Emergency Preparedness Program Frequently Asked Question (EPFAQ)

EPFAQ Number:	2018-01
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Organization:	NEI
Relevant Guidance:	This question concerns NEI 99-01, *Development of Emergency Action Levels for Non-Passive Reactors*, Revision 6.
Applicable Section(s):	Pressurized Water Reactor (PWR) Fission Product Barrier Matrix-Reactor Coolant System (RCS) Barrier Loss Threshold 1.A
Date Accepted for Review:	4/4/2018
Status:	Under Review

QUESTION OR COMMENT:

Background

The PWR EAL Fission Product Barrier Table in NEI 99-01, Rev. 6, contains the following RCS Barrier Loss threshold: An automatic or manual ECCS (SI) actuation is required by **EITHER** of the following:

1. UNISOLABLE RCS leakage

OR

2. SG tube RUPTURE.

The basis section for this threshold states,

> This threshold is based on an UNISOLABLE RCS leak of sufficient size to require an automatic or manual actuation of the Emergency Core Cooling System (ECCS). This condition clearly represents a loss of the RCS Barrier.
>
> This threshold is applicable to unidentified and pressure boundary leakage, as well as identified leakage. It is also applicable to UNISOLABLE RCS leakage through an interfacing system. The mass loss may be into any location – inside containment, to the secondary-side (i.e., steam generator tube leakage) or outside of containment.

NEI 99-01, Rev. 6, also states, “The RCS Barrier includes the RCS primary side and its connections up to and including the pressurizer safety and relief valves, and other connections up to and including the primary isolation valves.”

NEI 99-01, Rev. 6, defines UNISOLABLE as, “An open or breached system line that cannot be isolated, remotely or locally.”

During a significant and protracted loss of feedwater to the steam generators, PWR emergency operating procedures (EOPs) may direct the opening of Pressurizer pressure relief valves as one action to implement a core cooling strategy often referred as a “feed and bleed” cooldown. The action will allow reactor coolant to exit the RCS through a pressurizer pressure relief line,

collect in a pressurizer relief tank until the rupture of an engineered pressure relief device (such as a disk), and then be recirculated via the containment sumps.

Question

If there is a significant and protracted loss of feedwater to the steam generators, and EOPs direct operators to open the Pressurizer pressure relief valves to implement a core cooling strategy (i.e., a "feed and bleed" cooldown), then should this condition be considered a LOSS of the RCS Barrier?

PROPOSED SOLUTION:

If EOPs direct operators to open the Pressurizer pressure relief valves to implement a core cooling strategy (i.e., a "feed and bleed" cooldown), then there will exist a reactor coolant flow path from the RCS, past the "pressurizer safety and relief valves" and into the containment that operators cannot isolate without compromising the effectiveness of the strategy (i.e., for the strategy to be effective, the valves must be kept in the open position); therefore, the flow through the pressure relief line is UNISOLABLE. In this case, the ability of the RCS pressure boundary to serve as an effective barrier to a release of fission products has been eliminated and thus this condition constitutes a loss of the RCS barrier.

A licensee may add clarifying wording reflecting this position to their site-specific emergency classification scheme procedure and/or technical basis document. 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 this change would be considered as a "difference."

NRC RESPONSE:

RECOMMENDED FUTURE ACTION(S):

☐ INFORMATION ONLY, MAINTAIN EPFAQ

☒ UPDATE GUIDANCE DURING NEXT REVISION