

February 22, 2016

MEMORANDUM TO: William M. Dean, Director
Office of Nuclear Reactor Regulation

FROM: Scott A. Morris, Director */RA/*
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF COLLECTIVE CHANGES TO THE REACTOR
OVERSIGHT PROCESS

This memorandum transmits the results of the staff assessment of the unintended consequences and impacts of the aggregate changes made to the Reactor Oversight Process (ROP) from 2013 – 2015.

Background

In a memorandum, “Differing Professional Opinion Involving a Change in the Definition of a Repetitive Degraded Cornerstone – (DPO-2014-003),” dated June 11, 2015 (Agency Documents Access and Management System (ADAMS) Accession No. ML15194A444), you stated that the staff should provide an assessment of the unintended consequences of the collective changes made to the ROP during the period of time under consideration.

In SECY-15-0108, “Recommendation to Revise the Definition of Degraded Cornerstone as Used in the Reactor Oversight Process,” dated August 28, 2015 (ADAMS Accession No. ML15076A066), the staff described several changes to the ROP made recently or being considered by the staff that tended in the direction of perceived or actual reduced oversight, and that the staff planned to evaluate the efficacy of those changes as part of the annual ROP self-assessment process. Those changes included: (1) a revision to the definition of a “Repetitive Degraded Cornerstone” to extend the period before a licensee in Column 3, the “Degraded Performance” column, of the ROP Action Matrix is at risk for Column 4, the “Multiple/Repetitive Degraded Cornerstone” column, from four quarters to five quarters; (2) a revision to increase the number of findings with the same cross-cutting aspects required and the duration of those aspects before citing a cross-cutting issue; (3) ongoing reviews of the performance thresholds in certain deterministic Significance Determination Processes (SDPs); (4) potential changes to the scope of the component design basis inspection (CDBI); and

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(5) a change to the definition of “Degraded Cornerstone” from two White inputs to three White inputs in the same cornerstone.

Assessment

The goal of the assessment was to determine if the noted revisions to the ROP have led to unintended consequences or an unacceptable reduction in regulatory oversight. The staff completed an assessment of the impact of each individual change, and assessed the impact of the aggregate of changes to the ROP. The assessment was conducted by looking back to the beginning of the ROP to determine how the revised criteria would have impacted the assessment of licensee performance and subsequent regulatory actions taken. Staff evaluated whether the NRC would have missed any licensees exhibiting declining performance, keeping in mind that the ROP is designed to provide adequate margin in the assessment of licensee performance so that appropriate licensee and NRC actions are taken before unacceptable performance occurs.

Repetitive Degraded Cornerstone

The staff reviewed all plants that transitioned to Column 4 because of a Repetitive Degraded Cornerstone under the original definition of a cornerstone that was degraded for more than four quarters. The staff then applied the new criterion of more than five quarters (that was implemented on April 9, 2015) to determine if there were any licensees that would not have moved to Column 4 under the revised definition.

The staff determined that the change to the definition of Repetitive Degraded Cornerstone from more than four quarters to more than five quarters degraded would have had no impact on the licensees who transitioned to Column 4 under the original definition of Repetitive Degraded Cornerstone. All of those plants would have ultimately transitioned under the new definition, albeit one quarter later. The staff deems it unlikely that the one quarter delay would have resulted in a licensee approaching unacceptable performance because the licensee was already under increased regulatory oversight while in Column 3 of the Action Matrix.

Substantive Cross-Cutting Issues (SCCIs)

The original threshold for a cross-cutting “theme,” implemented in 2006, was four inspection findings with the same cross-cutting aspect (CCA) in the Human Performance (HU) or Problem Identification and Resolution (PI&R) areas in the previous 12-month period. An SCCI was assigned if a licensee met the criteria for a theme, and there was an NRC concern with the licensee’s ability to correct the theme.

The revised threshold for a cross-cutting theme is now six inspection findings with the same CCA in the HU or PI&R areas in the previous 12-month period. Additionally, there is a new cross-cutting theme at the cross-cutting area level when there are 20 inspection findings in the previous 12-month period with an HU aspect, or 12 inspection findings in the previous 12-month period with a PI&R aspect. A Cross-Cutting Issue (CCI) is assigned if a licensee has the same cross-cutting theme for three consecutive assessment periods.

