

impacts are expected as a result of the proposed exemption.

Accordingly, the NRC staff concludes that there are no significant environmental impacts associated with the proposed action.

With its request to extend the implementation deadline, the licensee currently maintains a security system acceptable to the NRC and that will continue to provide acceptable physical protection of HBRSEP in lieu of the new requirements in 10 CFR Part 73.

Therefore, the extension of the implementation date for one element of the new requirements of 10 CFR Part 73 to September 16, 2011, would not have any significant environmental impacts.

The NRC staff's safety evaluation will be provided as part of a letter to the licensee approving the exemption to the regulation, if granted.

Environmental Impacts of the Alternatives to the Proposed Action

As an alternative to the proposed action, the NRC staff considered denial of the proposed action (*i.e.*, the "no action" alternative). Denial of the exemption request would result in no change in current environmental impacts. If the proposed action was denied, the licensee would have to comply with the existing implementation deadline of December 30, 2010, for one remaining item of the two requirements, as granted on March 3, 2010. The environmental impacts of the proposed exemption and the "no action" alternative are similar.

Alternative Use of Resources

The action does not involve the use of any different resources than those considered in the Final Environmental Statement for the HBRSEP, dated April 1975, as supplemented through the "Generic Environmental Impact Statement for License Renewal of Nuclear Plants: H.B. Robinson Steam Electric Plant, Unit 2—Final Report (NUREG—1437, Supplement 13)."

Agencies and Persons Consulted

In accordance with its stated policy, on December 15, 2010, the NRC staff consulted with the South Carolina State official, Susan Jenkins of the South Carolina Bureau of Land and Waste Management, regarding the environmental impact of the proposed action. The State official had no comments.

Finding of No Significant Impact

On the basis of the environmental assessment, the NRC concludes that the proposed action will not have a significant effect on the quality of the

human environment. Accordingly, the NRC has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated September 30, 2010. Portions of the September 30, 2010, submittal contain proprietary and security-related information, and accordingly, a redacted version of this letter is available for public review in the Agencywide Documents Access and Management System (ADAMS), Accession No. ML102770306. This document may be examined, and/or copied for a fee, at the NRC's Public Document Room (PDR), located at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available records will be accessible electronically from the ADAMS Public Electronic Reading Room on the Internet at the NRC Web site, <http://www.nrc.gov/reading-rm/adams.html>.

Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or send an e-mail to pdr.resource@nrc.gov.

Dated at Rockville, Maryland, this 16th day of December 2010.

For the Nuclear Regulatory Commission.

Farideh E. Saba,

Senior Project Manager, Plant Licensing Branch II-2, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation.

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NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50-280 and 50-281; NRC-2010-0283]

Virginia Electric and Power Company; Surry Power Station Unit Nos. 1 and 2; Exemption

1.0 Background

Virginia Electric and Power Company (the licensee) is the holder of Facility Operating License Nos. DPR-32 and DPR-37 which authorizes operation of the Surry Power Station (SURRY) Unit Nos. 1 and 2. The license provides, among other things, that the facility is subject to all rules, regulations, and Orders of the U.S. Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect.

The facility consists of a pressurized-water reactor located in Surry County, Virginia.

2.0 Request/Action

Pursuant to Title 10 of the Code of Federal Regulations (10 CFR), Section 50.12, "Specific exemptions," the Virginia Electric and Power Company (VEPCO), by letter dated February 10, 2010,¹ requested an exemption from certain requirements of 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems [ECCS] for light-water nuclear power reactors," and Appendix K to 10 CFR Part 50, "ECCS Evaluation Models" (Appendix K). The regulations in 10 CFR 50.46 contain acceptance criteria for the ECCS for reactors fueled with zircaloy or ZIRLO™ cladding. In addition, Appendix K to 10 CFR Part 50 requires that the Baker-Just equation be used to predict the rates of energy release, hydrogen concentration, and cladding oxidation from the metal/water reaction. The Baker-Just equation assumed the use of a zirconium alloy different than Optimized ZIRLO™. The exemption request relates solely to the specific types of cladding material specified in these regulations. As written, the regulations presume the use of zircaloy or ZIRLO™ fuel rod cladding. Thus, an exemption from the requirements of 10 CFR 50.46 and Appendix K is needed to support the use of different fuel rod cladding material. Therefore, the licensee requested an exemption that would allow the use of Optimized ZIRLO™ fuel rod cladding at SURRY. The NRC staff will prepare a separate safety evaluation, fully addressing VEPCO's application for a related license amendment.

3.0 Discussion

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present. Under 10 CFR 50.12(a)(2), special circumstances include, among other things, when application of the specific regulation in the particular circumstance would not serve, or is not necessary to achieve, the underlying purpose of the rule.

¹ VEPCO letter to NRC, Agencywide Documents Access and Management System (ADAMS) Accession No. ML100470738.

Authorized by Law

This exemption would allow the use of Optimized ZIRLO™ fuel rod cladding material at SURRY. As stated above, 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR Part 50. The NRC staff has determined that granting of the licensee's proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the exemption is authorized by law.

