UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION

CALVERT CLIFFS UNITS 1 & 2 AUXILIARY FEEDWATER AUTOMATIC INITIATION AND FLOW INDICATION ACTION PLAN ITEM II.E.1.2

INTRODUCTION AND SUMMARY

To improve the reliability of Auxiliary Feedwater Systems (AFWS) at pressurized water reactor (PWR) facilities, the staff is requiring licensees to upgrade the system where necessary to ensure safety grade automatic initiation and flow indication. The criteria for this upgrading are contained in NUREG-0737 (Clarifications of TMI Action Plan Requirements), Section II.E.1.2.

The evaluation of the Calvert Cliffs Units 1 & 2 AFWS designs was performed for the NRC by Franklin Research Center (FRC) as part of a technical assistance contract program. The results of the FRC evaluation are reported in the attached Technical Evaluation Report (TER - C5257-281/290).

Based on our review of the FRC TER, we conclude that the AFW automatic initiation and flow indication designs are acceptable. Several Technical Specification changes, however, are necessary as indicated below.

EVALUATION

The attached TER provides a technical evaluation of the electrical, instrumentation, and control design aspects of the Calvert Cliffs Units 1 & 2 AFWS with regard to automatic initiation and flow indication. As noted in the TER, under certain accident conditions (ruptured steam generator in conjunction with a single failure of a pump or in the control circuitry associated with the intact steam generator) only 130 gpm of auxiliary feedwater would be delivered to the intact steam generator. Under these conditions, the operator would have 15 minutes to increase this flow to 400 gpm which is needed to remove decay heat assuming worst-case heat loads. This can be accomplished from the control room by changing AFWS flow control valve position via controllers mounted on the main control board. The acceptability of this design is to be determined as part of the II.E.1.1 review performed by the Auxiliary Systems Branch (ASB).

The Calvert Cliffs Units 1 & 2 Technical Specifications currently do not require periodic testing of the AFWS automatic actuation logic. The actuation logic should be tested on a staggered monthly basis (i.e., test each train every other month) consistent with the Combustion Engineering Standard Technical Specifications (NUREG-0212). In addition, periodic testing of the steam generator differential pressure instrument channels (used to generate a steam generator rupture signal - SGRS) at a frequency consistent with other safety related instrument channels should be required by the Calvert Cliffs Technical Specifications. Table 4.3-2 (Engineered Safety Feature Actuation System Instrumentation Surveillance Requirements) should be modified to include this testing.

The environmental qualification of safety related systems including AFWS circuits and components is being reviewed by the Environmental Qualification Branch as part of their review of licensee responses to "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," issued to the licensee in NRR letter dated March 5, 1980.

In order to adequately determine from the control room the performance of the AFWS, steam generator level instrumentation is used, in addition to flow indication. The requirements for this steam generator level instrumentation are specified in Regulatory Guide 1.97 Revision 2 (R.G. 1.97 - "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident"). The steam generator level instrumentation at Calvert Cliffs should be in conformance with these requirements and implemented in accordance with the schedule for implementation of the referenced R. G.

CONCLUSION

Based on our review of the Franklin Research Center TER we conclude that the Calvert Cliffs Units 1 & 2 AFWS automatic initiation and flow indication systems comply with the staff's long term safety grade requirements, and therefore, are acceptable. The Calvert Cliffs Units 1 & 2 Technical Specifications, however, should be revised to include periodic testing of the AFWS automatic actuation logic and steam generator differential pressure instrument channels as discussed above.

Attachment: FRC TER