August 12, 2005

Mr. Christopher M. Crane
President and Chief Executive Officer
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 - AMENDMENT RE: MISSED SURVEILLANCE CRITERIA REQUIREMENTS AND ADDITION OF A BASES CONTROL PROGRAM (TAC NO. MC3653)

Dear Mr. Crane:

The Commission has issued the enclosed Amendment No. 256 to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit 1 (TMI-1), in response to your application dated June 24, 2004, as supplemented February 24, 2005.

The amendment revises TMI-1 Technical Specification (TS) 4.0.2 to adopt the provisions of Technical Specification Task Force (TSTF) Traveller TSTF-358, Revision 6, revising the required actions and time constraints regarding missed surveillances. The amendment also includes a new Section 6.18 to the TSs incorporating a Technical Specifications Bases Control Program.

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,

/RA/

Peter S. Tam, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosures: 1. Amendment No. 256 to DPR-50
2. Safety Evaluation

cc w/encls: See next page

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Three Mile Island Nuclear Station, Unit 1

cc:

Site Vice President - Three Mile Island Nuclear Station, Unit 1
AmerGen Energy Company, LLC
P. O. Box 480
Middletown, PA 17057

Senior Vice President - Nuclear Services
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Vice President - Operations, Mid-Atlantic
AmerGen Energy Company, LLC
200 Exelon Way, KSA 3-N
Kennett Square, PA 19348

Vice President - Licensing and Regulatory Affairs
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Chairman
Board of County Commissioners
of Dauphin County
Dauphin County Courthouse
Harrisburg, PA 17120

Chairman
Board of Supervisors
of Londonderry Township
R.D. #1, Geyers Church Road
Middletown, PA 17057

Senior Resident Inspector (TMI-1)
U.S. Nuclear Regulatory Commission
P.O. Box 219
Middletown, PA 17057

Director - Licensing and Regulatory Affairs
AmerGen Energy Company, LLC
200 Exelon Way, KSA 3-E
Kennett Square, PA 19348

Rich Janati, Chief
Division of Nuclear Safety
Bureau of Radiation Protection
Department of Environmental Protection
Rachel Carson State Office Building
P.O. Box 8469
Harrisburg, PA 17105-8469

Plant Manager - Three Mile Island Nuclear Station, Unit 1
AmerGen Energy Company, LLC
P. O. Box 480
Middletown, PA 17057

Regulatory Assurance Manager - Three Mile Island Nuclear Station, Unit 1
AmerGen Energy Company, LLC
P.O. Box 480
Middletown, PA 17057

Ronald Bellamy, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Michael A. Schoppman
Framatome ANP
Suite 705
1911 North Ft. Myer Drive
Rosslyn, VA 22209

Vice President, General Counsel and Secretary
AmerGen Energy Company, LLC
2301 Market Street, S23-1
Philadelphia, PA 19101

Three Mile Island Nuclear Station, Unit 1

cc:

Dr. Judith Johnsrud
National Energy Committee
Sierra Club
433 Orlando Avenue
State College, PA 16803

Eric Epstein
TMI Alert
4100 Hillsdale Road
Harrisburg, PA 17112

Correspondence Control Desk
AmerGen Energy Company, LLC
P.O. Box 160
Kennett Square, PA 19348

Manager Licensing - Three Mile Island Nuclear Station, Unit 1
Exelon Generation Company, LLC
200 Exelon Way, KSA 3-E
Kennett Square, PA 19348

Associate General Counsel
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

AMERGEN ENERGY COMPANY, LLC

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 256
License No. DPR-50

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

   A. The application for amendment by AmerGen Energy Company, LLC (the licensee), dated June 24, 2004, as supplemented February 24, 2005, 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.

