Niagara Mohawk

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October 13, 1998
NMP1L 1369

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

RE: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Subject: ***Supplemental Request for Additional Information Regarding Increased Spent Fuel Pool Storage Capacity at Nine Mile Point Nuclear Station Unit 1 (TAC No. MA1945)***

Gentlemen:

By letter dated May 15, 1998, Niagara Mohawk Power Corporation submitted an application to amend Nine Mile Point Unit 1 (NMP1) Technical Specification 5.5, Storage of Unirradiated and Spent Fuel. The changes reflect proposed modifications to increase the storage capacity of the NMP1 spent fuel pool from 2776 to 4086 fuel assemblies. The NRC's letter dated August 11, 1998 requested additional information regarding our application. Our submittal of September 25, 1998 provided our responses.

In your letter dated August 24, 1998, the NRC provided their second request for additional information. The attachment to this letter provides this information.

Sincerely,

Richard B. Abbott

Richard B. Abbott
Vice President Nuclear Engineering

RBA/JMT/sc

xc: Mr. H. J. Miller, NRC Regional Administrator Region I
Mr. S. S. Bajwa, Director, Project Directorate I-1, NRR
Mr. B. S. Norris, Senior Resident Inspector
Mr. D. S. Hood, Senior Project Manager, NRR
Mr. John P. Spath
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ATTACHMENT

SUPPLEMENTAL REQUEST FOR ADDITIONAL INFORMATION REGARDING SPENT FUEL POOL MODIFICATIONS NIAGARA MOHAWK POWER CORPORATION NINE MILE POINT NUCLEAR STATION UNIT 1 DOCKET NO. 50-220

PLANT SYSTEMS

Question 7:

On page X-30 of the Updated Safety Analysis Report (UFSAR) for Nine Mile Point Nuclear Station Unit 1 (NMP1), Niagara Mohawk Power Corporation (NMPC) stated that it "committed to the Nuclear Regulatory Commission (NRC), in Technical Specification Amendment 54, that refueling and core offload operations would not begin until it was determined that spent fuel pool (SFP) cooling systems were operable, to ensure that the 125 °F pool temperature would not be exceeded." In the May 15, 1998 submittal, 140 °F is used as the SFP temperature limit in the thermal-hydraulic analyses. Thus, it appears that the SFP temperature limit is being raised from 125 °F to 140 °F. If this is correct, please provide detailed evaluation of the effects of this elevated SFP temperature limit on the design and operation of the SFP cooling systems. This should include the affect upon operator reaction time before pool boiling would occur in the event of a loss of all mechanical cooling systems.

Response:

As indicated in Amendment No. 54 and our May 15, 1998 submittal, the NRC indicated acceptance of our existing thermal-hydraulic analysis based on the fact that with the maximum normal heat load assumed and one cooling train in operation, pool water is calculated to be 125°F which is below the 140°F limit recommended in Standard Review Plan (SRP) Section 9.1.3. Accordingly, the existing SFP temperature limit for this SRP case is 140°F. The analysis provided in Section 5, Attachment C of our May 15, 1998 submittal indicated how the proposed change meets the requirements of the SRP (i.e., 140°F). The SFP temperature limit of 140°F is well within the 170°F SFP cooling system design temperature as well as the design temperature of the pool structure and liner.

As stated in item (iv) on page 5-1 of the Licensing Report, the time available for operators to respond to a complete loss of cooling (time-to-boil) is evaluated. The methodology for these evaluations is presented in Section 5.5 (bottom of page 5-10 through page 5-11) with the results of the evaluations presented in Section 5.8 of the Licensing Report. Operators have in excess of 8.5 hours to respond to a complete loss of forced cooling even under the most restrictive scenario. Neither this evaluation nor the results need to be revised.

Question 8:

In the thermal-hydraulic analysis (Section 5.0 of Attachments C and F of your submittal) for the unplanned (abnormal) full-core offload scenario, HOLTEC, International assumed, in part, that 36 days after 148 spent fuel assemblies (SFAs) from the previous planned refueling were discharged to the SFP, a full core was transferred to the pool, beginning no sooner than 150 hours after reactor shutdown. Table 5.5-1 of the SFP Re-racking Licensing Report indicates that after each planned refueling, 200 SFAs would be left in the pool. Therefore, it appears that the thermal-hydraulic analysis for the unplanned full-core offload scenario should be revised using 200 SFAs as the previously discharged SFAs. If this is correct, provide the revised results (i.e., decay heat load, SFP peak temperature, etc.). If this is not correct, explain why you consider the use of 148 SFAs to be acceptable for the unplanned full-core scenario.

