

October 29, 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. 166 TO FACILITY OPERATING LICENSE NO. NPF-3  
(TAC NO. 180507) M

The Commission has issued Amendment No. 166 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 May 31, 1991, as supplemented August 29, and October 15, 1991.

This amendment allows the replacement of defective fuel rods with stainless steel filler rods.

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:  
J. B. Hopkins

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. 166 to License No. NPF-3
2. Safety Evaluation

cc: See next page

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LA/PD33/DRPW PM/PD33/DRPW  
PKreutzer JHopkins/bj  
10/23/91 10/23/91  
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DOCUMENT NAME: 80507 AMD

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RJones  
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D/PD33/DRPW  
JHannon  
10/13/91

OGC-WF1 <sup>my note</sup>  
revisions made  
10/24/91  
JBH 10-29-91

NOT needed,  
because SRXB  
provided SE. -JBH

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P PDR

DF01 1/

Mr. Donald C. Shelton  
Toledo Edison Company

cc:

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Davis-Besse Nuclear Power Station  
Unit No. 1

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General  
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Mr. James W. Harris, Director  
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Columbus, Ohio 43216

Ohio Environmental Protection Agency  
DERR--Compliance Unit  
ATTN: Zack A. Clayton  
P. O. Box 1049  
Columbus, Ohio 43266-0149

Resident, Board of Ottawa  
County Commissioners  
Port Clinton, Ohio 43452

State of Ohio  
Public Utilities Commission  
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Columbus, Ohio 43266-0573

Mr. James R. Williams  
State Liaison to the NRC  
Adjutant General's Department  
Office of Emergency Management  
Agency  
2825 West Ganville Road  
Columbus, Ohio 43235-2712



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. 166  
License No. NPF-3

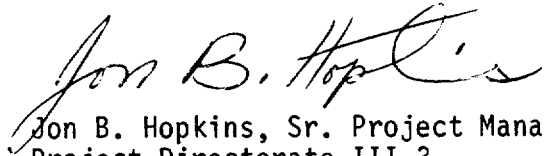
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by the Toledo Edison Company, Centerior Service Company, and the Cleveland Electric Illuminating Company (the licensees) dated May 31, 1991, as supplemented August 29 and October 15, 1991, complies 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. 166, 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 29, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 166

