ENCLOSURE 1 TO NYN-90211

PROPOSED TECHNICAL SPECIFICATION CHANGE

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F PDR

EMERGENCY CORE COOLING SYSTEMS

ECCS SUBSYSTEMS - $T_{avg}$ LESS THAN 350°F

ECCS SUBSYSTEMS - $T_{avg}$ EQUAL TO OR LESS THAN 200°F

LIMITING CONDITION FOR OPERATION

3.5.3.2 All Safety Injection pumps shall be inoperable.

APPLICABILITY: MODE 5 ** and MODE 6 ** with the reactor vessel head on.

ACTION:

With a Safety Injection pump OPERABLE, restore all Safety Injection pumps to an inoperable status within 4 hours.

SURVEILLANCE REQUIREMENTS

4.5.3.2 *** All Safety Injection pumps shall be demonstrated inoperable* by verifying that the motor circuit breakers are secured in the open position at least once per 31 days.

*An inoperable pump may be energized for testing or for filling accumulators provided the discharge at the pump has been isolated from the RCS by a closed isolation valve with power removed from the valve operator, or by a manual isolation valve secured in the closed position.

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** A Safety Injection pump may be made operable with its control switch in the 'Pull to Lock' position, when the RCS has a mechanical opening equal to or greater than 18 sq. in. to support operation in a reduced inventory condition.

*** When the Safety Injection pump has been made operable in a reduced inventory condition, the required sized vent opening will be verified daily.

New Hampshire Yankee
December 14, 1990

ENCLOSURE 2 TO NYN-90211

PROPOSED REVISIONS TO
TECHNICAL SPECIFICATION BASES

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

COLD OVERPRESSURE PROTECTION

The Maximum Allowed PORV Setpoint for the Cold Overpressure Mitigation System (COMS) is derived by analysis which models the performance of the COMS assuming various mass input and heat input transients. Operation with a PORV Setpoint less than or equal to the maximum Setpoint ensures that Appendix G criteria will not be violated with consideration for: (1) a maximum pressure overshoot beyond the PORV Setpoint which can occur as a result of time delays in signal processing and valve opening; (2) a 50°F heat transport effect made possible by the geometrical relationship of the RHR suction line and the RCS wide range temperature indicator used for COMS; (3) instrument uncertainties; and (4) single failure. To ensure mass and heat input transients more severe than those assumed cannot occur, Technical Specifications require lock-out of both Safety Injection pumps and all but one centrifugal charging pump while in MODES 4, 5, and 6 with the reactor vessel head installed and disallow start of an RCP if secondary coolant temperature is more than 50°F above reactor coolant temperature. Exceptions to these requirements are acceptable as described below.

Operation above 350°F but less than 375°F with only centrifugal charging pump OPERABLE and no Safety Injection pumps OPERABLE is allowed for up to 4 hours. As shown by analysis, LOCAs occurring at low temperature, low pressure conditions can be successfully mitigated by the operation of a single centrifugal charging pump and a single RHR pump with no credit for accumulator injection. Given the short time duration and the condition of having only one centrifugal charging pump OPERABLE and the probability of a LOCA occurring during this time, the failure of the single centrifugal charging pump is not assumed.

Operation below 350°F but greater than 325°F with all centrifugal charging and Safety Injection pumps OPERABLE is allowed for up to 4 hours. During low pressure, low temperature operation all automatic Safety Injection actuation signals except Containment Pressure - High are blocked. In normal conditions, a single failure of the ESF actuation circuitry will result in the starting of at most one train of Safety Injection (one centrifugal charging pump, and one Safety Injection pump). For temperatures above 325°F, an overpressure event occurring as a result of starting two pumps can be successfully mitigated by operation of both PORVs without exceeding Appendix G limit. Given the short time duration that this condition is allowed and the low probability of ~~a~~ INSERT single failure of a PORV is not assumed. Initiation of both trains of Safety Injection during this 4-hour time frame due to operator error or a single failure occurring during testing of a redundant channel are not considered to be credible accidents.

Operation with all centrifugal charging pumps and both Safety Injection pumps OPERABLE is acceptable when RCS temperature is greater than 350°F, a single PORV has sufficient capacity to relieve the combined flow rate of all

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an event occurring during this interval in conjunction with a single failure of a PORV to open,

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

COLD OVERPRESSURE PROTECTION (Continued)

pumps. Above 350°F two RCPs and all pressure safety valves are required to be OPERABLE. Operation of an RCP eliminates the possibility of a 50°F difference existing between indicated and actual RCS temperature as a result of heat transport effects. Considering instrument uncertainties only, an indicated RCS temperature of 350°F is sufficiently high to allow full RCS pressurization in accordance with Appendix G limitations. Should an overpressure event occur in these conditions, the pressurizer safety valves provide acceptable and redundant overpressure protection.

