

Docket 714

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Docket Nos. 50-348
and 50-364

January 31, 1985

Mr. R. P. McDonald
Senior Vice President
Alabama Power Company
Post Office Box 2641
Birmingham, Alabama 35291

Dear Mr. McDonald:

SUBJECT: CONTAINMENT VENT AND PURGE OPERATION JOSEPH M. FARLEY NUCLEAR
PLANT UNITS 1 AND 2

By letter dated August 5, 1981, we advised you that we had completed our long-term review of Generic Item B-24 for Unit 1 relating to Commission concerns on purging and venting the containment. In that letter we proposed that you consider finalizing the Technical Specifications (TS) by using the model Technical Specifications provided for B-24 and NUREG-0737, Item II.E.4.2. We requested that you provide a TS change request within 45 days of receipt of our August 5, 1981 letter. Your letter dated September 21, 1981, advised of your intention to propose additional Technical Specifications prior to installation of the 8-inch purge valves.

Enclosure 2 of our August 5, 1981 letter provided a restatement of the salient features of Branch Technical Position CSB 6-4, Revision 1, to assist in your understanding of the NRC staff position on purge/vent operation. We stated in Enclosure 2 of that letter the following:

"Some purging/venting on current plants will be permitted provided that:

- a) purging is needed and justified for safety purposes, and
- b) valves are judged by the staff to be both operable and reliable, and
- c) the estimated amount of radioactivity released during the time required to close the valve(s) following a LOCA either
 - i. does not cause the total dose to exceed the 10 CFR Part 100 Guidelines; then a goal should be established which represents a limit on the annual hours of purging expected through each particular valve*, or
 - ii. causes the total dose to exceed the guideline valves; then purging/venting shall be limited to 90 hours/year."

* underline added here for emphasis

Mr. McDonald

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January 31, 1985

When Unit 2 was licensed on October 23, 1980, the Commission included License Condition 2-C (17) requiring modification of the vent and purge system to reduce the use of the 18-inch purge valves during power operation. By letter dated October 30, 1981, you provided a description of the revised design using 8-inch valves to replace the 18-inch valves in compliance with the license condition noted. Later, after several discussions between the two staffs, you then proposed administrative changes to the TS (e.g., correcting the valve size, sealing closed the inoperable 48-inch valve per NUREG-0737, Item II.E.4.2.6, and noting that purging was for safety related reasons). On Unit 2 we reviewed the proposals and on May 17, 1984 we issued administrative TS in License Amendment No. 34.

In the safety evaluation which accompanied Amendment No. 34, we noted that our review of the 8-inch design was continuing. Also, we noted that the need for continuous purging and venting is still considered an open issue for the Farley Plant with respect to establishing a purge "goal" and proposing the remaining TS. We have completed the review of your response for License Condition 2-C (17). Our safety evaluation is enclosed.

The evaluation is applicable to Units 1 and 2 and requires your action based on the included NRC staff recommendations. Your letter dated March 23, 1984, was used as the basis of the administrative Technical Specification changes issued for Unit 2 as noted above. However, we do not plan to act on the March 23, 1984, request for Unit 1 at this time. We would propose that the final Technical Specifications for Units 1 and 2 be done in response to the NRC staff recommendations contained in the enclosed safety evaluation.

You are requested to respond with 45 days of receipt of this letter with appropriate TS proposals and with your schedule for a study to reduce containment building purging at Farley Plant.

