EMERGENCY PREPAREDNESS FREQUENTLY ASKED QUESTION (EPFAQ)

EPFAQ Number: 2015-001 **DATE INITIATED** 20-Apr-15

STATUS: UNDER REVIEW

ORIGINATOR DAVID YOUNG **EMAIL** PERKINS-GREW, Susan <spg

ORGANIZATION NEI **PHONE #** 202-739-8016

RELEVANT GUIDANCE: NEI 99-01 REVISIONS 4 THROUGH 6; NUMARC/NESP-007

APPLICABLE SECTION(S VARIOUS

QUESTION OR COMMENT

Assume that an NRC-approved high-wind speed EAL reads "Wind speed greater than X mph;" however, no instrumentation or parameter value source is specified in the EAL or the Basis. Operators have instructions in severe weather operating procedures (i.e., not EPIPs) for determining wind speed from onsite sources (e.g., a primary tower, a backup tower and/or portable temporary instruments) and offsite sources (e.g., NWS or a local airport), and are trained on the acquisition of the necessary data. Some of these sources can provide data more quickly than others – an installed instrument reading vs. a phone call or use of portable temporary instruments. NEI believes that a loss of emergency assessment capability report (for the loss of the ability to assess the wind spend EAL) would be required if all the procedurally-driven sources for wind speed were unavailable. Would this be a reasonable approach for licensees in this situation to follow?

PROPOSED SOLUTION

If the licensee's approved EAL threshold and bases DO NOT identify the instrument displaying the wind speed expressed in the EAL, then whatever procedurally defined source(s) for the wind speed value could be used to declare the EAL. As long as there was an available source for the wind speed value, then the assessment capability is not LOST. Again, this response is contingent upon the EAL that identifies the threshold wind speed value, and its basis, NOT specifying the instrument(s) used to obtain the wind speed. If a single specific wind speed instrument is identified, then that instrument would be the basis for determining if reportable condition exists. All of the other possible data sources might fall into the compensatory action category. Engineering judgment may come into play when assessing the various sources of the wind speed value. For example, a remote/offsite wind speed source must be representative of the conditions at the site.

NRC RESPONSE:

This FAQ is related to event notifications required by 10 CFR 50.72(b)(3)(xiii) for major losses of emergency assessment, offsite response, and offsite communications capabilities. Supplement 1 to NUREG-1022 Revision 3, "Event Report Guidelines," endorsed NEI 13-01, "Reportable Action Levels for Loss of Emergency Preparedness capabilities," dated July 2014. Specifically, the FAQ seeks a clarification of NEI 13-01, RAL 3.1, Table A, "Loss of Emergency Classification Capability." The guidance in NEI 13-01 provides that an instrumentation failure or planned outage is a major loss of assessment capability if it prevents the evaluation of all emergency action levels (EAL) for a particular initiating condition (IC).

In the situation posed by the FAQ, there is but one EAL for the IC — "wind speed greater than X mph" — and an specific instrument designation isn't explicitly identified in the EAL or its basis. Generally, instruments are identified in the EAL scheme by specific instrument designators from engineering documentation or operating procedures. Licensee procedures for severe weather identified other sources of wind speed data, although none of these sources were identified in the affected EAL or its basis. Engineering judgment would need to be applied because the specific guidance in NEI 13-01 cannot be applied directly.

The NRC agrees with the proposed solution that any available source capable of providing a wind speed value representative of the conditions at the site could be used to evaluate the EAL and declare the event. Accordingly, there would not be a major loss of assessment capability and the outage would not be reportable in the circumstances described in the FAQ. Because wind speed is also an input to radiological assessment, the licensee should also consider reportability under NEI-13-01 Table C "Loss of Radiological Assessment Capability."

A decision that an failure or planned outage is not reportable does not relieve the license from maintaining the effectiveness of the emergency plan as required by §50.54(q)(2). Similarly, such a decision is not an input to the evaluation required by §50.54(q)(3).

