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VARGA,S.A. Operating Reactors Branch 1

SUBJECT: Forwards response to 821210 request for addl info re util submittal on NUREG-0737 Item II.E.1.2, "Auxiliary Feedwater Sys Automatic Initiation & Flow Indication."

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CP&L
Carolina Power & Light Company

February 9, 1983

SERIAL: LAP-83-19

Director of Nuclear Reactor Regulation
Attention: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing
United States Nuclear Regulatory Commission
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
NUREG-0737, ITEM II.E.1.2 -
AUXILIARY FEEDWATER SYSTEM AUTOMATIC INITIATION AND FLOW INDICATION

Dear Mr. Varga:

Carolina Power & Light Company (CP&L) has received your letter dated December 10, 1982 requesting additional information regarding our submittal in response to NUREG-0737, Item II.E.1.2 - Auxiliary Feedwater System Automatic Initiation and Flow Indication for the H. B. Robinson Steam Electric Plant Unit No. 2 (HBR2). The five open items identified in your letter are listed in the enclosure with our response to each item.

If you have any further questions regarding this matter, please contact a member of our Nuclear Licensing Staff.

Yours very truly,

W. J. Hurford
Manager
Technical Services

WJH/kjr (6185DCW)
Enclosure

cc: Mr. J. P. O'Reilly (NRC-RII)
Mr. G. Requa (NRC)
Mr. Steve Weise (NRC-HBR)

A046

411 Fayetteville Street • P. O. Box 1551 • Raleigh, N. C. 27602

ROBINSON UNIT 2 - AUXILIARY FEEDWATER
AUTOMATIC INITIATION-REQUEST FOR
ADDITIONAL INFORMATION (TMI ACTION
PLAN ITEM II.E.1.2.1)

NRC Comment

1. Carolina Power & Light Company letter NO-81-2139 dated December 23, 1981 describes (see Response 2) the bypassing of AFWS initiating signals from "Steam Generator Low level" and "Main Feedwater Pump Breaker Open" with jumpers. It is stated that the bypass of the low level signal is controlled procedurally through the "safety related Jumper Log." It is our understanding that these bypasses are no longer achieved through the use of jumpers, but through a series of recently installed keylock switches. It is also our understanding that use of any of these switches to effect a bypass causes an automatic indication of the bypass condition to be provided in the control room. Please provide a detailed description of this new design including the indication of bypass provided to the operator.

   CP&L Response

   The keylock switches are now in service and are controlled by approved procedures. At the present time there is no indication of the bypass condition in the control room. This indication will be installed during the next Steam Generator Inspection Outage currently scheduled for April 1983. The indication will consist of a status light on the Reactor Turbine Generator Control Board (RTGB) for each train and will operate when any of the keylock switches are operated to the bypass/block position.

NRC Comment

2. It is our understanding that the bypasses mentioned in item 1 above are procedurally instated in two phases when the unit is to be shutdown. First, when going to a hot standby condition (roughly when T = 500 F), the AFWS initiation signal from the main feedwater pump breakers is bypassed. Second, when going from hot shutdown to cold shutdown (roughly when T = 350 F) the steam generator low level AFWS initiation signal is bypassed. It is also our understanding that both of these bypasses only affect automatic initiation of the motor driven AFWS pumps.

   It is the staff's position that where operating requirements necessitate bypass of a protective function, the design shall be such that the bypass will be removed automatically whenever permissive conditions are not met. This position is stated in Section 4.12 of IEEE Std. 279-1971. The staff considers bypasses required to permit mode changes (for example, bypasses used to prevent the initiation of protection system equipment during the cold shutdown mode) as operating bypasses. Because these bypasses are used every time the plant is shutdown, we believe it is necessary to remove them automatically (especially for steam generator low level since this is the signal taken credit for in the safety analyses). It is our understanding that these bypasses are considered

maintenance bypasses (not requiring automatic removal) by CP&L since steam generator fill and/or vent operation are performed each time the plant is shutdown. The staff disagrees with the CP&L interpretations. The frequency at which these initiation signals are likely to be bypassed by operating procedure warrants their automatic removal. Compliance with Section 4.12 of IEEE Std. 279 is required by Section II.E.1.2.1 of NUREG-0737 (Clarification of TMI Action Plan Requirements).

Please confirm whether or not our understanding of these bypassses is correct. If our understanding is correct, commit to automatic removal of these bypasses (at least for steam generator low level), or propose changes to the operating procedures or other corrective actions such that these initiation signals are not bypassed each time the plant is shutdown, or justify the existing design on some other basis. Reliance upon administrative procedures to remove bypasses used to prevent automatic initiation of the AFWS each time the plant goes through certain mode changes (even if maintenance activities are planned) is not acceptable to the staff.

CP&L Response

Your understanding of the bypasses mentioned in item 1 is not completely correct. One additional feature of the second phase of the bypass is not mentioned in your description. Two blocks are initiated when going to cold shutdown. The first bypass blocks the low-low steam generator level start signal to the motor driven pumps. The second bypass blocks the low-low steam generator level start signal from two out of three steam generators to the steam turbine driven pump. You also stated that these bypasses need to be automatically removed since they bypass protective functions. Carolina Power & Light Company considers the protective function of the AFWS to provide the required AFW Flow during design basis FSAR transients. For these transients the initiating signal is either a Safety Injection (SI) signal or a Blackout signal. Neither of these signals is blocked by the bypasses described in item 1. Since the keylock switches only bypass the low-low steam generator level signals, and not the protective function SI and Blackout signals, CP&L believes that the existing administrative controls on the keylock switches is adequate and backfitting permissives is not necessary.

