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CLASS	UNCLASS XXX	PROP INFO	INPUT	NO CYS REC'D 1	DOCKET NO: 50-220	

DESCRIPTION: Ltr re our 7-8-75 submittal.... trans the following:

ENCLOSURES: Safety Evaluation of Additional Spent Fuel Storage Racks k for Nine Mile Pt. Unit 1.....

(1 cy encl rec'd)

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ACKNOWLEDGED

PLANT NAME: Nine Mile Pt. Unit 1

FOR ACTION/INFORMATION

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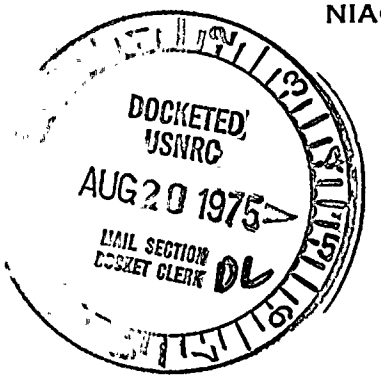
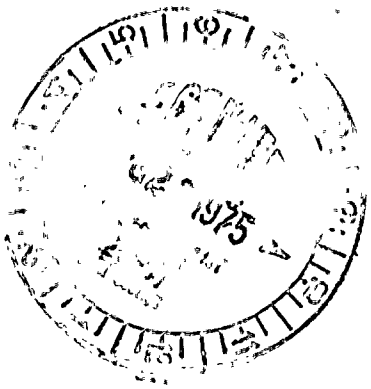




August 8, 1975

Mr. George E. Lear, Chief
Operating Reactors Branch #3
Division of Reactor Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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

Dear Mr. Lear:

The enclosed submittal is in response to your letter of July 8, 1975. That letter requested a conclusion on whether the planned modification to the spent fuel pool constitutes an unreviewed safety question and the basis therefore. We have concluded that the planned addition of spent fuel racks to the Nine Mile Point Unit 1 spent fuel pool, as described in our submittal of June 10, 1975, does not constitute an unreviewed safety question pursuant to 10 CFR Part 50, Paragraph 50.59. The Site Operations Review Committee and the Safety Review and Audit Board have reviewed this safety evaluation and concur with its conclusions. Additional information in support of this conclusion is attached.

No licensing action is requested. This material is supplied for your information.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

Gerald K. Rhode
Vice President-Engineering

8857

NLR/sz
Enclosure

SAFETY EVALUATION OF ADDITIONAL SPENT FUEL STORAGE RACKS NINE MILE POINT UNIT 1

8-8-75

I. SUMMARY

A. Existing Design

The spent fuel storage pool is a reinforced concrete structure lined with stainless steel plate. The pool is 33 feet 2 inches wide, 37 feet 5 1/2 inches long, and 38 feet 10 inches in depth. It was designed specifically to maintain the mean temperature of the pool below 125 F. In so doing, it was originally considered that the pool should accommodate full core discharge capability and the associated maximum heat load. The spacing of the fuel bundles is maintained such that the Effective Multiplication Factor (k_{eff}) is always less than 0.90.

B. Description of Modification

Up to seventeen new spent fuel storage racks will be installed in the spent fuel pool. Our June 10, 1975 submittal analyzed an addition of twelve spent fuel racks to the spent fuel pool. However, the original design allowed for spacing of up to seventeen racks. Therefore, we have re-analyzed to accommodate the addition of seventeen spent fuel racks. The seventeen racks will provide capacity for an additional 340 spent fuel bundles. To accommodate the new racks, thirteen control rod racks will be relocated to an aisle area, where they will be bolted to a support base, and braced laterally for seismic restraint.

These additional racks will be placed in locations provided in the original design and construction. Swing bolt assemblies to accommodate these additional racks were installed in the pool during original construction.