EMERGENCY PREPAREDNESS FREQUENTLY ASKED QUESTION (EPFAQ)

EPFAQ Number: 2015-002 **DATE INITIATED** 20-Apr-15

STATUS: UNDER REVIEW

ORIGINATOR DAVID YOUNG **EMAIL** PERKINS-GREW, Susan <spg

ORGANIZATION NEI **PHONE #** 202-739-8016

RELEVANT GUIDANCE: NEI 99-01 REVISIONS 4 THROUGH 6; NUMARC/NESP-007

APPLICABLE SECTION(S VARIOUS

QUESTION OR COMMENT

Assume that a fire detector in an area containing safety system equipment fails. In accordance with their Fire Protection Program requirements, a plant would establish a fire watch for the area. There would be a short period of time between the failure and the establishment of a fire watch, but the necessary actions are controlled by a fire protection program procedure. Would a loss of emergency assessment capability report (for the loss of remote fire detection in the given area) be required in this case? The failure/malfunction of a fire detector is not an infrequent event and, given the planned programmatic actions to address it, the industry is unclear if this type of an event warrants a report.

PROPOSED SOLUTION

Given the information provided, the NRC staff does not believe that this event would be reportable under § 50.72(b)(3)(xiii) provided that the licensee's fire-related EALs address fire notifications by plant personnel. In the last 3 revisions of NEI 99-01, this provision is addressed by:

Revision 4 – "FIRE in buildings or areas contiguous to any of the following (site-specific) areas not extinguished within 15 minutes of control room notification or verification of a control room alarm:"
Revision 5 – "FIRE in buildings or areas contiguous to any of the following (site-specific) areas not extinguished within 15 minutes of control room notification or verification of a control room alarm:"
Revision 6 – "Report from the field (i.e., visual observation)"

None of these EALs contain a reference to a specific fire alarm; therefore, they are not affected by a fire alarm outage. Further, there are two parameter sources here: (1) a fire alarm and (2) a receipt of a notification. In keeping with the general guidance, both must be lost to warrant an event report, i.e., a loss of ALL procedurally driven sources. An outage of a fire alarm would not be reportable as the notifications threshold is still available. Although a dedicated fire watch may be driven by the fire protection plan, a fire watch isn't the only source of notification. As is typically covered in site-specific access training, all plant employees are required to promptly report emergency conditions such as fires to the control room. The NRC staff approved site-specific EALs knowing that not all areas of the plant are monitored by fire alarms; for these areas, observation by plant workers is the sole indication of a fire.

The licensee needs to also keep in mind the requirements of §50.54(q)(2). The NRC resident inspectors will be interested in the status of any long-term fire detection outages.

NRC RESPONSE:

This FAQ is related to event notifications required by 10 CFR 50.72(b)(3)(xiii) for major losses of emergency assessment, offsite response, and offsite communications capabilities. Supplement 1 to NUREG-1022 Revision 3, "Event Report Guidelines," endorsed NEI 13-01, "Reportable Action Levels for Loss of Emergency Preparedness capabilities," dated July 2014. Specifically, the FAQ seeks a clarification of NEI 13-01, RAL 3.1, Table A, "Loss of Emergency Classification Capability."

The guidance in NEI 13-01 provides that an instrumentation failure or planned outage is a major loss of assessment capability only if it prevents the evaluation of all emergency action levels (EAL) for a particular initiating condition (IC). The endorsed EAL HU2 in NEI 99-01, Revisions 4 and 5, are predicated on a fire that cannot be extinguished within 15 minutes of control room notification or verification of a control room alarm. Revision 6 of NEI 13-01 added a third threshold to HU4: "receipt of multiple (more than 1) fire alarms or indications." In all of these revisions, the EAL can be declared, in the absence of a fire detector, on the control room notification threshold. Accordingly, an event notification would not be required for the loss of a fire detector if the licensee approved EALs also include control room notifications, whether made by a designated

fire watch or any other plant personnel. Engineering judgement will be needed for those plant areas (e.g., containment or drywell at power, infrequently occupied areas), that are protected by the O.O.S. fire detector, to determine whether detection of a fire by observation of plant personnel would be feasible.

