Enclosure 2
Meeting Summary Handouts
of the December 1, 2010
ROP Public Meeting
Dated December 14, 2010

REACTOR OVERSIGHT PROCESS (ROP)
MONTHLY PUBLIC MEETING AGENDA

December 1, 2010; 9:00 AM – 2:00 PM; The Legacy Hotel;
Salon II - 1775 Rockville Pike, Rockville, MD 20852

9:00 – 9:05 AM	Introduction and Purpose of Meeting
9:05 – 9:15 AM	Operating Experience Branch Topics 1. General operating experience topics of interest 2. Opportunity for public comment
9:15 – 10:00 AM	Reactor Inspection Branch Topics 1. General inspection topics of interest 2. Opportunity for public comment
10:00 – 10:20 AM	Performance Assessment Branch Topics 1. General assessment topics of interest 2. Opportunity for public comment
10:20 – 11:30 AM	Discussion of Performance Indicator (PI) Topics 1. Potential NEI 99-02 guidance changes • MSPI EDG boundary conditions (FOTP modeling options) • MSPI EDG failure mode definitions (1999-2001 failure data review) • MSPI basis document update process • MSPI Component Cooling Water Boundary white paper • Unplanned Power Changes white paper • Update on Gap Analysis of the ROP 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) *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

Open FAQs on NEI 99-02
Status Date: For 12/1/10 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. Awaiting NRC response to industry mark-up.	Generic	Walt Lee (TVA), Marty Hug (NEI)
10-02	IE04	USwC	NRC will provide feedback on mark-up conveyed by ROP TF in the October 20 meeting.	Generic	Jim Slider (NEI)for the ROP Task Force
10-06	MS	Cascading Unavailability	Introduced at October 20 ROP meeting.	Generic	John Dowling (Ameren)
10-07	IE04	Vendor EOPs	Introduced at December 1 ROP meeting	Generic	Steve Vaughn (NRC)

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.

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.~~

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

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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.

Calculation
The site indicator is calculated as follows:

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

inspection.

[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

FAQ 09-10

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

~~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.

43 Credit can be granted to Key Positions for ERO Participation for a Security related Drill or
44 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.~~

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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

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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 Feedwater~~MFW ~~pump and start feeding Steam Generators with the Main Feedwater~~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 ~~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?

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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?

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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)

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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 trip~~specific 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 more~~take longer ~~than 30 minutes~~ to complete ~~(even if all systems were hot and the material condition of the plants systems following the reactor trip were~~was ~~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 is~~lasting ~~longer than 30 minutes. The opinion~~professional judgment ~~of the on-shift licensed SRO during the reactor trip should be accepted~~used ~~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?

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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 ~~Systems~~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 Systems~~system 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 necessary~~Therefore, 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

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For October 20, 2010 ROP Public Meeting

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.)

FAQ 10-07

Plant: Generic
Date of Event: N/A
Submittal Date: 12/1/2010
Licensee Contact: Jim Slider Tel/email: 202.739.8015/jes@nei.org__
NRC Contact: Steve Vaughn Tel/email: 301.415.3640/Stephen.Vaughn@nrc.gov___

Performance Indicator: USwC – IE04

Site-Specific FAQ (Appendix D)? No

FAQ requested to become effective when approved

Question Section

NEI 99-02 Guidance needing interpretation (include page and line citation):

Page 21, lines 5-13; Page 23, line 15-23; H-5, line 39-46; H-6, lines 1-12; H-20, lines 21-46; H-21, line 1-11;

Event or circumstances requiring guidance interpretation:

As stated in FAQ 10-05 (ID #475), Palo Verde proposed additional wording to Appendix D of NEI 99-02 that would relieve Combustion Engineering (CE) plants from reporting a complicated scram for loss of forced cooling (LOFC) events as long as the LOFC event was not caused by a loss of off-site power (LOOP). The guidance in NEI 99-02 was clear and did not result in a question of interpretation; rather, the licensee sought relief from the reporting guidance. The NRC determined that the LOFC at Palo Verde counted as a complicated scram because more than one EOP was entered while the operators responded to the event. However, representatives from Palo Verde expressed concern that Westinghouse plants were at an unfair advantage because the structure of their EOPs would lead to a different determination under the PI guidance for the same scram. For example, a scram at a Westinghouse plant might result in only one EOP entry, while the same scram at a CE plant might result in entering multiple EOPs. The ROP Working Group agreed to initiate a generic FAQ to evaluate the potential disparity among vendor designs and recommend changes to "level the playing field."

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

Potentially relevant existing FAQ numbers
FAQ 10-05 (ID #475)

Response Section
Proposed Resolution of FAQ: Revise the guidance to ensure that a similar scram experienced at different vendor sites will result in consistent implementation.

Summary of FAQ 10-06
“Cascading of MSPI Unavailability”

11/30/10

John Dowling
Callaway Plant

Ameren MISSOURI

Precipitating Event

- Feb. 6, 2010: DC power supply PS2 failed in Cabinet SA036C, the ESFAS Channel 2 termination/logic cabinet.
  - PS2 supports the logic circuits in panel SA036
  - The logic circuits support several components:
    - Turbine Driven Aux. Feedwater Pump (monitored – Train T)
    - Two steam admission valves (not monitored – Train T)
    - Loss of suction pressure signal (all 3 trains Heat Removal)
    - Automatic Test Insertion function for all three BOP ESFAS cabinets (all 3 trains Heat Removal)
- PS2 has no physical association with the TDAFP

Ameren MISSOURI

Precipitating Event (con't)

- The effect of the loss of PS2 on the heat removal system is like having dead batteries in a universal remote:
  - Although the remote control can't send control signals without power, manual control and functioning of the associated devices (e.g., TV, AV system, Cable box, DVD player) are not affected.
  - Similarly, manual functioning of the TDAFP was not affected by loss of PS2.

Ameren MISSOURI

Precipitating Event (con't)

- In addition,
  - ESFAS is not within the boundary of MSPI systems (per NEI 99-02, App. F, Table 2 and Figures F-2, -3, and -4), and
  - The ESFAS logic panel is outside the MSPI boundary of the Heat Removal system (per Callaway MSPI Basis Document).

Ameren MISSOURI

Precipitating Event (con't)

- Thus
  - Receipt of unexpected alarms for ESFAS NOT NORMAL, resulted in identifying failure of PS2 within SA036C
  - Per Tech Specs, the Turbine Driven Aux Feed Pump (TDAFP) was declared inoperable
    - Tech Specs do cascade inoperability
  - Ameren reported no unavailability for the TDAFP because of the "no cascading clause" of NEI 99-02.
    - MSPI does not cascade unavailability

Ameren MISSOURI

Key Question

- What constitutes cascaded unavailability?
  - "No support systems are to be cascaded onto the monitored systems, e.g., HVAC room coolers, DC power, Instrument Air, etc." (NEI 99-02 p 34 line 37)
  - No explicit statements regarding the definition of boundaries between frontline systems and support systems in the Unavailability element of MSPI
  - Boundaries <u>are</u> explicitly stated in the Unreliability Section (NEI 99-02 pp F19-20)

Ameren MISSOURI

Key Question

- 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 reported as intended?

Ameren MISSOURI

NRC Inspectors' View

- Callaway's resident inspectors interpret the guidance on NEI 99-02, page F-29, line 18, to mean that failures of SSCs 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.
- Based on this, the inspectors believe the time associated with the failure of PS2 should count as unplanned Unavailability for TDAFW.

Ameren MISSOURI

Licensee's View

- The inspectors' interpretation conflicts with guidance prohibiting cascading of unavailability. The guidance on F-29, line 18 pertains to unmonitored components (not included in the performance index) within the train boundary causing unavailability of a monitored component within the same train. This statement was written as an exception so that a failure of an unmonitored component (within the train boundary) would not result in declaring a failure of the monitored component.

