



# PECO NUCLEAR

A UNIT OF PECO ENERGY

10 CFR 50.90

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

March 29, 1996

Docket Nos. 50-352  
50-353

License Nos. NPF-39  
NPF-85

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

Subject: Limerick Generating Station, Units 1 and 2  
Technical Specifications Change Request No. 96-01-0

Gentlemen:

PECO Energy Company is submitting Technical Specifications (TS) Change Request No. 96-01-0, in accordance with 10 CFR 50.90, requesting an amendment to the TS (Appendix A) of Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively. This proposed TS change involves revising the TS Surveillance Requirement (SR) 4.5.1.d.2.b to delete the requirement to perform functional testing of the Automatic Depressurization System (ADS) valves as part of start-up testing activities.

Currently, the LGS TS require that the ADS safety relief valves (SRVs) undergo manual exercise testing at least every 24-months (i.e., in-situ start-up testing). Performing these tests imposes an unnecessary challenge on these valves and has been linked to valve degradation (e.g., pilot valve and/or main valve leakage) at LGS. The proposed TS change will ensure that the valves will continue to be tested pursuant to the requirements specified in TS 4.0.5, and that each ADS valve is capable of being opened. Operability of the ADS valves is assured through the remaining surveillance tests and inspections that are routinely performed on these valves. This proposed TS change should reduce leakage through these valves, thereby improving their reliability by reducing the potential for spurious valve actuation.

We are requesting an expeditious review of this proposed TS change in order to support an upcoming LGS, Unit 2, mini-outage scheduled to begin on May 12, 1996. Therefore, we request, that, if approved, the amendments to the LGS, Units 1 and 2, TS be issued by May 12, 1996, and become effective within 30 days of issuance.

This TS Change Request is being submitted under affirmation, and the required affidavit is enclosed. In addition, a revised Relief Request (i.e., Relief Request No. 41-VRR-2, Revision 3) to the LGS Inservice Testing (IST) Program is being submitted under separate letter in support of this proposed TS Change Request.

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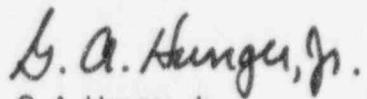
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March 29, 1996  
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If you have any questions or require additional information, please do not hesitate to contact us.

Very truly yours,



G. A. Hunger, Jr.  
Director - Licensing

Attachments  
Enclosure

cc: T. T. Martin, Administrator, Region I, USNRC (w/ attachments, enclosure)  
N. S. Perry, USNRC Senior Resident Inspector, LGS (w/ attachments, enclosure)  
R. R. Janati, Director, PA Bureau of Radiological Protection (w/ attachments, enclosure)

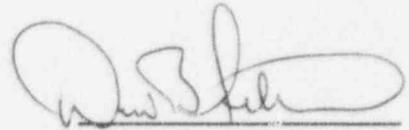
COMMONWEALTH OF PENNSYLVANIA :

: ss.

COUNTY OF CHESTER :

D. B. Fetters, being first duly sworn, deposes and says:

That he is Vice President of PECO Energy Company, the Applicant herein; that he has read the foregoing information supporting Technical Specifications Change Request No. 96-01-0 for Limerick Generating Station, Units 1 and 2, Facility Operating License Nos. NPF-39 and NPF-85, to revise TS Surveillance Requirement (SR) 4.5.1.d.2.b to delete the requirement to conduct functional testing of the Automatic Depressurization System (ADS) valves which is performed during start-up testing activities, and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information, and belief.

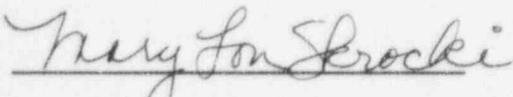


Vice President

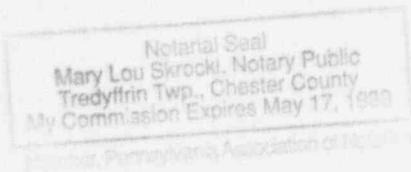
Subscribed and sworn to

before me this 29<sup>th</sup> day

of March 1996.