A decision that an failure or planned outage is not reportable does not relieve the license from maintaining the effectiveness of the emergency plan as required by §50.54(q)(2). Similarly, such a decision is not an input to the evaluation required by §50.54(q)(3).

EMERGENCY PREPAREDNESS FREQUENTLY ASKED QUESTION (EPFAQ)

EPFAQ Number: 2015-003 **DATE INITIATED** 01-Jul-15

STATUS: UNDER REVIEW

ORIGINATOR DAVID YOUNG, NEI **EMAIL** dly@nei.org

ORGANIZATION NEI **PHONE #** 202.739.8127

RELEVANT GUIDANCE: NEI 99-01 R5, R6.

APPLICABLE SECTION(S FISSION BARRIER MATRIX CRITERIA

QUESTION OR COMMENT

Background:
The Boiling Water Reactor Owners Group (BWROG) identified generic Emergency Operating Procedure (EOP) concerns and enhancements following a review of the Operating Experience (OE) from the accident at Fukushima Daiichi. As a result of this review, the BWROG Emergency Procedure/Severe Accident Guidelines (EPGs/SAGs) were updated to address the OE lessons learned and improve generic emergency procedure guidance. The updated guidance was issued as EPG/SAG Revision 3, published in February 2013.

Question:
Revision 3 of the BWROG EPG allows for limiting Reactor Pressure Vessel (RPV) depressurization by reclosing the Safety Relief Valves (SRVs). This strategy change is intended to prolong operation of steam-driven water injection required for adequate core cooling (e.g., Reactor Core Isolation Cooling [RCIC] System, High Pressure Coolant Injection [HPCI] System, etc.) following an extended loss of AC power, and thus maintain the core cooling safety function. [S*team-driven water injection systems require RPV pressure to be above a certain value to sustain operation.*] Operators will determine if RPV depressurization will result in a loss of RCIC/HPCI, and, if so, terminate depressurization while maintaining RPV pressure as low as practicable. How should this change be addressed vis-à-vis the NEI 99-01, BWR Fission Product Barrier Table, RCS Barrier Loss threshold, #3 RCS Leak Rate?

PROPOSED SOLUTION

There is no effect on the fission product barrier threshold intent. The relationship between the operationally significant action and the RCS barrier status is unchanged, i.e., performing an Emergency RPV Depressurization per site-specific EOPs is indicative of a loss of the RCS barrier. Even though the SRVs may be reclosed, RCS mass has been lost to the wetwell and subsequent depressurizations may be required (i.e., the ability of the RCS pressure boundary to serve as an effective barrier to a release of fission products has been diminished). For clarity, the threshold basis should be revised to indicate that plant operators may reclose the SRVs following an Emergency RPV Depressurization.

To address this change, licensees should consider updating their emergency classification system procedure and/or basis document as indicated below:

1. NUMARC/NESP-007: Term/threshold not used; no impact from this change.
2. NEI 99-01, Revision 4: Term/threshold not used; no impact from this change.
3. NEI 99-01, Revision 5:
   Refer to the BWR EAL Fission Product Barrier Table, Thresholds for LOSS or POTENTIAL LOSS of Barriers. Using the generic wording as an example, the basis for RCS Barrier LOSS #3, RCS Leak Rate, threshold B, “Emergency RPV Depressurization is required” should be revised as follows:

Plant symptoms requiring Emergency RPV Depressurization per the site specific EOPs are indicative of a loss of the RCS barrier. If Emergency RPV depressurization is required, the plant operators are directed to open safety relief valves (SRVs). Even though the RCS is being vented into the suppression pool, a loss of the RCS should be considered to exist due to the diminished effectiveness of the RCS pressure barrier to a release of fission products beyond its boundary.