NRC Comment

3. Motor-driven AFWS pump discharge valve V2-16A is normally powered from emergency bus E1. An automatic bus transfer (ABT) is provided to transfer the power source for this valve to emergency bus E2 if bus E1 becomes unavailable. The staff's position is that electrical independence must be maintained between redundant emergency power sources. The slightly improved defense against a random single failure achieved by the ABT is more that offset by the additional vulnerability to common mode failures which is created. This automatic transfer feature provides a connection between redundant load groups and should be removed. Carolina Power & Light Company has stated that the breaker scheme employed would prevent the transfer of a fault from one bus to another and that these breakers and the ABT are Class 1E safeguards equipment.

The staff's position is that this is not sufficient justification for the ABT and that faults within the ABT or within the valve itself present potential challenges to these protective devices which are unnecessary. Valve V2-16A should be powered such that a failure of its supply in combination with a break in an opposite steam generator (steam generator B or C) will not preclude sufficient AFWS flow for decay heat removal. AFWS flow must be established to two out of the three steam generators. We understand that certain AFWS automatic initiation signals only start the motor driven pumps. This means that given certain single failures, initiation of flow to two steam generators will be delayed until the steam driven AFWS pump starts if the ABT is removed. The staff believes, however, that this delay (which only occurs given a single failure) is insignificant as opposed to challenging redundant safety divisions via the ABT. Please respond to this concern. Further guidance regarding independence between redundant power sources can be found in IEEE Standard 384-1977 and specifically regarding automatic transfer devices in Regulatory Guide 1.6 (Independence Between Redundant Standby (Onsite) Power Sources and Between Their Distribution Systems).

CP&L Response

Valve V2-16A does use an ABT as part of the logic to feed two steam generators under various failures. This ABT is part of the original design and licensing basis of the plant. The ABT is isolated from the valve motor by a thermal overload device and is isolated from MCCs 9 and 10 by independent breakers. MCC 9 and MCC 10 are each isolated from MCC 6 and MCC 5 respectively by breakers. Finally MCC 5 and MCC 6 are each isolated from E1 and E2 by breakers. Carolina Power & Light Company believes that the significant number of failures required to have a single fault cause the loss of redundant buses makes this event very improbable. H. B. Robinson's licensing basis, FSAR and Technical Specifications are based on the capability of feeding two Steam Generators utilizing the features of the V2-16A ABT, if necessary. Carolina Power & Light Company believes that, for this concern, the above information more than justifies the inappropriateness of back fitting the requirements of IEEE 384-1977 at HBR2.

NRC Comment

4. It is our understanding that the circuits used to automatically start the turbine driven auxiliary feedwater pump on 4kV bus undervoltage are not periodically tested. The sensors (undervoltage relays) are calibrated during each refueling outage. The automatic start signals are taken upstream of the reactor protecton system circuits which also use 4kV bus undervoltage as an input and are tested monthly. These AFWS automatic initiation circuits are hardwired with no coincidence logic and contain no built in test features. These circuits should be tested each refueling by simulating 4kV bus undervoltage and verifying that an automatic start of the turbine driven AFWS pump has occured. It is our understanding that this testing will be committed to by CP&L as part of the Robinson Unit 2 Technical Specifications. Please document this commitment.

CP&L Response

Periodic Test, PT-6.3, has been implemented to test the undervoltage automatic start of the turbine driven auxiliary feedwater system. This PT was used during the 1982 refueling outage. Periodic Test, PT - 6.4, is currently being developed to test the automatic start of the motor driven auxiliary feedwater system when both main feedwater breakers are opened. This PT will be ready for use during the next refueling outage.

NRC Comment

5. If one of the motor driven AFWS pump trains is taken out of service during operation, this is accomplished by racking out the pump breaker and pulling the control power fuses. Administrative controls are relied upon to return the AFWS train to service. Section 4.13 of IEEE Std. 279 (Indication of Bypasses) requires that when the protective action of some part of the protection system has been bypassed or deliberately rendered inoperative for any purpose, this fact shall be continuously indicated in the control room. Status indicating lights in the control room do go out when the control power fuses are pulled, however, the staff does not consider this "lack of indication" to be a positive indication of AFWS train inoperability. The staff's position is that if conditions a, b, and c of regulatory position C3 of Regulatory Gide 1.47 (Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems) are met, then an automatic indication of AFWS train inoperability should be provided in the control room to supplement existing administrative procedures. Either provide continuous indication (automatically activated) of AFWS pump inoperability in the control room when the motor driven auxiliary feedwater pump breakers are racked out or justify the existing design. This justification should include a discussion of how the existing design complies with the guidance given in Regulatory Guide 1.47. Compliance with Section 4.13 of IEEE Std. 279 is required by Section II.E.1.2.1 of NUREG-0737.

CP&L Response

The HBR2 Instrumentation and Control system was not designed to Regulatory Guide 1.47 and does not have train or system inoperable indication for any of the safety systems. H. B. Robinson Unit 2 operations personnel have controlled inoperable equipment for eleven (11) years by the use of administrative control and found this method very acceptable. When any piece of safety related equipment is removed from service, including an AFWS pump, a clearance will be taken on that piece of equipment to allow the required maintenance. The equipment breaker is racked out, the control fuse pulled, and a bright red cap is placed on the control module on the RTGB. This cap is very obvious to the control operators and shift foreman, and along with the status lights being out provide ample indication of inoperable equipment. All pieces of inoperable safety related equipment are logged on the Minimum Equipment List (MEL) which is reviewed every shift. The time the component is out of service is also tracked using the Equipment Inoperable Record (EIR). This record is used to keep the shift foreman informed as to the amount of time remaining before additional action is required per the applicable Limiting Condition for Operation (LCO). Carolina Power & Light Company

feels very comfortable with the existing system and believes that conformance with Regulatory Guide 1.47, to which the plant was not designed, would not result in an increase in plant safety.