

POLICY ISSUE NOTATION VOTE

October 26, 2004

SECY-04-0199

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations

SUBJECT: REQUEST FOR AUTHORIZATION TO ISSUE A LICENSE FOR THE
IDAHO SPENT FUEL FACILITY, UNDER 10 CFR PART 72

PURPOSE:

To request the Commission's authorization to issue a license to the Foster Wheeler Environmental Corporation (FWENC) for the interim storage of spent nuclear fuel (SNF) at the Idaho Spent Fuel (ISF) Facility, in accordance with 10 CFR Part 72.

SUMMARY:

In this paper, the staff discusses its review of the application submitted by FWENC to the U.S. Nuclear Regulatory Commission (NRC) for a license to store SNF from the U.S. Department of Energy (DOE) at the proposed ISF Facility. The ISF Facility is an independent spent fuel storage installation (ISFSI) to be located at the Idaho National Engineering and Environmental Laboratory (INEEL). The staff has completed its safety, security, and environmental reviews of the license application, and has determined that: (i) there is reasonable assurance that the activities authorized by the license can be conducted without endangering the health and safety of the public; (ii) these activities will be conducted in compliance with the applicable regulations of Title 10, Chapter I, of the Code of Federal Regulations; (iii) the issuance of the license will not be inimical to the common defense and security; and (iv) the environmental impacts of the

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proposed action will be small and are acceptable. As specified in 10 CFR 72.46(d), the Director, Office of Nuclear Material Safety and Safeguards, shall not issue an initial license for the construction and operation of an ISFSI located at a site other than a reactor site, unless expressly authorized to do so by the Commission. The staff requests that the Commission provide its authorization to proceed with the issuance of a license to FWENC for the proposed ISF Facility.

BACKGROUND:

On November 19, 2001, FWENC submitted a license application to NRC, in accordance with Part 72, to construct and operate an ISFSI, called the ISF Facility. The proposed ISF Facility represents one element of a Settlement Agreement, dated October 17, 1995, among DOE, the U.S. Navy, and the State of Idaho, regarding waste removal and environmental cleanup at the INEEL. Under its contract with DOE, FWENC will be the sole licensee, and will design, construct, and operate this facility. The ISF Facility will provide for the repackaging and interim dry storage of specific types and quantities of SNF currently stored by DOE at the INEEL, in preparation for eventual shipment to a high-level waste geologic repository. The proposed facility will be located on the INEEL site, adjacent to existing DOE SNF storage facilities, including the NRC-licensed ISFSI for the TMI-2 fuel debris.

Spent nuclear fuel at the INEEL is currently stored in above-ground facilities, including wet storage pools, and in dry underground storage facilities. Most of the SNF at INEEL was originally destined for reprocessing, and thus has been stored under conditions intended for short-term storage. Although the SNF is safe in the current storage configurations, the potential for degradation of the existing INEEL SNF storage facilities over time is of concern.

The ISF Facility is designed to receive, repackage, and store certain SNF, currently in DOE's possession, that originated primarily from early commercial power reactors. The specific material to be stored at the ISF Facility consists of SNF and associated radioactive material from: (1) the Peach Bottom Unit 1 reactor (a decommissioned high-temperature gas-cooled reactor, or HTGR); (2) the Shippingport Atomic Power Station (a decommissioned light-water breeder reactor, or LWBR); and (3) various Training, Research, and Isotope reactors built by General Atomics (TRIGA reactors). The SNF will be transferred from its current INEEL storage locations to the ISF Facility and repackaged into new storage canisters, which will then be placed into interim dry storage. The license for the ISF Facility would be granted for a period of 20 years, subject to renewal.