4. NEI 99-01, Revision 6:
   Refer to the BWR EAL Fission Product Barrier Table, Thresholds for LOSS or POTENTIAL LOSS of Barriers. Using the generic wording as an example, the basis for RCS Barrier LOSS #3, RCS Leak Rate, threshold B, “Emergency RPV Depressurization” should be revised as follows:

Emergency RPV Depressurization in accordance with the EOPs is indicative of a loss of the RCS barrier. If Emergency RPV Depressurization is performed, the plant operators are directed to open safety relief valves (SRVs). Even though the RCS is being vented into the suppression pool, a Loss of the RCS barrier exists due to the diminished effectiveness of the RCS to retain fission products within its boundary.

Consistent with the guidance in 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*, it is reasonable to conclude that the change proposed above would be considered as a "difference.

NRC RESPONSE:

EMERGENCY PREPAREDNESS FREQUENTLY ASKED QUESTION (EPFAQ)

EPFAQ Number: 2015-004 **DATE INITIATED** 01-Jul-15

STATUS: UNDER REVIEW

ORIGINATOR DAVID YOUNG, NEI **EMAIL** dly@nei.org

ORGANIZATION NEI **PHONE #** 202.739.8127

RELEVANT GUIDANCE: NEI 99-01 R4, R5, R6

APPLICABLE SECTION(S FISSION BARRIER MATRIX CRITERIA

QUESTION OR COMMENT

Background:
The Boiling Water Reactor Owners Group (BWROG) identified generic Emergency Operating Procedure (EOP) concerns and enhancements following a review of the Operating Experience (OE) from the accident at Fukushima Daiichi. As a result of this review, the BWROG Emergency Procedure/Severe Accident Guidelines (EPGs/SAGs) were updated to address the OE lessons learned and improve generic emergency procedure guidance. The updated guidance was issued as EPG/SAG Revision 3, published in February 2013.

Question:
Revision 3 of the BWROG SAG changes the conditions under which the primary containment flooding strategy would be employed. The objectives of this strategy are to remove heat from the RPV, retain core debris in the RPV, maintain primary containment integrity, scrub fission products from the containment atmosphere, and minimize radioactivity releases. In earlier SAG revisions, this strategy was implemented shortly after SAG entry in response to the inadequate core cooling condition. As changed, primary containment flooding is a discretionary strategy that must be coordinated with other accident management objectives. The appropriate timing and extent of primary containment flooding considers:

- Whether a primary system break exists (i.e., whether primary containment flooding will submerge fuel and core debris inside the RPV).
- The potential benefits of ex-vessel cooling.
- The optimal timing of venting to control primary containment pressure as the containment is filled.
- The availability and need for pressure suppression and vacuum relief capabilities.
- The effect of higher injection rates on hydrogen production and combustible gas control strategies.
- The likelihood and effect of increased seismic loads.
- Capabilities for containing of any water leakage from the primary containment.
- The availability of required resources, including personnel, electrical power, pneumatic supplies, and water sources.

How should this change be addressed vis-à-vis NEI 99-01, BWR Fission Product Barrier Table, Primary Containment Potential Loss threshold, #2 Reactor Vessel (or RPV) Water Level?

PROPOSED SOLUTION

This SAG change affects the associated fission product barrier threshold and basis and may change the point at which a Potential Loss of the Containment Barrier is determined to have occurred. In the current threshold basis, the potential for core damage and a possible core melt sequence is evident in the BWROG EPG/SAG requirement to exit all EOPs and enter the SAGs because adequate core cooling cannot be restored and maintained (i.e., assured). In earlier EPG revisions, this condition was signaled by the phrase “PRIMARY CONTAINMENT FLOODING IS REQUIRED.”

In EPG/SAG Revision 3, the condition “primary containment flooding is required” is only reached after SAG entry and the decision to flood the primary containment has been thoroughly evaluated based on the set of considerations listed above. Under some conditions, fuel melting is occurring and core debris has breached the RPV before a containment flooding strategy begins. The migration of corium to a location outside the RPV can be expected to present a significant challenge to primary containment integrity.

