Enclosure 2
Meeting Summary Handouts
of the October 20, 2010
ROP Public Meeting
**Dated November 5, 2010**

# REACTOR OVERSIGHT PROCESS (ROP)
# MONTHLY PUBLIC MEETING AGENDA

October 20, 2010; 9:00 AM – 2:00 PM; The Legacy Hotel;
The Georgetown Room – 1775 Rockville Pike, Rockville, MD 20851

| | |
|---|---|
| 9:00 – 9:05 AM | Introduction and Purpose of Meeting |
| 9:05 – 9:25 AM | Operating Experience Branch Topics<br>1. General inspection topics of interest<br>2. Opportunity for public comment |
| 9:25 – 9:45 AM | Reactor Inspection Branch Topics<br>1. General assessment topics of interest<br>2. Opportunity for public comment |
| 9:45 – 10:00 AM | Performance Assessment Branch Topics<br>1. General assessment topics of interest<br>2. Opportunity for public comment |
| 10:00 – 11:30 AM | Discussion of Performance Indicator (PI) Topics<br>1. Potential NEI 99-02 guidance changes<br>• MSPI EDG boundary conditions (FOTP modeling options)<br>• MSPI EDG failure mode definitions (1999-2001 failure data review)<br>• MSPI basis document update process<br>2. Opportunity for public comment |
| 11:30 AM – 12:30 PM | Lunch |
| 12:30 – 1:45 PM | Discussion of Open and New PI Frequently Asked Questions (FAQs)<br><br>*Note: Topic may be moved up if meeting is ahead of schedule. The latest draft FAQs is located on the public web at: http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/draft_faqs.pdf. This list is subject to change the day before the meeting based on availability of new draft FAQs provided by the Nuclear Energy Institute. Public comments will be addressed on FAQs following the discussion.* |
| 1:45 – 2:00 PM | Future Meeting Dates, Action Items, Future Agenda Topics |

*Breaks will be taken as needed*

**NRC Handout – SCCI and Cross-Cutting Theme Terminology**

**Excerpts from Current IMC 0305 Revision (Issue Date 12/24/09):**

04.20 Substantive Cross-Cutting Issue (SCCI). An SCCI is a cross-cutting theme that has been identified in PI&R, HU, or SCWE about which the NRC staff has a concern with the licensee's scope of efforts or progress in addressing the cross-cutting theme.

13.02 Criteria for Substantive Cross-Cutting Issues. An SCCI in the HU, PI&R, or SCWE cross-cutting areas exists if (1) a cross-cutting theme(s) in these cross-cutting areas exists and (2) the NRC staff has a concern with the licensee's scope of efforts or progress in addressing the cross-cutting theme(s).

13.03 Documentation and Follow-Up Actions

a. The assessment letter should summarize the specific SCCI by describing:

…

2. The single SCCI and each individual cross-cutting theme of that SCCI;

…

6. The criteria for clearing the cross-cutting issue. Examples of criteria include, but are not limited to:

…

- Increased confidence in the licensee's corrective action program and their ability to correct the issues. In this case, if the staff had confidence in the licensee's program, even in situations where the SCCI threshold was exceeded, then the SCCI would be cleared.

…

*For an SCCI with multiple cross-cutting themes, all of the cross-cutting themes need to be cleared before the SCCI can be cleared.* [emphasis added]

…

f. In the second consecutive assessment letter identifying the same SCCI with the same cross-cutting aspect,…

…

g. In the third consecutive assessment letter identifying the same SCCI with the same cross-cutting aspect, the regional office would typically request that the licensee perform an assessment of safety culture.

**Example:**

| SCCI: | MC1 | EOC1 | MC2 | EOC2 | MC3 | EOC3 |
|---|---|---|---|---|---|---|
| H.1.a | SCCI, T | SCCI, T | | | | |
| H.2.a | | | SCCI, T | SCCI, T | SCCI, T | |
| H.2.b | | | | SCCI, T | SCCI | |

T – indicates that a theme existed in the assessment period

An SCCI in H.1.a is opened in MC1. Per IMC 0305, the "overall" SCCI still exists in MC2 because H.1.a was closed, but H.2.a was opened.

A safety culture assessment would not be requested per IMC 0305 until MC3 because it is the third consecutive letter with the same SCCI *with the same aspect* (H.2.a). NRC would not request a safety culture assessment per IMC 0305 in MC2 because the "overall" SCCI doesn't have one aspect that has lasted for three consecutive letters. This concept may not be understood by stakeholders if the focus is on the duration of the "overall" SCCI.

In MC3, IMC 0305 directs the NRC to state that there's one human performance SCCI with two themes; however, there are two SCCIs – one for H.2.a and one for H.2.b, but only one theme exists (H.2.a). It is possible for an SCCI to remain open even though the theme criteria are not met.

**Proposed Draft Guidance in IMC 0305:**

14.02 Substantive Cross-Cutting Issues.

An SCCI ~~in the HU, PI&R, or SCWE cross-cutting areas~~ exists if (1) a cross-cutting theme~~(s) in these cross-cutting areas~~ exists and (2) the NRC staff has a concern with the licensee's scope of efforts or progress in addressing the cross-cutting theme. In evaluating whether the second criterion is met, the regional offices should consider if any of the following situations exists:

…

Multiple SCCIs in the same cross-cutting area shall be represented individually and not combined into one overall SCCI for that cross-cutting area. ~~For an SCCI having multiple cross-cutting themes, all of the cross-cutting themes need to be cleared before the SCCI can be cleared.~~

14.03 Closing Substantive Cross-Cutting Issues.

…

b. The regional office shall establish the criteria for closing the SCCI. Examples of closure criteria include, but are not limited to, the following or any combination of the following:

1. Fewer findings with the same ~~causal factor~~ CCA as the SCCI. In this case, if the number of findings in the current assessment ~~was~~ period is less than the number of findings when the ~~cross-cutting issue~~SCCI was opened, then the SCCI would be ~~cleared~~closed.

2. Increased confidence in the licensee's ~~corrective action program and their~~ ability to address ~~correct~~ the ~~issues~~ SCCI. In this case, if the staff has confidence in the licensee's ~~program~~ scope of efforts or progress in addressing the SCCI, even ~~in situations where the SCCI threshold was exceeded~~ though the cross-cutting theme criteria continue to be met, then the SCCI would be ~~cleared~~ closed.

3. An improving ~~The~~ trend in the number of findings with the same CCA as the SCCI during the ~~two~~ most recent ~~6-month~~half of the assessment period. In this case, if the licensee made significant improvements in the last half of the assessment period but still meets the cross-cutting theme criteria, then the SCCI could be closed. ~~can also be evaluated when considering whether to clear the SCCI.~~

c. The decision to continue to ~~highlight~~ identify an SCCI in the next assessment letter will be based on the whether the closure criteria established in the assessment letter were met. ~~used to initiate the SCCI. In this case, the PI&R and HU findings for a 12-month assessment period or the SCWE findings for an 18-month period will be analyzed against the conditions listed in Section 13.02. For example, if the number of findings with the same CCA as the SCCI was cited as an exit criterion, and the number of findings in the current assessment is less than the cross-cutting theme threshold, the existing SCCI will be cleared unless there is an overlapping CAL that remains open.~~

14.04 Follow-up Actions for Substantive Cross-Cutting Issues.

c. In the second consecutive assessment letter identifying the same SCCI ~~with the same CCA~~, …

d. In the third consecutive assessment letter identifying the same SCCI ~~with the same CCA~~, …

e. If ~~an~~ the same SCCI ~~with the same CCA~~ is identified beyond the third consecutive assessment letter...

**Example assessment letter boilerplate language for multiple SCCIs:**

"In the area of [HU, PI&R, SCWE] we identified that substantive cross cutting issues exist associated with the [cross-cutting aspect(s) of (enter alpha-numeric identifier(s)), if applicable]."

