

Title of Proposed Change, Test or Experiment: Setpoint Change to the Auxiliary Feedwater By-pass Control Valves Time Delay Relay Setpoints (1/2-NC005, 62-P38A and 62-P38B)

Reference Document(s) #: STPT 14.11, DBD-01, FSAR 14.2.4, 14.2.5, AABD module 14

Prepared by: JACK HAMMERS *J. Hammers* Date: 11/13/97
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Reviewed by: JOSEPH P. SCHMAELING *Joseph P. Schmaeling* Date: 11/24/97
 Name (Print) Signature

MSS Review: *James [Signature]* 12-4-97 MSS#: 99-17

Manager - PBNP Approval: CARL N. Gately *[Signature]* for AP Date: 12/4/97
 Name (Print) Signature

In lieu of MSS and Manager signature, attach PBF-0026d if serial review has been conducted. (MSS and manager approvals are not necessary for a determination of non-applicability.)

SECTION 1 SCREENING

- A Describe the proposed change, test, or experiment. Include interim configurations or conditions.
 The proposed change would change the time delay relay setpoints on the Auxiliary Feedwater By-pass Control Valves (recirc) from 3 minutes to 45 seconds. The change would reduce the time that flow is diverted from the steam generators and still allow for pump coastdown protection. The setpoint changes will be done in conjunction with the trip/throttle valve and DC separation modification MR 97-99.
- B. List relevant current licensing basis (CLB) and Independent Spent Fuel Storage Installation (ISFSI) licensing basis documents and sections.
 FSAR 10.2, 10.3, NUREG 0737, NRC SER 1/27/81
- C. Does the proposed change, test or experiment involve a change to any Technical Specification? (For the ISFSI, the Technical Specifications reside in the Certificate of Compliance.) If a change is required, briefly describe what the change should be and why it is required. If "Yes," see NP 10.3.1 for guidance. Yes No

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SECTION 1 - CONTINUATION

D Screening for 10 CFR 50.59 and 10 CFR 72.48 Applicability:

NOTE: If any question in Section 1.D.1 is answered yes, complete Section 2, "10 CFR 50.59 Safety Evaluation." If any question is answered "yes", the "no" answers do not have to be explained.

1. 10 CFR 50.59 Screening:

- a. Does the proposed activity change the facility as described in the CLB? Yes No
If "No," explain:

- b. Does the proposed activity change procedures as described in the CLB? If "No," explain: Yes No

- c. Could the proposed activity affect the operation, function, or method of performing the function of an SSC as described in the CLB? (This includes interim conditions.) If "No," explain. Yes No

- d. Will a test or experiment be performed which is not described in the CLB? If "No" explain. Yes No

NOTE: If any question in Section 1.D.2 is answered yes, complete Section 3, "10 CFR. 72.48 Safety Evaluation." If any question is answered "yes", the "no" answers do not have to be explained.

2. 10 CFR 72.48 Screening for the Independent Spent Fuel Storage Installation (ISFSI):

- a. Does the proposed activity change the facility as described in the ISFSI licensing basis? Yes No
If "No," explain.
The AFW recirculation valve time delay is not described or relied on in any ISFSI licensing basis documents. Therefore, changing the AFW recirculation valve time delay relay setpoint does not affect any facilities as described in the ISFSI licensing basis documents.

- b. Does the proposed activity change procedures as described in the ISFSI licensing basis? Yes No
If "No," explain.
The proposed activity is not described or relied on in any ISFSI licensing basis documents and does not affect any procedures described in the ISFSI licensing basis.

SECTION 1 - CONTINUATION

- c. Could the proposed activity affect the operation, function, or method of performing the function of an SSC important to safety as described in the ISFSI licensing basis? (This includes interim conditions.) If "No," explain. Yes No

The AFW recirculation valve time delay is not described or relied on in any ISFSI licensing basis documents. Therefore, changing the AFW pump recirculation valve time delay setpoint does not affect the operation, function or method of performing the function of an SSC important to safety as described in the ISFSI licensing basis

- d. Will a test or experiment be performed which is not described in the ISFSI licensing basis? If "No," explain. Yes No

Changing the recirculation valve time delay is not a test or experiment

SECTION 2 - 10 CFR 50.59 SAFETY EVALUATION

- A. 1. Could the proposed activity increase the probability of occurrence of an accident or event previously evaluated in the CLB? Yes No

