

July 27, 1995

Mr. J.P. O'Hanlon  
Senior Vice President - Nuclear  
Virginia Electric and Power Company  
5000 Dominion Blvd.  
Glen Allen, Virginia 23060

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SUBJECT: SURRY UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: USE OF ZIRLO  
(TAC NOS. M91003 AND M91004)

Dear Mr. O'Hanlon:

The Commission has issued the enclosed Amendment No. 202 to Facility Operating License No. DPR-32 and Amendment No. 202 to Facility Operating License No. DPR-37 for the Surry Power Station, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TS) in response to your application transmitted by letter dated November 29, 1994.

These amendments allow the use of ZIRLO, a new zirconium-based alloy, as a fuel cladding material.

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

Sincerely,

Original signed by:

Bart C. Buckley, Senior Project Manager  
Project Directorate II-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 202 to DPR-32
2. Amendment No. 202 to DPR-37
3. Safety Evaluation

cc w/enclosures:  
See next page

Document Name -

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DATED: July 27, 1995

AMENDMENT NO. 202 TO FACILITY OPERATING LICENSE NO. DPR-32 - SURRY UNIT 1  
AMENDMENT NO. 202 TO FACILITY OPERATING LICENSE NO. DPR-37 - SURRY UNIT 2

**Docket File**

NRC & Local PDRs

PDII-1 Reading File

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Mr. J. P. O'Hanlon  
Virginia Electric and Power Company

Surry Power Station  
Units 1 and 2

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

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 202  
License No. DPR-32

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Virginia Electric and Power Company (the licensee) dated November 29, 1994, 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-32 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 202, 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 its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

*Brenda Mozafari, for*

David B. Matthews, Director  
Project Directorate II-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: July 27, 1995



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

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 202  
License No. DPR-37

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Virginia Electric and Power Company (the licensee) dated November 29, 1994, 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-37 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 202, 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 its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

*Brenda Mozafari, for*

David B. Matthews, Director  
Project Directorate II-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: July 27, 1995

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 202 TO FACILITY OPERATING LICENSE NO. DPR-32

AMENDMENT NO. 202 TO FACILITY OPERATING LICENSE NO. DPR-37

DOCKET NOS. 50-280 AND 50-281

Revise Appendix A as follows:

Remove Pages

TS 5.3-1  
TS 6.2-3

Insert Pages

TS 5.3-1  
TS 6.2-3



### 5.3 REACTOR

#### Applicability

Applies to the reactor core, Reactor Coolant System, and Safety Injection System.

#### Objective

To define those design features which are essential in providing for safe system operations.

#### Specifications

##### A. Reactor Core

1. The reactor core contains approximately 176,200 lbs of uranium dioxide in the form of slightly enriched uranium dioxide pellets. The pellets are encapsulated in Zircaloy-4 or ZIRLO tubing to form fuel rods. All fuel rods are pressurized with helium during fabrication. The reactor core is made up of 157 fuel assemblies. Each fuel assembly contains 204 fuel rods except for fuel assemblies which may be reconstituted to replace leaking fuel rods with non-fueled rods (e.g. zircaloy or stainless steel).
2. The average enrichment of the initial core is 2.51 weight percent of U-235. Three fuel enrichments are used in the initial core. The highest enrichment is 3.12 weight percent of U-235.

- 2d. WCAP-10054-P-A, "Westinghouse Small Break ECCS Evaluation Model Using the TRUMP Code," August 1985 (W Proprietary)  
(Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Heat Flux Hot Channel Factor)
- 2e. WCAP-10079-P-A, "NOTRUMP, A Nodal Transient Small Break and General Network Code," August 1985 (W Proprietary)  
(Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Heat Flux Hot Channel Factor)
- 2f. WCAP-12610, "VANTAGE+ Fuel Assembly Report," June 1990 (Westinghouse Proprietary).  
(Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Heat Flux Hot Channel Factor)
- 3a. VEP-NE-2-A, "Statistical DNBR Evaluation Methodology," June 1987  
(Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Nuclear Enthalpy Rise Hot Channel Factor)
- 3b. VEP-NE-3-A, "Qualification of the WRB-1 CHF Correlation in the Virginia Power COBRA Code," July 1990  
(Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Nuclear Enthalpy Rise Hot Channel Factor)



