Emergency Preparedness Program Frequently Asked Question (EPFAQ)

EPFAQ Number: 2019-04

Originator: David Young

Organization: NEI

Relevant Guidance: This question concerns NEI 99-01, *Development of Emergency Action Levels for Non-Passive Reactors*, Revision 6.

Applicable Section(s): Definitions (appear generically in NEI 99-01, Revision 6, Appendix B) and the Following Initiating Conditions (ICs):

- CU1, "UNPLANNED loss of (reactor vessel/RCS [PWR] or RPV [BWR]) inventory for 15 minutes or longer."
- CA1, "Loss of (reactor vessel/RCS [PWR] or RPV[BWR]) inventory."
- CS1, "Loss of (reactor vessel/RCS [PWR] or RPV [BWR]) inventory affecting core decay heat removal capability."
- CG1, "Loss of (reactor vessel/RCS [PWR] or RPV [BWR]) inventory affecting fuel clad integrity with containment challenged."
- Containment Potential Loss threshold 1.B, "(site-specific explosive mixture) exists inside containment."
- Containment Potential Loss threshold 1.C, "HCTL exceeded."
- Containment Potential Loss threshold 2.A, "Primary containment flooding required."
- SU2, "UNPLANNED loss of Control Room indications for 15 minutes or longer."
- SA2, "UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress."
- SS5, "Inability to shut down the reactor causing a challenge to (core cooling [PWR] / RPV water level [BWR]) or RCS heat removal."

Date Accepted for Review: 12/4/2019

Status: Under Review

QUESTION OR COMMENT:

Background

In June 2018, the Boiling Water Reactor Owners' Group (BWROG) issued Revision 4 of the Emergency Procedure and Severe Accident Guidelines (EPG/SAG). EPG/SAG Revision 4 contains procedural enhancements that address shutdown and refueling modes, insights from the March 2011 accident at Fukushima, better integration with other event mitigation procedures (FLEX and B.5.b), post-Fukushima regulatory requirements, and lessons learned from previous changes (e.g., training and implementation feedback). The EPG/SAG revision was developed by subject matter experts with backgrounds in BWR operations, engineering, training, risk

assessment, severe accident analysis, human factors, emergency operating procedures and licensing.

Certain changes incorporated into EPG/SAG Revision 4 impact the Emergency Action Level (EAL) development guidance found in NEI 99-01, “Development of Emergency Action Levels for Non-Passive Reactors,” Revision 6. This EPFAQ identifies those impacts and provides recommended changes to maintain alignment between a plant’s emergency operating procedures and severe accident guidelines, and emergency classification scheme.

When issued as a final/approved EPFAQ, a licensee may choose to implement whichever of the following changes, if any, are deemed appropriate. Implementation of all changes is encouraged but not required.

EPFAQ 2019-04 consists of 9 separate questions. Although all nine questions are related to changes incorporated into EPG/SAG Revision 4, each question is distinct. As such, these questions will be evaluated and responded by the NRC staff as individual questions.

Emergency Preparedness Program Frequently Asked Question (EPFAQ)

Question 2019-04-01

EPG/SAG Revision 4, Vol. III (EPG-CSD), Step RC/L-3, and EPG/SAG Vol. IV (EPG-RF), Step DH/L-1.1, adds spray cooling as a method to maintain adequate core cooling when Reactor Pressure Vessel (RPV) water level is at or above the jet pump suction. This method would be available during Modes 4 and 5 but is not currently credited in the EALs for IC's CS1 or CG1. Absent this credit, a Site Area Emergency or General Emergency declaration may occur due to RPV level below the top of active fuel even though adequate core cooling can be maintained through spray cooling.

Can the EALs for IC's CS1 and CG1 be revised to incorporate credit for spray cooling?

PROPOSED SOLUTION FOR QUESTION 2019-04-01:

Yes, provided the site-specific emergency operating procedures incorporate spray cooling in Modes 4 and 5, the EAL statements based on inadequate core cooling, IC CS1, EAL #2.b and IC CG1, EAL #1.a, may be revised to reflect the need for both an RPV level below the top of active fuel and the unavailability of spray cooling.

