

April 14, 1989

Docket No.: 50-352

Mr. George A. Hunger, Jr.
Director-Licensing
Philadelphia Electric Company
Correspondence Control Desk
P. O. Box 7520
Philadelphia, Pennsylvania 19101

Dear Mr. Hunger:

SUBJECT: TECHNICAL SPECIFICATION CHANGES TO REFLECT REVISIONS TO THE DEGRADED
GRID UNDERVOLTAGE RELAY SETPOINTS (TAC NO. 72712)

RE: LIMERICK GENERATING STATION, UNIT 1

The Commission has issued the enclosed Amendment No. 18 to Facility Operating License No. NPF-39 for the Limerick Generating Station, Unit 1. This amendment consists of changes to the Technical Specifications in response to your application dated March 23, 1989 and is being issued on an exigent basis.

This amendment changes the Technical Specifications Table 3.3.3-2 to reflect compliance with the Final Safety Analysis Report design bases of the degraded grid undervoltage relay setpoints which provide a second level of undervoltage protection to the Class 1E equipment.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,

/S/

Mohan C. Thadani, Project Manager
Project Directorate I-2
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 18 to License No. NPF-39
- 2. Safety Evaluation

cc w/enclosures:
See next page

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

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2. Safety Evaluation

cc w/enclosures:
See next page

Mr. George A. Hunger, Jr.
Philadelphia Electric Company

Limerick Generating Station
Units 1 & 2

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

PHILADELPHIA ELECTRIC COMPANY

DOCKET NO. 50-352

LIMERICK GENERATING STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 18
License No. NPF-39

1. The Nuclear Regulatory Commission (the Commission) has found that
 - A. The application for amendment by Philadelphia Electric Company (the licensee) dated March 23, 1989, 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. NPF-39 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 18, are hereby incorporated into this license. Philadelphia Electric Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Walter R. Butler, Director
Project Directorate I-2
Division of Reactor Projects I/II

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 14, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 18

FACILITY OPERATING LICENSE NO. NPF-39

DOCKET NO. 50-352

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised page is identified by Amendment number and contains vertical lines indicating the area of change. Overleaf page is provided to maintain document completeness.*

Remove

3/4 3-37*
3/4 3-38

Insert

3/4 3-37*
3/4 3-38

TABLE 3.3.3-2

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
1. <u>CORE SPRAY SYSTEM</u>		
a. Reactor Vessel Water Level - Low Low Low, Level 1	> -129 inches*	> -136 inches
b. Drywell Pressure - High	< 1.68 psig	< 1.88 psig
c. Reactor Vessel Pressure - Low	> 455 psig,(decreasing)	> 435 psig, (decreasing)
d. Manual Initiation	N.A.	N.A.
2. <u>LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM</u>		
a. Reactor Vessel Water Level - Low Low Low, Level 1	> -129 inches*	> -136 inches
b. Drywell Pressure - High	< 1.68 psig	< 1.88 psig
c. Reactor Vessel Pressure - Low	> 455 psig,(decreasing)	> 435 psig, (decreasing)
d. Injection Valve Differential Pressure - Low	> 74 psid, (decreasing)	> 64 psid and < 84 psid
e. Manual Initiation	N.A.	N.A.
3. <u>HIGH PRESSURE COOLANT INJECTION SYSTEM</u>		
a. Reactor Vessel Water Level - (Low Low, Level 2)	> -38 inches*	> -45 inches
b. Drywell Pressure - High	< 1.68 psig	< 1.88 psig
c. Condensate Storage Tank Level - Low	> 167.8 inches**	> 164.3 inches
d. Suppression Pool Water Level - High	< 24 feet 1.5 inches	< 24 feet 3 inches
e. Reactor Vessel Water Level - High, Level 8	< 54 inches	< 60 inches
f. Manual Initiation	N.A.	N.A.
4. <u>AUTOMATIC DEPRESSURIZATION SYSTEM</u>		
a. Reactor Water Level - Low Low Low, Level 1	> -129 inches*	> -136 inches
b. Drywell Pressure - High	< 1.68 psig	< 1.88 psig
c. ADS Timer	< 105 seconds	< 117 seconds
d. Core Spray Pump Discharge Pressure - High	> 145 psig,(increasing)	> 125 psig, (increasing),
e. RHR LPCI Mode Pump Discharge Pressure-High	> 125 psig,(increasing)	> 115 psig, (increasing)
f. Reactor Vessel Water Level-Low, Level 3	> 12.5 inches	> 11.0 inches
g. Manual Initiation	N.A.	N.A.
h. ADS Drywell Pressure Bypass Timer	< 420 seconds	< 450 seconds

