# TECHNICAL EVALUATION REPORT
# JOSEPH M. FARLEY NUCLEAR POWER PLANT

## DELETION OF REACTOR TRIP ON TURBINE TRIP BELOW 50 PERCENT POWER

DOCKET NUMBER 50-348

AUGUST 1979

PREPARED BY

WAYNE E. REEVES

LAWRENCE LIVERMORE LABORATORY

1.0 INTRODUCTION:

The Alabama Power Co., the holder of License #NPF-2 at the Joseph M. Farley Nuclear Plant, submitted a license amendment request for the deletion of reactor trip on turbine trip below 50% power. Their present criteria states that they will trip the reactor any time the power turbine trip when they are operating above 10% of rater power.

2.0 PROPOSED CHANGES:

Pursuant to 10CFR50.59, the holders of Operating License #NFP-2 propose the following changes to Appendix A Technical Specifications.

1. Add to Table 3.3-1 the following:

   "P-9- With 2 of 4 power range neutron flux channels $\geq$ 50% of rated thermal power, P-9 defeats the automatic block of reactor trip on turbine trip."

2. Add on limiting safety system settings B2-7 which reads,

   "Turbine Trip

   A Turbine Trip causes a direct reactor trip when operating above P-9. Each of the turbine trips provide turbine protection and reduce the severity of the ensuing transient. No credit was taken in the accident analyses for operation of these trips. Their functional capability at the specififed trip settings is required to enhance the overall reliability of the Reactor Protection System."

3.0 REASON FOR CHANGE:

The submittal states:

The current Farley reactor protection system designed provides for a direct reactor trip following a turbine trip when the plant is above 10-percent power. Since Farley is designed for 50-percent load rejection capability, a reactor trip following turbine trip below 50% power can be eliminated without compromising adequate safety margins. Deletion of the reactor trip following turbine trip would significantly reduce the down time required if the cause of the turbine trip is readily correctable.

4.0 REVIEW OF LICENSEE'S SUBMITTAL:

The review showed:

1. The licensee states that, "The plant operations review committee and the Nuclear Operations Review Board have reviewed the above proposed changes and have determined that the changes do not involve an unreviewed safety question."

2. An evaluation and analysis has been performed to ensure that the deletion of reactor trip following turbine trip from 50-percent power or less has no adverse affect on plant safety. This evaluation consisted of:

(1) A verification of the worst case transient with respect to core limits in the 10 to 50-percent power range is acceptable (i.e., minimum DNBR > 1.30),

(2) The consideration of the worst single active failure (unsuccessful reactor coolant pump bus transfer 30 seconds after turbine trip), and

(3) The acceptability of potential offsite doses resulting from the loss of the condenser and consequential atmospheric dumping of steam through the main steam line safety valve.

Results of the analysis show that the plant design is such that a turbine trip without a direct or immediate reactor trip from 50 percent power or less presents no hazard to the integrity of the RCS, the main steam system, or the general public. Pressure relieving devices incorporated in the two systems are adequate to limit the maximum pressures to within the design limits. The analysis also demonstrates that for a complete loss of forced reactor coolant flow initiated from the most adverse preconditions of a turbine trip, the DNBR is well above 1.3 at any time during the transient. Thus, no fuel or clad damage is predicted, and all applicable acceptance criteria are met. In addition, the potential offsite doses associated with the loss of the condenser and consequential atmospheric dumping of steam through the main steam safety valves were found to be well within the Appendix I limits.

5.0 CONCLUSIONS:

I have reviewed the technical aspects of the licensee's submittal which shows:

1. No degradation of the engineered safety features occurs due to this change.

2. The system has the capability to bypass 50% of rated power steam around the turbine.

3. No credit is taken for the steam dump system in the FSAR.

Based on this review, I recommend that NRC approve this proposed change.

6.0 REFERENCES:

1. Letter, F. L. Clayton, Jr., of Alabama Power to A. Schwencer of DOR, November 15, 1978.

2. FSAR Section 15.2.7.

3. Enclosed submittal

   a. Safety Evaluation of Reactor Trip Following Turbine Trip Below 50% Power.

   b. Technical Specification Table 3.3-1

   c. Limiting Safety System Settings B2-7