Historically, 34 plants had SCCIs documented under the original criteria (some plants received more than one SCCI). Using the new criteria, nine plants would have received a CCI (four plants that were in Column 3 or 4; five plants that were in Column 1 or 2). Sixteen plants would have met the new criteria for a cross-cutting theme, but did not maintain the theme long enough to open a CCI. Because fewer licensees would have met the criteria for a cross-cutting theme under the revised process, the staff concluded that licensee corrective actions to address potential declining performance in the cross-cutting areas prior to crossing the new threshold were effective.

Twelve licensees would have met the new criteria for a cross-cutting theme at the area level. However, only four of those 12 licensees met the new criteria for a CCI at the cross-cutting area level: Cooper, Palo Verde, San Onofre, and Wolf Creek. Of these, Palo Verde and Wolf Creek were in Columns 4 and 3 respectively, so CCIs were consistent with degraded performance. Both Cooper and San Onofre were in Column 2.

The staff completed an effectiveness review of the original SCCI process in 2014 (ADAMS Accession No. ML14099A171). The staff concluded that SCCIs were not a leading indicator of declining licensee performance and that it was not possible to definitively conclude that the SCCI process was either effective or ineffective. As described in the SCCI effectiveness review, the staff could not establish a direct correlation between the former SCCI program and licensee performance as demonstrated by position in the Action Matrix. Eighty-six plants moved right in the Action Matrix without an SCCI. Only nine of the 31 units that transitioned to Column 3 because of two White inputs had documented SCCIs. This assessment concluded that using the new criteria would have resulted in cross-cutting themes or CCIs for several licensees more clearly exhibiting declining or degraded performance. The staff plans to conduct another effectiveness review of the new CCI process after the new criteria for CCIs have some "run time" to determine if there is a correlation between the new criteria and licensee performance.

Potential Changes to SDPs

The staff continues to review and refine the deterministic SDPs related to the Security Cornerstone. Licensee security programs are assessed in several different areas: access authorization, access control, physical protection, material control and accounting, Force-on-Force, and fatigue management. Recent revisions to the Force-on-Force SDP place more emphasis on a licensee's overall physical protection program vice solely relying on exercise performance. This may result in fewer greater-than-Green inspection findings in the Security Cornerstone. Other changes to SDPs for the Security Cornerstone may also result in fewer greater-than-Green inspection findings. Nonetheless, the staff views these changes to be more reflective of the actual risk associated with the specific performance deficiency.

Historically, the vast majority of inspection findings in the Security Cornerstone have been of low-to-moderate safety significance. When inspectors identify performance deficiencies in security programs, licensees are expected to implement immediate compensatory actions to address or correct those deficiencies. Only one licensee has transitioned to Column 3 of the Action Matrix because of more than one greater-than-Green input in the Security Cornerstone. In the case of that licensee, there have been no changes to the SDP for which the performance

deficiencies were evaluated, and therefore no impact on the number of greater-than-Green inspection findings documented. However, as a result of the change in the criteria for a Degraded Cornerstone, that licensee would not have transitioned to Column 3. That licensee would have still received increased oversight in the form of supplemental inspections. No licensees have moved to Column 4 because of degraded performance in the Security Cornerstone. Because multiple risk significant inspection findings in the Security Cornerstone are relatively rare, and licensees are expected to implement immediate compensatory measures whenever a performance deficiency is identified, changes to the SDPs in the Security Cornerstone are not expected to have a significant impact on the assessment of licensee performance.

There have been no efforts to revise the deterministic SDP thresholds for the Emergency Preparedness, Occupational Radiation Safety, or Public Radiation Safety Cornerstones, so those cornerstones were not included in this assessment.

Changes to the CDBI

Changes being made to the component design basis inspection include a reduction in the sample size for the inspection, while adding a review of the licensee's engineering program implementation to the scope of the inspection. Since the CDBI was introduced into the baseline inspection program, inspection teams have identified and documented over 800 inspection findings, which is a substantial number. All but two of those findings were determined to be of very low safety significance. A reduced sample size would have resulted in fewer inspection findings. It is not possible to determine whether the two safety significant inspection findings would have been missed with a reduced sample size. Those two findings may have been identified through other baseline inspection efforts if they had not been identified through the CDBI. Additionally, some of the Green inspection findings may have potentially become more safety significant if the CDBI teams had not identified them and licensees taken corrective actions. Given the historical data, the staff concluded that the changes to the CDBI would have resulted in very little change to the assessment of plant performance as described by the ROP Action Matrix.