No Undue Risk to Public Health and Safety

The underlying purpose of 10 CFR 50.46 is to establish acceptance criteria for adequate ECCS performance. By letter dated June 10, 2005, the NRC staff issued a safety evaluation (SE)² approving Addendum 1 to Westinghouse Topical Report WCAP-12610-P-A and CENPD-404-P-A, "Optimized ZIRLO™ (these topical reports are non-publicly available because they contain proprietary information)," wherein the NRC staff approved the use of Optimized ZIRLO™ as a fuel cladding material. The NRC staff approved the use of Optimized ZIRLO™ as a fuel cladding material based on: (1) Similarities with standard ZIRLO™, (2) demonstrated material performance, and (3) a commitment to provide irradiated data and validate fuel performance models ahead of burnups achieved in batch application. The NRC staff's safety evaluation for Optimized ZIRLO™ includes 10 conditions and limitations for its use. As previously documented in the NRC staff's review of topical reports submitted by Westinghouse Electric Company, LLC (Westinghouse), and subject to compliance with the specific conditions of approval established therein, the NRC staff finds that the applicability of these ECCS acceptance criteria to Optimized ZIRLO™ has been demonstrated by Westinghouse. Ring compression tests performed by Westinghouse on Optimized ZIRLO™ (NRC-reviewed, approved, and documented in Appendix B of WCAP-12610-P-A and CENPD-404-P-A, Addendum 1-A, "Optimized ZIRLO™") demonstrate an acceptable retention of post-quench ductility up to 10 CFR 50.46 limits of 2200 degrees Fahrenheit and 17 percent equivalent clad reacted. Furthermore, the NRC staff has concluded that oxidation measurements provided by the licensee illustrate that oxide thickness (and associated hydrogen pickup) for Optimized

ZIRLO™ at any given burnup would be less than both zircaloy-4 and ZIRLO™. Hence, the NRC staff concludes that Optimized ZIRLO™ would be expected to maintain better post-quench ductility than ZIRLO™. This finding is further supported by an ongoing loss-of-coolant accident (LOCA) research program at Argonne National Laboratory, which has identified a strong correlation between cladding hydrogen content (due to in-service corrosion) and post-quench ductility.

The underlying purpose of 10 CFR Part 50, Appendix K, Section I.A.5, "Metal-Water Reaction Rate," is to ensure that cladding oxidation and hydrogen generation are appropriately limited during a LOCA and conservatively accounted for in the ECCS evaluation model. Appendix K states that the rates of energy release, hydrogen concentration, and cladding oxidation from the metal-water reaction shall be calculated using the Baker-Just equation. Since the Baker-Just equation presumes the use of zircaloy clad fuel, strict application of the rule would not permit use of the equation for Optimized ZIRLO™ cladding for determining acceptable fuel performance. However, the NRC staff has found that metal-water reaction tests performed by Westinghouse on Optimized ZIRLO™ demonstrate conservative reaction rates relative to the Baker-Just equation and are bounding for those approved for ZIRLO™ under anticipated operational occurrences and postulated accidents.

Based on the above, no new accident precursors are created by using Optimized ZIRLO™; thus, the probability of postulated accidents is not increased. Also, based on the above, the consequences of postulated accidents are not increased. Therefore, there is no undue risk to public health and safety due to using Optimized ZIRLO™.

Consistent With Common Defense and Security

The proposed exemption would allow the use of Optimized ZIRLO™ fuel rod cladding material at SURRY. This change to the plant configuration has no relation to security issues. Therefore, the common defense and security is not impacted by this exemption.

Special Circumstances

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR 50.46 and Appendix

K to 10 CFR Part 50 is to establish acceptance criteria for ECCS performance. The wording of the regulations in 10 CFR 50.46 and Appendix K is not directly applicable to Optimized ZIRLO™, even though the evaluations above show that the intent of the regulation is met. Therefore, since the underlying purposes of 10 CFR 50.46 and Appendix K are achieved through the use of Optimized ZIRLO™ fuel rod cladding material, the special circumstances required by 10 CFR 50.12(a)(2)(ii) for the granting of an exemption from certain requirements of 10 CFR 50.46 and Appendix K exist.

4.0 Conclusion

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances are present. Therefore, the Commission hereby grants VEPCO an exemption from certain requirements of 10 CFR 50.46 and Appendix K to 10 CFR Part 50, to allow the use of Optimized ZIRLO™ fuel rod cladding material, for SURRY, Unit Nos. 1 and 2.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment as published in the **Federal Register** on October 5, 2010 (75 FR 61528).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 15th day of December 2010.

For the Nuclear Regulatory Commission.
Joseph G. Giitter,

*Director, Division of Operating Reactor
Licensing, Office of Nuclear Reactor
Regulation.*

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NUCLEAR REGULATORY COMMISSION

[Docket No. 50-400; NRC-2010-0020]

**Carolina Power & Light Company,
Shearon Harris Nuclear Power Plant,
Unit No. 1; Exemption**

1.0 Background

Carolina Power & Light Company (CP&L, the licensee) is the holder of Renewed Facility Operating License No. NPF-63, which authorizes operation of the Shearon Harris Nuclear Power Plant (HNP), Unit 1. The license provides, among other things, that the facility is

² ADAMS Accession No. ML051670408.