Mr. Martin L. Bowling, Jr.
Recovery Officer - Technical Services
Northeast Nuclear Energy Company
c/o Ms. Patricia A. Loftus
Director - Regulatory Affairs
P. O. Box 128
Waterford, Connecticut 06385

September 2 1998

SUBJECT: ISSUANCE OF AMENDMENT - MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2 (TAC NO. M93362)

Dear Mr. Bowling:

The Commission has issued the enclosed Amendment No. 220 to Facility Operating License No. DPR-65 for the Millstone Nuclear Power Station, Unit No. 2, in response to your application dated August 23, 1995.

The amendment extends the Allowed Outage Time (AOT) for an inoperable Safety Injection Tank (SIT) from 1 hour to 24 hours, unless the SIT is inoperable due to either boron concentration not within its limits or an inoperable water level or nitrogen cover pressure instrument. The change, for these two special cases, extends the AOT for an inoperable SIT to 72 hours. In addition, the completion times and conditions for action statements and the criteria for surveillance requirements are also changed. The supporting TS Bases are updated to reflect the changes.

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by:

Daniel G. McDonald, Jr., Senior Project Manager
Millstone Project Directorate
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

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PDR ADOCK 05000336
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Docket No. 50-336

Enclosures: 1. Amendment No. 220 to DPR-65
2. Safety Evaluation

cc w/encls: See next page

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

September 3, 1998

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Docket No. 50-336

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cc w/encls: See next page

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Unit 2

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Millstone Nuclear Power Station
Unit 2

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

NORTHEAST NUCLEAR ENERGY COMPANY

THE CONNECTICUT LIGHT AND POWER COMPANY

THE WESTERN MASSACHUSETTS ELECTRIC COMPANY

DOCKET NO. 50-336

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 220
License No. DPR-65

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Northeast Nuclear Energy Company, et al. (the licensee) dated August 23, 1995, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

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

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-65 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 220, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of issuance, to be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

William M. Dean, Director
Millstone Project Directorate
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 3, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 220

FACILITY OPERATING LICENSE NO. DPR-65

DOCKET NO. 50-336

Replace the following pages of the Appendix A, Technical Specifications, with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove	Insert
3/4 5-1	3/4 5-1
3/4 5-2	3/4 5-2
B 3/4 5-1	B 3/4 5-1
B 3/4 5-2	B 3/4 5-2
B 3/4 5-2a	B 3/4 5-2a*
B 3/4 5-2b	B 3/4 5-2b*

* overflow page - no change

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

SAFETY INJECTION TANKS (SITs)

LIMITING CONDITION FOR OPERATION

3.5.1 Each reactor coolant system SIT shall be OPERABLE with:

a. The isolation valve open and the power to the valve operator removed,

b. Between 1080 and 1190 cubic feet of borated water,

c. A minimum boron concentration of 1720 PPM, and

d. A nitrogen cover-pressure of between 200 and 250 psig.

APPLICABILITY: MODES 1, 2 and 3*.

ACTION:

a. With one SIT inoperable due to boron concentration not within limits, restore boron concentration to within limits within 72 hours.

b. With one SIT inoperable due solely to inability to verify level or pressure, restore SIT to OPERABLE status within 72 hours.

c. With one SIT inoperable, except as a result of boron concentration not within limits or inoperable level or pressure instrumentation, restore SIT to OPERABLE status within 24 hours.

d. With required ACTION a. or b. or c. and associated Completion Time not met:

   1. Be in MODE 3 within 6 hours, and

   2. Reduce pressurizer pressure to < 1750 psia within 12 hours.

e. With two or more SITs inoperable, immediately enter LCO 3.0.3.

*With pressurizer pressure ≥ 1750 psia.

SURVEILLANCE REQUIREMENTS

4.5.1 Each SIT shall be demonstrated OPERABLE:

a. Verify each SIT isolation valve is fully open at least once per 12 hours.[1]

b. Verify borated water volume in each SIT is ≥ 1080 cubic feet and ≤ 1190 cubic feet at least once per 12 hours.[2]

c. Verify nitrogen cover-pressure in each SIT is ≥ 200 psig and ≤ 250 psig at least once per 12 hours.[3]

d. Verify boron concentration in each SIT is ≥ 1720 ppm at least once per 31 days, and once within 6 hours after each solution volume increase of ≥ 1% of tank volume[4] that is not the result of addition from the refueling water storage tank.

e. Verify that the closing coil in the valve breaker cubicle is removed at least once per 31 days.

f. Verify that the SIT isolation valves open automatically before the Reactor Coolant System pressure exceeds 1750 psia and on a safety injection signal at least once per 18 months.