Degraded Cornerstone

In the Staff Requirements Memorandum (SRM) to SECY-15-0108, dated December 2, 2015 (ADAMS Accession No. ML15335A559), the Commission approved the staff recommendation to revise the definition of a Degraded Cornerstone from two White inputs or one Yellow input to three White inputs or one Yellow input. The staff reviewed all licensees that transitioned to Column 3 because of two White inputs into the Action Matrix to determine the impact from changing the definition of a Degraded Cornerstone to three White inputs.

There were 31 plants that moved to Column 3 because of two White inputs. Of those 31, seven would have later transitioned under the other Column 3 criteria of either one Yellow input, or three White inputs in a Strategic Performance Area: Cooper (2001), Cooper (2008), Farley, Oconee 3, Perry, Pilgrim, and Point Beach 1. Therefore, under the revised definition of a Degraded Cornerstone, 24 plants would not have transitioned to Column 3 of the Action Matrix,

and would not have been subjected to the additional regulatory oversight required by the Action Matrix.

Of the 24 plants that would not have been subject to an Inspection Procedure (IP) 95002, "Supplemental Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area," a review of the IP 95002 inspection reports revealed that 21 of those units demonstrated adequate root cause analyses, extent-of-condition analyses, and corrective actions to address the safety significant issues without significant input from the independent extent-of-condition reviews conducted by NRC inspectors, as required by IP 95002. Three units failed to successfully meet all of the objectives of the IP 95002 supplemental inspection on the first try, primarily because of inadequate root cause evaluations or extent-of-condition evaluations. While these inadequate evaluations may have been identified under the IP 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area," supplemental inspection, it is not possible to definitively conclude that they would have been identified without the independent evaluations. However, a forthcoming revision to IP 95001 to review licensee common cause evaluations for units with two White inputs into the Action Matrix, as directed by the Commission as part of the definition change, will increase the likelihood that inadequate licensee evaluations will be identified. Additionally, if licensee performance should continue to degrade, an additional safety significant input into the Action Matrix will drive that unit into Column 3 under the revised definition of a Degraded Cornerstone, so the licensee will be subject to the additional oversight afforded by the IP 95002 supplemental inspection, maintaining an adequate margin from unacceptable performance.

While the staff concluded that there would have been no impact to the licensees that transitioned to Column 4 because of a Repetitive Degraded Cornerstone, there were two licensees that would not have met the criteria for Column 4 when taking into consideration the change in the definition of a Degraded Cornerstone: Cooper (2001) and Pilgrim (2015). Because Cooper failed to successfully complete the IP 95002 supplemental inspection, the inspection findings were held open more than four quarters, and Cooper may have met the new criteria for Column 4 if they were unable to complete the follow-up inspection by the end of the next quarter. However, because Cooper moved to Column 4 under the old criteria, the follow-up IP 95002 supplemental inspection was never scheduled. For both of these licensees, NRC inspectors identified a common performance concern, i.e., the inability to effectively correct problems resulting in degraded station performance. Because the NRC identified this issue in both cases, it is reasonable to assume that the NRC would have continued to stress a concern in this area in order to focus licensee improvement plans for corrective action programs, whether or not the licensees were in Column 4 of the Action Matrix. It is not possible to predict whether or not an Action Matrix deviation would have been requested in either case to provide any additional oversight necessary had those licensees not met the criteria for Column 4.

Conclusions Regarding Unintended Consequences and Aggregate Impact

Going forward, the staff expects fewer licensees will transition to Column 3 or 4 of the Action Matrix. This is because: (1) changes to the Security Cornerstone SDPs may result in fewer White inspection findings, (2) more White findings are required in a cornerstone before that

licensee meets the new definition of a Degraded Cornerstone, and (3) more White inputs would have to remain open for a longer period of time before a licensee meets the definition of a Repetitive Degraded Cornerstone. The result is that enhanced regulatory oversight in the form of more intrusive supplemental inspections would be delayed for licensees demonstrating declining performance. Declining performance is measured by a licensee's position in the Action Matrix because of safety significant inspection findings or performance indicators that cross a threshold. Performance indicators are a significant contributor to the assessment of licensee performance, and there have been no substantive changes to the thresholds for those indicators.

While implementation of more intrusive supplemental inspections may be delayed, every safety significant input will still receive enhanced regulatory oversight (i.e., IP 95001 supplemental inspection), ensuring licensees adequately addressed the root causes of their declining performance, and have implemented corrective actions to address their performance deficiencies. Licensee performance is continuously assessed through the observations of the resident inspectors and daily discussions with Regional management, ensuring the margin to unacceptable performance is maintained. One unintended consequence that might be considered a benefit of the changes would be that NRC engagement can occur sooner and at a lower level when implementing the lower level supplemental inspections (i.e., IP 95001). It generally takes licensees significantly more time to prepare for the higher level supplemental inspections, further delaying NRC oversight activities associated with the deficient performance.

