Carl L. Newman
Vice President

Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, N. Y. 10003
Telephone (212) 460-5133

RECEIVED
AUG 23 1975

RECEIVED COPY

50-247

August 19, 1975

DOCKETED
USNRC
AUG 23 1975
U.S. NUCLEAR REGULATORY COMMISSION
Mail Section

Mr. George W. Knighton, Chief
Environmental Projects Branch No. 1
Division of Reactor Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Knighton

The enclosed responses are to provide the additional information you requested on August 8, 1975 regarding the proposed modification to the Indian Point Unit No. 2 spent fuel pool.

Should you require any further information to facilitate your review of the planned modification, please do not hesitate to contact us.

Very truly yours

Carl L. Newman

Carl L. Newman
Vice President

enc.
mk

8074

8111160023 750819
PDR ADOCK 05000247
P PDR

Question 2

What is the total construction cost associated with this expansion.

Response

It is estimated that this expansion will cost $1.7 million.

Question 3

What are the alternatives to increasing the capacity of the spent fuel pool? Include costs of alternatives considered.

Response

Two possible alternatives to increasing the capacity of the Indian Point Unit No. 2 spent fuel pool were considered for cost comparison; however, it is not certain that these alternatives would be available to Con Edison:

(1) Ship spent fuel to and store at an independent storage facility, and

(2) Ship spent fuel to and store at a reprocessor's storage facility

The alternatives are summarized below. To put them in perspective, the following table contains their estimated costs, along with the estimated cost of increasing the capacity of the IP2 spent fuel pool, in terms of a cost per kilogram of fuel storage provided, i.e., $/KgU.

Alternative	Cost, $/KgU
Increase Capacity of IP2 Spent Fuel Pool	21
Ship Spent Fuel to and Store at a Commercial Storage Facility	
1. Independent Storage Facility (15-Year Commitment).	75
2. Reprocessor's Storage Facility (10-Year Commitment).	90

As the table indicates, increasing the spent fuel storage capacity of the IP2 spent fuel pool is less costly than any of the other storage arrangements considered.
The cost of storing spent fuel at a commercial storage facility is much higher because of the cost of constructing entirely new storage facilities compared with the cost of installing new racks in the existing Indian Point Unit No. 2 spent fuel storage pool.

It is important to note that the above numbers do not include the cost of transporting spent fuel to off-site storage facilities. Generally accepted figures for the cost of shipping spent fuel from a nuclear power plant to an off-site storage facility are in excess of $10/KgU.

Question 4

What is the additional time period that fuel assemblies may be stored in the spent fuel pool as a result of the planned expansion?

Response

In general, spent fuel will be stored until it is scheduled to be shipped for reprocessing. Since reprocessing is not expected to be available to Con Edison until 1980, at the earliest, all spent fuel discharged until then will be stored in the spent fuel pool, with or without the planned expansion. Therefore, the planned expansion is not expected to result in an increase in the storage time of individual spent fuel assemblies.

Question 5

What is the design basis for the maximum spent fuel pool water temperature without the increase in capacity.

Response

The design bases of the auxiliary coolant system include a maximum spent fuel pool water temperature of 150°F, as indicated in Section 9.3.1 of the FSAR.

Question 6

Provide data regarding Krypton-85, Tritium and Iodine-131 measured from the fuel building ventilation system during the second half of 1973, 1974, and the first half of 1975. If data are not available from the ventilation system, provide this data as measured for the overall plant.

Response

Data are not available for the fuel building alone* therefore, data are provided in the table below for all of Indian Point Unit No. 2:

Period	Noble Gases** (Curies)	Tritium (Curies)	I-131 (Curies)
July-Dec. 1973	15	2.00	2.35×10^{-4}
Jan-June 1974	585	3.11	2.04×10^{-2}
July-Dec. 1974	455	17.6	8.54×10^{-2}
Jan-June 1975	3758	13.5	23.0×10^{-2}

* No spent fuel has ever been stored in the fuel storage building. The first refueling is scheduled for the Spring of 1976.

** Continuous isotopic identification of these gases has not been performed. However, in all analyses performed, Krypton-85 has been typically 0.1% of the noble gases.

Additional Information Regarding Spent Fuel Pool Expansion
Requested by NRC Letter Dated August 8, 1975
Indian Point Unit No. 2

Question 1

What are the specific needs relative to Indian Point Unit No. 2 operation and reliability that require an expansion of the spent fuel capacity?

Response

At present, the Indian Point Unit No. 2 spent fuel storage pool has a storage capacity of 264 fuel assemblies, or slightly more than four regions. The planned modification will increase the capacity to 482 assemblies (about seven regions). However, it is prudent engineering practice to always reserve storage space to receive an entire reactor core (three regions) should this be necessary for any reason. It is expected that spent fuel reprocessing facilities will not be available to Con Edison, and no spent fuel will be shipped off-site, until 1980, at the earliest. Thus, after the second refueling, scheduled for September 1977, it would not be possible to discharge the entire reactor core into the present storage racks, and the plant would not be able to continue power operation if a situation were to develop requiring a full-core discharge. The planned expansion of fuel storage capacity, on the other hand, will assure full-core discharge capability until late 1981.

With the present fuel storage capacity, and the present estimated refueling schedule, Indian Point Unit No. 2 would not have sufficient spent fuel storage space to discharge another region of spent fuel and continue operation after the Fall of 1981.

Question 7

What is the radionuclide concentration (μCi/cc) in the spent fuel pool as a result of this expansion? Also provide details regarding the models and calculations used to compute the dose rate above the pool surface and address the annual expected man-rem exposure based on all operations to be performed by personnel in the pool area.

Response

Radionuclide concentrations in the spent fuel pool were computed assuming normal reactor coolant activity (corresponding to 0.20% failed fuel), based on information contained in Table 9.2.5 of the Indian Point Unit No. 3 FSAR. Computations assumed normal cleanup of the primary water prior to refueling, uniform mixture of refueling water and reactor coolant, and that refueling operations begin ninety hours after shutdown. These concentrations are not expected to change significantly as a result of the proposed expansion.

Expected doses resulting from fuel-handling operations were computed using these radionuclide concentrations and treating the fuel pool as a uniformly distributed gamma-ray source. Such a model provides conservative estimates of dose rates above the fuel-handling pool. Dose rates at the surface of the pool have been computed to be a maximum of 3.0 mR/hr. using the above assumptions. It is expected that 3 to 6 man shifts per day would be required in the fuel storage building during normal fuel-handling operations. Thus, the maximum integrated exposure received by personnel during the expected three-week refueling period would be 1.5 to 3.0 Rem.

Most of the man-rem exposure would be received during refueling operations, therefore, the calculated exposures would be approximately equal to the annual exposures during years when refueling is performed, with total exposures much lower in other years.