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 Office of Nuclear Reactor Regulation
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SUBJECT: Forwards response to NRC 800331 ltr re auxiliary feedwater
 sys recommendations.

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Carolina Power & Light Company

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Office of Nuclear Reactor Regulation
Attention: Mr. Albert Schwencer, Chief
Operating Reactors Branch No. 1
United States Nuclear Regulatory Commission
Washington, D. C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
AUXILIARY FEEDWATER SYSTEM

Dear Mr. Schwencer:

In response to your letter of March 31, 1980, Carolina Power & Light Company (CP&L) submits the attached responses. The letter/number designations for each item correspond to those in your letter.

Many of our responses are based on understandings reached with members of your staff in a meeting held in your offices on April 30, 1980.

We trust this information is suitable for your use.

Yours very truly,

M. A. M. Duffie
for E. E. Utley

Executive Vice President
Power Supply and
Engineering & Construction

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H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2
DOCKET NO. 50-261
RESPONSE TO AUXILIARY FEEDWATER SYSTEM RECOMMENDATIONS

1. Recommendation GS-1

CP&L Response

The H. B. Robinson Unit 2 auxiliary feedwater system conforms to the requirements of the current Technical Specifications which state that two of the three auxiliary feedwater pumps must be operable whenever the reactor coolant system is to be heated above 350°F. However, it has been the more general operating practice during all normal modes of operation, with certain exceptions, to provide two motor driven auxiliary feedwater pumps each powered from separate busses together with one turbine driven auxiliary feedwater pump powered from the main steam supply system. Thus, while the Technical Specification requires two of the three auxiliary feedwater pumps to be operable, it has been normal practice to maintain all three AFW pumps in the operable condition during the normal modes of power operation, startup, or hot standby. Certain exceptions to this normal practice have resulted when maintenance has been required. Preventive maintenance, repair, and inspection has required on occasion that one of the three units be in an inoperable condition for an extended period of time to perform the required maintenance effort. Since maintenance is performed on only one unit at a time, the remaining two units are retained in the operable condition in order to satisfy the requirements of the Technical Specification.

CP&L has re-reviewed the necessity for the AFW system operability requirements, recognizing the need for the turbine driven AFW pump as an integral part of the H. B. Robinson dedicated shutdown system, which is being developed in support of an improved fire protection scheme. To this end, CP&L is prepared to propose revisions to the Technical Specification to include additional operability requirements for this pump. A review of the maintenance history of these

units shows that a seven-day interval for maintenance performance is a reasonable time period to assure that accurate dedicated and thorough execution of proper maintenance procedures can be accomplished. This interval is commensurate with the maintenance interval for one of the two diesel generators as permitted by Technical Specifications. Accordingly, CP&L will propose a revision to the Technical Specification to include three AFW pumps as a part of the normal operating mode with provisions for one AFW pump in an inoperable condition for a period up to seven days and two for a period up to twenty-four hours. A proposed License Amendment for revision of the unit Technical Specification as described above will be submitted as part of the total operability requirement for the Fire Protection Dedicated Shutdown System.

2. Recommendation GS-2

CP&L Response

The H. B. Robinson Unit 2 currently complies with the stated requirements for locked open valves in accordance with the valve lineup instructions contained in Plant Operating Procedure OP-14A. Specifically, the valves in the supply piping between the condensate storage tank and the suction of each of the three auxiliary feedwater pumps are all maintained in a locked open condition. Further, as stated in our letter of October 31, 1979, monthly verification of the locked open valve status is assured by the administrative controls imposed by the periodic test procedures, except when periods of reactor cold shutdown extend the periodic test beyond one month as defined by Section 4.8 of the Technical Specifications. Because the current Technical Specifications presently require monthly surveillance procedures to verify the operability of each motor driven auxiliary feedwater pump as well as the operability of the steam turbine driven auxiliary feedwater pump, and because the administrative controls which assure that this surveillance is performed in accordance with existing periodic test instructions, no addition to the Technical Specifications is considered necessary. Further, the present administrative controls require a complete verification of valve position including both the auxiliary feedwater pump suction train which includes a series of locked open valves between the pump suction and the normal water source which is the condensate storage tank as well as verification of the valve position in the pump discharge train during the conduct of the periodic test which is performed monthly to verify the operability of the complete auxiliary feedwater system and its ability to respond properly when required. For these reasons, and because the existing administrative controls provide a valid documentation of the monthly surveillance of the auxiliary feedwater system operability, no revision to the Technical Specifications is proposed. This was reviewed with your staff in our meeting of April 30, 1980 and determined by them to be acceptable.

