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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 48 TO FACILITY OPERATING LICENSE NO. DPR-50

METROPOLITAN EDISON COMPANY
JERSEY CENTRAL POWER AND LIGHT COMPANY
PENNSYLVANIA ELECTRIC COMPANY

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-289

Introduction

By letter dated December 26, 1978, as supplemented and revised by letter dated January 11, 1979, Metropolitan Edison Company (Met Ed) requested an amendment of the facility Technical Specifications (TS) for Three Mile Island Nuclear Station, Unit No. 1 (TMI-1) which would permit removal to storage of the steel gate presently separating spent fuel storage pools A and B.

Background

TMI-1 TS 3.11.6 sets forth certain restrictions on handling loads weighing in excess of 3,000 pounds in the vicinity of stored spent fuel. The purpose of these restrictions is to provide assurance that the consequences of dropping an object upon stored spent fuel will not significantly exceed the consequences previously calculated and found acceptable for the fuel handling accident (which assumes dropping of a single fuel assembly weighing approximately 3,000 pounds).

During past fuel handling operations, sporadic operation of an air motor used in underwater fuel handling has been observed. In order to provide more reliable operation during the refueling operations which are scheduled to begin in the very near future, Met Ed desires to overhaul this motor before such operations begin. To perform this overhaul, it will be necessary to transfer some of the spent fuel currently stored in Pool A (where the air motor is located) to Pool B. This is necessary to reduce the radiation levels in Pool A such that divers may retrieve the air motor for overhaul and subsequently reinstall it, without receiving excessive radiation exposure. Before such fuel transfer can be accomplished, however, it is necessary to remove the steel gate which presently separates Pools A and B so that fuel can be moved underwater through this opening from Pool A to Pool B.. Because the gate weighs in excess of 3,000 pounds (approximately 5,000 pounds) and because it must necessarily be handled in close proximity to a pool containing stored spent fuel, a conflict with Specification 3.11.6 arises.

Originally Met Ed requested a change in the facility specifications to permit unrestricted transfer of the above gate between its normal functional location and its storage location in Pool A. Following discussions with the NRC staff, this request was revised to limit the movement of the gate to transfer only from its functional location to its storage location with such movement to be completed prior to the refueling outage for Cycle 5. With this change, any future movement of the gate will require prior NRC review and approval.

Evaluation

In support of its request, Met Ed has submitted analyses of the radiological consequences of damaging all of the fuel elements in either spent fuel pool. The basic assumptions used in the analyses followed the applicable guidance contained in Safety Guide 25, "Assumptions Used in Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors." In addition, assumptions specific to the present analysis included: (1) a conservative meteorological dispersion factor (X/Q) appropriate to this site = 8.2×10^{-4} sec/m^3; (2) the damaged fuel elements in Pool A consisted of 60 elements with at least 28 days of radioactive decay and 196 elements with at least 180 days of radioactive decay; and (3) the damaged fuel elements in Pool B consisted of 60 elements with at least 28 days of radioactive decay and 436 elements with at least 180 days of radioactive decay. The staff finds that the above assumptions used in this analysis are acceptable.

The results of these analyses indicate that even with the very conservative assumption of receipt of damage by all elements in a pool, the thyroid dose at the exclusion boundary would not exceed 229 rem and the whole body gamma dose at the same location would not exceed 1.03 rem. This assumption is very conservative because the gate, if it were to fall, could only cover and thus damage, about 45 elements in Pool A or(because of a different storage pitch) about 96 elements in Pool B. Thus, far less than all of the elements could be damaged by dropping the gate. Because the predominant portion of the calculated dose is due to damage to the 60 elements with as little as 28 days decay, however, the actual dose could vary widely within this limit depending upon how many of these elements were actually damaged.

In the present situation, however, the analyses are even more conservative because at the time the proposed transfer would take place, there will only be 156 total elements in the spent fuel pool and none of these will have less than 180 days decay. As a result, the maximum radiation dose at the exclusion area boundary resulting from dropping

of the gate would be less than 2 mrem to the thyroid and less than 202 mrem whole body gamma. These values clearly are well within the limits established by 10 CFR 20 and 10 CFR 100 for unrestricted areas. Because the above fuel element inventory and decay conditions will apply at the time of the proposed transfer, we have modified Met Ed's proposed Technical Specifications to reflect these conditions. These changes have been discussed with and agreed to by Met Ed.

Although the analyses presented by Met Ed indicate that dropping of the spent fuel pool gate would not cause excessive radiation exposures in unrestricted areas, Met Ed, following discussions with the NRC staff, has also proposed to implement measures which would provide greater assurance that the gate would not be dropped. These include:

(1) Provision of stronger lifting brackets on the gate. Each of these redundant brackets is designed to singly support three times the static plus dynamic load of the gate.

(2) Each branch of the lifting rigging between each attachment bracket and crane main hook will be designed to the same load capacity noted above with an allowance for nonvertical alignment.

(3) Nonredundant elements of the load path will be designed to support greater than six times the static plus dynamic load of the gate. The principal element in this load path is the spent fuel cask handling crane. This crane has a capacity of 110 tons which is well in excess of the above design criteria.

(4) Permission is requested at this time only for the single operation of transfer of the spent fuel pool gate from its functional location to its storage location. Any subsequent movement will be the subject of a separate review and approval action based on the conditions applicable at that time.

Based on the above, we conclude that amendment of the facility Technical Specifications as requested by Met Ed, with revisions suggested by the NRC staff and agreed to by representatives of Met Ed, will not significantly increase the probability of incurring fuel damage and that even if such damage should occur, the maximum dose in unrestricted areas would be within acceptable limits. Accordingly, we conclude that the proposed change will not significantly affect the health and safety of the public and is therefore acceptable.

Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: January 18, 1979