*See Bases Figure B 3/4.3-1.

**Corresponds to 2.25 feet indicated.

TABLE 3.3.3-2 (Continued)
EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION</u>	<u>RELAY</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
5. <u>LOSS OF POWER</u>			
a. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	127-11X	NA	NA
b. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	<u>RELAY</u> 127-11X0X and 102-11X0X	a. 4.16 kV Basis 2905 ± 115 volts b. 120 V Basis 83 ± 3 volts c. < 1 second time delay	2905 ± 145 volts 83 ± 4 volts < 1.5 second time delay
	127Y-11X0X** and 127Y-1-11X0X	a. 4.16 kV Basis 3640 ± 91 volts b. 120 V Basis 104 ± 3 volts c. < 52 second time delay	3640 ± 182 volts 104 ± 5.2 volts < 60 second time delay
	127Z-11X0X and 162Y-11X0X	a. 4.16 kV Basis 3910 ± 11 volts b. 120 V Basis 111.7 ± 0.3 volts c. < 10 second time delay	3910 ± 19 volts 111.7 ± 0.5 volts < 11 second time delay
	127Z-11X0X and 162Z-11X0X	a. 4.16 kV Basis 3910 ± 11 volts b. 120 V Basis 111.7 ± 0.3 volts c. < 61 second time delay	3910 ± 19 volts 111.7 ± 0.5 volts < 64 second time delay

**This is an inverse time delay voltage relay. The voltages shown are the maximum that will not result in a trip. Some voltage conditions will result in decreased trip times.

LIMERICK - UNIT 1

3/4 3-38

Amendment No. 18



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 18 TO FACILITY OPERATING LICENSE NO. NPF-39
PHILADELPHIA ELECTRIC COMPANY
LIMERICK GENERATING STATION, UNIT 1
DOCKET NO. 50-352

1.0 INTRODUCTION

By letter dated March 23, 1989, Philadelphia Electric Company (the licensee) requested an amendment to Facility Operating License No. NPF-39 for the Limerick Generating Station (LGS), Unit 1. The proposed amendment would change the Technical Specifications (TSs) to lower the undervoltage relay setpoints for the 4160V bus. These setpoint changes are intended to provide a second level (degraded grid) of undervoltage protection to the Class 1E equipment in compliance to the design bases committed to in the Final Safety Analysis Report (FSAR) Section 8.1.6.3.6 and in accordance with the staff position PSB-1, "Adequacy of Station Electric Distribution System Voltages." The proposed changes are indicated by vertical bars in the margin of Technical Specification page 3/4 3-38.

On December 30, 1988 the licensee found that the current undervoltage relay setpoints on Unit 1 are too low to assure adequate voltage levels to 480V Class 1E loads under all conditions. This licensee finding is contrary to the above staff position and the plant has been operated with non-conservative undervoltage relay setpoints. The licensee's request of March 23, 1989 is intended to remedy the non-conservative setting of the undervoltage relay setpoints.

Subsequent to the December 30, 1988 discovery of the inadequate relay setpoints, additional calculations were performed by the licensee to determine an optimal undervoltage setpoint. Based on the calculations, the licensee proposed a Technical Specification setpoint (94%) of 4160V (3910V), with a tap setting of 2.5% boost on the 4160/480V load center transformers. This change also requires the replacement of old undervoltage relays with new relays. In the meantime, to mitigate the potential effects of a low safety system bus voltage, procedural guidance has been issued to operations personnel to monitor the bus voltages once per eight hour shift with instructions for corrective actions. The licensee requests that this proposed change be processed on an exigent basis in order to allow Unit 1 to startup in full compliance with the FSAR and that the change be issued prior to the current scheduled startup date of April 21, 1989.