Difference/Deviation Determination

As indicated in the "Relevant Guidance" entry, EPFAQ 2019-04-01 may be considered only by sites that have implemented NEI 99-01, Revision 6. The response above promotes alignment between BWR emergency operating procedures and emergency classification schemes; therefore, implementation of the guidance in this EPFAQ will improve the accuracy and timeliness of emergency classifications. Moreover, the responses will result in EAL interpretations that are consistent with the meaning and intent of NRC-approved EAL bases such that the classification of the addressed events/conditions would not be different from that approved by the NRC in a site-specific application. For this reason, it is reasonable to conclude that incorporation of the guidance from this EPFAQ into an NRC-approved site-specific scheme would be considered a "difference" in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, Use of Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 4, dated January 2003.

NRC RESPONSE:

RECOMMENDED FUTURE ACTION(S):

☐ INFORMATION ONLY, MAINTAIN EPFAQ

☒ UPDATE GUIDANCE DURING NEXT REVISION

Emergency Preparedness Program Frequently Asked Question (EPFAQ)

Question 2019-04-02

In Table 9-F-2, "BWR EAL Fission Product Barrier Table," Containment Barrier Potential Loss threshold 2.A, states, "Primary containment flooding required." This threshold, appearing in NEI 99-01 Revision 6, dated November 2012, was based on guidance in EPG/SAG Revision 2. The threshold was subsequently updated by EPFAQ 2015-004 to reflect changes incorporated into EPG/SAG Revision 3; the revised threshold is, "SAG entry is required."

In Revision 2, primary containment flooding was required when core cooling was determined to be inadequate. These conditions also served as transition criteria for exiting the EPGs and entering the SAGs. In EPG/SAG Revision 3, the condition "primary containment flooding is required" was reached only after SAG entry and the decision to flood the primary containment had been thoroughly evaluated against a set of technical criteria. To address the variability in the timing of containment flooding, as permitted by Revision 3 strategy change, the containment barrier potential loss threshold was changed by EPFAQ 2015-004 such that it remained functionally equivalent to the threshold wording reflecting the Revision 2 strategy. The Containment barrier was considered potentially lost when adequate core cooling could no longer be assured and core damage was imminent. Within the context of EPGs, this point is best defined when operators are directed to enter a SAG (i.e., a threshold of "SAG entry is required").

In EPG/SAG Revision 4, the containment flooding strategy was re-evaluated and modified to consider new insights related to quenching of fuel debris in the lower cavity. The flooding strategy was modified to permit the use of FLEX equipment to supply an initial high flow rate of water with a preferred injection point into the vessel and then reduce it to just enough to maintain debris coolability. This strategy preserves the hardened wetwell vent and provides for a longer-term use of the suppression pool to scrub radionuclides to reduce the offsite dose and land contamination. Thus, flooding of the containment is less of a preferred option early in severe accident progression and, in some sequences, may not be directed.

Since primary containment flooding may or may not be directed after entry into a SAG, as described in EPG/SAG Revision 4, the threshold approved in EPFAQ 2015-004 is no longer optimum (i.e., tying it to SAG entry). Can Primary Containment Potential Loss threshold 2.A be revised to reflect the operationally significant decision to flood the containment, which would restore the wording approved in NEI 99-01, Revision 6?

PROPOSED SOLUTION FOR QUESTION 2019-04-02:

Yes. Primary Containment Potential Loss threshold 2.A may be revised back to the original wording in NEI 99-01, Revision 6, "Primary containment flooding is required."

> NOTE: The related change discussed in EPFAQ 2015-004 regarding the recommended use "SAG entry is required" for Fuel Clad Loss threshold 2.A is not affected by this question and proposed solution.