FACILITY OPERATING LICENSE NO. NPF-3

DOCKET NO. 50-346

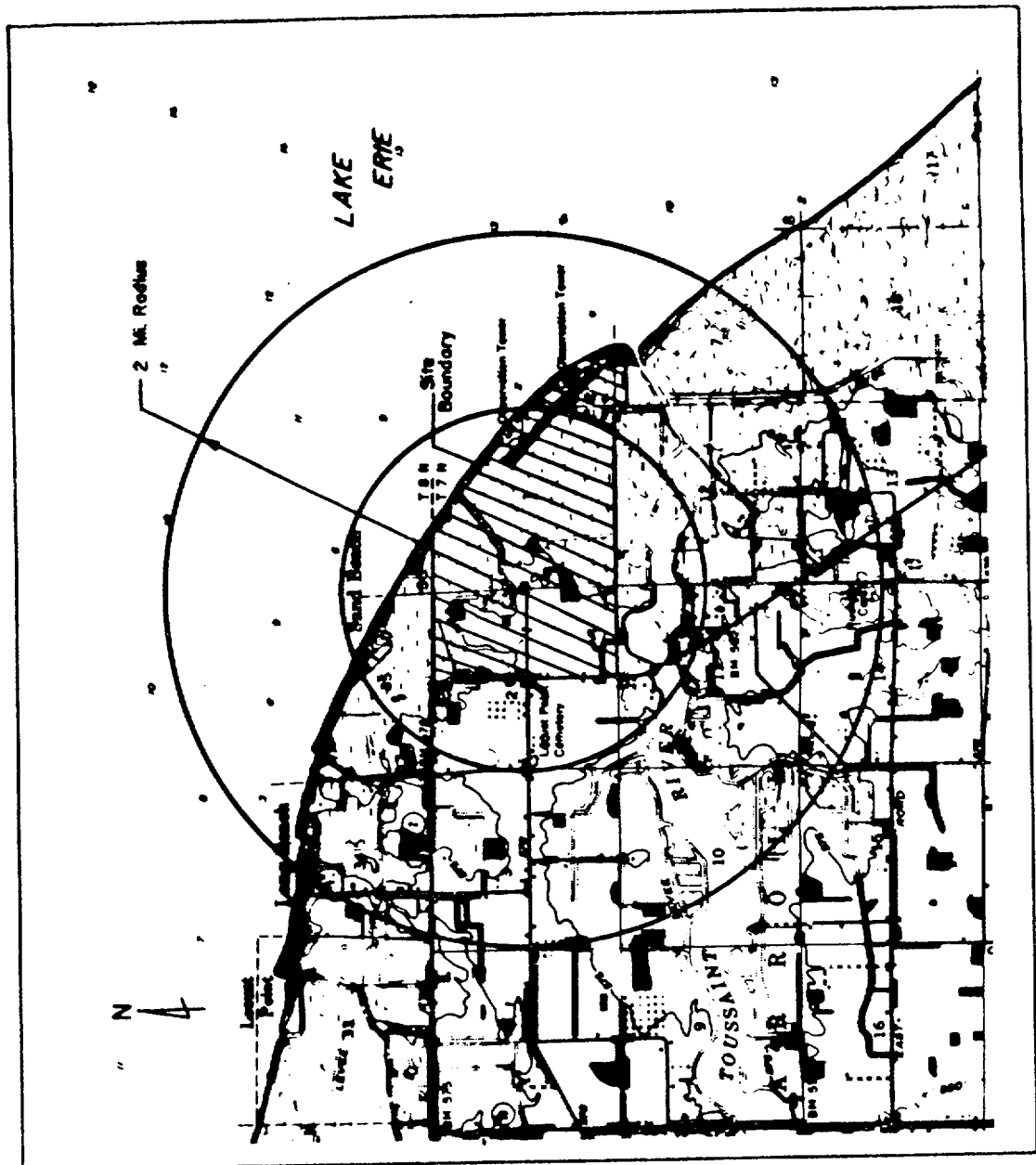
Replace the following page of the Appendix "A" Technical Specifications with the attached page. The revised page is identified by amendment number and contains vertical lines indicating the area of change. The corresponding overleaf page is also provided to maintain document completeness.

Remove

5-4

Insert

5-4



DAVIS-BESSE NUCLEAR POWER STATION  
 LOW POPULATION ZONE  
 FIGURE 5.1-2

## DESIGN FEATURES

### DESIGN PRESSURE AND TEMPERATURE

5.2.2 The reactor containment building is designed and shall be maintained for a maximum internal pressure of 40 psig and a temperature of 264°F.

### 5.3 REACTOR CORE

#### FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 177 fuel assemblies. Each assembly shall consist of a matrix of Zircaloy clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide (UO<sub>2</sub>) as fuel material, with a maximum enrichment of 3.8 weight percent U-235. Limited substitutions of stainless steel filler rods for fuel rods, in accordance with approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff approved codes and methods and shown by tests or analyses to comply with all fuel safety design bases. Each fuel rod shall have a nominal active fuel length of 144 inches and shall contain a maximum total weight of 2500 grams uranium.

#### CONTROL RODS

5.3.2 The reactor core shall contain 53 safety and regulating and 8 axial power shaping (APSR) control rods. The safety and regulating control rods shall contain a nominal 134 inches of absorber material. The nominal values of absorber material shall be 80 percent silver, 15 percent indium and 5 percent cadmium. All control rods shall be clad with stainless steel tubing. The APSRs shall contain a nominal 63 inches of absorber material at their lower ends. The absorber material for the APSRs shall be 100 percent Inconel-600.

