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November 2, 1998
BVY 98-16

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Vermont Yankee Nuclear Power Station
License No. DPR-28 (Docket No. 50-271)
Technical Specification Proposed Change No. 197
Revision to Emergency Core Cooling System Actuation Instrumentation Table
3.2.1 for: Low Pressure Coolant Injection and Core Spray Systems

In accordance with 10 CFR 50.90, Vermont Yankee Nuclear Power Corporation (VYNPC) requests that Appendix A of the Facility Operating License be amended to modify the Vermont Yankee Technical Specifications to more clearly describe the Emergency Core Cooling System Actuation Instrumentation - Low Pressure Coolant Injection System A/B RHR Pump Start time delay requirements and the Core Spray System A/B Pump Start time delay requirements.

VYNPC has determined that the proposed license amendment does not involve a significant hazards consideration pursuant to 10 CFR 50.92. A description of the amendment request is provided in Attachment 1. The no significant hazards determination in support of the proposed Technical Specification change is provided in Attachment 2. Attachment 3 provides the proposed marked up copies of the Technical Specifications pages. Attachment 4 provides the revised new Technical Specification pages.

The proposed license amendment has been reviewed by the Vermont Yankee Plant Operations Review Committee (PORC) and the Nuclear Safety Audit and Review Committee (NSARC).

Should there be any questions pertaining to this request, please contact this office.

Sincerely,

Vermont Yankee Nuclear Power Corporation

Gregory A. Maret
Director of Operations

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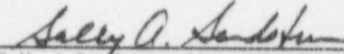
Attachments

cc: USNRC Region 1 Administrator
USNRC Resident Inspector - VYNPS
USNRC Project Manager - VYNPS
VT Department of Public Service



STATE OF VERMONT)
)ss
WINDHAM COUNTY)

Then personally appeared before me, Gregory A. Maret, who, being duly sworn, did state that he is Director of Operations, of Vermont Yankee Nuclear Power Corporation, that he is duly authorized to execute and file the foregoing document in the name and on behalf of Vermont Yankee Nuclear Power Corporation, and that the statements therein are true to the best of his knowledge and belief.



Sally A Sandstrum, Notary Public
My Commission expires February 10, 1999

ATTACHMENT 1

DESCRIPTION OF AMENDMENT REQUEST

This proposed change revises Technical Specifications (TS) to: 1) eliminate the Residual Heat Removal (RHR) Pump A and D time delay function (Trip Level Setting - 0 seconds), 2) provide a lower limit of 3 seconds to the existing ≤ 5 second Trip Level Setting for the RHR Pump B and C start time delay function, 3) provide a lower limit of 8 seconds to the existing ≤ 10 second Trip Level Setting for the Core Spray Pump Start time delay function, and 4) modify the bases of Technical Specification 3.2 to include a discussion of the RHR Pump A through D and Core Spray Pump A and B LOCA start sequences.

Specifically, the changes proposed are as follows:

(1) T.S. Table 3.2.1 Emergency Core Cooling System Actuation Instrumentation - Low Pressure Coolant Injection System A & B, page 39: Delete Trip Function "Time Delay (10A-K51A & B)" and all other associated information for this function.

(2) T.S. Table 3.2.1 Emergency Core Cooling System Actuation Instrumentation - Low Pressure Coolant Injection System A & B, page 39: Add a lower limit to the "Trip Level Setting" for Trip Function "Time Delay (10A-K50A & B)". Revise Trip Level Setting to " $3 \leq t \leq 5$ seconds".

(3) T.S. Table 3.2.1 Emergency Core Cooling System Actuation Instrumentation - Core Spray System A & B, page 38: Add a lower limit to the "Trip Level Setting" for Trip Function "Time Delay (14A-K16A & B)". Revise Trip Level Setting to " $8 \leq t \leq 10$ seconds".

(4) Section 3.2 Bases, page 79: Add a new paragraph following the final paragraph of this page. This paragraph provides a discussion of the RHR Pump A through D and Core Spray Pump A and B LOCA start sequences. The statement reads: "Upon receipt of a LOCA initiation signal, if normal AC power is available, all RHR pumps and both Core Spray pumps start simultaneously with no intentional time delay. If normal AC power is not available, RHR Pumps A and D start immediately on restoration of power, RHR pumps B and C start within 3 to 5 seconds of restoration of power and both Core Spray pumps start within 8 to 10 seconds of restoration of power. The purpose of these time delays is to stagger the start of the RHR and Core Spray pumps on the associated Division 1 and Division 2 Buses, thus limiting the starting transients on the 4 kV emergency buses. The time delay functions are only necessary when power is being supplied from the standby power sources (EDGs). The time delays remain in the pump start logic at all times as the time delay relay contact is in parallel with the Auxiliary Power Monitor relay contact. Either contact closure will initiate pump start. Thus, the time delays do not affect low pressure ECCS pump operation with normal AC power available. With normal AC power not available, the pump start relays which would have started B and C RHR pumps and both Core Spray pumps, are blocked by the Auxiliary Power Monitor relay contacts and the pump start time delay relays become the controlling devices."

