

June 8, 1999

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Mr. Guy G. Campbell, Vice President - Nuclear
FirstEnergy Nuclear Operating Company
5501 North State Route 2
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SUBJECT: AMENDMENT NO. 232 TO FACILITY OPERATING LICENSE NO. NPF-3 -
DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1 (TAC NO. MA5019)

Dear Mr. Campbell:

The Commission has issued the enclosed Amendment No. ²³² to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit No. 1. The amendment revises the Technical Specifications (TSs) in response to your application dated March 9, 1999 (Licensing Action Request 97-01, Ser. No. 2570). The changes increase the inservice inspection interval, and reduce the scope of volumetric and surface examinations for the reactor coolant pump flywheels.

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

William O. Long, Sr. Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosures: 1. Amendment No. 232 to
License No. NPF-3
2. Safety Evaluation

cc w/encls: See next page

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DOCUMENT NAME: G:\PD3-3\DAVISBES\FLYWHEEL.AMD

OFFICE	LA:PD32	PM:PD32	EMCB:BC	OGC	SC:PD32
NAME	EBarnhill	WLong	W. Bateman	G. Grant	AMendiola
DATE	4/23/99	4/29/99	5/21/99	5/27/99	6/13/99

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Davis-Besse Nuclear Power Station, Unit 1

cc:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-346

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 232
License No. NPF-3

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by FirstEnergy Nuclear Operating Company (the licensee) dated March 9, 1999, 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:

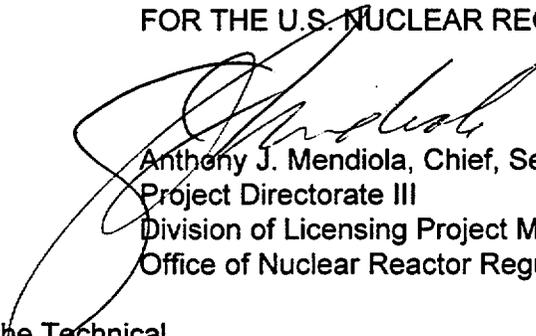
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(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 232 are hereby incorporated in the license. FENOC shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of issuance: June 8, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 232

FACILITY OPERATING LICENSE NO. NPF-3

DOCKET NO. 50-346

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the area of change.

Remove

TS 3/4 4-30

Insert

TS 3/4 4-30

REACTOR COOLANT SYSTEM

3.4.10 STRUCTURAL INTEGRITY

ASME CODE CLASS 1, 2 and 3 COMPONENTS

LIMITING CONDITION FOR OPERATION

3.4.10.1 The structural integrity of ASME Code Class 1, 2 and 3 components shall be maintained in accordance with Specification 4.4.10.1.

APPLICABILITY: All MODES.

ACTION:

- a. With the structural integrity of any ASME Code Class 1 component(s) not conforming to the above requirements, restore the structural integrity of the affected component(s) to within its limit or isolate the affected component(s) prior to increasing the Reactor Coolant System temperature more than 50 °F above the minimum temperature required by NDT considerations.
- b. With the structural integrity of any ASME Code Class 2 component(s) not conforming to the above requirements, restore the structural integrity of the affected component(s) to within its limit or isolate the affected component(s) prior to increasing the Reactor Coolant System temperature above 200 °F.
- c. With the structural integrity of any ASME Code Class 3 component(s) not conforming to the above requirements, restore the structural integrity of the component(s) to within its limit or isolate the affected component(s) from service.
- d. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.10.1 In addition to the requirements of Specification 4.0.5:

- a. Inservice inspection of each reactor coolant pump flywheel shall be performed at least once every 10 years. The inservice inspection shall be either an ultrasonic examination of the volume from the inner bore of the flywheel to the circle of one-half the outer radius, or a surface examination of exposed surfaces of the disassembled flywheel. The recommendations delineated in Regulatory Guide 1.14, Revision 1, August 1975, Positions 3, 4 and 5 of Section C.4.b shall apply.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 232TC FACILITY OPERATING LICENSE NO. NPF-3
FIRSTENERGY NUCLEAR OPERATING COMPANY
DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1
DOCKET NO. 50-346

1.0 INTRODUCTION

By application dated March 9, 1999, FirstEnergy Nuclear Operating Company (FENOC, the licensee) submitted a request for changes to the Davis-Besse Nuclear Power Station, Unit No. 1, Technical Specifications (TS).

The amendment would revise the TS in response to an application dated March 9, 1999 (Licensing Action Request 97-01). The proposed changes would increase the inservice inspection interval, and reduce the scope of volumetric and surface examinations for the reactor coolant pump flywheels.

2.0 BACKGROUND

The reactor coolant system (RCS) is described in the Davis-Besse Updated Safety Analysis Report (USAR) Section 1.2.2, "General Station Description - Nuclear Steam Supply System," and Section 5, "Reactor Coolant System." Additional information is provided in USAR Appendix 5A, "Safety Evaluation of RC Pump Motor Flywheels."

The function of the reactor coolant pumps (RCPs) in the RCS is to maintain an adequate cooling flow rate by circulating a large volume of primary coolant water at high temperature and pressure through the RCS. The RCPs are provided with flywheels that serve to provide angular momentum that will improve the coastdown flow characteristics of the RCS in the event of a trip of the RCPs. However, in the event of a loss-of-coolant accident, these flywheels may be subjected to overspeed conditions. The centrifugal forces that could result from excessive overspeed could cause a flywheel to fail, becoming a missile hazard. Analyses have been performed to assure that the maximum postulated RCP overspeed conditions would not result in failure of a structurally sound flywheel.