DISCUSSION:

ISF Facility Description

The proposed ISF Facility is designed for storage of three unique types of spent fuel and associated components. These are spent fuel elements from the Peach Bottom Unit 1 HTGR; reactor reflector modules and fuel rods from the Shippingport LWBR; and spent fuel elements from TRIGA reactors. The Peach Bottom Unit 1 and Shippingport reactors ceased operations in 1974 and 1982, respectively. All of the Peach Bottom Unit 1 and Shippingport spent fuel and most of the TRIGA spent fuel to be stored at the proposed facility is currently in storage at the Idaho Nuclear Technology and Engineering Center (INTEC), a complex of facilities at INEEL.

that is immediately adjacent to the ISF Facility site. Both INTEC and the ISF Facility are approximately 13.6 kilometers (8.5 miles) from the nearest INEEL site boundary.

The ISF Facility will be designed and licensed to store these spent fuel elements and associated materials in specified quantities. The Shippingport rods and modules will comprise 85.9 percent by weight of the total heavy metal inventory; the Peach Bottom elements, 12.7 percent; and the TRIGA fuel elements, 1.4 percent. When the ISF Facility becomes operational, DOE will transfer the SNF from its current storage locations at INTEC to the ISF Facility, using DOE-owned transfer casks. A small amount of the TRIGA spent fuel to be stored at the ISF Facility is currently stored offsite and will be transported to INTEC by DOE, under separate authority. As part of its review, the staff has specifically evaluated the DOE transfer casks for movement of SNF within the ISF Facility boundary, under this Part 72 license. Transfer of the SNF from the INTEC facilities to the ISF Facility gate will be conducted under DOE authority. Each transfer of SNF will occur over a distance of approximately 460 meters (500 yards) and will take place completely within the boundaries of the INEEL site. Once received at the ISF Facility, FWENC will repackage the SNF and place it in interim dry storage.

The ISF Facility is a fully enclosed building complex consisting of three principal areas: (i) the cask receipt area; (ii) the transfer area; and (iii) the storage area. A common transfer tunnel will provide connections between these three areas of the ISF Facility. In the ISF Facility cask receipt area, a loaded transfer cask will be removed from the transport trailer and placed onto the cask trolley. The cask trolley will be moved to the transfer area, where the SNF will be unloaded from its existing containers and repackaged into specially designed ISF canisters. The ISF canisters are made of stainless steel and provide the primary confinement system for the SNF. After the SNF transfer is completed, the ISF canisters will be filled with an inert gas, sealed, and moved to the storage area for interim dry storage. The loaded and sealed ISF canisters are to be stored in 246 individual metal storage tubes in a passively cooled concrete vault. After each ISF canister is placed vertically into its metal storage tube, a shield plug is installed and the metal storage tube is sealed with a cover plate with dual metallic seal rings. The metal storage tubes with cover plates will provide a redundant, outer confinement barrier for the SNF. The storage tubes are also filled with an inert gas to reduce potential corrosion of the ISF canisters during storage.

The ISF Facility transfer area incorporates a unique fuel packaging area where the SNF is remotely handled using specially designed fuel handling tools. These include a fuel handling machine with a single failure-proof hoist, a closed circuit television system, a power manipulator system, and separate master/slave manipulators to perform any remote manual operations. The floor, walls, and ceiling of the fuel packaging area are made of reinforced concrete having a minimum thickness of 0.91 meters (3 feet). The SNF will be removed from its current DOE containers and repackaged into ISF canisters within this enclosed shielded area, which is designed to confine and limit the potential spread of radioactive material.

Staff Review and Conclusions

FWENC provided the following information in its application for a Part 72 license for the ISF Facility: (a) a Safety Analysis Report (SAR); (b) a seismic design exemption request; (c) an operator training and certification plan; (d) a proposed decommissioning plan; (e) proposed Technical Specifications; (f) an Emergency Plan; (g) a Safeguards and Physical Security Plan; and (h) an Environmental Report. FWENC supplemented the application through: (a) its

responses to the staff's requests for additional information (submitted in January and August 2003); (b) revisions to the SAR (submitted in November 2002, and March and November 2003); and (c) other correspondence, including an exemption request from certain decommissioning funding requirements. The comprehensive information submitted by the applicant extensively described the design of the proposed facility, the programs to be implemented to ensure safe and secure operation, the organizational responsibilities, and the financial arrangements.