Difference/Deviation Determination

As indicated in the "Relevant Guidance" entry, EPFAQ 2019-04-02 may be considered only by sites that have implemented NEI 99-01, Revision 6. The response above promotes alignment

between BWR emergency operating procedures and emergency classification schemes; therefore, implementation of the guidance in this EPFAQ will improve the accuracy and timeliness of emergency classifications. Moreover, the responses will result in EAL interpretations that are consistent with the meaning and intent of NRC-approved EAL bases such that the classification of the addressed events/conditions would not be different from that approved by the NRC in a site-specific application. For this reason, it is reasonable to conclude that incorporation of the guidance from this EPFAQ into an NRC-approved site-specific scheme would be considered a "difference" in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, Use of Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 4, dated January 2003.

NRC Response

RECOMMENDED FUTURE ACTION(S):

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Emergency Preparedness Program Frequently Asked Question (EPFAQ)

Question 2019-04-03

Concerning Table 9-F-2, "BWR EAL Fission Product Barrier Table," Fuel Clad Potential Loss threshold 2.A and RCS Loss threshold 2.A state, "RPV water level cannot be restored and maintained above (site-specific RPV water level corresponding to the top of active fuel) or cannot be determined."

The bases section states, in part:

> This threshold is considered to be exceeded when, as specified in the site-specific EOPs, RPV water level cannot be restored and maintained above the specified level following depressurization of the RPV (either manually, automatically or by failure of the RCS barrier) or when procedural guidance or a lack of low pressure RPV injection sources preclude Emergency RPV depressurization.

The EPG/SAG definition of the phrase "cannot be restored and maintained above" includes the requirement that the parameter be held above the limit as well as restored above the limit. Refer to EPG/SAG Revision 4 App. B Vol. I, page B.I-4-5, for the definitions of "cannot be maintained above/below" and "cannot be restored above/below."

To promote understanding and use of this term consistent with BWR emergency operating procedures, can a licensee operating a BWR add the definitions of "cannot be maintained above/below" and "cannot be restored above/below" from EPG/SAG, Revision 4, to their emergency classification scheme?

PROPOSED SOLUTION FOR QUESTION 2019-04-03:

Yes. A BWR licensee may add the definitions discussed above, as they appear in the site-specific emergency operating procedures and/or controlling development procedures, to their emergency classification scheme.

Difference/Deviation Determination

As indicated in the "Relevant Guidance" entry, EPFAQ 2019-04-03 may be considered only by sites that have implemented NEI 99-01, Revision 6. The response above promotes alignment between BWR emergency operating procedures and emergency classification schemes; therefore, implementation of the guidance in this EPFAQ will improve the accuracy and timeliness of emergency classifications. Moreover, the responses will result in EAL interpretations that are consistent with the meaning and intent of NRC-approved EAL bases such that the classification of the addressed events/conditions would not be different from that approved by the NRC in a site-specific application. For this reason, it is reasonable to conclude that incorporation of the guidance from this EPFAQ into an NRC-approved site-specific scheme would be considered a "difference" in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, Use of Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 4, dated January 2003.

NRC RESPONSE:

Emergency Preparedness Program Frequently Asked Question (EPFAQ)

RECOMMENDED FUTURE ACTION(S):

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Emergency Preparedness Program Frequently Asked Question (EPFAQ)

Question 2019-04-04

Concerning Table 9-F-2, "BWR EAL Fission Product Barrier Table," the bases for Containment Potential Loss threshold 1.C, HCTL exceeded, states:

> The Heat Capacity Temperature Limit (HCTL) is the highest suppression pool temperature from which Emergency RPV Depressurization will not raise:
>
> - Suppression chamber temperature above the maximum temperature capability of the suppression chamber and equipment within the suppression chamber which may be required to operate when the RPV is pressurized,
>
> OR
>
> - Suppression chamber pressure above Primary Containment Pressure Limit A, while the rate of energy transfer from the RPV to the containment is greater than the capacity of the containment vent.
>
> The HCTL is a function of RPV pressure, suppression pool temperature and suppression pool water level. It is utilized to preclude failure of the containment and equipment in the containment necessary for the safe shutdown of the plant and therefore, the inability to maintain plant parameters below the limit constitutes a potential loss of containment.

