May 29, 1987

See Correction letter of 6/26/87

Docket No. 50-482

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Mr. Bart D. Withers
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, Kansas 66839

Dear Mr. Withers:

SUBJECT: WOLF CREEK GENERATING STATION - AMENEMENT NO. 8 TO FACILITY OPERATING LICENSE NO. NPF-42 (TAC NO. 63951)

The Commission has issued the enclosed Amendment No. 8 to Facility Operating License No. NPF-42 for the Wolf Creek Generating Station. The amendment consists of changes to the Technical Specifications in response to your application dated November 14, 1986 and your supplement dated April 17, 1987 which provided additional clarification to your application.

The amendment changes the Technical Specifications to increase overall emergency diesel generator reliability and to prevent undue stress and wear on the diesel generator changes.

A copy of our related Safety Evaluation is enclosed. The notice of issuance will be included in the Commission's next bi-weekly Federal Register notice.

Sincerely,

/S/

Paul W. O'Connor, Project Manager
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects

Enclosures:
1. Amendment No. 8 to License No. NPF-42
2. Safety Evaluation

cc w/enclosures:
See next page

PD4-LA	PD4-PM	OGC-Beth	PD4-D
PNoonan	PO'Connor	M. Karman	JCalvo
5/20/87	5/21/87	5/22/87	5/29/87

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P PDR

Mr. Bart D. Withers
Wolf Creek Nuclear Operating Corporation

Wolf Creek Generating Station
Unit No. 1

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

KANSAS GAS & ELECTRIC COMPANY

KANSAS CITY POWER AND LIGHT COMPANY

KANSAS ELECTRIC POWER COOPERATIVE, INC.

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 8
License No. NPF-42

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the Wolf Creek Generating Station (the facility) Facility Operating License No. NPF-42 filed by Kansas Gas and Electric Company acting for itself and Kansas City Power and Light Company and Kansas Electric Power Cooperative, Inc., (licensees) dated November 14, 1986 as supplemented April 17, 1987, 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, as amended, 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 license 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.

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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-42 is hereby amended to read as follows:

   2. Technical Specification

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 8 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. KG&E 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

Jose A. Calvo, Director
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 29, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 8

FACILITY OPERATING LICENSE NO. NPF-42

DOCKET NO. 50-482

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by amendment number and contain marginal lines indicating the area of change. The corresponding overleaf page is also provided to maintain document completeness.

REMOVE PAGES	INSERT PAGES
3/4 8-1	3/4 8/1
-	3/4 8-1a
3/4 8/2	3/4 8-2
3/4 8-3	3/4 8-3
3/4 8-4	3/4 8-4
-	3/4 8-4a
3/4 8-5	3/4 8-5
3/4 8-6	3/4 8-6
-	3/4 8-6a
3/4 8-7	3/4 8-7
3/4 8-8*	3/4 8-8*
B 3/4 8-1	B 3/4 8-1
B 3/4 8-2*	B 3/4 8-2*

*Overleaf pages added for completeness

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent circuits between the offsite transmission network and the Onsite Class 1E Distribution System, and

b. Two separate and independent diesel generators, each with:

   1) A separate day tank containing a minimum volume of 390 gallons of fuel,

   2) A separate Fuel Oil Storage System containing a minimum volume of 85,300 gallons of fuel, and

   3) A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With an offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. source by performing Specification 4.8.1.1.1 within 1 hour and at least once per 8 hours thereafter. If either diesel generator of the above required A.C. electrical power sources has not been successfully tested within the past 24 hours, demonstrate OPERABILITY by performing Specification 4.8.1.1.2a.4* separately for that diesel generator within 24 hours. Restore at least two offsite circuits to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the offsite A.C. sources by performing Specification 4.8.1.1.1 within 1 hour and at least once per 8 hours thereafter. Demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Specification 4.8.1.1.2a.4 within 24 hours**; restore the inoperable diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

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*The automatic start and sequence loading of a diesel generator satisfies the testing requirements of Specification 4.8.1.1.2a.4 for this Action Statement.

**This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status unless the diesel was declared inoperable to do preplanned preventative maintenance, testing, or maintenance to correct a condition which, if left uncorrected, would not affect the operability of the diesel generator.

3/4.8.1 A.C. SOURCES

ACTION:

LIMITING CONDITION FOR OPERATION

c. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. source by performing Specification 4.8.1.1.1 within 1 hour and at least once per 8 hours thereafter and Specification 4.8.1.1.2a.4* within 8 hours** on the redundant diesel generator; restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore the remaining A.C. electrical power source (offsite circuit or diesel generator) to OPERABLE in accordance with Specification 3.8.1.1. ACTION a. or ACTION b. as applicable with the time requirement for the ACTION based on the time of the initial loss of the remaining inoperable A.C. electrical power source. A successful test of diesel generator OPERABILITY performed in accordance with Specification 4.8.1.1.2a.4* under this ACTION for an OPERABLE diesel generator or a diesel generator that was restored to OPERABLE, satisfies the subsequent testing requirement of Specification 3.8.1.1 ACTION a. or ACTION b. for an OPERABLE diesel generator.

d. With one diesel generator inoperable in addition to ACTION b. or c. above, verify that:

   1. All required systems, subsystems, trains, components, and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE, and

*The automatic start and sequence loading of a diesel generator satisfies the testing requirements of Specification 4.8.1.1.2a.4 for this Action Statement.

**This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status unless the diesel was declared inoperable to do preplanned preventative maintenance, testing, or maintenance to correct a condition which, if left uncorrected, would not affect the operability of the diesel generator.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

2. When in MODE 1, 2, or 3, the steam-driven auxiliary feedwater pump is OPERABLE.

If these conditions are not satisfied within 2 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

e. With two of the above required offsite A.C. circuits inoperable, demonstrate the OPERABILITY of two diesel generators by sequentially performing Specification 4.8.1.1.2a.4 within 8 hours unless the diesel generators are already operating; restore at least one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. Following restoration of one offsite A.C. electrical power source, follow ACTION a. above with the time requirement of ACTION a. based on the time of the initial loss of the remaining inoperable offsite A.C. electrical power source. A successful test of diesel generator OPERABILITY performed in accordance with Specification 4.8.1.1.2a.4* under this ACTION for the OPERABLE diesel generators, satisfies the subsequent testing requirement of Specification 3.8.1.1 ACTION a.

f. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Specification 4.8.1.1.1 within 1 hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Following restoration of one diesel generator follow ACTION b. with the time requirement of the ACTION based on the time of initial loss of the remaining inoperable diesel generator. A successful test of diesel generator operability performed in accordance with Specification 4.8.1.1.2a.4 under this ACTION for the OPERABLE diesel generators, satisfies the subsequent testing requirement of Specification 3.8.1.1 ACTION b.

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 determined OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability.

*The automatic start and sequence loading of a diesel generator satisfies the testing requirements of Specification 4.8.1.1.2a.4 for this Action Statement.

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. In accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS by:

1) Verifying the fuel level in the day 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 tank,

4) Verifying the diesel starts and accelerates to at least 514 rpm in less than or equal to 12 seconds.** The generator voltage and frequency shall be 4160 + 160 - 420 volts and 60 ± 1.2 Hz within 12 seconds** after the start signal. The diesel generator shall be started for this test by using one of the following signals:

a) Manual, or

b) Simulated loss-of-offsite power by itself, or

c) Safety Injection test signal.

5) Verifying the generator is synchronized, gradually loaded to an indicated 6000 to 6201 kW*** for at least 60 minutes, and

6) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the day tanks;

c. At least once per 31 days by checking for and removing accumulated water from the fuel oil storage tanks;

**Diesel generator starts from ambient conditions shall be performed only once per 184 days in these surveillance tests and all other engine starts for the purpose of this surveillance testing shall be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that the mechanical stress and wear on the diesel engine is minimized.

***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 or momentary variations due to changing bus loads shall not invalidate this test.

d. By sampling new fuel oil in accordance with ASTM D4057 prior to addition to 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 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 30 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.

e. At least once every 31 days by obtaining a sample of fuel oil 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.

f. At least once per 184 days the diesel generators shall be started* from ambient conditions (using the keep warm system) using one of the signals specified in 4.8.1.1.2a.4 and accelerated to at least 514 rpm in less than or equal to 12 seconds. The generator voltage and frequency shall be 4160 + 160-420 volts and 60 ± 1.2 Hz within 12 seconds after the start signal. Subsequently verify the generator is loaded to an indicated 6000 to 6201 kW** in less than or equal to 60 seconds and operates at a load of 6000 to 6201 kW** for at least 60 minutes.

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*This test shall be preceded by an engine prelube period so that the mechanical stress and wear on the diesel engine is minimized.

**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 or momentary variations due to changing bus loads shall not invalidate this test.

SURVEILLANCE REQUIREMENTS (Continued)

g. At least once per 18 months, during shutdown, by:

1) 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) Verifying the diesel generator capability to reject a load of greater than or equal to 1352 kW (ESW pump) while maintaining voltage at 4160 + 160 - 420 volts and frequency at 60 ± 5.4 Hz,

3) Verifying the diesel generator capability to reject a load of 6201 kW without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection,

4) Simulating a loss-of-offsite power by itself, and:

a) Verifying deenergization of the emergency busses and load shedding from the emergency busses, and

b) Verifying the diesel starts*** on the auto-start signal, energizes the emergency busses with permanently connected loads within 12 seconds, energizes the auto-connected shutdown loads through the shutdown sequencer 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 4160 + 160 - 420 volts and 60 ± 1.2 Hz during this test.

***This test shall be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that the mechanical stress and wear on the diesel engine is minimized.

5) Verifying that on a Safety Injection 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; and the offsite power source energizes the auto-connected emergency (accident) load through the LOCA sequencer. The generator voltage and frequency shall be 4160 + 160 - 420 volts and 60 ± 1.2 Hz within 12 seconds after the auto-start signal; the generator steady-state generator voltage and frequency shall be maintained within these limits during this test;

6) Simulating a loss-of-offsite power in conjunction with a Safety Injection test signal, and

   a) Verifying deenergization of the emergency busses and load shedding from the emergency busses;

   b) Verifying the diesel starts* on the auto-start signal, energizes the emergency busses with permanently connected loads within 12 seconds, energizes the auto-connected emergency (accident) loads through the LOCA sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 + 160 - 420 volts and 60 ± 1.2 Hz during this test; and

   c) Verifying that all automatic diesel generator trips, except high jacket coolant temperature, engine overspeed, low lube oil pressure, high crankcase pressure, start failure relay, and generator differential, are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal.

7) 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 6600 to 6821 kW** and during the remaining 22 hours of this test, the diesel generator shall be loaded to an indicated 6000 to 6201 kW.** The generator

*This test shall be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that the mechanical stress and wear on the diesel engine is minimized.

**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 or momentary variations due to changing bus loads shall not invalidate this test.

voltage and frequency shall be 4160 + 160 - 420 volts and 60 + 1.2 Hz, - 3 Hz within 12 seconds after the start signal; the steady-state generator voltage and frequency shall be maintained within 4160 ± 160 - 420 volts and 60 ± 1.2 Hz during this test. Within 5 minutes after completing this 24-hour test, perform Specification 4.8.1.1.2g.6b*;

8) Verifying that the auto-connected loads to each diesel generator do not exceed 6201 kW;

9) 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.

10) Verifying that with the diesel generator operating in a test mode, connected to its bus, a simulated Safety Injection signal overrides the test mode by: (1) returning the diesel generator to standby operation and (2) automatically energizing the emergency loads with offsite power;

11) Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the day tank of each diesel via the installed cross-connection lines; and

12) Verifying that the automatic LOCA and Shutdown sequence timer is OPERABLE with the interval between each load block within ± 10% of its design interval.

h. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting** both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to at least 514 rpm in less than or equal to 12 seconds; and

*If Specification 4.8.1.1.2g.6b is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at 6201 kW for 1 hour or until operating temperature has stabilized.

**This test shall be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that the mechanical stress and wear on the diesel engine is minimized.

SURVEILLANCE REQUIREMENTS (Continued)

i. At least once per 10 years by:

1) Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution or equivalent, and

2) Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure.

4.8.1.1.3 Reports - All diesel generator failures, valid or nonvalid, shall be reported in a Special Report to the Commission 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. If the number of failures in the last 100 valid tests (on a per nuclear unit basis) is greater than or equal to 7, the report shall be supplemented to include the additional information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. SOURCES, D.C. SOURCES, AND ONSITE POWER DISTRIBUTION

The OPERABILITY of the A.C. and D.C power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety-related equipment required for: (1) the safe shutdown of the facility, and (2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criterion 17 of Appendix A to 10 CFR Part 50.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite A.C. source. The A.C. and D.C. source allowable out-of-service times are based on Regulatory Guide 1.93, "Availability of Electrical Power Sources", December 1974. When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE, and that the steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that: (1) the facility can be maintained in the shutdown or refueling condition for extended time periods, and (2) sufficient instrumentation and control capability are available for monitoring and maintaining the unit status.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977 as modified by Amendment No. 8 issued on May 29, 1987 , and 1.137, "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979.

A.C. SOURCES, D.C. SOURCES, AND ONSITE POWER DISTRIBUTION (Continued)

The Surveillance Requirement for demonstrating the OPERABILITY of the Station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-2 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-2 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

NUMBER OF FAILURES IN LAST 20 VALID TESTS*	NUMBER OF FAILURES IN LAST 100 VALID TESTS*	TEST FREQUENCY
≤ 1	≤ 4	At least once per 31 days
≤ 2**	≥ 5	At least once per 7 days

*Criteria for determining number of failures and number of valid tests shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, Revision 1, August 1977, but determined on a per diesel generator basis. For the purposes of determining the required test frequency, the previous test failure count may be reduced to zero if a complete diesel overhaul to like-new conditions is completed, provided that the overhaul including appropriate post-maintenance operation and testing, is specifically approved by the manufacturer, and if acceptable reliability has been demonstrated. The reliability criterion shall be the successful completion of 14 consecutive tests in a single series. Ten of these tests shall be in accordance with Specifications 4.8.1.1.2a.4 and 4.8.1.1.2a.5, four tests, in accordance with Specification 4.8.1.1.2f. If this criterion is not satisfied during the first series of tests, any alternate criterion to be used to transvalue the failure count to zero requires NRC approval.

**The associated test frequency shall be maintained until seven consecutive failure free tests have been performed and the number of failures in the last 20 valid tests has been reduced to one.

LIMITING CONDITION FOR OPERATION

3.8.1.2 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. One circuit between the offsite transmission network and the Onsite Class 1E Distribution System, and

b. One diesel generator with:

   1) A day tank containing a minimum volume of 390 gallons of fuel,

   2) A fuel storage system containing a minimum volume of 85,300 gallons of fuel, and

   3) A fuel transfer pump.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, or crane operation with loads over the spent fuel pool. In addition, when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the requirements of Specifications 4.8.1.1.1, 4.8.1.1.2 (except for Specification 4.8.1.1.2a.5)), and 4.8.1.1.3.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 8 TO FACILITY OPERATING LICENSE NO. NPF-42

KANSAS GAS & ELECTRIC COMPANY

KANSAS CITY POWER AND LIGHT COMPANY

KANSAS ELECTRIC POWER COOPERATIVE, INC.

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

INTRODUCTION

By letter dated November 14, 1986, Kansas Gas and Electric Company (KG&E) requested changes to the Technical Specifications for the diesel generators at the Wolf Creek Generating Station. A supplemental letter dated April 17, 1987, provided additional clarification to the change in the November 14, 1986, letter. KG&E has in general used the staff's guidance outlined in Generic Letter 84-15 and the technical specifications approved for the North Anna Power Station as a basis for the proposed changes to the diesel generator Action statements and Surveillance Requirements.

EVALUATION

(a) Action statement 3.8.1.1a deletes the requirement to demonstrate the diesel generators operable for loss of an offsite circuit provided they have been successfully tested within the past 24 hours. We find this change reduces unnecessary testing and thereby the associated detrimental effects of frequent starts and is therefore acceptable. This change is also in accordance with previously approved technical specifications on North Anna.

(b) Action statements 3.8.1.1a,b,c and e expand the length of time allowed to demonstrate a diesel generator operable from 1 hour in all cases, to 8 hours for the loss of two power sources (offsite or onsite) and 24 hours for the loss of one power source. The requirement to retest at least once per 8 hours is also eliminated. We find these changes provide sufficient time to perform an orderly start test on the diesel generators, reduce unnecessary testing and thereby the associated detrimental effects of frequent starts and is therefore acceptable. This change is also in accordance with the guidance in Generic Letter 84-15 and with previously appproved technical specifications on North Anna.

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(c) A footnote has been added to Action statements 3.8.1.1a,c and e that says the automatic start and sequence loading of a diesel generator satisfies the testing requirements of Specification 4.8.1.1.2a.4) for this Action Statement. Each of the Action statements involves the loss of at least one offsite power source. The purpose of the footnote is to provide clarification that an additional start of the diesel generator for test purposes only, is not required if the diesel generator has automatically started and loaded following the loss of the offsite power source to its respective bus. This change is considered to be only a clarification of an already existing Technical Specification requirement and is therefore acceptable.

(d) A footnote has been added to Action statements 3.8.1.1b and c that requires that surveillance testing on a redundant diesel generator be completed regardless of when the inoperable diesel generator is restored to operability. The footnote also eliminates the need to demonstrate the operability of a diesel generator when its redundant counterpart is declared inoperable to do preplanned preventive maintenance, testing, or maintenance to correct a condition which, if left uncorrected, would not affect the operability of the diesel generator. We find that the first part of this footnote ensures that both diesel generators are tested for common-mode failures which may have caused the initial inoperability of the first DG and is therefore acceptable. The second part of the footnote reduces unnecessary testing and thereby the associated detrimental effects of frequent starts and is therefore also acceptable. Both changes are also in accordance with previously approved technical specifications on North Anna.

(e) In the Surveillance Requirements section the licensee has modified Surveillance Requirements 4.8.1.1.2a.4, 4.8.1.1.2a.5, and the applicable footnote so that the new surveillances and footnote now describe a diesel generator start that includes prelube, gradual loading, and warmup procedures recommended by the manufacturer. The fast start and load from ambient conditions required every 184 days on the diesel generator is now incorporated as a new Surveillance Requirement 4.8.1.1.2f separate from the above Surveillance Requirements. The new Surveillance Requirement 4.8.1.1.2f also includes a footnote which allows prelubing of the diesel generator prior to the start. Prelubing the diesel prior to the 184 day start will not affect the validity or results of the test and will reduce the mechanical stress and wear on the diesel generator which should result in an overall improvement in diesel engine reliability and availability. The change on prelubing is therefore acceptable and has been approved by the staff on recent near term operating license reviews. The

other changes described above do not result in any changes to the diesel generator testing requirements as they existed in the previous Technical Specification and are therefore acceptable.

(f) The modified footnote referenced above, that applies to Surveillance Requirement 4.8.1.1.2a.4, has also been made applicable to all the diesel generator starts in the 18 month surveillances 4.8.1.1.2g.4, 5, and 6, and 10 year surveillance 4.8.1.1.2h. The footnote reads: "This test shall be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that the mechanical stress and wear on the diesel engine is minimized." In Generic Letter 84-15 the staff stated that in its technical judgement an overall improvement in diesel engine reliability and availability can be gained by performing diesel generator starts for surveillance testing using engine prelube and other manufacturer recommended procedures to reduce engine stress and wear. The staff concluded that the frequency of fast start tests from ambient conditions of diesel generators should be reduced. This proposed technical specification change follows that guidance and is therefore acceptable.

(g) In Surveillance Requirements 4.8.1.1.2a.5, 4.8.1.1.2f, and 4.8.1.1.2g.7 the diesel generator loading requirements have been specified as an indicated loading band which extends up to the continuous rating or overload rating as appropriate (i.e., "an indicated 6000 to 6201 kW" for the continuous rating and "an indicated 6600 to 6821 kW" for the overload rating). The diesel generator loading requirements in these surveillances were originally specified as "greater than or equal to 6201kW" for the continuous rating, and "greater than or equal to 6821 kW" for the overload rating. A new footnote has also been added to the loading band specified in these Surveillance Requirements which reads: "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 or momentary variations due to changing bus loads shall not invalidate this test." The staff has found that the open-ended language "greater than or equal to" that exists in the present Technical Specification has the potential for routine overloading of the diesel generators. The open-ended load requirement creates a situation wherein operators will tend to operate the diesel generators at a load for which the meter indicates a value greater than the specified value in order to avoid an enforcement action for an invalid test if the meter indication should slip below the specified value. Because routine overloading of the diesel generators should be avoided, and because the loading bands utilized are sufficiently narrow to ensure the machines are nominally loaded to their continuous and overload ratings the staff finds these changes acceptable. The staff has also approved this type of change on North Anna and on near term operating license reviews.

(h) With regard to the changes made in Table 4.8-1, titled "Diesel Generator Test Schedule," the first specific proposal is to change the basis for the testing schedule from "a per nuclear unit basis" to "a per diesel generator basis." The second proposal is to reduce the test frequency for an individual diesel generator (DG) based on the number of failures from the present minimum interval of once per three days to a minimum of once per seven days.

The objective of testing the diesels on a regular basis is to ensure the DGs' operability by timely failure detection and necessary corrective action. Such testing provides a degree of assurance of the DGs' availability during the periods between tests. Therefore, the existing and the previous DG testing concepts are that the above assurance has to be demonstrated with more frequent testing as the number of DG failures increases. Thus, the existing and the previous TS require that diesels be tested so that the interval depends on the demonstrated DG performance, i.e., the interval shortens as the number of failures increases. Furthermore, the previous test interval is established conservatively on a per nuclear unit basis, rather than on a per diesel basis. Thus, improper diagnosis of a DG failure could potentially result in more frequent testing of all the DGs. Also, test intervals that are too short could have an adverse impact on DG reliability.

Past experience has shown that many licensees have been frequently testing their good DGs mainly to quickly get out of the frequent test cycles imposed by the TS. The staff and industry agree that current requirements for testing of good DGs do not improve reliability of the good DGs and may be a factor in potentially degrading them. Also, this excessive testing may have negative effects on the overall expected life of the good DGs and, hence, such testing is not warranted. Therefore, the staff agrees with the licensee's proposal to count DG failures on a per DG basis rather than on a per nuclear unit basis and that the frequency of testing a DG will be based on the number of its own failures. This is consistent with the guidance provided in Generic Letter 84-15 on DG reliability. Thus, the staff finds that these proposed changes are acceptable because they reduce the potential for degrading DG reliability due to excessive testing and are not detrimental to the health and safety of the public.

In addition, the staff has for sometime been evaluating the frequency of DG testing and the associated potential for severe degradation of engine parts due to frequent fast start testing. The staff concludes that the test frequency can be reduced to minimize this potential without affecting the overall DG reliability. Therefore, the staff finds that the licensee's proposal to reduce the test frequency for an individual diesel generator, based on the number of failures, from the present minimum interval of once per three days to a minimum of once per seven days is acceptable. This is consistent with the guidance provided in Generic Letter 84-15 on DG reliability.

The final change proposed in Table 4.8-1 would provide an explicit direct incentive for the licensee to perform a thorough and comprehensive complete overhaul of the DG (the DG would be rebuilt to like-new conditions) that is approved by the DG manufacturer. Following such an overhaul, the DG would become operable after it successfully passed the appropriate surveillance tests one time. However, in return for the overhaul, the utility would receive the benefit of not being required to count previous failures on that DG if an acceptable reliability can be demonstrated. With "no previous failures" in the past 20 or 100 tests, the DG would re-enter the test schedule at the monthly test frequency. Accelerated testing (weekly) would not become required until either 2 failures in 20 tests or 5 failures in 100 tests occur. The staff finds that this change is acceptable because a thorough and complete overhaul of a DG, that has experienced excessive number of failures, would potentially provide for better reliability.

The proposed reliability criterion for the rebuilt DG is the successful completion of 14 consecutive tests, at least 4 of which would be "fast cold" starts. Statistically, the probability that a DG with an actual reliability of less than 0.90 demand will satisfy this 14-test criterion is no greater than 20% and decreases rapidly with the actual reliability. The probability that a DG with an actual reliability of less than 0.95 will satisfy the 14-test criterion is 42% or less. The staff, therefore, finds the proposed 14-test criterion to be acceptable. A note of caution should be added regarding repeated attempts to satisfy the 14-test criterion because in such a case the statistical situation changes. If a DG passes the criterion on a second attempt, the probability that the actual reliability is 0.95 would be reduced to only about 25%. Therefore, if the 14-test criterion is not passed on the first attempt, the previous test failures could not be disposed of until some new criterion is negotiated with the NRC. This is specifically required as part of the reliability test criterion in the current Table 4.8-1 and is, therefore, acceptable.

ENVIRONMENTAL CONSIDERATION

The amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or in a surveillance requirement. 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 exposures. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: May 29, 1987

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