Notary Public



**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. 96-01-0**

**"Deletion of Automatic Depressurization System Valve Start-Up Testing"**

**Supporting Information for Changes - 8 pages**

PECO Energy Company, Licensee under Facility Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively, requests that the Technical Specifications (TS) contained in Appendix A to the Operating Licenses be amended as proposed herein to revise TS Surveillance Requirement (SR) 4.5.1.d.2.b to delete the requirement to perform in-situ functional testing of the Automatic Depressurization System (ADS) valves once every 24-months as part of start-up testing activities. The proposed change to TS SR is shown on the attached mark-up of TS pages 3/4 5-5 for Units 1 and 2. The TS pages showing the proposed change are contained in Attachment 2.

PECO Energy is requesting an expeditious review of this TS Change Request in order to support an upcoming LGS, Unit 2, mini-outage scheduled to being on May 12, 1996. Therefore, we are requesting that, if approved, the amendments to the TS be issued by May 12, 1996, 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

Currently, Limerick Generating Station (LGS), Units 1 and 2, Technical Specifications (TS) Surveillance Requirement (SR) 4.5.1.d.2.b requires that at least once every 24-months the Automatic Depressurization System (ADS) safety relief valves (SRVs) undergo manual in-situ functional exercise testing as part of start-up testing activities following an outage. This testing is typically performed at 500 psig. This proposed TS change will revise the wording in TS SR 4.5.1.d.2.b to delete requirement to perform the in-situ testing, but will provide a requirement to verify that when the valves are tested pursuant to the requirements of TS Section 4.0.5, which pertains to inservice inspection and testing of American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components, that each ADS valve is capable of being opened.

Performing these tests imposes an unnecessary challenge on these valves and has been linked to valve degradation (e.g., pilot valve and/or main valve leakage) at LGS. The proposed TS change will ensure that the valves will continue to be tested pursuant to the requirements specified in TS 4.0.5, and that each ADS valve is capable of being opened. Operability of the ADS valves is assured through the remaining surveillance tests and inspections that are routinely performed on these valves. This proposed TS change should reduce leakage through these valves, thereby improving their reliability by reducing the potential for spurious valve actuation.

In addition, a revised Relief Request (i.e., Relief Request No. 41-VRR-2, Revision 3) is being submitted under separate letter in support of this proposed TS Change Request. This revision to Relief Request 41-VRR-2 requests relief from the requirements stipulated in Subsections IWV-3412 and IWV-3413 of the ASME, Section XI, Code.

### Safety Assessment

#### System Description

The Automatic Depressurization System (ADS) utilizes five (5) of 14 main steam line safety relief valves (SRVs) to reduce reactor pressure vessel pressure during small pipe breaks, or after containment isolation, in the event that the High Pressure Coolant Injection (HPCI) system and/or the Reactor Core Isolation Cooling (RCIC) system fail to maintain adequate reactor pressure vessel water level. The ADS is independent from any other Emergency Core Cooling System (ECCS), and is designed to reduce

reactor pressure vessel pressure in order to permit the low pressure ECCS (i.e., Low Pressure Coolant Injection (LPCI) and/or Core Spray (CS) systems) to inject water into the reactor vessel in time to cool the core and limit fuel cladding temperature.

The ADS utilizes the following five (5) main steam line SRVs per unit:

<u>Unit 1</u>	<u>Unit 2</u>
PSV-41-1F013E	PSV-41-2F013E
PSV-41-1F013H	PSV-41-2F013H
PSV-41-1F013K	PSV-41-2F013K
PSV-41-1F013M	PSV-41-2F013M
PSV-41-1F013S	PSV-41-2F013S

The five (5) ADS/SRVs are controlled by ECCS logic to automatically open and provide rapid reactor pressure vessel depressurization in order to enable low pressure ECCS cooling. Reactor operators may initiate ADS manually as required by the plant Emergency Operating Procedures (EOPs). These valves, and the remaining nine (9) non-ADS SRVs, are two (2) stage pilot actuated relief valves manufactured by Target Rock Corporation. The nine (9) non-ADS SRVs may also be actuated manually to relieve reactor pressure vessel pressure. All 14 SRVs are designed to be opened by either of the following two (2) methods.