The report and/or recordkeeping requirements of this letter affect fewer than ten respondents, therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,
/s/SVarga

Steven A. Varga, Branch Chief
Operating Reactors Branch #1
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

ORB#1:DL
EReeves/ts
9/24/84

C-ORB#1:DL
SVarga
9/24/84

AD:OR/DL
Glatas
13/84

Mr. R. P. McDonald
Alabama Power Company

Joseph M. Farley Nuclear Plant
Units 1 and 2

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO VENT AND PURGE SYSTEM OPERATION

JOSEPH M. FARLEY NUCLER PLANT, UNITS 1 AND 2

DOCKET NOS. 50-348 AND 50-364

INTRODUCTION

In Supplement 5 to the Safety Evaluation Report (SSER 5) issued for Joseph M. Farley Nuclear Plant Unit 2 when licensed October 23, 1980, we indicated that the licensee, Alabama Power Company (APCo), would install a modified vent and purge system. Accordingly, the Unit 2 operating license was conditioned as follows: "Prior to October 1, 1981, the licensee shall submit to the NRC the design of a modified containment vent and purge system to reduce the use of the 18-inch purge valves during power operation. Prior to startup following the first refueling, the licensee shall install the modified system."

Information regarding the modified containment vent and purge system, and the associated Technical Specifications were provided by the licensee in letters dated September 30, and October 30, 1981, and December 20, 1983. The modifications were subsequently implemented by APCo at Farley, Units 1 and 2.

We have reviewed the licensee's submittals to determine compliance with Unit 2 License Condition 2.C.(17), the Branch Technical Position (BTP) CSB 6-4 "Containment Purging During Normal Plant Operation", the requirements of NUREG-0737, Item II.E.4.2, and the guidance developed as part of Multi-Plant

Action (MPA) B-24 which we provided to the licensee by letter dated August 5, 1981. The results of our review are provided in the following evaluation which applies to Farley, Units 1 and 2.

DISCUSSION

The vent and purge system installed in Farley, Units 1 and 2 at the time SSER 5 was issued, consisted of 48-inch supply and exhaust lines penetrating containment, with each having 48-inch isolation valves inside and outside of containment. A mini-purge system was also provided to reduce the need for purging with the 48-inch system. The mini-purge system consisted of an 18-inch isolation valve installed in parallel with each 48-inch valve, branch lines connecting to the 48-inch lines, and supply and exhaust blowers in series with the 18-inch valves outside containment. As noted in SSER 5, the licensee had proposed to modify the vent and purge system by installing a 3-inch vent line (with three isolation valves in series) in addition to the 18- and 48-inch purge lines. The licensee was also considering an alternate design involving the use of 8-inch valves instead of 3-inch valves.

By letter dated September 30, 1981, the licensee submitted the design of a modified vent and purge system which contains 8-inch isolation valves to replace the 18-inch valves in the original system, and a third 8-inch isolation valve in series in each line. By letter dated October 30, 1981, the licensee indicated that the third 8-inch isolation valve in each line would be eliminated from the final system design. Hence, the final vent and purge system design submitted by the licensee, differs from that originally installed at Farley only in the use of 8-inch butterfly isolation valves instead of 18-inch valves. This modification to the system was subsequently implemented at Farley, Units 1 and 2.

The 8-inch butterfly valves installed in the vent and purge system are actuated by air-operated Bettis actuators. The actuator design is "air-to-open and spring to-close" with the valves failing in the closed position. Both the valves and actuators are qualified seismically and environmentally, and can withstand a cumulative radiation dose of 1×10^8 rads (gamma). The valves are considered by APCo to be capable of opening or closing against the postulated Design Basis Accident Loss of Coolant Accident and Main Steam Line Break conditions. The valves are designed to function at a pressure of 80 psig, a temperature of 381° F, a maximum differential pressure of 80 psi and 100% relative humidity, when exposed to containment spray (NaOH and 10,000 PPM Boric acid). The closing time of the valves at design conditions are less than or equal to 3.5 seconds. These valves will close upon receipt of a containment isolation signal (generated as a result of safety injection, high containment pressure, or high containment radiation) and will remain closed on safety injection reset as required by IEB 80-06.

