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SUBJECT: Forwards response to NRC 981027 supplemental RAI re increased spent fuel pool storage capacity at facility.

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December 9, 1998
NMP1L 1389

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 letters dated August 11, 1998 and August 24, 1998 requested additional information regarding our application. Our submittals of September 25, 1998 and October 13, 1998 provided our responses.

In your letter dated October 27, 1998, the NRC provided their third request for additional information. The attachment to this letter provides this information.

Sincerely,

Richard B. Abbott

Richard B. Abbott
Vice President - Nuclear Engineering

210022

RBA/JMT/kap
Attachment

xc: Mr. H. J. Miller, NRC Regional Administrator Region I
Mr. S. S. Bajwa, Director, Project Directorate I-1, NRR
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A001

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

IV. RADIATION PROTECTION

Question 11:

In Section 9.3 of Attachment C to your application dated May 15, 1998, you state that radiation levels in zones surrounding the pool are not expected to be significantly affected by the proposed spent fuel pool (SFP) reracking. Please confirm that, and explain why, the increased number of fuel assemblies stored in the SFP and the closer vicinity of the replacement spent fuel racks to the SFP walls does not significantly affect dose rates in accessible areas adjacent to the SFP that may be below the refueling pool deck level or below the SFP itself. Describe any administrative controls used to preclude storing freshly offloaded fuel assemblies in cell locations adjacent to SFP walls.

Response

Calculations were performed to confirm that the radiation dose levels in the zones surrounding the SFP are not significantly affected by the closer approach of spent fuel to the pool wall and the higher density of spent fuel in storage. These calculations were made assuming spent fuel with cooling time of 24 hours and using the QAD code (a 2-dimensional point kernal gamma ray tracing code), giving the following dose rates:

Outside the concrete wall -	< 5 mr/hr maximum
Below the concrete floor of the pool -	0.8 mr/hr maximum

These values are not significantly higher than the dose rates currently expected in zones surrounding the pool, thereby confirming that there is sufficient water and concrete shielding to maintain a low external dose rate with the proposed racks. The dose rate external to the concrete wall of the pool is affected only by the closest three rows of stored fuel with the interior fuel being shielded by the intervening water and stored fuel. Accordingly, the majority of the stored fuel assemblies have no affect on dose rates.

Based on the above information, administrative controls are not required to preclude storing freshly offloaded fuel assemblies in cell locations adjacent to SFP walls.

Question 12:

What precautions (such as use of TV monitoring, tethers, etc.) will be used to ensure that divers will maintain a safe distance from spent fuel assemblies or any other high radiation sources in the SFP? How will you monitor the doses received by divers during the reracking operation (e.g., use of dosimetry, alarming dosimeters, remote readout radiation detectors)? Discuss any other procedures that you will use to ensure that doses to divers are minimized.

Response

The primary methods to ensure the diver's radiological safety involve the use of constant visual and verbal contact, physical or visual barriers, remote readout dosimetry, tethering system, pre-dive surveys and meetings, specific Radiation Protection dive procedure, specific Radiation Work Permit, and a formal Pre-Job ALARA Review.

Continuous monitoring of the divers will be accomplished through the use of underwater cameras that will permit remote monitoring by Radiation Protection personnel of the diver's location at all times. Continuous voice communication will be established between the diver and Radiation Protection personnel. During diving activities, verbal communication between the diver and Radiation Protection personnel will be accomplished through the use of "three-way communication." Loss of visual and/or verbal contact with the diver will result in immediate termination of the dive.

The use of barriers, either visual or physical, will be utilized to ensure a safe distance is maintained between spent fuel assemblies or any other high radiation sources in the SFP. Each dive will be evaluated individually to determine the most appropriate control for ensuring diver safety.

Whole-body and extremity dosimetry will be used on the divers with remote readout capabilities of selected areas that will provide real-time exposure data. Radiation Protection personnel will maintain continuous surveillance of dosimetry data. Loss of remote dosimetry readout capabilities or unexpected readings will result in immediate termination of the dive.

The safety line attached to the diver and manned at all times by the dive tender out of water, will be an additional means utilized to maintain positive diver control.

Radiological surveys of the work area will be conducted prior to each individual dive. Divers will be equipped with underwater survey instrumentation with remote readout capabilities that will allow subsequent dose rates to be obtained during the dive.

Pre-dive meetings will be conducted prior to each individual dive. Topics such as job scope, stay times, stop work authority, radiological requirements, travel paths, restrictions, and survey results will be addressed. Pertinent industry events related to SFP diving will be covered in detail.

SFP diving activities will be governed by a specific Radiation Protection procedure as well as a specific Radiation Work Permit and formal ALARA Review. These documents will detail the radiological requirements associated with SFP diving.

Question 13:

Your application for amendment dated May 15, 1998, does not include an analysis of the potential radiological consequences of a Fuel Handling Accident (FHA) in the reactor building, although such an analysis was provided in support of your application dated May 2, 1998, regarding changes to the initiation circuitry for the Control Room Air Treatment System. Please confirm that all the assumptions used in this previous FHA analysis in the reactor building remain applicable with respect to your May 15, 1998, application for amendment, or identify the revised assumptions. Similarly, confirm that the resulting postulated thyroid and whole body doses at the Exclusion Area Boundary, Low Population Zone, and within the control room as a result of an FHA remain valid, or provide revised doses.

Response:

The analysis provided in support of the May 2, 1998 application concluded that for the FHA, actuation of the Control Room Air Treatment System in the emergency mode is not required to maintain the control room doses within regulatory limits. The limiting FHA is an assembly dropped onto the reactor core, rather than in the spent fuel pool, due to the height of the drop. Section 7.2.1 of Attachment C to the May 15, 1998 application, addresses a dropped fuel assembly accident onto the new storage racks for both a Deep Drop Scenario and a Shallow Drop Scenario and concludes that the active fuel region of the fuel assembly in the impacted cell is not affected. Therefore, no fuel damage is postulated. Also, page 2 of Attachment D to the May 15, 1998 submittal concludes that the consequences of a FHA with the new storage racks are bounded by the existing Refueling Accident reported in UFSAR Section 15.c.3. Accordingly, the postulated thyroid and whole body doses at the Exclusion Area Boundary, Low Population Zone, and within the control room as a result of a FHA remain valid.