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Reason/Bases For Change:

Change (1): Delete Trip Function Time Delay (10A-K51A & B). The start sequence for the RHR pumps in response to an accident signal depends upon the availability of power to the emergency buses. If normal power is available, all RHR pumps start immediately and directly from the accident signal. If normal power is not available, the four RHR pumps will automatically start in a predetermined sequence after the associated Emergency Diesel Generator (EDG) has powered the associated emergency bus. Two pumps will start immediately and two pumps approximately 5 seconds later. The timed starting sequence is provided to prevent overloading of the EDGs. Additional equipment is similarly sequenced on the emergency buses to ensure the EDGs are not overloaded.

The relays that were used in the original plant design to accomplish the predetermined loading sequence for all four RHR pumps used time delay contacts with an adjustable range of 0.2 to 180 seconds (minimum setting of 200 milliseconds). Due to inherent drift, these relays were subsequently changed out with General Electric specified replacement relays (GE SIL 230 R1) which provided an adjustable range of .5 to 15 seconds (minimum setting of 500 milliseconds). The minimum 0.5 second start time was considered conservative (the time was enveloped by the assumptions of the safety analysis of record) even though the time exceeded the Technical Specification Table 3.2.1 specified value of 0 seconds for that start time delay function. This was documented in Vermont Yankee License Event Report LER 96-027. These relays have since been replaced with "instantaneous" logic sequence relays as part of the corrective action for LER 96-027 and the time delay function is no longer applicable.

Change (2): Addition of Lower Limit to Trip Level Setting for Trip Function Time Delay (10A-K50A & B). Technical Specifications Appendix A Table 3.2.1 - LPCI System A&B Time Delay (10A-K50A and B) for the start of the second two RHR Pumps specifies a Trip Level Setting of ≤ 5 seconds. Without a lower limit, the Trip Level Setting of ≤ 5 seconds could allow the time delay to be set too low. The second two RHR pumps could start before the first two pumps have fully started and before EDG voltage and frequency have recovered. Therefore, a lower limit of 3 seconds is being proposed for the Trip Level Setting. The proposed Trip Level Setting of $3 \leq t \leq 5$ seconds has been evaluated in accordance with the Vermont Yankee Instrument Setpoint and Uncertainty Program and validated through EDG testing performed during Integrated ECCS testing.

Change (3): Addition of Lower Limit to Trip Level Setting for Trip Function Time Delay (14A-K16A & B). Technical Specifications Appendix A Table 3.2.1 - Core Spray A&B Time Delay (14A-K16A and B) for the start of the Core Spray Pumps specifies a Trip Level Setting of ≤ 10 seconds. Without a lower limit, the Trip Level Setting of ≤ 10 seconds could allow the time delay to be set too low. The Core Spray pumps could start before the second RHR pumps have fully started and before EDG voltage and frequency have recovered. Therefore, a lower limit of 8 seconds is being proposed for the Trip Level Setting. The proposed Trip Level Setting of $8 \leq t \leq 10$ seconds has been evaluated in accordance with the Vermont Yankee Instrument Setpoint and Uncertainty Program and validated through EDG testing performed during Integrated ECCS testing.

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Change 4: Section 3.2 Bases Addition. A description of the RHR and Core Spray pump start sequence on a LOCA presently does not exist in the Technical Specification Section 3.2 Bases and is being added for clarification. The description details are consistent with the description / bases addressed above.

Safety Considerations

The installation of the "instantaneous" logic sequence relays which actuate in ≤ 35 milliseconds is consistent with the intent of the 0 seconds time delay which existed in VY Technical Specifications since initial issuance. The deletion of the 0 seconds time delay Trip Function is consistent with the methodology existing in Technical Specifications for "instantaneous" logic sequence relays. A separate Trip Function is not listed for instantaneous relays and these relays are functionally tested once/operating cycle under the Trip System Logic Trip Function. The only change is that a calibration will not be required for an instantaneous logic sequence relay.

