

Mr. William R. McCollum
Catawba Site Vice President
Duke Power Company
P. O. Box 1006
Charlotte, NC 28201

April 26, 1996

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - OPERATION OF CONTAINMENT PURGE VENTILATION DURING STARTUP, CATAWBA NUCLEAR STATION, UNIT 1 (TAC NO. M94561)

Dear Mr. McCollum:

The NRC staff, is reviewing and evaluating your application request dated January 26, 1996 to allow operation of the Containment Purge Ventilation System during Modes 3 and 4 during startup of Catawba Unit 1 from the steam generator replacement outage. Additional information, as discussed in the enclosure is required from Duke Power Company in order for the staff to complete its review. Your expeditious response to this request will facilitate completion of the staff's review by the date of June 3, 1996 as discussed in your application.

Sincerely,

Original signed by:

Robert E. Martin, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-413

Enclosure: Request for
Additional Information

cc w/encl: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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Sincerely,

A handwritten signature in cursive script that reads "Robert E. Martin".

Robert E. Martin, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

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cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

CATAWBA, UNIT 1, CONTAINMENT PURGE 24" BUTTERFLY VALVE QUALIFICATION

1. Performance Testing

Could a diagnostic test measuring torque requirement and output be performed during refueling to simulate the design-basis differential pressure and flow (for example, using purge fans)? The licensee's information indicates that closing torque is required at the zero-degree position. Could a valve leak test be performed after the dynamic test to more closely approximate leakage under accident conditions?

2. Inservice Test Requirements

These valves are classified as Passive Category A in the inservice testing (IST) program submitted to the staff. Will they be tested in accordance with ASME OM-10 as Active Category A air operated valves prior to purging operations? Will a fail-safe test and remote position verification be included? Will leak testing be performed following a fail-safe test?

3. Butterfly Valve Performance

Has the Fisher torque requirement prediction methodology for the specific butterfly valve, size, disc type, and aspect ratio used at Catawba been evaluated against butterfly valve testing, such as the EPRI butterfly valve test results and model, or INEL purge valve testing?

Have flow path characteristics such as elbows or tees been reviewed against assumptions in the analysis of the torque and self-closing performance under design-basis loss-of-coolant accident (DBLOCA) conditions?

Has performance of the elastomer seats been monitored? When were the elastomer seats last replaced? If the assessment is for new valves, will deteriorated elastomers cause problems with the operation of the valves?

The Fisher report uses information obtained during a laboratory test of a 6-inch butterfly valve and appears to extrapolate the test results to a 24-inch butterfly valve. ANSI B16.41 Annex J recommends extrapolation proportionality limits of 50 to 200% of nominal piping diameter. Were tests of any larger valves used to verify the qualification calculations? Does the fact that Duke Power Company (DPC) uses a 7600 disc in a 9200 valve affect its analysis?

Has the licensee considered the effect on torque requirements resulting from the purge system operating during a DBLOCA with containment pressurization?

If the air operated valve vents pilot air inside containment, has the containment backpressure effect on closing torque margins been considered?

ENCLOSURE

4. Actuator Qualification and Capability

It appears from the information provided that the valves' control systems are not engineered safety features (ESF). How does the fact that the operators and controls are not ESF grade affect assumptions used in determining reliability under DBLOCA conditions? Are the valves capable of fail-safe closing in the event that power and controls to the valve actuators are lost?

Is the actuator rating adequate for its requirements?

It appears that the torque requirement exceeds spring torque output at greater than 50 degrees open position. Discuss reliance on flow to enable the valve to close. What is the assurance that sufficient flow will occur to assist in the closure of the valve? Valve testing at INEL indicates that supersonic flow existed downstream of the valve during most of the valve cycle. This could affect the linearity of calculations using differential pressure (reference NUREG/CR-4141).

Discuss reliability of 80-degree open limit. Will limit stops be installed if not already in place? If not, how will DPC control the limit? Fisher recommends that both valves be limited to 70 - 80 degrees open, but DPC's information appears to limit only the outboard valve.

What are the results of the component structural integrity analysis?

5. Emergency Procedures

What is the contingency plan to mitigate consequences if valves do not close (such as emergency operating procedures)? How long would it take to access the valves and close at least one in each line? What is the risk of a design-basis LOCA over this period?

6. Possible Alternative Approaches

On what basis did DPC "determine" to inspect the new supports in a hot condition rather than cold? It appears that the current inspection requirements would allow the inspections in the cold condition to be acceptable. Is a "hot" inspection a concern that overrides placing the plant in a condition that is only conditionally qualified (i.e., allowing the 24-inch purge valves to be open during some period of time in Modes 4 and 3)? Could the "hot" inspection be done at any other time and accomplish the same purpose?

Could the building be cleared of toxic gases before changing modes such that the purge valves could be closed?

How was this issue addressed at other plants replacing steam generators which do not appear to have requested a similar TS change?

In that this request relates to NUREG-0737 Item II.E.4.2, discuss the particular hardship if purging is not allowed in Modes 3 and 4.

7. Other Valves

Discuss the butterfly valves used for incore instrumentation room penetration and their status as related to the technical specification amendment. In one place, DPC states that the valves will remain closed, but in another place, it says that the capability to close these 12-inch valves is bounded by the 24-inch valve. Does Fisher agree with this statement?