**Proposed new wording to NEI 99-02, Rev 6, page 33 lines 37-43, page 34 lines 1-45, and page 35, lines 1-2 for discussion at the September 2010 ROP Monthly Working Group Public Meeting**.
*Incorporates Roy's comments at the September 15th public meeting*
Updated: 10-20-2010

**Documentation and Changes**

Each licensee will have the system boundaries, monitored components, monitored functions, and success criteria which differ from design basis readily available for NRC inspection on site. Design basis criteria do not need to be separately documented. Additionally, plant-specific information used in Appendix F should also be readily available for inspection. An acceptable format, listing the minimum required information, is provided in Appendix G**.** As stated in the Introduction section of NEI 99-02, plant-specific comments (with sufficient detail) shall be provided in the data submittal when either the MSPI basis document or an MSPI coefficient is changed.~~The objective of maintaining an accurate basis document is to administratively reflect the current as-built plant which in turn supports inspection activities that verify performance indicator implementation.~~ Changes to the site PRA of record, the site basis document, and the CDE database should be made in accordance with the following:

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***PRA model revisions:*** Updates to the MSPI coefficients (which are directly obtained from the plant specific PRA) will be made in the quarter following approval of an update to the plant-specific PRA of record. Thus, the MSPI coefficients in use at the beginning of a quarter will remain in effect for the remainder of that quarter. In addition, changes to the CDE database and MSPI basis document that are necessary to reflect changes to the plant-specific PRA of record should be incorporated prior to the next quarter's data submittal. ~~The quarterly data submittal should include a comment that provides a summary of any changes to the MSPI coefficients. The comments automatically generated by CDE when MSPI coefficients are changed do not fulfill this requirement. The plant must generate a plant-specific comment that describes, in sufficient detail, what was changed.~~ For example, if a plant's PRA model of record is approved on September 29 (3rd quarter), MSPI coefficients based on that revised PRA model of record should be used for the 4th quarter. Updates to the MSPI basis document and the CDE database should be made prior to reporting the 4th quarter's data (i.e., completed by January 21).

***Changes to non-PRA information:*** Updates to information that are not directly obtained from the PRA (e.g., unavailability baseline data, estimated demands/run hours) can affect both the MSPI basis document and the MSPI inputs into the CDE database. Changes to the MSPI basis document and MSPI inputs into the CDE database that are needed to reflect changes to non-PRA information will be made prior to the next quarterly data submittal. . The quarterly data submittal should include a comment that provides a summary of any changes to the MSPI basis document and MSPI inputs to the CDE database. Any comments automatically generated by CDE when information or data is changed do not fulfill this requirement. ~~The plant must generate a plant-specific comment that describes, in sufficient detail, what was changed.~~

***Plant Modifications:*** Any changes to the plant should be evaluated for their impact on the MSPI basis document, MSPI inputs into the CDE database, and the PRA of record. Plant modifications have the potential to involve both changes to the PRA model and non-PRA information, while some modifications may be limited to either the PRA model or non-PRA information. Modifications to the plant design that result in a change to segment or train boundaries, monitored components, or affect monitored functions or success criteria, shall be reflected in the MSPI basis document the quarter following the completed implementation. Additionally, if modifications are made to sub-components within the boundary of a monitored component (such as the replacement of an emergency AC voltage regulator with a different type) and that sub-component is described in the basis document, the basis document should be updated to reflect the sub-component modification the quarter following the completed implementation (if the sub-component is not modeled in the PRA). If the subcomponent is modeled in the PRA then the basis document should be updated the quarter following approval of an update to the plant-specific PRA of record.

If the plant modification has the potential to impact the PRA model in a manner that affects MSPI results, the modification shall be evaluated against the following criteria:~~in accordance with ASME/ANS RA-Sa-2009 Section 1-5 (Reference X)~~.

1) If a change results in a factor of 3 change in the corrected Birnbaum value of an MSPI monitored train or component, *and* the new Birnbaum value is greater than 1E-6, the

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MSPI basis document shall be updated to reflect the new Birnbaum values the quarter following the completed implementation.

2) The use of supplemental evaluations to estimate the revised MSPI inputs for pending PRA model changes is allowed as an interim alternative until PRA model of record is updated.

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~~The quarterly data submittal should include a comment that provides a summary of any changes to the basis document. Any comments automatically generated by CDE when information or data is changed do not fulfill this requirement. The plant must generate a plant specific comment that describes, in sufficient detail, what was changed.~~

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Examples to help illustrate the level of effectiveness of the proposed guidance:
*--(Note: intended to be added as examples to NEI 99-02, the purpose of the examples is to test the guidance changes to verify the desired result is attained)*

1) **AFW pump modification**:

Jan 2010 - planning begins for the AFW install for the Fall 2010 RFO.
Winter, Spring, Summer 2010 – in addition to procuring the AFW hardware:

a) Proposed PRA model updates to account for the AFW pump mod begin. Includes adding the new AFW train to the fault tree, adding all the basic event parameters, performing a sensitivity analysis, re-quantifying the PRA, etc.
b) MSPI Basis Document mark-ups begin. Includes adding AFW pump mod to the PI&D, listing the new monitored components (maybe just the AFW pump and no valves?), basis for demands/run hours (also to be used for CDE inputs), and PRA information used in MSPI (i.e., Unavailability and Unreliability FV and UR, CCF, Unavailability baseline data, assumptions)
c) Software changes to CDE (via INPO). Need to add the new monitored component(s) to CDE.

Nov 2010 – AFW pump, piping, valves, electrical power, indications, sensors are installed during the RFO.
Jan 9th, 2011 – before or after unit start-up the new AFW pump mod is tested satisfactorily and implementation is deemed complete.
Jan 19th, 2011 – the PRA model of record is revised to include the AFW pump mod.
April 1st, 2011 – new MSPI coefficients and MSPI inputs into CDE for AFW (Heat Removal System) can start to be used for the monthly recording for 2nd quarter data.
July 21st, 2011 – new MSPI coefficients and MSPI inputs into CDE for AFW (Heat Removal System) need to be used in the 2nd quarter data submittal. Also, the MSPI basis document has to be revised to incorporate the complete impact of the AFW pump mod.

2) **Change from *estimated* demands/run hours for the HPCI pump to *actual* demands/run hours.**

May 2011 – decide to use actuals instead of estimates.
July 1st, 2011 – can start using the actual demands and run hours for HPCI for the monthly recording of 3rd quarter data.
Oct 21st, 2011 – need to use the actual demands and run hours for HPCI to report the 3rd quarter data submittal. Also, the MSPI basis document has to be revised to reflect the change from estimates to actuals.

??? If a site wants to change to actual can they start with the actuals of the most recent quarter and use estimates for the previous 11 quarters? Or do they have to wait to get 12 quarters of actual to take the "actual" route towards demand counting???

3) **Procedure change to credit an operator action which in turn impacts a MSPI coefficient(s) (e.g., Birnbaum for UA and/or UR)**

July 2011 – postulate the risk benefit of creating a procedure to credit operator action under certain operational events/scenarios.

Summer and Fall of 2011 – create the procedure, verify effectiveness, train operators, and demonstrate changes to the PRA model reflecting this procedure addition.

Dec 11th, 2011 – The PRA model of record is updated to reflect the risk-reduction of the new procedure.

Jan 1st, 2012 - new MSPI coefficients and MSPI inputs into CDE can start to be used for the monthly recording for 1st quarter data.

April 21st, 2011 – new MSPI coefficients and MSPI inputs into CDE need to be used in the 1st quarter data submittal. Also, the MSPI basis document has to be revised to incorporate the complete impact of the new procedure.

**Open FAQs on NEI 99-02**
**Status Date: For 10/20/10 ROP Public Meeting**

| No. | PI | Topic | Status | Plant/Co. | Point of Contact |
|---|---|---|---|---|---|
| 09-10 | EP02 | Common EOF | Discussed status 9/15/10. Provided a revision of the text of FAQ 09-10 to NRC. FAQ remains open.<br><br>NRC NSIR and NEI's Marty Hug, et.al., have agreed to a concept and are now fine-tuning the words that would document the proposed resolution of the FAQ. | Generic | Walt Lee (TVA), Marty Hug (NEI) |
| 10-02 | IE04 | USwC | To be discussed. NRC has provided a new mark-up. ROP TF is to provide post-scram stabilization criteria and a white paper on how to revise indicator to address NRC concerns on unavailability of main feedwater. | Generic | Jim Slider (NEI)for the ROP Task Force |
| 10-06 | MS | Cascading Unavailability | Proposed FAQ, for discussion at October 20 ROP meeting | Generic | John Dowling (Ameren) |

NEI Contact: James E. Slider, 202-739-8015, jes@nei.org

**NEI 99-02 FAQ TEMPLATE**

**Number 09-10, "~~Common Facilities~~Multiple Units at One or More Sites"**

**Revised September 27, 2010**

**Plant:** Tennessee Valley Authority - Sequoyah

**Date of Event:** 10/19/2009

**Submittal Date:** Original – 11/9/2009, Revised – 09/XX/2010

**Licensee Contact:** Walt Lee **Tel/email:** whlee@tva.gov

**NRC Contact:** **Tel/email:**

**Performance Indicator:**
NEI 99-02, Revision 6, Section 2.4, Emergency Preparedness Cornerstone, Indicator EP01- Drill and Exercise Performance; and Indicator EP02 – ERO Drill Participation.

