

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

ENVIRONMENTAL IMPACT APPRAISAL BY THE DIVISION OF REACTOR LICENSING

SUPPORTING AMENDMENT NO. 14 TO LICENSE NO. DPR-55

CHANGE NO. 14 TO THE TECHNICAL SPECIFICATIONS

DUKE POWER COMPANY

OCONEE NUCLEAR STATION UNIT 3

ENVIRONMENTAL IMPACT APPRAISAL

1. Description of Proposed Action

By letter dated September 12, 1975, Duke Power Company (the licensee) proposed to change the spent fuel storage design for the Oconee Nuclear Station Unit 3 from that which was described in the FSAR and approved in the operating license review. The purpose of the change is to enlarge the spent fuel facility storage capacity from 216 to 474 fuel assemblies.

During the earlier reviews (construction permit and operating license stages), the environmental aspects of the operation of this spent fuel storage pool was included in the staff's overall assessment of the plant's components. No specific environmental impact was attributed to the storage pool although when filled with spent fuel, it would be a minor contributor ( $27.3 \times 10^6$  BTU/hr) to the overall heat load (in excess of  $5,000 \times 10^6$  BTU/hr) discharged from the plant into Lake Keowee during normal operation and also to the total radioactive waste generated by the plant.

The change proposed by the licensee involves the replacement of the existing spent fuel storage racks which have a capacity of 216 assemblies, with the Combustion Engineering, Incorporated, supplied high capacity fuel assembly racks. The new racks will have a maximum capacity of 474 fuel assemblies with a reduced center-to-center spacing. The new racks will not require changing the basic structural geometry of the spent fuel storage pool.

Currently, spent fuel is not being reprocessed on a commercial basis in the United States. The Nuclear Fuel Services (NFS) plant in New York was shut down in 1972 for alterations and expansion. The Allied General Nuclear Services (AGNS) proposed plant is under construction in South Carolina and this facility is not licensed to operate. The General Electric Company's (GE) Midwest Fuel Recovery Plant in Illinois is in a decommissioned condition.

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Although no plants are licensed for reprocessing fuel, the GE and NFS facilities are licensed for storing spent fuel and applications have been filed for permission to expand these facilities. Also, AGNS has applied for a license to receive and store irradiated fuel assemblies prior to a decision on the licensing action relating to the separations facility. Construction of the AGNS receiving and storage station itself is complete.

The Commission's staff projects that by the end of calendar year 1975, the GE storage facility will have no unfilled storage capacity and the NFS facility will have space available for 85 metric tons of uranium. If its pending license application is approved, the AGNS facility could have licensed storage space for 400 metric tons of uranium in early 1976.

The expansion of the licensee's storage pool by 258 assembly spaces would permit additional storage of as much as 135 tons of uranium oxide. If no corrective action is taken, the present capacity for storing spent fuel at the Oconee Nuclear Station would be filled in mid 1978. The earliest that spent fuel reprocessing could begin on a commercial basis, if authorized, would be late 1976. Even if limited reprocessing should begin at that time there would still be a shortage of spent fuel storage capacity by 1978. By increasing the capacity as proposed, the spent fuel storage racks will not be filled until late 1979.

## 2. Analysis of Potential Environmental Impacts of Proposed Action

Using the same guidelines as those employed during its earlier environmental reviews, we have assessed the potential impacts, both radiological and nonradiological, that might result from the construction and operations of an expanded spent fuel facility.

We cannot identify any potential effect on the environs outside of the building that houses the spent fuel storage pool that will result from the proposed construction work. Within this building, the impacts are expected to be limited to those normally associated with metal working activities.

Similarly, we cannot identify any adverse problems that will occur onsite and in the surrounding environs when the licensee increases the number of fuel assemblies in the pool above 216. Although the closed cycle cooling water system will not be modified, the licensee and we believe that the heat load ( $27.3 \times 10^6$  BTU/hr) resulting from the increase in storage capacity can be dissipated without the bulk fluid temperature exceeding the 150°F design limit of the original design. This additional heat load is approximately 0.5 percent of the total heat discharged from the plant and is not considered significant.

