

NUCLEAR REGULATORY COMMISSION

[Docket No. 50-483]

Union Electric Company; Callaway Plant, Unit 1 Environmental Assessment and Finding of No Significant Impact

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. NPF-30, issued to Union Electric Company (the licensee), for operation of the Callaway Plant, Unit 1 located in Callaway County, Missouri.

Environmental Assessment

Identification of the Proposed Action

The proposed action would revise the Callaway Plant, Unit 1 technical specifications to allow an increase in the Callaway Plant, Unit 1 spent fuel pool (SFP) storage capacity and to allow storage of an additional 279 fuel assemblies in the cask loading pit.

The proposed action is in accordance with the licensee's application for amendment dated February 24, 1998, as supplemented by letters dated May 27, June 25, August 25, September 3, November 3, and December 4, 1998.

The Need for the Proposed Action

The licensee received its low power operating license on June 11, 1984. At that time, the SFP was authorized to store no more than 1344 fuel assemblies. The licensee's current projections, based on expected future spent fuel discharges, indicate that loss of full-core discharge capability will occur at the end of Cycle 14 in 2004. Operation of Callaway Plant, Unit 1 beyond loss of full-core discharge capability is possible for Cycles 15 and 16 to provide an additional three years of operation until 2007. The licensee has evaluated spent fuel storage alternatives that have been licensed by the NRC and that are currently feasible for use at the Callaway site. The evaluation concludes that reracking is currently the most cost-effective alternative. Reracking would provide an increase in storage capacity to 2642 fuel assemblies, which would maintain the plant's capability to accommodate a full-core discharge, through the end of the current plant license in 2024.

Environmental Impacts of the Proposed Action

Radiological Impacts

Callaway Plant, Unit 1 uses waste treatment systems designed to collect and process gaseous, liquid, and solid

waste that might contain radioactive material. These radioactive waste treatment systems were evaluated in the Final Environmental Statement (FES) dated January 1982. The proposed SFP expansion will not involve any change in the waste treatment systems described in the FES.

Radioactive Material Released to the Atmosphere

The storage of additional spent fuel assemblies in the SFP is not expected to affect the releases of radioactive gases from the SFP. Gaseous fission products such as Krypton-85 and Iodine-131 are produced by the fuel in the core during reactor operation. A small percentage of these fission gases is released to the reactor coolant from the small number of fuel assemblies that are expected to develop leaks during reactor operation. During refueling operations, some of these fission products enter the SFP and are subsequently released into the air. Since the frequency of refuelings (and therefore the number of freshly offloaded spent fuel assemblies stored in the SFP at any one time) will not increase, there will be no increase in the amounts of these types of fission products released to the atmosphere as a result of the increased SFP fuel storage capacity.

The increased heat load on the SFP from the storage of additional spent fuel assemblies could potentially result in an increase in the SFP evaporation rate, which may result in a slight increase in the amount of gaseous tritium released from the pool. However, the overall release of radioactive gases from Callaway Plant, Unit 1 will remain a small fraction of the limits of 10 CFR 20.1301.

Solid Radioactive Wastes

Spent resins, which are generated by the processing of SFP water through the SFP purification system, are changed about once a year at Callaway Plant, Unit 1. These spent resins are disposed of as solid radioactive waste. The water turbulence caused by the SFP reracking may result in some resuspension of particulate matter in the SFP. This could result in a temporary increase in the resin changeout frequency of the SFP purification system during the SFP reracking operation. The licensee will use a Tri-Nuke underwater filtration unit to clean the floor of the SFP following removal of the old SFP rack modules. Vacuuming of the SFP floor will remove any extraneous debris and crud and ensure visual clarity in the SFP (to facilitate diving operations). Debris and crud will be filtered and stored underwater in special handling

baskets purchased for this operation. Additional solid radwaste will consist of the old SFP rack modules themselves as well as any interferences or SFP hardware that may have to be removed from the SFP to permit installation of the new SFP rack modules. Other than the radwaste generated during the actual reracking operation, the staff does not expect that the additional fuel storage made possible by the increased SFP storage capacity will result in a significant change in the generation of solid radwaste at Callaway Plant, Unit 1.

Liquid Radioactive Waste

The release of radioactive liquids will not be affected directly as a result of the SFP modifications. The SFP ion exchanger resins remove soluble radioactive materials from the SFP water. When the resins are changed out, the small amount of resin sludge water that is released is processed by the radwaste system. As stated above, the frequency of resin changeout may increase slightly during the installation of the new racks. However, the amount of liquid radioactivity released to the environment as a result of the proposed SFP expansion is expected to be negligible.

Occupational Doses

Radiation protection personnel will constantly monitor the doses to the workers during the SFP expansion operation. If it becomes necessary to utilize divers for the SFP reracking operation, the licensee will equip each diver with electronic dosimeters with remote, above surface, readouts, which will be continuously monitored by Health Physics personnel. The total occupational dose to plant workers as a result of the SFP expansion operation is estimated to be between 6 and 12 person-rem. This dose estimate is comparable to doses for similar SFP modifications performed at other plants. The upcoming SFP rack installation will follow detailed procedures prepared with full consideration of as low as is reasonably achievable (ALARA) principles.

