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February 10, 1997

Docket No. 50-336
B16221

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Millstone Unit No. 2
Response to Request For Additional Information
Regarding Moving a Spent Fuel Assembly
And Its Associated Lifting And Handling Components

The purpose of this letter is for Northeast Nuclear Energy Company (NNECO) to provide additional information regarding the Technical Specification restrictions on load movement over spent fuel assemblies and the design basis for load drops and activity releases in the Spent Fuel Pool (SFP) as requested by the Staff in the letter of January 9, 1997.[1] Specifically, the letter requests that 1) NNECO explain any inconsistencies between the Technical Specification requirements and the Final Safety Analysis Report (FSAR) for load movement over the Spent Fuel Pool, and, 2), that NNECO verify that possible impact loads in the Spent Fuel Pool are within the boundaries of the accident analysis.

I. The Millstone Unit No. 2 Technical Specifications provide the following requirements with respect to load movements over irradiated fuel:

A. LCO 3.9.7 states:

"Loads in excess of 1800 pounds, with the exception of the consolidated fuel storage box, shall be prohibited from travel over irradiated fuel assemblies in the storage pool."

B. Technical Specification Bases section 3/4.9.7 provides the following basis for this load limitation:

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1 Phillip F. McKee to B. D. Kenyon, "Request for Additional Regarding Moving a Spent Fuel Assembly And Its Associated Lifting And Handling Components," dated January 9, 1997.

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"The restriction on movement of loads in excess of the nominal weight of a fuel assembly and CEA over irradiated fuel assemblies ensures that no more than the contents of one fuel assembly will be ruptured in the event of a fuel handling accident. Specific analysis has been performed for the drop of a consolidated fuel storage box on an intact fuel assembly. This assumption is consistent with the activity release assumed in the accident analysis."

The drop of the consolidated fuel storage box was added to the load drop analyses in the letter of May 21, 1986,[2] which requested a change to the Millstone Unit No. 2 Technical Specifications. This change was approved by the Staff in the letter of June 2, 1987,[3] which transmitted Amendment No. 117 to the Millstone Unit No. 2 Technical Specifications.

II. The Millstone Unit No. 2 Final Safety Analysis Report (FSAR) contains the following analyses for load movements and drops in the Spent Fuel Pool area:

A. Section 9.8.2.1.2.c

- Dropping of a Spent Fuel Pool Bulkhead Gate

  The Spent Fuel Pool Bulkhead Gates are normally stored near the transfer slots where they will be used in the event that a draindown of either the fuel transfer canal or the cask laydown area becomes necessary. Each gate is essentially a 26 foot long, three and one-half foot wide, one inch thick flat plate weighing approximately 4000 pounds. When a gate is moved from its storage position to a transfer slot, it does not pass directly over spent fuel stored in the pool. During movement, the bottom of the gate is approximately six inches above the top of the fuel racks. In the event that a gate was dropped during a move, some damage to the top of the fuel racks is predicted in the impact area but no fuel damage will occur.

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2 Letter from J. F. Opeka to Ashok C. Thadani, "Millstone Nuclear Power Station, Unit No. 2, Proposed Change to Technical Specifications, Storage of Consolidated Fuel," dated May 21, 1986.

3 Letter from David H. Jaffe to Edward J. Mroczka, "Amendment No. 117 to Facility Operating License No. DPR-65 for Millstone Nuclear Power Station, Unit No. 2," dated June 2, 1987.

- Dropping of a New Fuel Assembly

  If a new fuel assembly is dropped in the immediate vicinity of the new fuel elevator, it could fall into the spent fuel pool. The new assembly will not cause any major damage to the spent fuel racks.

- Dropping of a Fuel Handling Tool

  The fuel handling tool is approximately 25 feet long and three inches in diameter. It weighs approximately 270 pounds. Due to the shape of the tool, the pool water would offer no resistance during the fall. The tool weight and drop height are small enough, however, that no damage would occur to either the fuel racks or the fuel bundles even for a direct impact.

- Dropping of a Fuel Assembly During Fuel Movement

  The spent fuel pool racks have been designed to withstand the dropping of a fuel assembly, during fuel movement in the spent fuel pool, with no appreciable damage.

B. Section 9.8.2.2.2

The spent fuel storage racks are fabricated of 0.135 inch thick stainless steel. The racks are designed to withstand the dropping of a fuel assembly or a consolidated fuel storage box onto the top of the racks with no loss of design function.