During storage of spent fuel under water, radioactive wastes are released through both liquid and gaseous pathways. Small amounts of fission and activation products such as isotopes of cesium and cobalt are released from the surfaces of the assemblies and are dispersed in solution or as particulates in the borated cooling water. The licensee employs a continuous water purification system to remove these liquid wastes through filtration or demineralization, thereby maintaining the quality of the water at a high level and the radiation background at a minimum.

An increase in the number of spent fuel assemblies in the pool will increase the amount of long-lived radionuclides, primarily cesium-134 and cesium-137 transferred to the cooling water. Therefore, the principal results will be more rapid depletion of filters and demineralizers resulting in more frequent replacement of these purification components, thereby leading to a minimal increase in the amount of solid radioactive waste generated by the plant.

Based on the spent fuel pool source terms and other facility spent fuel pool dose rate calculations and measurements using respective source terms, normally greater than those calculated for Ocone, we have calculated dose equivalent rates of approximately 1.5 mrem/hr at three feet above the fuel pool surface. Using 1.5 mrem/hr, a conservative estimate, and the 240 man-hrs occupancy factor, our calculation of maximum dose during normal fuel pool operations is 0.360 man-rem/refueling.

The licensee has supplied current information related to the probable transfer of 150 spent fuel assemblies from Unit 1 and 2 spent fuel pool to Unit 3 spent fuel pool. The transfer of 150 elements would be the maximum number to occur over the life of the plant. The dose rate for the transfer of 150 assemblies is calculated to be approximately 15 man-rem..

Radioactive gases may be released from the spent fuel directly into the atmosphere of the fuel building. Under normal conditions, this atmosphere is exhausted with the ventilation air without treatment unless radiation measurements exceed a predetermined value. We have calculated that gaseous waste, principally krypton-85, will increase by 289 Ci/yr for the additional two years gained by the increased storage, based on a 1/3 core reload every 13 months. Based on these calculations, we find that the proposed modification will have an insignificant effect on radioactive materials released from the site and is, therefore, acceptable.

3. Consideration of Environmental Factors

On September 16, 1975, the Commission announced (40 FR 42801) its intent to prepare a generic environmental impact statement on handling and storage of spent fuel from light water power reactors. In this notice, the Commission also announced its conclusion that it would not be in the public interest to defer licensing actions intended to ameliorate a possible shortage of spent fuel storage capacity pending completion of the generic environmental impact statement. In reaching this conclusion, the Commission indicated that five specific factors would be applied, weighed, and balanced within the context of the required environmental statement or appraisal in reaching individual licensing determinations. These five factors are discussed in this section.

- a. Does the licensing action here proposed have a utility that is independent of the utility of other licensing actions designed to ameliorate a possible shortage of spent fuel capacity?

The proposed licensing action is required solely to meet the needs of the Oconee Nuclear Units for spent fuel storage until such time as commercial storage is available. Based on conversations with the licensee there are no plans to store spent fuel from a source other than the Oconee units in the spent fuel racks at Oconee. Hence the present licensing action will have no effect on other licensing actions designed to ameliorate a possible shortage of spent fuel capacity.

- b. Does the taking of the action here proposed prior to the preparation of the generic statement constitute a commitment of resources that would tend to significantly foreclose the alternatives available with respect to any other licensing actions designed to ameliorate a possible shortage of spent fuel storage capacity?

It is not likely that the taking of the licensing action here proposed would constitute a commitment of resources that would tend to significantly foreclose the alternatives available with respect to any other individual licensing action designed to ameliorate a possible shortage of spent fuel storage capacity. The time frame under consideration is two years, the staff's estimate of the time necessary to complete the generic environmental statement. The action here proposed will not have any significant effect on whether similar actions are or should be taken at other nuclear reactors since it will not affect either the need for or availability of storage facilities at other nuclear reactors. Nor will the added capacity here significantly affect the need for the total additional storage space presently planned

at reprocessing facilities for which licensing actions are pending.