C. Purpose of Modification

The spent fuel storage pool, with the additional seventeen storage racks, will provide sufficient capability to store a full core discharge should the need arise following the Fall, 1975 refueling. Additional racks are required due to the recent removal of six racks for installation of the Cask Drop Protection System, and also because of the unavailability of off-site storage and fuel reprocessing services.

D. Results of Safety Evaluation

The Safety Evaluation demonstrates that the planned addition of spent fuel storage racks does not constitute an unreviewed safety question pursuant to 10 CFR Part 50, paragraph 50.59:

1. Neither the probability of occurrence nor the consequences of an accident or malfunction of equipment important to safety will be changed.

2. No possibility for an accident or malfunction of a different type than previously evaluated has been created.

3. No margin of safety defined in the basis for any technical specification has been reduced.

II. DESIGN CONSIDERATIONS

A. Description

Table 1 outlines the past, present and future condition of the equipment in the pool based upon this submittal. The seventeen racks identified as "New" in Figure 1 will be identical to those existing and will be installed on existing swing bolt mountings on the pool floor. The thirteen control rod racks will be placed in the aisle area as shown in Figure 1. There, they will be bolted to a support base braced laterally for seismic restraint.

B. Seismic and Structural Considerations

1) Static - The original design accounted for the weight loadings associated with the additional racks in that the entire floor was assumed to be supporting fuel including the weight of the cask in the northwest corner.

2) Dynamic - As in the static design, the original dynamic design of a horizontal earthquake of 0.25g included the pool filled with spent fuel plus the cask. The control rod racks, relocated to the aisle of the pool as proposed will not overstress the supports of the adjacent spent fuel racks.

C. Effective Multiplication Factor (k_{eff})

The original calculations which limit k_{eff} to less than 0.9 are based on the spacing of the spent fuel storage racks and not the number. The racks being added are designed and will be placed in the pool such that spacing is identical to that of the original racks. Therefore, k_{eff} will remain unchanged.

D. Shielding

Presently the reactor floor area is a controlled "Radiation Area". As defined in the Station's radiation protection procedures, a "Radiation Area" is one where the radiation level is from 5 mrem/hr to 100 mrem/hr. Presently the dose level around the spent fuel pool area is about 5 mrem/hr, largely a result of the radioactivity in the spent fuel pool water. The increase in the number of spent fuel pool bundles may increase this level slightly but will not cause the control of this area to be changed.

E. U-235 and By-Product Inventory

Operating License DPR-63 allows for the possession of U-235 and the associated by-products from reactor operation. Calculations show that even after the Spring, 1977 refueling including the increased number of spent fuel bundles, less than 3800 kg of U-235 will be located at the Nine Mile Point Unit 1 facility.

F. Spent Fuel Pool Cooling

The maximum pool heat input under normal conditions will be less than 9 million BTU per hour. Only one of the two pool filtering and cooling systems will be required to remove this heat and maintain bulk pool temperature at or below 125 F.

Normal pool heat input is based on storage of 500 spent fuel bundles (94 percent of core) with decay as follows:

300 bundles (56 percent of core) with one year or more decay

200 bundles (38 percent of core) with twelve days decay

The maximum pool heat input with 1140 fuel bundles in the spent fuel pool will be 27.3 million BTU per hour. Both pool filtering and cooling systems will be required to remove this heat and maintain bulk pool temperature at or below 125 F. If one pool cooling loop becomes inoperable, pool bulk temperature will not exceed 150 F. Because the fuel must be irradiated to generate decay heat, the worst case heat load is assumed to occur if the reactor is shutdown seven days after startup. Twelve days was assumed as the time necessary to unload the core into the spent fuel pool.

III. ACCIDENT ANALYSIS

A. Seismic Event

Because all of the new fuel racks will be installed onto existing mountings, the seismic adequacy of the mountings will be unaffected. The additional racks would not affect the integrity of the pool in the design event. As discussed in IIB above, both the static and dynamic loadings due to this modification will not overstress any structural components in the spent fuel pool.