- 1) **Automatically** - Steam pressure above the setpoint pressure overcomes the spring forces on the pilot disc assembly and opens the pilot disc.
- 2) **Manually** - Direct actuation by a pneumatic diaphragm assembly (i.e., auxiliary actuation device) that removes the pilot spring force allowing the pilot disc to open.

The SRVs are designed such that once the pilot valve is opened a force imbalance across the main valve disc piston is created causing the main valve disc to rapidly and reliably open at greater than 50 psig nominal inlet pressure.

All 14 valves are included in the LGS, Units 1 and 2, Inservice Testing (IST) Program developed to ensure compliance with Section IX of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, and are tested in accordance with ASME OM-1, 1981, which provides guidance for testing relief/safety valves, and TS Section 3/4.4.2, "Safety/Relief Valves." This testing requires that 50% of the SRVs be set pressure tested in accordance with manufacturer's recommendations every refuel cycle (i.e., once every 24-months) and that all 14 SRVs are tested at least once per 54-months.

PECO Energy, along with several other utilities, performs this testing on the pilot assembly actuating portion of the SRV which provides the pressure setpoint actuation. This testing is performed off-site at a certified test facility (i.e., Wyle Labs) and is supported, as needed, by the valve manufacturer (i.e., Target Rock Corporation).

PECO Energy also performs additional SRV surveillance testing, which together fulfills the periodic testing requirements stipulated in ASME OM-1, 1981, Section 3.3. The five (5) ADS/SRVs are maintained and tested by PECO Energy as ASME "Class 1 Pressure Relief Valves with Auxiliary Actuating Devices" as stipulated in ASME OM-1, 1981, Sections 3.3.1.1 and 3.4.1.1.

In addition to the required surveillance tests and inspections described above, LGS routinely inspects the SRVs (as recommended by General Electric Co. Service Information Letter (SIL) No. 196, "Summary of Recommendations for Target Rock Main Steam Safety/Relief Valves") refurbishes, and setpoint tests the entire SRV assembly at the certified test facility. This SRV inspection and testing is currently performed on a sampling basis during each fuel cycle as part of routine SRV preventive maintenance and control activities.

#### Valve Performance History

ADS is considered to be one of the most highly reliable Boiling Water Reactor (BWR) Emergency Core Cooling Systems (ECCS). Based on discussions with Target Rock Corporation and utility surveys, there has never been a failure of an ADS valve to open once the pilot valve has opened during in-situ functional testing at any BWR. PECO Energy conducted a survey of other utilities operating BWRs and received confirmatory responses from three (3) utilities other than PECO Energy all of which utilize the 2-stage SRV manufactured by Target Rock Corporation.

Additionally, PECO Energy contacted both Wyle Labs and Target Rock Corporation regarding the SRV main disc failure history. Based on these discussions, failures are considered extremely rare and statistically insignificant. Also, Wyle Labs and Target Rock Corporation do not consider main disc failure to be a generic industry concern. It is important to note that no such failures have occurred with an in-service SRV to date, and the few that have occurred were during limited flow conditions on a test stand. GE and Target Rock Corporation indicated in SIL 196, Supplement 17, "Target Rock SRV Main Disc Spring Relaxation and Tip Breakage," that valve dynamics under full flow conditions (i.e., discharge not gagged) are much less severe than those under limited flow conditions. Under full flow conditions, flow forces and discharge backpressure slow the opening of the main valve disc. Valve opening under full flow conditions is thought to contribute less significantly to spring relaxation.