On the basis of the review of the licensee proposal, the staff concludes that the Callaway Plant, Unit 1 SFP rack installation can be performed in a manner that will ensure that doses to workers will be maintained ALARA. The estimated dose of 6 to 12 person-rem to perform the proposed SFP rack installation is a small fraction of the annual collective dose accrued at Callaway Plant, Unit 1.

Accident Considerations

In its application, the licensee evaluated the possible consequences of a fuel handling accident to determine the thyroid and whole-body doses at the exclusion area boundary (EAB), low population zone (LPZ), and control room. The proposed SFP rack installation at the Callaway Plant, Unit 1 will not affect any of the assumptions or inputs used in evaluating the dose consequences of a fuel handling accident and therefore will not result in an increase in the doses from a postulated fuel handling accident.

The Commission has completed its evaluation of the proposed action and concludes that the proposed action will not increase the probability or consequences of accidents, no changes are being made in the amount or 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 non-radiological impacts, the proposed action does not involve any historical sites. It does not affect non-radiological plant effluents and has no other environmental impact. Therefore, there are no significant non-radiological environmental impacts associated with the proposed action.

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

Alternatives to the Proposed Action

Shipment of Fuel to a Permanent Federal Fuel Storage/Disposal Facility

Shipment of spent fuel to a high-level radioactive storage facility is an alternative to increasing the onsite spent fuel storage capacity. However, the U.S. Department of Energy's (DOE's) high-level radioactive waste repository is not expected to begin receiving spent fuel until approximately 2010, at the earliest. In October 1996, the Administration did commit DOE to begin storing wastes at a centralized location by January 31, 1998. However, no location has been identified and an interim federal storage facility has yet to be identified in advance of a decision on a permanent repository. Therefore, shipping spent fuel to the DOE repository is not considered an alternative to increased onsite spent fuel storage capacity at this time.

Shipment of Fuel to a Reprocessing Facility

Reprocessing of spent fuel from Callaway Plant, Unit 1 is not a viable alternative since there are no operating commercial reprocessing facilities in the United States. Therefore, spent fuel would have to be shipped to an overseas facility for reprocessing. However, this approach has never been used and it would require approval by the Department of State as well as other entities. Additionally, the cost of spent fuel reprocessing is not offset by the salvage value of the residual uranium; reprocessing represents an added cost. The shipment of spent fuel to a reprocessing facility is not an acceptable alternative because of increased fuel handling risks and additional occupational exposure.

Shipment of Fuel to Another Utility or Site for Storage

The shipment of fuel to another utility for storage would provide short-term relief from the storage problem at Callaway Plant, Unit 1. The Nuclear Waste Policy Act and 10 CFR Part 53, however, clearly place the responsibility for the interim storage of spent fuel with each owner or operator of a nuclear plant. The shipment of fuel to another source is not an acceptable alternative because of increased fuel handling risks and additional occupational radiation exposure, as well as the fact that no additional storage capacity would be created.

Reduction of Spent Fuel Generation

Operation at a reduced power level would decrease the amount of fuel being stored in the pool and thus increase the amount of time before full core off-load capacity is lost. However, operating the plant at a reduced power level would not make effective use of available resources, and would cause unnecessary economic hardship on Union Electric Company and its customers. Therefore, reducing the amount of spent fuel generated by reducing power is not considered a practical alternative.

Development of Onsite Storage Facility

An independent spent fuel storage installation (ISFSI) is licensed under 10 CFR Part 72. It is a passive storage system which stores spent fuel in dry casks on a concrete platform in a secured area. There are no commercial ISFSIs operating in the United States. Although use of an ISFSI provides benefits, the site-specific development of an independent dry fuel storage facility at Callaway Plant, Unit 1 was deemed undesirable by the licensee compared to the use of the higher

density spent fuel racks. Furthermore, construction of such a facility would not use the existing expansion capacity of the existing Callaway Plant, Unit 1 SFP and would have the potential to cause additional and different environmental impacts due to activities related to construction and operation. Development of a site-specific ISFSI at this time and in response to the licensee's current needs would waste available resources.

The staff also considered denial of the proposed action (no-action alternative). Denial of the application would result in no change in current environmental impacts.

Alternative Use of Resources

This action does not involve the use of any resources not previously considered in the Final Environmental Statement for the Callaway Plant, Unit 1 dated January 1982.

Agencies and Persons Consulted

In accordance with its stated policy, on January 11, 1999, the staff consulted with the Missouri State official, Mr. Tom Lange of the Missouri Department of Natural Resources, 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 February 24, 1998, as supplemented by letters dated May 27, 1998, June 25, 1998, August 25, 1998, September 3, 1998, November 3, 1998, and December 4, 1998, which are available for public inspection at the Commission's Public Document Room, The Gelman Building, 2120 L Street, NW., Washington, DC, and at the local public document room located at the University of Missouri—Columbia, Elmer Ellis Library, Columbia, Missouri, 65201-5149.

Dated at Rockville, Maryland, this 11th day of January 1999.

For the Nuclear Regulatory Commission.

Mel Gray,

Project Manager, Project Directorate IV-2, Division of Reactor Projects—III/IV, Office of Nuclear Reactor Regulation.

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