3. Recommendation GS-5

CP&L Response

One AFW train, the steam driven auxiliary feedwater pump, is capable of providing the required AFW flow independent of any AC power supply for at least the minimum two-hour cooling required in hot standby. Operation in this mode however does require manual operator action to (1) realign the cooling water valves to supply AFW cooling water to the turbo pump oil cooler, (2) open the main steam admission valves to the steam turbine, and (3) open the pump discharge isolation valves to feed the steam generator. Thus, full flow capability can be achieved with the steam driven pump providing cooling to the steam generator without reliance on any AC power source. An emergency instruction has been developed and implemented (issued November 30, 1979) which incorporates the steps listed above as a part of the blackout procedure. This revised emergency instruction to assure uninterrupted feeding of the steam generators by manually initiating steam turbine driven AFW pump operation independent of alternating current power was described in the CP&L letter dated October 31, 1979.

4. Recommendation GS-6

CP&L Response

The H. B. Robinson Unit 2 General Procedures for operation routinely verify the operability of both motor driven auxiliary feedwater pumps by demonstrating the feeding of the steam generators during every plant startup from cold solid plant to the hot subcritical condition. Verification of system operability is appropriate to any startup from cold solid plant condition including startup from a refueling shutdown as well as plant recovery from shutdown for any other reason not necessarily associated with refueling. Further, as plant heatup continues during the startup evolution, the steam driven auxiliary feedwater pump operability is also verified as sufficient steam pressure becomes available to permit turbine operation. Feeding of the steam generators occurs during this operation. Also, monthly periodic testing as discussed above is accomplished to assure operability of this system. Thus, the current General Procedures require the auxiliary feedwater system performance to be demonstrated during any recovery from a cold shutdown condition of any duration. Because the current General Procedures and associated Administrative Controls are more restrictive than the suggested revision to the Technical Specifications, this revision is not considered necessary.

Flow verification of each train of the auxiliary feedwater system required following maintenance and testing is preceded by confirmation of proper flow path between the condensate storage tank and the steam generators by valve position verification. Attendant to this flow path confirmation, the operating procedures will be revised to require a second operator (different from the first operator) to independently verify proper valve position in the main flow paths. This requirement will be incorporated into Procedure OP-14A prior to startup from the upcoming refueling outage. Based on our discussions with your staff during our April 30, 1980 meeting, we consider that these actions will satisfy your concerns.

5. Recommendation GS-7

CP&L Response

Carolina Power & Light Company letter dated December 31, 1979, submitted documentation of the method of implementation of all Category A requirements for the H. B. Robinson Plant. This submittal contained detailed drawings of the auxiliary feedwater system relays, contacts, connector pin, and terminal designations in order to document compliance with the safety grade functional criteria. These drawings are sufficiently descriptive to permit independent review in accordance with NUREG-0578 with respect to the short-term safety grade requirements for the AFW system signals and associated circuitry. This submittal confirms the AFW system automatic start signals conform to the safety grade requirements of recommendation GL-5.

6. Short-Term Plant Specific Recommendation 7

CP&L Response

Alternate water supply connections are provided to the suction of the AFW pumps to provide two redundant sources of water to the normal supply of water and to provide additional water for potential long term cooling in accordance with existing emergency instructions. These alternate water supply sources are isolated by normally locked closed valves to preclude inadvertent operation with the alternate supply sources from the service water system or the deep well system except where the existing emergency instructions direct that the valves be unlocked and opened. In order to assure operability of the valves in this event, quarterly periodic testing is currently performed. This testing includes manual cycling of the valves to assure valve operability. Because the current periodic test procedures are incorporated into the inservice inspection program and provide a demonstrated verification of valve operability, no revision to the Technical Specifications is considered necessary.