2.0 EVALUATION

The degraded grid undervoltage relays provide a second level of undervoltage protection to the Class 1E equipment in accordance with the guidance of the staff position that, "a second level of undervoltage with a time delay is needed to protect the Class 1E equipment under degraded power supply conditions which would not actuate a loss of power relay typically set at 70% of nominal." Concurrent with this protective function, it further states that, "the settings in these relays be such that the likelihood for spurious separation of Class 1E systems from the offsite power system be minimized."

The above non-compliance, i.e., failure to provide an acceptable setting, was confirmed on January 10, 1989 as a result of the LGS Unit 2 independent design review and parallel review of Generic Letter 88-15 "Electric Power Systems - Inadequate Control Over Design Process." It was detailed in LGS Unit 1 Licensee Event Report (LER) 89-004 and submitted to the NRC on February 10, 1989.

The original calculation to ensure adequate voltage levels at the 480V Class 1E loads was performed during construction of LGS Unit 1. The study showed that a relay setting of 92% of 4160V with a tap changer setting of 5% boost on the 4160/480V transformer was necessary. For the ITE-27D relay which has a $\pm 2\%$ setpoint tolerance with a 3% pickup-to-dropout ratio, it translates to a maximum relay actuation at 94% and maximum reset at 97%. These actuation and reset voltage levels were considered too high, since they may create the possibility for spurious trips. Considering these facts, the licensee chose a 90% relay setting. Also, during plant construction, there were instances of equipment damage due to overvoltage in the power supply to the 480V loads. The offsite electrical engineer had authorized the transformer taps to be lowered to nominal boost (0%) from 5% boost. This resulted in the current Technical Specification setpoint 90% 4160V with a nominal boost (0%) tap. The licensee contends that the improper setpoint setting occurred because engineers failed to follow applicable design procedures to assess the setpoints (i.e., not realizing the impact of the tap change on the previous voltage study and the need to evaluate to validate the new 90% relay setpoint).

New calculations were performed to determine the optimal setpoint to satisfy the staff guidance. Based on the calculations, the proposed Technical Specification setpoint was determined to be 94% of 4160V (3910V) with a tap setting of 2.5% boost. However, use of the existing ITE-27D relays could result in an unacceptably high reset voltage (i.e., 97% for actuation and 99% for reset). For this reason, the licensee proposes to replace the existing relays with ITE-27N relays with a setpoint tolerance of $\pm 0.3\%$ and a pickup-to-dropout ratio that can be set at approximately 0.5%. Thus, this tighter setpoint tolerance and pickup-to-dropout ratio of the new relay (i.e., 94.2% for actuation and 94.8% for reset) provides the performance necessary to minimize spurious tripping

of the supply offsite source and ensures that adequate voltages will be available to all Class 1E equipment in all modes of plant operation.

3.0 FINDINGS:

We have reviewed the licensee's LER and documentation for their proposed setpoints. With the proposed 2.5% boost tap setting from the current nominal (0%) boost, the licensee's concern regarding the 480V equipment damage (resulting from the calculated 5% tap on the 4160/480V transformer) will be reduced. Additionally, the new tap setting should improve the minimum operating voltages for 480V Class 1E loads experienced under the current tap setting. Consequently, the proposed 2.5% boost tap setting will ensure adequate voltages to all Class 1E equipment in all modes of plant operation. Therefore, we find the proposed transformer tap setting of 2.5% boost acceptable. As for increasing the relay setpoint to 94% of 4160V from the current 90%, the current relay with new trip setting would be more susceptible to spurious tripping than with old setpoint. However, replacement of the existing relays with new ITE-27N relay accommodates relay setting for dropout at 94.8% of 4160V, without the jeopardy of causing spurious tripping. Therefore, we find the proposed setpoint and the replacement of relays acceptable.