---

(1) If one SIT is inoperable, <u>except</u> as a result of boron concentration not within limits <u>or</u> inoperable level or pressure instrumentation, surveillance is not applicable to the affected SIT.

(2) If one SIT is inoperable due solely to inoperable water level instrumentation, surveillance is not applicable to the affected SIT.

(3) If one SIT is inoperable due solely to inoperable pressure instrumentation, surveillance is not applicable to affected SIT.

(4) Only required to be performed for affected SIT.

3/4.5.1 SAFETY INJECTION TANKS

The OPERABILITY of each of the RCS SITs 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 SITs. This initial surge of water into the core provides the initial cooling mechanism during large RCS pipe ruptures.

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

If the boron concentration of one SIT is not within limits, it must be returned to within the limits within 72 hours. In this condition, ability to maintain subcriticality or minimum boron precipitation time may be reduced, but the reduced concentration effects on core subcriticality during reflood are minor. Boiling of the ECCS water in the core during reflood concentrates the boron in the saturated liquid that remains in the core. In addition, the volume of the SIT is still available for injection. Since the boron requirements are based on the average boron concentration of the total volume of three SITs, the consequences are less severe than they would be if a SIT were not available for injection. Thus, 72 hours is allowed to return the boron concentration to within limits.

If one SIT is inoperable, for a reason other than boron concentration or the inoperability of water level or pressure channel instrumentation, the SIT must be returned to OPERABLE status within 24 hours. In this condition, the required contents of three SITs cannot be assumed to reach the core during a LOCA as is assumed in Appendix K to 10CFR50.

Reference 1 provides a series of deterministic and probabilistic analysis findings that support 24 hours as being either "risk beneficial" or "risk neutral" in comparison to shorter periods for restoring the SIT to OPERABLE status. Reference 1 discusses recent best-estimate analysis that confirmed that for large-break LOCAs, core melt can be prevented by either operation of one LPSI pump or the operation of one HPSI pump and a single SIT. Reference 1 also discusses plant-specific probabilistic analysis that evaluated the risk-impact of the 24 hour recovery period in comparison to shorter recovery periods.

If the SIT cannot be restored to OPERABLE status within the associated completion time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3

Reference

1 CE NPSD-994, "CEOG Joint Applications Report on Safety Injection Tank AOT/SIT Extension," April 1995.

3/4.5.1 SAFETY INJECTION TANKS (continued)

within 6 hours and pressurizer pressure reduced to < 1750 psia within 12 hours. The allowed completion times are reasonable, based on operating experience, to reach the required plant condition from full power conditions in an orderly manner and without challenging plant systems.

If more than one SIT is inoperable, the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two separate and 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 safety injection tanks 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.

The ECCS leak rate surveillance requirements assure that the leakage rates assumed for the system outside containment during the recirculation phase will not be exceeded.

The Surveillance Requirements provided to ensure OPERABILITY of each component ensures that at a minimum, the assumptions used in the accident analyses are met and that subsystem OPERABILITY is maintained. The purpose of the HPSI and LPSI pumps differential pressure test on recirculation ensures that the pump(s) have not degraded to a point where the accident analysis would be adversely impacted. The actual inputs into the safety analysis for HPSI and LPSI pumps differential pressure (discharge-suction) when running on recirculation are 1209 and 150 psi, respectively. The acceptance criteria in the Technical Specifications were adjusted upward to account for instrument uncertainties and drift.

The purpose of the ECCS throttle valve surveillance requirements is to 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.

Verification of the correct position for the mechanical and/or electrical valve stops can be performed by either of the following methods:

1. Visuallly verify the valve opens to the designated throttled position; or

2. Manually position the valve to the designated throttled position and verify that the valve does not move when the applicable valve control switch is placed to "OPEN."

In MODE 4 the automatic safety injection signal generated by low pressurizer pressure and high containment pressure and the automatic sump recirculation actuation signal generation by low refueling water storage tank level are not required to be OPERABLE. Automatic actuation in MODE 4 is not required because adequate time is available for plant operators to evaluate plant conditions and respond by manually operating engineered safety features components. Since the manual actuation (trip pushbuttons) portion of the safety injection and sump recirculation actuation signal generation is required to be OPERABLE in MODE 4, the plant operators can use the manual trip pushbuttons to rapidly position all components to the required accident position. Therefore, the safety injection and sump recirculation actuation trip pushbuttons satisfy the requirement for generation of safety injection and sump recirculation actuation signals in MODE 4.

