UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 125 TO FACILITY OPERATING LICENSE NO. DPR-3

YANKEE ATOMIC ELECTRIC COMPANY

YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-029

INTRODUCTION

By letter dated April 14, 1989, the Yankee Atomic Electric Company (YAEC or the licensee) requested an amendment to Facility Operating License No. DPR-3 for the Yankee Nuclear Power Station (YNPS or the plant). The proposed amendment would incorporate into the Technical Specifications of YNPS new operability and surveillance requirements for equipment installed to meet the criteria of NUREG-0737 Item III.D.3.4, "Control Room Habitability."

EVALUATION

In accordance with Task Action Plan, Item III.D.3.4, "Control Room Habitability," licensees shall assure that Control Room operators will be adequately protected against the effect of accidental releases of toxic and radioactive gases; and that the nuclear power plant can be safely operated or shutdown under design basis accident conditions.

In response to the requirements of the Task Action Plan, Yankee revised an existing system. The most important new feature in the revised system is that a single filter unit consisting of a High Efficiency Particulate Air (HEPA) prefilter, a 2" charcoal filter, and a following HEPA filter will be used. The system will have redundant fans and motors. The staff in its letter, dated May 28, 1987, concluded that the Control Room Habitability Systems provide safe, habitable conditions within the Control Room under both toxic gas and radiological releases and the design meets the criteria identified in Item III.D.3.4 and is acceptable.

Single Failure Analysis

By letter dated January 23, 1984 YAEC proposed operability and surveillance requirements for the Control Room Habitability Systems. By letter dated May 14, 1986, the staff rejected the proposed requirements, noting that they reflected operation susceptible to single failure and needed to be reevaluated. YAEC, in this current proposed change submittal, addresses the susceptability of the carbon filters to a single failure and the time interval associated with system inoperability. The proposed surveillance requirements dictate that Di-Octal Phthalate (DOP) removal, greater than or equal to 99% radioactive methyl iodine removal. Assuming a normal six-week refueling for Yankee, it is possible to remove a carbon test cell early on the refueling, and within 31 days perform the laboratory analysis to determine the radioactive methyl iodine removal efficiency of the carbon trays. Following acceptance or replacement of the carbon trays, the DOP and hydrocarbon removal efficiency tests would be performed

along with system flow and filter differential pressure measurements. This would result in a fully tested, fully operable filter prior to the end of the refueling. While this is the desired sequence of events, YAEC recognized the difficulties associated with scheduling the carbon test cell removal at the beginning of each refueling.

During the 1987 Yankee refueling, significant Main Control Board (MCB) rework was performed which required the MCB to be repainted. Accordingly, the carbon test cell was not removed until this painting was complete so as to ensure that the paint fumes did not degrade the carbon filter media. The carbon test cell was removed, and with the exception of the carbon test cell laboratory analysis, all testing was successfully performed during the last week of the refueling. The results of the carbon test cell analysis, which were received after the plant returned to normal operation, showed the methyl iodine removal efficiency to be 99.4%. The filter train was, therefore, still deemed operable.

Had the laboratory analysis for methyl iodine removal efficiency shown less than 99% efficiency, the filter train would have been declared inoperable and the action statement of the proposed Technical Specification would have applied. This does not constitute susceptibility to a single failure for the following reasons:

1. Carbon filters do not degrade catastrophically. Rather, they exhibit gradual degradations in their efficiency. At YNPS this degradation has been less than 0.2% per refueling interval. A passive filter train is not analogous to active components such as motors or switches which are assumed to either function or not function. The filter train even though inoperable by definition (less than 99% methyl iodine removal efficiency), would still be a functional component.

2. Even assuming a degradation of twice the current rate of 0.2% per refueling interval and assuming the worst case, the carbon had tested satisfactorily the previous refueling at the proposed Technical Specification limit of 99.0% methyl iodine removal efficiency, a minimum efficiency of 98.6% would exist. This continues to exceed the assigned activated charcoal decontamination efficiency of 95% and, thus, maintains the conservatism of the Control Room personnel radiation exposure analysis.

3. YAEC maintains a certified carbon reload in stock. The carbon tray design allows for replacement in less than one hour and would be performed as soon as test personnel who can perform DOP bypass leakage testing are on-site. Replacement would not be performed immediately due to the possibility of creating a bypass leakage path. Continuing to operate with the assumed 98.6% efficient carbon media would maintain the conservatism of the Control Room exposure analysis. Changing out the carbon media without the ability to verify bypass leakage could, on the other hand, significantly affect the Control Room exposure analysis. Therefore, 3-1/2 days were provided for in the proposed change in order to allow for securing the services of testing personnel who would test for bypass leakage immediately after the carbon tray replacement.

The proposed change to the YNPS Technical Specification for the CREACS provides for reasonable flexibility in scheduling filter efficiency testing. It does so while also maintaining the conservatism of the Control Room personnel radiation exposure analysis. It was not YAEC's intention to infer continued full power operation without the availability of the CREACS filter train, but within the limited context of OPERABLE versus INOPERABLE that implication did result. With the proposed Technical Specification surveillance requirements, the filter train is declared INOPERABLE, and replaced while it can still perform its intended function, i.e., it is still a system capable of operating. It is being replaced in the time frame specified due to the conservatism built into the surveillance acceptance criteria. With the above clarification, the staff finds the proposed change to the Technical Specification to be acceptable.

Operability and Surveillance Requirements

The proposed surveillance requirement 4.7.5.3 requires in-place tests and laboratory tests at least every 18 months and following painting, fire, or chemical release in any ventilating zone communicating with the system, while the system is operating, that could contaminate and impair the function of the HEPA filters or charcoal absorbers. This requirement is consistent with the Standard Technical Specifications, except for the inclusion of the phrase "while the system is operating". By telephone discussion with representatives of the licensee, on August 30, 1989, the licensee agreed to the deletion of this phrase. The deletion does not affect the nature of the action nor does it change the Staff's initial determination published in the Federal Register on May 17, 1989. The intent of the requirement is to require testing whenever such contamination could occur, but not to require the testing when such contamination is precluded, for example, by temporary barriers which prevent transport of the containment to the HEPA filters and charcoal absorbers.

This proposed change incorporates into the Technical Specifications of YNPS new operability and surveillance requirements for equipment installed to meet the criteria of Item III.D.3.4 of NUREG-0737, "Control Room Habitability." The design of the equipment has been previously approved by the NRC, and the specific changes made to the Technical Specification pages are in accordance with staff guidance. Based on the considerations contained herein, it is concluded that there is reasonable assurance that operation of YNPS, consistent with this proposed Technical Specification, will not endanger the health and safety of the public. Therefore, this proposed change is acceptable.

ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or a change to surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously published a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (54 FR 21319) on May 17, 1989 and consulted with the State of Massachusetts. No public comments were received and the State of Massachusetts did not have any comments.

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: October 17, 1989