

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. 94-47-0

"Clarify the Emergency Diesel Generator Acceptable
Steady State Voltage Range"

Supporting Information for Changes - 3 pages

PECO Energy Company, Licensee under Facility Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station, 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 Requirements 4.8.1.1.2.a.4, 4.8.1.1.2.e.2, 4.8.1.1.2.e.4.b, 4.8.1.1.2.e.5, 4.8.1.1.2.e.6.b, 4.8.1.1.2.e.8.b, and 4.8.1.1.2.h to clarify the Emergency Diesel Generator acceptable steady state voltage range. The proposed changes to the TS are indicated by a vertical bar in the margin of TS pages 3/4 8-3, 3/4 8-4, 3/4 8-5, 3/4 8-6, and 3/4 8-7a for Units 1 and 2. The TS pages showing the proposed changes are contained in Attachment 2.

We request that, if approved, the TS changes proposed herein be issued by September 1, 1995 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 Requirements 4.8.1.1.2.a.4, 4.8.1.1.2.e.2, 4.8.1.1.2.e.4.b, 4.8.1.1.2.e.5, 4.8.1.1.2.e.6.b, 4.8.1.1.2.e.8.b, and 4.8.1.1.2.h require an Emergency Diesel Generator steady state voltage range of 4285 ± 420 volts. The proposed changes reduce the acceptable range to 4280 ± 120 volts for each of these TS Surveillance Requirements. The proposed changes align the Emergency Diesel Generator steady state voltage range with the minimum voltage range analyzed in the Emergency Diesel Generator Voltage Regulation Study (4160 volts) and the operating voltage range for connected loads (4kv motors; 4400 volts).

Safety Assessment

The minimum steady state Emergency Diesel Generator voltage analyzed by calculation is 4160V. This voltage provides acceptable starting and running voltage to equipment connected to the 4160V and 480V distribution systems. This voltage accounts for voltage drops through the distribution system and results in acceptable end terminal device starting and running voltage.

The maximum Emergency Diesel Generator steady state voltage is 4400 volts based on a review of equipment powered from the 4kV buses. NEMA Standard MG1-20.45.1 states that 4kV motors shall operate successfully at voltage ten percent above the rated voltage (4000V).

Therefore, given the above discussion, the steady state voltage range for the Emergency Diesel Generators is ≥ 4160 volts and ≤ 4400 volts (i.e., 4280 ± 120 volts).

In addition, Technical Specification 4.8.1.1.2.e.2, which addresses the Emergency Diesel Generator's ability to reject a load of greater than or equal to that of the RHR pump motor, has been clarified by adding the statement that "after steady state conditions are reached, voltage is maintained at 4280 ± 120 volts." This clarification maintains the allowable voltage range for the RHR motor reject transient at the existing Technical Specification value and adds the stipulation that the voltage return to a steady state voltage range consistent with the previously discussed revisions.

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) to revise Technical Specifications Surveillance Requirements 4.8.1.1.2.a.4, 4.8.1.1.2.e.2, 4.8.1.1.2.e.4.b, 4.8.1.1.2.e.5, 4.8.1.1.2.e.6.b, 4.8.1.1.2.e.8.b, and 4.8.1.1.2.h to clarify the Emergency Diesel Generator steady state voltage range 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 proposed Emergency Diesel Generator steady state voltage range of 4280 ± 120 volts provides voltages through the 4160V and 480V distribution systems which are within the operating range of the connected equipment and power system components. Therefore, the reduced steady state voltage range will not cause the malfunction of any equipment or affect the operation of any equipment in a manner which would increase the probability of occurrence of an accident previously evaluated in the SAR.

Reducing the Emergency Diesel Generator steady state voltage range in the Technical Specifications maintains the capability of the Emergency Diesel Generator to start and attain rated voltage and frequency within 10 seconds and to accept the engineered safeguard loads in the required time in order to mitigate the consequences of an accident. The Emergency Diesel Generator automatic voltage regulator setting is calibrated to within a range of 4266.5 volts to 4308.5 volts. A review of results from recent monthly Emergency Diesel Generator Surveillance Tests has confirmed that the voltage regulators currently maintain the Emergency Diesel Generator steady state voltage within the 4280 ± 120 volt range to be included in the Technical Specifications. Establishing, via Technical Specification surveillance requirements and administrative limits within Station Surveillance Test Procedures, that the Emergency Diesel Generator voltage regulator is maintaining the steady state voltage within a narrower range (within the existing range) provides increased assurance that connected equipment required to mitigate the consequences of an accident will operate as required.

Therefore, the proposed TS changes do not involve an 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.

Reducing the Emergency Diesel Generator steady state voltage range in the Technical Specifications to a range of 4280 ± 120 volts does not create any new accident initiators or affect any existing accident initiators such that a different type of accident than previously evaluated could result. The function and operation of the Emergency Diesel Generators and their connected loads are not changed in a manner which would create the possibility of an accident of a different type than any previously evaluated.

Therefore, the proposed TS changes do not create the possibility of a new or

different kind of accident from any previously evaluated.

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

Reducing the Emergency Diesel Generator steady state voltage range in the Technical Specifications to a range of 4280 ± 120 volts does not reduce the margin of safety. The reduced range provides increased assurance that the equipment powered by the Emergency Diesel Generators will start and operate as designed in order to perform their design basis functions.

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

Information Supporting an Environmental Assessment

An Environmental Assessment is not required for the changes proposed by this TS Change Request because the requested changes to the LGS, Units 1 and 2, TS conform to the criteria for "actions eligible for categorical exclusion," as specified in 10 CFR 51.22(c)(9). The requested 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 change in the types or 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 these proposed changes to the 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.

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. 94-47-0

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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

- a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability, and
- b. Demonstrated OPERABLE at least once per 24 months by transferring, manually and automatically, unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each of the above required diesel generators shall be demonstrated OPERABLE:

- a. In accordance with the frequency specified in Table 4.8.1.1.2-1 on a STAGGERED TEST BASIS by:
 1. Verifying the fuel level in the day fuel tank.
 2. Verifying the fuel level in the fuel storage tank.
 3. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank.
 4. Verify that the diesel can start* and gradually accelerate to synchronous speed with generator voltage and frequency at 4280 ± 120 volts and 60 ± 1.2 HZ.
 5. Verify diesel is synchronized, gradually loaded* to an indicated 2700-2800 KW** and operates with this load for at least 60 minutes.
 6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
 7. Verifying the pressure in all diesel generator air start receivers to be greater than or equal to 225 psig.

*This test shall be conducted in accordance with the manufacturer's recommendations regarding engine pre-lube and warmup procedures, and as applicable regarding loading and shutdown recommendations.

**This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing under direct monitoring by the manufacturer or momentary variations due to changing bus loads shall not invalidate the test.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b. By removing accumulated water:
 - 1) From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and
 - 2) From the storage tank at least once per 31 days.
- c. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:
 - 1) By verifying in accordance with the tests specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:
 - a) An API Gravity of within 0.3 degrees at 60°F or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89 or an API gravity at 60°F of greater than or equal to 27 degrees but less than or equal to 39 degrees.
 - b) A kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.
 - c) A flash point equal to or greater than 125°F, and
 - d) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.
 - 2) By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.
- d. At least once every 31 days by obtaining a sample of fuel oil from the storage tanks in accordance with ASTM D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, Method A, except that the filters specified in ASTM D2276-78, Sections 5.1.6 and 5.1.7, may have a nominal pore size of up to three (3) microns.
- e. At the following frequency by:
 - 1. Every 18 months subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.
 - 2. Every 24 months verify the diesel generator capability to reject a load of greater than or equal to that of the RHR Pump Motor (992 Kw) for each diesel generator while maintaining voltage at 4285 ± 420 volts and frequency at 60 ± 1.2 hz and after steady state conditions are reached, voltage is maintained at 4280 ± 120 volts.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

3. Every 24 months verifying the diesel generator capability to reject a load of 2850 kW without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection.
4. Every 24 months simulating a loss-of-offsite power by itself, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
 - b) Verifying the diesel generator starts* on the auto-start signal, energizes the emergency busses within 10 seconds, energizes the auto-connected loads through the individual load timers and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4280 ± 120 volts and 60 ± 1.2 Hz during this test.
5. Every 24 months verifying that on an ECCS actuation test signal, without loss-of-offsite power, the diesel generator starts* on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall reach 4280 ± 120 volts and 60 ± 1.2 Hz within 10 seconds after the auto-start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test.
6. Every 24 months simulating a loss-of-offsite power in conjunction with an ECCS actuation test signal, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
 - b) Verifying the diesel generator starts* on the auto-start signal, energizes the emergency busses within 10 seconds, energizes the auto-connected shutdown loads through the individual load timers and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4280 ± 120 volts and 60 ± 1.2 Hz during this test.
7. Every 24 months verifying that all automatic diesel generator trips, except engine overspeed and generator differential over-current are automatically bypassed upon an ECCS actuation signal.

* This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warm-up procedures, and as applicable regarding loading and shutdown recommendations.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

8. a) Every 18 months verifying the diesel generator operates* for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to an indicated 2950-3050 kW** and during the remaining 22 hours of this test, the diesel generator shall be loaded to an indicated 2700-2800 kW**.
- b) Every 18 months verifying that, within 5 minutes of shutting down the diesel generator after the diesel generator has operated* for at least 2 hours at an indicated 2700-2800 kW**, the diesel generator starts*. The generator voltage and frequency shall reach 4280 ± 120 volts and 60 ± 1.2 Hz within 10 seconds after the start signal.
9. Every 24 months verifying that the auto-connected loads to each diesel generator do not exceed the 2000-hour rating of 3100 kW.
10. Every 24 months verifying the diesel generator's capability to:
 - a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,
 - b) Transfer its loads to the offsite power source, and
 - c) Be restored to its standby status.
11. Every 24 months verifying that with the diesel generator operating in a test mode and connected to its bus, a simulated ECCS actuation signal overrides the test mode by (1) returning the diesel generator to standby operation, and (2) automatically energizes the emergency loads with offsite power.
12. Every 24 months verifying that the automatic load sequence timers are OPERABLE with the interval between each load block within $\pm 10\%$ of its design interval.

* This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup procedures, and as applicable regarding loading and shutdown recommendations.

** This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing under direct monitoring by the manufacturer or momentary variations due to changing bus loads shall not invalidate the test.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

h. At least once per 184 days the diesel generator shall be started* and verified to accelerate to synchronous speed in less than or equal to 10 seconds. The generator voltage and frequency shall reach 4280 ± 120 volts and 60 ± 1.2 Hz within 10 seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:

- a) Manual***
- b) Simulated loss-of-offsite power by itself.
- c) Simulated loss-of-offsite power in conjunction with an ECCS actuation test signal.
- d) An ECCS actuation test signal by itself.

The generator shall be manually synchronized to its appropriate emergency bus, loaded to an indicated 2700-2800 KW** in less than or equal to 200 seconds, and operate for at least 60 minutes. This test, if it is performed so it coincides with the testing required by Surveillance Requirement 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5, may also serve to concurrently meet those requirements as well.

4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission in a Special Report pursuant to Specification 6.9.2 within 30 days. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

*This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup procedures, and as applicable regarding loading and shutdown recommendations.

**This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing under direct monitoring by the manufacturer or momentary variations due to changing bus loads shall not invalidate the test.

***If diesel generator started manually from the control room, 10 seconds after the automatic prelube period.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- h. At least once per 184 days the diesel generator shall be started* and verified to accelerate to synchronous speed in less than or equal to 10 seconds. The generator voltage and frequency shall reach 4280 ± 120 volts and 60 ± 1.2 Hz within 10 seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:

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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

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 6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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 - 1) From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and
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- c. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:
 - 1) By verifying in accordance with the tests specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:
 - a) An API Gravity of within 0.3 degrees at 60°F or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89 or an API gravity at 60°F of greater than or equal to 27 degrees but less than or equal to 39 degrees.
 - b) A kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.
 - c) A flash point equal to or greater than 125°F, and
 - d) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.
 - 2) By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.
- d. At least once every 31 days by obtaining a sample of fuel oil from the storage tanks in accordance with ASTM D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, Method A, except that the filters specified in ASTM D2276-78, Sections 5.1.6 and 5.1.7, may have a nominal pore size of up to three (3) microns.
- e. At the following frequency by:
 - 1. Every 18 months subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.
 - 2. Every 24 months verifying the diesel generator capability to reject a load of greater than or equal to that of the RHR Pump Motor (992 kW) for each diesel generator while maintaining voltage at 4285 ± 420 volts and frequency at 60 ± 1.2 Hz and after steady state conditions are reached, voltage is maintained at 4280 ± 120 volts.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

3. Every 24 months verifying the diesel generator capability to reject a load of 2850 kW without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection.
4. Every 24 months simulating a loss-of-offsite power by itself, and:
 - a) Verifying deenergization of the emergency buses and load shedding from the emergency buses.
 - b) Verifying the diesel generator starts* on the auto-start signal, energizes the emergency buses within 10 seconds, energizes the auto-connected loads through the individual load timers and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady-state voltage and frequency of the emergency buses shall be maintained at 4280 ± 120 volts and 60 ± 1.2 Hz during this test.
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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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10. Every 24 months verifying the diesel generator's capability to:
 - a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,
 - b) Transfer its loads to the offsite power source, and
 - c) Be restored to its standby status.
11. Every 24 months verifying that with the diesel generator operating in a test mode and connected to its bus, a simulated ECCS actuation signal overrides the test mode by (1) returning the diesel generator to standby operation, and (2) automatically energizes the emergency loads with offsite power.
12. Every 24 months verifying that the automatic load sequence timers are OPERABLE with the interval between each load block within $\pm 10\%$ of its design interval.

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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- h. At least once per 184 days the diesel generator shall be started* and verified to accelerate to synchronous speed in less than or equal to 10 seconds. The generator voltage and frequency shall reach 4280 ± 120 volts and 60 ± 1.2 Hz within 10 seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:

- a) Manual***
- b) Simulated loss-of-offsite power by itself.
- c) Simulated loss-of-offsite power in conjunction with an ECCS actuation test signal.
- d) An ECCS actuation test signal by itself.

The generator shall be manually synchronized to its appropriate emergency bus, loaded to an indicated 2700-2800 KW** in less than or equal to 200 seconds, and operate for at least 60 minutes. This test, if it is performed so it coincides with the testing required by Surveillance Requirement 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5, may also serve to concurrently meet those requirements as well.

4.8.1.1.3 Reports - All diesel generator failures, valid or nonvalid, shall be reported to the Commission in a Special Report pursuant to Specification 6.9.2 within 30 days. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

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***If diesel generator started manually from the control room, 10 seconds after the automatic prelube period.