Additionally, the ROP deviation process is always available to increase regulatory oversight for licensees exhibiting declining performance before tripping PI thresholds or waiting for a safety significant inspection finding.

The staff will continue to evaluate changes made to the ROP as part of the annual ROP self-assessment process to ensure adequate margin continues to exist in the assessment of licensee performance so that appropriate licensee and NRC actions are taken before unacceptable performance occurs.

Enclosure:
Impact of Cumulative Changes to ROP

licensee meets the new definition of a Degraded Cornerstone, and (3) more White inputs would have to remain open for a longer period of time before a licensee meets the definition of a Repetitive Degraded Cornerstone. The result is that enhanced regulatory oversight in the form of more intrusive supplemental inspections would be delayed for licensees demonstrating declining performance. Declining performance is measured by a licensee's position in the Action Matrix because of safety significant inspection findings or performance indicators that cross a threshold. Performance indicators are a significant contributor to the assessment of licensee performance, and there have been no substantive changes to the thresholds for those indicators.

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Enclosure:
Impact of Cumulative Changes to ROP

ADAMS Accession Number.: ML16034A346

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Impact of Cumulative Changes to ROP

Revising Definition of Repetitive Degraded Cornerstone from More than Four Quarters to More than Five Quarters

Licenses meeting criteria for Column 4 since ROP Inception:

Plant	Date	Reason
Indian Point 2	2000	Red finding
Cooper	2002	Repetitive Degraded
Oconee 1	2002	Repetitive Degraded
Point Beach 1&2	2003	Red finding
Perry	2004	Repetitive Degraded
Palo Verde 3	2006	Repetitive Degraded
Browns Ferry 1	2010	Red finding
Ft. Calhoun	2011	Repetitive Degraded/Red finding
Perry	2012	Repetitive Degraded
Monticello	2014	Repetitive Degraded
ANO 1&2	2014	2 Yellow findings
Pilgrim	2015	Repetitive Degraded

Fourteen units met the criteria for Column 4 since ROP inception.

Six units initially moved to Column 4 because of a Red input or multiple Yellow inputs into the Action Matrix. Although Davis-Besse also received a Red finding in 2002, the plant was not included in this list because it was never placed into Column 4. Davis-Besse was placed into IMC 0350 oversight before the Red finding was assessed.

Seven units transitioned to Column 4 under the original definition of a Repetitive Degraded Cornerstone, a cornerstone degraded for more than four consecutive quarters. Of those seven, three received deviations to either not implement the IP 95003 supplemental inspection, or keeping them out of Column 4 (Oconee 1, Perry (2012), Monticello).

Of the four remaining units meeting the old criteria for Repetitive Degraded Cornerstone, Ft. Calhoun would have moved to Column 4 because of an additional Red finding, Perry (2004) (failed 95002) and Palo Verde (failed 95002) would have met the revised definition of Repetitive Degraded Cornerstone because their cornerstones were degraded for more than five quarters. The fourth plant, Cooper, had several inspection findings in the early implementation of the ROP. Cooper had four white findings in EP (3Q2000, 2Q2001, 3Q2001, 3Q2001) and one white finding in MS (4Q2001). The EP cornerstone was considered degraded beginning 2Q2001 (two white inputs), and remained degraded because of two additional white inputs commencing 3Q2001, with an additional white input commencing in 4Q2001. The two white findings opened in 3Q2001 and the held open white finding from 2Q2001 were inspected in April 2002 (report 02-05, dated June 13, 2002), and the licensee did not successfully complete the supplemental inspection. The three white findings were held open longer than 4 quarters. Therefore, the licensee would have met the revised definition of repetitive degraded cornerstone since the EP cornerstone was degraded for longer than five consecutive quarters. They also had an additional white input from another cornerstone so they met the criteria for the 2006

revised definition requiring an additional inspection finding before being considered repetitive degraded.

The final plant on the list, Pilgrim, transitioned to Column 4 under the revised definition of a Repetitive Degraded Cornerstone, i.e., a cornerstone that was degraded for more than five consecutive quarters. Because Pilgrim had a Degraded Cornerstone for more than five consecutive quarters, they would have also met the original criteria of a Repetitive Degraded Cornerstone.