Only one HPSI pump may be OPERABLE in MODE 4 with RCS temperatures less than or equal to 275°F due to the restricted relief capacity with Low-Temperature Overpressure Protection System. To reduce shutdown risk by having additional pumping capacity readily available, a HPSI pump may be made inoperable but available at short notice by shutting its discharge valve with the key lock on the control panel.

The provision in Specification 3.5.3 that Specifications 3.0.4 and 4.0.4 are not applicable for entry into MODE 4 is provided to allow for connecting the HPSI pump breaker to the respective power supply or to remove the tag and open the discharge valve, and perform the subsequent testing necessary to declare the inoperable HPSI pump OPERABLE. Specification 3.4.9.3 requires all HPSI pumps to be not capable of injecting into the RCS when RCS temperature is at or below 190°F. Once RCS temperature is above 190°F one HPSI pump can be capable of injecting into the RCS. However, sufficient time may not be available to ensure one HPSI pump is OPERABLE prior to entering MODE 4 as required by Specification 3.5.3. Since Specifications 3.0.4 and 4.0.4

prohibit a MODE change in this situation, this exemption will allow Millstone Unit No. 2 to enter MODE 4, take the steps necessary to make the HPSI pump capable of injecting into the RCS, and then declare the pump OPERABLE. If it is necessary to use this exemption during plant heatup, the appropriate action statement of Specification 3.5.3 should be entered as soon as MODE 4 is reached.

3/4.5.4 REFUELING WATER STORAGE TANK (RWST)

The OPERABILITY of the 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) after a LOCA the reactor will remain subcritical in the cold condition following mixing of the RWST and the RCS water volumes. Small break LOCAs assume that all control rods are inserted, except for the control element assembly (CEA) of highest worth, which remains withdrawn from the core. Large break LOCAs assume that all CEAs remain withdrawn from the core. TSCR 2-5-98

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 220

TO FACILITY OPERATING LICENSE NO. DPR-65

NORTHEAST NUCLEAR ENERGY COMPANY

THE CONNECTICUT LIGHT AND POWER COMPANY

THE WESTERN MASSACHUSETTS ELECTRIC COMPANY

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

DOCKET NO. 50-336

1.0 INTRODUCTION

By letter dated August 23, 1995, the Northeast Nuclear Energy Company, et al. (the licensee), submitted a request for changes to the Millstone Nuclear Power Station, Unit No. 2 (MNPS-2) Technical Specifications (TS). Supporting information was provided by the Combustion Engineering Owners Group (CEOG), on June 14, 1995, which was referenced in the licensee's submittal. The requested changes would extend the Allowed Outage Time (AOT) for an inoperable Safety Injection Tank (SIT) from 1 hour to 24 hours, unless the SIT is inoperable due to either boron concentration not within its limits or an inoperable water level or nitrogen cover pressure instrument. The proposed change, for these two special cases, extends the AOT for an inoperable SIT to 72 hours. In addition, changes were proposed for action statement completion times, conditions, and the criteria for surveillance requirements.

Since the mid-1980s, the NRC has been reviewing and granting improvements to TS that are based, at least in part, on probabilistic risk assessment (PRA) insights. In its final policy statement on TS improvements of July 22, 1993 , the NRC stated that it:

> expects that licensees, in preparing their Technical Specification related submittals, will utilize any plant-specific PSA [probabilistic safety assessment][1] or risk survey and any available literature on risk insights and PSAs.... Similarly, the NRC staff will also employ risk insights and PSAs in evaluating Technical Specification related submittals. Further, as a part of the Commission's ongoing program of improving Technical Specifications, it will continue to consider methods to make better use of risk and reliability information for defining future generic Technical Specification requirements.

[1] PSA and PRA are used interchangeably herein.

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The NRC restated this point when it issued the revision to 10 CFR 50.36, "Technical Specifications," in July 1995 (60 FR 36953). In August 1995, the NRC adopted a final policy statement on the use of PRA methods in nuclear regulatory activities that encouraged greater use of PRA to improve safety decision making and regulatory efficiency (60 FR 42622). The PRA policy statement, which expanded its previous position, included the following points:

1. The use of PRA technology should be increased in all regulatory matters to the extent supported by the state of the art in PRA methods and data and in a manner that complements the NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy.

