



# PECO NUCLEAR

A Unit of PECO Energy

10 CFR 50.90

PECO Energy Company  
965 Chesterbrook Boulevard  
Wayne, PA 19087-5691

May 26, 1999

Docket Nos. 50-352  
50-353

License Nos. NPF-39  
NPF-85

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Subject: Limerick Generating Station, Units 1 and 2  
Technical Specifications Change Request No. 99-02-0  
Control Rod Scram Accumulator Testing

Dear Sir/Madam:

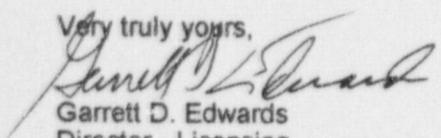
PECO Energy Company is submitting Technical Specifications (TS) Change Request No. 99-02-0, in accordance with 10CFR50.90, requesting an amendment to the TS (Appendix A) for Facility Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2. This proposed TS Change Request involves revising TS Section 4.1.3.5.b to remove and relocate the control rod scram accumulators' alarm instrumentation to the Updated Final Safety Analysis Report (UFSAR), and revising TS Section 3.1.3.5 to allow an alternate method for determining whether a control rod drive pump is operating.

Information supporting this TS Change Request is contained in Attachment 1 to this letter, and the proposed TS pages (including marked-up pages) showing the proposed changes to the LGS, Units 1 and 2, TS are contained in Attachment 2. This information is being submitted under affirmation, and the required affidavit is contained in Attachment 3.

We request that, if approved, the amendments to the LGS, Units 1 and 2, TS be issued by November 30, 1999, and become effective within 30 days of issuance.

If you have any questions, please do not hesitate to contact us.

Very truly yours,

  
Garrett D. Edwards  
Director - Licensing

Attachments

cc: H. J. Miller, Administrator, Region I, USNRC (w/ attachments)  
A. L. Burritt, USNRC Senior Resident Inspector, LGS (w/ attachments)  
R. R. Janati, PA Bureau of Radiological Protection (w/ attachments)

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ATTACHMENT 1

Limerick Generating Station

Units 1 and 2

Docket Nos. 50-352  
50-353

License Nos. NPF-39  
NPF-85

Technical Specifications Change Request  
No. 99-02-0

**"Control Rod Scram Accumulator Testing"**

Supporting Information for Change - 7 Pages

**Limerick Generating Station, Units 1 and 2  
Technical Specifications Change Request No. 99-02-0  
Control Rod Scram Accumulator Testing**

**Subject**

PECO Energy Company, licensee under Facility Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, requests that the Technical Specifications (TS) contained in Appendix A to the Operating Licenses be amended as proposed herein. This proposed TS change request involves revising TS Section 4.1.3.5.b to remove and relocate the control rod scram accumulators' alarm instrumentation to the Updated Final Safety Analysis Report (UFSAR), and revising TS Section 3.1.3.5 to allow an alternate method for determining whether a control rod drive pump is operating.

The proposed changes to the LGS, Units 1 and 2, TS are shown by vertical bars in the margins, as applicable, on the affected TS pages (i.e., pages 3/4 1-9 and 3/4 1-10), and are contained in Attachment 2. Marked-up pages indicating the changes are also contained in Attachment 2.

We request that, if approved, the TS changes proposed herein be issued by November 30, 1999, and become effective within 30 days of issuance.

This TS Change Request provides a discussion and description of the proposed TS changes, a safety assessment of the proposed TS changes, information supporting a finding of No Significant Hazards Consideration, and information supporting an Environmental Assessment.

**Discussion and Description of the Proposed Changes**

This proposed TS Change Request involves revising TS Section 4.1.3.5.b to remove and relocate the control rod scram accumulators' alarm instrumentation to the Updated Final Safety Analysis Report (UFSAR), and revising TS Section 3.1.3.5 to allow an alternate method for determining whether a control rod drive pump is operating. The proposed changes are being requested because the current TS requirements are unnecessarily restrictive and place the unit in a shutdown statement when the Reactor Manual Control System (RMCS), a non safety-related power generation system, becomes temporarily inoperable. These changes are consistent with Improved Standard Technical Specifications (ITS) NUREG 1433, Rev.1 and 10CFR50.36(c)(2)(ii) TS screening criteria requirements.

