



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

Docket File
TSCB
50-237

May 16, 1997

Ms. Irene Johnson, Acting Manager
Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. M96180 AND M96181)

Dear Ms. Johnson:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 159 to Facility Operating License No. DPR-19 and Amendment No. 154 to Facility Operating License No. DPR-25 for Dresden, Units 2 and 3. The amendments are in response to your application dated June 20, 1996, as supplemented by letters dated December 30, 1996, and March 5, 1997.

The amendments would change the Technical Specifications (TS) by incorporating an NRC-approved thermal limit licensing methodology in the list of approved methodologies used in establishing the fuel cycle-specific thermal limits. In addition, the proposed amendments would change the TSs to reflect the use of Siemens Power Corporation (SPC) ATRIUM-9B fuel for the first time at Dresden, Units 2 or 3. The proposed amendments would also correct minor editorial items in the TSs.

In March 1997, the NRC staff performed an audit of the application of Advanced Nuclear Fuel for Boiling Water Reactors (ANFB) to ATRIUM-9B fuel. The staff raised concerns associated with the ATRIUM-9B fuel additive constant uncertainty used as input to the NRC-approved methodology for the calculation of minimum critical power ratio (MCPR). In response to the audit findings, by letter dated April 18, 1997, SPC submitted a generic topical report (ANF-1125(P) Supplement 1 Appendix D), which is currently under staff review, for the future reload analysis in the safety limit MCPR calculation. The staff schedule for the review of the topical report will not be timely enough for the resolution of the ATRIUM-9B MCPR issue to support reload and restart of Dresden, Unit 3. Therefore, by letters dated May 2 and May 6, 1997, ComEd provided additional information concerning the MCPR issues and how it will affect the Dresden, Unit 3, D3R15 fuel cycle and provided additional information concerning the ATRIUM-9B fuel design and shutdown margin that are applicable during refueling and shutdown.

The staff is currently reviewing the licensee's May 2 and May 6, 1997, letters. To be more timely and support the reload schedule for Dresden, Unit 3 (currently scheduled for May 20, 1997), the staff has chosen to split its consideration of the proposed amendments into two parts. The first part of the amendment package now being evaluated would modify Section 5.3.A,

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"Design Features" of the TSs to reflect the use of the ATRIUM-9B fuel design and would include two SPC topical reports in TS Section 6.9.A.6, "Core Operating Limits Report," to reflect mechanical design criteria for this fuel. This change would allow this fuel to be loaded into the core only under Operational Modes 3 (Hot Shutdown), 4 (Cold Shutdown), and 5 (Refueling) and does not permit startup or power operation using the ATRIUM-9B fuel.

The outstanding issues concerning the uncertainty of ANFB additive constants used for 9X9 fuels with an internal water channel in the MCPR safety limit analysis and the other requested changes to the TSs will be evaluated separately as a second part of the amendment package, prior to restart of Dresden, Unit 3 (currently scheduled for June 8, 1997).

A copy of the Safety Evaluation evaluating the first part of the amendment package is enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by:

John F. Stang, Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-237 and 50-249

Enclosures: 1. Amendment No. 159 to DPR-19
2. Amendment No. 154 to DPR-25
3. Safety Evaluation

cc w/encl: see next page

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I. Johnson
Commonwealth Edison Company

Dresden Nuclear Power Station
Unit Nos. 2 and 3

cc:

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

COMMONWEALTH EDISON COMPANY

DOCKET NO. 50-237

DRESDEN NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 159
License No. DPR-19

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Commonwealth Edison Company (the licensee) dated June 20, 1996, as supplemented December 30, 1996, and March 5, 1997, 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. DPR-19 is hereby amended to read as follows:

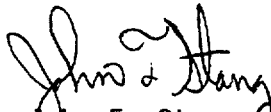
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(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 159, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



John F. Stang, Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 16, 1997



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

COMMONWEALTH EDISON COMPANY

DOCKET NO. 50-249

DRESDEN NUCLEAR POWER STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 154
License No. DPR-25