EVALUATION

We have reviewed the modified vent and purge system for compliance with the containment isolation requirements set forth in BTP CSB 6-4, NUREG-0737, Item II.E.4.2, and guidelines developed as part of B-24. We consider that the 8-inch valves meet our requirements for operability following a postulated accident and are acceptable for containment isolation. The 48-inch valves, the purge system ductwork, debris screens, and isolation signal provisions were previously reviewed and were also found acceptable (see SSER 5 and our evaluation contained in our August 5, 1981, letter). Furthermore, accident analyses for offsite doses and the minimum containment pressure for ECCS backpressure determination that were based on use of 18-inch isolation valves are not invalidated by the use of 8-inch valves. On the basis of our review,

we find that the modified containment vent and purge system at Farley satisfies all the explicit provisions set forth in BTP CSB 6-4. We note, however, that the present Technical Specifications regarding the vent and purge system are unacceptable without further modification as discussed below.

Unlimited use of the 8-inch mini-purge system, as permitted by the present Technical Specification 3.6.1.7, and as proposed by the licensee in a letter dated December 20, 1983, is inconsistent with the NRC staff's efforts to minimize purging and to establish a goal for purging during normal operation (above 200^o F, coolant temperature). The licensee has attempted to justify continuous purging on the basis that unlimited purging is preferable to excessive cyclic operation of the mini-purge system valves and to preclude damage to the vent and purge system ductwork outside of containment.

Furthermore, the licensee has indicated that a number of alternative methods of preventing containment pressurization during normal operation have been considered but have not been implemented due to cost considerations of uncertainty regarding NRC acceptance. In our view, the need for continuous purging for either safety-related reasons (ALARA) or containment pressure control has not been adequately justified by APCo. We feel that the licensee should undertake a further study of possible ways to preclude the practice of unlimited purging of the reactor containment building with the 8-inch lines. In addition to the modifications previously evaluated by the licensee, this study should consider a valve operator maintenance/modification program, modifications to the ventilation system ductwork/filter, and any other possible plant modifications and/or maintenance and replacement programs which would reduce the rate of containment pressurization. The rate of containment pressurization appears to be the licensee's basic argument for continuous purging.

For operation during the interim period, use of the 8-inch mini-purge system on a continuous basis is acceptable, provided the proposed studies are initiated and the identified deficiencies in the present Technical Specifications are corrected. These deficiencies are summarized as follows:

1. Surveillance requirements in the Technical Specifications do not adequately address operability (i.e., acceptability of leakage integrity) of the supply and exhaust isolation valves having resilient seals. Specifically, such surveillance of resilient seal type valves in the 48-inch purge system and the 8-inch mini-purge system are required. For the inactive and sealed closed, 48-inch valves, Technical Specification 4.6.3.4 currently requires a demonstration of valve operability via leak rate testing at 18-month intervals. A more simplified pressurization test at 6-month intervals on a staggered test basis, would be acceptable to the NRC staff. For the 8-inch valves, the current Technical Specifications contain no requirement to periodically demonstrate valve operability via leak rate testing of this active valve. The NRC staff recommends and would accept a more simplified pressurization test of the 8-inch valves at 3-month intervals.
2. The current Technical Specifications allow purging so that the containment internal pressure can be maintained between -1.5 and 3.0 psig. The licensee has attempted to justify continuous purging or venting on the basis that periodic purging at an internal pressure above about 0.25 psig would damage the vent system ductwork/filter outside of containment. To resolve this apparent inconsistency, the licensee should evaluate the pressure capability of the vent and purge

ductwork/filter. Then the licensee should propose either revised Technical Specifications for other means of containment pressure control or revised estimates of the isolation valve cycling frequency required for periodic, limited containment purging or venting.

CONCLUSION

On the basis of our review, we conclude that the modified vent and purge system for the Joseph M. Farley Nuclear Plant, Units 1 and 2, meets the explicit requirements for acceptable operation and containment isolation. However, we consider that certain revisions are need to the existing Technical Specifications as described herein regarding the purge/vent system operation and testing.

Further, we recommend the following:

- (1) License Condition 2.C.(17) be retained in the Unit 2 Operating License,
- (2) the licensee conduct further investigations of possible ways to reduce containment pressurization, and
- (3) the licensee submit proposed revisions to the plant Technical Specifications as a condition for continued use of the vent and purge system.

Dated: January 31, 1985

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