2. PRA and associated analyses (e.g., sensitivity studies, uncertainty analyses, and importance measures) should be used in regulatory matters, where practical within the bounds of the state of the art, to reduce unnecessary conservatism associated with current regulatory requirements.

3. PRA evaluations in support of regulatory decisions should be as realistic as practicable and appropriate supporting data should be publicly available for review.

In August 1995, the CEOG submitted several joint application reports for the staff's review. Two of the CEOG joint application reports provided justifications for extensions of the AOTs for SITs and the low pressure safety injection system (LPSI).[2] The justifications for these extensions are based on a balance of probabilistic considerations, traditional engineering considerations, including defense-in-depth, and operating experience. Risk assessments for all of the Combustion Engineering (CE) plants are contained in the joint application reports. The staff first reviewed the reports and then reviewed the licensee's plant-specific amendment request, which incorporated the joint application reports by reference.

Arkansas Nuclear One, Unit 2 (ANO-2) was the lead CE plant for the SIT and LPSI system TS changes. The staff performed an in-depth review of the ANO-2 PRA methodology relating to these changes, as the lead plant for the CEOG. Therefore, a portion of the review of the MNPS-2 amendment request was based on a comparison of its PRA results with those from ANO-2.

In addition, one of the proposed changes would revise TS 3.5.1, "Safety Injection Tanks (SITs)" to incorporate recommendations and suggestions from Generic Letter (GL) 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operations."

2.0 BACKGROUND

The staff evaluated the licensee's proposed changes to the TS AOTs using a combination of traditional engineering analysis, PRA methods, and a review of operating experience. The staff's traditional analysis evaluated the capabilities of the plant to mitigate design basis events with one SIT inoperable. The staff then used insights derived from the use of PRA methods to determine

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[2] CE NPSD-994, "Joint Application Report for Safety Injection Tank AOT/SIT Extension," May 1995, and CE NPSD-1995, Joint Application Report for Low Pressure Safety Injection System AOT Extension," May 1995.

the risk significance of the proposed changes. The results of these evaluations were used in combination by the staff to determine the safety impact of extending the AOTs for one inoperable SIT.

2.1 Proposed Change to an SIT AOT From 1 to 72 Hours When an SIT is Inoperable Due to Inability to Verify Level or Pressure

The NRC issued GL 93-05 on September 27, 1993, and recommended that licensees add a condition to the SIT TS for the case where one SIT is inoperable due to an inoperable water level or pressure channels in which the AOT to restore the SIT to operable status would be 72 hours. GL 93-05 stated that the NRC staff and industry efforts to develop new Standard Technical Specifications (STS), recognized that SIT instrumentation operability was not directly related to the capability of the SITs to perform their safety function. Therefore, surveillance requirements for SIT pressure and level instrumentation were relocated from the new STS to the TS Bases section and the only surveillance that was retained was that surveillance required to confirm that the parameters, which define SIT operability, are within their specified limits. At the time of the development of the STS, the staff did not include a separate condition in the SIT TS for an inoperable SIT due to the inability to verify level or pressure, as was recommended in GL 93-05. However, the staff believes this is appropriate based on the analysis done during the development of NUREG-1366, "Improvements to Technical Specifications Surveillance Requirements," which formed the basis for the issuance of GL 93-05, and the 72-hour time period is acceptable.

2.2 Proposed Change to an SIT AOT From 1 to 24 Hours When an SIT is Inoperable for Other Reasons

Industry operating experience has demonstrated that many of the causes of an inoperable SIT have been diagnosed and corrected within a relatively short period, but one that is often longer than the existing 1-hour AOT. In several cases, the diagnosis of an inoperable SIT has resulted in plant shutdowns.

If a single SIT were to be diagnosed as inoperable for reasons other than boron concentration being outside of limits (which is already addressed as a separate action item with a 72-hour completion time), the current MNPS-2 TS 3.5.1, Action b, allows 1 hour for operators to restore the SIT to operable. If the action is not completed within 1 hour, the plant would have to be placed in Mode 3 and brought to less than 1750 pounds per square inch absolute (psia) within the next 8 hours. The extension of the existing SIT AOT from 1 to 24 hours should provide the licensee with sufficient time in which to diagnose and possibly repair minor SIT system malfunctions at power, thereby averting an unplanned plant shutdown. Since risk analyses demonstrate that the increased risk of operating with a single SIT out of service is negligible, increasing the AOT can be beneficial to plant safety by avoiding unplanned shutdowns associated with an inoperable SIT. Unnecessary plant shutdowns associated with the outage of nonrisk-significant equipment are undesirable because mode changes have the potential to increase the risk above that of steady state operation.