The Containment Potential Loss 1.C developer note states:

> Since the HCTL is defined assuming a range of suppression pool water levels as low as the elevation of the downcomer openings in Mk I/II containments, or 2 feet above the elevation of the horizontal vents in a Mk III containment, it is unnecessary to consider separate Containment barrier Loss or Potential Loss thresholds for abnormal suppression pool water level conditions. If desired, developers may include a separate Containment Potential Loss threshold based on the inability to maintain suppression pool water level above the downcomer openings in Mk I/II containments, or 2 feet above the elevation of the horizontal vents in a Mk III containment with RPV pressure above the minimum decay heat removal pressure, if it will simplify the assessment of the suppression pool level component of the HCTL.

The material in EPG/SAG Revision 4 may necessitate a change the HCTL value in two ways:

1) Appendix C contains an updated HCTL calculation methodology, and
2) The Primary Containment Control guideline now places increased emphasis on ensuring suppression pool water level never rises higher than the most limiting of the Maximum Pressure Suppression Primary Containment Water Level (MPSPCWL), elevation of the suppression chamber- to-drywell vacuum breakers, or the elevation of the suppression chamber vent. This change supports implementation of the Severe Accident Water Addition and Water Management (SAWA/SAWM) strategies used if conditions degrade and SAGs are entered. The high suppression pool water level forms one of the bounding values for the HCTL.

Emergency Preparedness Program Frequently Asked Question (EPFAQ)

Can a licensee update the HCTL threshold in their emergency classification scheme to reflect the calculation methodology in EPG/SAG Revision 4, and add an additional threshold statement to address high suppression pool water level?

PROPOSED SOLUTION FOR QUESTION 2019-04-04:

Yes. A licensee may update the Containment Potential Loss threshold 1.C threshold in their emergency classification scheme to reflect the HCTL developed in accordance with EPG/SAG Revision 4 and implemented in the site-specific emergency operating procedures. This includes the addition of a threshold to address high suppression pool water level.

Difference/Deviation Determination

As indicated in the "Relevant Guidance" entry, EPFAQ 2019-04-04 may be considered only by sites that have implemented NEI 99-01, Revision 6. The response above promotes alignment between BWR emergency operating procedures and emergency classification schemes; therefore, implementation of the guidance in this EPFAQ will improve the accuracy and timeliness of emergency classifications. Moreover, the responses will result in EAL interpretations that are consistent with the meaning and intent of NRC-approved EAL bases such that the classification of the addressed events/conditions would not be different from that approved by the NRC in a site-specific application. For this reason, it is reasonable to conclude that incorporation of the guidance from this EPFAQ into an NRC-approved site-specific scheme would be considered a "difference" in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, Use of Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 4, dated January 2003.

NRC RESPONSE:

RECOMMENDED FUTURE ACTION(S):

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☒ UPDATE GUIDANCE DURING NEXT REVISION

Emergency Preparedness Program Frequently Asked Question (EPFAQ)

Question 2019-04-05

Concerning Table 9-F-2, "BWR EAL Fission Product Barrier Table," Containment Potential Loss threshold 1.B states, "(site-specific explosive mixture) exists inside containment."

The threshold bases states:

> If hydrogen concentration reaches or exceeds the lower flammability limit, as defined in plant EOPs, in an oxygen rich environment, a potentially explosive mixture exists. If the combustible mixture ignites inside the primary containment, loss of the Containment barrier could occur.

The associated developer notes state:

> BWR EPGs/SAGs specifically define the limits associated with explosive mixtures in terms of deflagration concentrations of hydrogen and oxygen. For Mk I/II containments the deflagration limits are "6% hydrogen and 5% oxygen in the drywell or suppression chamber". For Mk III containments, the limit is the "Hydrogen Deflagration Overpressure Limit". The threshold term "explosive mixture" is synonymous with the EPG/SAG "deflagration limits."

The threshold wording and bases focus on "explosive mixture" is inconsistent with the diagnostic approach in EPG/SAGs which directs actions relative to "deflagration limits" (Mark I/II/ABWR) or the "Hydrogen Deflagration Overpressure Limit" (Mark III); this approach is reflected in the developer note. Deflagration (i.e., subsonic flame propagation) is different from detonation (i.e., an explosion), and hydrogen concentrations necessary for deflagration are lower than those needed for detonation. To address this inconsistency, can a licensee revise the bases to identify the flammability concern as deflagration since this is the parameter considered within EPG/SAG diagnostic and control guidance?