**Site-Specific FAQ (Appendix D)?** No, FAQ is Generic.

**FAQ requested to become effective:** In the quarter following approval.

## Question Section

**NEI 99-02 Guidance needing interpretation (include page and line citation):**
Page 50, Lines 3-13

> **Purpose**
>
> This indicator tracks the participation of ERO members assigned to fill Key Positions in performance enhancing experiences, and through linkage to the DEP indicator ensures that the risk significant aspects of classification, notification, and PAR development are evaluated and included in the PI process. This indicator measures the percentage of ERO members assigned to fill Key Positions who have participated recently in performance-enhancing experiences such as drills, exercises, or in an actual event.
>
> **Indicator Definition**
>
> The percentage of ERO members assigned to fill Key Positions that have participated in a drill, exercise, or actual event during the previous eight quarters, **as measured on the last calendar day of the quarter.** [bolding is in original]

**Event or circumstances requiring guidance interpretation:**

The event or circumstance involves utilities with common Emergency Operations Facilities (EOFs) where the functions of EOF Senior Manager, EOF Key Protective

**FAQ 09-10**

**"~~Common EOF~~" Multiple Units at One or More Sites**

Measures and EOF Communicator are assigned to Key Positions that support multiple nuclear sites. ERO members assigned to each function are grouped and monitored to ensure that each receives a "meaningful opportunity to gain proficiency". These opportunities are accounted for at the end of each quarter and reported through the ROP process.

~~Where a common EOF supports multiple nuclear sites, the ERO members are trained to support each site served by that EOF when emergencies are declared. ERO members will receive initial and continuing training on site specific techknowlegiestechnologies procedures, processes and protocols as well asThe training includes involvement in a drill and exercise program to ensure that they are fully qualified. Because the EOF ERO has to support multiple nuclear sites, procedures, processes and protocols have been established that apply generically across the supported sites. This ensures the skill sets needed are similar in application regardless of the nuclear site involved.~~

~~Currently for drills and exercises involving sites supported by a common EOF, the Drill and Exercise Participation Credit is counted for Key Positions for all sites, not just for the particular nuclear site involved in the drill or exercise. The clarification being sought would allow continuing granting of Participation Credit for the "generic" Key Positions for all the sites served by the common EOF when a Key Position member is provided a meaningful opportunity to gain proficiency during a drill or exercise at any of the supported nuclear sites.~~

Where an ERO member is assigned to fill a Key Position supporting multiple nuclear units, the ERO member is trained to support each unit served. Units may be at one site or multiple sites. ERO members receive initial and continuing training on unit-specific technologies procedures, processes and protocols as well as involvement in a drill and exercise program. This ensures the skill sets needed are similar in application regardless of the nuclear unit involved.

The clarification being sought would allow granting of Participation Credit for the "generic" Key Positions for all the sites served by the common EOF when a Key Position member is provided a meaningful opportunity to gain proficiency during a drill or exercise at any of the supported nuclear units.

**If licensee and NRC resident/region do not agree on the facts and circumstances explain**

NRC does not agree with the current method for granting participation credit for common EOFs and has specified that participation credit can be provided only to the specific site involved in the drill or exercise.

**Potentially relevant existing FAQ numbers:** None identified.

## FAQ 09-10

## "~~Common EOF~~" Multiple Units at One or More Sites

### Response Section

### Proposed Resolution of FAQ

Revise NEI 99-02, Section 2.4, to provide the option of an alternate methodology that would allow participation credit for the common facility to be counted across all units or sites supported by that facility. The common facility could include an Emergency Operations Facility, Technical Support ~~Facility~~ Center, or Operational Support Center. The alternate methodology could be elected for a common facility serving either multiple units or sites or serving units with different technologies, provided the following five conditions are met:

1. The functions of Classification, Protective Action Recommendations (PARs), Dose Assessment, and Emergency Notifications are performed similarly (a common facility may not perform all 4 functions, therefore this requirement only applies to the functions performed in the common facility) for each unit ~~or site~~ served by the common facility.
2. The link between the Drill and Exercise Performance (DEP) indicator and the ERO Drill Participation indicator is maintained by granting DEP credit (both success and failure) from one drill to all units ~~or sites~~ served by the common facility.
3. Lessons learned through the common facility are shared with all the nuclear units or sites that are supported by the common facility.
4. Corrective actions associated with Key Positions in the ERO are applied to each unit or site served by the common facility.
5. Initial and continuing position specific training is required for Key ERO positions to include at a minimum all position tasks associated with RSPS.

**If appropriate, provide proposed rewording of guidance for inclusion in next revision.**

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***[DRILL AND EXERCISE PERFORMANCE]***

*NEI 99-02 Revision 6, Section 2.4, page 45, "Clarifying Notes"*

33 If credit for an opportunity is given in the ERO Drill Participation performance indicator, then
34 that opportunity must be included in the drill/exercise performance indicator. For example, if the
35 communicator performing the entire notification during performance enhancing scenario is an
36 ERO member in a Key Position, then the notification may be considered as an opportunity and, if
37 so, participation credit awarded to the ERO member in the Key Position.
38

*[New text to be inserted at Line 38]*

If ~~a licensee elects the alternate methodology applicable to use of a common facility~~an ERO member in a Key Position supports multiple units (at one or more sites), Drill/Exercise Performance (DEP) opportunities performed in the common facility shall be credited to all units ~~or sites~~ served by the common facility, in addition to the specific unit ~~or site~~ participating in the drill or exercise. ~~For calculating DEP opportunities, the methodology in effect on the first day of the quarter shall be used for that quarter.~~

39 When a performance enhancing experience occurs before an individual is assigned to a Key
40 Position in the ERO, then opportunities for that individual that were identified in advance shall
41 contribute to the Drill/Exercise (DEP) metric at the time the member is assigned to the ERO.
42

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## *[PARTICIPATION]*

### *NEI 99-02 Revision 6, page 50, "Data Reporting Elements"*

*[New text to be inserted at Line 24]*

The participation indicator may include participation in a facility that supports multiple ~~sites or unit technologies~~units.

25 **Calculation**
26 The site indicator is calculated as follows:
27

### *NEI 99-02 Revision 6, page 51, "Clarifying Notes"*

41 inspection.
42

*[New text to be inserted at Line 42]*

If an ERO member in a Key Position supports multiple units (at one or more sites)~~a licensee elects the alternate methodology applicable to use of a common facility~~, participation credit shall be granted ~~for Key Positions~~ for all units ~~or sites served by the common facility during any one nuclear site drill~~ when a performance-enhancing experience occurs provided similar skill sets are demonstrated. ~~To maintain the link between DEP and ERO Participation, use of the alternate methodology requires that DEP opportunities occurring in the common facility be credited to all units or sites served by the common facility, in addition to the unit or site participating in the drill or exercise.~~

**Similarity of Skill Sets**

~~For the purpose of the alternate methodology applicable to use of common facilities, s~~Skill sets are considered similar when the procedures, processes and protocols involved accomplish the same task or goal. Examples of similar skill sets are provided below:

**Classification**

Classification of an emergency is similar when the Emergency Action Level procedures, processes and protocols are the same for all units ~~or sites~~ served by the ~~common facility~~ERO member in the Key Position. Training for key ERO members performing this function is to include unit- ~~or site~~ specific and/or technology differences in Initiating Conditions / Emergency Action Levels ~~for units or sites served by the common facility~~ (e.g., ISFSI, unique hazards, design considerations, etc.).

**Protection Action Recommendations (PARs)**

Protection Action Recommendations, when developed with the same protective action strategies, are similar provided that the procedures, processes and protocols for the development of the protective action recommendations are essentially the same. For example:

- Logic flow charts may differ (e.g., because of population differences among the sites), but should serve the same purpose and be used in the same way.
- Protective Action Zones may differ between sites, but the process used to identify the action taken for the zones should be the same.
- Implementation of potassium iodide (KI) strategies may differ based on the implementation strategies of responsible authorities at the State and/or Local level, but the procedures, processes and protocols used to determine if KI is warranted should be the same.
- PAR development discussion strategies should be the same for each site supported by the common facility.

