

ATTACHMENT 2 TO AEP:NRC:0896H

REVISED PAGES FOR THE

DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2

TECHNICAL SPECIFICATIONS

8712010163 871125
PDR ADDCK 05000315 PDR
P

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

- a. In accordance with the frequency specified in Table 4.8-2 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 that the fuel transfer pump can be started and that it transfers fuel from the storage system to the day tank,
 4. Verifying that the diesel starts from ambient condition and that it accelerates to at least 514 rpm in less than or equal to 10 seconds,*
 5. Verifying that the generator is loaded to greater than or equal to 1700 kw and that it operates for greater than or equal to 60 minutes and verifying that the generator output breaker to the emergency bus is OPERABLE, and
 6. Verifying that the diesel generator is aligned to provide standby power to the associated emergency busses.
- 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 tanks at least once per 31 days.
- c. By sampling new fuel oil** in accordance with the applicable guidelines of ASTM D4057-81 prior to adding new fuel to the storage tanks and
 - 1) By verifying, in accordance with the tests specified in ASTM D975-81 and prior to adding the new fuel to the storage tanks, that the sample has
 - a) A kinematic viscosity of greater than or equal to 1.9 centistokes but less than or equal to 4.1 centistokes at 40°C (alternatively, Saybolt viscosity, SUS at 100°F of greater than or equal to 32.6 but less than or equal to 40.1), if gravity was not determined by comparison with supplier's certification.
 - b) A flash point equal to or greater than 125°F.

*The diesel generator start (10 seconds) from ambient conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts for the purpose of this surveillance testing and compensatory action may be at reduced acceleration rates as recommended by the manufacturer so that mechanical stress and wear on the diesel engine are minimized.

**The actions to be taken should any of the properties be found outside of specified limits are defined in the Bases.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 2) By verifying, in accordance with the test specified in ASTM D1298-80 and prior to adding the new fuel to the storage tanks, that the sample has either an API gravity of greater than or equal to 30 degrees but less than or equal to 40 degrees at 60°F or an absolute specific gravity at 60/60°F of greater than or equal to 0.82 but less than or equal to 0.88, or an API gravity of within 0.3 degrees at 60°F when compared to the supplier's certificate or a specific gravity of within 0.0016 at 60/60°F when compared to the supplier's certificate.
- 3) By verifying, in accordance with the test specified in ASTM D4176-82 and prior to adding new fuel to the storage tanks, that the sample has a clear and bright appearance with proper color.
- 4) By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are within the appropriate limits when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D2622-82.
- d. At least once per 31 days by obtaining a sample of fuel oil from the storage tanks in accordance with ASTM D2276-83, and verifying that total particulate contamination is less than 10 mg/liter when tested in accordance with ASTM D2276-83, Method A**.
- e. At least once per 18 months, during shutdown, by:
 1. Subjecting the diesel engine to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service,
 2. Verifying the generator capability to reject a load greater than or equal to 600 kw while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz,
 3. Verifying the generator capability to reject a load of 3500 kw without exceeding 75% of the difference between nominal speed and the overspeed trip setpoint,
 4. Simulating a loss of offsite power by itself, and:
 - a) Verifying de-energization of the emergency busses and load shedding from the emergency busses,

**The actions to be taken should any of the properties be found outside of the specified limits are defined in the Bases.

SURVEILLANCE REQUIREMENTS (Continued)

- b) Verifying that the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected shutdown loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After load sequencing is completed, the steady state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during the test.
5. Verifying that, on a Safety Injection 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,
6. Simulating a loss of offsite power in conjunction with a Safety Injection actuation test signal, and by:
 - a) Verifying de-energization 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 10 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After load sequencing is completed, the steady state voltage and frequency of the emergency busses shall be 4160 ± 420 volts and 60 ± 1.2 Hz. The voltage and frequency shall be maintained within these limits for the remainder of this test, and
 - c) Verifying that all automatic diesel generator trips, except engine overspeed and generator differential, are automatically bypassed upon loss of voltage on the emergency bus and/or Safety Injection actuation signal.
7. Verifying that the diesel generator operates for at least 24 hours. During this test the diesel generator shall be loaded to 3500 kw. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2.e.4.
8. Verifying that the auto-connected loads to each diesel generator do not exceed 3500 kw.
9. Verifying the diesel generator's capability to:

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 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 while connected to its test load, a simulated Safety Injection signal overrides the test mode by:
- a) Returning the diesel generator to standby operation, and
 - b) Verifying the emergency loads are serviced by offsite power.
- f. At least once per 10 years by:
1. Draining each fuel oil storage tank, removing the accumulated sediment, and cleaning the tank, or agitating the fuel oil in the storage tank and then pumping the oil from the bottom of the tank, through a 5-micron filter, and back to the opposite end of the tank.
 2. Performing a precision leak detection test to verify that the leakage rate from the fuel oil system is less than or equal to .05 gallons per hour.

3/4.8 ELECTRICAL POWER SYSTEMS

BASES

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 Criteria 17 of Appendix "A" to 10 CFR 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 accident 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 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 is available for monitoring and maintaining the facility status.

In reference to Specification 3.8.1.1 Action b, the phrase "and an accumulated annual outage time of 576 hours exclusive of MODES 5 and 6" shall be interpreted as follows. This phrase refers to the amount of time the diesel generator has been inoperable in the past 365 days while in MODES 1, 2, 3, and 4. This time includes the amount of time spent in ACTION statements except for the time utilized for regularly scheduled surveillances. The accumulated annual outage time is reset to zero upon successful completion of the diesel generator requalification program (Attachment 2 to Table 4.8-1).

The train N station battery system provides an independent 250 volt DC power supply for power and control of the turbine driven auxiliary feedwater pump train. The limiting conditions of operation for the train N battery are consistent with the requirements of the auxiliary feedwater system. The surveillance requirements for the train N battery system are consistent with the requirements of the AB and CD station batteries. The train N battery loads are derived from equipment in the turbine driven auxiliary feedwater pump train and battery sizing is consistent with the functional requirements of these components. Simulated loads for battery tests are loads equivalent to measured actual loads.

3/4.8 ELECTRICAL POWER SYSTEMS (Continued)

BASES

Removal of accumulated water as required by 4.8.1.1.2.b.2 is performed by drawing the contents off the bottom of the tank until acceptable results are obtained for either a tape test or a water and sediment test. An acceptable result for the water and sediment content is a measured value less than 0.05 percent volume.

The sample specified in 4.8.1.1.2.c.4 is sent offsite for testing. A serious attempt will be made to meet the 31-day limit on the offsite tests; however, if for some reason this limit is not met (e.g., if the sample is lost or broken or if the results are not received in 31 days), the diesel generators should not be considered inoperable. If the sample is lost, broken, or fails the offsite tests and the new oil has already been put into the storage tank, the offsite tests will be performed on a sample taken from the storage tank. If the results on the subsequent storage tank sample are not within specified limits, the diesel generators should be considered OPERABLE and the out-of-spec properties should be returned to within specification as soon as possible.

If a storage tank sample fails the particulate contamination test, the diesel generators should be considered OPERABLE and the contamination level should be restored to below 10 mg/liter as soon as possible.

The precision leak-detection test described in Surveillance Requirement 4.8.1.1.2.f.2 should be performed as described in NFPA (National Fire Protection Association) -329. As NFPA-329 is revised, the precision leak-detection test may be modified to incorporate changes to the test as described in the revisions to NFPA-329.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

