JUL 16 1984

Docket No. 50-271

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Mr. J. B. Sinclair
Licensing Engineer
Vermont Yankee Nuclear Power Corporation
1671 Worcester Road
Framingham, Massachusetts 01701

Dear Mr. Sinclair:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - MPA F-55 (TMI II.K.3.28) "QUALIFICATION OF ADS ACCUMULATORS" PER 10 CFR 50.54(f)

Re: Vermont Yankee Nuclear Power Station

During the course of our review, your facility was identified as a plant that did not either have sufficient accumulator capacity to ensure that the ADS valves can operate to provide emergency cooling system operation for 100 days following an accident or one for which adequate justification was not provided as to why the accumulator design is acceptable if the 100 day function is not met (see position - II.K. 3.28 - NUREG-0737 dated November 1980). Since you have not provided an adequate response addressing the above stated item, we request, pursuant to 10 CFR 50.54(f), that you provide the information listed in the enclosure. A response to this request is required under oath or affirmation within 45 days of the receipt of this letter.

We will consider your response in determining whether to modify or suspend your license.

The information requested in this letter affects fewer than 10 respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

Original signed by
Darrell G. Eisenhut

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P PDR

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Enclosure:
Request for Additional Information

cc w/enclosures:
See next page

*Please see previous concurrence page.

DL:ORB#2	DL:ORB#2	DL:ORB#2	DL:AD:OR	OELD	DL:DIR
SNorris;jk*	VRooney*	DVassallo*	GLainas*	SBurns*	DEisenhut
06/27/84	06/27/84	06/27/84	06/27/84	07/02/84	07/16/84

Mr. J. B. Sinclair
Vermont Yankee Nuclear Power Corporation
Vermont Yankee Nuclear Power Station

cc:

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Mr. Richard Saudek, Commissioner
Vermont Department of Public Service
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VERMONT YANKEE-DOCKET NO. 50-271

MULTI-PLANT ACTION F-55 OR TMIII.K.3.28
VERIFY QUALIFICATION OF ACCUMULATOR ON ADS VALVES

1) Your letter of December 5, 1983 indicated that the accumulator system was capable of actuating the ADS valves for periods of up to three hours following an accident. Based on the requirements of NUREG-0737 Item II.K.3.28, it is necessary to demonstrate that the ADS valves, accumulators, and associated equipment and instrumentation meet the requirements specified in the plant FSAR and are capable of performing their functions during and following exposure to hostile environments, taking no credit for non-safety-related equipment or instrumentation. Additionally, air (or nitrogen) leakage through the valves must be accounted for to assure that enough inventory of compressed gas is available to cycle the ADS valves. If this cannot be demonstrated, it must be shown that the accumulator design is still acceptable. If reliance on backup systems to recharge the accumulators is necessary for long-term operation (for instance, feed and bleed if shutdown cooling mode of RHR not available) clarify if the backup system is environmentally and seismically qualified or that compensating measures are provided for long-term operation (i.e., procedures for manual action, additional air or nitrogen on hand, hardware for connections readily available or installed, bases that sufficient time exists for the required manual actions). Since this system is a part of the emergency core cooling system, it must function for the long-term period of 100 days following an accident or justification be provided for the time specified for long-term operation.

   You are requested to address in detail: (a) how you meet this long-term capability requirement of 100 days following an accident, or (b) the justification as to why three hours or less is sufficient long-term capability for your plant, or (c) provide a commitment and schedule for upgrading to the 100 day long-term capability requirement.

2) Your letter of December 5, 1983 indicates that the last step in your leakage test procedure (OP 4028) is to return the ADS to service. This would involve the replacement of the accumulator drain plug. You are requested to confirm that the test procedure include a final leak check for this fitting.

   The staff's preliminary assessment supporting the questions above is attached.

PRELIMINARY ASSESSMENT

VERMONT YANKEE - DOCKET NO. 50-271

MULTI-PLANT ACTION F-55
VERIFY QUALIFICATION OF ACCUMULATOR ON ADS VALVES

1.0 Background

Safety analysis reports claim that air or nitrogen accumulators for the automatic depressurization system (ADS) valves are provided with sufficient capacity to cycle the valves open five times at design pressures. GE has also stated that the emergency core cooling (ECC) systems are designed to withstand a hostile environment and still perform their function for 100 days following an accident. Licensees and applicants must demonstrate that the ADS valves, accumulators, and associated equipment and instrumentation meet the requirements specified in the plant's FSAR and are capable of performing their functions during and following exposure to hostile environments, taking no credit for non-safety-related equipment or instrumentation. Additionally, air (or nitrogen) leakage through valves must be accounted for in order to assure that enough inventory of compressed air is available to cycle the ADS valves. If this cannot be demonstrated, it must be shown that the accumulator design is still acceptable.