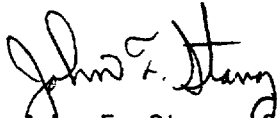
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Commonwealth Edison Company (the licensee) dated June 20, 1996, as supplemented December 30, 1996, and March 5, 1997, complies with the standards and requirements of the Atomic Energy Act 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 3.B. of Facility Operating License No. DPR-25 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 154, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



John F. Stang, Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 16, 1997

ATTACHMENT TO LICENSE AMENDMENT NOS. 159 AND 154
FACILITY OPERATING LICENSE NOS. DPR-19 AND DPR-25
DOCKET NOS. 50-237 AND 50-249

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by the captioned amendment numbers and contain marginal lines indicating the area of change.

REMOVE

5-5

6-15

6-16

INSERT

5-5

6-15

6-16

5.0 DESIGN FEATURES

5.3 REACTOR CORE

Fuel Assemblies

- 5.3.A The reactor core shall contain 724 fuel assemblies¹. Each assembly consists of a matrix of Zircaloy clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide as fuel material. The assemblies may contain water rods or a water box. Limited substitutions of Zircaloy or ZIRLO or stainless steel filler rods for fuel rods, in accordance with NRC-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 bases². A limited number of lead test assemblies that have not completed representative testing may be placed in non-limiting core regions.

Control Rod Assemblies

- 5.3.B The reactor core shall contain 177 cruciform shaped control rod assemblies. The control material shall be boron carbide powder (B_4C) and/or hafnium metal. The control rod assembly shall have a nominal axial absorber length of 143 inches.

¹ ATRIUM-9B fuel with exception of lead test assemblies is only allowed in the reactor core in Operational Modes 3, 4 and 5, and with no more than one control rod withdrawn.

² The design bases applicable to ATRIUM-9B fuel are those which are applicable to Operational Modes 3, 4, and 5.

ADMINISTRATIVE CONTROLS

- b. The analytical methods used to determine the operating limits shall be those previously reviewed and approved by the NRC in the latest approved revision or supplement of topical reports:
- (1) ANF-1125(P)(A), "Critical Power Correlation - ANFB."
 - (2) ANF-524(P)(A), "ANF Critical Power Methodology for Boiling Water Reactors."
 - (3) XN-NF-79-71(P)(A), "Exxon Nuclear Plant Transient Methodology for Boiling Water Reactors."
 - (4) XN-NF-80-19(P)(A), "Exxon Nuclear Methodology for Boiling Water Reactors."
 - (5) XN-NF-85-67(P)(A), "Generic Mechanical Design for Exxon Nuclear Jet Pump Boiling Water Reactors Reload Fuel."
 - (6) XN-NF-81-22(P)(A), "Generic Statistical Uncertainty Analysis Methodology."
 - (7) ANF-913(P)(A), "CONTRANSA2: A Computer Program for Boiling Water Reactor Transient Analysis."
 - (8) Commonwealth Edison Company Topical Report NFSR-0091, "Benchmark of CASMO/MICROBURN BWR Nuclear Design Methods", and associated Supplements on Neutronics Licensing Analyses (Supplement 1) and La Salle County Unit 2 Benchmarking (Supplement 2).
 - (9) ANF-89-14(P)(A), Advanced Nuclear Fuels Corporation Generic Mechanical Design for Advance Nuclear Fuels Corporation 9x9-IX and 9x9-9X BWR Reload Fuel, Revision 1 and Supplements 1 and 2, Advanced Nuclear Fuels Corporation, October 1991.
 - (10) ANF-89-98(P)(A), Generic Mechanical Design Criteria for BWR Fuel Designs, Revision 1 and Revision 1 Supplement 1, Advanced Nuclear Fuels Corporation, May 1995.

ADMINISTRATIVE CONTROLS

- c. The core operating limits shall be determined so that all applicable limits (e.g., fuel thermal-mechanical limits, core thermal-hydraulic limits, ECCS limits, nuclear limits such as shutdown margin, and transient and accident analysis limits) of the safety analysis are met. The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements thereto, shall be provided upon issuance, for each reload cycle, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector.