Both units at LGS have experienced instances of SRV leakage and have instituted leakage monitoring action plans through the measurement of SRV tail pipe temperatures. Tail pipe temperature "Alert" and "Action" levels have been developed and instituted at LGS. These "Alert" and "Action" levels were developed to ensure that adequate time is available to schedule an outage and replace the affected SRV before reaching a temperature at which an SRV has been known to lift due to severe pilot valve erosion. SRV leakage is considered by PECO Energy to be a serious problem which is adversely affecting the operation and availability of LGS, Units 1 and 2. Therefore, PECO Energy considers that all unnecessary challenges to the SRV which could aggravate the leakage problem be absolutely minimized if adequate proof of operability can be provided by alternate means. This approach is consistent with a Boiling Water Reactor Owners' Group (BWROG) study of NUREG-0737, "Clarification of TMI Action Plan Requirements," Item II.K.3.16, "Reduction of Challenges and Failures of Relief Valves," which recommends that in-situ ADS valve actuations be reduced as much as possible.

The BWROG, of which PECO Energy is an active participant, has a committee which is tasked with understanding the maintenance and surveillance practices that affect SRV leakage. The results from this effort should ultimately lead to changes in these areas and also in SRV design to mitigate the SRV leakage problems, which are not confined to ADS valves.

The table below documents recent instances of SRV leakage at LGS following plant startups, of which a high percentage occurred after performance of the in-situ ADS/SRV functional test (i.e., TS SR 4.5.1.d.2.b)

- Start-up After Unit 1, 5th Refueling Outage (1RO5)

<u>SRV</u>	<u>Description of Leakage</u>
1M (ADS)	Leaked after in-situ test (eventually pilot failed, resulting in inadvertent SRV actuation).
1S (ADS)	Leaked after in-situ test.
1F (non-ADS)	Pilot leaked severely after startup.

- Start-up after Unit 1, 6th Refueling Outage (1RO6)

<u>SRV</u>	<u>Description of Leakage</u>
1H (ADS)	Leaked after in-situ test.
1K (ADS)	Leaked after in-situ test.
1E (ADS)	Started leaking near full pressure above "Alert" limit.
1D (non-ADS)	Started leaking near full pressure.
1G (non-ADS)	Started leaking near full pressure.
1N (non-ADS)	Started leaking at full pressure.

- Start-up after Unit 2, 3rd Refueling Outage (2RO3)

<u>SRV</u>	<u>Description of Leakage</u>
2E (ADS)	Leaked after in-situ test.
2H (ADS)	Leaked after in-situ test.

Adequacy of Existing and Alternate Testing

PECO Energy contends that the in-situ testing of the ADS/SRVs is not necessary because the remaining ADS surveillance tests and SRV inspections provide the necessary assurance of ADS valve operability. These additional tests and inspections of the ADS/SRV are described below.

A. Division 1 and 3 ADS Logic System Functional Test

This test, performed during each refuel cycle, verifies the ECCS logic functions to actuate the ADS on Low Reactor Water Level - Level 1 , and High Drywell Pressure. Verification of ADS from the start of the automatic initiation logic to, but not including, instrument gas/accumulator solenoids is demonstrated. It is important to note that the TS Bases for this functional test do not require actual stroking of the ADS/SRV.

B. Main Steam Relief Valve (MSRV) Cyclic Test

This test, performed during each refueling cycle and each time maintenance is performed on the SRV, verifies proper operation of the ADS solenoid valves, air operator, and pilot assembly. This test will serve as the new alternate IST Program exercise test and is described in the revised IST Relief Request 41-VRR-2 (submitted via separate letter).

C. ADS Leak Test

This test, performed during each refuel cycle and each time maintenance is performed on the ADS valve, verifies that ADS instrument gas/accumulator leakage is low enough to ensure that there will be sufficient pneumatic pressure for design basis ADS/SRV operation. The ADS design basis calls for two (2) ADS/SRV actuations over a period of six (6) hours to depressurize the reactor pressure vessel down to the Residual Heat Removal (RHR) Shutdown Cooling operating pressure range.

D. SRV Setpoint/Leakage Testing

These functional tests and inspections, are performed on at least 50% of the SRV pilot stages during each refueling outage, and they verify the pilot valve and setpoint spring assembly open and close at the required set-pressure, and that leakage is within strict vendor specified criteria.

