

## Emergency Preparedness Frequently Asked Question

**EPFAQ Number:** 26-01

**Date Accepted for Review:** TBD

**Originator:** David Young

**Organization:** NEI

### Relevant guidance:

1. Nuclear Energy Institute (NEI) technical report NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 7, dated September 2024 (ADAMS Accession No. ML 24274A312)
2. BWR Owners Group, Emergency Procedure and Severe Accident Guidelines, Appendix B, Volumes I and II, Revision 4.13

**Applicable Sections:** Initiating Condition (IC) SS8, "Inability to shut down the reactor causing a challenge to (core cooling [*PWR*] / RPV water level [*BWR*]) or RCS heat removal."

**Status:** TBD

### QUESTION OR COMMENT:

#### Background

This EPFAQ applies to BWRs only.

In some cases, NEI 99-01, Revision 7, makes use of conditions and parameter values found in a site's emergency operating procedures (EOPs) as criteria for defining emergency ICs and Emergency Action Levels (EALs). This approach promotes timely and accurate emergency classifications because EAL assessments can utilize terms and values that operators are readily familiar with. The conditions and parameter values found in site EOPs are based on procedure development guidance and technical bases provided by the BWR Owners Group (BWROG).

One IC that makes use of EOP criteria is IC SS8, "Inability to shut down the reactor causing a challenge to (core cooling [*PWR*] / RPV water level [*BWR*]) or RCS heat removal." IC SS8 is the subject of this EPFAQ and, specifically, the first bullet of example EAL 1.c:

"(Site-specific indication of an inadequate core cooling)"

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The associated Developer Notes for the first bullet states:

Site-specific indication of inadequate core cooling:

“[BWR] – Reactor vessel water level cannot be restored and maintained above Minimum Steam Cooling RPV Water Level (as described in the EOP bases).”

The BWROG EOP development guidance defines three methods for establishing adequate core cooling: core submergence, core spray cooling, and steam cooling. The Minimum Steam Cooling Reactor Water Level (MSCRWL) is the lowest Reactor Pressure Vessel (RPV) water level at which the covered portion of the reactor core will generate sufficient steam to prevent clad temperatures in the uncovered part of the core from exceeding 1,500°F. Similarly, the Minimum Core Steam Flow (MCSF) is the lowest steam flow that will prevent clad temperatures from exceeding 1,500°F, even if the reactor core is not completely covered. The steam cooling method may be employed when RPV water level cannot be maintained above the top of active fuel, such as during Anticipated Transient Without Scram (ATWS) and emergency RPV depressurization scenarios. The analyses demonstrating the core cooling effectiveness of the MSCRWL and MCSF are described in EPGs/SAGs, Appendix B, Vol. I (Introduction).

The implementing instructions for use of the MCSF core cooling method are described in EPGs/SAGs, Appendix B, Vol. II (EPGs/SAGs for Hot Conditions), steps C4-1 and C5/L-4, which direct controlling RPV injection to restore and maintain core steam flow above the MCSF.

While the developer note from NEI 99-01, Revision 7, cited above is correct, it can be seen that the BWROG EOP technical basis recognizes a second criterion that is also indicative of inadequate core cooling during an ATWS condition. That criterion is that core steam flow cannot be restored and maintained above the MCSF. In other words, the core will be adequately cooled provided the core steam flow is higher than the site-specific MCSF value.

### Question

Given the above information and the goal of promoting alignment between EOPs and EALs, can a licensee incorporate the MCSF core cooling criterion into IC SS8 of their site emergency classification scheme through a reading of the following revised EAL development guidance?

1) Revise the generic first bullet of example EAL 1.c to state:

- (Site-specific indications of ~~an~~ inadequate core cooling)

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2) Revise the associated Developer Notes to state:

Site-specific indications of inadequate core cooling:

“[BWR] – Reactor vessel water level cannot be restored and maintained above Minimum Steam Cooling RPV Water Level AND core steam flow cannot be restored and maintained above the Minimum Core Steam Flow (as described in the EOP bases).”

### PROPOSED SOLUTION:

Yes, a licensee may incorporate the MCSF core cooling criterion into their site-specific IC SS8 through a reading of the revised EAL development guidance presented in the question above.

### Difference/Deviation Determination

This EPFAQ may be considered by a licensee that has implemented NEI 99-01, Revision 7, or will be submitting a License Amendment Request (LAR) to convert their emergency classification scheme to Revision 7. The response above promotes alignment between BWR EOPs and EAL schemes; therefore, implementation of the guidance in this EPFAQ will promote timely and accurate emergency classifications. Moreover, the added criterion will result in EAL interpretations that are consistent with the meaning and intent of the NRC-approved EAL basis, such that the classification of the addressed event/condition would not be different from that in the NRC-approved EAL basis. For this reason, it is reasonable to conclude that incorporation of the guidance from this EPFAQ into a scheme conversion LAR or an NRC-approved, site-specific EAL scheme based on NEI 99-01, Revision 7, would be considered a “difference” in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2.

### NRC RESPONSE:

TBD

### RECOMMENDED FUTURE ACTION(S):

INFORMATION ONLY, MAINTAIN EPFAQ

UPDATE GUIDANCE DURING NEXT REVISION