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Peter A. Morris, Director
Division of Reactor Licensing
THRU: Roger S. Boyd, AD/HP, DRL

GE CORE COOLING MODEL AND THE ECCS FOR THE OYSTER CREEK AND NINE MILE POINT PLANTS (Docket Nos. 50-219 and 50-220)

Background

On the basis of our review of the Oyster Creek ECCS, we concluded that high pressure coolant injection capability with onsite power capability was needed to provide additional protection in the small break region. The ACRS concurred in this position. We informed Jersey Central by letter dated November 7, 1967, such capability is necessary. The system design should be sufficient to:

(1) provide protection up to 0.2 ft^2 in break area,

(2) limit fuel clad temperature to not greater than 2000°F, and

(3) prevent fuel clad failure up to at least 0.02 ft^2 in break area.

Jersey Central proposed to upgrade the existing Feedwater System to serve as a high pressure coolant injection system using an onsite power source and increasing the system design capacity to approach Class I standards on a reasonable and practical basis. We found the overall approach acceptable.

Niagara Mohawk initially indicated that it would provide a similar capability to its Nine Mile Point Plant. However, it proposed to use offsite power only, claiming an ultra-high degree of reliability. Our preliminary review of the design indicates that no special credit could be given to the offsite power system to make it equivalent to the combined system of on and offsite power sources. This matter was discussed with the structure groups of DRL.

Niagara Mohawk met with us on October 16, 1968, and discussed the results of a new evaluation using a revised GE core cooling model. The results of the new evaluation indicate that adequate core cooling could be achieved using the auto-relief system in conjunction with the core spray system.

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Adequate core cooling was manifested by lower fuel clad temperatures and no fuel clad failure in the small break range. On the basis of this revised model the requirements for high pressure coolant injection capability should be reevaluated.

Status

We have requested RT to assist in the review and evaluation of the new GE core cooling model. A meeting was held on October 29, 1968 with GE and Commonwealth Edison to go over the model. On the basis of this meeting we find that additional information from GE will be necessary before the overall acceptability of the new model can be determined.

It is clear that the new model is less conservative than the earlier GE design basis core cooling model. The degree of conservatism removed can be estimated by the results obtained; i.e. peak clad temperatures are now near saturation whereas before they were in the 2000°F and up range; also the extent of fuel failure for small breaks has been reduced from about 40% to zero.

Recommendation

It seems clear that whatever position is taken on Nine Mile Point would also apply to Oyster Creek and vice versa. If we accept the new GE model, the basis for which we required a high pressure coolant injection system, would have to be reevaluated. This evaluation may extend even further to include current plants. However, no conclusion can be made at this time pending further review of the GE model. Therefore, until questions relating to the GE model are resolved between DRL and GE, I suggest that we notify Niagara Mohawk that it should at least commit to providing high pressure coolant injection capability, using both onsite and offsite power sources in the event our reevaluation of the problem results in no change from our previous position. Niagara should also submit for our review a detailed report of its evaluation to support its proposed position. I view the plant licensing schedule short compared to the model resolution time. Because implementation can be delayed in both plants, sufficient time (about a year or so) will be available to further our evaluation of the model and then reassess our overall position on both plants. This also will include discussions with the ACRS.

In conjunction with this approach, we should notify Jersey Central of our present thinking and permit it to defer heavy cost and construction commitments.

Robert L. Tedesco, DRL

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