The addition of the 3 second lower limit to the second RHR Pump Start Time Delay (10A-K50A/B) Trip Level setting is a more restrictive change which ensures a minimum time lapse between the instantaneous start of the first RHR Pump and the sequential start of the second RHR Pump on the associated 4 kV Emergency Bus (powered by the EDG). FSAR Section 8.5 states "For each of the two diesel-driven generators a voltage drop limit of 40% is established as a maximum voltage variation to occur during the starting of any load group shown in the starting sequences of Tables 8.5-1A/B, 8.5.2A/B and 8.5.3A/B." Surveillance testing during the integrated ECCS test demonstrates that EDG output voltage recovers to rated voltage within 3 seconds following the start of each load group. The proposed minimum 3 second delay is bypassed when normal power is available.

The addition of the 8 second lower limit to the Core Spray Pump Start Time Delay (14A-K16A/B) Trip Level setting is a more restrictive change which ensures a minimum time lapse between the B and C RHR Pump start and the sequential start of the Core Spray Pump on the associated 4 kV Emergency Bus (powered by the EDG). The acceptability of the voltage drop at the time when the Core Spray pumps are started was discussed in the previous paragraph. The proposed minimum 8 second delay is bypassed when normal power is available.

The VY FSAR Section 6.5, entitled Safety Evaluation, Table 6.5.3 describes the operating characteristics assumed for Low Pressure Coolant Injection (LPCI) and Core Spray (CS) in the performance of VY Emergency Core Cooling System (ECCS) acceptance criteria verification per 10CFR50.46. This table specifies a parameter for a maximum allowable time from initiating signal to pump at rated speed and capable of rated flow (including EDG start time) of 28.1 seconds for the LPCI system (RHR pump). Credit is not taken for the initial RHR pump start. The maximum allowable time from initiating signal to pump at rated speed and capable of rated flow (including EDG start time) for the Core Spray System is specified as 33.1 seconds.

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Removal of the 0 second first RHR Pump Start Time Delay Trip Function (10A-K51A/B) and the addition of the lower limit (3 seconds) on the second RHR Pump Start Time Delay Trip Function (10A-K50A/B) and the addition of the lower limit (8 seconds) on the CS Pump Start Time Delay Function (14A-K16A/B) are bounded by the FSAR Section 6.5 evaluation and the current Vermont Yankee (SAFER/GESTR) LOCA analysis.

There are no additional safety considerations required for the changes made to the Technical Specifications Section 3.2 Bases to reflect the associated specification change.

ATTACHMENT 2

NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The standards used to determine that a request for amendment involves no significant hazards are included in 10 CFR 50.92 of the Commission's rules and regulations. These standards state that operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. The discussion below addresses each of these criteria and demonstrates that the proposed amendment does not constitute a significant hazard.

Change #1: Deletion of the 0 second Time Delay for First RHR Pump (A/D) Start

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated:

The proposed change does not involve a change to the plant design or operation. The instantaneous relays installed under corrective actions of LER 96-027 were evaluated as being equivalent in meeting the plant design of a 0 second time delay (instantaneous start) and an improvement on the minimum 500 millisecond time delay relays previously installed. The intent is to get LPCI flow started as soon as possible within the limits of the emergency bus power supply. The instantaneous start provides for a faster flow initiation. The proposed change does not affect any of the parameters or conditions that contribute to initiation of any accidents previously evaluated. Therefore, the proposed change cannot increase the probability of an accident previously evaluated.

The proposed change does not involve a change in the operation of the relay controlling the initial RHR pump start on a LOCA with normal AC power not available. The instantaneous logic sequence relay functions to start the initial RHR Pump within 35 milliseconds of re-energization of the associated Emergency Bus. This start time is consistent with the plant safety analysis and EDG load analysis, therefore, the proposed change does not significantly increase the consequences of any accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any previously evaluated:

This proposed change will not involve any physical changes to plant structures, systems or components (SSC), or the manner in which these SSCs are operated or maintained. Deletion of the 0 second Time Delay Trip Function and associated calibration requirement will not affect initial RHR pump starting on a LOCA signal with normal AC power not available. The instantaneous logic sequence relay will still be tested under the Trip System Logic Functional Test at a frequency of once per operating cycle. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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3. The proposed amendment will not involve a significant reduction in the margin of safety.

This proposed change to delete the 0 second Time Delay Trip Function and associated calibration requirement will not change operation of the initial RHR Pump start on a LOCA signal with normal power not available. The instantaneous logic sequence relay will function to initiate RHR Pump A/D start within 35 milliseconds of re-energization of the associated Emergency Bus, therefore, water will be delivered as designed. This RHR Pump start time is within the assumptions of the LOCA safety analysis of record. Therefore, this change does not involve a significant reduction in a margin of safety.