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The Maximum Allowed PORV Setpoint for the Cold Overpressure Mitigation System will be revised on the basis of the results of examinations of reactor vessel material irradiation surveillance specimens performed as required by 10 CFR Part 50, Appendix H.

3/4.4.10 STRUCTURAL INTEGRITY

The inservice inspection and testing programs for ASME Code Class 1, 2, and 3 components ensure that the structural integrity and operational readiness of these components will be maintained at an acceptable level throughout the life of the plant. These programs are in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g) except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i).

Components of the Reactor Coolant System were designed to provide access to permit inservice inspections in accordance with Section XI of the ASME Boiler and Pressure Vessel Code, 1983 Edition and Addenda through Summer 1983.

3/4.4.11 REACTOR COOLANT SYSTEM VENTS

Reactor Coolant System vents are provided to exhaust noncondensible gases and/or steam from the Reactor Coolant System that could inhibit natural circulation core cooling. The OPERABILITY of least one Reactor Coolant System vent path from the reactor vessel head and the pressurizer steam space ensures that the capability exists to perform this function.

The valve redundancy of the Reactor Coolant System vent paths serves to minimize the probability of inadvertent or irreversible actuation while ensuring that a single failure of a vent valve, power supply, or control system does not prevent isolation of the vent path.

The function, capabilities, and testing requirements of the Reactor Coolant System vents are consistent with the requirements of Item II.B.1 of NUREG-0737, "Clarification of TMI Action Plant Requirements," November 1980.

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When operating below 350° F in Mode 5 or 6, Technical Specification 3.5.3.2 allows one Safety Injection pump to be made OPERABLE to support operation in a reduced inventory condition. Cold overpressure protection in this situation is provided by the mechanical opening in the RCS pressure boundary specified in Technical Specification 3.5.3.2.

BASES

3/4.5.1 ACCUMULATORS

The OPERABILITY of each Reactor Coolant System (RCS) accumulator ensures that a sufficient volume of borated water will be immediately forced into the reactor core through each of the cold legs in the event the RCS pressure falls below the pressure of the accumulators. This initial surge of water into the core provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on accumulator volume, boron concentration, and pressure ensure that the assumptions used for accumulator injection in the safety analysis are met.

The accumulator power-operated isolation valves are considered to be "operating bypasses" in the context of IEEE Std. 279-1971, which requires that bypasses of a protective function be removed automatically whenever permissive conditions are not met. In addition, as these accumulator isolation valves fail to meet single-failure criteria, removal of power to the valves is required.

The limits for operation with an accumulator inoperable for any reason except an isolation valve closed minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional accumulator which may result in unacceptable peak cladding temperatures. If a closed isolation valve cannot be immediately opened, the full capability of one accumulator is not available and prompt action is required to place the reactor in a mode where this capability is not required.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two independent ECCS subsystems ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single-failure consideration. Either subsystem operating in conjunction with the accumulators is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double-ended break of the largest RCS cold-leg pipe downward. In addition, each ECCS subsystem provides long-term core cooling capability in the recirculation mode during the accident recovery period.

With the RCS temperature below 350°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the limited core cooling requirements.

The limitation for a maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps and safety injection pumps except the required OPERABLE charging pump to be inoperable in MODES 4 and 5 and in MODE 6 with the reactor vessel head on provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV or RHR suction relief valve.

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The exception allowing one Safety Injection pump to be made OPERABLE when operating below 350° F in Mode 5 or 6 to support operation in a reduced inventory condition provides additional mass injection capacity to ensure adequate core cooling during certain loss of Residual Heat Removal scenarios. When operating in this configuration, cold overpressure protection is provide by the mechanical vent opening required to be present in the RCS pressure boundary prior to making the pump OPERABLE.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS (Continued)

The Surveillance Requirements provided to ensure OPERABILITY of each component ensures that at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. Surveillance Requirements for throttle valve position stops and flow balance testing provide assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: (1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, (2) provide the proper flow split between injection points in accordance with the assumptions used in the ECCS-LOCA analyses, and (3) provide an acceptable level of total ECCS flow to all injection points equal to or above that assumed in the ECCS-LOCA analyses.