The proposed TS changes will:

- 1) Remove Surveillance Requirement (SR) 4.1.3.5.b from TS and relocate it to the UFSAR and plant procedures. This proposed change will allow the accumulators to remain operable if the Reactor Manual Control System (RMCS) alarm function becomes inoperable. TS SR 4.1.3.5.b requires control rod scram accumulator leak detector channel functional testing and pressure detector channel calibration once per 24 months.
- 2) Modify Limiting Condition for Operation (LCO) 3.1.3.5.a.2.a) to allow an alternate means for determining whether a Control Rod Drive (CRD) pump is operating. LCO 3.1.3.5.a.2.a) currently requires insertion of at least one withdrawn control rod at least one full notch to demonstrate CRD pump operation when more than one control rod scram accumulator is inoperable. Modification of LCO 3.1.3.5.a.2.a) will add a check of the charging water header pressure instrumentation as an alternate way to verify the operation of at least one CRD pump, if loss of RMCS prevents control rod motion.

**Safety Assessment**

**Change 1:** Remove Surveillance Requirement (SR) 4.1.3.5.b from TS and relocate it to the UFSAR and plant procedures.

Due to the design of the Reactor Manual Control System (RMCS), scram accumulator alarm information is only provided to the control room if RMCS is in operation in the scan mode (monitoring control rod status). If RMCS trips, scram accumulator status is no longer updated, until RMCS is restored. Although RMCS is not a safety-related system, it is used to support TS 3.1.3.5 operability by monitoring the level and pressure instrumentation on the scram accumulators. Loss of RMCS renders the control rod scram accumulator alarm inoperable. Because there is no TS action statement for inoperable scram accumulator alarm instrumentation, the affected accumulators must be declared inoperable, thereby placing the unit in a shutdown action statement.

While not frequent, a temporary loss of RMCS does occasionally occur. RMCS restoration time varies, but in general, it is repaired within a 12 hour time period. However, due to the complexity of RMCS, status and inputs to 185 control rods, electronic logic failures, etc., RMCS restoration may be impractical within the allowable TS LCO time period of 12 hours. RMCS restoration within the allowable 12 hour time period is unnecessarily restrictive, because UFSAR Section 7.7.1.2 states that RMCS is a power generation system and it is classified as a non safety-related system. This proposed change will allow the scram accumulators to remain operable, if RMCS becomes temporarily inoperable.

The control rod drive (CRD) system is described in UFSAR Section 4.6.1. The control rod scram accumulators are part of the CRD system and are provided to ensure that control rods can be inserted under the most unfavorable reactor depressurization condition. The control rod scram accumulator stores sufficient energy to fully insert a control rod at any reactor pressure. At reactor pressures above 600 psig, reactor pressure provides adequate energy to insert the control rod without the assistance of the accumulator.

Operability of the accumulators is determined by verifying that the pressure in each accumulator is greater than or equal to 955 psig. TS 4.1.3.5.a requires weekly verification of accumulator pressure. The local pressure indicator for each accumulator is the normal means of satisfying this surveillance. The 24 month channel functional test of the CRD scram accumulator leak detectors and a channel calibration of the pressure detectors required by TS 4.1.3.5.b ensures that functional and accurate indication of scram accumulator status is provided to the plant operator.

LGS, Units 1 and 2, TS 4.1.3.5 contains surveillance requirements for scram accumulator instruments that serve only an alarm or indication function. The TS, as currently written, requires that the scram accumulator associated with these instruments be declared inoperable if the instrument SR cannot be met; although inoperability of these instruments does not indicate inoperability of the scram accumulator or its associated control rod required by the Limiting Condition for Operation. The proposed TS change will allow the scram accumulator to remain operable if the alarm function becomes inoperable.

10CFR50.36 contains the regulatory requirements related to the content of TS. Evaluation of the scram accumulator instrumentation discussed above against the four TS inclusion criteria in 10CFR50.36(c)(2)(ii), determined that none of the criteria applies to this TS surveillance requirement and it can be relocated for the reasons specified below:

*Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary;*

The subject instruments are used only to detect and indicate scram accumulator pressure and water level.

*Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier;*

The subject instruments serve no active function in an accident or transient.

*Criterion 3: A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier;*

The subject instruments do not have automatic or interlock function to mitigate an accident or transient.

*Criterion 4: A structure, system, or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety;*

Operating experience and the LGS probabilistic safety assessment have not determined these instruments to be significant to public health and safety.

Therefore, the proposed TS surveillance requirement removal and relocation to the UFSAR and plant procedures is acceptable, because the subject alarm or indication-only instrumentation does not meet the 10CFR50.36(c)(2)(ii) criteria as being required to be included in TS.

Furthermore, removal of scram accumulator Surveillance Requirement 4.1.3.5.b from TS and relocation to the UFSAR and plant procedures is consistent with Improved Standard Technical Specifications (ITS) NUREG-1433, Rev. 1. The generic ITS scram accumulator surveillance requirements are limited to verifying indicated accumulator pressure weekly. ITS does not require or specify indication-only or alarm-only instrumentation to be operable to support operability of system or components. Control of the availability of and the necessary compensatory activities if not available, for alarm and/or indication only, are contained in plant procedures.