In summary, the change to the definition of repetitive degraded cornerstone from more than four quarters to more than five quarters degraded would have no impact on the licensees who ultimately transitioned to Column 4 under the original definition of repetitive degraded cornerstone. The revised definition of repetitive degraded cornerstone may have resulted in fewer deviations to the Action Matrix. For instance, Perry met the criteria because the licensee failed the IP 95002 supplemental inspection. An extra quarter to prepare may have precluded Perry's supplemental inspection failure negating the need for a deviation.

Change to Threshold for Cross-Cutting Theme and Substantive Cross-Cutting Issues

Original threshold for cross-cutting theme: 4 findings with the same cross-cutting aspect (CCA) in Human Performance (HU) or Problem Identification and Resolution (PI&R) areas in previous 12-month period.

Substantive cross-cutting issue (SCCI): meet criteria for a theme and NRC concern with licensee's ability to correct.

New threshold for cross-cutting theme: 6 findings with the same CCA in HU or PI&R areas in previous 12-month period.

New cross-cutting theme in HU area: 20 findings in previous 12-month period

New theme in PI&R area: 12 findings in previous 12-month period

Cross-cutting Issue (CCI): 3 consecutive assessment periods with the same cross-cutting theme.

Licensees meeting the new criteria (from EOC 2006 – MC 2015):

Licensee	Assessment Period	CCA	Number of findings	Cross-Cutting Area Theme	Number of Findings	Action Matrix
Indian Point	MC 2006	H.2(c)	7			2/1
Salem	MC 2007	H.4(b)	6			1
	EOC 2008	H.2(c)	7			1
	MC 2009	H.2(c)	7			1
Susquehanna	EOC 2011	P.1(c)	6			3
Vermont Yankee	MC 2008	H.2(c)	6			2/1
	EOC 2008	H.2(c)	6			1
Browns Ferry	MC 2010	P.1(c)	6			3
	EOC 2012	H.2(c)	6			4
Byron	MC 2008	H.1(b)	6			2
Fermi	MC 2010	H.2(c)	6			1
Kewaunee	EOC 2006	H.4(b), P.1(c)	7, 6			3
		P.1(c)	6			3

	MC 2007 EOC 2007	H.4(b), P.1(c)	7, 7			3
Palisades	EOC 2008 EOC 2011	H.2(c)	6	HU	24	1/2 1/3
Perry	MC 2009			HU	20	1
Point Beach	MC 2007 EOC 2007 MC 2008 EOC 2008	H.2(c) H.2(c) H.2(c), P.1(d) H.2(c), P.1(d)	6 9 8, 8 7, 6			4/1 1 1 1
Prairie Island	MC 2009 EOC 2009	H.1(b) H.2(c), H.4(b)	6 6, 7	HU HU	25 26	1/2 2
Quad Cities	EOC 2007	H.2(c)	7			2/1
ANO	EOC 2007	H.1(b)	7			1
Callaway	EOC 2006 MC 2007 EOC 2007	P.1(c) P.1(c) P.1(c)	11 11 6	PI&R PI&R	14 14	2 2/1 1
Columbia	MC 2012			HU	20	1/3
Cooper Note 1	MC 2007 EOC 2007 EOC 2009 MC 2010 EOC 2010 MC 2011 EOC 2011 MC 2012 EOC 2012 MC 2013 EOC 2013	H.2(c) H.2(c) H.4(a) H.4(a) H.1(b) H.1(b), P.1(c) H.1(b), H.4(a), P.1(c) H.1(b), P.1(c) H.1(b), P.1(c) H.1(b) H.1(b)	6 9 7 6 6 11, 6 6, 6, 7 10, 8 13, 8 13 7	 HU HU, PI&R HU, PI&R HU HU	 22 24, 14 22, 14 25 31	1/2 2 2/1 1 1 1/2 2 2/1 1 1 1
Diablo Canyon	MC 2009 EOC 2009 MC 2010 EOC 2010 MC 2011	P.1(c) P.1(c) P.1(c) H.1(b), P.1(c) H.1(b), P.1(c)	7 6 14 8, 15 8, 7	 PI&R PI&R	 21 23	1 1 1 1 1
Ft Calhoun Note 5	EOC 2007 MC 2015	H.2(c) H.14, P.2	6 7, 7	 HU, PI&R	 32, 12	2/3 1
Grand Gulf	EOC 2007 EOC 2012	H.1(b)	8	HU HU	21 20	1 1
Palo Verde Note 2	EOC 2006 MC 2007 EOC 2007 MC 2008 EOC 2009	H.4(b), P.1(c) P.1(a), P.1(c) H.1(b), H.4(a) P.1(a), P.1(c) H.4(a), P.1(c)	10, 8 8, 6 7, 7 6, 7 8, 7	HU, PI&R HU, PI&R HU, PI&R HU, PI&R PI&R	26, 12 24, 14 36, 22 36, 18 13	3/4 4 4 4 4/1
River Bend	EOC 2006 MC 2007 EOC 2007	H.4(a) H.4(a) H.4(a)	7 10 6			1 1 1
San Onofre Note 3	EOC 2007 MC 2008 EOC 2008	P.1(c) P.1(c) P.1(c)	6 6 7			1 1 2

