From: Beltz, Terry
Sent: Tuesday, December 21, 2010 11:53 AM
To: Hale, Steve
Cc: Abbott, Liz; Costedio, James; Flentje, Fritzie; Hanneman, Harv
Subject: Point Beach Nuclear Plant, Units 1 and 2 - Request for Additional Clarification (SNPB) re: Extended Power Uprate Review (TAC Nos. ME1044 and ME1045)

Dear Mr. Hale:

The NRC staff in the Nuclear Performance and Code Review Branch (SNPB) in the Office of Nuclear Reactor Regulation requires some additional clarification related to the following:

Follow-up to RAI 2.8.5.6-8 from the May 20, 2010, response letter (ADAMS Accession No. ML101440069):

SNPB-1

Although LHSI is not interrupted during the switchover from injection to the recirculation mode, HHSI is terminated. For a small break in the range of 2 – 6 inches in diameter, RCS pressure can remain above the shutoff head of the LHSI pump (134 psia) for a couple of hours. As such, there will be a period during the LOCA when there is no injection until the HHSI pumps are re-aligned. For small breaks on the top or side of the cold discharge leg, RCS pressure can limit the fluid in the core and upper plenum to reduced values compared to breaks on the bottom of the pipe. Therefore, when HHSI is terminated with RCS pressure above 134 psia, core uncover can occur if HHSI is not initiated within 15 minutes of drainage of the RWST.

How are small cold leg breaks in the 2 – 6 inch range handled when RCS pressure remains above the shutoff head of the LHSI pump and HHSI is terminated when the RWST drains?

How do the EOPs deal with this particular scenario? That is, if a SBLOCA occurs and RCS pressure remains above 134 psia, then the operators will need to immediately re-align HHSI to the sump to assure the time during the LOCA without any injection is minimized to limit the PCT. Please explain how this condition is handled.

SNPB-2

Background and additional clarification requested regarding the potential for injection for extended periods of time following SBLOCAs and a possible inadvertent rapid depression:

As a result of staff calculations for small breaks, failure of an ADV to open and the possible need for the PORVs to be opened to ensure a timely cooldown to actuate LPSI could be required. The staff RELAP5 calculations showed that the RCS pressure cannot be reduced below about 120 psia (i.e., the pressure required for sufficient RHR low pressure injection flow to begin flushing the core) for at least 8.0 hrs when 2 ADVs and 2 PORVs are opened at one hour following a 0.0125 ft^2 cold leg break. The staff calculations suggest that with the RCS boiling for extended periods of time, or more than

8 hours in this example, large amounts of boric acid can accumulate in the vessel. While the RCS pressure remains above 120 psia, the RCS temperature is sufficiently high to keep the boric acid in solution. As such, there is the concern that should operators regain power or the ability to more rapidly depressurize the RCS, precipitation could be inadvertently produced. It would therefore be important for the EOPs to instruct or alert the operators not to exceed the maximum cooldown limit following a small break LOCA. Staff calculations also show that the operators could also utilize the PORVs should only one of the ADVs fail to open. While the staff finds that one ADV may not depressurize the RCS to 120 psia for small breaks for many hours, the high RCS temperature will maintain the boric acid in solution. Potential modifications to the EOPs or guidance to stay within the limits of the permissible cooldown rates will prevent the operators from causing an inadvertent precipitation by limiting the depressurization rate during small breaks in the event boiling persist for extended periods of time with the RCS pressure above 120 psia (or that RCS pressure where LPSI injection can flush the core to control boric acid).

Please provide information as to how the EOPs and operating procedures instruct the operators to not exceed the permissible cooldown limits following a SBLOCA.

These clarifications were discussed with you and your staff during a teleconference on December 20, 2010. The information being requested is necessary to complete the SNPB staff's review associated with the extended power uprate license amendment request.

Sincerely,

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