- a. In accordance with the frequency specified in Table 4.8-2 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 that the fuel transfer pump can be started and that it transfers fuel from the storage system to the day tank,
 4. Verifying that the diesel starts from ambient condition and that it accelerates to at least 514 rpm in less than or equal to 10 seconds,*
 5. Verifying that the generator is loaded to greater than or equal to 1700 kw and that it operates for greater than or equal to 60 minutes and verifying that the generator output breaker to the emergency bus is OPERABLE, and
 6. Verifying that the diesel generator is aligned to provide standby power to the associated emergency busses.
- 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 tanks at least once per 31 days.
- c. By sampling new fuel oil** in accordance with the applicable guidelines of ASTM D4057-81 prior to adding new fuel to the storage tanks and
 - 1) By verifying, in accordance with the tests specified in ASTM D975-81 and prior to adding the new fuel to the storage tanks, that the sample has
 - a) A kinematic viscosity of greater than or equal to 1.9 centistokes but less than or equal to 4.1 centistokes at 40°C (alternatively, Saybolt viscosity, SUS at 100°F of greater than or equal to 32.6 but less than or equal to 40.1), if gravity was not determined by comparison with supplier's certification.
 - b) A flash point equal to or greater than 125°F.

*The diesel generator start (10 seconds) from ambient conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts for the purpose of this surveillance testing and compensatory action may be at reduced acceleration rates as recommended by the manufacturer so that mechanical stress and wear on the diesel engine are minimized.

**The actions to be taken should any of the properties be found outside of specified limits are defined in the Bases.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 2) By verifying, in accordance with the test specified in ASTM D1298-80 and prior to adding the new fuel to the storage tanks, that the sample has either an API gravity of greater than or equal to 30 degrees but less than or equal to 40 degrees at 60°F or an absolute specific gravity at 60/60°F of greater than or equal to 0.82 but less than or equal to 0.88, or an API gravity of within 0.3 degrees at 60°F when compared to the supplier's certificate or a specific gravity of within 0.0016 at 60/60°F when compared to the supplier's certificate.
 - 3) By verifying, in accordance with the test specified in ASTM D4176-82 and prior to adding new fuel to the storage tanks, that the sample has a clear and bright appearance with proper color.
 - 4) By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are within the appropriate limits when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D2622-82.
- d. At least once per 31 days by obtaining a sample of fuel oil from the storage tanks in accordance with ASTM D2276-83, and verifying that total particulate contamination is less than 10 mg/liter when tested in accordance with ASTM D2276-83, Method A**.
- e. At least once per 18 months, during shutdown, by:
1. Subjecting the diesel engine to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service,
 2. Verifying the generator capability to reject a load greater than or equal to 600 kw while maintaining voltage at 4160 \pm 420 volts and frequency at 60 \pm 1.2 Hz,
 3. Verifying the generator capability to reject a load of 3500 kw without exceeding 75% of the difference between nominal speed and the overspeed trip setpoint,
 4. Simulating a loss of offsite power by itself, and:
 - a) Verifying de-energization of the emergency busses and load shedding from the emergency busses,

**The actions to be taken should any of the properties be found outside of the specified limits are defined in the Bases.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b) Verifying that the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected shutdown loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After load sequencing is completed, the steady state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during the test.
5. Verifying that, on a Safety Injection 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,
6. Simulating a loss of offsite power in conjunction with a Safety Injection actuation test signal, and by:
 - a) Verifying de-energization 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 10 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After load sequencing is completed, the steady state voltage and frequency of the emergency busses shall be 4160 ± 420 volts and 60 ± 1.2 Hz. The voltage and frequency shall be maintained within these limits for the remainder of this test, and
 - c) Verifying that all automatic diesel generator trips, except engine overspeed and generator differential, are automatically bypassed upon loss of voltage on the emergency bus and/or Safety Injection actuation signal.
7. Verifying that the diesel generator operates for at least 24 hours. During this test the diesel generator shall be loaded to 3500 kw. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2.e.4.
8. Verifying that the auto-connected loads to each diesel generator do not exceed 3500 kw.
9. Verifying the diesel generator's capability to:

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 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 while connected to its test load, a simulated Safety Injection signal overrides the test mode by:
- a) Returning the diesel generator to standby operation, and
 - b) Verifying the emergency loads are serviced by offsite power.
- f. At least once per 10 years by:
- 1. Draining each fuel oil storage tank, removing the accumulated sediment, and cleaning the tank, or agitating the fuel oil in the storage tank and then pumping the oil from the bottom of the tank, through a 5-micron filter, and back to the opposite end of the tank.
 - 2. Performing a precision leak detection test to verify that the leakage rate from the fuel oil system is less than or equal to .05 gallons per hour.

