



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

TOLEDO EDISON COMPANY

DAVIS-BESSE UNIT 1

DOCKET NO. 50-346

IMPLEMENTATION OF TMI ACTION ITEM II.K.3.5

"AUTOMATIC TRIP OF REACTOR COOLANT PUMPS"

(RESPONSE TO GENERIC LETTER NO. 86-05)

1.0 SUMMARY

In Generic Letter 86-05 (Ref. 1) the staff reported that the information provided by the B&W Owners Group (BWO) in support of alternative Reactor Coolant Pump (RCP) trip criteria was acceptable on a generic basis. The review noted that a number of considerations were assigned plant-specific status. Accordingly, the staff requested that operating reactor licensees select and implement an appropriate RCP trip criterion based upon the BWO methodology. This Safety Evaluation (SE) contains the staff's findings concerning this issue for Toledo Edison Company's Davis-Besse Unit 1.

Reference 1 required owners of B&W Nuclear Steam Generating Systems to evaluate their plants with respect to RCP trip. The objective was to demonstrate that their proposed RCP trip setpoints assure pump trip for small break LOCA's and, in addition, to provide reasonable assurance that RCP's are not tripped unnecessarily during non-Loca events. A number of plant-specific items were identified which were to be considered by applicants and licensees, including the selected RCP trip parameter, instrumentation quality and redundancy, instrumentation uncertainty, possible adverse environments, calculational uncertainty, potential RCP and RCP-associated problems, operator training, and operating procedures.

The licensee has addressed the Generic Letter 86-05 criteria and the staff has reviewed this information with assistance from consultants at EG&G. The staff finds the material submitted by the licensee to be acceptable and that the licensee has satisfied the requirements in regard to TMI Action Item II.K.3.5.

2.0 BACKGROUND

TMI Action Plan Item II.K.3.5 of NUREG-0737 (Ref. 2) required all licensees to consider solutions pertinent to tripping RCP's under transient and Loss-of-Coolant Accident (LOCA) conditions. A summary of the industry and NRC programs concerning RCP trip was provided in SECY-82-475 (Ref. 3). Reference 3 also provided NRC guidance and criteria for resolution for II.K.3.5, and enclosed Generic Letter 83-10 (Ref 4), which outlined requirements pertinent to RCP trip.

The B&W Owners Group responded to Reference 4 by developing RCP trip criteria based upon a loss of subcooling margin and provided information which individual utilities could use for plant-specific implementation (Ref. 5). The staff then issued Generic Letter 86-05, and directed each applicant and licensee to provide RCP trip criteria and substantiating information.

The licensee addressed this issue in Reference 6, which the staff has reviewed with the assistance of EG&G consultants.

3.0 EVALUATION

The staff finds that Toledo Edison Company has complied with the requirements of Generic Letter 86-05 and has, therefore, met the requirements in regard to implementation of TMI Action Item II.K.3.5.

These requirements include:

A. Determination of RCP Trip Criteria

The reactor coolant pump will be tripped if the indicated subcooling margin falls below 25°F. This agrees with the approved B&W Owners Group guidelines and, hence, is acceptable.

A1. Instrumentation Identification Including Redundancy and Quality Level

The licensee has identified all of the essential instrumentation and degree of redundancy used to trip the RCP's. Since the licensee has shown an adequate redundancy in tripping the RCP's, the staff concludes these are acceptable.

A2. Instrumentation Uncertainties for Normal and Adverse Environments

The licensee has demonstrated that the instrument uncertainties do not exceed the allowable limits specified by NRC. The staff concludes these uncertainties are acceptable.

A3. Analysis Uncertainties

The licensee has demonstrated that the results of the BWOG generic analyses are conservative for Davis-Besse Unit 1. Therefore, the staff considers these acceptable.

B. Potential Reactor Coolant Pump Problems

B1. Containment Isolation Impact Upon RCP Operation

The licensee has demonstrated that the RCP water services can be restored following containment isolation signal actuation. Since the licensee has established satisfactory procedures, the staff considers this acceptable.

B2. Components Required for RCP Trip

Manual trip of the RCP's is accomplished from the main control room console. No critical components required to initiate manual RCP trip are located in a harsh environment. The staff concludes that the licensee has provided an acceptable response to this item.

C. Operator Training and Procedures

The licensee has provided operator training and procedures which are consistent with the NRC staff guidelines. The staff thus concludes these are acceptable.

4.0 CONCLUSION

Each of the points identified in Reference 1 has been satisfactorily addressed by the licensee. Further, the licensee has considered items pertinent to RCP trip and operation which are in addition to the Reference 1 requirements. The staff finds the licensee treatment of RCP trip to be acceptable and the licensee has satisfied the requirements of TMI Action Item II.K.3.5.

Principal Contributor: S. L. Wu, SRXB

Date: May 24, 1988

5.0 REFERENCES

1. Miraglia, Frank J., "Implementation of TMI Action Item II.K.3.5, 'Automatic Trip of Reactor Coolant Pumps' (Generic Letter No. 86-05)," letter from Director, Division of PWR Licensing-B, NRC, to all applicants and licensees with Babcock and Wilcox (B&W) designed nuclear steam supply systems (NSSS's), May 29, 1986.
2. "Clarification of TMI Action Plan Requirements," NUREG-0737, US NRC, November 1980.
3. Dircks, William J., "Staff Resolution of the Reactor Coolant Pump Trip Issue," Policy Issue for the Commissioners from the Executive Director for Operations, NRC, SECY-82-475, November 30, 1982.
4. Eisenhut, Darrel G., "Resolution of TMI Action Item II.K.3.5, 'Automatic Trip of Reactor Coolant Pumps,' (Generic Letter No. 83-10)," letter to all applicants with (PWR vendor) designed nuclear steam supply systems from Director, Division of Licensing, NRC.
5. R. H. Bryan, "Reactor Coolant Pump Trip Philosophy," letter from R. H. Bryan, Chairman, B&W Owners Group Analysis Committee, to J. R. Miller, Chief, Operating Reactors Branch No. 3, USNRC, June 18, 1984.
6. J. Williams, Jr., Toledo Edison Company, to J. F. Stolz, PWR Project Directorate 6, USNRC, "Response to Generic Letter 86-05, Implementation of TMI Action Item II.K.3.5," December 29, 1986.