PROPOSED SOLUTION FOR QUESTION 2019-04-05:

Yes. A licensee may revise the threshold and bases paragraph to read:

> "(site-specific deflagration mixture) exists inside containment," and
>
> An elevated hydrogen concentration in the presence of oxygen may lead to a deflagration of the mixture inside the primary containment. The rapid burning of this mixture will lead to a pressure increase that could result in a loss of the primary containment barrier.

Difference/Deviation Determination

As indicated in the "Relevant Guidance" entry, EPFAQ 2019-04-05 may be considered only by sites that have implemented NEI 99-01, Revision 6. The response above promotes alignment between BWR emergency operating procedures and emergency classification schemes; therefore, implementation of the guidance in this EPFAQ will improve the accuracy and timeliness of emergency classifications. Moreover, the responses will result in EAL interpretations that are consistent with the meaning and intent of NRC-approved EAL bases such that the classification of the addressed events/conditions would not be different from that

approved by the NRC in a site-specific application. For this reason, it is reasonable to conclude that incorporation of the guidance from this EPFAQ into an NRC-approved site-specific scheme would be considered a "difference" in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, Use of Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 4, dated January 2003.

NRC RESPONSE:

RECOMMENDED FUTURE ACTION(S):

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Emergency Preparedness Program Frequently Asked Question (EPFAQ)

Question 2019-04-06

Concerning Table 9-F-2, "BWR EAL Fission Product Barrier Table," the bases for Containment Potential Loss threshold 1.C, "HCTL exceeded," states, in part:

> Suppression chamber pressure above Primary Containment Pressure Limit A, while the rate of energy transfer from the RPV to the containment is greater than the capacity of the containment vent.

The guidance in EPG/SAG Revision 4 no longer differentiates primary containment pressure limits (PCPL) as PCPL-A, PCPL-B, and PCPL-C; it now recognizes only one PCPL.

Can a licensee revise the Containment Potential Loss threshold 1.C bases to align with the EPG/SAG Revision 4 guidance by reflecting only one PCPL?

PROPOSED SOLUTION FOR QUESTION 2019-04-06:

Yes. Provided that site-specific emergency operating procedures and/or controlling development procedures reference only one PCPL, a licensee may revise the cited sentence above to read, "Suppression chamber pressure above Primary Containment Pressure Limit, while the rate of energy transfer from the RPV to the containment is greater than the capacity of the containment vent."

Difference/Deviation Determination

As indicated in the "Relevant Guidance" entry, EPFAQ 2019-04-06 may be considered only by sites that have implemented NEI 99-01, Revision 6. The response above promotes alignment between BWR emergency operating procedures and emergency classification schemes; therefore, implementation of the guidance in this EPFAQ will improve the accuracy and timeliness of emergency classifications. Moreover, the responses will result in EAL interpretations that are consistent with the meaning and intent of NRC-approved EAL bases such that the classification of the addressed events/conditions would not be different from that approved by the NRC in a site-specific application. For this reason, it is reasonable to conclude that incorporation of the guidance from this EPFAQ into an NRC-approved site-specific scheme would be considered a "difference" in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, Use of Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 4, dated January 2003.

NRC RESPONSE:

RECOMMENDED FUTURE ACTION(S):

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Emergency Preparedness Program Frequently Asked Question (EPFAQ)

Question 2019-04-07

This question applies to IC's SU5, SA5 and SS5, which address a failure of the reactor to shut down following an automatic or manual scram. The basis section for these IC's states:

> A reactor shutdown is determined in accordance with applicable Emergency Operating Procedure criteria.

In EPG/SAG Revision 4, Appendix B, Volume 1, the term "Shutdown" is defined as:

> As applied to the reactor, subcritical with reactor power below the heating range

The BWR industry interprets this definition to mean reactor power below the Average Power Range Monitor (APRM) downscale setpoint because this setpoint is specified in EPG/SAG Volume II (EPGs-Hot) as an RPV Control guideline entry condition for reactor power.

