SAFETY EVALUATION

BY THE

DIVISION OF OPERATING REACTORS

CONCERNING

PHILADELPHIA ELECTRIC COMPANY'S

APPLICATION FOR AMENDMENT TO ITS OPERATING LICENSE

TO CHANGE THE TECHNICAL SPECIFICATIONS

FOR THE

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-277 AND 50-278

1.0 INTRODUCTION

By its letter dated August 27, 1979, the Philadelphia Electric Company (PECO) applied for license amendments to change Technical Specification 3.10E from a single, 120 hour (five day) delay time prior to moving fuel to the spent fuel pool to an allowable discharge rate, which could commence as soon as twenty-four hours after the reactor is shutdown. In PECO's proposal this allowable rate would be determined for each refueling from a set of graphs, to be included in the Technical Specifications. PECO calculated the data for these graphs on the basis that the temperature of the water coming out of the spent fuel pool should never exceed 150°F even though only two of the three spent fuel cooling loops were operable at the time of the peak heat load.

2.0 SPENT FUEL COOLING

The spent fuel pool cooling systems at Peach Bottom consist of three pumps and three heat exchangers in parallel for each of the two reactors. Each of these three pumps is designed to pump 533 gpm (2.67×10^5 pounds per hour). Each heat exchanger is designed to transfer 3.75×10^6 BTU/hr from 115°F fuel pool water to 90°F service water, which is flowing through the heat exchanger at a rate of 4.0×10^5 pounds per hour.

3.0 EVALUATION

This Technical Specification and proposed change only pertains to normal refuelings. It does not affect or change the reactor cooling time when a full core complement of 764 fuel assemblies is transferred to the spent fuel pool. In that case, the fuel pool can be adequately cooled by the Residual Heat Removal System regardless of when the core is transferred.

In the graphs it submitted, PECO allowed for a range in the number of assemblies that may be offloaded in any refueling. The maximum number in this range is 338. The minimum reactor cooling time in these graphs is twenty four hours, which is the time it normally takes to cool the reactor down. The maximum fuel assembly discharge rate PECO considered is about 8 fuel assemblies per hour. From these data we calculated the maximum heat load for any refueling considered in the proposal to be about 21 x 10^6 BTU/hr. If we add to this the 3.3 x 10^6 BTU/hr which will be generated by 2320 spent fuel assemblies already in the pool, we get a total maximum refueling heat load of 24.3 x 10^6 BTU/hr. Assuming the conditions given in Section 2.0 Spent Fuel Cooling for this heat load, the temperature of the water coming out of the spent fuel pool would be about 144°F. If we were to use the measured temperature of the service water in lieu of the design basis 90°F, as suggested in PECO's submittal and were to include the heat loss from the surface of the pool, this maximum temperature would be less than 140°F. Under the guidelines given in NRC Standard Review Plan 9.1.3, 140°F is a permissible maximum temperature for normal operation of the spent fuel pool cooling system.

In the event that one of the three loops were to fail at this peak load, we calculate that the temperature of the water coming out of the pool could go up to about 175°F in about four hours. Because of the low heat flux, the fuel element temperatures would still stay below 180°F, which is far below the 600°F or so at which the fuel elements were in the operating reactor. Thus, one would expect that none of the fuel elements would be damaged by this gradual increase in temperature up to about 180°F. If none of the fuel elements are damaged, the additional radioactivity that would be released from the site would be insignificant for this temporary, emergency situation. Thus, for the NRC objective of protecting the public health and safety, this is an acceptable temperature for this failed condition.

From the above calculations, we find that PECO is in compliance with NRC regulations without adding these graphs to the Peach Bottom 2 and 3 Technical Specifications.

4.0 CONCLUSION

The present Technical Specification 3.10E, which prohibits moving fuel at the Peach Bottom reactors prior to 120 hours (5 days) after shutdown, is not necessary to protect the health and safety of the public and may be deleted from the Technical Specifications.