The NRC staff performed its safety, technical, and environmental reviews of the application with assistance from the Center for Nuclear Waste Regulatory Analyses. These reviews were conducted in accordance with the "Standard Review Plan for Spent Fuel Dry Storage Facilities (NUREG-1567)," the "Standard Review Plan for Dry Cask Storage Systems (NUREG-1536)," and the "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs (NUREG-1748)."

On July 29, 2004, the staff issued its preliminary Safety Evaluation Report (SER) for the ISF Facility. In the preliminary SER, the staff documented its findings regarding FWENC's application for a Part 72 license, except for those findings related to its reviews of the Safeguards and Physical Security Plan and the Environmental Report, which were addressed separately.

As documented in the preliminary SER, the staff's evaluation included: (i) the characteristics of the ISF Facility site; (ii) facility operations and operating systems; (iii) the design and design criteria for the ISF Facility and its structures, systems, and components important to safety; (iv) programs that support protection of public health and safety and worker health and safety; (v) the impact of potential off-normal and accident events on structures, systems, and components important to safety; (vi) the financial qualifications of the applicant and the decommissioning funding assurance exemption request; (vii) the proposed technical specifications; (viii) the emergency plan; (ix) the seismic design exemption request; (x) the applicant's training and qualifications; and (xi) the quality assurance program.

The staff made the following findings in the preliminary SER, corresponding to the areas of evaluation identified above:

- (i) The applicant's SAR provides an acceptable description and safety assessment of the ISF Facility site, and the proposed site complies with the siting evaluation factors identified in Part 72, Subpart E, subject to the granting of an exemption to 10 CFR 72.102(f), regarding the determination of the design earthquake, as discussed in item (ix) below.
- (ii) Potential interactions between the ISF Facility and nearby DOE facilities have been acceptably evaluated and the staff has determined that the proposed facility would not pose an undue risk to the safe operation of these nearby facilities. The proposed operating procedures to protect health and minimize danger to life and property are adequate, and facility operations can be conducted without endangering the health and safety of the public. The design of the ISF Facility, the operating procedures, and the schedule for operations provide acceptable controls for security, monitoring, and surveillance during all transfer, handling, and storage operations.

- (iii) The SAR appropriately specifies the design criteria for the structures, systems, and components important to safety. The ISF Facility structures, systems, and components important to safety will be designed to quality standards commensurate with their functions. Appropriate structural load combinations for normal and accident conditions, including the effects of natural phenomena, have been considered.
- (iv) The design and operation of the ISF Facility acceptably incorporates “as low as reasonably achievable” concepts to minimize occupational radiation exposure. Operating features and procedures, including the radiological protection program, alarm systems, and direct-radiation monitoring programs, will ensure that radiation doses to individual members of the public, from normal operation and postulated accidents, will be below NRC regulatory limits.
- (v) The proposed ISF Facility will be designed, constructed, and operated so that during all normal activities, off-normal events, and credible accidents, public health and safety will be adequately protected. The proposed ISF Facility will maintain subcriticality, confinement, and sufficient shielding of the SNF for all credible off-normal and accident scenarios.
- (vi) FWENC has submitted acceptable estimates of the costs, and has provided reasonable assurance that funds will be available for construction, operation, and decommissioning of the facility. FWENC will obtain sufficient funds for the licensing, construction, and operation of the ISF Facility through its contractual agreement with DOE. DOE has also provided a Statement of Intent to FWENC confirming that the Department will make a timely request to the U.S. Congress for funds to decommission the facility. The staff determined that an exemption to Section 72.30(c) is warranted in this case, to allow DOE to provide a commitment to obtain the decommissioning funding for this facility, even though FWENC will be the licensee.
- (vii) The SAR provides acceptable technical specifications for the facility, which include appropriate specifications for functional and operating limits, monitoring instruments, limiting control settings, limiting conditions, surveillance requirements, design features, and administrative controls.
- (viii) The ISF Facility Emergency Plan is acceptable. The plan appropriately describes the applicant’s program for responding to onsite emergencies and for seeking offsite assistance if needed. The staff determined that FWENC had acceptably coordinated the ISF Facility Emergency Plan with DOE’s INEEL site-wide emergency plan, to ensure that all required emergency actions can be performed, as necessary.
- (ix) FWENC has submitted an acceptable probabilistic seismic hazards analysis (PSHA) to determine the design earthquake for the ISF Facility, and the granting of an exemption to 10 CFR 72.102(f) is warranted. This exemption would be similar to that previously granted for the TMI-2 ISFSI, which is located in close proximity to the proposed ISF Facility. The PSHA methodology used by FWENC would be an acceptable approach to meeting the new geological and