**Dose Assessment**

Dose assessment is similar when methodologies, applicable computer programs, and models are the same across sites and/or unit technologies served by the common facility. Definitions of what constitutes a radiological release during a classified emergency are the same. Training for key ERO members performing this function must include ~~site~~ unit-specific ~~and/or technology~~ differences in effluent monitors and release pathways and how these differences impact the dose assessment.

**Emergency Notifications**

The emergency communicator functions are similar when ~~common facility~~ procedures, processes and protocols are performed utilizing a similar emergency notification form design and content. Emergency communicators will be trained on all notification procedures, processes and protocol differences including, but not limited to, offsite contacts, form content, methods and equipment.

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**Link to Drill and Exercise Performance**

~~If a licensee elects the alternate methodology applicable to common facilities, l~~Lessons learned (positive and negative) should be shared to ensure that the benefits of the performance enhancing experience of the key ERO member(s) are applied across all units~~ and sites served by the common facility~~. Corrective actions from the performance of key ERO members performing DEP activities should be shared with and applied to all key ERO members of all units~~ and sites served by the common facility~~. Similarly, corrective actions associated with common facility Key ERO member performance (e.g. training or qualification gaps, procedure deficiencies, equipment issues) should be applied across all units~~ and sites served by the common facility~~. DEP opportunities performed ~~in the common facility~~ shall be credited to all units~~ or sites served by the common facility~~, in addition to the unit ~~or site~~ participating in the drill or exercise.

Credit can be granted to Key Positions for ERO Participation for a Security related Drill or Exercise as long as the Key Positions are observed evaluating the need to upgrade to the next

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## UNPLANNED SCRAMS WITH COMPLICATIONS (USWC)

### Purpose

This indicator monitors that subset of unplanned automatic and manual scrams that either require additional operator actions beyond that of ~~the~~a "normal" scram or involve the inability to recover main feedwater. Such events or conditions have the potential to present additional challenges to the plant operations staff and therefore, may be more risk-significant than "uncomplicated" scrams.

~~* When determining Main Feedwater (MFW) unavailability or non-recoverability using approved plant procedures the focus is not on whether MFW was used (i.e., actually required additional operator actions), but whether MFW was available to be used to perform its intended function.~~

...

### Indicator Definition

The USwC indicator is defined as the number of unplanned scrams while critical, both manual and automatic, during the previous 4 quarters that require additional operator actions as defined by the applicable flowchart (Figure 2) and the associated flowchart questions.

### Data Reporting Elements

The following data are required to be reported for each reactor unit.

The number of unplanned automatic and manual scrams while critical in the previous quarter that required additional operator response as determined by the flowchart criteria.

### Calculation

The indicator is determined using the values reported for the previous 4 quarters as follows:

value = total unplanned scrams while critical in the previous 4 quarters that required additional operator response as defined by the applicable flowchart and the associated flowchart questions.

### Definition of Terms

*Scram* means the shutdown of the reactor by the rapid addition of negative reactivity by any means, e.g., insertion of control rods, boron, use of diverse scram switches, or opening reactor trip breakers

*Normal Scram* means any scram that is not determined to be complicated in accordance with the guidance provided in the Unplanned Scrams with Complications indicator. A normal scram is synonymous with an uncomplicated scram.

*Unplanned scram* means that the scram was not an intentional part of a planned evolution

or test as directed by a normal operating or test procedure. This includes scrams that occurred during the execution of procedures or evolutions in which there was a high chance of a scram occurring but the scram was neither planned nor intended.

*Scram Response* refers to the period of time which starts with the onset of the initiating event and concludes when operators have ~~performed and verified post scram actions in accordance with the applicable EOP(s) and determined that the plant has~~ achieved a stabilized condition in accordance with criteria in approved plant procedures~~ and analyses~~.

**Clarifying Notes**

…

**PWR FLOWCHART QUESTIONS (See Figure 2)**

**Did two or more control rods fail to fully insert?**

…

**Did the turbine fail to trip?**

…

**Was power lost to any ESF bus?**

…

**Was a Safety Injection signal received?**

…

**Was ~~Main Feedwater~~(MFW) unavailable or not recoverable using approved plant procedures following the scram?**

If operating prior to the scram, did ~~Main Feedwater~~MFW cease to operate and was it unable to be restarted during the reactor scram response? The consideration for this question is whether ~~Main Feedwater~~MFW could be used to feed the steam generators if necessary. The qualifier of "not recoverable using approved plant procedures" will allow a licensee to answer "No" to this question if there is no physical equipment restraint to prevent the operations staff from starting the necessary equipment, aligning the required systems, or satisfying required logic using plant procedures approved for use and in place prior to the reactor scram occurring.

The operations staff must be able to start and operate the required equipment using normal alignments and approved normal and off-normal operating procedures to ~~feed~~ provide the required flow to the minimum number of steam generators required by the EOPs~~ to satisfy the heat sink~~

~~criteria~~. Manual operation of controllers/equipment, even if normally automatic, is allowed if addressed by procedure. Situations that require ~~maintenance~~ repair activities or non-proceduralized operating alignments require an answer of "Yes." ~~Additionally, the restoration of MFW must be capable of feeding the Steam Generators in a reasonable period of time. Operations should be able to start a Main FeedwaterMFW pump and start feeding Steam Generators with the Main FeedwaterMFW system within about 30 minutes. after a scram. Additionally, if MFW is initially available post scram and then becomes unavailable, the 30 minute estimate could be used as a reasonable period of time it would take to recover MFW. Again, this 30 minute time period is just an estimate used to quantify what a reasonable period of time would be to start or recover MFW under normal conditions.~~ During startup conditions where ~~Main Feedwater~~MFW was not placed in service prior to the scram this question would not be considered and should be skipped. If design features or procedural prohibitions prevent restarting ~~Main Feedwater~~MFW under certain plant conditions, and MFW is ~~free from damage or failure and~~ available for use~~, the MFW system is not considered unavailable and~~ this question should be answered as "No."

**Was the scram response procedure unable to be completed without entering another EOP?**

…

**BWR FLOWCHART QUESTIONS (See Figure 2)**

**Did an RPS actuation fail to indicate / establish a shutdown rod pattern for a cold clean core?**

…

**Was pressure control unable to be established following the initial transient?**

…

**Was power lost to any Class 1E Emergency / ESF bus?**

…

**Was a Level 1 Injection signal received?**

…

**Was ~~Main Feedwater~~MFW not available or not recoverable using approved plant procedures?**

If operating prior to the scram, did ~~Main Feedwater~~MFW cease to operate and was it unable to

be restarted during the reactor scram response? The consideration for this question is whether ~~Main Feedwater~~MFW could be used to feed the reactor vessel if necessary. The qualifier of "not recoverable using approved plant procedures" will allow a licensee to answer "NO" to this question if there is no physical equipment restraint to prevent the operations staff from starting the necessary equipment, aligning the required systems, or satisfying required logic circuitry using plant procedures approved for use that were in place prior to the scram occurring.

The operations staff must be able to start and operate the required equipment using normal alignments and approved normal and off-normal operating procedures to provide the required flow to the minimum number of steam generators required by the EOPs. Manual operation of controllers/equipment, even if normally automatic, is allowed if addressed by procedure. Situations that require repair activities or non-proceduralized operating alignments require an answer of "Yes." The MFW must be capable of feeding the reactor vessel during the scram response time. During startup conditions where MFW was not placed in service prior to the scram this question would not be considered and should be skipped. If design features or procedural prohibitions prevent restarting MFW under certain plant conditions, and MFW is available for use this question should be answered as "No."
~~The operations staff must be able to start and operate the required equipment using normal alignments and approved normal and off-normal operating procedures. Manual operation of controllers/equipment, even if normally automatic, is allowed if addressed by procedure. Situations that require maintenance activities or non-proceduralized operating alignments will not satisfy this question. Additionally, the restoration of Main~~MFW ~~must be capable of being restored to provide feedwater (FW) to the reactor vessel in Feedwater must be capable of being restored to provide feedwater to the reactor vessel in a reasonable period of time. Operations should be able to start a Main Feedwater~~MFW ~~pump and start feeding the reactor vessel with the Main Feedwater System~~MFW system ~~within~~ about ~~30 minutes.~~ after a scram. ~~Additionally, if MFW is initially available post scram and then becomes unavailable, the 30 minute estimate could be used as a reasonable period of time it would take to recover MFW. Again, this 30 minute time period is just an estimate used to quantify what a reasonable period of time would be to start or recover MFW under normal conditions. During startup conditions where Main Feedwater~~MFW ~~was not placed in service prior to the scram, this question would not be considered, and should be skipped.~~ If design ~~features or procedural prohibitions prevent restarting MFW under certain plant conditions, and MFW is free from damage or failure and is available for use, the MFW system is not considered unavailable and this question should be answered as "No."~~

**Following initial transient, did stabilization of reactor pressure/level and drywell pressure meet the entry conditions for EOPs?**

…

# APPENDIX H

**USwC Basis Document**

The USwC PI will monitor the following six conditions that -complicate the operators' scram response ~~recovery~~ actions or involve inability to restore main feedwater.