A concern regarding overspeed of the RCP and its potential for failure led to the issuance of Regulatory Guide (RG) 1.14, "Reactor Coolant Pump Flywheel Integrity," in 1971 (subsequently updated as Revision 1 dated August 1975). Since then, most licensees for PWR plants, including Davis-Besse, have adopted the guidelines of RG 1.14 to conduct their RCP flywheel

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examinations. These requirements are normally specified in the individual plant's TS, as is the case for Davis-Besse. The current TS Surveillance Requirement 4.4.10.1.a prescribes inspection activities that ensure that the flywheels are structurally sound.

Westinghouse Topical Report WCAP-14535A, "Topical Report on Reactor Coolant Pump Flywheel Inspection Elimination," was approved, with certain conditions, on September 12, 1996, by the Nuclear Regulatory Commission (NRC) staff. This report provides the basis for relaxing part of the flywheel inspection guidelines as listed in RG 1.14.

In the safety evaluation (SE) for WCAP-14535A, the staff stated that the evaluation methodology for RCP flywheels is appropriate and the criteria are in accordance with the design criteria of RG 1.14 for a fatigue life of at least 10 years. In addition, the staff specified:

- Criterion (1) Licensees who plan to submit a plant-specific application of this topical report for flywheels made of SA533B material need to confirm that their flywheels are made of SA533B material. Further, licensees having Group-15 flywheels need to demonstrate that material properties of their A516 material is equivalent to SA533B material, and its reference temperature, RT_{NDT} , is less than 30 °F.
- Criterion (2) Licensees who plan to submit a plant-specific application of this topical report for their flywheels not made of SA533B or A516 material need to either demonstrate that their flywheel material properties are bounded by those of SA533B material, or provide the minimum specified ultimate tensile stress, S_u , the fracture toughness, K_{Ic} , and the reference temperature, RT_{NDT} , for that material. For the latter, the licensees should employ these material properties, and use the methodology in the topical report, as extended in the two responses to the staff's RAI [request for additional information], to provide an assessment to justify a change in inspection schedule for their plants.
- Criterion (3) Licensees meeting either (1) or (2) above should either conduct a qualified in-place ultrasonic testing (UT) examination of the volume from the inner bore of the flywheel to the circle of one-half the outer radius or conduct a surface examination (MT and/or PT) of exposed surfaces defined by the volume [the phrase "defined by the volume" was removed after a clarification from the staff] of the disassembled flywheels once every 10 years. The staff considers this 10-year inspection requirement not burdensome when the flywheel inspection is conducted during scheduled ISI inspection or RCP motor maintenance. This would provide an appropriate level of defense in depth.

These conditions require that flywheel material either satisfy Criteria (1) and (3) or Criteria (2) and (3). In addition, the staff required that "Licensees with Group 10 flywheels need to confirm in the near term that their flywheels have an adequate shrink fit of the flywheels at the maximum overspeed."

3.0 EVALUATION

The licensee has proposed to change the RCP flywheel inspection intervals in accordance with the above criteria of the staff SE. In particular, TS 4.4.10.1.a, which currently reads:

4.4.10.1 In addition to the requirements of Specification 4.0.5:

- a. The reactor coolant pump flywheels shall be inspected per the recommendations of Regulatory Position C.4.b. of Regulatory Guide 1.14, Revision 1, August 1975.

would be changed to read:

4.4.10.1 In addition to the requirements of Specification 4.0.5:

- a. Inservice inspection of each reactor coolant pump flywheel shall be performed at least once every 10 years. The inservice inspection shall be either an ultrasonic examination of the volume from the inner bore of the flywheel to the circle of one-half the outer radius, or a surface examination of exposed surfaces of the disassembled flywheel. The recommendations delineated in Regulatory Guide 1.14, Revision 1, August 1975, Positions 3, 4 and 5 of Section C.4.b shall apply.

This change replaces Positions 1 and 2 of Section C.4.b of RG 1.14 with the proposed text, but continues to ensure the application of Positions 3, 4 and 5.

Topical Report WCAP-14535A, Table 2-1, "Summary of Westinghouse and Babcock and Wilcox Domestic Flywheel Information," lists the Davis-Besse flywheel material as SA533B, with a note stating that one spare RCP motor has a flywheel made of SA508 material. The facility FSAR indicates that the flywheel material is ASTM A533 69A, Grade B Class 1. The licensee confirmed that the A533 flywheel material is the same alloy and the installed flywheels thus meet Criterion (1). The licensee provided mechanical properties of the SA508B (Class 3) spare flywheel material, and compared them with SA533B properties. The staff confirmed that the property values provided for both materials are in agreement with the ASME Boiler and Pressure Vessel Code Section III values, and that the SA508B (Class 3) properties are bounded by the SA533B properties. In addition, the ASME Code Section XI K_{Ic} curve for SA533B is also applicable to SA508B (Class 3). The licensee further stated that the Material Test Certification for the SA508B (Class 3) material lists the nil-ductility transition temperature as <10 °F. Therefore, Criterion (2) is satisfied for SA508B (Class 3). In addition, the proposed wording in TS 4.4.10.1.a regarding examinations is consistent with Criterion (3).

The staff has determined that flywheel material SA533B satisfies Criteria (1) and (3), and flywheel material SA508B (Class 3) satisfies Criteria (2) and (3). The staff has also verified that the Davis-Besse flywheels do not belong to the Group 10 identified in WCAP-14535A and therefore, no additional analysis is needed to address the issue of shrink fit. Since all the flywheel material at Davis-Besse satisfies the requirements of the Topical Report staff SE, the proposed change is acceptable.

4.0 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.

5.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or 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 effluent 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (64 FR 24196). 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.

6.0 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 Contributors: A. Hansen, W. Long

Date: June 8, 1999