E. Main Disc Exercise Test (New Testing Requirement)

SRV main disc actuation and leakage is also verified when the entire valve assembly is shipped to the certified test facility under the LGS SRV Preventive Maintenance (PM) Program. In addition, the LGS SRV PM Program will be revised to verify that at least two (2) SRV main discs can freely open each refuel cycle and that all 14 SRVs per unit are verified within seven (7) operating cycles. This surveillance requirement will be included in the LGS IST Program as part of the revision to Relief Request 41-VRR-2 being submitted in support of this TS Change Request.

The elimination of the in-situ functional test during start-up as described in this proposed TS Change Request also removes the current method of stroke time testing the ADS valves. Stroke time testing is currently provided by indirect means through the detection of steam flow by acoustic monitoring. For fast acting valves such as the ADS/SRVs, the current practice of measuring stroke times is considered of limited or no value as a degradation detection method. ADS/SRV degradation is more reliably detected by the other alternative testing and inspection methods as described above. The combined tests and inspections discussed above verify all required ADS critical component performance requirements. The proposed TS change will effectively only reduce the frequency of verifying that the opening of the pilot disc directly results in opening of the main valve disc. However, this SRV/ADS subcomponent function is considered to be extremely reliable based on the simplicity of this aspect of the SRV design. This is supported by the ADS/SRV valve performance history described above.

In addition, the TS Bases for the Improved Standard TS (i.e., NUREG-1433, dated September 28, 1992) states that the in-situ ADS testing also verifies that the SRV discharge line is not blocked. The probability of blocking an SRV line and preventing ADS depressurization is considered to be extremely remote. PECO Energy has an effective Foreign Material Exclusion (FME) Program in place at LGS in order to minimize the potential of debris blocking an ADS/SRV discharge line.

PECO Energy considers that the in-situ testing imposes an unnecessary challenge on the ADS/SRVs and has been linked to SRV degradation (e.g., pilot valve and/or main valve leakage). Therefore, this proposed TS change should reduce SRV leakage and improve ADS/SRV reliability by reducing the potential for spurious SRV actuation.

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

We have concluded that the proposed change to Limerick Generating Station (LGS), Units 1 and 2, Technical Specifications (TS) Surveillance Requirement (SR) 4.5.1.d.2.b to delete the requirement to perform in-situ functional testing of the Automatic Depressurization System (ADS) safety relief valves (SRVs) during start-up testing activities, does 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) change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed TS change does not involve any physical changes to plant structures, systems, or components (SSC). The ADS will continue to function as designed. The ADS is an Emergency Core Cooling System (ECCS) designed to mitigate the consequences of an accident, and therefore, can not contribute to the initiation of any accident. The ADS utilizes five (5) of the 14 main steam line SRVs as the primary method for depressurizing the reactor pressure vessel to permit low pressure core cooling capability in the event of a small break Loss-of-Coolant-Accident (LOCA) if the high pressure cooling systems (i.e., High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems) fail to maintain adequate reactor vessel water level.

Deleting the TS SR to perform the in-situ testing of the ADS/SRVs during start-up, as proposed, should reduce the probability of an inadvertent opening of an SRV as discussed in Section 15.1.4 of the LGS Updated Final Safety Analysis Report (UFSAR) since deleting this testing requirement will eliminate a known initiator of SRV pilot leakage and subsequent erosion. This proposed TS change will have a tendency to increase, rather than decrease, the reliability of the ADS/SRVs by eliminating the in-situ ADS functional start-up testing. The probability of the ADS/SRVs to open on demand has been demonstrated to be extremely high and is not measurably improved through the in-situ ADS functional start-up testing.

This proposed TS change will not increase the probability of occurrence of a malfunction of any plant equipment important to safety. Alternate testing methods at LGS, Units 1 and 2, and at the off-site test facility, adequately demonstrate proper ADS valve operation and assure that the valves will continue to function as designed. Existing surveillance testing and inspections of the ADS/SRVs at LGS verify that the ADS initiation logic, solenoid valve operation, pneumatic gas supply integrity and air operator assembly (including pilot rod) will operate as designed. Offsite testing verifies pilot disc operation, setpoint calibration and main valve disc operation.

