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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 102 TO FACILITY OPERATING LICENSE NO. DPR-3

YANKEE ATOMIC ELECTRIC COMPANY

YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-029

1.0 INTRODUCTION

By letter dated October 15, 1985, the Yankee Atomic Electric Company (YAEC) submitted a request for changes to the Yankee Nuclear Power Station (Yankee) Technical Specifications (TS).

The amendment modifies the Technical Specifications for the reactor coolant system vent system to allow power to be removed from the valves during normal plant operations.

2.0 DISCUSSION

In accordance with the requirements of TMI Action Plan Item II.B.1, YAEC has installed a reactor coolant system vent system. The function of the system is to vent noncondensible gases to assure core cooling during natural circulation. The normal flow paths are from the pressurizer and the reactor vessel head through the power-operated relief valve (PORV) discharge piping. When originally installed, the reactor vessel head vent valve, the pressurizer vent block valve, and the reactor vessel head block valve were powered from the emergency buses. The pressurizer vent valve was powered by a non-emergency bus; however, it could be backfed with emergency power by manual actions outside the control room. The staff issued its evaluation for Yankee on TMI Action Plan Item II.B.1, Reactor Coolant System (RCS) Vents, on September 14, 1983. In that evaluation, the staff concluded that the use of a non-emergency motor control center (MCC) in powering the pressurizer vent valve was acceptable provided the licensee confirms that all necessary equipment to ensure operability when operating from the emergency bus is in conformance with the requirements of NUREG-0737, Item II.B.1, subitem A(10) concerning seismic and environmental qualification. Further, the staff concluded that the licensee should undertake to propose amendments to the Technical Specifications which will provide for operability testing with both off-site and emergency power sources including the related capability of transferring from the non-emergency to the emergency bus within 30 minutes of the loss of the off-site source. New TS requiring operability testing were implemented in Amendment No. 84 to Facility Operating License DPR-3 on October 1, 1985.

A design change was subsequently implemented such that all four vent valves were powered from buses supplied by the emergency diesel generators. However, the power, control, and position indication cables for all four vent valves run through the control room. A hot short of the control cables resulting from a control room fire, could cause inadvertent actuation of the valves and thus cause a leak from the reactor coolant system. Therefore, as part of the resolution of Appendix R to 10 CFR Part 50, the licensee committed to relocate the power supplies to the switchgear room (for ease of operation) and to lock open the power supply breakers for the vent valves.

However, during the course of the review it was recognized that 10 CFR 50.44(c)(3)(iii) specifies that the RCS vents be remotely operated from the control room. By letter dated October 3, 1986, the licensee requested an exemption from this requirement so that the fire protection commitments could be satisfied. On December 29, 1986, the NRC issued to YAEC an exemption from the control room operability requirement of 10 CFR 50.44(c)(3)(iii) for the reactor coolant vent system permitting operator action outside the control room to restore power.

In its earlier letter dated October 15, 1985, YAEC had submitted proposed Technical Specifications to permit power to be removed from the valves.

The proposed changes to TS 3.4.11 would add the words "with power removed from the valve actuator" after the requirement that the valves be OPERABLE and closed.

In addition, an existing phrase which reads "...two valves in series powered from emergency buses or capable of being powered from an emergency bus...." would be revised by deletion of the phrase beginning "...or capable...."

Section 4.4.11.1 would be added to the surveillance requirements; existing section 4.4.11 would be renumbered as 4.4.11.2. New Section 4.4.11.1 would require that the locked open power supply be verified at least once per 31 days.

3.0 EVALUATION

The licensee requested modifications to the plant Technical Specifications to permit power to be removed from the valves in the high point vent lines on the pressurizer and the reactor vessel head. The valves are normally closed. The licensee proposes to relocate the power supplies for all four valves from the control room to the switchgear room. With power removed from the valves at the switchgear room, a control room fire would no longer be capable of producing a hot short which could cause valves to open. Inadvertent opening of the vent valves would create a

leak in the reactor system. The leak would be limited by a flow orifice in the vent discharge line; however, the possibility of unisolatable leakage is undesirable following a control room fire.

With the power removed from the valve operators at the switchgear room, operators would be required to leave the control room to restore power to the valves before they could be operated. The high point vents are not required to operate to mitigate any design basis accident but are required by 10 CFR 50.44 of the Commission's regulations for noncondensible gas removal. Noncondensible gas might accumulate in the high points of the reactor system following a severe accident with multiple failures beyond the design basis. The licensee states that the switchgear room will be accessible after an accident requiring operation of the valves.

Use of the vents is not postulated until during the recovery phase of an accident when core cooling by natural circulation has been restored so that the reactor system can be cooled and depressurized. If a bubble of noncondensible gas were present in the reactor vessel head, the gas could be relieved through the vent lines to prevent its accumulating and entering the steam generators. If the gas entered the steam generators, natural circulation would be retarded. Since use of the vents is not postulated until the recovery period after an accident when core cooling has been restored, and the necessary operator actions are simple (closing four switches), the staff concludes that ample time will be available to restore power to the valves in the vent lines. Once power is restored, the valves can be remotely operated from the control room.

In summary, the proposed TS changes are needed to accommodate the system design changes. To prevent inadvertent operation in the event of a fire, power is to be normally removed from the valve actuator. The valves are required to be otherwise in an OPERABLE condition such that they could be used in the event of an accident. All the vent valves now are directly powered from the emergency bus; thus, the backfeed capability is no longer needed. A surveillance requirement is added to verify the desired power alignment; that is, with the power supply breaker open. Based on the above discussion, the staff concludes that removal of power from the vent valves for normal plant operations is acceptable, and therefore, that the proposed TS changes are acceptable.

4.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes to the 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 issued a proposed finding that this 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.

5.0 CONCLUSION

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 the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ACKNOWLEDGEMENT

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