Change #2: Addition of a 3 second Lower Limit to the Trip Level Setting for the second RHR Pump (B/C) Start Time Delay trip function.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated:

The proposed change does not involve a change to the plant design or operation. The proposed change is more restrictive than existing Technical Specifications for this function. The proposed change limits the low value Trip Level Setting of the time delay relay and thus provides for EDG recovery from the initial RHR Pump (A/D) start. As a result, the proposed change does not affect any of the parameters or conditions that contribute to initiation of any accidents previously evaluated. The equipment will still start within the assumptions of the LOCA safety analysis of record. Thus, the proposed change cannot increase the probability of an accident previously evaluated.

The proposed change ensures that the EDG has sufficient time to recover from the loading of the first RHR pump (A/D) prior to the loading of the second RHR pump (B/C). This load sequencing is experienced during a LOCA with normal AC power not available, thus providing increased reliability. Therefore, the proposed change will not result in a significant change in the consequences of any accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any previously evaluated:

This proposed change will not involve any physical changes to plant systems, structures or components (SSC), or the manner in which these SSCs are intended to be operated or maintained. Addition of the 3 second lower limit on the second RHR Pump (B/C) Start Time Delay Function will ensure that, on a LOCA signal with normal AC power not available, the EDG voltage and frequency will adequately recover prior to the second RHR pump start. The instantaneous logic sequence relay will still be tested under the Trip System Logic Functional Test each Operating Cycle. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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3. The proposed amendment will not involve a significant reduction in the margin of safety.

This proposed change to include a 3 second lower limit to the second RHR Pump Start Time Delay Trip Function will not change operation of the second RHR Pump start on a LOCA signal (without normal power available). The proposed change will ensure sufficient time is available for the EDG to recover from the initial RHR Pump (A/D) start. The proposed second RHR Pump Start Time Delay Trip Level Setting of $3 \leq t \leq 5$ seconds is within the assumptions of the LOCA evaluation and analysis of FSAR Sections 6.5 and 8.5. Therefore, this change does not involve a significant reduction in a margin of safety.

Change #3: Addition of a 8 second Lower Limit to the Trip Level Setting for the Core Spray Pump (A/B) Start Time Delay trip function.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated:

The proposed change does not involve a change to the plant design or operation. The proposed change is more restrictive than existing Technical Specifications for this function. The proposed change limits the low value Trip Level Setting of the time delay relay and thus provides for EDG recovery following the RHR B/C Pump start. As a result, the proposed change does not affect any of the parameters or conditions that contribute to initiation of any accidents previously evaluated. The equipment will still start within the assumptions of the LOCA analysis of record. Thus, the proposed change cannot increase the probability of an accident previously evaluated.

The proposed change ensures that the EDG has sufficient time to recover following the loading of the B/C RHR pump and prior to the loading of the associated Core Spray pump. This load sequencing is experienced during a LOCA without normal power available, thus providing increased reliability. Therefore, the proposed change will not result in a significant change in the consequences of any accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any previously evaluated:

This proposed change will not involve any physical changes to plant structures, systems or components (SSC), or the manner in which these SSCs are intended to be operated or maintained. Addition of the 8 second lower limit on the Core Spray Pump Start Time Delay Trip Function will ensure that, on a LOCA signal (with normal power not available) the EDG voltage and frequency will adequately recover prior to the Core Spray pump start. The Core Spray instantaneous logic sequence relays (normal AC available) and the CS Pump Start Time Delay relays will still be tested under the Trip System Logic Functional Test each Operating Cycle. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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3. The proposed amendment will not involve a significant reduction in the margin of safety.

This proposed change to include a 8 second lower limit to the Core Spray Pump Start Time Delay Trip Function will not change operation of the Core Spray Pump start on a LOCA signal with normal AC power not available. The proposed change will ensure sufficient time is available for the EDG to recover from the previous RHR Pump start. The proposed Core Spray Pump Start Time Delay Trip Level Setting of $8 \leq t \leq 10$ seconds is within the assumptions of the LOCA evaluation and analysis of FSAR Sections 6.5 and 8.5. Therefore, this change does not involve a significant reduction in a margin of safety.

Change #4: Addition of the RHR and Core Spray Pump start sequence (during a LOCA event) to the Section 3.2 Bases

This proposed change provides a description of the RHR and Core Spray Pump start sequence during a LOCA event, with or without normal power available. This proposed change does not change plant design or operation or the manner in which SSCs are maintained, modified, tested or inspected. The proposed Bases description does not change any limits or any analyses previously evaluated. This change is being made consistent with the above changes and does not affect the conclusions reached.

Based on the above discussions, we have determined that no significant hazards as defined in 10CFR50.92 arise from this proposed license amendment.

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ATTACHMENT 3

Marked Up Current Technical Specification Pages