seismological evaluation requirements of 10 CFR 72.103, added in October 2003. However, the application preceded the rule change; therefore, the new rule does not apply and an exemption is necessary.

- (x) The applicant's personnel training and certification program complies with 10 CFR Part 72, Subpart I. FWENC's program for selection, training, and retraining of operating personnel will provide adequately trained operations and supervisory staffs, acceptable documentation, and appropriate records of training. The personnel qualification requirements and training program commitments described by the applicant in the SAR are acceptable.
- (xi) The ISF Facility Quality Program Plan complies with the requirements of 10 CFR Part 72, Subpart G. This finding was transmitted to FWENC in a letter dated August 5, 2004.

The staff reviewed the proposed safeguards and physical protection plan for the ISF Facility against the existing requirements for ISFSI security (10 CFR Part 72, Subpart H and 10 CFR 73.51). Of note, the applicant proposed to rely on the existing DOE security resources at the adjacent INTEC complex as an alternative to certain requirements. The applicant described the coordination of security resources and the integration of the ISF security plan with existing DOE resources for the TMI-2 ISFSI and other INEEL facilities. Based on its review, the staff concluded that the licensee's application meets existing requirements. The staff's approval was documented in its security evaluation dated September 16, 2004.

The staff plans to develop additional security measures (ASMs), as appropriate, to be issued to the licensee subsequent to issuance of the Part 72 license (but well in advance of facility operation), consistent with Commission direction and previous staff practice. In determining the appropriate ASMs for the ISF Facility, the staff will consider those Interim Compensatory Measures that have been issued to other licensed facilities whose operation (including handling of spent fuel assemblies) is similar to the proposed ISF Facility. In the event that the staff identifies any new policy issues regarding the imposition of ASMs for this facility, the staff will advise the Commission of those issues before the issuance of any such additional security measures.

The staff also reviewed the applicant's Environmental Report, and has prepared and issued a final environmental impact statement (FEIS) for this action ("Environmental Impact Statement for the Proposed Idaho Spent Fuel Facility at the Idaho National Engineering and Environmental Laboratory in Butte County, Idaho," NUREG-1773, Final Report, January 2004). The FEIS complies with the National Environmental Policy Act (NEPA); the NRC regulations for implementing NEPA; and the guidance provided by the Council on Environmental Quality regulations implementing the procedural provisions of NEPA. The staff has determined that no significant environmental impacts will be generated as a result of construction and operation of the proposed ISF Facility.

A Notice of Opportunity for a Hearing for this action was issued on June 27, 2002, but no requests for a hearing were received. Stakeholder comments regarding this action were solicited through the issuance of a Draft Environmental Impact Statement in June 2003. More than 90 written comments were received and were addressed by the staff in the FEIS. The

FEIS also documented the staff's consultations with the U.S. Department of the Interior and the Idaho State Historical Society.

The staff will prepare a communications plan for this licensing action, which will include a press release to be issued at an appropriate time following the Commission's action on the staff's request.

RECOMMENDATION:

The staff recommends that the Commission authorize the issuance of a license for the ISF Facility to FWENC in accordance with the provisions of Part 72.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections.

/RA Martin J. Virgilio Acting For/

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* see previous concurrence

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