2.3 Traditional Engineering Analysis

The performance of all of the Emergency Core Cooling Systems (ECCS), including the SITs, is calculated in accordance with 10 CFR Part 50, Appendix K, such that the ECCS ensures that the acceptance criteria of 10 CFR 50.46 are satisfied. These criteria were established in order to

define deterministic acceptance criteria that could be used to judge the acceptability of a given ECCS design. The methodology defined in Appendix K conservatively represents loss-of-coolant accident (LOCA) thermohydraulic and hydrodynamic phenomenology to be used in calculating the peak fuel clad temperature. As a result, the methodology may well overstate the minimum equipment requirements needed for adequate response to an event.

3.0 EVALUATION OF TS 3/4.5.1 - SAFETY INJECTION TANKS

The SITs are passive pressure vessels partially filled with borated water and pressurized with a cover gas (nitrogen) to facilitate injection into the reactor vessel during the blowdown phase of a large break LOCA. This action provides inventory to assist in accomplishing the refill stage following blowdown. The SITs also provide reactor coolant system (RCS) makeup for a small break LOCA.

Each SIT is piped into an associated RCS cold leg via an ECCS line also utilized by high pressure safety injection and LPSI. Each SIT is isolated from the RCS during full pressure operations by two check valves that are in series and has a motor-operated isolation valve, normally open and deenergized, which is used to isolate the SIT from the RCS during normal cooldown and depressurization evolutions. In addition, each of the isolation valves receive a safety injection actuation signal to assure that the valves are open. The SIT gas pressure and volume, water volume, and outlet pipe size are designed to allow three of the four SITs to inject the inventory necessary to keep clad temperature and zirconium-water reaction within design assumptions following a design basis LOCA. The design assumes the loss of inventory from one SIT through the LOCA break.

The Limiting Condition of Operation (LCO) 3.5.1 requires that all SITs be operable whenever the plant is in Modes 1, 2, or 3, with pressurizer pressure greater than or equal to 1750 psia. The LCO is based on the assumption that when the plant is in any of these modes of operation, the SITs must be capable of performing the same safety-related function that would be required for a LOCA at full rated thermal power. When the plant is in any of the applicable modes, an SIT is considered operable when the following conditions exist:

- The associated isolation valve is fully open.
- Electric power has been interrupted to the motor for the associated isolation valve.
- Water inventory in the tank is within the assumed band.
- The boric acid concentration of the water inventory of the tank is within the assumed band.
- The nitrogen cover pressure within the tank is within the assumed band.

In the past, a justification for the short AOT for one inoperable SIT has been that the perceived severity of the consequences of not having all SITs available to provide passive injection during a design basis LOCA warranted the severity of the requirement to return an inoperable SIT to operable status within 1 hour or shut down the unit. However, the current 1-hour AOT is based solely on engineering judgment and did not take into consideration a quantitative assessment of risk.

The SIT operational parameters are set by the design basis large break LOCA analysis. Since the SITs are passive devices and provide a limited safety-related function, operability has been restricted to mean that the equipment's initial conditions are within a band supported by 10 CFR

Part 50, Appendix K, design basis analysis. Analytical models of Appendix K to 10 CFR Part 50 are devised so as to overestimate the amount of liquid lost from the break and to underestimate the residual inventory in the reactor vessel lower plenum. Consequently, inventory discharge requirements are conservatively set at a high level. Extending the AOT from 1 to 24 hours for one SIT that is inoperable, for reasons other than boron concentration being outside of limits or the inability to verify level or pressure, will allow time for the licensee to correct minor problems with an SIT. Considering the short time frame that an SIT is allowed to be out of service, the low likelihood of a large break LOCA during this short time frame, and the potential increase in risk associated with plant shutdowns, extending the SIT AOT will allow the design basis defense in depth to be maintained while not significantly affecting the overall safety margins assumed in the MNPS-2 Final Safety Analysis Report.