1. Reactivity Control
2. Pressure Control (BWRs)/Turbine Trip (PWRs)
3. Power available to Emergency Busses
4. Need to actuate emergency injection sources
5. Availability of Main Feedwater (MFW)
6. Utilization of scram recovery Emergency Operating Procedures (EOPs)

…

## H 1 PWR Flowchart Basis Discussion

### H 1.1 Did two or more control rods fail to fully insert?

…

### H 1.2 Did the turbine fail to trip?

…

### H 1.3 Was power lost to any ESF bus?

…

### H 1.4 Was a Safety Injection signal received?

…

### H 1.5 Was ~~Main Feedwater~~MFW unavailable or not recoverable using approved plant procedures following the scram?

This section of the indicator is a holdover from the Scrams with Loss of Normal Heat Removal indicator which the USwC indicator is replacing. Since all PWR designs have an emergency ~~Feedwater~~FW system that operates if necessary, the availability of the normal or main ~~main Feedwater~~FW systems ~~is~~ , as a backup in emergency situations, can be important for managing risk following a reactor scram. This portion of the indicator -is designed to measure ~~that backup availability~~the ability to restore MFW as directed by ~~the~~ -approved plant procedures

(e.g., EOPs) on a loss of all emergency ~~Feedwater~~FW. ~~Licensees should rely on the material condition availability of the equipment to reach the decision for this question.~~

It is not necessary for the ~~main Feedwater~~MFW system to continue operating following a reactor trip. ~~The~~Some plants have design features in place to prevent MFW from continued operation or from allowing it to be restarted unless certain criteria are met. ~~Although these design features are in place to protect the plant, the MFW system must be free from damage or failure that would prohibit restart of the system if necessary. Since~~~~For example, s~~Some plant designs do not include electric driven ~~main Feedwater~~MFW pumps (steam driven pumps only) and it may not be possible to restart ~~main Feedwater~~MFW pumps without a critical reactor. ~~Those plants should answer this question as"No" and move on. Some~~ Additionally, some other plant designs have interlocks and signals in place to prevent feeding the steam generators with ~~main Feedwater~~MFW unless reactor coolant temperature is greater than the no-load average temperature. These plants ~~should also answer~~may be justified in answering this question as "No"~~and move on.~~ if ~~the design feature is active and the MFW system is otherwise free from damage or failure and available to perform its intended function.~~

~~Licensees should rely on the material condition availability of the equipment to reach the decision for this question. Condenser vacuum, cooling water, steam pressure values should be evaluated based on the requirements to operate the pumps may be lower than normal if procedures allow pump operation at that lower value.these support systems are able to be restarted (if not running) to support main feedwater restart within them 30 minute timeframe they can be considered as available. These requirements apply until the completion or exit of the scram response procedure.~~

~~The availability of steam dumps to the condenser does NOT enter into this indicator at all Use of atmospheric steam dumps following the reactor trip is acceptable for any duration.~~

~~Loss of one feed pump does not cause a loss of main feedwater. Only one is needed to remove residual heat after a trip. As long as at least one pump~~~~As long as~~ the minimum number of pump(s) and valve(s) can still operate and provide ~~Feedwater~~FW to the minimum number of steam generators required by the EOPs ~~to satisfy the heat sink criteria, main feedwater~~~~MFW should be considered available~~.

The timeframe for considering MFW availability is determined by the scram response time (i.e., the time needed to reach stable conditions). For a

~~The failure in a closed position of a feedwater isolation valve to a steam generator is a loss of feed to that one steam generator. As long as the main feedwater system is able to feed the minimum number of steam generators required by the EOPs to satisfy the heat sink criteria, the loss of ability to feed other steam generators should not be considered a loss of feedwater. Isolation of the feedwater regulating or isolation valves does not constitute a loss of feedwater if nothing prevents them from being reopened in accordance with procedures .~~

~~A Steam Generator Isolation Signal or Feedwater Isolation Signal does not constitute a loss~~

~~of main feedwater as long as it can be cleared and feedwater restarted. If the isolation signal was caused by a high steam generator level, the estimate time frame should start once the high level isolation signal has cleared.~~

~~The 30 minute time frame for restart of main FeedwaterThe 30 minutes time frame for restart of MFW was chosen based on restarting from a hot and filled condition. Since this time frame will not be measured directly it should be an estimation developed based on the material condition of the plants systems following the reactor tripspecific plant design and plant operating experience. If no abnormal material conditions exist the 30 minutes should normally be met. If actions to restart MFW as directed by plant procedures and design would require moretake longer than 30 minutes to complete (even if all systems were hot and the material condition of the plants systems following the reactor trip werewas normal,) that routine time should be used in the evaluation of this question, provided SG dry-out cannot occur on an uncomplicated trip if the time islasting longer than 30 minutes. The opinionprofessional judgment of the on-shift licensed SRO during the reactor trip should be acceptedused in determining if this timeframe was met.~~PWR, the reactor is considered stable when all of the following are true:

- Pressurizer pressure is within the nominal operating pressure band
- Pressurizer level is within the no-load pressurizer band
- The level of all steam generators is between the bottom of the narrow range indication and 50%, including allowances for channel accuracies and reference leg process errors.
- The RCS temperature is within the allowable RCS no-load temperature band ($T_{ave}$ if any RCS pump running, $T_{cold}$ if no RCS pumps running).

**H 1.6 Was the scram response procedure unable to be completed without entering another EOP?**

…

## H 3 BWR Flowchart Basis Discussion

**H 3.1 Did an RPS actuation fail to indicate / establish a shutdown rod pattern for a cold clean core?**

…

**H 3.2 Was pressure control unable to be established following the initial transient?**

…

**H 3.3 Was power lost to any Class 1E Emergency / ESF bus?**

…

**H 3.4 Was a Level 1 Injection signal received?**

…

**H 3.5 Was Main Feedwater not available or not recoverable using approved plant procedures?**

If operating prior to the scram, did ~~Main Feedwater~~MFW cease to operate and was it unable to be restarted during the reactor scram response? The consideration for this question is whether ~~Main Feedwater~~MFW could be used to feed the reactor vessel if necessary. The qualifier of "not recoverable using approved plant procedures" will allow a licensee to answer "NO" to this question if there is no physical equipment restraint to prevent the operations staff from starting the necessary equipment, aligning the required systems, or satisfying required logic circuitry using plant procedures approved for use that were in place prior to the scram occurring.

The operations staff must be able to start and operate the required equipment using normal alignments and approved normal and off-normal operating procedures to provide the required flow required by the EOPs. Manual operation of controllers/equipment, even if normally automatic, is allowed if addressed by procedure. Situations that require repair activities or non-proceduralized operating alignments require an answer of "Yes." The MFW must be capable of feeding the reactor vessel during the scram response time. During startup conditions where MFW was not placed in service prior to the scram this question would not be considered and should be skipped. If design features or procedural prohibitions prevent restarting MFW under certain plant conditions, and MFW is available for use this question should be answered as "No."

**H 3.6 Following initial transient, did stabilization of reactor pressure/level and drywell pressure meet the entry conditions for EOPs?**

Since BWR designs have an emergency high pressure system that operates automatically between a vessel-high and vessel-low level, it is not necessary for the ~~Main Feedwater~~MFW ~~System~~system to continue operating following a reactor trip. ~~However,~~ ~~Although these design features are in place to protect the plant, the MFW system must be available (i.e., free from damage or failure that would prohibit restart of the Main Feedwater Systemsystem if necessary). Therefore,~~ F~~f~~ailure of the MFW system to be available is considered to be risk significant enough to require a "Yes" response for this PI.~~To be considered available, the system must be free from damage or failure that would The system must be free from damage or failure that would prohibit restart of the system if necessaryTherefore, there is some~~. Therefore, there is significant reliance on the material condition or availability of the equipment to reach the decision for this question. Condenser vacuum, cooling water, and steam pressure values should be evaluated based on the requirements to operate the pumps, and may be lower than normal if procedures allow pump operation at that lower value.