7. Recommendation GL-2

CP&L Response

The H. B. Robinson auxiliary feedwater system pumps are protected from low suction pressure through two (2) redundant pressure detectors located on the pump discharge piping in conjunction with the normally aligned recirculation line. Low pressure indicated at either pressure switch will alarm in the control room. Low pressure indicated at both detectors will stop the pump. A similar protection system is installed on each of the three AFW pumps. The purpose of the pressure detectors is to protect the pump from damage which may result from low suction pressure or loss of water supply to the pump suction. The principal AFW system water supply at the condensate storage tank passes through an isolation valve at a single tank penetration and subsequently branches to provide water supply to each of the three AFW pumps. All valves in the AFW pump normal supply water piping are locked open as described under Recommendation GS-2. Locked open suction valves and low pressure pump trip detectors are redundant protection methods to make pump damage from loss of suction a highly unlikely event.

The installed pump redundant pressure protection detectors, the administrative control of the CST suction valves which are locked in the open position, the periodic test inspection of the flow path and the revision to the periodic test to require a second operator (different from the first operator) to independently verify the proper flow path are a combination of active steps which are considered entirely adequate to assure the AFW system operability. For these reasons, no additional procedural or equipment modification is believed necessary.

8. Recommendation GL-3

CP&L Response

H. B. Robinson Unit No. 2 is presently committed to develop and install an independent dedicated shutdown system. Details of this dedicated shutdown system (DS) were transmitted by Carolina Power & Light Company letter dated February 1, 1980. Provisions of this dedicated shutdown system include an independent separated redundant dedicated AC power supply which will be operated from a DS Control panel located in the turbine building. A transfer panel, also located in the turbine building, will enable transfer of controls for the steam driven AFW pump shutoff valves V1-8A and V2-14A from the existing remote controls signals to local control from the turbine building panel. In this mode, operation of the steam driven AFW pump may be conducted without dependence upon any of the existing AC power supply sources. As indicated in the February 1, 1980 letter, CP&L will forward information concerning the procedure for this operating mode by October 31, 1980. Elements of short term recommendation GS-5 have been initiated to serve until the dedicated shutdown system becomes operational as discussed herein.

Operation with the dedicated shutdown system will continue to require certain manual steps in the operation of the steam driven AFW pump. However, these manual operations are limited to procedural steps which are normally accomplished as manual throttle adjustments to control Steam Generator level and realignment of the cooling water flow to the turbo pump lube oil cooler. Manual transfer of lube oil cooling from service water cooling to AFW water cooling is necessary to prevent potential overheating of the lube oil since back leakage from the steam generator feed line to the cooler could result in lube oil temperatures which exceed the recommended, and in turn, result in potential pump bearing damage. Since approximately four minutes are required to manually initiate steam driven AFW pump operation, this is well below the time limit to establish steam generator feeding. Note that the steam generators require more than thirty-one minutes to boil dry as indicated in WCAP-9601.

9. Recommendation GL-5

CP&L Response

Documentation of compliance with the implementation of Category A requirements with respect to the safety grade automatic initiation of the auxiliary feedwater system was forwarded by CP&L letter dated December 31, 1979.

10. Basis for AFW System Flow Requirements

CP&L Response

CP&L letter dated April 29, 1980, forwarded information which was developed as a review of the design basis of the auxiliary feed-water applicable to design basis transients and accident conditions appropriate to the H. B. Robinson Unit 2 Plant.

11. Additional Short Term Recommendation No. 1

This additional short term recommendation proposed that redundant condensate storage tank low level alarms should be provided in the control room to allow the operator to anticipate the need for makeup water or to transfer from the CST supply to an alternate water supply. As described in CP&L letter dated October 31, 1979, the H. B. Robinson Unit 2 is currently equipped with redundant level indication and one low level alarm. To resolve this short term recommendation, a redundant low level alarm will be installed as soon as possible based on equipment delivery. The low level alarm setpoint allows thirty-five minutes for operator action. This will meet requirement 1 of this item. Upgrading of the level indicators and alarms as addressed in requirement 2 will be accomplished consistent with the requirements of Regulatory Guide 1.97, Revision 2 as applicable to operating plants, which is scheduled for implementation by June 1, 1982.

12. Additional Short Term Recommendation No. 2

CP&L intends to comply with the revised position in Auxiliary Feedwater Pump Endurance Test.