Ameren MISSOURI

Licensee's Conclusion

- PS2 is a supporting component for the SA036C cabinet (Key Component) and thus is within the SA036C boundary and outside MSPI scope.
- PS2 is not a supporting component of either the TDAFP or the two steam admission valves and therefore is not within the boundaries for these components.
- PS2 provides functions that support all three trains of auxiliary feedwater, therefore it cannot be described as solely supporting Train T (TDAFP).
- Since PS2 is not within the boundary for the Heat Removal System trains, failure of PS2 does not result in unavailability for any of the Heat Removal System's monitored components.

Ameren MISSOURI

Implications

- If the inspectors' view governs, Unavailability would be de-linked from Unreliability. This would enable failures in support systems to count against Unavailability but not Unreliability.
- If the Licensee's view governs, Unavailability and Unreliability remain consistent as intended.

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

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~~more than one isolation valve~~(s). If the~~ (e.g, manual isolation valve(s)~~).~~ If these isolation valve(s) were closed it would only result in ~~EDG~~supported train unavailability and would not affect the availability of the cooling water system ~~unavailability~~. See attached mark-up of page F-55 for an illustration. However, the guidance on page F-53 ~~would~~could lead one to the opposite conclusion and suggest that the cooling water system would be unavailable.

NEI 99-02 Revision 6, pages F-52 and F-53.

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, lines 1-9 to read as follows:

~~1~~ Systems that provide this function typically include service water and component cooling water or ~~2~~ their cooling water equivalents. Pumps, valves, heat exchangers and line segments that are ~~3~~ necessary to provide cooling to the other monitored systems are included in the system scope up ~~4~~ to, but not including, the ~~last~~isolation valve(s) that ~~connects~~connect(s) the cooling water support system to components ~~5~~ in a single monitored ~~system.~~train. This ~~last~~/These isolation valve(s) is/are included in the other monitored system boundary. ~~6~~ If the last valve provides cooling to SSCs in more than one monitored system or train, then it is included ~~7~~ in the cooling water support system. If the cooling water line to a single monitored component ~~8~~ or train contains ~~manual~~more than one isolation valve(s) that would only affect the monitored component or train, those valves are ~~9~~ included in the ~~monitored component~~other system boundary. Service water systems are typically open "raw ~~10~~ water" systems that use natural sources of water such as rivers, lakes or oceans. Component Cooling ~~11~~ Water systems are typically closed "clean water" systems.

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).

UNPLANNED POWER CHANGES ASSOCIATED WITH BWR RECIRCULATION PUMP TRIP

Proposed wording in the white paper to be added to 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).

Concerns with proposed wording in the white paper:

1. Can there be similar situation with other equipment?
2. What if the first power reduction is less than 20%?
3. What if the first and second power reductions are 20% less each but greater than 20% combined?
4. Should state the 2nd power reduction is greater 20% (or it wouldn't count to begin with)
5. Should state the 2nd power reduction is implemented by an approved procedure.

NRC proposed wording:

In some cases, power changes are necessary to place equipment in service. For example, in BWRs, a power reduction greater than 20% for the purpose of re-starting a reactor recirculation pump to re-establish two-loop operation is excluded if the initial power reduction of greater than 20% is caused by the recirculation pump trip. This event is not counted twice because the second power reduction to recover the tripped recirculation pump is implemented by an approved procedure.

One concern remains:

1. What if the first and second power reductions are 20% less each but greater than 20% combined?

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 comment from 10-20-2010 public meeting
Updated: 11-29-2010

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 to provide traceability to utility documentation supporting the change, such as document numbers, LERs, etc) shall be provided in the data submittal when either the MSPI basis document or an MSPI coefficient is changed. Changes to the site PRA of record, the site basis document, and the CDE database should be made in accordance with the following:

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. 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.

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:.

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 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.