The timeframe for considering MFW availability is determined by the scram response time (i.e., the time needed to reach stable conditions). For a BWR, the reactor is considered stable when all of the following are true:

- No EOP entry conditions exist
- Reactor cooldown rates are less than 100 degrees F/hr
- Reactor water level is being maintained within the range specified by plant procedures

…

**Proposed FAQ 10-06**

| | |
|---|---|
| **Plant:** | **Callaway Plant** |
| **Date of Event:** | **2/6/10** |
| **Submittal Date:** | **Proposed as 10/20/10** |
| **Licensee Contact:** | **John Dowling, 314-225-1546, jdowling@ameren.com** |
| **NRC Contact:** | **Jeremy Groom** |
| **Performance Indicator:** | **Mitigating Systems** |
| **Site Specific FAQ:** | **No** |

**FAQ requested to become effective when approved.**

## Question Section:

The Licensee and Resident Inspectors request clarification in the guidance for what constitutes cascaded unavailability. NEI 99-02 section 2.2, Mitigating System Performance Index, pages 31-36, provide the guidance on how to properly administer and report this performance indicator. On page 34, under the Monitored Systems section, line 37 states explicitly "No support systems are to be cascaded onto the monitored systems, e.g., HVAC room coolers, DC power, Instrument Air, etc."

Appendix F section 2.1.3 provides guidance on how to define the boundaries of frontline system monitored components and support system components for the Unreliability element of MSPI. While this guidance could reasonably be extended to the unavailability section, there are no explicit statements regarding the definition of boundaries between frontline systems and support systems in the Unavailability element of MSPI.

What guidance should be used to define the frontline system and support system boundaries for the unavailability element of MSPI to ensure the "no cascading of unavailability" clause is met and unavailability is accurately reported?

**Guidance needing clarification/interpretation:**

Add a statement in Appendix F, section 1.2.1 regarding the establishment of boundaries between frontline and support system components for reporting unavailability consistent with the "No cascading of unavailability" clause from page 34.

Page F-6 "No Cascading of Unavailability" section should be clarified. Currently, all examples in this section refer to disabling a function of a monitored piece of equipment for protection when a support system is out of service. This could lead to an interpretation that these examples are the only conditions applicable to the "no cascading clause" on page 34.

Page F-29 "Failures and Discovered Conditions of Non-Monitored Structures, Systems, and Components" section does not appear to be consistent with the guidance of page 34 for no cascading of support systems onto monitored systems, specifically lines 20 – 23 … " An

example could be a manual suction isolation valve left closed which would have caused a pump to fail. This would not be counted as a failure of the pump. Any mis-positioning of the valve that caused the train to be unavailable would be counted as unavailability from the time of discovery." This example does not indicate whether the mis-positioned valve was inside or outside the monitored system boundary, which introduces confusion. This example should include a statement that the mis-positioned valve is inside the monitored system boundary.

**Event requiring guidance interpretation:**

On February 6, 2010 a DC power supply failed in cabinet SA036C, the ESFAS Channel 2 termination/logic cabinet. This power supply failure resulted in declaring the Turbine Driven Auxiliary Feedwater Pump inoperable in accordance with Tech Spec requirements. No actions were taken that removed the capability of the pump to flow water to the steam generators. Licensee did not count unplanned unavailability for the Turbine Driven Auxiliary Feedwater train because it was considered “cascaded” unavailability from the ESFAS system. This cabinet is not within the train boundary for the Turbine Driven Auxiliary Feedwater train as identified in the Callaway MSPI Basis Document. Referring to Figure F-4 on page F-58 of Appendix F of NEI 99-02, the ESFAS system is outside the Turbine Driven Pump boundary. The failed power supply does not meet the definition of a support component as defined in INPO 98-001 "Supporting components – A supporting component exists in the plant solely to support the operation of a single key component. If a component supports multiple key components, it should be considered a key component." The failed power supply, SA036C, supports actuation signals to the two steam admission valves to the Turbine Driven Auxiliary Feedwater Pump, the Turbine Driven Auxiliary Feedwater Pump (a monitored component) the Turbine Driven Pump loss of suction pressure signal (one of 3 logic) to other Auxiliary Feedwater pumps suction valves, and the Automatic Test Insertion function. The two steam admission valves are within the MSPI boundary for the TDAFP train (TRAIN T) but are outside the boundary for the Turbine Driven Auxiliary Feedwater Pump and are not monitored components. Since SA036C supports more than one component, with only one of those being a monitored component, it can not be considered a supporting control component, and thus is not included within the boundary of the Turbine Driven Auxiliary Feedwater pump per the guidance of F.2.1.3.

Licensee's interpretation of cascaded unavailability is: monitored train unavailability resulting from equipment failure or other unavailability of a support system outside the boundary of the monitored train. NEI 99-02 Revision 6 page 34 lines 37 and 38 states: No support systems are to be cascaded onto monitored systems, e.g., HVAC room coolers, DC power, instrument air, etc. Licensee interprets the referenced NEI 99-02 Appendix F pages and sections above as clarification and reinforcement of the no cascading clause on page 34. However, these references can lend themselves to varied interpretation.

It is the Licensee’s position that the “Failures and Discovered Conditions of Non-Monitored Structures, Systems, and Components" section on page F-29, refers only to those components within the frontline system boundary and not to those components outside the boundary or to

support system components. Any other interpretation would conflict with the general guidance against cascaded unavailability on page 34.

**NRC Resident Inspector Position:**

In the case of the failure of ESFAS Power Supply SA036C, the automatic start functions of the turbine driven auxiliary feedwater pump would be unavailable. Following the failure, the licensee did declare the turbine driven auxiliary feedwater pump inoperable. The resident inspectors believe the time associated with the failure of this power supply should count as unplanned unavailability for the turbine driven train of the auxiliary feedwater system. Unavailability is defined in NEI 99-02, Revision 6, Page 31, beginning on line 15.

> *Unavailability is the ratio of the hours the train/system was unavailable to perform its monitored functions (as defined by PRA success criteria and mission times) due to planned and unplanned maintenance or test during the previous 12 quarters while critical to the number of critical hours during the previous 12 quarters.*

NEI 99-02 (Page 31, Line 22-27) goes on to state that:

> *In any case where a monitored component has been declared inoperable due to a degraded condition, if the component is considered available, there must be a documented basis for that determination, otherwise a failure will be assumed and unplanned unavailability would accrue.*

While the ESFAS Power Supply SA036C is a unmonitored component in MSPI (in terms of the Unreliability Index) the inspectors believe the time associated with the power supply failure should be included in the Unavailability Index based on the guidance in NEI 99-02, Revision 6, Page F-29, (Beginning on Line 18.)

> *"Failures of SSCs that are **not included in the performance index** will not be counted as a failure or a demand. Failures of SSCs that would have caused an SSC within the scope of the performance index to fail will not be counted as a failure or demand. An example could be a manual suction isolation valve left closed which would have caused a pump to fail. This would not be counted as a failure of the pump. Any mis-positioning of the valve **that caused the train to be unavailable would be counted as unavailability from the time of discovery."***

The inspectors believe this guidance indicates that failures of SSCs that are not included in the performance index will not be counted as a failure or a demand in the Unreliability Index but should be counted as unavailability from the time of discovery.

**If licensee and NRC resident/region do not agree on the facts and circumstances explain:**

NA, there is agreement on facts and circumstances, but not on interpretation of the existing guidance as stated above.

**Potentially relevant existing FAQ numbers:** NA

## Response Section:

**Proposed Resolution of FAQ:**
Provide a judgment as to the correct interpretation of NEI 99-02 guidance as it pertains to the question and event requiring guidance interpretation.

The licensee recommends incorporating the following proposed wording changes or changes with equivalent meaning into the next revision of NEI 99-02. The basis for this recommendation is to ensure consistency between NEI 99-02 section 2.2, Mitigating System Performance Index, pages 31-36, and NEI 99-02 and Appendix F Section's 1.2.1, 2.2.1 and 2.2.2 and provide explicit guidance as to the definition of boundaries between frontline systems and support systems in the Unavailability section.