3/4.8 ELECTRICAL POWER SYSTEMS

BASES

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 Criteria 17 of Appendix "A" to 10 CFR 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 accident 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 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 is available for monitoring and maintaining the facility status.

In reference to Specification 3.8.1.1 Action b, the phrase "and an accumulated annual outage time of 576 hours exclusive of MODES 5 and 6" shall be interpreted as follows. This phrase refers to the amount of time the diesel generator has been inoperable in the past 365 days while in MODES 1, 2, 3, and 4. This time includes the amount of time spent in ACTION statements except for the time utilized for regularly scheduled surveillances. The accumulated annual outage time is reset to zero upon successful completion of the diesel generator requalification program (Attachment 2 to Table 4.8-1).

The train N station battery system provides an independent 250 volt DC power supply for power and control of the turbine driven auxiliary feedwater pump train. The limiting conditions of operation for the train N battery are consistent with the requirements of the auxiliary feedwater system. The surveillance requirements for the train N battery system are consistent with the requirements of the AB and CD station batteries. The train N battery loads are derived from equipment in the turbine driven auxiliary feedwater pump train and battery sizing is consistent with the functional requirements of these components. Simulated loads for battery tests are loads equivalent to measured actual loads.

3/4.8 ELECTRICAL POWER SYSTEMS (Continued)

BASES

Removal of accumulated water as required by 4.8.1.1.2.b.2 is performed by drawing the contents off the bottom of the tank until acceptable results are obtained for either a tape test or a water and sediment test. An acceptable result for the water and sediment content is a measured value less than 0.05 percent volume.

The sample specified in 4.8.1.1.2.c.4 is sent offsite for testing. A serious attempt will be made to meet the 31-day limit on the offsite tests; however, if for some reason this limit is not met (e.g., if the sample is lost or broken or if the results are not received in 31 days), the diesel generators should not be considered inoperable. If the sample is lost, broken, or fails the offsite tests and the new oil has already been put into the storage tank, the offsite tests will be performed on a sample taken from the storage tank. If the results on the subsequent storage tank sample are not within specified limits, the diesel generators should be considered OPERABLE and the out-of-spec properties should be returned to within specification as soon as possible.

If a storage tank sample fails the particulate contamination test, the diesel generators should be considered OPERABLE and the contamination level should be restored to below 10 mg/liter as soon as possible.

The precision leak-detection test described in Surveillance Requirement 4.8.1.1.2.f.2 should be performed as described in NFPA (National Fire Protection Association) -329. As NFPA-329 is revised, the precision leak-detection test may be modified to incorporate changes to the test as described in the revisions to NFPA-329.