The maintenance and calibration of the instrumentation for accumulator leakage and pressure detection are unaffected by this proposed change. Upon relocation to the UFSAR, any changes to the testing, calibration or surveillance interval of these instruments will be made in accordance with 10CFR50.59.

**Change 2:** Modify Limiting Condition for Operation (LCO) 3.1.3.5.a.2.a) to allow an alternate means for determining whether a Control Rod Drive (CRD) pump is operating.

The TS action statement, as currently written, requires movement of a withdrawn control rod to demonstrate CRD pump operation when more than one control rod scram accumulator is inoperable. By specifying only one method of verifying control rod drive pump operation within the

TS action statement, other methods of equal validity are prohibited. If a loss of RMCS prevents normal control rod motion, with more than one control rod scram accumulator inoperable, the TS action statement can not be satisfied, thereby placing the unit in a shutdown action statement.

Modification of LCO 3.1.3.5.a.2.a) will allow an alternate method for determining whether a control rod drive pump is operating. The proposed TS action statement modification will add a check of the charging water header pressure instrumentation as an alternate way to verify the operation of at least one CRD pump. Therefore, if loss of RMCS prevents normal control rod motion, a pressure indicator in the control room is available to the operator to provide indication of whether a CRD pump is operating.

With more than one inoperable control rod scram accumulator associated with a withdrawn control rod, the current TS 3.1.3.5 action statement requires verification that at least one control rod drive pump is operating. This must be accomplished immediately by inserting at least one withdrawn control rod at least one full notch. The action statement continues, that if no control rod drive pump is operating and reactor pressure is greater than or equal to 900 psig, at least one control rod drive pump must be restarted within 20 minutes or the reactor mode switch must be placed in the SHUTDOWN position. If reactor pressure is less than or equal to 900 psig, the mode switch must be immediately taken to the SHUTDOWN position.

The 900 psig distinction is made because at high reactor pressures, reactor pressure alone is sufficient to fully insert all control rods within TS and design basis requirements without the assistance of the accumulator. At lower reactor pressures (less than 600 psig per UFSAR Section 4.6.2) this assurance does not exist, hence the requirement to take the mode switch to SHUTDOWN immediately, scrambling all control rods before more accumulators might become inoperable.

This Change Request proposes to add another method for immediate verification of whether a CRD pump is operating. The proposed TS action statement modification will add a check to verify charging water header pressure is in excess of 1400 psig. The alternate method chosen, verifying charging water header pressure, is justifiable because the pressure at that location in the CRD system is truly indicative of the operating condition of the CRD pump.

The pressure in the charging water header is shown in the Main Control Room. The operators are also alerted to a low charging water header pressure condition by the charging water header low pressure alarm. This pressure indicator and its associated instrument loop are powered from a diesel-backed, non-safety related power supply, as is the CRD pump itself. Consequently, if loss of RMCS prevents control rod motion, a pressure indicator and alarm in the Main Control Room is available to the operator to provide indication of whether a CRD pump is operating.

This change request does not alter any of the controls placed on the plant if it is found that no control rod drive pumps are operating, including controlled shutdown or scram. Therefore, the addition of another method for immediate verification of whether a CRD pump is operating is considered acceptable.

Furthermore, verifying charging water header pressure to determine CRD pump operation is consistent with Improved Standard Technical Specifications (ITS) NUREG-1433, Rev. 1. The generic ITS scram accumulator TS specifies checking charging water header pressure. ITS does not specify inserting at least one withdrawn control rod at least one full notch to verify CRD pump operation.

**Information Supporting a Finding of No Significant Hazards Consideration**

We have concluded that the proposed changes to the Limerick Generating Station (LGS), Units 1 and 2, Technical Specifications (TS) revising TS Section 4.1.3.5.b to remove and relocate the control rod scram accumulators' alarm instrumentation to the Updated Final Safety Analysis Report (UFSAR), and revising TS Section 3.1.3.5 to allow an alternate method for determining whether a control rod drive pump is operating, do not involve a Significant Hazards Consideration. In support of this determination, an evaluation of each of the three (3) standards set forth in 10 CFR 50.92 is provided below.

1. The proposed Technical Specifications (TS) changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The first proposed change relocates control rod drive (CRD) instrumentation requirements from the TS to the UFSAR and plant procedures. The second proposed change adds an alternate method for verifying operation of a control rod drive pump in the TS action statement.