Response:

As stated in the fourth paragraph on page 5-4 of the Licensing Report, the unplanned full-core offload scenario does not represent an actual discharge scenario at NMP1. This scenario is included to demonstrate compliance with SRP 9.1.3, which stipulates that the SFP temperature under this scenario should not result in bulk pool boiling.

The full core discharge of 532 assemblies causes the SFP temperature to rise less than 35°F above the temperature at the start of the discharge. Given that the calculated margin against boiling is 77°F (Licensing Report Section 5.8), the addition of 52 assemblies to the previous discharge batch would not cause the SRP 9.1.3 limit (212°F boiling temperature) to be exceeded. Accordingly, the use of 148 SFAs is acceptable for the unplanned full-core scenario.

Question 9:

As indicated in the SFP Re-racking Licensing Report, the heat removal capability of the SFP cooling system heat exchangers is a function of the temperature of the reactor building closed loop cooling (RBCLC) water system. To maintain the SFP water below the temperature limit of 140°F, the reactor shutdown time required before any SFAs are discharged to the SFP varies with RBCLC water temperature. Specifically, the following reactor shutdown times required before discharging SFAs to prevent the SFP from exceeding the 140°F temperature limit during a planned full-core offload (normal refueling) operation have been established with RBCLC water at four temperatures:

RBCLC Water Temperature, °F	*SFAs in Reactor Decay Time Required, Hrs.*
40	*72*
60	*116*
80	*405*
95	*916*

Provide the following information:

a. *Has single active failure of the SFP cooling system been considered in establishing the above constraints?*

b. *HOLTEC, International recommends that the above constraints to fuel discharge operations be incorporated into appropriate plant procedures. What is NMPC's position regarding the establishment of procedures for these fuel discharge constraints?*

c. *What is NMPC's position and reasoning as to whether these restrictions should be included in the NMP1 TS?*

Response:

a. A single active failure is considered in the evaluation of Licensing Report Case 3, actual end-of-cycle refueling. This is stated in the third paragraph on page 5-5 and item (i) on page 5-6 of the Licensing Report in which we discuss one (versus two) fuel pool cooling trains operating (i.e., a single failure).

b. As stated in Section 5.4.v of the Licensing Report, since the maximum temperature of the RBCLC system depends on the lake temperature, coincident decay heat in the pool and other system heat loads, cycle specific evaluations shall be performed. These evaluations will ensure that with specific RBCLC temperatures and decay heat inventory in the pool, the required hold times shall be such that the bulk SFP temperature will be maintained at or below 140°F with one spent fuel pool cooling train operating. The requirement to perform these cycle-specific evaluations is in NMP1 administrative procedures. The appropriate NMP1 operating procedure will be revised prior to each refueling outage to reflect the appropriate fuel discharge constraints.

c. The subject restrictions need not be included in the NMP1 Technical Specifications (TS). As indicated in Response 9b, the constraints to fuel discharge operations will be incorporated into the appropriate plant procedures. Except for TS 5.0, Design Features, the NMP1 TSs are silent regarding the SFP. As indicated by its title, TS 5.0 is meant to convey important design information, not to provide operational guidance. Therefore, incorporating these constraints into plant procedures versus the NMP1 TSs is appropriate.

Question 10:

Discuss the procedures to be utilized by NMPC staff to monitor and control SFP water temperature and decay heat load so that these parameters will remain within the design basis limiting values for planned or unplanned full core offload events.

Response:

Refueling and core offloading procedures at NMP1 will be revised to ensure that the SFP bulk temperature is maintained at or below 140°F. The results from the cycle-specific analysis discussed in Question 9.b. will be used to determine the core off-loading start time and offload rate to ensure SFP bulk water temperature will be maintained at or below 140°F. The total number of offloaded SFAs in the pool at any specific time during the offload, SFA in-reactor decay times and RBCLC heat loads for a given full core offload will be placed into the appropriate refueling and core offloading procedures. The SFP high temperature alarm provides temperature indication for the operators to ensure that the temperature is maintained at or below 140°F.