

October 24, 1991

Docket No. 50-346

Mr. Donald C. Shelton, Vice President
Nuclear - Davis-Besse
c/o Toledo Edison Company
300 Madison Avenue
Toledo, Ohio 43652

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Dear Mr. Shelton:

SUBJECT: AMENDMENT NO. 165 TO FACILITY OPERATING LICENSE NO. NPF-3
(TAC NO. M73384)

The Commission has issued Amendment No. 165 to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit No. 1. The amendment revises the Technical Specifications in response to your application dated August 1, 1989, and supplemented February 1, 1990.

This amendment revises TS 3/4.4.10, Structural Integrity, Section 4.4.10.1.b Surveillance Requirements by changing the surveillance interval for inspection and operability testing of reactor vessel internals vent valves from 18 months to 24 months.

A copy of the Safety Evaluation is also enclosed. Notice of issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original Signed By:

Jon B. Hopkins, Sr. Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 165 to License No. NPF-3
2. Safety Evaluation

cc: See next page

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10/18/91

OGC-WF1
M20321
10/19/91

JBH
10-24-91

Mr. Donald C. Shelton
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Davis-Besse Nuclear Power Station
Unit No. 1

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

TOLEDO EDISON COMPANY
CENTERIOR SERVICE COMPANY
AND
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY
DOCKET NO. 50-346
DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 165
License No. NPF-3

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Toledo Edison Company, Centerior Service Company, and the Cleveland Electric Illuminating Company (the licensees) dated August 1, 1989, as supplemented February 1, 1990, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-3 is hereby amended to read as follows:

(a) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 165, are hereby incorporated in the license. The Toledo Edison Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented not later than 45 days after issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Jon B. Hopkins, Sr. Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of issuance: October 24, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 165

FACILITY OPERATING LICENSE NO. NPF-3

DOCKET NO. 50-346

Replace the following page of the Appendix "A" Technical Specifications with the attached page. The revised page is identified by amendment number and contains vertical lines indicating the area of change. The corresponding overleaf page is also provided to maintain document completeness.

Remove

3/4 4-31

Insert

3/4 4-31

REACTOR COOLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b. Each internals vent valve shall be demonstrated OPERABLE at least once per 24 months during shutdown by:
 - 1. Verifying through visual inspection that the valve body and valve disc exhibit no abnormal degradation,
 - 2. Verifying the valve is not stuck in an open position, and
 - 3. Verifying through manual actuation that the valve is fully open when a force of \leq 400 lbs. is applied vertically upward.

REACTOR COOLANT SYSTEM
REACTOR COOLANT SYSTEM VENTS
LIMITING CONDITION FOR OPERATION

3.4.11 The following reactor coolant system vent paths shall be operable:

- a. Reactor Coolant System Loop 1 with vent path through valves RC 4608A and RC 4608B.
- b. Reactor Coolant System Loop 2 with vent path through valves RC 4610A and RC 4610B.
- c. Pressurizer; with vent path through EITHER valves RC11 and RC 2A (PORV) OR valves RC 239A and RC 200.

APPLICABILITY: Modes 1, 2 and 3

ACTION:

- a. With one of the above vent paths inoperable, restore the inoperable vent path to OPERABLE status within 30 days, or, be in HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 30 hours.
- b. With two of the above vent paths inoperable, restore at least one of the inoperable vent paths to OPERABLE status within 72 hours or be in HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 30 hours.
- c. With three of the above vent paths inoperable, restore at least two of the inoperable vent paths to OPERABLE status within 72 hours or be in HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 30 hours.
- d. The provisions of specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.11 Each reactor coolant system vent path shall be demonstrated OPERABLE at least once per 18 months by:

1. Verifying all manual isolation valves in each vent path are locked in the open position, and
2. Cycling each valve in the vent path through at least one complete cycle of full travel from the control room during COLD SHUTDOWN or REFUELING, and
3. Verifying flow through the reactor coolant vent system vent paths during COLD SHUTDOWN or REFUELING.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 165 TO FACILITY OPERATING LICENSE NO. NPF-3
TOLEDO EDISON COMPANY
CENTERIOR SERVICE COMPANY
AND
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY
DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1
DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated August 1, 1989, the Toledo Edison Company (the licensee) requested changes to Technical Specification (TS) 3/4.4.10, Structural Integrity, which would revise the surveillance interval for inspection and operability testing of reactor vessel internals vent valves (RVVVs) from "at least once per 18 months, during shutdown" to "during shutdown for refueling." The proposed changes also delete the applicability of TS 4.0.2 from Surveillance Requirement (SR) 4.4.10.1.b, and delete an outdated Cycle Five specific footnote.

By letter dated February 1, 1990, after further evaluation of the subject application, the licensee requested that the proposed surveillance interval change be revised to "at least once per 24 months during shutdown." This revised wording is consistent with Amendment Number 108, dated September 26, 1988, issued by the NRC staff to Florida Power Corporation's Crystal River, Unit 3 (CR-3). The licensee's application of August 1, 1989 also proposed a footnote which deleted the applicability of TS 4.0.2. The licensee has determined that this portion of the original request no longer applies and hereby withdraws it from the application. The applicability of TS 4.0.2 to this surveillance requirement is also consistent with Amendment Number 108 for CR-3.

2.0 EVALUATION

In 1975, the NRC revised 10 CFR 50.55a to require an Inservice Inspection (ISI) of various safety-related components, including pumps and valves, to be performed in accordance with the ASME Boiler and Pressure Vessel Code,

Section XI, "to the extent practical within the limitations of design, geometry, and materials of construction." The existing Davis-Besse Technical Specification Section 4.4.10.1.b requires that the RVVVs be demonstrated operable at least once per 18 months with a provision that an extension of 25% may be granted for the 18-month period. The proposed amendment would change the surveillance interval for inspection and operability testing of the RVVVs from 18 months to 24 months.