To address this SAG Revision 3 strategy change, the Containment Barrier Potential Loss threshold should also be changed such that it remains functionally equivalent to the current threshold wording which reflects the prior

revisions of the SAGs; the Containment barrier should be considered potentially lost when adequate core cooling can no longer be assured and core damage is imminent. Within the context of EPGs, this point is best defined when, as a result of all core cooling methods being lost (i.e., unavailable or incapable of assuring adequate core cooling), operators are directed to enter a SAG (i.e., "SAG entry is required").

When preparing to implement Revision 3 of the SAGs, licensees should consider updating their emergency classification system procedure and/or basis document as indicated below:

1. NUMARC/NESP-007: Term/threshold not used; no impact from this change.
2. NEI 99-01, Revision 4:
   Refer to the BWR Emergency Action Level Fission Product Barrier Reference Table, Thresholds for LOSS or POTENTIAL LOSS of Barriers. Using the generic wording as an example, the threshold for Containment Barrier POTENTIAL LOSS #2, Reactor Vessel Water Level, "Primary containment flooding required" should be revised as follows: "SAG entry is required."

The associated basis should be revised as follows:
Reactor Vessel Water Level: The entry into Severe Accident Guidelines indicate that a core melt sequence is in progress. EOPs direct the operators to enter the Severe Accident Guidelines when adequate core cooling cannot be assured. Entry into the Severe Accident Guidelines is a logical escalation in response to the inability to assure adequate core cooling.

The conditions in this potential loss EAL represent imminent core melt sequences which, if not corrected, could lead to vessel failure and increased potential for containment failure. In conjunction with and an escalation of the level EALs in the Fuel and RCS barrier columns, this EAL will result in the declaration of a General Emergency -- loss of two barriers and the potential loss of a third. If the emergency operating procedures have been ineffective in restoring reactor vessel level above the RCS and Fuel Clad Barrier Threshold Values, there is not a "success" path and a core melt sequence is in progress. Entry into the Severe Accident Guidelines is a logical escalation in response to the inability to assure adequate core cooling.

3. NEI 99-01, Revision 5:
   Refer to the BWR EAL Fission Product Barrier Reference Table, Thresholds for LOSS or POTENTIAL LOSS of Barriers. Using the generic wording as an example, the threshold for Containment Barrier POTENTIAL LOSS #2, Reactor Vessel Water Level, "Primary containment flooding required" should be revised as follows: "SAG entry is required."

The associated basis should be revised as follows:
The potential loss requirement for entry into the Severe Accident Guidelines indicates adequate core cooling cannot be assured and that core melt is possible. Entry into the Severe Accident Guidelines is a logical escalation in response to the inability to assure adequate core cooling.

[*Severe Accident Guidelines (SAGs) direct the operators to perform actions when adequate core cooling cannot be assured.*]

Reflecting the above change, a site should determine if a corresponding change is also needed for the Fuel Clad Barrier LOSS #2.A threshold, Reactor Vessel Water Level. For example, if the site specified parameter values associated with inadequate core cooling conditions (e.g., an RPV water level), and did not refer to primary containment flooding, then no change may be needed. If, on the other hand, the threshold references primary containment flooding then it should be changed to "SAG entry is required," and provided with a basis similar to that above for the containment potential loss."

4. NEI 99-01, Revision 6:
   Refer to the BWR EAL Fission Product Barrier Reference Table, Thresholds for LOSS or POTENTIAL LOSS of Barriers. Using the generic wording as an example, the threshold for Containment Barrier POTENTIAL LOSS #2, RPV Water Level, "Primary containment flooding required" should be revised as follows: "SAG entry is required."