6.9.B Special Reports

Special reports shall be submitted to the Regional Administrator of the NRC Regional Office within the time period specified for each report.

6.10 [INTENTIONALLY LEFT BLANK]



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 159 TO FACILITY OPERATING LICENSE NO. DPR-19
AND AMENDMENT NO. 154 TO FACILITY OPERATING LICENSE NO. DPR-25

COMMONWEALTH EDISON COMPANY

DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-237 AND 50-249

1.0 INTRODUCTION

By letter dated June 20, 1996, as supplemented, December 30, 1996, and March 5, 1997, Commonwealth Edison Company (ComEd, the licensee) submitted an application for license amendments requesting changes to the Technical Specifications (TS). The amendments would change the TSs by incorporating an NRC-approved thermal limit licensing methodology in the list of approved methodologies used in establishing the fuel cycle-specific thermal limits. In addition, the proposed amendments would change the TSs to reflect the use of Siemens Power Corporation (SPC) ATRIUM-9B fuel for the first time at Dresden, Units 2 or 3. The proposed amendments would also correct minor editorial items in the TSs.

2.0 EVALUATION

The proposed change to the TSs being evaluated here allows the plant to enter Operational Modes 3, 4, and 5 with ATRIUM-9B fuel loaded in the reactor core. Operational Modes 3 and 4 permit increases in the allowable temperatures and pressures of the reactor coolant, but would not permit the reactor to become critical.

Fuel Characteristics

Pursuant to the amendments being considered, Dresden, Units 2 and 3, would use SPC ATRIUM-9B fuel which is a 9x9 matrix with 72 fuel rods and a water box. The mechanical design of this fuel has been analyzed in accordance with SPC NRC-approved generic mechanical design criteria (References 1 and 2). These references are being added to Section 6.9.A.6.b of the TSs.

The description of the fuel in TS Section 5.3.A is being changed to provide a description of the water rods and zirconium alloy. ATRIUM-9B contains central water boxes and the term "zirconium alloy" is being revised to Zircaloy and ZIRLO which are the only zirconium alloys allowed by 10 CFR 50.46. A footnote is being added to state that the ATRIUM-9B fuel, with the exception of lead test assemblies, is only allowed in the reactor core in Operational Modes 3, 4, and 5 and that the design bases applicable to ATRIUM-9B fuel are those

which are applicable to Operational Modes 3, 4, and 5. The amendments to allow startup and power operation with ATRIUM-9B will be considered separately prior to restart of Dresden, Unit 3.

With consent from ComEd, on May 14, 1997, TS page 5-5 was annotated to indicate that ATRIUM-9B is allowed in the reactor core with the exception of lead test assemblies, in Operational Modes 3, 4, and 5 only.

Core Loading Evaluation and Shutdown Margin

The ATRIUM-9B fuel weighs essentially the same as the current SPC fuel and is compatible with the refueling platform main grapple. Therefore, the refueling platform main hoist is sufficient to handle the new fuel. The ATRIUM-9B fuel uses a channel design with mechanical and structural design similar to the current SPC fuel. The staff finds that this new fuel can be safely loaded into the reactor core because it is physically similar to the current fuel.

Support of fuel in Operational Modes 3, 4, and 5 requires consideration of core shutdown margin (SDM) and fuel bundle mechanical integrity. Core SDM is defined as the amount of shutdown core reactivity with all the control rods inserted and with the strongest worth control rod fully withdrawn at 68 degrees Fahrenheit and zero Xenon concentration. The licensee's methodology for calculating SDM is contained in References (3) and (4) and also in the current TS Sections 6.9.A.6.b.(4) and 6.9.A.6.b.(8), both previously approved by the NRC. Core SDM for beginning of cycle is greater than 1.00 percent ΔK , which satisfies the TS value of 0.42 percent ΔK . Therefore, the staff finds that the ATRIUM-9B fuel can be loaded and placed in its planned Cycle 15 configuration for Dresden, Unit 3, and remain subcritical with the strongest worth control rod withdrawn.

The fuel handling equipment accidents were also considered. The licensee determined that the evaluated fuel bundle drop accident for the ATRIUM-9B fuel assembly is bound by the results of the fuel handling accident presented in the Updated Final Safety Analysis Report (UFSAR).

