



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 50 TO FACILITY OPERATING LICENSE NO. NPF-2
AND AMENDMENT NO. 41 TO FACILITY OPERATING LICENSE NO. NPF-8
ALABAMA POWER COMPANY
JOSEPH M. FARLEY NUCLEAR PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-348 AND 50-364

Introduction

By reference 1 Alabama Power Company (the licensee) submitted proposed revisions to the Technical Specifications for Farley 1 and 2 reactor coolant system pressure isolation valves (PIV's). These proposed Technical Specifications reflected previous resolution of issues and staff concerns as outlined in references 1 and 2, as well as in previous correspondence. Our discussion and evaluation follows.

Discussion and Evaluation

As a result of the Event V Order issued for Farley 1 on April 20, 1981, the Technical Specifications required leak rate testing of only four PIV's valves. The acceptance criteria for valve leakage for these valves is as follows:

1. Leakage rates less than or equal to 1.0 gpm are considered acceptable. However, for initial tests, or tests following valve repair or replacement, leakage rates less than or equal to 5.0 gpm are considered acceptable.
2. Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are considered acceptable if the latest measured rate has not exceeded the rate determined by the previous test by an amount that reduces the margin between measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.
3. Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are considered unacceptable if the latest measured rate exceeded the rate determined by the previous test by an amount that reduces the margin between measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.
4. Leakage rates greater than 5.0 gpm, are considered unacceptable.

With regard to the Farley 2 PIV test program, the NRC staff position originally was that acceptable leak rates for PIV's should not be greater

than one gpm. However, the NRC staff had granted approval to use higher leak rate acceptance criteria, similar to Farley 1, at Farley 2 on two separate occasions, each on a one-time-only basis. (See references 3 and 5). The licensee proposes the higher acceptance criteria permanently at Farley 2 and uniformly for both Farley 1 and 2.

The licensee proposes to make the PIV leak test program identical at both Farley 1 and Farley 2. The PIV list for each plant will consist of 20 valves. The staff had previously determined (see Reference 2) that these valves constitute the PIV list for Farley 2. The staff concurs with this approach at Farley 1 as well, for the reasons noted in Reference 2.

The maximum allowable leak rate for each PIV is proposed to be 3 gpm for 6 inch valves and 5 gpm for the remaining valves which are either 10 inch or 12 inch. This is equivalent to an allowable leak rate of one-half gpm for each inch of valve size with maximum upper limit of 5 gpm. In addition the licensee proposes that the measured leak rate for any given test should not reduce the difference between the test results of a previous test and the maximum leak rate by more than 50 percent.

The staff concurs with the licensee's proposal. An approach similar to that advocated by the licensee is now being considered by the NRC staff, and if approved by NRC management will result in a Standard Technical Specification change. The change is justified as follows:

- (a) The original one gpm criterion for Farley 2 was more-or-less arbitrary. This criterion has been imposed on all plants licensed since the TMI-2 accident. It was based on a very conservative estimate of the pressure relief system capacity for a plant. The one gpm criteria is not an indicator of imminent accelerated deterioration or potential valve failure.
- (b) In a study which was sponsored by the staff (EGG Report EGG-NTAP-6175, February 1983, "In Service Leak Testing of Primary Pressure Isolation Valves", R. A. Livingston) it was concluded that allowable leak rates based on valve size were superior to a single allowable value because a single allowable value imposes an unjustified penalty on larger valves without providing information on potential valve degradation. Also, the larger valves must be repaired in-place which subjects plant personnel to radiation exposure in order to meet an overly conservative standard. In addition, an indexing criterion to account for gross increases in leakage from one test to a later test, as found in the ASME code, paragraph IWV-3427 (b) is a direct indicator of potential valve degradation. Since such an indexing criterion will be used by the licensee, this will provide at least as good, if not better, an indication of valve deterioration as the one gpm criterion.
- (c) Previous safety evaluations (see attachments to references 3 and 5) in support of the one time Technical Specification changes allowed for Farley 2 provided analyses of data submitted by the licensee in support of his requests (see, for example, Reference 4). In support of the staff's position the following paragraph is quoted from Reference 5:

"Alabama Power Company (APCo) has supported their request by providing actual leakage data accumulated over approximately two years of leak testing these valves for Units 1 and 2 to the two different criteria. APCo provided the following historical data: The Unit 1 valves have been exposed to sixteen tests in past outages and resulted in six failures when the utility had arbitrarily imposed the Unit 2 1 gpm criteria. Personnel radiation exposure was estimated to be 25 rem to meet the 1 gpm criteria, but only 2.5 rem to meet the 1 to 5 gpm criterion. The utility also states that of the valves which failed the 1 gpm criterion and those that failed the 1 to 5 gpm criterion no discernible differences in seating surfaces could be found, and no evidence of impending valve failures were found in any of the valves that failed either criterion."

The staff's contemplated approach to monitoring leak rates for PIV's is to be found in ASME Code paragraph IWV-3427(b) of Section XI. The licensee's approach is somewhat more conservative than the NRC staff's proposal since it calls for immediate repair or replacement of valves which do not meet the "50% criterion." The staff's proposal would not immediately require repair or replacement unless the increase in leakage rate was pronounced. It is considered that the staff's approach is desirable since it allows some flexibility when the increase in leak rates is on the borderline of acceptability.

SAFETY SUMMARY

In conclusion, the PIV leak rate criteria proposed by the licensee is acceptable to the staff. This conclusion is based on an evaluation of the data submitted by the licensee and our independent staff study (EGG Report).

- References:
- 1 Alabama Power Company letter to USNRC dated April 10, 1984, Farley 1 and 2, "Proposed Technical Specification change for Leakage Testing of Reactor Coolant System Pressure Isolation Valves"
 - 2 USNRC letter to Alabama Power Company dated January 26, 1984, Farley 1 and 2, "Relief from ASME Section XI Requirement for Inservice Testing Program for Pumps and Valves"
 - 3 USNRC letter to Alabama Power Company dated September 8, 1983, Farley 2, Amendment No. 25 to License NPF8
 - 4 Alabama Power Company letter to USNRC dated June 3, 1983, Farley 2, "RCS Pressure Isolation Valve Leak Test Results"
 - 5 USNRC letter to Alabama Power Company dated November 24, 1982, Farley 2, Amendment No. 20 to Facility Operating License No. NPF8

Environmental Consideration

These amendments involve a change in the installation or use of the facilities components located within the restricted areas as defined in 10 CFR 20. The staff has determined that these amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: October 15, 1984

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