	MC 2009	H.4(a), P.1(c)	6, 7	HU	21	2
	EOC 2009	None		HU, PI&R	23, 13	2
	MC 2010	H.4(b),	9, 6	HU, PI&R	33, 19	2
		H.4(c),	7, 8			
	EOC 2010	P.1(a), P.1(c)	6, 9	HU	30	2/1
		H.1(b), H.4(b)				
Waterford	MC 2008	H.4(a)	6			1
Wolf Creek	MC 2008	P.1(c), P.1(d)	7,7	PI&R	19	1
	EOC 2008	H.2(c), P.1(c)	6, 8	PI&R	17	1
Note 4		P.1(d)	8			
	EOC 2009	P.1(c)	12	HU, PI&R	21, 21	1/2
	MC 2010	P.1(c)	13	PI&R	21	2/3
	EOC 2010	H.2(c), P.1(c)	6, 8	PI&R	20	3
		P.1(a)	6			
	MC 2011	H.2(c),	8, 10	HU, PI&R	25, 20	3/1
		P.1(c), P.1(d)	6			
	EOC 2011	P.1(c)	7			3/1
	MC 2012	H.2(c)	8			1/3
	EOC 2012	H.2(c)	7			3

Met criteria for a CCI

Note 1: Cooper met criteria for CCIs in P.1(c) (MC 2011 – EOC 2012); and H.1(b) (EOC 2010 – EOC 2013); and HU (MC 2011 – EOC 2012)

Note 2: Palo Verde met criteria for CCIs in P.1(c), HU, and PI&R (EOC 2006 – MC 2008)

Note 3: San Onofre met criteria for CCIs in P.1(c) (EOC 2007 – MC 2009); and HU (MC 2009 – EOC 2010)

Note 4: Wolf Creek met criteria for CCIs in P,1(c) (EOC 2009 – EOC 2011); and PI&R (EOC 2009 – MC 2011)

Note 5: Fort Calhoun data not evaluated while under IMC 0350 process. MC 2015 reflects findings from the IMC 0350 process and most are expected to drop off at the next assessment period.

Summary

Old criteria: 34 plants met criteria for SCCIs (some plants more than one SCCI and/or more than one time)

New criteria: 9 plants met criteria for CCIs (4 plants in Col 3/4; 5 plants in Col 1/2)
16 plants met criteria for theme, but not a CCI

Old criteria: 28 plants were in Column 3 or 4 with no SCCI (some plants made multiple entries into Column 3 or 4)
14 plants were in Column 3 or 4 with an SCCI (some plants made multiple entries into Column 3 or 4)
45 plants were in Column 1 or 2 with an SCCI (some plants assigned SCCIs more than once)

New criteria: 4 plants in Column 3 or 4 met criteria for a CCI
5 plants in Column 3 or 4 met criteria for a cross-cutting theme, but not a CCI
4 plants met the criteria for a CCI at the backstop area level

Five of the 14 plants in Columns 3 or 4 that were assigned SCCIs under the old criteria did not meet the criteria for a CCI under the new criteria. (Salem, Robinson, Monticello, Perry [2006, 2011]).

Salem had an SCCI in HU prior to moving to Column 3 in 2007.

Browns Ferry had an SCCI in PI&R prior to moving to Column 4 in 2010.

Kewaunee had SCCIs in HU and PI&R prior to moving to Column 3 in 2007 (repeat move).

Perry had an SCCI in HU prior to moving to Column 3 in 2011.

Fort Calhoun had an SCCI in HU prior to moving to Column 3 in 2007.

Palo Verde had SCCIs in HU and PI&R prior to moving to Column 4 in 2006.

Wolf Creek had an SCCI in PI&R prior to moving to Column 3 in 2010 and 2012.

Columbia had an SCCI in HU prior to moving to Column 3 in 2012.

Conversely, 27 plants moved to Columns 3 or 4 with no SCCIs under old criteria.

SCCI Effectiveness Memo concluded that SCCIs are not a leading indicator of declining licensee performance.