The RVVVs are large swing check valves mounted vertically between the inlet and outlet sides of the core support shield. The core support shield directs cold leg (inlet) flow downward into the annular space just inside the vessel and contains core outlet flow in the central portion, directing it upward to the hot leg nozzles. The vent valve assemblies are installed so they can swing outward into the cold leg water space should pressure on the outlet side of the core exceed inlet pressure. Under normal operating conditions, the vent valves are closed.

The RVVV materials were selected on the basis of their corrosion resistance, surface hardness, anti-galling characteristics, and compatibility with mating materials in the reactor coolant environment. The valve disc, hinge shaft, shaft journals (bushings), disc journal receptacles, and valve body journal receptacles have been designed to withstand, without failure, the internal and external differential pressure loadings resulting from a loss-of-coolant accident. These valve materials are non-destructively tested and accepted in accordance with the ASME Code III requirements for Class A vessels as a reference quality level.

The design criteria for these valves included (1) functional integrity, (2) structural integrity, (3) individual part-capture capability, (4) functional reliability, (5) structural reliability, and (6) leak integrity through the design life.

The RVVV hinge assembly provides eight loose rotational clearances and two end-clearances to minimize any possibility of impairment of disc-free motion in service. In the event that one rotational clearance should bind in service, seven loose rotational clearances would remain to allow unhampered disc-free motion. In the worst case, at least three clearances must bind or seize solidly to adversely affect the valve disc-free motion.

In addition, the valve disc hinge loose clearances permit disc self-alignment so that the external differential pressure adjusts the disc seal face to the valve body seal face. This feature minimizes the possibility of increased leakage and pressure-induced deflection loadings on the hinge parts in-service.

The RVVVs are installed in the core support shield to prevent a pressure unbalance which might delay or interfere with emergency core cooling following a postulated inlet pipe rupture. The arrangement consists of four 14-inch inside diameter valve assemblies installed in the cylindrical wall of the internal core support shield. The RVVVs provide a direct path to vent steam in the upper plenum through the break following a postulated

cold-leg rupture. The valves are required because the arrangement of the reactor coolant system (RCS) could delay the venting of steam generated in the core after the system is depressurized, if significant quantities of coolant remain in the reactor inlet piping at the end of the blowdown period. Without venting of the steam, the pressure in and above the core region could be greater than the pressure in the reactor vessel inlet annulus where emergency coolant is injected. This pressure differential could retard flow into the core. The RVVVs provide a flowpath from the region above the core directly to the pipe rupture location. This flowpath allows the pressures to equalize and permits emergency coolant water to reflood the core rapidly.

The licensee has stated that surveillance testing of each of the 4 RVVVs at Davis-Besse has been completed nine times since 1977, resulting in a total of 36 exercises of the valves. The results of the last inspection after an extended surveillance interval of 42 months demonstrated satisfactory operability.

The NRC staff has taken into consideration the record of the past tests of similar RVVVs, which represented about 480 inspections and exercises at other B&W facilities. The data presented by the licensee indicated that the RVVVs have demonstrated a high degree of reliability and no failures were found. The only degradation of the RVVVs was noted in November 1978 at two other B&W facilities. At that time, jackscrew locking mechanism wear was discovered in the RVVVs adjacent to the reactor vessel outlet nozzle. The only problem found at Davis-Besse occurred in 1973 prior to operation, and involved the seizing of one jackscrew, which was attributed to an excessive thickness of electrolyze which spalled off the screw threads. This problem was corrected and no further jackscrew problems have occurred.

The RVVV components that are vulnerable to corrosion include the shaft, bushing and the body. These parts are constructed of Type 431 martensitic stainless steel, stellite Number 6, and Type 304 austenitic stainless steel, respectively. Data on the RCS hot operating conditions indicate that the general corrosion rates of these materials are in the range of .05 mils/year or less. The NRC staff has also evaluated the information relating to the RCS chemistry, the compatibility of the mating materials, their corrosion resistance, and the reactor coolant environment. Since the corrosion deposit is about three times the rate of corrosion, the expected thickness of the deposited material is about .15 mils/year. It is estimated that the minimum cold clearance gap dimensions vary from 3 to 60 mils, thus there would be sufficient gap so as not to hinder valve operation prior to the next RVVV test.

Information is available from TMI-1 and Davis-Besse that indicates that the RVVVs are capable of remaining operable for unusually long intervals between tests. TMI-1 experienced one test interval of 37 months, and Davis-Besse experienced an interval of 42 months, and in each case the valves remained operable. Using the corrosion rates and clearance gap measurements discussed previously, corrosion would not close the gap and hinder valve operation even during such extended test intervals.

The operating experience with the RVVVs in the industry, supported by the past performance of these valves at Davis-Besse, has shown that they will remain operable for periods greater than 18 months. The staff has reviewed the proposed change to TS 4.4.10.1.b and finds that it would be acceptable to extend the surveillance interval for inspection and operability testing of the RVVVs at Davis-Besse to 24 months. In addition the application proposes the deletion of an outdated footnote in TS 4.4.10.1.b. The footnote allowed a one-time extension of the RVVVs' Surveillance Requirement which was to be performed no later than the fifth refueling outage. Since this requirement has been complied with and the time frame has expired, the footnote is no longer applicable. The staff finds this deletion to be acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Ohio State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a surveillance requirement. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released off-site, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (55 FR 6121). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 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 the amendment.

5.0 CONCLUSION

The staff has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: J. Lombardo

Date: October 24, 1991