**Licensee proposed wording changes:**

**Bolded and underlined phrases indicate proposed changes**, strike-throughs indicate deletions.

Page F-6

*No Cascading of Unavailability:* **There is no cascading of unavailability from support system components to frontline system monitored components. A failure of a support system component may require a monitored component to be declared Inoperable. If the monitored component is not rendered non-functional through tag out or physical plant conditions then no unavailable time should be accrued for the monitored component.**
In some cases plants will disable the autostart of a supported monitored system when the support system is out of service. For example, a diesel generator may have the start function inhibited when the service water system that provides diesel generator cooling is removed from service. This is done for the purposes of equipment protection. This could be accomplished by putting a ~~supported system~~ **monitored train** in "maintenance" mode or by pulling the control fuses of the ~~supported~~ **monitored** component~~.~~ If no maintenance is being performed ~~on a supported component~~ **within a monitored train** and it is only ~~disabled for equipment protection~~ **unavailable** due to a support system being out of service, no unavailability should be reported for the train/segment. If however, maintenance is performed on the monitored ~~component~~ train, then the unavailability must be counted. For example, if an Emergency Service Water train/segment is under clearance, and the ~~autostart of the~~ associated High Pressure Safety Injection (HPSI) pump is ~~disabled~~ **unavailable**, there is no unavailability to be reported for the HPSI pump. If a maintenance task to collect a lube oil sample is performed

and it can be performed with no additional tag out, no unavailability has to be reported for the HPSI pump. If however, the sample required an additional tag out that would make the HPSI pump unavailable, then the time that the additional tag out was in place must be reported as planned unavailable hours for the HPSI pump.

Page F-29

Failures and Discovered Conditions of Non-Monitored Structures, Systems, and Components (SSC)

**This statement refers to Non-Monitored SSCs within the boundary of the frontline system.** Failures of SSCs that are not included in the performance index will not be counted as a failure or a demand. Failures of SSCs that would have caused an SSC within the scope of the performance index to fail will not be counted as a failure or demand. An example could be a manual suction isolation valve left closed which would have caused a pump to fail. This would not be counted as a failure of the pump. Any mis-positioning of the valve that caused the train to be unavailable would be counted as unavailability from the time of discovery. The significance of the mis-positioned valve prior to discovery would be addressed through the inspection process. (Note, however, in the above example, if the shut manual suction isolation valve resulted in an actual pump failure, the pump failure would be counted as a demand and failure of the pump.)

**ROP Task Force White Paper**
**UNPLANNED POWER CHANGES ASSOCIATED WITH BWR RECIRCULATION PUMP TRIP**

*[White paper prepared by Robin Ritzman for consideration by the ROP Task Force at its October 19, 2010 meeting. J. Slider.]*

## INDICATOR BACKGROUND

The purpose of the Unplanned Power Change performance indicator [NEI 99-02, Revision 6, pages 13-17] is to monitor the number of unplanned power changes (excluding scrams) that could have, under other plant conditions, challenged safety functions. It may provide leading indication of risk-significant events but is not itself risk-significant. In order to monitor the appropriate power changes, the PI was defined to monitor changes in reactor power that are initiated less than 72 hours following the discovery of an off-normal condition, and that result in, or require a change in, power level of greater than 20% of full power to resolve. Unplanned changes in reactor power also include uncontrolled excursions of greater than 20% of full power that occur in response to changes in reactor or plant conditions and are not an expected part of a planned evolution or test.

Some provisions have been included as Clarifying Notes both to ensure that the appropriate power changes were counted in, and others were excluded from, the PI. The following are some examples of these Clarifying Notes:

- [NEI 99-02, page 14, Line 6] In developing a plan to conduct a power reduction, additional contingency power reductions may be incorporated. These additional power reductions are not counted if they are implemented to address the initial condition.

- [NEI 99-02, page 14, Line 10] Equipment problems encountered during a planned power reduction greater than 20% that alone may have required a power reduction of 20% or more to repair are not counted as part of this indicator if they are repaired during the planned power reduction. However, if during the implementation of a planned power reduction, power is reduced by more than 20% of full power beyond the planned reduction, then an unplanned power change has occurred.

- [NEI 99-02, page 14, Line 16] Unplanned power changes and shutdowns include those conducted in response to equipment failures or personnel errors and those conducted to perform maintenance. They do not include automatic or manual scrams or load-follow power changes.

- [NEI 99-02, page 14, Line 23] Unplanned power changes include runbacks and power oscillations greater than 20% of full power. A power oscillation that results in an unplanned power decrease of greater than 20% followed by an unplanned power increase of 20% should be counted as two separate PI events, unless the power restoration is implemented using approved procedures. For example, an operator mistakenly opens a breaker causing a recirculation flow decrease and a decrease in power of greater than 20%. The operator, hearing an alarm, suspects it was caused by his action and closes the breaker resulting in a power increase of greater than 20%.

Both transients would count since they were the result of two separate errors (or unplanned/non-proceduralized action).

- [NEI 99-02, page 15, Line 31] Power changes to make rod pattern adjustments are excluded.

The above examples establish the principle that power changes that are intended to count result from equipment failure and/or human performance errors. The above examples also illustrate the corollary principle that power changes that are planned (contingencies, included in another downpower, or periodically scheduled activities like rod adjustments) do not count.

Another example Clarifying Note is found below:

- [NEI 99-02, page 16, Line 4] Off-normal conditions that begin with one or more power reductions and end with an unplanned reactor trip are counted in the unplanned reactor scram indicator only. However, if the cause of the downpower(s) and the scram are different, an unplanned power change and an unplanned scram must both be counted. For example, an unplanned power reduction is made to take the turbine generator off line while remaining critical to repair a component. However, when the generator is taken off line, vacuum drops rapidly due to a separate problem and a scram occurs. In this case, both an unplanned power change and an unplanned scram would be counted. If an off-normal condition occurs above 20% power, and the plant is shutdown by a planned reactor trip using normal operating procedures, only an unplanned power change is counted.

This example demonstrates that “double-counting” should not occur for a single event, for example, one or more power reductions and a scram with the same cause.

The following example Clarifying Note demonstrates that in certain predefined, pre-approved cases, credit can be given for proceduralized steps

- [NEI 99-02, page 14, Line 42] 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.

    - [NEI 99-02, page 15, Line 4] In order for an environmental event to be excluded, any of the following may be applied:

- If the conditions have been experienced before and they exhibit a pattern of predictability or periodicity (e.g., seasons, temperatures, weather events, animals, 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 procedure that directs actions to be taken to address the specific environmental conditions (e.g., jellyfish, gracilaria, frazil ice, etc.)

- If the event is predictable, but the magnitude of the event becomes unique, the licensee must take appropriate actions and equipment designed to mitigate the event must be fully functional at the time of the event to receive an exclusion.

- Environmental conditions that are unpredictable (i.e., lightning strikes) may not need to count if equipment designed to mitigate the event was fully functional at the time of the event.

- Downpowers caused by adherence to environmental regulations, NPDES permits, or ultimate heat sink temperature limits may be excluded from the indicator.

Combining the above three sets of examples, we see that equipment failures and performance errors that require prompt (less than 72 hours) response are counted, while planned, proceduralized, or already-counted (assuming same cause) power reductions or not.

**CONCERN**
Certain specific events, such as a reactor recirculation pump trip, are inappropriately counted as two Unplanned Power Changes – one (appropriately) for the trip and one (inappropriately) to recover the pump.

**SPECIFIC EVENT**
At 0707 hours on June 4, 2010, the Perry Nuclear Power Plant entered single loop operation (SLO) when Reactor Recirculation Pump A tripped OFF due to a failed optical isolator card. Reactor power in SLO was approximately 58% rated thermal power. This power change is counted as an unplanned power change under the PI because the power change was greater than 20% (100% to 58%) and was initiated less than 72 hours following discovery of the off-normal condition.

After replacing the optical isolator card, operators had to reduce power to approximately 21% to establish reactor conditions necessary to restart Reactor Recirculation Pump A and

commence power ascension. The power reduction began at 2220 hours and ended at 1827 hours on June 5, 2010. The second power reduction was also counted as an unplanned power change under the PI because the power change was greater than 20% (58% to 21%) and was initiated less than 72 hours following discovery of the off-normal condition.

The second power reduction should not count because it was required by procedure and was a result of the reactor recirculation pump trip, i.e., the same cause as the first power reduction. The second power reduction was implemented to address the initial condition (i.e., Reactor Recirculation Pump A trip). It is not desirable for a boiling water reactor (BWR) to operate in SLO for long periods of time, although SLO is a licensed operating mode. The reactor has to be brought to a condition with adequate margins to thermal limits and stability in order to restart the non-operating recirculation pump after repairs are completed. A power reduction is necessary to reach those conditions. The operating recirculation pump has to be transferred to slow speed. Then the non-operating pump is started in slow speed at the desired power level. Power ascension may commence with both pumps running in slow speed.