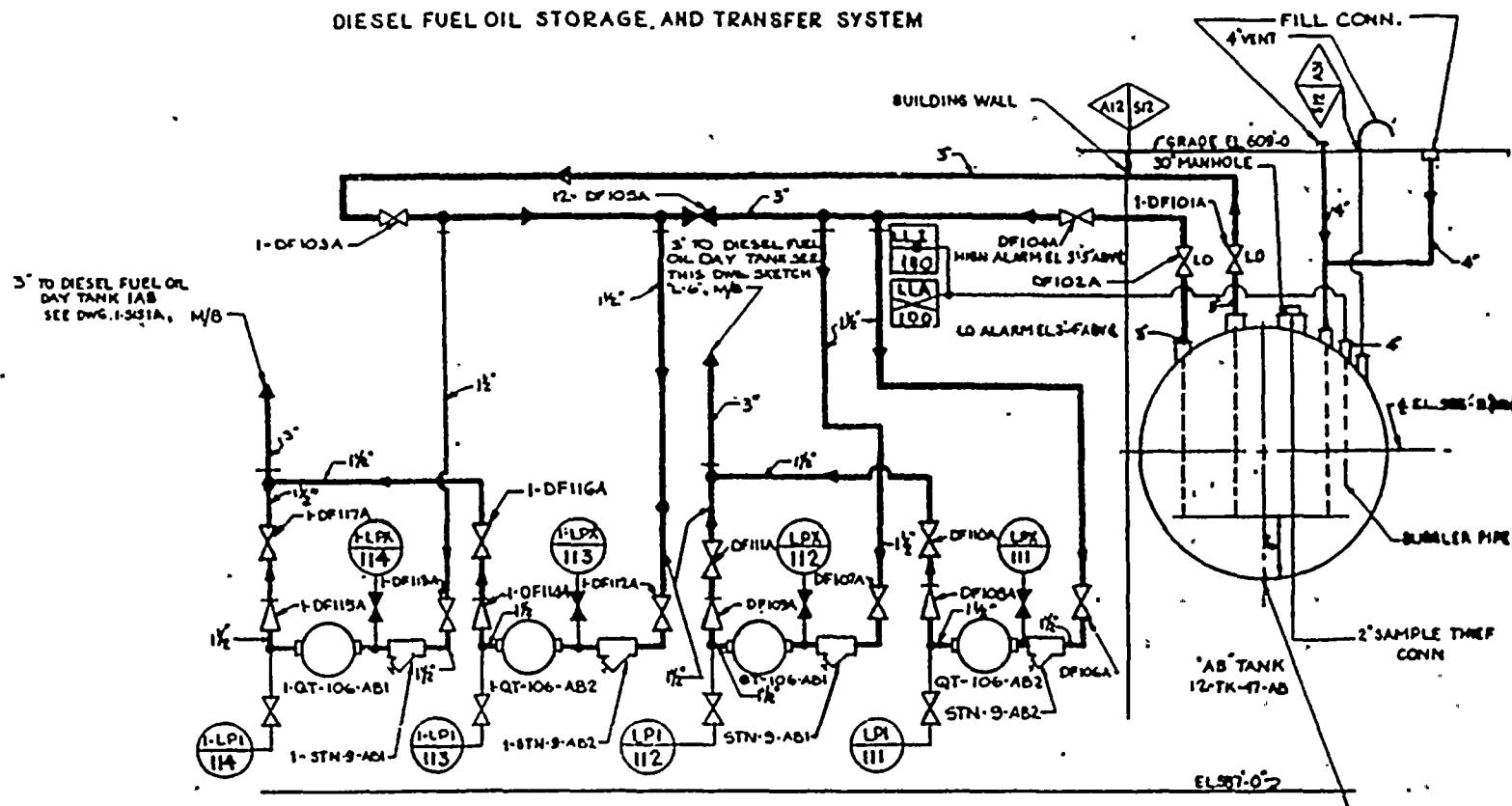
ATTACHMENT 3 TO AEP:NRC:0896G

FLOW DIAGRAM OF DIESEL FUEL OIL TANKS
AND EXPLANATION OF WHY EMPTYING TANKS

REQUIRES DUAL UNIT SHUTDOWN

As shown on Figures 1 and 2, the "AB" tank supplies fuel to the Unit 1 "AB" diesel generator and the Unit 2 "AB" diesel generator, while the "CD" tank supplies fuel to the Unit 1 "CD" diesel generator and the Unit 2 "CD" diesel generator. Figure 3 shows the location of the tanks relative to each other. There is no cross-tie between the tanks; therefore, to empty either tank to clean it would require making a diesel generator in each unit inoperable. Since cleaning the tanks cannot be accomplished within the 72-hour Action Statement of T/S 3.8.1.1, emptying the tanks to clean them would require both units to be shut down.