### 5.4 REACTOR COOLANT SYSTEM

#### DESIGN PRESSURE AND TEMPERATURE

5.4.1 The reactor coolant system is designed and shall be maintained:

- a. In accordance with the code requirements specified in Section 5.2 of the FSAR, with allowance for normal degradation pursuant to applicable Surveillance Requirements.
- b. For a pressure of 2500 psig, and
- c. For a temperature of 650°F, except for the pressurizer and pressurizer surge line which is 670°F.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 166 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 May 31, 1991, Toledo Edison Company (TE) submitted an application for an amendment to Technical Specification 5.3.1, Fuel Assemblies, for Davis-Besse Nuclear Power Station (DBNPS). The proposed change would allow the use of stainless steel filler rods to replace defective fuel rods. Subsequent to meetings with NRC staff on August 14 and 21, 1991, TE provided supplemental information by letter dated August 29, 1991. In response to the NRC staff request, additional information was provided by letter dated October 15, 1991 describing the fuel inspection and repair process, the cycle-specific vendor redesign analyses, the plan for use of a single stainless steel filler rod in a single repaired fuel assembly in the Cycle 8 core, the proposed core location of the repaired assembly, and the minimum thermal margin available compared to the limiting assembly. That information did not alter the proposed action or affect the determination published September 25, 1991. Our evaluation follows.

2.0 EVALUATION

The replacement of damaged fuel rods with non-fuel stainless steel filler rods has been previously implemented at other Babcock and Wilcox (B&W) designed facilities. The proposed technical specification is considered acceptable since it requires that the number and location of filler rod substitutions are limited to configurations for which applicable NRC approved codes and methods are valid and that have been shown by test or analyses to comply with all fuel safety design bases.

The licensee stated in the meeting of August 21, 1991, that thermal hydraulic analysis of the proposed insertion of a cold rod into the center of a 3x3 matrix of active fuel is supported by test data which includes 3x3, 4x4 and 5x5 rod configurations. The fuel vendor intends to submit a licensing topical report documenting the DNB tests described in that meeting in support of the position that the use of the Babcock & Wilcox BWC CHF correlation is applicable to the proposed configuration. Although the



cycle-specific vendor analyses to support the Cycle 8 redesign are still in progress, the repaired assembly will be located in a non-limiting core location with greater than 5 percent margin relative to the lead power generation fuel assemblies. This margin is considered sufficient to assure that the repaired assembly will not be limiting with respect to DNB occurring during Cycle 8.

Structural evaluations completed by the vendor also indicate that replacement of fuel rods with stainless steel rods does not adversely affect the performance of a fuel assembly during combined loss-of-coolant accident (LOCA) and seismic loads. The filler rod material (SS304) is a standard reactor grade material. The radial thermal expansion of the stainless steel rod is greater than a Zircaloy-4 clad fuel rod, resulting in more compression of the spacer grid springs. However this is still within the elastic range and no adverse effect is translatable to adjacent fuel rod grid springs.

The axial expansion differential is handled by leaving a gap of 1.7 inches (cold) between the top of the filler rod and the bottom of the upper end fitting. Analyses show sufficient clearance with no interference or rod bow potential. The filler rod design also has no effect on the hydraulic lift characteristics of the fuel assembly. The staff concludes that this mechanical assessment is reasonable and acceptable.

The staff has reviewed the licensee's submittals for replacement of defective fuel rods with stainless steel rods. Based on the information supplied by the licensee and the staff's review of the evaluation method and acceptance criteria for the analyses being performed prior to the startup of the Cycle 8 core, the staff concludes that the proposed Technical Specification change is acceptable, and that the methodology used is acceptable for the proposed Cycle 8 core. Approval of the BWC CHF correlation for application to other reconstituted fuel assembly and reactor core configurations will require further review.

### 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 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 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 the amendment involves no significant hazards consideration and there has been no public comment on such finding (56 FR 29282 and 56 FR 48591). 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: E. Kendrick

Date: October 29, 1991