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SUBJECT: Forwards response to Questions 1,2,3,4,7,9,10,12 & 13,based on questions raised during NRC review of 830624 submittal on proposed spent fuel pool expansion.Response to remaining questions will be provided by 831118.

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[illegible] Station, [illegible]

[illegible] Niagara Mohawk Power Corp.

[illegible]

[illegible] submittal on [illegible] Spent Fuel Pool Expansion, response to remaining questions will be provided by [illegible].

[illegible]

NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

October 26, 1983

Director of Nuclear Reactor Regulation
Attention: Mr. Domenic B. Vassallo, Chief
Operating Reactors Branch No. 2
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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

Gentlemen:

During the review of Niagara Mohawk's June 24, 1983 submittal on the proposed Spent Fuel Pool expansion at Nine Mile Point Unit 1, the Auxiliary Systems Branch raised 19 questions. In order to expedite the review, our response will be in two parts. The first responds to questions 1, 2, 3, 4, 7, 9, 10, 12 and 13. The second, covering the remaining questions, will be provided by November 18, 1983.

Sincerely,

C. V. Mangan
Vice President
Nuclear Engineering and Licensing

CVM/JTL:djm
Attachment

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AUXILIARY SYSTEMS BRANCH
REQUEST FOR ADDITIONAL INFORMATION
NINE MILE POINT UNIT 1
SPENT FUEL POOL EXPANSION
DOCKET 50-220

NRC Question 1

With the aid of drawings, describe the flow path of pool water into those storage cells directly above the rack pedestal shown in Figure 3 and demonstrate that the flow rate is such that sufficient margin exists between the temperature of the water exiting at the top of the fuel cell and the corresponding saturation temperatures.

Response

As illustrated in Figure 1 attached, for storage cells located directly above the rack pedestals, cooling water will flow through (1) the four - 2.75 inch diameter flow holes (flow area = 23.76 square inches) in the pedestal side plates, (2) through the two - 4.0 inch diameter flow holes (flow area = 25.13 square inches) in the pedestal upper plate, and (3) into the fuel bundles through the two - 3.81 inch diameter flow holes (flow area = 22.80 square inches) in the bottom plate of the racks. For storage cells not located directly above the rack pedestals, the cooling water will flow into the fuel bundles through the two 3.81 inch diameter flow holes (flow area = 22.80 square inches) in the rack's bottom plates. Thus, the minimum flow area provided for cooling water flow to the storage cells located directly above the rack pedestals is the same as the minimum flow area provided for cooling water flow to other storage cells.

The maximum exit temperature of the water leaving the storage cells located directly above the rack pedestals will be the same as the maximum exit temperature of the water leaving other storage cells. Exit water temperature margins are indicated in the response to Question 3 of this response.

NRC Question 2

With the aid of drawings of the leveling screws, describe the range of adjustment with respect to their nominal position, how the adjustment is made and what precautions are taken to prevent them from becoming out of adjustment due to thermal cycling of the pool water.

Response

The Supplemental Submittal (Section 1.2) dated June 1983, indicates the methods of adjustment for the rack pedestals, wall seismic restraints, seismic beams, etc. There are no screw leveling devices in the proposed modification. The spent fuel pool has been surveyed to obtain as-built dimensions and variations from the nominal pool liner elevation 301'-2". Adjustments for physical and thermal purposes are accomplished by shim packs on the rack pedestals, seismic beams and wall seismic restraints as shown in Figures 3 and 4 of the June 1983 submittal. Each shim pack consists of several plates differing in thickness to accommodate dimensional variations. Nominal positions are based on as-built dimensions of the pool and racks with allowances for thermal growth. Thermal cycling will not cause misalignments because shim packs will be mechanically retained in position.

NRC-Question-3

Assuming the screwjacks are adjusted such that the minimum distance exists to the floor and that the cells are filled with the hottest fuel in the row being analyzed for the storage cell having the longest flow path, indicate the margin between the cell inlet and outlet water temperature and the corresponding saturation temperatures.

Response

As described in the response to Question 2, screw jacks have not been incorporated in the design of the racks. The rack pedestal height is 11-1/4 inches without shim packs. Therefore, it is the minimum vertical flow path dimension between the pool floor and rack bottoms.

The thermal hydraulic analysis considered the flow path from the sparger to the hottest fuel cell placed in rack number 14 which is the furthest distance from the sparger. The outlet water temperature at the top of the rack, under the condition of full core off-load with one heat exchanger operating, was calculated to be 185°F with a corresponding saturation temperature of 240°F, which is the controlling condition.

NRC-Question-4

With the aid of drawings showing the dimensions of the fuel cell, describe and demonstrate that the lead-in provisions at the top of the cell provide adequate guidance for the insertion of fuel assemblies and for the fuel grappling device during the removal of fuel assemblies.

