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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Edwin I. Hatch Nuclear Plant
Response to Request for Additional Information on
Emergency Operating Procedures

Gentlemen:

On May 20, 1997, the Nuclear Regulatory Commission (NRC) staff requested additional information on Plant Hatch's implementation of Emergency Procedure Guidelines (EPGs) concerning reactor depressurization during a loss of all high pressure feed to the reactor vessel.

In your letter, you documented that following a July 1996 simulator scenario at Hatch, operators did not pursue a reactor depressurization in anticipation of an emergency depressurization. Southern Nuclear Operating Company (SNC) provides the following response to the request for information:

An override in the reactor control/pressure (RC/P) path of the EPG states that, if an emergency depressurization is anticipated, a rapid depressurization through the bypass valves should be performed. The Hatch emergency operating procedure (EOP) contains the same override. The purpose of the override is to divert as much energy as possible to the main condenser prior to opening safety relief valves for emergency depressurization. At Hatch, if an emergency depressurization is anticipated for any reason other than decreasing water level in the vessel, the actions of this override will be promptly taken. However, if the emergency depressurization is anticipated for inventory loss, or loss of injection, caution must be exercised for the reasons provided below.

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During the July simulator scenario, a small break Loss of Coolant Accident had occurred with a loss of all high pressure make-up to the reactor vessel. Reactor water level was low and very close to the main steam isolation valve (MSIV) closure setpoint (approximately 10 inches from the setpoint). As with any similar scenario, the operating crew did not use the RC/P override to anticipate an emergency depressurization through the bypass valves.

With the reactor water level so low, a rapid depressurization through the bypass valves could have resulted in a loss of water level and a subsequent MSIV closure, immediately isolating the reactor from the main condenser. An MSIV closure following a bypass valve depressurization would have caused reactor water level to decrease rapidly, possibly resulting in a loss of level control by the operating crew. Reactor water level could have decreased so rapidly in fact, that operators could have difficulty in initiating the emergency depressurization at the top of the active fuel (TAF); this could jeopardize adequate core cooling. Also, anticipating an emergency depressurization in this situation is a very subjective judgment because, at any time, a high pressure pump may be recovered and made available for use, avoiding an emergency depressurization. Additionally, a normal cooldown was not immediately initiated during this scenario since this also would have resulted in a loss of reactor water.

The strategy of waiting until the TAF is reached prior to initiating an emergency depressurization (Opening 7 Automatic Depressurization System valves) is an acceptable strategy per the EPGs and insures adequate core cooling; in fact, the EPGs <u>require</u> waiting until the reactor water level actually reaches the TAF before initiating emergency depressurization. Appendix B to the EPGs, in discussing the step to initiate emergency depressurization states, "Emergency depressurization is not initiated until RPV water level has dropped to the top of the active fuel because: 1) Adequate core cooling exists so long as RPV water level remains above the top of the active fuel, and 2) The time required for RPV water level to decrease to the top of the active fuel can best be used to line up and start pumps, attempting to reverse the decreasing RPV water level trend before RPV depressurization is required to assure adequate core cooling", (Ref: page B-10-28 of Appendix B to the EPGs). Accordingly, this strategy is in compliance with the EPGs and assures adequate core cooling.

The EPGs call for anticipating an emergency depressurization through the bypass valves because it is desirable to deposit as much energy as possible to the main condenser, for the purpose of preserving the heat capacity of the primary containment. As mentioned previously, Hatch will promptly perform these actions for an emergency depressurization that is anticipated for any reason other than decreasing water level. In these cases, (decreasing water level) opening bypass valves will result in a loss of inventory and may result in a loss of level control. However, heat capacity of the containment is maintained even if no cooldown to the main condenser is performed prior to emergency depressurization. The heat capacity of the containment is assured by other containment limits, such as the heat capacity temperature limit, which will insure that an emergency depressurization is initiated prior to the heat capacity of the torus being exceeded. Therefore, the strategy of using caution with regard to reactor depressurization when no high pressure make-up is available, insures containment integrity as well as adequate core cooling.

The Hatch EOP step mentioned in your letter, "Wait until a reactor pressure reduction is required" is not intended to subvert any requirement to cooldown the reactor vessel, and is not a deviation from the EPGs. While this step is located on the RC/P path immediately before the step to begin a normal cooldown, it is merely intended as a place on the flow chart where the Shift Supervisor (SS) can, after reactor pressure is under control, momentarily pause, and consider further actions. This allows him to direct operators to other tasks such as containment control, electrical system recovery, checking the status of ventilation systems, etc. This pause is acceptable because reactor pressure is under control and there may not be a need to cooldown the vessel if no emergency conditions exist; the SS may choose to remain in the EOP even if no emergency procedure entry conditions exist. If an entry condition <u>does</u> exist, the entry parameter may be approaching its normal value. For example, a normal scram may result in a reactor water level below the EOP entry condition for a short period of time before normal or safety related make-up systems provide injection and recover normal level. In these cases, it may not be appropriate for a cooldown to commence. Likewise, it may not be appropriate to initiate a cooldown if no high pressure systems are available, since this will result in a loss of reactor water. Appendix B to the EPGs, in discussing the reactor pressure vessel (RPV) control guidelines, states that "RPV pressure control actions stabilize RPV pressure to assist in controlling RPV water level and, <u>if necessary</u>, depressurize and cool down the reactor to cold shutdown conditions" (Ref: page B-6-2 of Appendix B to the EPGs). The EPGs therefore offer some latitude to the shift supervisor in determining the need for a cooldown. Nonetheless, Hatch operators <u>will</u> initiate a cooldown on a loss of high pressure make-up systems, if condensate booster pumps are available. In this case, it is possible to reduce pressure without an appreciable loss of inventory and achieve injection since the booster pumps have a relatively high shutoff head (approximately 600 psig).

The potential for an actual MSIV closure and a subsequent rapid decrease in water level following a rapid depressurization through the bypass valves depends on several factors, such as the decay heat level, the reactor water level and pressure at the point the depressurization is initiated, and the presence and size of a coolant line break. Hatch presently does not have a rigorous analysis defining these points. To that end, Hatch is working with General Electric on an analysis, specifically for Hatch Units 1 and 2, to determine at what reactor water level and pressure, if any, a rapid depressurization through the bypass valves could be initiated without reaching the MSIV closure before achieving injection with a low pressure make-up pump. When this analysis is completed and reviewed, the results, if appropriate will be implemented in Hatch EOP policy. This analysis will be completed by September 1997 and initially reviewed by November, 1997.

The Hatch Probabilistic Risk Assessment is presently modeled using Safety Relief Valve depressurization capabilities only for a loss of high pressure make-up system to the reactor vessel. We do not presently model early depressurization through the bypass valves except for the unique case of pressure reduction to the shutoff head of the condensate booster pumps.

If you have questions, please contact this office.

Sincerely,

Lewis Sumner

H. L. Sumner, Jr.

OCV/eb

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