The licensee has not submitted the calculations which support its basis for selection of undervoltage protection relay setpoint for our review. To substantiate our findings, we verified (during a telephone conversation of March 29, 1989) that there were no changes in the onsite electrical distribution system (no addition of new transformers) and load increases due to equipment changes from their original study. We further verified that licensee had performed its new voltage study on the computer software used for its original study.

Based on our review of the licensee's submittals, we find that the proposed Technical Specification changes to incorporate 94% setpoints will ensure adequate voltages to all Class 1E equipment in all modes of plant operation and the new relay will provide the performance necessary to prevent spurious tripping of the offsite source. Thus, an unnecessary transfer of the offsite power supply to the alternate source is minimized. The proposed Technical Specification changes are therefore acceptable. We also conclude that the modifications to the setpoints and the Technical Specification changes will result in full compliance with the design basis committed to in the FSAR Section 8.1.6.3.6.

We have requested the licensee to submit the new voltage study for staff review.

4.0 EXIGENT CIRCUMSTANCES

The Commission's regulation 10 CFR 50.91 provides special exceptions for issuance of amendments when the usual 30-day public notice period cannot be met. One type of special exception is an exigency. An exigency is a case where the staff and licensee need to act promptly, but failure to act promptly does not involve imminent plant shutdown, derating, or delay in startup. In the present case, the plant startup may or may not be affected depending on numerous factors involved in the unit's outage activities. However, the need for the Commission and the licensee to act prior to the unit startup is clearly established by the fact the unit's current Technical Specifications related to undervoltage protection relay setpoints are non-conservative and do not meet the staff position.

Based on the above, the Commission has determined that the licensee has properly invoked the exigency provisions of 10 CFR 50.91(a)(6)(vi). Failure of the Commission to act on the licensee request would result in high probability of delay in restart; and therefore the request should be processed under the exigency provisions of 10 CFR 50.91(a)(6)(vi).

5.0 FINAL NO SIGNIFICANT HAZARDS DETERMINATION CONSIDERATION

The Commission has provided standards for determining whether a significant hazards consideration exists (10 CFR 50.92(c)). A proposed amendment to an operating license for a facility involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

The staff has reviewed the licensee's request and concurs with the following basis and conclusion provided by the licensee in its March 23, 1989 submittal.

- A. The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed relay setpoints will ensure that adequate voltages are available to all Class 1E equipment in all modes of plant operation. The proposed changes will provide consistency to the design objectives approved by the NRC and committed to in the design bases. The current setpoints do not fully comply with those objectives. Therefore, the proposed changes will not result in a significant increase in the probability or consequences of an accident previously evaluated.

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

The proposed changes do not involve any design changes to the undervoltage protection scheme. Since the proposed changes will result in system operation consistent with the design bases (which will remain the same), the current FSAR will remain complete and accurate in its discussion of the licensing basis events and in analyzing plant response and consequences. Therefore, no equipment is adversely affected, nor could the proposed changes involve any potential initiating events which would create any new or different kind of accident. As such, the plant initial conditions utilized for the design basis accident analyses are still valid. Thus, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

- C. The proposed changes do not involve a significant reduction in a margin of safety.

As discussed above, the proposed changes do not change the design bases but will result in full compliance with the FSAR commitment. As such, an incremental improvement in the margin of safety will result. Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above considerations, including the staff's safety evaluation, the staff concludes that the amendment meets the standards set forth in 10 CFR 50.92 for a no significant hazards determination. Therefore, the staff has made a final determination that the proposed amendment involves a no significant hazards consideration.

6.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement nor environmental assessment need be prepared in connection with the issuance of this amendment.

7.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (54 FR 12978) on March 29, 1989 and consulted with the State of Pennsylvania. No public comments were received and the State of Pennsylvania did not have any comments.

We have concluded, based on the considerations discussed above, that (1) because the amendments do not involve a significant increase in the probability or consequences of an accident previously evaluated, do not create the possibility of an accident of a type different from any evaluated previously, and do not involve a significant reduction in a margin of safety, the amendments do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: P. Kang and M. Thadani

Dated: April 14, 1989