DIESEL FUEL OIL STORAGE, AND TRANSFER SYSTEM



LEGEND

DIESEL FUEL OIL
SUPPLY
AUXILIARY PIPING

(4) DIESEL FUEL OIL TRANSFER PUMPS
(WITH BUILT IN RELIEF VALVES)
(2 PER ENGINE-2 HP 514 RPM
(4) PUMP 1,800 RPM 3500 GPM EACH

- (1) DIESEL FUEL OIL STORAGE TANKS - BURIED IN YARD
(1 PER 2 ENGINES 60000 GALS. CAPACITY EACH)
(240 HOURS WORTH FOR 1 ENGINE AT FULL LOAD)
12'-0" DIA x 72'-0" LONG EC-3

Donald C. Cook Nuclear Plant
November 24, 1987
Cern

Figure 1

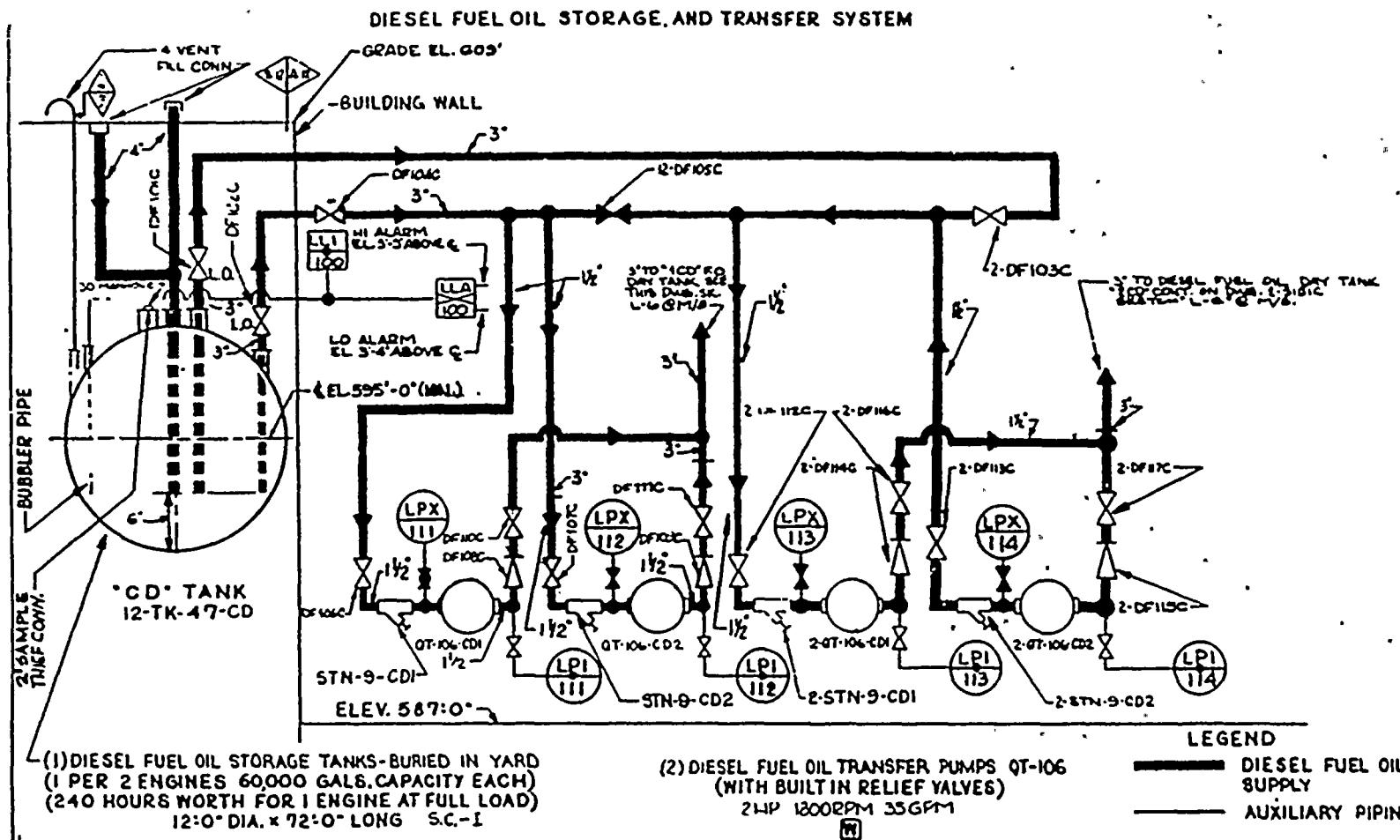


Figure 2

Donald C. Cook Nuclear Plant
 November 24, 1987
 CEGM

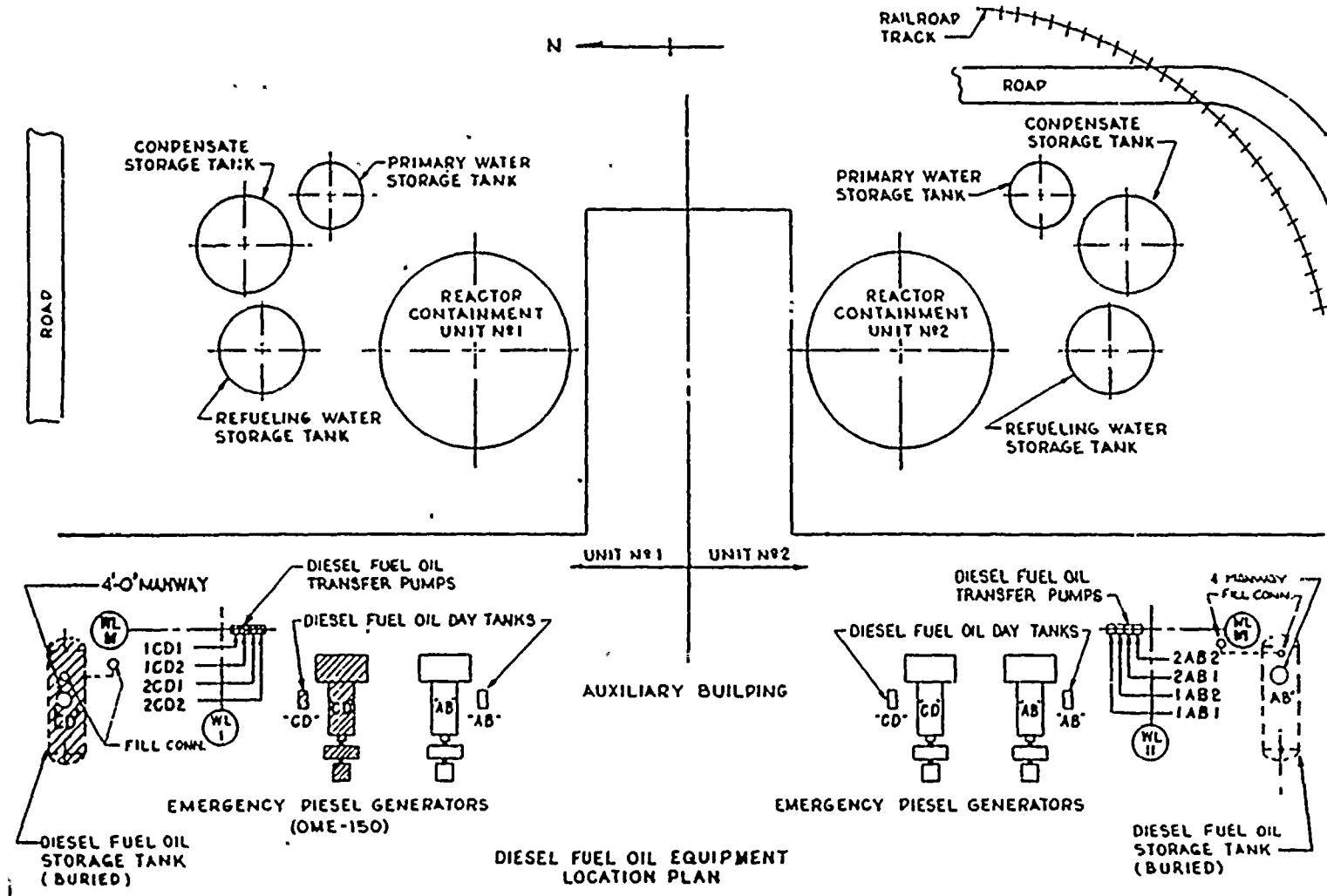


Figure 3

Donald C. Cook Nuclear Plant
November 24, 1987
CEM