Revising Definition of Degraded Cornerstone from Two White Inputs to Three

Licensees initially transitioned to Column 3 because of 2 White inputs in one cornerstone since implementation of the ROP:

Plant	Entered Column 3	Exited Column 3	Column1	Cornerstone	SCCs
Braidwood	1Q2002	4Q2002	1-W-F, 1-W-PI	MS	None
Browns Ferry 2	4Q2012	3Q2014	1-W-F, 1-W-PI	MS	PIR
Brunswick 1	1Q2007	3Q2007	1-W-F, 1-W-PI	MS	None
Columbia	2Q2012	2Q2013	2-W-F	EP	HU
Cooper	2Q2001	1Q2002	2-W-F	EP	PIR
Cooper	2Q2008	4Q2008	2-W-F	MS	None
DC Cook 2	2Q2002	2Q2003	2-W-F	MS	PIR
DC Cook 2	4Q2003	2Q2004	2-W-PI	IE	PIR
Duane Arnold	3Q2013	3Q2014	2-W-F	MS	None
Farley 1	3Q2007	2Q2008	1-W-F, 1-W-PI	MS	None
Fort Calhoun	2Q2007	1Q2008	1-W-F, 1-W-PI	MS	HU
Ginna	3Q2009	3Q2010	1-W-F, 1-W-PI	MS	None
Harris	2Q2002	3Q2003	2-W-F	MS	None
Hatch 2	4Q2009	3Q2010	2-W-F	MS	None
Millstone 2	1Q2001	2Q2001	1-W-F, 1-W-PI	MS	PIR
Oconee 3	2Q2001	2Q2002	2-W-F	MS	None
Oconee 1	4Q2006	2Q2007	1-W-F, 1-W-PI	MS	None
Oconee 2	4Q2006	2Q2007	1-W-F, 1-W-PI	MS	None
Oconee 3	4Q2006	3Q2007	1-W-F, 1-W-PI	MS	None
Oyster Creek	3Q2005	4Q2005	2-W-F	EP	PIR
Perry	4Q2003	1Q2004	2-W-F	MS	None
Perry	2Q2011	3Q2013	1-W-F, 1-W-PI	ORS	HU
Pilgrim	4Q2013	1Q2015*	2-W-PI	IE	None
Point Beach 1	1Q2013	1Q2015	2-W-F	MS	None
Sequoyah 1	1Q2013	4Q2013	2-W-F	MS	None
Sequoyah 2	1Q2013	4Q2013	2-W-F	MS	None
St. Lucie 1	1Q2012	4Q2012	2-W-PI	IE	None
Summer	2Q2010	3Q2011	2-W-F	S	None
Surry 1	1Q2004	3Q2004	1-W-F, 1-W-PI	MS	None
Susquehanna 1	1Q2011	1Q2012	1-W-F, 1-W-PI	IE	None
Susquehanna 2	3Q2013	3Q2014	2-W-PI	IE	None

*= Licensee transitioned to Column 4

Of the 31, four transitioned due to two White PIs (all Unplanned Scrams per 7000 hours and Unplanned Scrams with Complications). Pilgrim moved to Column 3 initially for two White PIs. Failure to complete the 95002 resulted in parallel White inspection findings being assigned. One additional White finding issued (three total in Strategic Performance Area). Licensee actually

moved to Column 4 after meeting criteria for repetitive degraded cornerstone. **However, Pilgrim would not have met the criteria for Column 4 with the revised definition of three White inputs in the same cornerstone to be a Degraded Cornerstone.**

Thirteen units transitioned due to one White PI and one White finding. (MS – 11; IE – 1; ORS – 1)

- Farley – one additional White PI (MSPI-EAC) (three total in Strategic Performance Area)
- Oconee 3 – one additional White finding in MS (three total in Strategic Performance Area)
- Perry – PI crossed into Yellow

Fourteen units transitioned due to two White findings in the same cornerstone (MS – 10; EP – 3; S -1)

- Cooper (EP) – two additional White findings in EP (four total)
- Cooper (MS) – one additional White finding in MS (three total in Strategic Performance Area)
- Point Beach 1 (MS) – one additional White finding in EP (three total in Strategic Performance Area)
- Pilgrim (IE) – one additional White finding in MS (three total in Strategic Performance Area)

Summary: Of the 31 licensees that transitioned to Column 3 because of two White inputs in the same cornerstone, seven of those ultimately would have transitioned to Column 3 based on the additional criteria of either one Yellow input, or three White inputs in a Strategic Performance Area. Therefore, there were a total of 24 licensees that transitioned to Column 3 solely because of two White inputs in the same cornerstone.