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 202 TO FACILITY OPERATING LICENSE NO. DPR-32  
AND AMENDMENT NO. 202 TO FACILITY OPERATING LICENSE NO. DPR-37  
VIRGINIA ELECTRIC AND POWER COMPANY  
SURRY POWER STATION, UNIT NOS. 1 AND 2  
DOCKET NOS. 50-280 AND 50-281

1.0 INTRODUCTION

By letter dated November 29, 1994, the Virginia Electric and Power Company (the licensee) proposed changes to the Technical Specifications (TS) for the Surry Power Station, Units 1 and 2 (SPS-1&2). The proposed changes would allow the use of ZIRLO material for fuel cladding for SPS-1&2. The Westinghouse ZIRLO fuel was described in the topical report WCAP-12610 "VANTAGE+ Fuel Assembly Reference Core Report," and was approved by the NRC staff for irradiation up to 60,000 MWd/MTU rod average burnup. Two demonstration or lead test assemblies of ZIRLO-clad fuel have successfully completed two cycles of operation in the North Anna, Unit 1 core. The staff's evaluation is presented below.

2.0 DISCUSSION

The NRC staff approved the ZIRLO fuel design in a Safety Evaluation dated July 1, 1991, for the Westinghouse topical report WCAP-12610 "VANTAGE+ Fuel Assembly Reference Core Report." The NRC staff also approved Loss-of-Coolant Accident (LOCA) methodologies in a Safety Evaluation dated October 9, 1991, for the Westinghouse topical reports WCAP-12610, Appendix F, "LOCA NOTRUMP Evaluation Model: ZIRLO Modifications," and Appendix G, "LOCA Plant Specific Accident Evaluation." In addition, the NRC staff also approved the ZIRLO growth model as discussed in a Safety Evaluation dated September 15, 1994, for the Westinghouse Topical Report WCAP-12610, Appendix B, Addendum 1, "Extended Burnup Fuel Design Methodology and ZIRLO Fuel Performance Models."

3.0 TECHNICAL SPECIFICATION CHANGES (Section 5.3.A.1)

The reactor core contains approximately 176,200 lbs of uranium dioxide in the form of slightly enriched uranium dioxide pellets. The pellets are encapsulated in Zircaloy-4 or ZIRLO tubing to form fuel rods. All fuel rods are pressurized with helium during fabrication. The reactor core is made up of 157 fuel assemblies. Each fuel assembly contains 204 fuel rods except for fuel assemblies which may be reconstituted to replace leaking fuel rods with non-fueled rods (e.g. zircaloy or stainless steel).

#### 4.0 EVALUATION

The only substantial change to the TS proposed by this amendment is to allow the use of fuel clad with ZIRLO. The use of ZIRLO does not, in itself, change the mechanical, nuclear, or thermohydraulic characteristics of the fuel. The staff finds that the use of ZIRLO will cause no appreciable increase in the consequences of any non-LOCA accident; furthermore, the staff finds that the LOCA safety analysis described in Appendices F and G of WCAP-12610 shows that ZIRLO clad fuel is acceptable for use at Surry Power Station. The staff finds, therefore, that the proposed changes are acceptable.

#### 5.0 STATE CONSULTATION

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

#### 6.0 ENVIRONMENTAL CONSIDERATION

These amendments change a requirement with respect to 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 these amendments involve no significant hazards consideration and there has been no public comment on such finding (60 FR 508). Accordingly, these 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 these amendments.

#### 7.0 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 these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: B. Buckley

Date: July 27, 1995