

UNITED STATES NUCLEAR REGULATORY COMMISSION**FIRSTENERGY NUCLEAR OPERATING COMPANY****DOCKET NO. 50-346****DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1****ENVIRONMENTAL ASSESSMENT AND FINDING OF****NO SIGNIFICANT IMPACT**

The U.S. Nuclear Regulatory Commission (the Commission) is considering the issuance of exemptions from the provisions of: (1) 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors," which states requirements to control the hydrogen generated by Zircaloy or ZIRLO fuel cladding after a postulated loss-of-coolant accident (LOCA); (2) 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors," which requires the calculated emergency core cooling system (ECCS) performance for reactors with Zircaloy or ZIRLO fuel cladding to meet certain criteria; and (3) Appendix K to 10 CFR Part 50, "ECCS Evaluation Models," which presumes the use of Zircaloy or ZIRLO fuel cladding when doing calculations for energy release, cladding oxidation and hydrogen generation after a postulated LOCA, for Facility Operating License No. NPF-3, issued to the FirstEnergy Nuclear Operating Company (the licensee), for operation of the Davis-Besse Nuclear Power Station, Unit 1, located in Ottawa County, Ohio.

ENVIRONMENTAL ASSESSMENT**Identification of the Proposed Action:**

The licensee has requested exemptions from 10 CFR 50.44, 10 CFR 50.46 and 10 CFR 50 Appendix K regarding the proposed use of M5 advanced alloy for fuel assemblies. The

proposed action would allow the licensee to use fuel assemblies with fuel rod cladding that falls outside of the definition of Zircaloy and ZIRLO in the cited regulations. These assemblies would be loaded into the Davis-Besse reactor during the refueling outage in the spring of 2000. The proposed action is in accordance with the licensee's application for exemption dated September 15, 1998.

Need for the Proposed Action:

10 CFR 50.46(a)(1)(i) and Appendix K to 10 CFR Part 50 require the demonstration of adequate ECCS performance for light-water reactors that contain fuel consisting of uranium oxide pellets enclosed in Zircaloy or ZIRLO tubes. In addition, 10 CFR 50.44(a) addresses requirements to control hydrogen generated by Zircaloy or ZIRLO fuel after a postulated LOCA. Each of these three regulations, either implicitly or explicitly, assume that either Zircaloy or ZIRLO is used as the fuel rod cladding material. In order to accommodate the high fuel rod burnups that are required for modern fuel management and core designs, Framatome Technologies, Inc. developed the M5 advanced fuel rod cladding and fuel assembly structural material. M5 is an alloy comprised primarily of zirconium (~99 percent) and niobium (~1 percent) that has demonstrated superior corrosion resistance and reduced irradiation induced growth relative to both standard and low-tin Zircaloy. However, since the chemical composition of the M5 advanced alloy differs from the specifications of either Zircaloy or ZIRLO, use of the M5 advanced alloy falls outside of the strict interpretation of these regulations. Therefore, approval of these exemptions is needed to permit the use of the M5 advanced alloy as a fuel rod cladding material at the Davis-Besse Nuclear Power Station.

10 CFR 50.12 permits the Nuclear Regulatory Commission to grant exemptions which are authorized by law, will not present an undue risk to the health and safety of the public, and are consistent with the common defense and security, provided that special circumstances are

present. Pursuant to 10 CFR 50.12(a)(2)(ii), the Commission believes that special circumstances exist since application of the rule in this case would not 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 requirements for emergency core cooling systems. The underlying purpose of 10 CFR 50.44 is to control hydrogen generated by the metal/water reaction after a postulated LOCA, regardless of fuel cladding material. The licensee addressed the safety impact of using M5 fuel in its amendment application dated September 8, 1998.

The staff has evaluated this impact and has concluded that use of the M5 advanced alloy as a fuel rod cladding material remains bounded by the original design basis for the Davis-Besse facility. Therefore, since the underlying purposes of 10 CFR 50.44, 10 CFR 50.46, and 10 CFR 50 Appendix K are achieved through the use of the M5 advanced alloy as a fuel rod cladding material, the special circumstances required by 10 CFR 50.12(a)(2)(ii) for the granting of exemptions are met.

Environmental Impacts of the Proposed Action:

With regard to potential radiological impacts to the general public, the exemptions under consideration involve features located entirely within the restricted area as defined in 10 CFR Part 20. The new fuel assemblies meet the same design bases as the fuel that is currently in the reactor. No safety limits have been changed or setpoints altered as a result of the use of these new assemblies. The FSAR analyses are bounding for the new assemblies as well as for the rest of the core. The advanced zirconium-based alloys Zircaloy and ZIRLO have been shown through testing to perform satisfactorily under conditions representative of a reactor environment and the material properties of M5 are very similar to these alloys.

With regard to the potential environmental impacts associated with the transportation of the M5 clad fuel assemblies, the advanced cladding has no impact on previous assessments determined in accordance with 10 CFR 51.52.

The proposed action will not significantly increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released off site, and there is no significant increase in occupational or public radiation exposure. Therefore, there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential nonradiological impacts, the proposed action does not involve any historic sites. It does not affect nonradiological plant effluents and has no other environmental impact. Therefore, there are no significant nonradiological environmental impacts associated with the proposed action.

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

Alternatives to the Proposed Action:

As an alternative to the proposed action, the staff considered denial of the proposed action (i.e., the "no-action" alternative). Denial of the application would result in no change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

This action does not involve the use of any resources not previously considered in the "Final Environmental Statement Related to the Operation of Davis-Besse Nuclear Power Station, Unit 1," dated October 1975.

Agencies and Persons Consulted:

In accordance with its stated policy, on December 7, 1999, the staff consulted with the Ohio State official, Carol O'Claire, of the Ohio Emergency Management Agency, regarding the environmental impact of the proposed action. The State official had no comments.

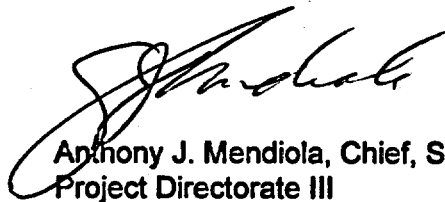
FINDING OF NO SIGNIFICANT IMPACT

On the basis of the environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the Commission 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 15, 1998, which is available for public inspection at the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC. Publically available records will be accessible electronically from the ADAMS Public Library component on the NRC Web site, <http://www.nrc.gov> (the Electronic Reading Room).

Dated at Rockville, Maryland, this 30th day of December 1999.

FOR THE NUCLEAR REGULATORY COMMISSION



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