Units requiring re-inspection:

- Fort Calhoun (2008): Licensee entered Column 3 on 1 White PI (SSFF) and 1 White finding. PI returned to Green next quarter, but licensee got a second White finding in MS when the PI returned to Green. Needed re-inspection because of concerns with extent of condition and to verify completion and adequacy of action items for preventative maintenance, so one finding was left open. No additional findings from 95002. Common themes included inadequate maintenance, post-maintenance testing, or corrective actions. Additional White finding, while not an input that would have triggered the criterion of three White inputs in a Strategic Performance Area, could have been indicative of a degraded cornerstone.
- Oyster Creek (2005): two White findings in Emergency Preparedness. Findings had two different causes with no commonality between them. No findings from the 95002 inspection. Required re-inspection because of a concern with weaknesses in operator procedure use and adherence. A biennial graded EP exercise completed after both findings were identified but before the 95002 inspection resulted in no findings, indicating the cornerstone may not have been degraded.
- Susquehanna 1 (2012): One White PI and one White finding in Initiating Events. One Green finding resulted from the 95002 inspection. Required re-inspection because licensee extent of condition and extent of cause evaluations were weak, and the licensee had not made sufficient progress in their procedure quality upgrade project for internal flooding, so White finding held open. Root causes included less than adequate risk informed decision-making, less than adequate

PI&R including CAP, procedure use and adherence, inadequate maintenance and management oversight (recurring causes since 2008).

- Of the 15 units reviewed, only one demonstrated declining performance within four quarters of returning to Column 1. Most showed no declining performance within two years of returning to Column 1.

Licensees that transitioned to Column 4 for a Repetitive Degraded Cornerstone (Impact of Revised Definition of Degraded Cornerstone to at Least Three White Inputs in the Same Cornerstone):

Cooper (2002) - Cooper had several inspection findings in the early implementation of the ROP. Cooper had four white findings in EP (3Q2000, 2Q2001, 3Q2001, 3Q2001) and one white finding in MS (4Q2001). The EP cornerstone was considered degraded under the old definition beginning 2Q2001 (two white inputs), and remained degraded because of two additional white inputs commencing 3Q2001, with an additional white input commencing in 4Q2001. The two white findings opened in 3Q2001 and the held open finding from 2Q2001 were inspected in April 2002 (report 02-05, dated June 13, 2002), and the licensee did not successfully complete the supplemental. Therefore, the three white findings were held open longer than four quarters. Therefore, the licensee would have met the revised definition of repetitive degraded cornerstone since the EP cornerstone was degraded for longer than five consecutive quarters. They also had an additional white input from another cornerstone so they met the criteria for the 2006 revised definition requiring an additional inspection finding before being considered repetitive degraded. However, under the revised definition of Degraded Cornerstone requiring three White inputs in the same cornerstone, the EP cornerstone would have been considered degraded starting 3Q2001. The licensee failed to successfully complete the IP 95002 supplemental inspection in 2Q2002; therefore, the three white findings were held open, so the cornerstone was degraded for at least four quarters. Under the revised definition of Repetitive Degraded Cornerstone, Cooper would not have transitioned to Column 4 beginning 2Q2002. Because they did transition under the original definition, the follow-up IP 95002 was never scheduled. If it had been scheduled and Cooper had successfully completed the follow-up IP 95002 supplemental inspection by the end of 3Q2002, they would not have met the criteria for Column 4. If they had not completed the follow-up supplemental inspection, Cooper would have still moved to Column 4 under the new criteria.

Perry (2004) (failed 95002) – would have still transitioned to Column 4 with revised definition of Degraded Cornerstone because of four White inputs in the same Strategic Performance Area, and three White inputs in the same cornerstone.

Palo Verde (2006) (failed 95002) - would have still transitioned to Column 4 with revised definition of Degraded Cornerstone because of one Yellow and one White input (met revised definition of Repetitive Degraded Cornerstone).

Fort Calhoun (2011) – would have still transitioned to Column 4 with revised definition of Degraded Cornerstone because of one Red input.

Pilgrim (2015) - transitioned to Column 4 after the new criteria for a Repetitive Degraded Cornerstone was in effect. Pilgrim would not have met the criteria for a Repetitive Degraded Cornerstone with the revised definition of Degraded Cornerstone (only two White inputs in the same cornerstone, as the cornerstone was not degraded for more than five quarters).