Deleting the in-situ testing requirement, as proposed, will reduce the probability of inflating SRV leakage which should reduce the probability of an inadvertent SRV opening. It has been documented throughout the BWR industry that pilot disc leakage leads to pilot disc and rod erosion, which can ultimately result in an inadvertent opening of an SRV. Therefore, any SRV pilot leakage that can be eliminated would reduce the probability of occurrence of a malfunction of that SRV.

Deleting the ADS/SRV in-situ functional test will in no way increase any consequences of a malfunction of plant equipment important to safety. The consequences of a malfunction of an ADS/SRV as discussed in the LGS UFSAR remain unchanged.

In addition, eliminating a known initiator of SRV leakage, as proposed in this TS change, would help to reduce operator workarounds in the form of suppression pool cooling and letdown operation activities. As a result, this will reduce the unnecessary operation of the Residual Heat Removal (RHR) and Residual Heat Removal Service Water (RHRSW) systems.

Therefore, the proposed TS change does not involve an increase in the probability or consequences of an accident previously evaluated.

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

This proposed TS change does not involve any physical changes to plant SSC. The design and operation of the ADS/SRVs is not changed from that currently described in the Safety Analysis Report (SAR). The ADS will continue to function as designed to mitigate the consequences of an accident. No changes of any kind are being made to the valves, auxiliary components, or ADS logic. Deleting the requirement to perform the ADS in-situ functional test during plant start-up as proposed in this TS Change Request reduces the likelihood of a SRV developing a leak and degrading throughout the subsequent operating cycle. There is no possibility that implementing this proposed TS change would create a different type of malfunction to the ADS/SRVs than any previously evaluated.

Eliminating the requirement to perform the in-situ testing of the ADS/SRVs during start-up activities, does not create a new or different type of accident than any previously evaluated. There is no accident scenario associated with testing the ADS/SRVs other than the inadvertent opening of a relief valve which is currently discussed in Section 15.1.4 of the LGS UFSAR. This proposed TS change does not alter the conclusions described in the UFSAR regarding an inadvertent opening of an SRV. No new or different type of accident will be created as a result of this proposed TS change.

Therefore, the proposed TS change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. The proposed TS change does not involve a significant reduction in a margin of safety.

The proposed TS change does not involve any physical changes to plant SSC. The design and functional requirements of the ADS will not change. The ADS will still function as designed to mitigate the consequences of an accident.

This proposed TS change involves deleting the requirement to perform in-situ functional testing of the ADS/SRVs during start-up activities. This testing imposes an unnecessary challenge on the ADS/SRVs and has been linked to SRV degradation (e.g., pilot valve and/or main valve leakage). This proposed TS change should reduce SRV leakage and improve ADS/SRV reliability by reducing the potential for spurious SRV actuation. The LGS TS Bases do not identify specific testing requirements for ADS. ADS operability can be readily demonstrated with extremely high confidence by the existing additional surveillance tests and inspections performed for the ADS. There will be no reduction in any margin of safety resulting from this proposed TS change.

Therefore, the proposed TS change does not involve a significant reduction in a margin of safety.

**Information Supporting an Environmental Assessment**

An Environmental Assessment is not required for the change proposed by this Change Request because the requested change to the LGS, Units 1 and 2, TS conforms to the criteria for "actions eligible for categorical exclusion," as specified in 10 CFR 51.22(c)(9). The requested change will have no impact on the environment. The proposed change does not involve a significant hazards consideration as discussed in the preceding section. The proposed change does not involve a significant change in the types or significant increase in the amounts of any effluent that may be released offsite. In addition, the proposed change does 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 change to the LGS, Units 1 and 2, TS and have concluded that it does not involve an unreviewed safety question, and will not endanger the health and safety of the public.

**ATTACHMENT 2**

**LIMERICK GENERATING STATION**

**UNITS 1 AND 2**

**Docket Nos. 50-352  
50-353**

**License Nos. NPF-39  
NPF-85**

**TECHNICAL SPECIFICATIONS CHANGE REQUEST**

**No. 96-01-0**

**LIST OF AFFECTED PAGES**

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