To promote understanding and assessment of IC's SU5, SA5 and SS5 consistent with BWR emergency operating procedures, can the above basis statement be changed to read:

> A reactor shutdown is determined in accordance with applicable Emergency Operating Procedure criteria [*PWR*] or by reaching the Average Power Range Monitor downscale setpoint [*BWR*].

PROPOSED SOLUTION FOR QUESTION 2019-04-07:

Yes. BWR licensees may incorporate the above revised sentence into their emergency classification scheme, within the bases for IC's SU5, SA5 and SS5.

Difference/Deviation Determination

As indicated in the "Relevant Guidance" entry, EPFAQ 2019-04-07 may be considered only by sites that have implemented NEI 99-01, Revision 6. The response above promotes alignment between BWR emergency operating procedures and emergency classification schemes; therefore, implementation of the guidance in this EPFAQ will improve the accuracy and timeliness of emergency classifications. Moreover, the responses will result in EAL interpretations that are consistent with the meaning and intent of NRC-approved EAL bases such that the classification of the addressed events/conditions would not be different from that approved by the NRC in a site-specific application. For this reason, it is reasonable to conclude that incorporation of the guidance from this EPFAQ into an NRC-approved site-specific scheme would be considered a "difference" in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, Use of Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 4, dated January 2003.

NRC RESPONSE:

Emergency Preparedness Program Frequently Asked Question (EPFAQ)

RECOMMENDED FUTURE ACTION(S):

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Emergency Preparedness Program Frequently Asked Question (EPFAQ)

Question 2019-04-08

IC SS5 is based on a failure of the reactor to shutdown following automatic and manual scram signals, in combination with either:

- (Site-specific indication of an inability to adequately remove heat from the core)
- (Site-specific indication of an inability to adequately remove heat from the RCS)

The developer notes state:

> Site-specific indication of an inability to adequately remove heat from the core:
>
> [BWR] – Reactor vessel water level cannot be restored and maintained above Minimum Steam Cooling RPV Water Level (as described in the EOP bases)
>
> Site-specific indication of an inability to adequately remove heat from the RCS:
>
> [BWR] - Use the Heat Capacity Temperature Limit. This addresses the inability to remove heat via the main condenser and the suppression pool due to high pool water temperature.

For BWRs, the second EAL generic statement "Site-specific indication of an inability to adequately remove heat from the RCS" should be updated to better align with the diagnostic approach and terminology used in EPGs and SAGs to assess heat removal capability. During an Anticipated Transient Without Scam (ATWS) condition, when the main condenser is unavailable, heat/energy from the RCS is transferred to the suppression pool as steam flow through the safety relief valves (SRVs). Reaching the Heat Capacity Temperature Limit (HCTL), which is specified in the Developer Notes, indicates a challenge to the capability to remove heat from the suppression pool (i.e., primary containment). Therefore, rather than referencing RCS heat removal, a term more appropriate for PWRs, the BWR-portion of the statement should focus on heat removal capability from the suppression pool, i.e., a challenge to the Heat Capacity Temperature Limit.

To align the BWR-related threshold wording with the diagnostic approach and terminology used in EPGs and SAGs, can IC SS5, EAL 1.c, second bullet be revised to read, "Site-specific indication of an inability to adequately remove heat from the RCS [*PWR*] or a challenge to the Heat Capacity Temperature Limit [*BWR*]."

PROPOSED SOLUTION FOR QUESTION 2019-04-08:

Yes.

Difference/Deviation Determination

As indicated in the "Relevant Guidance" entry, EPFAQ 2019-04-08 may be considered only by sites that have implemented NEI 99-01, Revision 6. The response above promotes alignment between BWR emergency operating procedures and emergency classification schemes; therefore, implementation of the guidance in this EPFAQ will improve the accuracy and timeliness of emergency classifications. Moreover, the responses will result in EAL interpretations that are consistent with the meaning and intent of NRC-approved EAL bases

such that the classification of the addressed events/conditions would not be different from that approved by the NRC in a site-specific application. For this reason, it is reasonable to conclude that incorporation of the guidance from this EPFAQ into an NRC-approved site-specific scheme would be considered a "difference" in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, Use of Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 4, dated January 2003.