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-50 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 256, are hereby incorporated in the license. The AmerGen Energy Company, LLC, shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

\RA by J. Boska

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: August 12, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 256

FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

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

Remove	Insert
v	v
4-1	4-1
4-1a	4-1a
-	4-1b
6-25	6-25
-	6-26

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 256 TO FACILITY OPERATING LICENSE NO. DPR-50

AMERGEN ENERGY COMPANY, LLC

THREE MILE ISLAND NUCLEAR STATION, UNIT 1

DOCKET NO. 50-289

1.0 INTRODUCTION

By application dated June 24, 2004 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML041840123), as supplemented by letter dated February 24, 2005 (Accession No. ML040610523), AmerGen Energy Company, LLC (the licensee), requested changes to the Technical Specifications (TSs) for Three Mile Island Nuclear Station, Unit 1 (TMI-1). The supplement dated February 24, 2005, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* (FR) on March 1, 2005 (70 FR 9987).

The proposed amendment would revise Surveillance Requirement (SR) 4.0.2 to extend the delay period, before entering a Limiting Condition for Operation (LCO), following a missed surveillance. The delay period would be extended from the current limit of "... up to 24 hours or up to the limit of the specified Frequency, whichever is less" to "...up to 24 hours or up to the limit of the specified Frequency, whichever is greater." In addition, the following requirement would be added to SR 4.0.2: "A risk evaluation shall be performed for any Surveillance delayed greater than 24 hours and the risk impact shall be managed."

In addition, the licensee proposed to add a new Section 6.18 to specify requirements for a TS Bases Control Program.

2.0 REGULATORY EVALUATION

The licensee's proposal follows one of the industry's initiatives under the risk-informed technical specification program. The licensee's application references Technical Specification Task Force (TSTF) -358, Revision 6, which incorporates changes made to TSTF-358, Revision 5, made in response to a notice published in the Federal Register (FR) on June 14, 2001 (66 FR 32400), seeking public comment. The licensee stated in its application that it is proposing no variations or deviations from the intent of the TS changes in TSTF-358, Revision 6, or in the NRC staff's model safety evaluation dated June 14, 2001, as modified by the comments and responses published in the FR on September 28, 2001 (66 FR 49714).

In a letter dated November 17, 1999, the Nuclear Energy Institute (NEI) TSTF proposed several changes to the improved Standard Technical Specifications (STS, NUREGs 1430 - 1434) on behalf of the industry. One of the proposed changes, identified as TSTF-358, was a change to STS SR 3.0.3 regarding missed SRs. The proposed change would modify SR 3.0.3 to allow a delay period for a missed SR of 24 hours or up to the surveillance frequency, whichever is longer.

On February 14, 2000, the NRC staff requested that the NEI TSTF modify TSTF-358 to address several questions and comments that the NRC staff had during its initial review of the proposed change. On September 15, 2000, the NEI TSTF submitted Revision 5 to TSTF-358 for review. (Revisions 2 through 4 were only reviewed by the industry and were never submitted for NRC review.) In response to comments resulting from the NRC staff's request for public comments (66 FR 32400, published June 14, 2001), the NEI TSTF submitted Revision 6 to TSTF-358 for review on September 14, 2001. Revision 6 to TSTF-358 was approved by the NRC staff on October 1, 2001 (see letter, W. D. Beckner to A. R. Pietrangelo of NEI, dated October 3, 2001; Accession No. ML012760469).

This safety evaluation (SE) is based on the model SE published in the FR on June 14, 2001 (66 FR 32400). The NRC staff has since then made minor editorial changes to the SE.

The regulations contained in Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36, “Technical specifications,” require that TSs include SRs. SRs are requirements relating to test, calibration, or inspection to ensure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met. The TSs require surveillance tests to be performed periodically (e.g., weekly or monthly). The periodic test interval defined in the TSs is called the surveillance frequency or surveillance interval. The majority of surveillance tests included in the TSs are designed to ensure that standby safety systems will be operable when they are needed to mitigate an accident. By testing these components, failures that may have occurred since the previous test can be detected and corrected.

STS SR 3.0.1 states that SRs shall be met during the MODES or other specified conditions in the applicability for individual LCOs and that failure to perform a surveillance within the specified frequency shall be a failure to meet the LCO, except as provided in STS SR 3.0.3.