Regarding the first proposed change, operability of the accumulators is determined by verifying that the pressure in each accumulator is greater than or equal to 955 psig. TS 4.1.3.5.a requires weekly verification of accumulator pressure. The local pressure indicator for each accumulator is the normal means of satisfying this surveillance. This proposed change does not affect or alter the requirements associated with this instrumentation. If the local pressure indicator is not functioning or pressure is less than 955 psig, the accumulator will still be declared inoperable.

Operability of the accumulator pressure or water level alarm and indication function provided by the Reactor Manual Control System (RMCS) is not critical to the ability to insert control rods because:

- (1) The rods can be inserted with normal charging water pressure if the accumulator is inoperable;
- (2) A controlled shutdown or scram would occur before the accumulator would lose its full capability to insert the control rod, if it is found that no control rod drive pumps are operating according to existing procedural and TS controls placed on the plant; and
- (3) The subject instruments' alarm and indication function are part of routine operational monitoring and are not considered in the plant safety analysis.

The second proposed change simply adds an alternate method for verifying operation of a control rod drive pump. This check provides an equivalent method of verifying that inoperable control rod accumulators were not caused by a control rod drive pump trip. In addition:

- (1) The assumed control rod reactivity insertion rate is not changed;

- (2) The maximum number of inoperable accumulators and control rods is not changed;
- (3) The TS actions to be taken in the event that a control rod drive pump is not operating remain unchanged; and
- (4) The instrumentation for accumulator leakage and pressure detection will continue to be maintained and calibrated.

A RMCS failure does not change the failure modes or the reliability of the control rod function as described and evaluated in the UFSAR. The CRD system will continue to be available to safely shutdown the plant as described and evaluated in the UFSAR.

Therefore, these proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed TS changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Neither the mechanism for initiating nor for carrying out a scram is modified by either of these proposed changes. These proposed changes do not:

- (1) Create a means by which the scram function could be impeded or prevented.
- (2) Involve a physical plant alteration or change the methods governing normal plant operation.
- (3) Impose or eliminate any requirements or change the controls for maintaining the requirements.

There are no other malfunctions that need to be considered since failure of a significant number of control rods to scram is analyzed in Section 15.8 of the UFSAR. This is the bounding analysis for multiple control rod malfunctions or severe degradation of control rod scram performance. This event is mitigated by safety systems not directly related to the CRD system including the scram accumulators.

Therefore, these proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed TS changes do not involve a significant reduction in a margin of safety.

The first proposed change relocates CRD instrumentation requirements from TS to the UFSAR and plant procedures. The proposed change will not reduce a margin of safety, because it has no impact on any safety analysis. Furthermore, since the proposed change is consistent with Improved Standard Technical Specifications (ITS) NUREG-1433, Rev. 1, revising the TS to reflect the approved level of instrumentation requirements ensures no significant reduction in the margin of safety. Additionally, the requirements to be transposed from the TS to the UFSAR and plant procedures are the same as the existing TS. Since any future changes to these requirements in the UFSAR or plant procedures will be evaluated per the requirements of 10CFR50.59, no reduction in a margin of safety will be allowed.

The second proposed change adds an alternate method for verifying operation of a control rod drive pump in the TS action statement. This proposed change does not reduce a margin of safety because the proposed change does not:

- (1) Affect the maximum allowable control rod scram times,
- (2) Change the maximum allowable number or minimum separation of inoperable control rods, or
- (3) Modify any of the instrument setpoints or functions.

The proposed change will either maintain the present margin of safety or increase it, by reducing the need for unnecessary challenges to the Reactor Protection System (RPS) and resulting plant shutdown, while still maintaining the capability to complete a reactor scram.

Therefore, these proposed TS changes do not involve a significant reduction in a margin of safety.

**Information Support:** (a) **Environmental Assessment**

An environmental assessment is not required for the changes proposed by this TS Change Request because the requested changes to the Limerick Generating Station (LGS), Units 1 and 2, Technical Specifications (TS) conform to the criteria for "actions eligible for categorical exclusion," as specified in 10CFR51.22(c)(9). The proposed changes will have no impact on the environment. The proposed changes do not involve a significant hazards consideration as discussed in the preceding section. The proposed changes do not involve a significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed changes do not involve a significant increase in individual or cumulative occupational radiation exposure.

**Conclusion**

The Plant Operations Review Committee and the Nuclear Review Board have reviewed the proposed changes to the Limerick Generating Station (LGS), Units 1 and 2, TS and have concluded that they do not involve an unreviewed safety question, and will not endanger the health and safety of the public.