NRC RESPONSE:

RECOMMENDED FUTURE ACTION(S):

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Emergency Preparedness Program Frequently Asked Question (EPFAQ)

Question 2019-04-09

With respect to the inability to determine RPV water level, the EALs for ICs CU1, CA1, CS1 and CG1 contain the phrase, ". . . cannot be monitored . . ." The associated bases states:

> If water level cannot be monitored, operators may determine that an inventory loss is occurring by observing changes in sump and/or tank levels.

The EALs for ICs SU2 and SA2 contain the phrase, "…inability to monitor one or more of the following parameters from with the Control Room…" The associated bases states:

> As used in this EAL, an "inability to monitor" means that values for one or more of the listed parameters cannot be determined from within the Control Room.

EPG/SAG Revision 4 uses the phrase "...cannot be determined..." to address instances when operators cannot monitor a parameter by any means (e.g. "RPV water level cannot be determined," "reactor power cannot be determined," etc.). The NEI 99-01 terms "cannot be monitored" and "inability to monitor" are synonymous (i.e., functionally equivalent) with the EPG/SAG term "cannot be determined."

Can a licensee operating a BWR replace the term "cannot be monitored" in ICs CU1, CA1, CS1 and CG1, and "inability to monitor" in ICs SU2 and SA2, with "cannot be determined" to align the EAL wording with the terminology used in EPG/SAG, Revision 4, and site-specific emergency operating procedures?

PROPOSED SOLUTION FOR QUESTION 2019-04-09:

Yes. Provided site-specific emergency operating procedures use the term "cannot be determined" in a manner consistent with EPG/SAG Revision 4, a licensee operating a BWR may revise:

- IC CU1, EAL 2.a, to read, "RPV level cannot be determined."
- IC CA1, EAL 2.a, to read, "RPV level cannot be determined for 15 minutes or longer."
- IC CS1, EAL 3.a, to read, "RPV level cannot be determined for 30 minutes or longer."
- IC CG1, EAL 2.a, to read, "RPV level cannot be determined for 30 minutes or longer."
- The Basis sentence in IC CA1, CS1 and CG1, to read, "If water level cannot be determined, operators may conclude that an inventory loss is occurring by observing changes in sump and/or tank levels."
- IC SU2 and SA2, EAL #1.a to read, "One or more of the following parameters cannot be determined from within the Control Room for 15 minutes or longer due to an UNPLANNED event."
- The Basis sentence in IC SU2 and SA2, "As used in this EAL, an "inability to monitor" means that values for one or more of the listed parameters cannot be determined from within the Control Room," may be deleted as it is no longer needed; the phase "inability to monitor" has been replaced with "cannot be determined" in the EALs.

For clarity, this change is not intended to generically permit credit for indications (parameter values) obtained at locations outside the Control Room (AKA local indications). The use of such indications may be acceptable; however, the proposed reliance on locally obtained data to

support an EAL assessment requires an evaluation in accordance with the requirements of 10 CFR 50.54(q).

Difference/Deviation Determination

As indicated in the "Relevant Guidance" entry, EPFAQ 2019-04-09 may be considered only by sites that have implemented NEI 99-01, Revision 6. The response above promotes alignment between BWR emergency operating procedures and emergency classification schemes; therefore, implementation of the guidance in this EPFAQ will improve the accuracy and timeliness of emergency classifications. Moreover, the responses will result in EAL interpretations that are consistent with the meaning and intent of NRC-approved EAL bases such that the classification of the addressed events/conditions would not be different from that approved by the NRC in a site-specific application. For this reason, it is reasonable to conclude that incorporation of the guidance from this EPFAQ into an NRC-approved site-specific scheme would be considered a "difference" in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, Use of Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 4, dated January 2003.

NRC RESPONSE:

RECOMMENDED FUTURE ACTION(S):

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