

**North
Atlantic**

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The Northeast Utilities System

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Docket No. 50-443
NYN-97021

United States Nuclear Regulatory Commission
Attn.: Document Control Desk
Washington, D.C. 20555

Seabrook Station
Response to Request for Additional Information
Spent Fuel Assembly Drop Analyses

North Atlantic Energy Service Corporation (North Atlantic) has enclosed the Seabrook Station response to the NRC Request for Additional Information (RAI)¹ letter dated January 9, 1997. The NRC RAI requested similar information for each of the Northeast Utilities nuclear units. The NU response for the other nuclear units will be provided under separate cover.

The NRC RAI as it pertained to Seabrook Station requested a basis and justification to support further NRC evaluation of apparent inconsistencies between the Technical Specifications and Updated Final Safety Analysis Report regarding (1) the weight of a spent fuel assembly and its associated handling and lifting components and, (2) the impact load for the design of the spent fuel pool storage racks. The enclosure to this letter addresses the apparent inconsistencies identified in the NRC RAI.

North Atlantic performed confirmatory calculations verifying that the drop of a load of 2100 pounds (the Technical Specification nominal value for the weight of a spent fuel assembly and handling tool, the actual value is 1976 pounds) on the spent fuel storage racks will not result in exceedence of specified margins with respect to rack configuration and fuel criticality. Seabrook Station spent fuel racks were designed to accommodate consolidated spent fuel and thus the racks are relatively stronger and more resistant to impact loads than conventional storage racks.

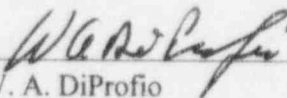
¹ NRC Letter dated January 9, 1997, "Request for Additional Information Regarding Moving a Spent Fuel Assembly and Its Associated Lifting and Handling Components" P.F. McKee to B. D. Kenyon.

ADD 1/1

Should you have any questions regarding this letter, please contact Mr. Anthony M. Callendrello, Licensing Manager at (603) 773-7751.

Very truly yours,

NORTH ATLANTIC ENERGY SERVICE CORP.



W. A. DiProfio
Station Director

cc: Hubert J. Miller, Region I Administrator
Mr. Albert W. De Agazio, Sr. Project Manager
Mr. John B. Macdonald, NRC Senior Resident Inspector

ENCLOSURE TO NYN-97021

SEABROOK STATION RESPONSE to
NRC REQUEST for ADDITIONAL INFORMATION
MOVEMENT of SPENT FUEL ASSEMBLIES and
ASSOCIATED LIFTING and HANDLING COMPONENTS

NRC Request for Additional Information dated January 13, 1997
(edited to address Seabrook Station questions only)

Section 3.9.7 of the Seabrook Station Technical Specifications (TS) states that loads in excess of 2100 pounds shall be prohibited from travel over fuel assemblies in the storage pool. The Bases for TS 3.9.7 state that the restriction on movement of loads in excess of the nominal weight of a fuel assembly and associated handling tool over the fuel assemblies in the storage pool ensures that in the event this load is dropped: (1) the activity release will be limited to that contained in a single fuel assembly, and (2) any possible distortion of fuel in the storage racks will not result in a critical array.

Section 9.1.4.3 of the Updated Final Safety Analysis Report (UFSAR) states that the spent fuel handling tool weighs approximately 400 pounds and the weight of one fuel assembly is 1600 pounds. Section 9.1.2.1 of the UFSAR states that the impact load for the design of the racks is based on a 17x17 fuel assembly, 8.426 inches square, 167 inches long, weighing 1616 pounds, and falling a distance of 18 inches to the racks at the worst possible orientation.

The TS seem to imply that the weight of one fuel assembly and its associated handling tool is 2100 pounds. However, the UFSAR seems to indicate that the weight of one fuel assembly and its associated handling tool is approximately 2000 pounds. Further, if the spent fuel storage rack design impact load is 1616 pounds as given in Section 9.1.2.1. of the UFSAR, this is significantly less than the previously mentioned TS limits.

In order to support further NRC evaluation of this apparent inconsistency and resulting potential safety concern, Northeast Utilities (NU) is requested to provide to the NRC its basis and justification for the previously described inconsistencies.