The commitment to satisfy the requirement of TMI action Item II.K.3.28 for Vermont Yankee is discussed in the licensee's initial submittal dated January 18, 1980, January 25, 1980, and May 15, 1980 and their response to the request for additional information dated December 5, 1983.

2.0 Discussion

At Vermont Yankee, there are four valves in the ADS, each with its own accumulator system. The individual accumulator system consists of a soft seated check valve, a 1.5 gallon accumulator, solenoid valve, and interconnecting piping. These systems are normally fed from a non-safety rated instrument air system which normally takes air from the containment atmosphere. Provision has been made to enable suction from outside of containment to permit continued operation after an accident or line rupture inside containment. There is no backup system to this pneumatic supply and the accumulators were sized to insure a minimum of two valve actuations at 70% of drywell design pressure within a short time of accident or loss of pneumatic supply (10 minutes). According to the licensee letters of May 15, 1981 and December 5, 1983, there is no requirement for long-term (up to 100 days) capability for ADS.

3.0 Demonstration of Qualification

3.1 Number of Actuations

The licensee's letter of December 5, 1983 states that the accumulators are sized and tested so that they will provide a minimum of two actuations of the ADS valves at 70% of containment design pressure. The test procedure

described below insures that this capability is available for three hours following a loss of instrument air supply.

3.2 Leakage Criteria

The minimum pressure required to actuate the ADS valves twice at 70% of containment design pressure is 64 psig. Therefore, the leakage criterion is less than 26 psi in three hours starting from 90 psig. Seismic events and harsh environments should not increase this leakage rate since the accumulator systems are designed for these events.

3.3 Periodic Leak Testing

The licensee has a plant procedure (OP 4028-ADS Air Supply Accumulator Surveillance) which is used to perform leak tests on the accumulator system during each refueling outage. A brief description of this procedure was given in the letter of December 5, 1983 as follows:

- Install a pressure gauge in place of the accumulator drain plug.
- Repressurize the accumulator system and re-isolate it from the compressors.
- Open pipe union upstream of check valve and insure vent path.
- Record time and pressure.
- Acceptance criteria is minimum of 64 psig after three hours.
- Return system to original configuration.

3.4 Seismic and Environmental Qualification

The licensee's letter of December 5, 1983 states that a seismic review was conducted, and a support upgrade was performed in order to insure that the ADS accumulator system is seismically qualified. This includes all piping and components from the check valve to the S/RV solenoids. The letter of January 25, 1980 indicates that the entire containment instrument air system is also Class I seismically qualified. The letter of December 5, 1983 also states that the only components susceptible to damage in a harsh environment are the solenoids and the seats of the check valves. The "ASCO" solenoids used are environmentally qualified for post LOCA and seismic conditions per IEEE-323-1974, IEEE-383-1972, and II-344-1975. The Nupro check valves are designed for 350F service in an accumulated radiation environment of 105 rads.

4.0 Evaluation

4.1 The licensee has defined and verified the number of times the ADS valves are capable of cycling using only the accumulators, and the length of time the accumulators are capable of performing their function following an accident. The staff finds this capability acceptable for the indicated time period only (up to three hours in this case). Long-term capability (up to 100 days) has not been demonstrated.

4.2 A basis for the allowable leakage criteria was provided. Although it would be more conservative to assume an increased leakage rate after a seismic event or an accident, the licensee has examined the effects of these events on the leakage rate and concluded that there will be no increase in the leakage rate. The effect of the possible additional leakage would be to reduce the time indicated in Section 4.1 above.

4.3 The licensee has developed a plant procedure for periodic (each refueling outage) leak testing of the accumulator system. The staff finds the specified period for these tests acceptable. The method is acceptable for determining the leakage rate of the accumulator system. However the final step, returning the system to service, should be expanded to include a leakage check of the final connection made (replacement of drain plug). The licensee should confirm that this final leakage check is included in the leak test procedure.

4.4 The licensee has provided statements acceptable to the staff confirming the following:

1. That the ADS valves, accumulators, and piping out to and including the isolation check valve are seismically and environmentally qualified.

2. That the accumulators and associated equipment are capable of performing their functions during and following an accident situation, while taking no credit for non-safety related equipment and instrumentation.

5.0 Conclusions

Based on the evaluations given in Sections 4.1, 4.2, and 4.4 above, and with the confirmation requested in Section 4.3, the staff concludes that the licensee has verified qualification of accumulators on the ADS valves only for the indicated time period of up to three hours, following an accident. Long-term capability (up to 100 days) has not been demonstrated.