- c. Can the environmental impacts associated with the proposed action be adequately addressed within the context of the license application without overlooking any cumulative environmental impacts?

The licensee has presented the need for additional storage capacity solely on the basis of this station. Because the additional capacity is for this site alone and for this licensee only, all the environmental impacts can be assessed within the context of this application. As noted in paragraph 2 above, the environmental impacts of the proposed action are negligible, readily defined, and limited to the environs of the Oconee station. Accordingly, it is not likely that any significant cumulative environmental impacts have been overlooked.

- d. Have all technical issues which have arisen during the review of this application been resolved within that context?

The accompanying Safety Evaluation Report addresses the technical review of the proposed fuel pool expansion. All issues which arose during the course of this review were totally resolved within the context of the application.

- e. Would a deferral or severe restriction on this licensing action result in substantial harm to the public interest?

If the proposed expansion is not authorized, and assuming no off-site storage is available, which appears likely, the present Oconee Station spent fuel storage capacity will be filled by mid-1978. Over the ensuing year all three units would be required to shutdown.

If the proposed action is deferred such that it cannot be completed prior to September 1976 (the time for refueling of Unit 3), subsequent power operation of Unit 3 will be correspondingly delayed because the refueling of Unit 3 cannot proceed until the pool is refilled with water after completion of the modifications.

If the initiation of the proposed action is deferred until after the next Unit 3 refueling (September 1976) it would be necessary to transfer Unit 3 spent fuel to the Units 1 and 2 storage pool in order to accomplish the construction work. This is undesirable because the extra fuel handling involved would cause increased radiation exposure to personnel and added costs to the licensee. In addition, the racks in the Unit 3 pool would require decontamination following the Unit 3 refueling and prior to commencing the proposed modifications. This would involve additional exposure and costs. Finally, the time required to complete the construction work is such that Unit 2 would be unable to unload fuel at its scheduled refueling outage in 1977 and subsequent operation of that unit would be delayed.

The alternative of storing spent fuel in the storage pool of another nuclear reactor also compares poorly with the proposed action. The licensee would be using storage space which the receiving reactor might need later. The handling and transporting necessary to move fuel to another reactor facility could be avoided if additional storage at reprocessing facilities were licensed during the additional storage period at Oconee Nuclear Station.

The licensee does not anticipate that storage space will be available commercially for the receipt of spent fuel from the Oconee Nuclear Station before the existing storage capacity is filled. The licensee has no contract which would guarantee a sufficient portion of the minimal amount of commercial storage capacity expected to exist, even if spent fuel reprocessing is commenced in late 1976.

In view of the above, a deferral or severe restriction on this licensing action would not allow its completion in the future without forcing a shutdown of one or more of the Oconee Units. This would adversely affect the ability of Duke Power Company to meet electrical energy needs and possibly force the operation of less economic plants or which have greater environmental impact, thus adversely affecting the public interest.

#### 4. Summary

The Oconee Station spent fuel pools could be filled by mid-1978. The proposed action is intended to ameliorate this possible shortage. A review of the five factors identified in the Commission's announcement of September 10, 1975, has revealed that the factual circumstances of the proposed licensing action are consistent with the Commission's general conclusions with respect to those factors. The environmental impacts of the proposed action are negligible and the action would not foreclose any of the alternatives being considered in the generic environmental impact statement being prepared by the Commission. Prompt approval of the proposed action is required to avoid unnecessary down time of one or more of the Oconee units.

#### 5. Conclusion and Basis for Negative Declaration

Having applied, weighed, and balanced the five specific factors required by the Nuclear Regulatory Commission (40 FR 42801), the staff finds that any environmental consequences that might reasonably be associated with the proposed action would result in no significant change in the environmental impact as analyzed and set forth in the Final Environmental Statement, issued March 1972, concerning operation of the Oconee Nuclear Station, Units 1, 2, and 3. The Commission has concluded that no environmental impact statement for the proposed action need be prepared and that, pursuant to 10 CFR 51.5(c), a negative declaration to this effect is appropriate.

Date: December 22, 1975