The current STS SR 3.0.3 provides that, if it is found that a surveillance test was not performed within its specified frequency, the associated LCO be declared not met (e.g., equipment be declared inoperable) unless the missed surveillance test is completed successfully within 24 hours or within the limit of the specified frequency, whichever is less, from the time it was discovered that the test was not performed. The provisions of STS SR 3.0.3 are based on NRC Generic Letter (GL) 87-09, “Sections 3.0 and 4.0 of the Standard Technical Specification (STS) of the Applicability of Limiting Conditions for Operation and Surveillance Requirements,” dated June 4, 1987.

GL 87-09 was published to address three specific issues with the application of TSs. One of those issues was missed surveillances. The GL states:

> The second problem involves unnecessary shutdowns caused by Specification 4.0.3 when surveillance intervals are inadvertently exceeded. The solution is to clarify the applicability of the Action Requirements, to specify a specific acceptable time limit for completing a missed surveillance in certain circumstances, and to clarify when a missed surveillance constitutes a violation of the Operability Requirements of an LCO. It is overly conservative to assume that systems or components are inoperable when a surveillance has not been performed because the vast majority of surveillances do in fact demonstrate that systems or components are OPERABLE. When a surveillance is missed, it is primarily a question of operability that has not been verified by the performance of a Surveillance Requirement. Because the allowable outage time limits of some Action Requirements do not provide an appropriate time for performing a missed surveillance before Shutdown Requirements apply, *the technical specifications should include a time limit that allows a delay of required actions to permit the performance of the missed surveillance based on consideration of plant conditions, adequate planning, availability of personnel, the time required to perform the surveillance, and, of course, the safety significance of the delay in completing the surveillance.* [Emphasis added] The NRC staff has concluded that 24 hours is an acceptable time limit for completing a missed surveillance when the allowable outage times of the Action Requirements are less than this limit, or when time is needed to obtain a temporary waiver[1] of the Surveillance Requirement.

The proposed change would extend the delay time for declaring the LCO not met and entering the required actions by allowing more time to perform the missed surveillance test. This will be achieved by modifying STS SR 3.0.3 to allow a delay period from 24 hours up to the surveillance frequency, whichever is greater, to perform a missed surveillance prior to having to declare the LCO not met. The change will add a sentence to STS SR 3.0.3 that states, “A risk evaluation shall be performed for any surveillance delayed greater than 24 hours and the risk impact shall be managed.”

The objective of the proposed change is to minimize the impact on plant risk resulting from the performance of a missed surveillance test by allowing flexibility in considering the plant conditions and other plant activities without compromising plant safety. In addition, implementation of the proposed change would reduce the need for the licensee to apply for regulatory relief to delay the performance of missed surveillances.

The basis for establishing the changes to requirements for missed surveillances, as recommended in GL 87-09, continues to apply to the current proposed change to SR 3.0.3. As evidenced by the discussion in GL 87-09, the intent of the change proposed in the GL was to reduce the impact on plant risk resulting from the performance of a missed surveillance test by allowing some flexibility in the performance of missed tests. The delay time of 24 hours was selected using engineering judgment in the absence of suitable tools to determine a delay period on a case-by-case basis. In addition, the NRC staff recognized in GL 87-09 that even a

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[1]The terminology “temporary waiver” was subsequently revised to refer to the practice as “enforcement discretion.”

24-hour delay period would not be sufficient in some cases and licensees would need to seek regulatory relief in those cases.

The recent revision to the Maintenance Rule to establish the requirements in 10 CFR 50.65(a)(4) to assess and manage the increase in risk that may result from maintenance activities provides a framework to allow a more risk-informed approach to addressing missed surveillances. This approach is consistent with the Commission's policy to increase the use of probabilistic risk assessment (PRA) technology in all regulatory matters to the extent supported by the state-of-the-art in PRA methods and data, and continues to support the objectives outlined by the NRC staff in GL 87-09.

The NRC staff believes that the proposed change to STS SR 3.0.3 is appropriate because: (1) the number of missed surveillance tests is a very small fraction of the total number of such tests performed at a nuclear plant each year; (2) the change applies to unintentionally missed surveillance tests and is not intended to be used as an operational convenience to extend surveillance frequencies (as stated in the proposed Bases SR 4.0.2); and (3) missed surveillances will be placed in the licensee's corrective action program.

The NRC staff has determined that the proposed change is applicable to all licensees. In GL 87-09, the NRC staff concluded that the proposed modifications would result in improved TSs for all plants, and no limitations were put on the applicability of the proposed changes. Because the basis for this proposed change is largely the same as for the change proposed in GL 87-09, the NRC staff believes the same broad applicability is appropriate. In addition, every licensee is required to comply with the Maintenance Rule and, therefore, will have implemented programs to comply with 10 CFR 50.65(a)(4) to assess and manage risk associated with maintenance and other operational activities.

3.0 TECHNICAL EVALUATION

The licensee proposed to adopt the wording of TSTF-358. The licensee only proposed minor changes or variations from the TS changes in TSTF-358, or in the NRC staff's model SE published in the FR on June 14, 2001 (66 FR 32400), as modified by the comments and responses published in the FR on September 28, 2001 (66 FR 49714). These variations are administrative or provide clarity and include changes such as replacing "SR 3.0.3" with "TS Section 4.0.2" to conform with TMI-1's custom TS format. In order to conform with NUREG-1433, Revision 2, "Standard Technical Specifications General Electric Plants, BWR/4," Section 5.5.11, the licensee proposed to add a new Section 6.18, "Technical Specifications (TS) Bases Control Program."

Administrative Changes

The licensee has included in its application the addition of a Bases Control Program (new Section 6.18) to the administrative section of the TSs. Prior to the issuance of the STS (NUREG-1433), the control of TS Bases was not clearly defined by either TSs or NRC regulations. The administrative requirements for a Bases Control Program were added to the STS to define a methodology for evaluating changes to and providing updates of the TS Bases. The addition of the TS Bases Control Program for plants that have not adopted the STS will provide the same benefits in terms of defining a methodology for the maintenance of the TS Bases. The licensee has proposed administrative controls that are consistent with the STS

requirements and, therefore, satisfy the condition that was included in the Federal Register Notice for the use of CLIIP for this amendment. The NRC staff finds the addition of the TSs Bases Control Program acceptable.

Incorporation of TSTF-358

This proposed change would revise TS 4.0.2 to allow a delay period from 24 hours up to the surveillance frequency, whichever is greater, to perform a missed surveillance prior to having to declare the LCO not met. The proposed change would also add a sentence to TS 4.0.2 that states, "A risk evaluation shall be performed for any surveillance delayed greater than 24 hours and the risk impact shall be managed."

The proposed change will not allow equipment known to be inoperable to be considered operable until the missed surveillance is performed. If it is known that the missed surveillance could not be met, the existing definition of the LCO (i.e., TS 4.0.1) clarifies that the LCO should be declared not met and the appropriate condition(s) entered. In addition, the Bases for TS 4.0.2 state that the use of the delay period established by TS 4.0.2 is a flexibility which is not intended to be used as an operational convenience to extend surveillance intervals, but only for the performance of missed surveillances.

The modification would also include the addition of text to the Bases for TS 4.0.2 that provides details on how to implement the new requirements. The Bases provide guidance for surveillance frequencies that are not based on time intervals, but are based on specified unit conditions, operating situations, or requirements of regulations. In addition, the Bases state that the licensee is expected to perform any missed surveillance test at the first reasonable opportunity, taking into account appropriate considerations, such as the impact on plant risk and accident analysis assumptions, consideration of unit conditions, planning, availability of personnel, and the time needed to perform the surveillance. The Bases also state that the risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and its implementation guidance, NRC Regulatory Guide (RG) 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants," dated May 2000, and that the missed surveillance should be treated as an emergent condition as discussed in RG 1.182. In addition, the Bases state that the degree of depth and rigor of the evaluation should be commensurate with the importance of the component and that missed surveillances for important components should be analyzed quantitatively. The Bases also state that, if the results of the risk evaluation determine that the risk increase is significant, the evaluation should be used to determine the safest course of action. Finally, the Bases state that all missed surveillances will be placed in the licensee's Corrective Action Program (CAP).

Key elements provided by the licensee to justify the proposed TS change are listed below. These elements were built into the process to ensure that every time a surveillance is missed, the risk will be properly assessed and managed. In addition, such elements facilitate regulatory oversight.

- A risk evaluation shall be performed for any surveillance test delayed longer than 24 hours and the risk impact shall be managed.

- Although the proposed addition of TS 4.0.2 allows an increase of the delay time, the missed surveillance test should be performed at the "first reasonable opportunity."

- The “first reasonable opportunity” will be determined by taking into consideration the risk impact from delaying the surveillance test (including risk from changing plant configurations or shutting the plant down to perform the surveillance, whenever applicable) as well as the impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time needed to perform the surveillance.

- A missed surveillance will be treated as an emergent condition in the same fashion as other unplanned maintenance activities. The risk impact of the condition will be managed through the program in place to implement 10 CFR 50.65(a)(4) and its implementation guidance, RG 1.182.

- A missed surveillance will be placed in the licensee’s CAP, thus providing the NRC staff with a means to verify that the number of missed surveillances continues to be very low.

- The NRC’s operating reactor oversight process will provide the framework for inspectors and other NRC staff to review missed surveillances and assess the licensee’s actions and performance.

The NRC staff finds that a process containing these key elements is appropriate in this case for the following reasons:

- Section 50.65(a)(4) of 10 CFR requires licensees to implement programs to assess and manage increases in risk that may result from planned maintenance activities. This program is suitable to assess and manage the risk impact of missed surveillances, because missed surveillances can be treated as emergent conditions and their risk impact will be assessed and managed in an integrated fashion with concurrent maintenance activities.

- Inspection procedures are in place which will allow the NRC staff to oversee the implementation of Maintenance Rule requirements, including the adequacy of risk assessments performed by licensees for maintenance configurations.

- The number of missed surveillance tests is a very small fraction of the total number of such tests performed at a nuclear plant each year. The proposed change is not intended to be used as an operational convenience to extend surveillance frequencies.

- This process is similar to other improvements that have been made to the TSs that allow the use of a controlled decision-making process by licensees when the process has some high-level regulatory oversight. Two examples of this are the adoption of the Core Operating Limits Report and the Pressure/Temperature Limits Report. In each of these cases, the NRC staff approved the methodology behind the calculation of certain TS parameter limits and then allowed the specific limits to be removed from TSs and controlled by the licensee using the approved methodology. Similarly, for this proposed

change, the NRC staff has already approved guidance that outlines a process for complying with 10 CFR 50.65(a)(4) and, therefore, can allow the licensee to use that guidance to determine the most prudent course of action in the case of a missed surveillance.

The guidance outlining an acceptable process for licensees to assess and manage increases in risk that may result from planned maintenance activities is found in RG 1.182. RG 1.182 endorses a revised Section 11 to NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2, dated February 22, 2000, updated by NEI.

Section 11 of NUMARC 93-01 provides guidance for assessing and managing risk impact resulting from performance of maintenance activities, including guidance for establishing action thresholds based on qualitative and quantitative considerations, as well as risk management actions. The objective of risk management is to control the temporary and aggregate risk increases from maintenance activities such that the plant's average baseline risk is maintained within a minimal range. This is accomplished by using the results of the risk assessment to plan and schedule maintenance such that the risk increases are limited, and to take additional actions beyond routine work controls to address situations where the temporary risk increase is above a certain threshold.

In order to gain additional insights into the proposed change, the NRC staff referred to the regulatory guidance provided in RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," dated July 1998 and in RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated August 1998, although these RGs do not specifically address the type of change in this proposal. RG 1.177 provides the NRC staff's recommendations for utilizing risk information to evaluate changes to nuclear power plant TSs by assessing the impact of such proposed changes on the risk associated with plant operation. The approach documented in RG 1.177 was taken into consideration by the NRC staff in evaluating the risk information provided in support of the proposed TS 4.0.2 which increases the time allowed to perform a missed surveillance.

One portion of the guidance in RG 1.177 includes the assessment of the risk impact of the proposed change for comparison to acceptance guidelines consistent with the Commission's Safety Goal Policy Statement, as documented in RG 1.174. In addition, the approach outlined in the guidance aims at ensuring that the plant risk does not increase unacceptably at any time during the implementation of the proposed change (i.e., during the extended surveillance interval).

Another portion of the guidance addresses the need for identifying risk-significant configurations resulting from maintenance or other operational activities and taking appropriate compensatory measures to avoid such configurations. This type of evaluation is directly addressed by the requirement to perform a risk assessment for missed surveillances delayed longer than 24 hours.

The NRC staff believes that insights from the guidance provided in RGs 1.174 and 1.177 can be used to show how the proposed change is expected to result in, at most, an increase in risk which is small and consistent with the Commission's Safety Goal Policy Statement. The NRC

staff believes that in the majority of the cases of missed surveillances, implementation of the proposed change will result in a risk benefit due to the proposed requirement for the licensee to evaluate the risk impact for missed surveillances that would require a delay of longer than 24 hours.

3.1 Risk Impact of the Proposed Change

The NRC staff made a qualitative assessment of the risk impact of the proposed change for comparison with the intent of the acceptance guidelines documented in RG 1.174, consistent with the Commission's Safety Goal Policy Statement. Such risk impact is measured by the average (yearly) risk change. In addition, the NRC staff took into consideration guidance in RG 1.177 aimed at ensuring that the plant risk does not increase unacceptably at any time during the implementation of the proposed change (i.e., during an extended surveillance interval in this case). The NRC staff's qualitative assessment is summarized below.

3.1.1 Average Risk Impact

The probability that a standby active component, such as a pump or a circuit breaker, will fail when demanded during an accident is based on the assumption that the component fails due to "standby" stresses (i.e., stresses which are present while the component is in standby, such as corrosion, dirt, lack of lubrication). This probability, also called the component's average "unavailability," is used in PRAs and is most frequently calculated by the following equation:

$$q = \frac{1}{2} * \lambda * T$$

where:

q = the component's average unavailability,
λ = the component's failure rate (assumed constant) while in standby, and
T = the interval at which the component is tested for operability.

The average unavailability of a structure, system, or component (SSC), calculated by using the above equation, reflects the potential vulnerability of the component to "standby" stresses. Such vulnerability increases with time between operability checks (tests) assuming corrective action is taken to restore failed components identified by the test. Thus, the risk impact of a missed surveillance is reflected by the increased unavailability of the related SSCs due to the increase of the interval between surveillance tests. If the missed surveillance affects two or more components, some "standby" stresses may impact multiple components. In such a case, the missed surveillance would also increase the average common cause failure (CCF) unavailability of two or more components and this should be addressed in the risk assessment (CCF unavailabilities are calculated by adjusting the single component failure unavailability using standard PRA techniques, such as the beta factor or the Multiple Greek Letter method).

The thresholds of the aggregate risk impacts are based on the permanent change guidelines discussed in RG 1.174. The licensee will be expected to manage the risk from the proposed TS change in conjunction with the risk from other concurrent plant activities to ensure that any

risk increase, in terms of Core Damage Frequency (CDF) and Large Early Release Frequency (LERF), will be small and consistent with the Commission's Safety Goal Policy Statement.

Risk insights from existing PRAs and the low frequency of missed surveillances indicate that the proposed TS change is highly unlikely to lead to a significant increase in the average (yearly) risk, in terms of CDF or LERF. Significant risk increases can occur only under the following conditions:

- The number of missed surveillances is allowed to increase significantly;
- High-risk configurations are allowed (e.g., by allowing certain combinations of multiple missed surveillances and/or outages); and
- Poor risk management of plant operational activities is allowed.

Any of these conditions would be in violation of the assumptions supporting proposed TS 4.0.2 (TS 4.0.2 for TMI-1) and could trigger a review by the NRC of the licensee's actions and performance. The implementation guidance found in the proposed TS 4.0.2 Bases is intended to ensure that such conditions would not occur. Licensees are already required to manage risk associated with online maintenance activities. Furthermore, the addition of missed surveillances (rather rare plant conditions) to the maintenance activities is not expected to increase risk. On the contrary, insights from existing risk assessments indicate that there are plant conditions during which it is preferable and safer not to have to complete missed surveillance tests for some SSCs. Therefore, the proposed TS change will allow the licensee to make informed decisions and take appropriate actions to control risk.

3.1.2 Temporary Risk Impact

In addition to changes in the mean values of CDF and LERF, the incremental conditional core damage probability and the incremental conditional large early release probability are proposed by RG 1.177 as appropriate measures of the increase in probability of core damage and large early release, respectively, during the period of implementation of a proposed TS change (i.e., during the extended surveillance period in the case of a missed surveillance). RG 1.182 provides guidance for controlling temporary risk increases resulting from maintenance activities. Such guidance, which is consistent with guidance provided in RG 1.177, establishes action thresholds based on qualitative and quantitative considerations as well as risk management actions. The NRC staff expects that the licensee will implement this guidance for assessing temporary risk increases from missed surveillances concurrently with maintenance and other operational activities.

Instantaneous and temporary risk increases from a missed surveillance are assessed by considering the time-dependent unavailability, most often calculated by the following equation:

$$q(t) = \lambda * t$$

where:

q(t) = the component's unavailability at time t
λ = the component's failure rate (assumed constant) while in standby, and
t = time from end of surveillance frequency of a missed surveillance test.

If the missed surveillance affects two or more components, some "standby" stresses may impact multiple components. In such a case, the missed surveillance would also increase the time-dependent CCF unavailability of two or more components, and should be addressed in the risk assessment.

Significant temporary risk increases, following a missed surveillance, can occur only under the following conditions:

- High-risk configurations are allowed (e.g., by allowing certain combinations of multiple missed surveillances and/or outages), and

- Poor risk management of plant operation activities is allowed.

Any of these conditions would be in violation of the assumptions supporting proposed TS 4.0.2 and could trigger an NRC review of the licensee's actions and performance. The requirements associated with the proposed change are intended to ensure that such conditions would not occur. Thus, the proposed TS change is not expected to lead to significant temporary risk increases. Following the discovery of an unintentionally missed surveillance, the licensee will have to assess temporary risk increases, qualitatively or quantitatively depending on the importance of the component affected by the missed surveillance, if the surveillance cannot be performed within 24 hours from the time it has been discovered.

3.2 Risk-Informed Configuration Risk Management

RG 1.177 addressed the need for identifying risk significant configurations resulting from maintenance or other operational activities and taking appropriate compensatory measures to avoid such configurations. The objective of such guidance for this review is to ensure that plant safety will be maintained and monitored during the period of an extended surveillance testing interval (associated with an unintentionally missed surveillance). The licensee proposes to use the program in place to implement the Maintenance Rule to identify "high-risk" configurations resulting from missed surveillance tests in conjunction with outages associated with maintenance activities. It is worth noting that the guidance provided in RG 1.177, with regard to the Configuration Risk Management Program, was used as the basis for developing the guidance contained in RG 1.182 for the 10 CFR 50.65(a)(4) provisions of the Maintenance Rule. This provides additional assurance that the proposed process for evaluating the risk impact of missed surveillances is consistent with guidance provided in RG 1.177.

3.3 Quality of PRA

Once a missed surveillance is discovered and the licensee determines that the surveillance cannot be performed within 24 hours, the licensee will have to use a risk assessment to determine the most prudent course of action. The risk assessment can be done qualitatively or quantitatively depending on the importance of the component affected by the missed surveillance (missed surveillances for risk important components should be analyzed

quantitatively). Such a risk assessment will be consistent with the program to implement the Maintenance Rule guidance to assess and account for both aggregate and temporary risk increases associated with "emergent" plant conditions, as well as before undertaking online maintenance or other operational activities.

All licensees must have the capability to assess and manage increases in risk from maintenance activities as required by the Maintenance Rule. Risk assessments performed pursuant to 10 CFR 50.65(a)(4) may use qualitative, quantitative or blended methods. The degree of depth and rigor of the evaluation should be commensurate with the complexity of the proposed configuration to be assessed. Section 11 of NUMARC 93-01 provides guidance for using qualitative, quantitative or blended methods to assess risk. Current inspection programs allow the NRC staff to oversee licensee implementation of 10 CFR 50.65(a)(4) requirements, including the adequacy of pre-maintenance risk assessments performed by licensees.

For the reasons listed below, the NRC staff finds that the same "quality" of PRA or PRA insights used to perform risk assessments pursuant to 10 CFR 50.65(a)(4) is also appropriate when assessing the impact of missed surveillances.

- The number of "emergent" conditions resulting from missed surveillances is very small (in both absolute terms and in comparison to the frequency of "emergent" conditions resulting from equipment failures). The licensee is expected to implement the proposed addition of TS 4.0.2 in a manner that ensures that this statement remains valid.

- A missed surveillance is equivalent to a one-time surveillance frequency extension. Therefore, the risk exposure is limited to the duration of the surveillance frequency extension. Risk increases are small compared to similar increases associated with equipment failures. The average (conditional) risk increase, given a missed surveillance, may be comparable to the risk increase from equipment failures. However, due to the rarity of missed surveillances, the average (yearly) risk increase from missed surveillances is expected to be small compared to the risk increase from equipment failures.

- PRA insights indicate that the risk impact from missed surveillances is significant only for a relatively small set of standby equipment. This equipment, such as auxiliary feedwater, high-pressure injection pumps, and emergency diesel generators, is located outside containment and generally can be easily tested in a short time, if necessary.

- NRC inspection programs allow NRC staff to oversee the implementation of 10 CFR 50.65(a)(4) requirements, including the adequacy of pre-maintenance risk assessments performed by licensees.

3.4 Summary

The NRC staff review finds that the process proposed by the licensee for addressing missed SRs meets Commission guidance for allowing TS changes. Key elements of the proposed change are listed below:

- A risk evaluation shall be performed for any surveillance delayed longer than 24 hours, and the risk impact shall be managed.

- The missed surveillance test should be performed at “the first reasonable opportunity.”

- The “first reasonable opportunity” will be determined by taking into consideration the risk impact from delaying the surveillance test, as well as the impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time needed to perform the surveillance.

- A missed surveillance will be treated as an “emergent” condition in the same fashion as other unplanned maintenance activities. The risk impact of the condition will be managed through the program in place to implement 10 CFR 50.65(a)(4) and its implementation guidance (NRC RG 1.182). Rescheduling of missed surveillances pursuant to RG 1.182 will ensure the necessary provisions for managing the risk impact of performing the surveillance in conjunction with other ongoing plant configuration changes.

- The NRC’s operating reactor oversight process will provide the framework for inspectors and other NRC staff to review missed surveillances and assess the licensee’s actions and performance. Inspection procedures are in place which will allow the NRC staff to oversee the implementation of Maintenance Rule requirements, including the adequacy of pre-maintenance risk assessments performed by licensees.

- A missed surveillance will be placed in the licensee’s CAP, thus providing the NRC staff with a means to verify that the number of missed surveillances continues to be very low.

- The number of missed surveillance tests is a very small fraction of the total number of such tests performed at a nuclear plant each year. The proposed change is not intended to be used as an operational convenience to extend surveillance frequencies.

- This process is similar to other improvements that have been made to the TSs that allow the use of a controlled decision-making process by licensees when the process has some high-level regulatory oversight. Two examples of this are the adoption of the Core Operating Limits Report and the Pressure/Temperature Limits Report. In each of these cases, the NRC staff approved the methodology behind the calculation of certain TS parameter limits and then allowed the specific limits to be removed from TSs and controlled by the licensee using the approved methodology. Similarly, for this proposed change, the NRC staff has already approved guidance that outlines a process for complying with 10 CFR 50.65(a)(4) and, therefore, can allow the licensee to use that guidance to determine the most prudent course of action in the case of a missed surveillance.

For these reasons, the NRC staff finds that the proposed TS change, to be implemented in accordance with the above listed key elements, is acceptable.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a surveillance requirement. The amendment also changes a recordkeeping, reporting, or administrative procedure or requirement. 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 (70 FR 9987). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and (10). 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.

6.0 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.

Principal Contributor: Based on safety evaluation published in 66 FR 32400; plant-specific revision made by T. Tjader and P. Tam

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