

August 20, 1986

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Docket No. 50-346

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Mr. Joe Williams, Jr.
Senior Vice President, Nuclear
Toledo Edison Company
Edison Plaza - Stop 712
300 Madison Avenue
Toledo, Ohio 43652

Dear Mr. Williams:

SUBJECT: AMENDMENT NO. 95 TO FACILITY OPERATING LICENSE NO. NPF-3; REACTOR
VESSEL INTERNALS VENT VALVES

The Commission has issued the enclosed Amendment No. 95 to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit No. 1. This amendment consists of changes to the Appendix A Technical Specifications (TSs) in response to your application dated June 6, 1986 (No. 1278), as supplemented July 30, 1986 (No. 1292).

This amendment modifies Surveillance Requirement 4.4.10.1.b to permit a one-time extension of the surveillance interval for the reactor vessel internals vent valves from 18 months (plus an allowable extension of 25 percent) to until the reactor vessel head is removed or until the refueling following Cycle 5 operation. Although no specific date is included in the TSs by when the surveillance must be done, it is understood that testing of these valves will be done approximately no later than March 1988. Thus, the surveillance interval will have been extended to approximately 42 months maximum.

A copy of the Safety Evaluation supporting this amendment is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

~~ORIGINAL SIGNED COPY~~

Albert W. De Agazio, Project Manager
PWR Project Directorate #6
Division of PWR Licensing-B

Enclosures:

1. Amendment No. 95 to NPF-3
2. Safety Evaluation

cc w/enclosures:
See next page

PBD-6
RIngram
8/14/86

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Ade Agazio:jak
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LKelly
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CMcCracken
8/14/86

PBD-6
JStoltz
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OGC
8/18/86

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PDR

Mr. J. Williams
Toledo Edison Company

Davis-Besse Nuclear Power Station
Unit No. 1

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

TOLEDO EDISON 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. 95
License No. NPF-3

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Toledo Edison Company and The Cleveland Electric Illuminating Company (the licensees) dated June 6, 1986, as supplemented July 30, 1986, 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:

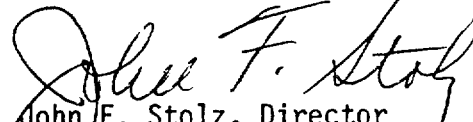
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Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 95 , 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.

FOR THE NUCLEAR REGULATORY COMMISSION


John F. Stolz, Director
PWR Project Directorate #6
Division of PWR Licensing-B

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 20, 1986

ATTACHMENT TO LICENSE AMENDMENT NO. 95

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 SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

- b. Each internals vent valve shall be demonstrated OPERABLE at least once per 18 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 ≤ 400 lbs. is applied vertically upward.

*For Cycle 5 Operation, performance of this Surveillance Requirement may be deferred to coincide with the next reactor vessel head removal but no later than the Cycle 5 refueling outage.

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 RC2 (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
SUPPORTING AMENDMENT NO. 95 TO FACILITY OPERATING LICENSE NO. NPF-3
TOLEDO EDISON COMPANY
AND
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY
DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1
DOCKET NO. 50-346

INTRODUCTION

By letter dated June 6, 1986, Toledo Edison Company (TED or the licensee) requested amendment to the Technical Specifications (TSs) appended to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit No. 1. The proposed amendment would modify Surveillance Requirement 4.4.10.1.b to extend the surveillance period of inspection and operability testing of the Reactor Vessel Internals Vent Valves (RVVVs) to coincide with the next reactor vessel head removal but not later than the refueling outage following Cycle 5 operation which is expected to occur no later than March 1988.

Following review of the initial application, a telephone conference was held with the NRC staff and representatives of Toledo Edison Company and Babcock and Wilcox Company (B&W) on July 24, 1986 to obtain clarification and to request additional information. The licensee submitted additional information regarding mechanical design, materials of construction, comparison of Three Mile Island Nuclear Station, Unit No. 1 (TMI-1) and Davis-Besse designs, and chemistry of the Reactor Coolant System (RCS) by letter dated July 30, 1986 (No. 1292).

BACKGROUND

In 1975, the NRC revised 10 CFR 50.55a to require an "Inservice Inspection" 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 Davis-Besse TS 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% (4.5 months) may be granted for the 18-month period.

The RVVVs were last tested in accordance with the surveillance requirement on October 12, 1984 during the refueling outage for Cycle 5. The refueling outage was completed in December 1984 and the facility was restarted in early January 1985. The core design for Cycle 5 allowed for 390 effective

full power days and, therefore, even with a capacity factor as low as 60%, the surveillance requirement could be met when the reactor vessel head was removed to refuel. However, in early June 1985, a loss of feedwater event occurred and the facility has not operated since then.