C. Section 14.7.4.2

This section of the Millstone Unit No. 2 FSAR addresses the radiological consequences of a fuel handling accident. For the purpose of defining an upper limit on fuel damage as a result of a fuel handling accident, it is assumed that a fuel assembly or a consolidated fuel storage box is dropped. The fuel storage racks are designed to extend above the top of the fuel bundles. A dropped fuel assembly or consolidated fuel storage box can not strike more than one fuel assembly in the storage racks. The impact can only occur between the bottom end of the dropped component and the top end of the impacted component. The results of an analysis on the energy absorption capability of a fuel assembly indicate that a fuel assembly is capable of absorbing the kinetic energy of a fuel assembly or consolidated fuel storage box drop with no fuel rod failures.

The worst case analyzed fuel handling incident is the dropping of a fuel assembly to the spent fuel pool floor. The model used for this event indicates that one row (14) fuel pins would rupture.

D. Section 14.7.4.2.1

The event used in the FSAR as the worst case fuel handling accident in the spent fuel pool is the complete rupture of all pins (176) in one fuel bundle. The analysis for this event uses the assumptions contained in Regulatory Guide 1.25.

E. Section 9.8.4.2

This section of the FSAR discusses the historical usage of dummy fuel assemblies for equipment testing. These dummy fuel assemblies continue to be used for testing purpose at Millstone Unit No. 2.

"... the entire fuel handling system was tested using a dummy fuel element before the plant was put into operation."

"The new and spent fuel storage racks are tested with a dummy fuel assembly for ease of insertion and alignment each time a cavity is fabricated, and after a rack is assembled."

The approximate weight of the heaviest dummy fuel assembly is 1745 pounds.

F. Table 3.3-1

Table 3.3-1 of the Millstone Unit No. 2 FSAR lists the approximate weights for the following components:

-	Combustion Engineering Fuel Assembly	1280 pounds
-	Westinghouse Fuel Assembly	1280 pounds
-	Siemens Power Corp. Fuel Assembly	1313 pounds
-	Control Element Assembly (CEA)	80.4 pounds

G. Section 9.8.2.1.2

-	Spent Fuel Handling Tool	270 pounds

III. Operation within the Boundaries of the Fuel Handling Accident Analysis

It is concluded that Millstone Unit No. 2 is operating within the boundaries of the Fuel Handling Accident Analysis for incidents outside of containment, specifically, in the spent Fuel Pool area. This conclusion is based upon the following:

- The consolidated fuel storage box weighs approximately 2329 pounds. Analyses, described above, have been performed which show that a drop of this box onto irradiated fuel is bounded by the current Fuel Handling Accident Analysis. The weight of the consolidated fuel storage box is significantly greater than the Technical Specification load limit of 1800 pounds.

- The FSAR Fuel Handling Accident Analysis does not utilize fuel assembly, CEA, or fuel handling tool weights as input to the accident analysis. The FSAR analysis assumes the non-mechanistic failure of all of the fuel pins in one assembly as the bounding event in accordance with the recommendations of Regulatory Guide 1.25

IV. Consistency of the Technical Specification Requirements and the FSAR Analysis

The Technical Specifications restrict load movement in the Spent Fuel Pool to 1800 pounds for movements over irradiated fuel. The 1800 pound limit, according to the Technical Specifications Bases, is based on restricting the movement of loads in excess of the nominal weight of a fuel assembly and CEA over irradiated fuel. The weight of a fuel assembly and CEA, assuming a Siemens Power Corporation fuel bundle as the worst case, would be approximately 1393 pounds. The Technical Specification Bases also, in accordance with the FSAR analysis, sets the upper limit on load movement over irradiated fuel at the weight of the consolidated fuel storage box. The 1800 pound technical specification limit bounds the FSAR limit of the consolidated fuel storage box weight yet is high enough to allow movement of the dummy fuel assembly in the Spent Fuel Pool for testing of the fuel handling equipment.

Therefore, based on the above, NNECO concludes that there are no inconsistencies at Millstone Unit No. 2 of the type described in Reference 1 for Millstone Unit No. 3 and Seabrook Station.

There are no commitments contained in this submittal.

If you have any additional questions concerning this submittal, please contact Mr. Ravi G. Joshi at (860) 440-2080.

Very truly yours,
NORTHEAST NUCLEAR ENERGY COMPANY

M L Bowling

Martin L. Bowling
Millstone Unit 2 Recovery Officer

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