The current MNPS-2 TS do not differentiate between an SIT that is inoperable due to tank inventory or nitrogen gas pressure discrepancies and an SIT whose inventory or gas pressure cannot be verified due solely to malfunctioning water level instrumentation or pressure instrumentation. Because these instruments provide no safety-related function, it is reasonable to extend the AOT to 72 hours under these conditions since the SIT is available to perform its safety-related function during this time. This proposed change is consistent with the NRC staff's recommendations in GL 93-05.

3.1 PRA Used to Support the Proposed AOT TS Changes

The staff considered a three-tiered approach to evaluate the risk associated with the proposed TS changes. The first tier evaluated the PRA model and the impact of the AOT extensions for the SITs on plant operational risk. The second tier addressed the need to preclude potentially high risk configurations, should additional equipment outages occur during the time when one SIT is out of service. The application of Tier 3 to the proposed SIT AOTs is not necessary because the SIT sequence modeling is relatively independent of other systems.

3.2 Cross Comparison Approach

After completing a detailed evaluation for the tentative approval of SIT AOT extensions for ANO-2, the staff used a cross comparison approach to consider the viability of similar AOT relaxations for other participating CEOG plants, including MNPS-2. The pilot technical evaluation report [3] used in support of the staff's safety evaluation for ANO-2 [4] focused on:

- the process adopted by the CEOG to assess single AOT risk,
- the identification of ANO-2 accident sequences in which credit was taken for SITs and LPSI,

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[3] SCIE-NRC-318-97, "Technical Evaluation of Combustion Engineering Owners Group (CEOG) Joint Application for Safety Injection Tanks and Low Pressure Safety Injection System Allowed Outage Time (AOT) Extension," July 21, 1997.

[4] SECY-97-095, "Probabilistic Risk Assessment Implementation Plan Pilot Application for Risk-Informed Technical Specifications," April 30, 1997.

- independent verification of the single AOT risk [essentially equivalent to incremental conditional core damage probability (ICCDP)[5]], and
- determination of the significance of single AOT risk relative to an acceptance guideline value.

The objective of this cross comparison evaluation is to use insights derived from the ANO-2 plant-specific safety evaluation to examine the validity of the conclusions drawn in the joint submittals. A common methodology was employed by the CEOG to quantify AOT risk and because CE plants generally have similar design characteristics, the staff believes that the findings of the lead pilot plant evaluation is generally applicable to other CE plants. The staff confirmed that differences in the underlying PRA models are chiefly attributed to:

- minor design differences,
- operational differences,
- success criteria assumptions, and
- common cause failure β-factor assumptions.

The cross comparison draws on information contained in the CEOG joint application reports, the licensees' responses to the staff's requests for additional information, the licensees' individual plant examinations (IPEs) performed in response to GL 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities," and the corresponding IPE evaluations performed by the staff.

3.3 Impact of SITs on Tier 1, 2, and 3 Requirements (Risk Measures)

The following factors are chiefly responsible for the differences in SIT AOT risks among the CE plants:

- modeling for success criteria for SITs,
- initiating event frequency assumed for the initiators challenging the SITs, and
- credit for SITs in mitigating medium size LOCAs.

The SIT single AOT risk (or essentially equivalently, ICCDP) for MNPS-2 is very small and below the acceptance guideline value of 5.0E-07, which was in the NRC Draft Guide (DG) -1065, "An Approach for Plant-Specific Risk-Informed Decision making: Technical Specifications," noticed in the Federal Register on June 25, 1997 (62 FR 34321). In addition, the change in the MNPS-2 updated baseline core damage frequency (CDF) due to the SIT AOT changes, as reported in the CEOG joint application report, is very small and remains about 3.41E-05 per year. The CDF of 3.41E-05 is within the acceptance guidelines published in DG-1061, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis," also included in the same Federal Register notice.

In the context of integrated decision making, the acceptance guidelines should not be interpreted as being overly prescriptive. They are intended to provide an indication, in numerical terms, of what is considered acceptable. As such, the numerical acceptance guideline is an approximate

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[5] ICCDP = [(conditional CDF with the subject equipment out of service) - (baseline CDF with nominal expected equipment unavailabilities)] X (duration of single AOT under consideration).

value that provides an indication of the changes that are generally acceptable. Furthermore, the state of knowledge or epistemic uncertainties associated with PRA calculations preclude a definitive decision with respect to the acceptance of a proposed change based purely on the numerical results. The intent in making the comparison of the PRA results with the acceptance guidelines is to demonstrate, with reasonable assurance, that the increase in risk is small and consistent with the intent of the Commission's Safety Goal Policy Statement. The staff believes that the proposed changes to the MNPS-2 SIT AOT TS meets this principle.