The associated basis should be revised as follows:

The Potential Loss threshold is identical to the Fuel Clad Loss RPV Water Level threshold 2.A. The Potential Loss requirement for entry into the Severe Accident Guidelines indicates adequate core cooling cannot be assured and that core damage is possible. BWR EPGs/SAGs specify the conditions when the EPGs are exited and SAGs are entered. Entry into SAGs is a logical escalation in response to the inability to assure adequate core cooling.

PRA studies indicate that the condition of this Potential Loss threshold could be a core melt sequence which, if not corrected, could lead to RPV failure and increased potential for primary containment failure. In conjunction with the RPV water level Loss thresholds in the Fuel Clad and RCS barrier columns, this threshold results in the declaration of a General Emergency.

Developer Notes: None.

5. Reflecting the above change and rationale, the following additional change should be made to Fuel Clad Barrier LOSS #2, RPV Water Level, “Primary containment flooding required,” “SAG entry is required.”

The associated basis should be revised as follows:
Loss 2.A: The Loss threshold represents any EOP requirement for entry into the Severe Accident Guidelines. This is identified in the BWROG EPGs/SAGs when adequate core cooling cannot be assured.

Developer Notes: None

Consistent with the guidance in 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*, it is reasonable to conclude that the change proposed above would be considered as a “deviation.”

NRC RESPONSE:

EMERGENCY PREPAREDNESS FREQUENTLY ASKED QUESTION (EPFAQ)

EPFAQ Number: 2015-005 **DATE INITIATED** 01-Jul-15

STATUS: UNDER REVIEW

ORIGINATOR DAVID YOUNG, NEI **EMAIL** dly@nei.org

ORGANIZATION NEI **PHONE #** 202.739.8127

RELEVANT GUIDANCE: NEI 99-01 R5, R6

APPLICABLE SECTION(S FISSION BARRIER MATRIX CRITERIA

QUESTION OR COMMENT

Background:
The Boiling Water Reactor Owners Group (BWROG) identified generic Emergency Operating Procedure (EOP) concerns and enhancements following a review of the Operating Experience (OE) from the accident at Fukushima Daiichi. As a result of this review, the BWROG Emergency Procedure/Severe Accident Guidelines (EPGs/SAGs) were updated to address the OE lessons learned and improve generic emergency procedure guidance. The updated guidance was issued as EPG/SAG Revision 3, published in February 2013.

Question:
Revision 3 of the BWROG EPGs allows for anticipatory venting to address conditions other than those associated with an immediate challenge to primary containment integrity resulting from high pressure (i.e., before suppression chamber pressure reaches the Primary Containment Pressure Limit) or combustible gas concentrations have reached a deflagration concentration. For example, venting may be performed early to address an adverse trend in suppression pool temperature that threatens the operation of systems required for adequate core cooling. How should this change be addressed vis-à-vis the NEI 99-01, BWR Fission Product Barrier Table thresholds dealing with a loss of containment due to primary containment isolation failure or bypass?

PROPOSED SOLUTION

The NEI EAL development documents address BWR containment venting as follows.

1. NUMARC/NESP-007:
   Threshold: Not used; however, the basis for Containment Loss threshold #2, Containment Isolation Valve Status After Containment Isolation Signal, states, “Also, an intentional venting of primary containment per EOPs to the secondary containment and/or the environment to considered a loss of containment.”

2. NEI 99-01, Revision 4:
   Threshold: Containment Loss threshold #3, CNMT Isolation Failure or Bypass, Intentional venting per EOPs. [*The venting threshold is one of three thresholds under this heading.*]

   Basis: “Also, an intentional venting of primary containment for pressure control per EOPs to the secondary containment and/or the environment is considered a loss of containment. Containment venting for temperature or pressure when not in an accident situation should not be considered.”

3. NEI 99-01, Revision 5:
   Threshold: Containment Loss threshold #3, CNMT Isolation Failure or Bypass, Intentional primary containment venting per EOPs. [*The venting threshold is one of three thresholds under this heading.*]

   Basis: “Intentional venting of primary containment for primary containment pressure or combustible gas control per EOPs to the secondary containment and/or the environment is considered a loss of containment. Containment venting for pressure when not in an accident situation should not be considered.”