B. Spent Fuel Cask Drop Over Pool

The cask drop protection system precludes the drop of a spent fuel cask onto spent fuel in the pool. Further, this system prevents damage to the pool and its contents by guiding and decelerating the cask, should it be dropped. Operation of the cask drop protection system is independent of the number of fuel racks or the amount of fuel in the pool. Therefore, the probability of such an accident and the consequences thereof would not be affected by the addition of spent fuel racks. (Reference letters - May 31, 1973, P. D. Raymond to D. L. Ziemann and September 29, 1972, T. J. Brosnan to J. F. O'Leary.)

C. Refueling Accident

As discussed in Appendix E to the FSAR, the Second Supplement to the FSAR, the Technical Supplement to Petition to Increase Power Level, and Amendment No. 1 to Application to Convert Provisional Operating License to Full Term Operating License, the most severe refueling accident remains the drop of a fuel bundle over the reactor core. The additional spent fuel storage racks will not alter this conclusion. The offsite dose resulting from this accident, or from dropping a fuel bundle into the spent fuel pool will not be changed. The probabilities of these accidents will not be affected.

D. Spent Fuel Pool Cooling

Loss of coolant from the pool is precluded because all penetrations are located at least one foot above the top of the fuel. The pool cooling water pumps, and the makeup water valve would be powered from the emergency diesel generators in the event of loss of offsite power.

As discussed above, the normal pool heat load requires operation of only one of the two cooling systems. Should one cooling system become unavailable, bulk pool temperature would not exceed 150 F.

As discussed in the Fourth Supplement to the FSAR, the large volume of pool water and the availability of makeup ensure a slow rate of temperature rise. In the unlikely event that both cooling systems become unavailable, continuous availability of makeup water to the pool is assured. Sufficient time would be available to repair the postulated malfunction.

The additional spent fuel racks will not affect the probability of a cooling system malfunction. In such an event, adequate measures would be available to provide or restore cooling such that safe spent fuel storage is maintained.

IV. TECHNICAL SPECIFICATIONS

The applicable Technical Specification is Specification 5.5, which requires a k_{eff} less than 0.9. As discussed in Section IIC above, the modification will not affect k_{eff}.

V. CONCLUSIONS

The Safety Evaluation demonstrates that the planned addition of spent fuel storage racks does not constitute an unreviewed safety question pursuant to 10 CFR Part 50, paragraph 50.59 because:

1. As discussed above, all systems associated with the spent fuel pool will perform their design function without exceeding their originally assigned margins of conservatism. Therefore, the probability of occurrence and the consequence of an accident or malfunction of equipment important to safety has not been changed.

2. The addition of spent fuel racks does not affect the probability of occurrence or consequences of any accidents discussed in the FSAR or supplements thereto. This is discussed in Section III above. Also, no accident or malfunction of a different type than previously evaluated in the FSAR has been created.