An AFW pump actuation is not an accident, event or initiator to an accident or event previously evaluated in the CLB. The Auxiliary Feedwater System is designed to automatically start and deliver flow for accidents that are time sensitive to AFW startup (LONF, LOOP, and LOL events); automatically start and deliver flow for SGTR and MSLB accidents; and automatically start and deliver flow for accidents that require long-term heat removal (SBLOCA). AFW flow is modelled in MSLB analyses (AABD 12.0) at 1200 gpm and does not take recirc into account at all. Although FSAR section 14.2.5 mentions requirements for feedwater isolation to mitigate a MSLB, it does not mention an operational requirement to isolate AFW within any time limit. FSAR 14.2.4 assumes that "auxiliary feedwater is available" during a SGTR and does not take into account recirc flows. Therefore, decreasing the recirc valve time delay setpoint does not increase the probability of occurrence of an accident or event previously evaluated in the CLB.

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2. Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the CLB? Yes No

FSAR section 10.3 specifically mentions auxiliary feedwater pump failure as a malfunction. Other CLB documents (NUREG 0737 and NRC SER 1/27/81) describe other malfunctions of the AFW system including AFW pump runout, low suction pressure trip, and discharge AOV failure (for P-38A and P-38B). This proposed activity will involve decreasing the AFW recirc valve time delay relay setpoint. The decreased setting will reduce the time flow is diverted from the steam generators, therefore, increasing the volume of water available to the steam generators to remove decay heat during design basis accidents. The reduction of the time delay does not impact the function of the time delay for pump coastdown protection following the shutdown of the pump. The pumps coastdown in less than 30 seconds, therefore, the new setpoint will not increase the probability of occurrence of a malfunction of the pumps. The turbine-driven Aux Feed pumps are lined up to the steam generators through normally throttled MOV's, and therefore have a flow path immediately upon pump start. The motor-driven Aux Feed pumps have normally closed MOV's and a normally closed AOV in the discharge line. These valves all have a stroke open time less than the proposed setpoint of 45 seconds, thus insuring pump discharge flow will not be restricted by the setpoint change to the recirc valve time delay. Byron Jackson (Kevin Speech, 847-741-0400) stated that this type of relay and minimum recirculation line is typical standard equipment for pump protection against thermal shock from high temperature feedwater (in boiler feedwater service) on initial startup, however, there is no concern with this type of thermal shock in the PBNP AFW pump application. This is consistent with statements in the Bechtel Specification M-6, "Auxiliary Feedwater Pumps", Section 2.4 which states that "pumps shall be designed for quick start with no warm-up". It is therefore concluded that based on input from Byron Jackson, statements in the pump specification, and extensive research not revealing any other functions for this time delay relay, that reducing the time setpoint does not reduce the pump protection function of the AFW recirculation line. The proposed change will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the CLB.

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3. Could the proposed activity increase the radiological consequences of an accident, event, or malfunction of equipment important to safety previously evaluated in the CLB? Yes No

During a Main Steam Line Break (MSLB) accident the operator must isolate the faulted steam generator to limit the mass-energy release to the containment and conserve AFW water inventory (CST). The reduction in the recirculation flow time delay will increase flow to the steam generators earlier in the accident. However, the MSLB analyses (AABD, module 12.0, Rupture of a Steam Pipe and NRC letter to WE, SER on Main Steam Line Break with Continued Feedwater Addition, 10/8/82) are relatively insensitive to the AFW flowrate and the duration that AFW is not isolated. With particular respect to the MSLB containment analysis the NRC letter states that operator action (to isolate AFW) could be delayed for 60 minutes before the consequences of the MSLB approach those of the LOCA. AFW flow is modelled in MSLB analyses (AABD 12.0) at 1200 gpm and does not take recirc into account at all. Although FSAR section 14.2.5 mentions requirements for feedwater isolation to mitigate a MSLB, it does not mention an operational requirement to isolate AFW within any time limit. In the event of a Steam Generator Tube Rupture (SGTR), the operator must isolate the faulted steam generator to limit the release of radioactivity and to control the subsequent cooldown. FSAR 14.2.4 states the operator's capability to secure auxiliary feedwater flow to the affected steam generator within 10 minutes (with off-site power available) or 30 minutes (without off-site power). Auxiliary Feedwater flow is not an input to the accident calculation, therefore the closure time of the recirc valve has no impact. FSAR 14.2.4 assumes that "auxiliary feedwater is available" during a SGTR and does not take into account recirc flows. The FSAR specifies that AFW should respond to provide flow within one minute for LONF and LOAC events. FSAR 14.2.4 assumes that "auxiliary feedwater is available" during a SGTR and does not take into account recirc flows. The change to the setpoint will allow an increase in flow to the steam generators sooner, following pump start, to mitigate the consequences of any of the accidents previously evaluated in the CLB. The proposed setpoint change to the recirc closure time delay, as concluded in question #2 (above), does not increase the probability of AFW pump damage because the valves will remain open during pump coastdown. Therefore, the proposed activity will not increase the radiological consequences of an accident, event, or malfunction of equipment important to safety previously evaluated in the CLB.

