UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 162 TO FACILITY OPERATING LICENSE NO. DPR-28

VERMONT YANKEE NUCLEAR POWER CORPORATION

VERMONT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-271

1.0 INTRODUCTION

The Vermont Yankee Nuclear Power Station is a boiling water reactor (BWR), model BWR-4, with a Mark I containment. By letter dated June 30, 1998, the Vermont Yankee Nuclear Power Corporation, the licensee for the Vermont Yankee Nuclear Power Plant, submitted for Nuclear Regulatory Commission (NRC) staff review a proposed change to the technical specifications (TS). This change eliminates calibration of the emergency core cooling actuation instrumentation - core spray subsystem and low pressure coolant injection system auxiliary power monitor. As justification for the change, the licensee states that the relays operate from a switched input and functional testing is sufficient to demonstrate the relay pickup/dropout capability.

Specifically, the changes proposed are as follows:

1) T.S. Table 4.2.1 Emergency Core Cooling Actuation Instrumentation - Core Spray System, page 59: Delete the "Auxiliary Power Monitor" function "Refueling Outage" calibration requirement.

2) T.S. Table 4.2.1 Emergency Core Cooling Actuation Instrumentation - Low Pressure Coolant Injection System, page 60: Delete the "Auxiliary Power Monitor" function "Refueling Outage" calibration requirement.

2.0 EVALUATION

The core spray subsystem and low pressure coolant injection subsystem, in conjunction with the high pressure coolant injection and automatic depressurization systems, make up the core standby cooling systems. The objective of the core standby cooling systems, in conjunction with the primary and secondary containments, is to limit the release of radioactive materials to the environment following a loss-of-coolant accident; so that resulting radiation exposures are kept to a practical minimum and are within the guideline values given in 10 CFR 100; and to meet the requirements of 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Reactors."

Two independent loops are provided as part of the core spray (CS) system. Each loop contains one 100% capacity centrifugal water pump driven by an electric motor, a spray sparger in the reactor vessel above the core, and a suction line from the suppression pool. The system automatically initiates on reactor vessel low-low water level with low reactor vessel pressure, primary containment (drywell) high pressure, or sustained low-low reactor vessel water level. When normal ac power is available, the core spray pump in both loops start. When

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normal ac power is not available, each core spray pump starts when its standby power becomes available, with an approximate 10-second time delay to avoid overloading the standby source.

Low pressure coolant injection (LPCI) is an operating mode of the residual heat removal (RHR) system. The four RHR pumps are aligned so two are assigned to inject water from the suppression pool into each recirculation loop. Coolant water is injected through the discharge side of the recirculation loop, through the jet pumps, into the lower plenum of the reactor vessel to flood the core from the bottom. The LPCI system automatically actuates on reactor vessel low-low water level with low reactor vessel pressure, primary containment (drywell) high pressure, or sustained low-low reactor vessel water level. With normal ac power available, all four pumps start simultaneously with no delay. If normal ac power is not available, one pump in each loop starts with no delay as soon as the emergency bus is energized from the standby power source. The second pump in each loop starts after an approximate 5-second time delay.

The safety function of the CS and LPCI auxiliary power monitors is to initiate logic on a Loss of Normal Power (LNP) to provide sequential starting of the RHR and CS pumps on the emergency diesel generators (EDGs). Part of the auxiliary power monitors function is to allow the immediate start of the four RHR and both CS pumps if normal power is available. The only delay is the inherent operating time for the pump auto start relay circuit. If the relay pickup did not occur, the RHR and CS pumps would start in the same sequence as with normal power not available and provide the required cooling for the LOCA condition.

As justification for the proposed change, the licensee stated that the parameter monitored is a switched input and not variable, therefore, for a logic relay, an instrument calibration of the relay pickup voltage setpoint does not provide any additional operability validation. Operability of the CS and LPCI auxiliary power monitor functions is demonstrated through the required functional test and Trip System Logic Test required by TS table 4.2.1 for each function and the Simulated Automatic Actuation Test of specification 4.5.A.1.a. The auxiliary power monitor relay pickup/dropout capability is verified by performance of the functional test and the total circuit is tested under the logic testing performed each refueling outage. The demonstration of the RHR and CS pump instantaneous and delayed starting logic within the times necessary to meet the LOCA analysis of record provides assurance of operability of the auxiliary power monitor function. An instrument calibration is not necessary.

Calibration refers to adjustment of an instrument signal output so that it corresponds, within acceptable range and accuracy, to a known value of the parameter with the instrument monitors. The parameter monitored in this case is a switched input and not variable, therefore, an instrument calibration of the relay pickup voltage setpoint does not provide any useful information on the operability of the component.

The staff agrees that calibration of these auxiliary relays is not needed since the relays operate from a switched input, either on or off, and functional testing required by the TS is adequate to demonstrate the relay pickup/dropout capability. The combination of the functional testing and logic testing which continues to be required by the TS is adequate to demonstrate the operability of these components.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Vermont State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (63 FR 40563). Accordingly, the 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 the amendment.

5.0 CONCLUSION

The Commission 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: September 1, 1998