The indicator monitors the number of unplanned power changes that could have, under other plant conditions, challenged safety functions. Operating in SLO in accordance with Technical Specifications does not challenge nuclear safety or is not in itself, risk-significant. Since the trip of the reactor recirculation pump counts as an Unplanned Power Change, a second power reduction to recover the reactor recirculation pump does not appear to be within the intent of the PI.

An additional Clarifying Note is requested to clarify reporting criteria for a BWR power reduction to recover a non-operating reactor recirculation pump.

The following is recommended for inclusion in the next revision of NEI 99-02.

> A power reduction for the purpose of re-starting a non-operating reactor recirculation pump in a BWR plant and to re-establish two-loop operation is excluded. The power reduction in this case is not counted because it is implemented to address the initial condition (i.e., reactor recirculation pump trip, which is counted).

NEI ROP Task Force
NEI 99-02
Cooling Water Support System
Scope Revision
White Paper

Problem Statement

NEI 99-02, Rev 6, provides the guidance for the Cooling Water Support System Scope on pages F-52 and F-53 (provided below). The text from page F-53, highlighted in italics, indicates that only the last valve in a cooling water system line is included in the boundary of the monitored component. While this may be correct in most applications, there are plant configurations where the cooling water line running to a monitored system (EDG for example) has a manual isolation valve(s). If the manual isolation valve(s) were closed it would only result in EDG unavailability and cooling water system unavailability. See attached mark-up of page F-55 for an illustration. However, the guidance on page F-53 would lead one to the opposite conclusion and suggest that the cooling water system would be unavailable.

NEI 99-02 Revision 6

**Cooling Water Support System**

**Scope**
The functions monitored for the cooling water support system are those functions that are necessary (i.e. Technical Specification-required) to provide for direct cooling of the components in the other monitored systems. It does not include indirect cooling provided by room coolers or other HVAC features.

F-52

NEI 99-02 Revision 6

Systems that provide this function typically include service water and component cooling water or their cooling water equivalents. *Pumps, valves, heat exchangers and line segments that are necessary to provide cooling to the other monitored systems are included in the system scope up to, but not including, the last valve that connects the cooling water support system to components in a single monitored system. This last valve is included in the other monitored system boundary. If the last valve provides cooling to SSCs in more than one monitored system, then it is included in the cooling water support system.* Service water systems are typically open "raw water" systems that use natural sources of water such as rivers, lakes or oceans. Component Cooling Water systems are typically closed "clean water" systems.

Valves in the cooling water support system that must close to ensure sufficient cooling to the other monitored system components to meet risk significant functions are included in the system boundary.

If a cooling water system provides cooling to only one monitored system, then it should be included in the scope of that monitored system. Systems that are dedicated to cooling RHR heat exchangers only are included in the cooling water support system scope.

**Train Determination**

The number of trains in the Cooling Water Support System will vary considerably from plant to plant. The way these functions are modeled in the plant-specific PRA will determine a logical approach for train determination. For example, if the PRA modeled separate pump and line segments, then the number of pumps and line segments would be the number of trains.

**Clarifying Notes**

Service water pump strainers, cyclone separators, and traveling screens are not considered to be monitored components and are therefore not part of URI. However, clogging of strainers and screens that render the train unavailable to perform its monitored cooling function (which includes the mission times) are included in UAI. Note, however, if the service water pumps fail due to a problem with the strainers, cyclone separators, or traveling screens, the failure is included in the URI.

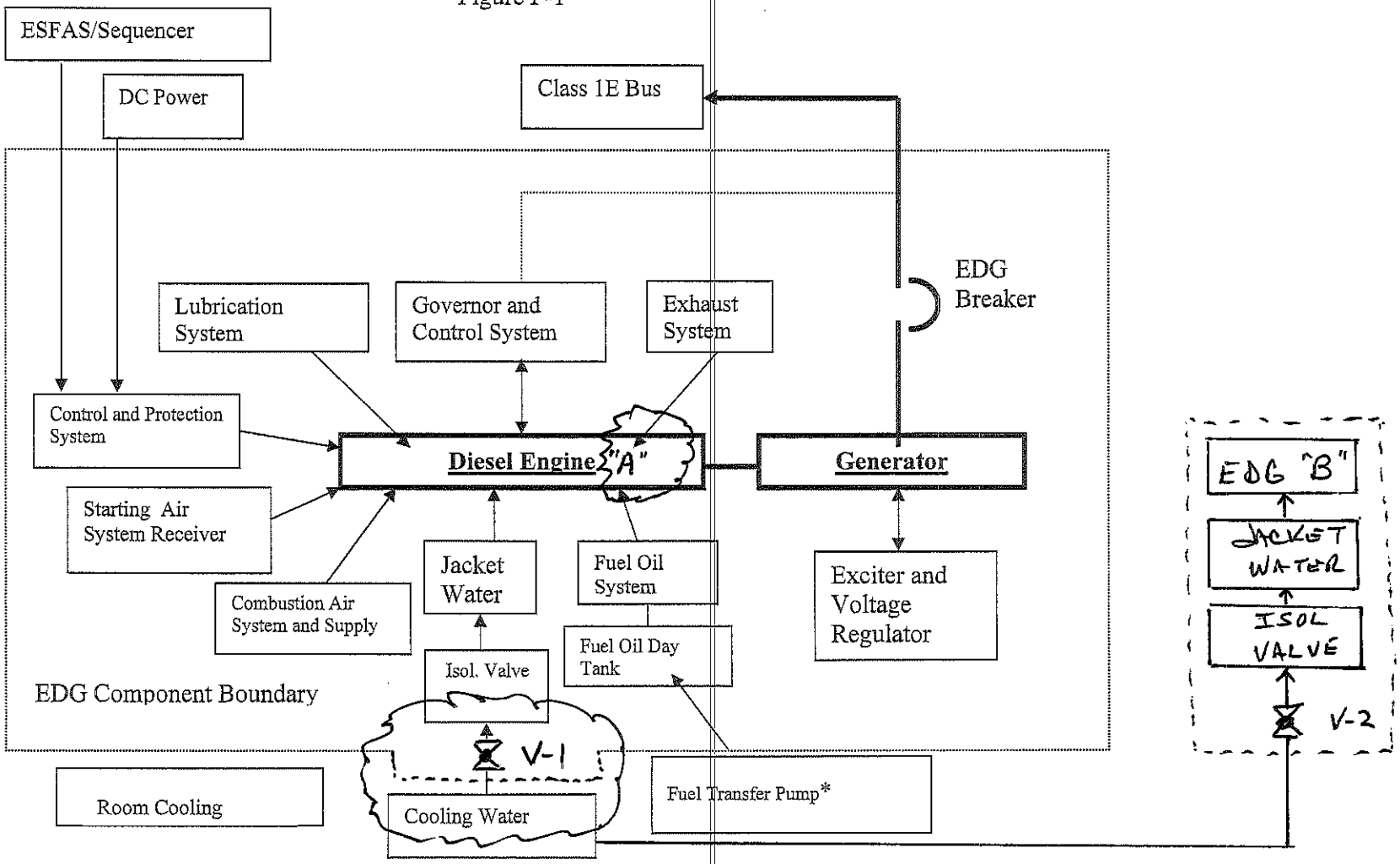
F-53

Recommendation.

Revise NEI 99-02, Rev 6, page F-53 as follows:

Systems that provide this function typically include service water and component cooling water or their cooling water equivalents. Pumps, valves, heat exchangers and line segments that are necessary to provide cooling to the other monitored systems are included in the system scope up to, but not including, the last valve that connects the cooling water support system to components in a single monitored system. This last valve is included in the other monitored system boundary. If the last valve provides cooling to SSCs in more than one monitored system, then it is included in the cooling water support system. If the cooling water line to a single monitored component contains manual isolation valve(s) that would only affect the monitored component, those valves are included in the monitored component boundary. Service water systems are typically open "raw water" systems that use natural sources of water such as rivers, lakes or oceans. Component Cooling Water systems are typically closed "clean water" systems.

Figure F-1




* The Fuel Transfer Pump is included in the EDG System Boundary. See Section 5 for monitoring requirements.