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SUBJECT: Discusses spent fuel storage pool safety issues resolution.

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

Gentlemen:

Donald C. Cook Nuclear Plant Units 1 and 2
SPENT FUEL STORAGE POOL SAFETY ISSUES RESOLUTION

The Nuclear Regulatory Commission letter of September 26, 1996, described two spent fuel pool (SFP) issues that have been identified for further review at Cook Nuclear Plant. These two issues were makeup capability versus liner leakage through the leak identification system (LIS), and potential interference of the operating unit's safety systems' functions due to an elevated SFP temperature resulting from recently discharged fuel.

We have reviewed these SFP issues and agree with the NRC's conclusion that existing structures, systems, and components related to the storage of irradiated fuel provide adequate protection of the public health and safety.

With regard to SFP liner leakage through the LIS, we have determined that sufficient makeup capability exists to mitigate credible failures of the SFP liner. Therefore, we believe isolation valve backfits are not warranted under 10 CFR 50.109(a)(3).

A maximum theoretical inventory loss rate through the LIS was estimated assuming failure of the SFP liner with the SFP inventory maintained at its highest normal level. These conditions expose the entire horizontal length of the LIS to the full static head of the SFP, and result in an estimated inventory loss rate of approximately 1,500 gpm. This is a conservative inventory loss rate estimate that bounds credible LIS leakage scenarios by assuming a complete and instantaneous disintegration of the entire SFP liner.

SFP inventory makeup is currently addressed in both normal and abnormal operating procedures. Inventory makeup to the SFP is periodically and routinely performed to compensate for normal evaporative losses. Normal makeup may be added from either the unit 1 or unit 2 refueling water storage tanks or primary water system at a 100 gpm flow rate. With the use of hoses stored proximate to the SFP, a mixture of fire protection and primary water may be added at a 2,200 gpm flow rate, so that total makeup capability exceeds the bounding LIS leak rate by 800 gpm. Therefore, sufficient makeup capability is available to mitigate the consequences of credible LIS leakage scenarios.

With regard to the postulated safety system interference issue (the "Susquehanna Scenario"), the NRC has identified three SFP design characteristics that must coexist for the scenario to be credible.

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These three SFP design characteristics are:

1. an open path by which steam from the SFP would effectively travel to areas housing safety systems;

2. a short time to boil (i.e., between 4 and 10 hours); and

3. a shared SFP at a multi-unit site.

If the pool were to boil, much of the steam would be removed by the auxiliary building ventilation system exhaust fan (which has a capacity of 30,000 cfm). Buoyancy forces would cause the remaining steam to rise, contact the roof and walls of the auxiliary building, and condense. There are also heavy metal structures that would serve as heat sinks until heated. In addition, the size of the most likely pathway to the lower elevations of the auxiliary building is very small compared to the size of the impacted area. Therefore, safety systems required for shutdown would be afforded protection during short boiling transients.

The design basis of the SFP requires a minimum of 5.74 hours to boil be maintained in the event of loss of all SFP cooling. Normal practice is to perform SFP cooling train pump maintenance prior to refueling outage periods so that two SFP cooling train pumps are in working order during refueling outages.

In credible loss of cooling events (e.g., a pump failure on one SFP cooling train combined with simultaneous component cooling water flow unavailability on the second train's heat exchanger), plant procedures direct personnel to cross-tie the two separate SFP cooling train lines and operate the combined loop with the single operable SFP cooling train pump. Although operating at reduced capacity, this procedure would extend the time to boil. Even greater times to boil may be achieved by supplying makeup water to the spent fuel pool in conjunction with the crosstie operation. Cook Nuclear Plant, therefore, has an effective time to boil greater than that given in the SFP design basis. We believe this time is sufficient to allow corrective actions to be implemented and SFP backfits are not warranted under 10 CFR 50.109(a)(3).

Sincerely,

E. E. Fitzpatrick

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Vice President

jmb

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