Response

The channeled fuel assembly is 5.438 inches square. The nominal storage cell is 5.87 inches square providing .43 inch clearance. As illustrated on Figure 2 attached, the lead-in provided by the fuel bundle nose cone is used for fuel installation in the North-South direction where there are no lead-in guides. There are, however, lead-in guides in the East-West direction, as illustrated in Figure 2 attached. Figure 3 attached, shows that there is no problem with the fuel grappling device since the fuel handle is above the top of the storage racks.

The poison rack design is similar to the non-poison rack design utilized in the north end of the pool. The non-poison design racks in the north half of the pool currently contain 1,044 fuel bundles. No problems have been experienced in inserting fuel assemblies into these racks.

NRC Question 7

The June 24, 1983 submittal was made up to clarify and supplement the previously proposed licensing amendment dated March 21, 1978 and letters dated December 20 and 21, 1978. The March 22, 1978 letter mentions a storage capacity of 3,009 storage spaces while the June 24, 1983 submittal indicates the maximum storage capacity is 2,776. Please clarify.

Response

Table 1 of the March 22, 1978 submittal indicates a projected storage capacity of 3,009 fuel assemblies for storage Matrix 7. This matrix would be achieved by installation of high density poison spent fuel racks in Pool Areas I, II, III and IV shown on Figure 1 of the March 22, 1978 submittal.

The storage capacity provided by the June 24, 1983 submittal for 2,776 fuel assemblies corresponds to storage Matrix 6 of Table 1 of the March 22, 1978 submittal. High density poison spent fuel racks are indicated in pool areas II, III and IV and flux trap spent fuel racks (currently installed) are indicated in Pool Area I. At the present time, Niagara Mohawk has no plans to replace the flux trap spent fuel racks in Pool Area I with high density poison spent fuel racks.

NRC Question 9

It is stated in your submittal, "The north half and south half fuel racks are similar in construction." Identify and describe all differences that bear on the functional requirements of the racks.

Response

Section 1.2, Paragraph 2 of the June 24, 1983 submittal describes the similarity in construction of the box sections of the racks and differences in design. The functional requirements of the north half and south half racks are the same. The submittal proposes to modify the spent fuel pool by storing spent fuel in a sub-critical array in an environment which can be maintained within the parameters listed in Section 1.3 of the June 24, 1983 submittal. In addition, the parameters are indicated in Table 2 of the March 22, 1978 Submittal and Table 1 of the December 1976 submittal for the flux trap design.

The conclusions are indicated in Section 1.4 of the June 24, 1983 submittal.

NRC Question 10

The December 1976 submittal indicates that replacement of old racks with new racks would be accomplished as storage needs dictate. In this regard, have all the racks in the north side of the pool been installed? Also, is it anticipated that all new racks will be installed in the south end of the pool during one outage? If not, provide the reasons.

Response

All racks in the north half of the pool have been installed. These racks, as described in the June 1983 submittal, are flux trap design providing 1,066 storage locations. This submittal does not propose to modify the north half of the pool.

As stated on page 2 of the June 24, 1983 submittal, Niagara Mohawk plans to install six spent fuel racks (1,296 fuel storage locations) and two Work Platforms in the south half of the spent fuel pool. The work will be performed prior to the March 1984 refueling outage in order to maintain full core discharge capability. The two Work Platforms will be installed in the west end of the south half of the spent fuel pool as shown in Figure 8 of the June 24, 1983 submittal. These work platforms will be replaced with spent fuel racks when additional storage space is required. At the present refueling schedule of 200 fuel assemblies every two years, the proposed interim installation (i.e. six spent fuel racks and two work platforms) will provide adequate storage with full core discharge capability up to the year 1990.

NRC Question 12

Indicate where operations on fuel assemblies such as the removal of the channel boxes from discharged fuel will take place when all storage racks are placed in the storage pool.

Response

Operation on fuel assemblies takes place in the fuel preparation area on the east wall of the spent fuel pool, adjacent to the flux trap racks.