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4. Could the proposed activity create the possibility of an accident or event of a different type than any previously evaluated in the CLB? Yes No

Reducing the time delay for the AFW pump recirc valves will allow the AFW system to provide the design flow rate to the steam generators sooner. Achieving design flow conditions sooner, during an accident, does not create the possibility of a new accident scenario of a different type than previously evaluated in the CLB.

5. Could the proposed activity create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the CLB? Yes No

The purpose (DBD-01) of the AFW pump recirc valve time delay is to (1) prevent the system from "hunting" for its operating point, and (2) allow pump heat removal during pump coastdown. Pump discharge flows are above the low flow setpoint in less than the proposed 45 second time delay. This therefore will not cause the system to "hunt". The coastdown time is also bounded by the proposed setpoint to prevent pump damage during coastdown. The proposed change improves the effect on pump runout protection by reducing the time an additional flow path is present for the AFW pumps upon startup. Since pump coastdown protection will exist for a sufficient time and design flow requirements are actually improved the proposed setpoint change does not create the possibility of a malfunction of equipment important to safety of a different type than previously evaluated in the CLB.

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Section 2 - Continuation

6. Does the proposed activity reduce the margin of safety defined in the basis for any Technical Specification?

Yes No

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This proposed change will reduce the amount time of water is diverted from the steam generators following an AFW system actuation. Since pump coastdown protection will exist for a sufficient time and design flow requirements are actually improved the margin of safety defined in the basis for any Technical Specification is not reduced .

DOES THE ACTIVITY, CHANGE, TEST, OR EXPERIMENT INVOLVE A 10 CFR 50.59 UNREVIEWED SAFETY QUESTION? (IS THE ANSWER TO ANY OF THE ABOVE QUESTIONS YES?)

Yes No

SECTION 2 - CONTINUATION

- B. 10 CFR 50.59 Evaluation Summary. The summary section should contain three brief paragraphs (no more than one page total), including 1) description of the proposed change including interim configurations, 2) justification logic for the answers to the safety evaluation questions, and 3) conclusion (i.e., is a USQ or Technical Specification conflict involved?)

The proposed change would change the time delay relay setpoints on the Auxiliary Feedwater By-pass Control Valves (recirc) from 3 minutes to 45 seconds. The change would reduce the time that flow is diverted from the steam generators and still allow for pump coastdown protection.

Decreasing the time delay means that the recirc valve, provided the low flow condition has cleared, will close sooner and therefore provides increased flow availability to the steam generators during an event. Although FSAR section 14.2.5 mentions requirements for feedwater isolation to mitigate a MSLB, it does not mention an operational requirement to isolate AFW within any time limit. ~~FSAR section 14.2.5 mentions requirements for feedwater isolation to mitigate a MSLB, it does not mention an operational requirement to isolate AFW within any time limit.~~ The recirc valve time delay is not an event, accident, or initiator to an accident or event previously evaluated in the CLB. Therefore, the proposed change does not: increase the probability of an accident or event; create an accident or event of a different type, or increase the radiological consequences of any accident or event previously evaluated in the CLB.

The purpose of the AFW pump recirc valve time delay, according to DBD-01, is to (1) prevent the system from "hunting" for its operating point, and (2) allow pump heat removal during pump coastdown. Pump discharge flows are above the low flow setpoint in less than the proposed 45 second time delay. This therefore will not cause the system to "hunt". The coastdown time is also bounded by the proposed setpoint to prevent pump damage during coastdown. The proposed change improves the effect on pump runout protection by reducing the time an additional flow path is present for the AFW pumps upon startup. Based on input from Byron Jackson, statements in the pump specification, and extensive research not revealing any other functions for this time delay relay, ~~that~~ reducing the time setpoint does not reduce the pump protection function of the AFW recirculation line. Therefore, the revised recirc valve time delay setpoint does not increase the probability of a malfunction of equipment important to safety, or create the possibility of a malfunction of equipment important to safety of a different type.

Conclusion

Based on the answers to the six safety evaluation questions, the proposed change does not involve an Unreviewed Safety Question. Additionally, the setting for the AFW recirc valve time delay is not discussed in PBNP's Technical Specifications. Therefore, the proposed change does not involve a change to any Technical Specification.