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SUBJECT: Responds to 950925 RAI re 941116 ltr requesting change to min time delay required after shutdown for movement of spent fuel from core to storage in spent fuel pool.

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INDIANA MICHIGAN POWER

February 1, 1996

AEP:NRC:1202A

Docket Nos.: 50-315
50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Donald C. Cook Nuclear Plant Units 1 and 2
REFUELING OPERATIONS DECAY TIME
UPDATED ANALYSIS AND RESPONSE TO REQUEST
FOR ADDITIONAL INFORMATION

This letter and its attachments constitute a response to the September 25, 1995, request for additional information concerning our November 16, 1994, submittal (AEP:NRC:1202). Our original submittal requested a change to the minimum time delay required after shutdown for movement of spent fuel from the core to storage in the spent fuel pool.

Attachment 1 contains our response to the request for information. Attachment 2 contains a revised thermal-hydraulic analysis which reflects changes in operational strategies to include longer fuel cycles on both units, and a potential increase in licensed power for Donald C. Cook Nuclear Plant Unit 2.

The thermal-hydraulic analysis summarized in attachment 2 supercedes the thermal-hydraulic analysis submitted in AEP:NRC:1202. The clarifications to the spent nuclear fuel pool storage rack boral poison surveillance program presented in AEP:NRC:1202 do, however, remain valid. The results presented in attachment 2 demonstrate that the maximum bulk spent fuel pool water temperature is bounded by the 155° F presented in AEP:NRC:1202 for normal discharge scenerios. The conclusions of the no significant hazards consideration performed pursuant to 10 CFR 50.92 contained in the original submittal, therefore, remain valid.

In compliance with the requirements of 10 CFR 50.91(b)(1), copies of this letter and its attachments have been transmitted to Mr. J. R. Padgett, of the Michigan Public Service Commission, and to the Michigan Department of Public Health.

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This letter is submitted pursuant to 10 CFR 50.30(b) and, as such, an oath statement is attached.

Sincerely,

E. E. Fitzpatrick

E. E. Fitzpatrick
Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 2nd DAY OF February 1996

Notary Public

My Commission Expires: 6-28-99

plt

Attachments

cc: A. A. Blind
G. Charnoff
H. J. Miller
NFEM Section Chief
NRC Resident Inspector - Bridgman
J. R. Padgett

ATTACHMENT 1 TO AEP:NRC:1202A

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

ANSWERS TO RAI BY NRR

This section contains responses to questions posed by the USNRC in response to the previously submitted Holtec Report HI-941183. Any reference to tables or figures in this section refer to the corresponding articles in either the original licensing report (dated July 26, 1991) or Holtec Report HI-941183.

Q 1. It is assumed that the combined SFP Hx heat load and evaporative heat losses (as shown in Table 2.2 of Holtec Report HI-941183) are equivalent to the total decay heat generation in each case, e.g., Case 1A SFP Hx load 30.84 E6 BTU/Hr. + evaporative losses 3.14 E6 BTU/Hr., for a total of 33.98 E6 BTU/Hr. If this is incorrect, explain what the correct decay heat load is in each case and justify any differences.

A 1. Your assumption is correct as stated. The total decay heat generation is equal to the sum of the SPF Hx heat load and the evaporative cooling loss.

Q 2. A preliminary comparison was made of the decay heat generated by the 80 fuel elements deposited in the spent fuel pool in cases 1A, 1B and 2 for the decay times shown in Table 2.2 with similar cases in Table 5.5.1 of your previous submittal dated July 26, 1991 wherein the fuel was permitted to decay for 168 in lieu of the decay period of 100 hours presently requested. That comparison shows differences of 2.6 to 2.7 E6 BTU/Hr. in lieu of the differences you show of 0.71 to 0.86 E6 BTU/Hr. Justify your calculations.

A 2. The reduction in the reactor hold time will increase the decay heat of the freshly discharged fuel assemblies only, the decay heat from previously discharged fuels is not affected by the change in hold time. However, the fresh fuel decay heat accounts for less than 50% of the total heat generation. Additionally, Holtec Report HI-941183 incorporates changes to the refueling schedule which reduce the decay heat contribution of the previously discharged fuel. Refueling schedule changes included using actual refueling outage durations and assembly discharge burnups. Actual refueling outage lengths were longer than forecasted and actual assembly discharge burnups were lower that previously assumed. These factors tend to decrease the decay heat contribution of the previously discharged fuel. The reduction in the decay heat of the previously discharged fuel serves to limit the increase in the total decay heat generation rate.

Q 3. Explain whether you have deviated from Table 2.1 of Holtec report Hi-941183 in using the number of those discharged

assemblies and dates of discharges in calculating the heat generation of the spent fuel assemblies stored in the spent fuel pool. For example, you stated that you calculated the heat generation for 80 fuel assemblies in a normal discharge batch in lieu of 76 shown in Table 2.1.

A 3. The decay heat calculations in Holtec Report HI-941183 are devised to provide an upper bound to any actual discharge scenarios. The calculation of the decay heat generation from all previously discharged fuels is based on the refueling schedule of Table 2.1. However, the normal discharge batch from Unit 1 contains more assemblies than does Unit 2. To provide an analysis that bounds all normal discharge scenarios, the final discharge batch size was assumed to be the Unit 1 batch size of 80 assemblies. This assumption serves to increase the conservatism of the analysis.

Q 4. Provide the decay heat generation rate for the assemblies deposited in the pool for each discharge cycle used in your calculations for Cases 3 and 4. If you do not use the discharges and cycle EFPD shown in Table 2.1 explain the method used and justify its application.

A 4. The decay heat generation rates for fuel from each previous discharge cycle are summarized below. It was conservatively assumed that the EFPD for all previously discharged fuel assemblies was 1260 days.

Cycle	Unit 1 Decay Heat (BTU/Hr)	Unit 2 Decay Heat (BTU/Hr)
1	182106	239391
2	184518	285822
3	189342	232155
4	197181	232155
5	198990	306928
6	204417	293661
7	261702	297882
8	273159	305118
9	287631	325017
10	300294	335871
11	311751	358785

12	324414	358785
13	337077	370845
14	348534	384714
15	361197	400392
16	373257	422100
17	385920	467928
18	399789	598176
19	414261	1078164
20	434160	
21	472149	
22	566820	
23	773046	
24	2981835	

Q 5. Discuss briefly, your operation of the spent fuel pool trains in a normal reload.

A 5. The spent fuel pool cooling system (SFPCS) is not directly associated with either plant startup, normal operation, or shutdown. It is operated when there is a need to lower the pool water temperature or when there is a need to clarify or purify the pool water. Both situations are dependent upon fuel loading of the pool and upon the elapsed time that the spent fuel has been in the pool. To date only one SFPCS train has been needed at any point in time to keep the pool temperature below the high temperature alarm setpoint of 125° F. An evaluation shall be performed prior to each full core offload to assure that one SFPCS train is sufficient to keep the pool bulk water temperature below that which is acceptable.

ATTACHMENT 2 TO AEP:NRC:1202A

REVISED SAFETY ANALYSIS PERFORMED BY

HOLTEC INTERNATIONAL