NRC Question 13

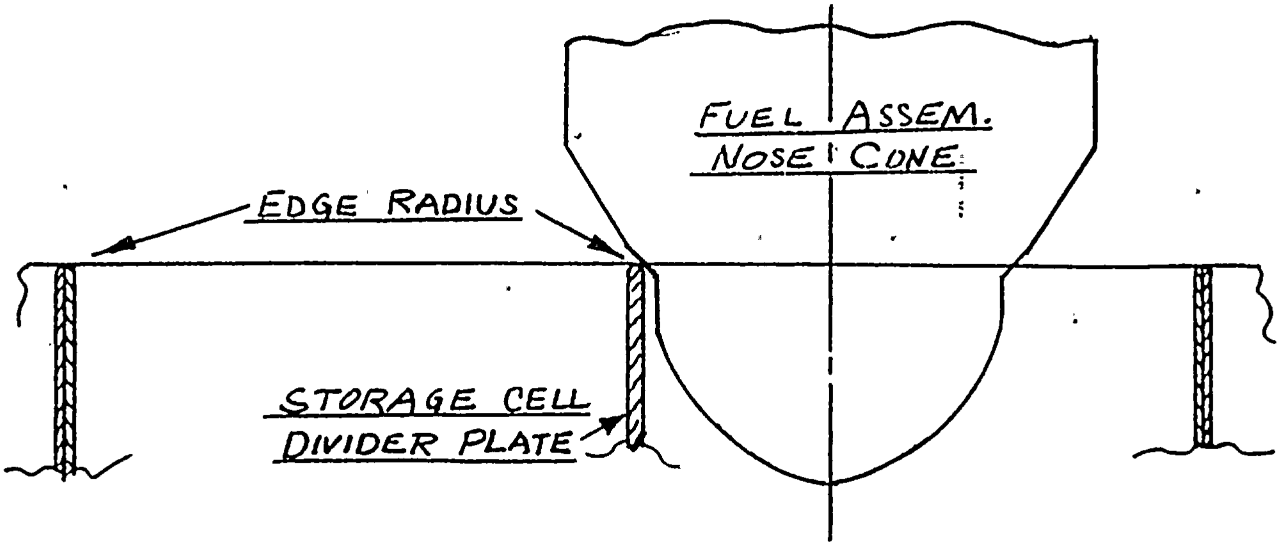
With the aid of drawings, describe and discuss the compressive forces that will develop between the seismic restraints and the racks should the bulk water temperature increase to the saturation temperature following the complete loss of all pool cooling.

Response

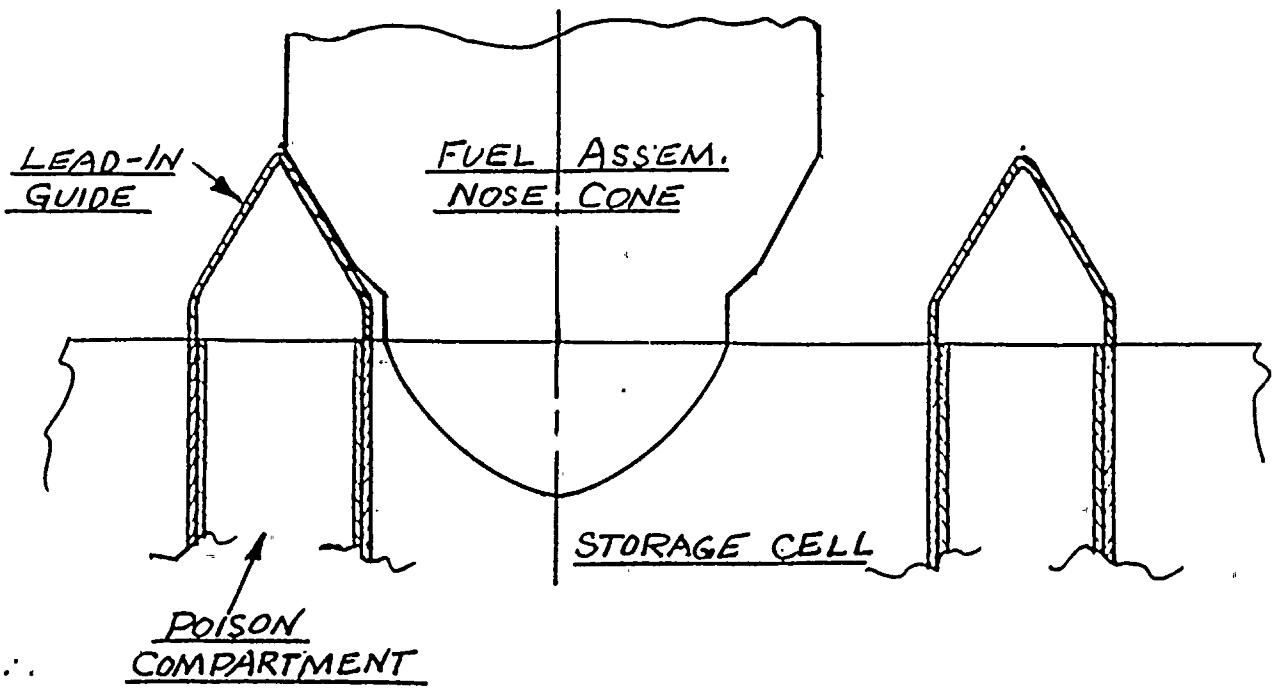
Seismic restraints are installed with a 1/4 inch gap between the seismic restraint and the adjacent spent fuel rack as shown on Figure 3 of the June 24, 1983 submittal. The maximum dimensional change due to differential thermal expansion between the spent fuel rack and the spent fuel pool will occur over the longest pool dimension, which is in the east-west direction. The total installed clearance east-west is 1/2 inch.