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3/4.5.4 REFUELING WATER STORAGE TANK

The OPERABILITY of the refueling water storage tank (RWST) as part of the ECCS ensures that a sufficient supply of borated water is available for injection by the ECCS in the event of a LOCA. The limits on RWST minimum volume and boron concentration ensure that: (1) sufficient water is available within containment to permit recirculation cooling flow to the core and (2) the reactor will remain subcritical in the cold condition following mixing of the RWST and the RCS water volumes with all control rods inserted except for the most reactive control assembly. These assumptions are consistent with the LOCA analyses.

The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 8.5 and 11.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mecnanical systems and components.

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The Surveillance Requirement to verify the presence of the required mechanical vent opening in the RCS when a Safety Injection pump has been made OPERABLE to support operation in a reduced inventory condition ensures that adequate cold overpressure protection exists in this configuration.

ENCLOSURE 3 TO NYN-90211

Background

NRC Generic Letter 88-17, "Loss of Decay Heat Removal", requires that prior to operating in a reduced inventory condition, at least two available means of adding inventory to the Reactor Coolant System (RCS) be provided in addition to pumps which are part of the normal decay heat removal system. These means are to include at least one high pressure injection pump. Currently, the Seabrook Station Technical Specifications require that all Safety Injection (SI) pumps be inoperable in Mode 5 and in Mode 6 with the reactor vessel head on to preclude RCS mass addition transients which are more severe than that assumed in the design basis for the Cold Overpressure Mitigation System. The proposed changes will allow one SI pump to be made operable when the plant is in either Mode 5 or Mode 6 with the reactor vessel head on when an adequate mechanical venting capability exists to preclude overpressure.

Description of Proposed Changes

The proposed changes revise Technical Specification 3/4.5.3.2 by adding a note to the applicability section of this Technical Specification which will allow a safety injection pump to be made operable with its control switch in the "pull-to-lock" position when the RCS has a mechanical opening of greater than or equal to 18 square inches. Overpressure protection for the reactor vessel Appendix G pressure/temperature limits during this mode of operation is achieved by requiring that the mechanical opening in the RCS pressure boundary exist prior to making the SI pump operable. An additional note is added to Surveillance Requirement 4.5.3.2 requiring that the required vent be verified daily when an SI pump has been made operable in a reduce inventory condition.

Safety Evaluation of Proposed Changes

New Hampshire Yankee has reviewed the proposed changes in accordance with the criteria specified in 10 CFR 50.92 and has determined that the proposed changes would not:

1. Involve a significant increase in the probability or consequences of any accident previously evaluated. The only accident adversely affected by the proposed change is the low temperature overpressurization mass addition transient. The probability of this event is not affected since the operable Safety Injection (SI) pump would only start in response to initiators such as an inadvertent 'S' signal which would start or realign the flow path of the operable Centrifugal Charging pump. The maximum possible flow rate into the Reactor Coolant System (RCS) during the mass addition transient will be increased, however this does not increase the consequences of this type of accident. The consequences of such an event would be mitigated by ensuring that a suitable vent path in the RCS pressure boundary exists prior to making an SI pump operable. This vent will prevent any transient induced pressure increase from exceeding the 10CFR50 Appendix G pressure limit. Additionally, by providing an additional source of reactor vessel inventory, the proposed change reduces the consequences of a malfunction of the Residual Heat Removal (RHR) system.

2. Create the possibility of a new or different kind of accident from any previously evaluated. Allowing a SI pump to be operable in these modes creates the possibility of a more severe mass addition transient than those within the capability of the Cold Overpressure Mitigation System (COMS). The proposed change requirement to provide a vent path prior to making the SI pump operable provides overpressure protection for the Appendix G limit. This prerequisite vent capability prior to allowing one (1) SI pump operable is similar to the existing requirement in Technical Specification 3.4.9.3c to provide an RCS vent of at least 1.58 square inches in the event that neither of the COMS alternate relief valve configurations is available. The opening of a small vent in the RCS pressure boundary to provide overpressure protection is not a new or different approach than that currently used for low temperature overpressure protection and therefore does not create the possibility of a new or different type of accident than any previously evaluated.

3. Involve a significant reduction in a margin of safety. The proposed changes would allow one SI pump to be made operable in Modes 5 and 6 to support operation in a reduced inventory condition, creating the possibility of a mass addition transient more severe than those considered in the COMS design basis. The requirement to provide a suitably sized RCS vent prior to making the SI pump operable will ensure that no violation of Appendix G limits will occur for such an event and no loss of margin of safety for overpressure protection can occur. This provides protection of the reactor vessel Appendix G limit independent of the COMS system. Therefore the proposed changes do not result in a reduction in the margin of safety.