4. NEI 99-01, Revision 6:
   Threshold: Containment Loss threshold #3, Primary Containment Isolation Failure, Intentional primary containment venting per EOPs. [*The venting threshold is one of three thresholds under this heading.*]

Basis: "Intentional venting of primary containment for primary containment pressure or combustible gas control to the secondary containment and/or the environment is a Loss of the Containment. Venting for primary containment pressure control when not in an accident situation (e.g., to control pressure below the drywell high pressure scram setpoint) does not meet the threshold condition.

There is no impact to the fission product barrier threshold or basis intent, and no change is recommended. The relationship between the operationally significant action and the Containment barrier status is unchanged, i.e., conditions and trends are such that the Control Room staff has made a decision to perform an intentional controlled venting of the containment. This intentional venting action results in a bypass of the primary containment, whether it is anticipatory or otherwise.

NRC RESPONSE:

EPFAQ Number: 2015-006 **DATE INITIATED** 01-Jul-15

STATUS: UNDER REVIEW

ORIGINATOR DAVID YOUNG, NEI **EMAIL** dly@nei.org

ORGANIZATION NEI **PHONE #** 202.739.8127

RELEVANT GUIDANCE: NEI 99-01 R5, R6

APPLICABLE SECTION(S FISSION BARRIER MATRIX CRITERIA

QUESTION OR COMMENT

Question:
Should the path of a radiological release that goes through a BWR wetwell be considered a "direct release path" for purposes of assessing the status of the containment fission product barrier (i.e., a loss or potential loss threshold)?

Background:
Note – In the event of a pipe break in the reactor coolant system inside a BWR drywell, pressurized coolant escaping from inside the reactor coolant system will flash to steam and begin to pressurize and heat the drywell atmosphere. As the pressure rises in the drywell, the downcomer vent system (or horizontal vents in Mk III containments) will also pressurize, eventually forcing the steam into the wetwell below the water level. The steam contacting the water condenses in the wetwell. This reduces (suppresses) the pressure in the primary containment following the loss of coolant accident by condensing the steam. In some designs and other usage contexts, a BWR wetwell may also be referred to as the torus or suppression pool.

PROPOSED SOLUTION

Yes. A release path is "direct" if it allows for the migration of radioactive material from the containment to the environment in a generally uninterrupted manner (e.g., little or no holdup time); therefore, within the context of a Containment barrier Loss or Potential Loss threshold, a release path through the wetwell is a direct release path. This answer reflects the fact that, although the water in the wetwell would cause some "scrubbing" of the release by reducing the amount of iodines and particulates, it would not affect the amount of noble gases released to the environment. Noble gases (Kr, Xe) contribute to whole body submersion or immersion dose from cloud shine.

Consistent with the guidance in 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*, it is reasonable to conclude that the addition of this clarification would be considered as a "difference."

NRC RESPONSE:

EMERGENCY PREPAREDNESS FREQUENTLY ASKED QUESTION (EPFAQ)

EPFAQ Number: 2015-007 **DATE INITIATED** 01-Jul-15

STATUS: UNDER REVIEW

ORIGINATOR DAVID YOUNG, NEI **EMAIL** dly@nei.org

ORGANIZATION NEI **PHONE #** 202.739.8127

RELEVANT GUIDANCE: NEI 99-01 R4, R5, R6; NUMARC/NESP-007

APPLICABLE SECTION(S EAL SG2(5)

QUESTION OR COMMENT

Question:
Consistent with the guidance in the Boiling Water Reactor Owners Group (BWROG) Emergency Procedure Guidelines (EPG), many sites have Emergency Operating Procedures (EOPs) that rely upon Minimum Core Steam Flow (MCSF) as an optional strategy to achieve adequate core cooling during an Anticipated Transient Without Scram (ATWS) event. Use of MCSF in BWR EOPs is an optional strategy that may not benefit all BWR designs. This core cooling strategy is not reflected in the NEI EAL development guidance for:

- NUMARC/NESP-007, Initiating Condition SG2
- NEI 99-01, Revision 4, Initiating Condition SG2
- NEI 99-01, Revision 5, Initiating Condition SG2
- NEI 99-01, Revision 6, Initiating Condition SS5

For an ATWS event, each of the above guidance documents base an EAL determination of an extreme challenge to core cooling on a specified Reactor Pressure Vessel (RPV) water level. Should EALs or Basis information be revised to also address the optional use the MCSF strategy during an ATWS?

Background:
Note – During some high-power ATWS conditions, operators may be required to intentionally lower RPV water level below the top of active fuel as an event mitigation action (i.e., to reduce reactor power). During this condition, the core may be generating at least the minimum steam flow required to assure adequate core cooling (i.e., MCSF) even though RPV water level is below the Minimum Steam Cooling RPV Water Level (MSCRWL). This action will delay fuel heatup by cooling the uncovered upper regions of the core through steam flow; the source of steam is the remaining inventory of water in the RPV. The MCSF cooling maneuver is implemented as a delaying tactic to avoid the need for emergency RPV depressurization before sufficient boron has been injected into the RPV to assure reactor shutdown under hot conditions.

PROPOSED SOLUTION

MCSF is an optional core cooling method, and its use and effectiveness is subject to a number of factors. During an ATWS, the fact that the MSCRWL cannot be restored and maintained is sufficient to meet the EAL criterion that core cooling is extremely challenged.

NRC RESPONSE:

EMERGENCY PREPAREDNESS FREQUENTLY ASKED QUESTION (EPFAQ)

EPFAQ Number: 2015-008

DATE INITIATED 01-Jul-15

STATUS: UNDER REVIEW

ORIGINATOR DAVID YOUNG, NEI

EMAIL dly@nei.org

ORGANIZATION NEI

PHONE # 202.739.8127

RELEVANT GUIDANCE: NEI 99-01 R6

APPLICABLE SECTION(S EALS CU2, CA2, SA1, SS1

QUESTION OR COMMENT

Question:
NEI 99-01 R6 contains the following Developer Note guidance for ICs CU2, CA2, SA1 and SS1:

"The EAL and/or Basis section may specify use of a non-safety-related power source provided that operation of this source is recognized in AOPs and EOPs, or beyond design basis accident response guidelines (e.g., FLEX support guidelines). Such power sources should generally meet the "Alternate ac source" definition provided in 10 CFR 50.2."

The earlier revisions of NEI 99-01 (R4 and R5) and NUMARC/NESP-007 predate the accident at Fukushima Daiichi and thus do not contain any reference to beyond design basis accident response guidelines.

Plants have added, or are in the process of adding, new FLEX capabilities in response to NRC Order EA-12-049. These capabilities will allow a plant to maintain or restore key safety functions for an indefinite period of time following an extended loss of AC power. Should EALs or Bases be revised to recognize/credit FLEX capabilities (e.g., a plant now has the ability to re-energize a bus from a FLEX generator)?

PROPOSED SOLUTION

Consistent with the Developer Note guidance cited above, a FLEX power source may be reflected in an EAL and/or Basis if the source meets the "Alternate ac power source" definition criteria in 10 CFR 50.2. A licensee may propose to include within their EALs or EAL bases other equipment specified in beyond design basis accident response guidelines (e.g., FLEX or B.5.b/EDMG equipment). The rationale for such proposals should include a discussion how the equipment would be maintained (to ensure reliability), deployed (including estimated times), and operated.

Consistent with the guidance in 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*, it is reasonable to conclude that a proposal to include beyond design basis event response equipment within EALs or EAL bases, outside of the guidance specifically allowed in NEI 99-01 R6, would be considered as a "deviation."

NRC RESPONSE: