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U. S. Nuclear Regulatory Commission
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SUSQUEHANNA STEAM ELECTRIC STATION
PROPOSED AMENDMENT NO. 253 TO LICENSE NPF-14
AND PROPOSED AMENDMENT NO. 218 TO LICENSE
NPF-22: REQUEST FOR ADOPTION OF TSTF-460-A, REV. 0,
"CONTROL ROD SCRAM TIME TEST FREQUENCY" USING
THE CONSOLIDATED LINE ITEM IMPROVEMENT
PROCESS (CLIIP) **Docket No. 50-387**
PLA-5604 **and 50-388**

In accordance with the provisions of Section 50.90 of Title 10 of the Code of Federal Regulations (10CFR), PPL Susquehanna, LLC (PPL) is submitting a request for an amendment to the Technical Specifications (TS) for Susquehanna Steam Electric Station (SSES) Units 1 and 2.

The proposed amendment would revise the TS testing frequency for the surveillance requirement (SR) in TS 3.1.4, "Control Rod Scram Times." These changes are based on TS Task Force (TSTF) change traveler TSTF-460 (Revision 0) that has been approved generically for the boiling water reactor (BWR) Standard TS, NUREG-1433 (BWR/4), by revising the frequency of SR 3.1.4.2, control rod scram time testing, from "120 days cumulative operation in Mode 1" to "200 days cumulative operation in Mode 1." A notice announcing the availability of this proposed TS change using the consolidated line item improvement process was published in the **Federal Register** on August 23, 2004 (69 FR 51864).

This proposed change has been reviewed by the SSES Plant Operations Review Committee and by the Susquehanna Review Committee.

Attachment 1 provides a description of the proposed change and confirmation of applicability. Attachment 2 provides the existing TS pages marked-up to show the proposed change. Attachment 3 provides a regulatory commitment to incorporate the revised acceptance criterion value of 7.5 percent of the control rods in the sample tested into the TS Bases for SSES Unit 1 and Unit 2 in accordance with the Bases Control

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Program described in TS 5.5.10. Attachment 4 provides the corresponding TS Bases pages marked-up for information.

The NRC has previously approved similar amendment requests to the TS for Columbia Generating Station (September 29, 2005), Fermi 2 (October 25, 2005), Cooper Nuclear Station (January 5, 2006), Browns Ferry Nuclear Plant, Units 2 and 3 (January 9, 2006), Pilgrim Nuclear Power Station (November 5, 2007), and Edwin I. Hatch Nuclear Plant, Unit Nos. 1 and 2 (November 26, 2007). The proposed amendment for Susquehanna Steam Electric Station Units 1 and 2 is similar to those approved for these other plants.

PPL requests approval of the proposed License Amendment by January 15, 2009 with the amendment, and regulatory commitment, being implemented within 60 days following approval.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated Commonwealth of Pennsylvania Official.

If you have any questions regarding this submittal, please contact Mr. C. E. Manges at (570) 542-3089.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 7/08

B. T. McKinney

Attachments:

Attachment 1 - Description and Assessment
Attachment 2 - Proposed Technical Specification Changes SSES Units 1 & 2 (Mark-up)
Attachment 3 - Regulatory Commitment
Attachment 4 - Technical Specification Bases (Mark-Up) (For Information)

cc: NRC Region I
Mr. R. R Janati, DEP/BRP
Mr. F. W. Jaxheimer, NRC Sr. Resident Inspector
Mr. B. K. Vaidya, NRC Project Manager

Attachment 1 to PLA-5604

Description and Assessment

DESCRIPTION AND ASSESSMENT

1.0 INTRODUCTION

The proposed license amendment revises the required testing frequency for the surveillance requirement (SR) in Technical Specification (TS) 3.1.4, "Control Rod Scram Times." A notice announcing the availability of this proposed TS change using the consolidated line item improvement process (CLIIP) was published in the **Federal Register** on August 23, 2004 (69 FR 51864).

2.0 PROPOSED CHANGE

These changes are based on TS Task Force (TSTF) change traveler TSTF-460 (Revision 0) that has been approved generically for the boiling water reactor (BWR) Standard TS, NUREG-1433 (BWR/4). The required frequency of SR 3.1.4.2, control rod scram time testing, is changed from "120 days cumulative operation in MODE 1" to "200 days cumulative operation in MODE 1."

3.0 BACKGROUND

The background for this application is adequately addressed by the CLIIP Notice of Availability published on August 23, 2004 (69 FR 51864) and TSTF-460.

4.0 REGULATORY REQUIREMENTS AND GUIDANCE

The applicable regulatory requirements and guidance associated with this application are adequately addressed by the CLIIP Notice of Availability published on August 23, 2004 (69 FR 51864) and TSTF-460.

5.0 TECHNICAL ANALYSIS

PPL Susquehanna, LLC (PPL) has reviewed the safety evaluation (SE) published on August 23, 2004 (69 FR 51864) as part of the CLIIP Notice of Availability. This verification included a review of the NRC staff's SE and the supporting information provided to support TSTF-460. PPL has concluded that the justifications presented in the TSTF proposal and the SE prepared by the NRC staff are applicable to Susquehanna

Steam Electric Station (SSES), Units 1 and 2, and justify this amendment for incorporation of the changes to the SSES, Units 1 and 2 TSs.

As described in the CLIIP model SE, part of the justification for the change in surveillance frequency is the high reliability of the SSES Units 1 and 2 control rod drive systems. As requested in the notice of availability published on August 23, 2004 (69 FR 51864), the historical performance of the control rod drive systems at SSES Units 1 and 2 is as follows:

Scram time testing results from 1993 to early 2008 were reviewed. This data represents at least seven operating cycles for each unit and reflects a combined total of more than 9100 individual control rod scram time tests (>5000 on Unit 1 and >4100 on Unit 2), each measuring the scram time at four insertion positions (Positions 45, 39, 25, and 05). The review determined that three control rods exceeded the "slow" control rod scram time criteria at Position 05 during the evaluated period as a result of control cell interference caused by fuel channel bow. No rods exceeded the criteria at Positions 45, 39, or 25. Further information associated with each failure is provided below.

Control Rod	**Date "Slow"**	**Scram Time to Position 05**
U2 Rod 26-31	March 8, 2003	3.59 seconds
U1 Rod 18-35	October 2, 2005	3.45 seconds
U1 Rod 30-31	April 22, 2007 June 16, 2007	3.52 seconds 4.39 seconds

Each case exceeded the TS "slow" limit of 3.44 seconds to Position 05 specified in LCO 3.1.4, and each was ultimately corrected by addressing the "bowed" fuel channels that were creating the interference condition. As indicated above, Unit 1 Control Rod 30-31 exceeded the "slow" criterion on two occasions. This rod was initially declared "slow" on April 22, 2007 and remained "slow" when tested again on June 16, 2007. This rod was ultimately inserted to Position 00 and declared inoperable on July 14, 2007 based on a projection that the scram time would potentially exceed 6.0 seconds prior to the next scheduled test. An accelerated scram time testing schedule was implemented to trend control rod performance and to ensure continued operability of control rods that were experiencing excessive friction due to channel bow.

In addition to the three control rods that exceeded the "slow" criterion, between 2005 and 2007 (inclusive), nine rods were declared inoperable based upon operational performance resulting from elevated control cell friction that was not sufficient to cause "slow" scram times (i.e., the rod could not be withdrawn, the rod was extremely difficult to insert, or the rod failed the insert stall test). These rods were declared inoperable, not as a result of exceeding any TS criteria, but as a result of conservative, non-TS criteria established in

response to the control cell friction phenomena. These rods were fully inserted to Position 00 and declared inoperable prior to exceeding the "slow" criteria.

During the evaluation period from 1993 to early 2008, no control rod exceeded any scram time testing criteria for a reason other than control cell interference caused by fuel channel bow. Although scram time testing of affected control rods was used to ensure operability in accordance with GE channel bow monitoring recommendations, control cell friction was not identified through the normal scram time surveillance. PPL understands the control cell friction phenomena, and actions have been implemented to eliminate the susceptibility to fuel channel bow interference (i.e., no expected bow of a magnitude that would impact scram times). PPL intentionally delayed the submission of this TS change request until the channel friction corrective actions had been completed. PPL has determined that the three "slow" control rods resulting from channel friction between 2003 and 2007 (inclusive) are not indicative of the current condition of the control cells in the SSES Units 1 and 2 cores, and current and future scram time performance is expected to be consistent with the performance observed prior to the occurrence of fuel channel bow induced control cell interference. The historical database therefore substantiates the highly reliable control rod scram time performance at SSES.

Each performance of TS SR 3.1.4.2 (every 120 days in Mode 1) requires 10 percent of the control rods to be tested. This currently results in five (on the current 24-month cycle) mid-cycle tests within an operating cycle. Therefore, half of the control rods are not tested during these mid-cycle tests, but are only tested after refueling during the initial cycle testing of each of the 185 control rods. As such, the historical test data shows that a substantial population of individual rods meets the scram time requirements with up to 24 months between tests and provides a basis to conclude that the more frequent testing does not provide any conditioning necessary for adequate performance of the control rod scram function. Future reliability of the SSES scram time performance is expected to remain at the historically high levels as a result of implementing the proposed change to the mid-cycle periodic testing frequency. Therefore, an extension from 120 to 200 days in Mode 1, and the associated reduction in the number of rods tested mid-cycle, will not introduce an increased risk of having "slow" control rods.

6.0 COMMITMENTS

As discussed in the CLIIP model SE published in the **Federal Register** on August 23, 2004 (69 FR 51864) for this TS improvement, PPL is making the following regulatory commitment with the understanding that the NRC will include it as a condition for issuance of the requested amendment:

> PPL Susquehanna, LLC will incorporate the revised acceptance criterion value of 7.5 percent into the TS Bases for Susquehanna Steam Electric Station Unit 1 and Unit 2 in accordance with the Bases Control Program described in TS 5.5.10.

7.0 NO SIGNIFICANT HAZARDS DETERMINATION

PPL has reviewed the proposed no significant hazards consideration determination published on August 23, 2004 (69 FR 51864) as part of the CLIIP. PPL has concluded that the proposed determination presented in the notice is applicable to SSES Units 1 and 2 and the evaluation is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

8.0 ENVIRONMENTAL EVALUATION

PPL has reviewed the environmental evaluation included in the model SE published on August 23, 2004 (69 FR 51864) as part of the CLIIP. PPL has concluded that the staff's findings presented in that evaluation are applicable to SSES and the evaluation is hereby incorporated by reference for this application.

9.0 PRECEDENT

This application is being made in accordance with the CLIIP. PPL is not proposing variations or deviations from the TS changes described in TSTF-460 or the NRC staff's model SE published on August 23, 2004 (69 FR 51864).

10.0 REFERENCES

Federal Register Notice: Notice of Availability of Model Application Concerning Technical Specifications Improvement Regarding Revision to the Control Rod Scram Time Testing Frequency in STS 3.1.4, "Control Rod Scram Times" for General Electric Boiling Water Reactors Using the Consolidated Line Item Improvement Process, published August 23, 2004 (69 FR 51864).

Attachment 2 to PLA-5604

Proposed Technical Specification Changes

SSES Units 1 & 2

(Mark-up)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	~~120~~ 200 days cumulative operation in MODE 1
SR 3.1.4.3	Verify each affected control rod scram time is within the limits of Table 3.1.4-1 with any reactor steam dome pressure.	Prior to declaring control rod OPERABLE after work on control rod or CRD System that could affect scram time
SR 3.1.4.4	Verify each affected control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	Prior to exceeding 40% RTP after fuel movement within the affected core cell AND Prior to exceeding 40% RTP after work on control rod or CRD System that could affect scram time

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	~~120~~ 200 days cumulative operation in MODE 1
SR 3.1.4.3	Verify each affected control rod scram time is within the limits of Table 3.1.4-1 with any reactor steam dome pressure.	Prior to declaring control rod OPERABLE after work on control rod or CRD System that could affect scram time
SR 3.1.4.4	Verify each affected control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	Prior to exceeding 40% RTP after fuel movement within the affected core cell AND Prior to exceeding 40% RTP after work on control rod or CRD System that could affect scram time

Attachment 3 to PLA-5604

Regulatory Commitment

REGULATORY COMMITMENT

The following table identifies those actions committed to by PPL Susquehanna, LLC in this document. Any other statements in this submittal are provided for information purposes and are not considered regulatory commitments.

REGULATORY COMMITMENT	Due Date/Event
PPL Susquehanna, LLC will incorporate the revised acceptance criterion value of 7.5 percent into the TS Bases for Susquehanna Steam Electric Station Unit 1 and Unit 2 in accordance with the Bases Control Program described in TS 5.5.10.	To be implemented in conjunction with the implementation of the approved Technical Specification amendment.

Attachment 4 to PLA-5604

Technical Specification Bases

(Mark-Up for Information)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.4.2

Additional testing of a sample of control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. The sample remains representative if no more than ~~20~~7.5% of the control rods in the sample tested are determined to be "slow." With more than ~~20~~7.5% of the sample declared to be "slow" per the criteria in Table 3.1.4-1, additional control rods are tested until this ~~20~~7.5% criterion (e.g., ~~20~~7.5% of the entire sample size) is satisfied, or until the total number of "slow" control rods (throughout the core, from all surveillances) exceeds the LCO limit. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data may have been previously tested in a sample. The ~~120~~200 day Frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle. This Frequency is also reasonable based on the additional Surveillances done on the CRDs at more frequent intervals in accordance with LCO 3.1.3 and LCO 3.1.5, "Control Rod Scram Accumulators."

SR 3.1.4.3

When work that could affect the scram insertion time is performed on a control rod or the CRD System, testing must be done to demonstrate that each affected control rod retains adequate scram performance over the range of applicable reactor pressures from zero to the maximum permissible pressure. The scram testing must be performed once before declaring the control rod OPERABLE. The required scram time testing must demonstrate the affected control rod is still within acceptable limits. The limits for reactor pressures < 800 psig are established based on a high probability of meeting the acceptance criteria at reactor pressures ≥ 800 psig. Limits for ≥ 800 psig are found in Table 3.1.4-1. If testing demonstrates the affected control rod does not meet these limits, but is within the 7-second limit of Table 3.1.4-1, Note 2, the control rod can be declared OPERABLE and "slow."

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.4.2

Additional testing of a sample of control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. The sample remains representative if no more than ~~20~~7.5% of the control rods in the sample tested are determined to be "slow." With more than ~~20~~7.5% of the sample declared to be "slow" per the criteria in Table 3.1.4-1, additional control rods are tested until this ~~20~~7.5% criterion (e.g., ~~20~~7.5% of the entire sample size) is satisfied, or until the total number of "slow" control rods (throughout the core, from all surveillances) exceeds the LCO limit. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data may have been previously tested in a sample. The ~~120~~ 200 day Frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle. This Frequency is also reasonable based on the additional Surveillances done on the CRDs at more frequent intervals in accordance with LCO 3.1.3 and LCO 3.1.5, "Control Rod Scram Accumulators."

SR 3.1.4.3

When work that could affect the scram insertion time is performed on a control rod or the CRD System, testing must be done to demonstrate that each affected control rod retains adequate scram performance over the range of applicable reactor pressures from zero to the maximum permissible pressure. The scram testing must be performed once before declaring the control rod OPERABLE. The required scram time testing must demonstrate the affected control rod is still within acceptable limits. The limits for reactor pressures < 800 psig are established based on a high probability of meeting the acceptance criteria at reactor pressures ≥ 800 psig. Limits for ≥ 800 psig are found in Table 3.1.4-1. If testing demonstrates the affected control rod does not meet these limits, but is within the 7-second limit of Table 3.1.4-1, Note 2, the control rod can be declared OPERABLE and "slow."

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