For the complete loss of cooling condition with no emergency cooling provided, the water will boil at bulk pool temperature of 212°F. Conservatively assuming that the stainless steel racks are at 212°F while the pool concrete is at 90°F, the differential thermal expansion between the racks and the pool is calculated to be 0.45 inch which is less than the 1/2 inch installed clearance. Thus, there are no compressive forces developed between the seismic restraints and the pool walls.

[illegible]

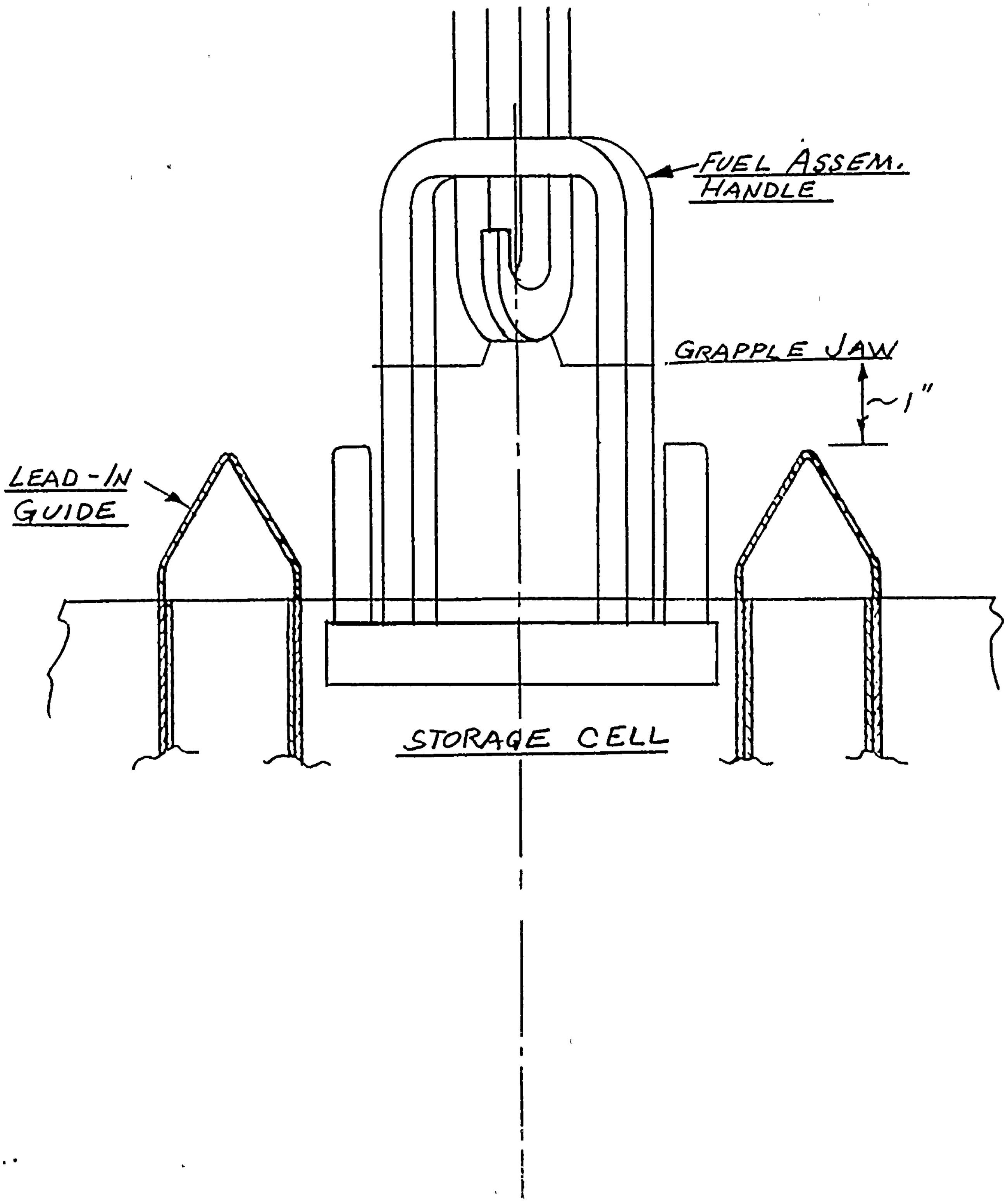


NORTH-SOUTH SECTION
THRU SPENT FUEL STORAGE RACK



EAST-WEST SECTION
THRU SPENT FUEL STORAGE RACK

FIGURE 2



FUEL GRAPPLE CLEARANCE
FIGURE 3