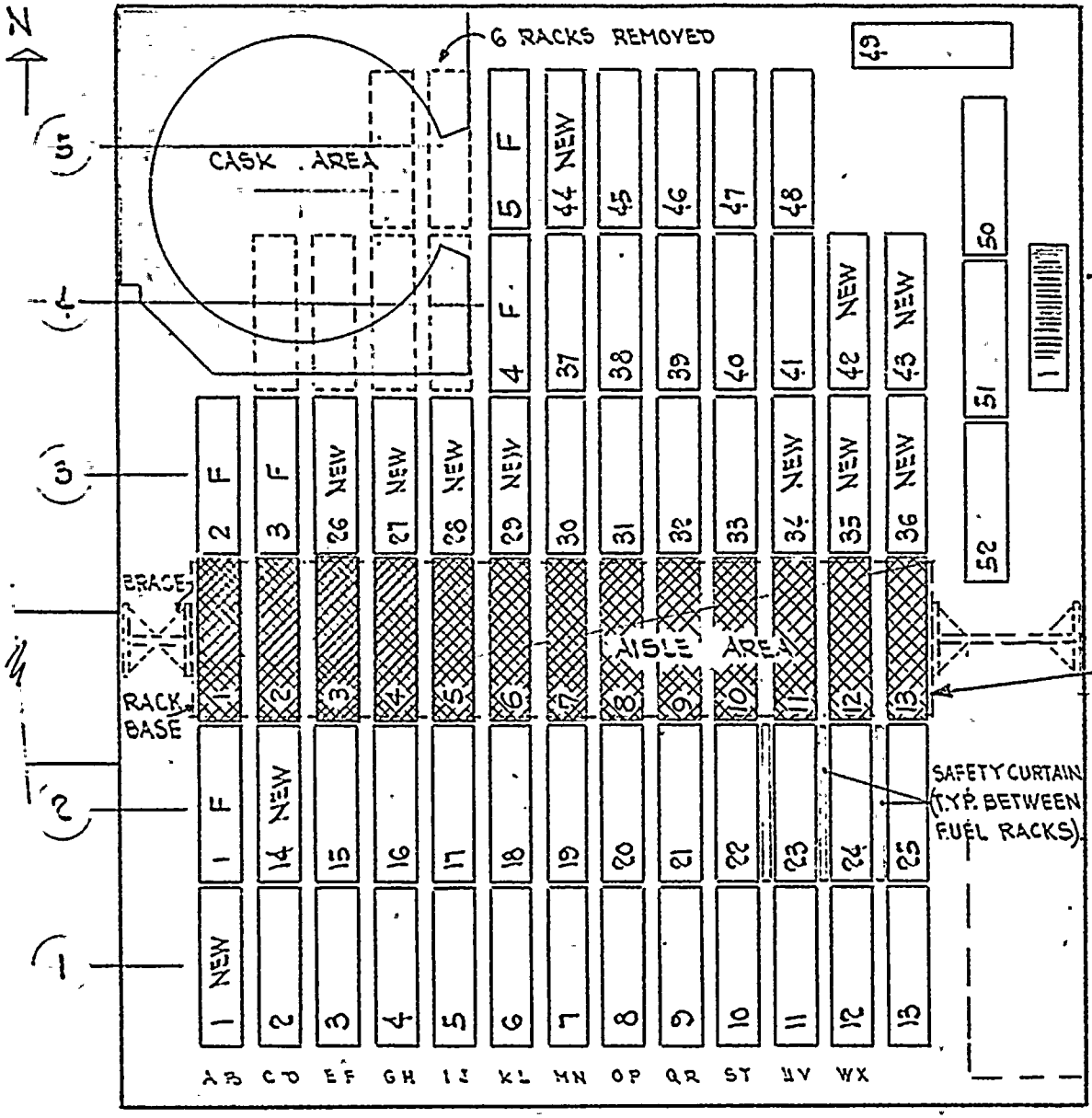
3. The conservative margins built into the design of equipment important to maintain safe operation of the spent fuel pool will not be exceeded. Both K_{eff} and the maximum pool temperature have not been altered. Therefore, the margin of safety defined in the basis for all technical specifications has not changed.

TABLE 1

Pool Conditions With Proposed Addition

	Original Design	Deleted For Cask System	Present Condition	Post 1975 Refueling	Future Capacity Total
Spent Fuel Racks	44	6	40	52	57
Spent Fuel Bundles	880	120	300	500	1140
Control Rod Racks	14	0	13	13	13
Control Rods	140	0	4	*	130
Channel Racks	6	0	6	1	1
Fuel Channels	120	0	293	*	20

*To Be Determined



PLAN OF SPENT FUEL POOL

NO. OF POSITIONS

F	FUTURE SPENT FUEL STORAGE RACK	100
	SPENT FUEL STORAGE RACK	1040
	CONTROL ROD RACK	130
	CHANNEL RACK	20

FIGURE #1

NIAGARA MOHAWK POWER CORP

NINE MILE POINT UNIT = 1

SPENT FUEL POOL

WITH PROPOSED ADDITION