Seabrook Station Response to NRC RAI dated January 13, 1997

*The actual weights for a rodged spent fuel assembly and handling tool are as follows:
(Ref: Foreign Prints 55127 for the handling tool and 50597 for the fuel assembly)*

Spent fuel assembly (rodged):	1616 pounds
Handling Tool:	360 pounds

Total Weight assembly and handling tool: 1976 pounds

Sources of Apparent Inconsistencies:

Updated Final Safety Analysis Report (UFSAR):

UFSAR Section 9.1.4.3

UFSAR Section 9.1.4.3 states the following regarding the spent fuel handling tool:

"When the fingers are latched a pin is inserted into the operating handle which prevents inadvertent actuation. The tool weighs approximately 400 pounds and is tested at 125 percent of the weight of one fuel assembly (1600 pounds)."

This section of the UFSAR is specifying an "approximate" weight for the handling tool (actual weight is 360 pounds for handling tool). This section is apparently specifying an approximate weight for a fuel assembly (actual is 1616 pounds). To eliminate any apparent inconsistency this section will be revised to eliminate discussion of specific weights. The testing referred to in this section was performed by the supplier of the handling tool, Westinghouse Electric Corporation. Foreign Print 55127 for the handling tool specifies that a load test is performed at 2500 pounds and that "2500 lbs. Capacity" is inscribed on the tool.

UFSAR Section 9.1.2.1

UFSAR Section 9.1.2.1(g) states the following regarding the analysis of a dropped fuel assembly:

"the impact load for the design of the racks is based on a 17X17 fuel assembly, 8.426 inches square, 167 inches long, weighing 1616 pounds, and falling a distance of 18 inches to the racks at the worst possible orientation."

The design analysis impact load is based upon the Standard Review Plan 3.8.4, Appendix D, "Technical Position on Spent Fuel Pool Racks". North Atlantic committed to Standard Review Plan 3.8.4 Appendix D in response to NRC RAI 220.35 which was incorporated into the FSAR in Amendment 45, June 1982. SRP 3.8.4 Appendix D requires spent fuel storage racks be evaluated for the accidental drop of a fuel assembly. The handling tool is not included in the SRP guidelines for analysis of loads and load combinations. Spent fuel pool impact load analyses which assumed the weight of a rodged fuel assembly (1616 pounds) as the dropped load, complied with the guidelines of the SRP. The Seabrook Station Safety Evaluation Report Section 9.1.2 contains the following conclusion: "The racks can withstand the impact of a dropped fuel assembly without unacceptable damage to the fuel and can withstand the maximum uplift forces exerted by the fuel handling machine. Thus the requirements of GDC 61 and 62 and the guidelines of RG 1.13 concerning the protection of fuel from mechanical damage and prevention of criticality are met."

North Atlantic conducted additional confirmatory analyses to ensure that an assumed impact load of 2100 pounds, the nominal weight of a fuel assembly and handling tool as stated in Technical Specification 3/4.9.7, would not result in any unacceptable damage to the fuel. It would not be expected that the Seabrook Station spent fuel storage racks which were designed to accept consolidated spent fuel would be effected by a load drop of 2100 pounds. This confirmatory analysis conservatively neglected the effects of fuel assembly displacement in water which was considered in the original analysis. Calculation C-S-1-10069 demonstrated that the conclusions of the original design analysis were still valid, that is, the spent fuel storage racks remain within specified margins with respect to rack configuration and fuel criticality. UFSAR Section 9.1.2.1 will be updated to reflect that the impact load for the design of the racks is 2100 pounds. This UFSAR change will result in full analytical consistency between the UFSAR and Technical Specification 3/4.9.7.

BASES for Technical Specification 3/4.9.7

The BASES for Technical Specification 3/4.9.7 state the following:

"The restriction on movement of loads in excess of the *nominal* weight of a fuel and control rod assembly and associated handling tool over other fuel assemblies in the storage pool ensures that in the event that this load is dropped: (1) the activity release will be limited to that contained in a single fuel assembly and (2) any possible distortion of fuel in the storage racks will not result in a critical array. This assumption is consistent with the activity release assumed in the safety analysis."

It is clear that this Technical Specification pertains to the nominal weight of a rodde~~d~~ fuel assembly and handling tool. The nominal weight of a rodde~~d~~ spent fuel assembly and handling tool as specified in Technical Specification 3/4.9.7 is 2100 pounds. The Technical Specification nominal weight of 2100 pounds corresponds to the actual weight of 1976 pounds.