In order to meet the TS requirement, valve operability would need to be demonstrated not later than August 27, 1986, unless the requested extension is granted.

The Davis-Besse facility is expected to be restarted about November 1986. Approximately 12-13 months additional operating life remains in the Cycle 5 core. Therefore, refueling would not be expected to be required until about March 1988. Thus, the interval from the last surveillance test could be as long as about 42 months.

Toledo Edison provided a justification for the requested extension by reference to paragraph IWA-2400(c) of Section XI, ASME Boiler and Pressure Vessel Code, addendum of Summer 1978 which states:

"...For power units that are out of service continuously for 6 months or more, the inspection interval during which the outage occurred may be extended for a period equivalent to the outage."

Toledo Edison noted that while the plant has been in the prolonged outage, the internals vent valves have not been exposed to the turbulent flow environment that exists when the plant is operating. The flow through the core while cooling is provided by the Decay Heat Removal System is less than 1% of the flow with four reactor coolant pumps operating. Under these conditions, the internals vent valves do not experience the large differential pressure that exists when the plant is operating. Without this large differential pressure, the vent valves are being held closed only by gravity in a quiescent environment.

At TMI-1, where the RVVVs were held in a similar environment for over three years, no adverse effects were found upon inspection and exercising of the RVVVs. Because of the similarities in valve design, construction and water chemistry between TMI-1 and Davis-Besse, Toledo Edison Company asserts that the favorable performance of the RVVVs at TMI-1 would indicate the acceptability of extending the surveillance interval at Davis-Besse for a comparable period.

A review of the results obtained from RVVV surveillance tests performed at eight operating B&W plants was performed by B&W. The data reported about 400 inspections and exercises over the past ten years without a failure. These data demonstrate that the RVVVs have exhibited a high degree of reliability with no observable degradation in valve operability with reactor age.

DISCUSSION AND EVALUATION

The internals vent valves 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 vent valve assemblies installed in the cylindrical wall of the internal core support shield. The internals vent valves provide a direct path to vent steam in the upper plenum through the break following a postulated cold-leg rupture. The vent valves are required

because the arrangement of the 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 vent valves 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.

In its evaluation of the licensee's request to extend the RVVV surveillance interval, the NRC staff considered the results from the approximately 400 inspections and exercises which have been performed at all operating B&W facilities.

The typical interval between RVVV inspection and exercise was 12 to 18 months with a maximum test interval (with the exception of TMI-1) of about two years. In the case of TMI-1, the longest interval between tests was 37 months. These inspections indicate a high degree of reliability for the RVVVs since no degradation in valve operability has been observed.

The NRC staff also evaluated information pertaining to the RCS chemistry, material compatibility and corrosion resistance, and the reactor coolant environment. The chemistry of the RCS water is controlled to minimize corrosion and material activations and to assure the reliability of reactor and steam generator equipment. The licensee reported that the RCS water has not been out of specification at any time since the last surveillance test of the RVVVs. Comparison of the critical elements of water chemistry such as the concentrations of boron, fluoride, oxygen, and chloride, as well as the pH for the Davis-Besse and TMI-1 plants, indicates that the water environments in both plants are similar. The RVVVs at TMI-1 were not exercised for about 37 months -- slightly less than the maximum interval to be expected in the case of the RVVVs at Davis-Besse. The staff believes that the favorable TMI-1 results are indicative of what would be expected at Davis-Besse.

Corrosion, which could have an effect on the operation of RVVVs, has been considered. The parts vulnerable to corrosion are the shaft, bushing, and the body. These components are constructed of Type 431 martensitic stainless steel, Stellite No. 6, and Type 304 austenitic stainless steel respectively. Available data for the RCS hot operating conditions indicate that the general corrosion rates of these materials, as reported by the licensee, are in the range of 0.05 mils/year or less. This information has been verified independently by the NRC staff in the scientific literature (Reference 3). Since the accumulation of the corrosion deposit is about three times the corrosion rate, the expected thickness of the deposited material would be 0.15 mils per year. The minimum cold clearance gap dimensions vary from 3 to 60 mils, therefore the gap would not close and hinder the operation of the valve during the period of time until the next test of the RVVVs.

ENVIRONMENTAL CONSIDERATION

This amendment involves changes in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. We have 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 offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this 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 this amendment.

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 this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: August 20, 1986

Principal Contributors: R. Lipinski
G. Hammer

References:

1. Letter from Joe Williams, Jr., Toledo Edison, to John F. Stolz, NRC, dated June 6, 1986.
2. Letter from Joe Williams, Jr., Toledo Edison, to John F. Stolz, NRC, dated July 30, 1986.
3. Uhlig, Herbert, H., "Corrosion and Corrosion Control," John Wiley and Sons Inc., 2nd Edition, 1971.