Mechanical Design

TS Section 6.9.6.b would be revised to include the NRC-approved topical reports ANF-89-98(P)(A), Revision 1, and Revision 1 Supplement 1, "Generic Mechanical Design Criteria for BWR Fuel Designs," (Reference 1) and "Advanced Nuclear Fuels Corporation Generic Mechanical Design for Advanced Nuclear Fuels 9X9-IX and 9X9-9X BWR Reload Fuel," ANF-89-014(P)(A), Revision 1, and Supplements 1 and 2, Advanced Nuclear Fuels Corporation, October 1991 (Reference 2), describing the criteria used by SPC to design boiling-water reactor (BWR) fuel assemblies. The reports are appropriate for the Dresden plant design and are acceptable for use. The ATRIUM-9B mechanical design has been analyzed according to this generic mechanical design criteria as applicable to Operational Modes 3, 4, and 5.

SPC mechanical design calculations using the above NRC-approved methodology demonstrate that ATRIUM-9B complies with the criteria applicable to Modes 3, 4, and 5. This plant-specific application of the NRC-approved criteria is acceptable by the staff, along with the proposed TSs reference changes.

In conclusion, the proposed changes to the Dresden, Units 2 and 3, TSs support loading of ATRIUM-9B fuel during Operational Modes 3, 4, and 5. Approved methodologies are used to analyze SDM and fuel bundle integrity during fuel loading in these modes. The staff has concluded that all applicable limits for Operational Modes 3, 4, and 5, such as nuclear (shutdown margin) and accident analysis limits, are met. Therefore, the changes are acceptable.

Consideration of Higher Pressures

The licensee has evaluated the potential blowdown at pressures corresponding to Operational Modes 3 and 4, which are higher than that in Operational Mode 5. The reactor would remain subcritical and no adverse consequences would result. The mechanical fuel design would accommodate both the higher pressure and a potential rapid pressure reduction, and the plant would still remain in a safe condition. The staff has reviewed the licensee's evaluation and finds it acceptable.

Summary

Based on the above, the staff has concluded that operating Dresden, Units 2 and 3, with ATRIUM-9B fuel other than lead test assemblies in Modes 3, 4, and 5 is acceptable based on the approved-mechanical design of the fuel, the maintenance of the reactor in a subcritical mode, and the existing SDM.

The outstanding issues concerning the uncertainty of ANFB additive constants used for 9X9 fuels with an internal water channel in the MCPR safety limit analysis and the other requested changes to the TSs will be evaluated in separate amendments prior to restart of Dresden, Unit 3 (currently scheduled for June 8, 1997).

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve 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

amendments involve no significant hazards consideration, and there has been no public comment on such finding (62 FR 17227). Accordingly, the amendments meet 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 amendments.

5.0 CONCLUSION

The Commission 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 the amendments would not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: John Stang

Date: May 16, 1997

6.0 REFERENCES

1. Advanced Nuclear Fuels Corporation, ANF-89-98(P)(A), Revision 1, and Revision 1 Supplement 1, "Generic Mechanical Design Criteria for BWR Fuel Designs," dated May 1995.
2. Advanced Nuclear Fuels Corporation, ANF-89-014(P)(A), Revision 1 and Supplements 1 and 2, "Advanced Nuclear Fuels Corporation Generic Mechanical Design for Advanced Nuclear Fuels 9X9-IX and 9X9-9X BWR Reload Fuel," dated October 1991.
3. Advanced Nuclear Fuels Corporation, XN-NF-80-19 (P)(A), Volume 1, Supplement 3, Supplement 3 Appendix F, and Supplement 4, "Advanced Nuclear Fuels Methodology for Boiling Water Reactors," dated November 1990.
4. Commonwealth Edison Company Topical Report NFSR-0091, "Benchmark of CASMO/MICROBURN BWR NUCLEAR DESIGN METHODS," Revision 0, Supplements 1 and 2, dated December 1991, March 1992 and May 1992, respectively; SER letter dated March 22, 1993.