The Tier 2 evaluation did not identify the need for any additional constraints or compensatory actions that, if implemented, would avoid or reduce the probability of a risk-significant configuration. Because the SIT sequence modeling is relatively independent of other systems, the staff has determined that the application of a Tier 3 evaluation of the proposed SIT AOTs is not necessary.

3.4 Implementation and Monitoring - AOTs

The staff expects the licensee to implement these TS changes in accordance with the approach previously described. In addition, the licensee has stated through endorsement of the CEOG joint application reports that the maintenance rule (10 CFR 50.65) will be the vehicle that controls the actual equipment maintenance cycle by defining unavailability performance criteria for the SITs. The AOT extensions will allow efficient scheduling of maintenance within the boundaries established by implementing the maintenance rule. The effect of the AOT extensions should be considered if any adverse trends in meeting established performance criteria are identified for the SITs. The maintenance rule will thereby be the vehicle that monitors the effectiveness of the AOT extensions. Application of these implementation and monitoring strategies will help to ensure that the extension of AOTs for the SITs does not degrade operational safety over time and that the risk incurred when an SIT is taken out of service is minimized.

3.5 Action Statement Completion Time and Clarification

As previously noted, the current TS action statement completion time requirement is that the plant must be in Mode 4 within 8 hours when an AOT is exceeded. The licensee proposes to require that the plant be in Mode 3 within 6 hours and less than 1750 psia within 12 hours when the proposed AOTs are exceeded. Also, the licensee proposes to add an action statement for more than one SIT inoperable for added clarification even though the current TS require that the plant be shut down when more than one SIT is inoperable. The proposed additional clarification and associated completion times are consistent with the current guidance and format of the STS for CE plants, NUREG-1432,"Standard Technical Specifications Combustion Engineering Plants," dated September 1992. Since the proposed completion times and action statement are consistent with the SIT design basis and safety-related function, as well as the guidance provided in NUREG-1432, the staff finds these proposed changes acceptable.

3.6 Boron Concentration Clarification

The current TS requirement is to verify the boron concentration whenever the volume in an SIT increases by 1 percent and does not specify a completion time for the verification requirement. The proposed change would not require verification if an SIT volume is increased from the refueling water storage tank (RWST) and would include a 6-hour completion time when verification is required. As noted in NUREG-1366, the boron concentration of the RWST is

greater than or equal to the minimum boron concentration of the SITs. Since there already is a requirement to verify the boron concentration in the RWST, there is no need to duplicate the requirement in the SIT TS. The addition of a completion time, when the verification of the boron concentration is required, provides added clarification and is consistent with NUREG-1432. Thus, the staff finds these proposed changes acceptable

4.0 SUMMARY

The staff has evaluated the licensee's proposed changes to the SIT AOTs for compliance with regulatory requirements as documented in this evaluation and has determined that they are acceptable. This determination is based on the following:

1. The need to maintain reliable safety systems.
2. Consideration of the design basis requirements for the SITs.
3. Staff recommendations contained in GL 93-05 regarding SIT TS requirements.
4. Interface considerations that ensure the risk incurred when an SIT is taken out of service is minimum.
5. Performance monitoring through the maintenance rule to ensure that extension of TS AOTs for SITs does not degrade operational safety over time.

The staff also evaluated the proposed changes and clarifications to the action statements completion times, and the requirements to verify the boron concentration and determined that they are consistent with the SIT design basis, functional requirements, and the current NRC guidance. The proposed TS Bases changes adequately reflect the proposed TS changes.

The staff has concluded that: (1) the AOT for one SIT that is inoperable for the inability to verify level or pressure may be extended to 72 hours; (2) the AOT for one SIT that is inoperable for reasons other than boron concentration not within limits or inability to verify level or pressure may be extended to 24 hours; and (3) the completion times, conditions for action statements, and the criteria for surveillances are consistent with the SIT design basis, functional requirements, current NRC guidance and will have a negligible impact on overall risk. Also, the staff concludes that the TS Bases adequately reflect the changes. Therefore, the proposed changes to MNPS-2 TS 3/4.5.1 and the supporting TS Bases are acceptable.

5.0 STATE CONSULTATION

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

6.0 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 (60 FR 47621 dated September 13, 1995). 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.

7.0 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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