3.7 AUXILIARY ELECTRICAL POWER

Applicability: Applies to the operating status of the auxiliary electrical power supply.

Objective: To assure the operability of the auxiliary electrical power supply.

Specification: A. The reactor shall not be made critical unless all of the following requirements are satisfied:

1. The following buses or panels energized.

   a. 4160 volt buses 1C and 1D in the turbine building switchgear room.

   b. 460 volt buses 1A2, 1B2, 1A21, 1B21 vital MCC 1A2 and 1B2 in the reactor building switchgear room: 1A3 and 1B3 at the intake structure; 1A21A, 1B21A, 1A21B, and 1B21B and vital MCC 1AB2 on 23'6" elevation in the reactor building; 1A24 and 1B24 at the stack.

   c. 208/120 volt panels 3, 4, 4A, 4B, 4C and VACP-1 in the reactor building switchgear room.

   d. 120 volt protection panel 1 and 2 in the cable room.

   e. 125 volt DC distribution centers C and B, and panel D, Panel DC-F, isolation valve motor control center DC-1 and 125V DC motor control center DC-2.

   f. 24 volt D.C. power panels A and B in the cable room.

2. One 230 KV line is fully operational and switch gear and both startup transformers are energized to carry power to the station 4160 volt AC buses and carry power to or away from the plant.

3. An additional source of power consisting of one of the following is in service connected to feed the appropriate plant 4160 V bus or buses:

   a. A second 230 KV line fully operational.

   b. One 34.5 KV line fully operational.

4. Station batteries B and C and an associated battery charger are operable. Switchgear control power for 4160 volt bus 1D and 460 volt buses 1B2 and 1B3 are provided by battery B. Switchgear control power for 4160 volt bus 1C and 460 volt buses 1A2 and 1A3 are provided by battery C.

5. Bus tie breakers ED and EC are in the open position.

B. The reactor shall be placed in the cold shutdown position if the availability of power falls below that required by Specification A above, except that

1. The reactor may remain in operation for a period not to exceed 7 days in any 30 day period if a startup transformer is out of service. None of the engineered safety feature equipment fed by the remaining transformer may be out of service.

2. The reactor may remain in operation for a period not to exceed 7 days if 125 VDC Motor Control Center DC-2 is out of service, provided the requirements of Specification 3.8 are met.

C. Standby Diesel Generators

1. The reactor shall not be made critical unless both diesel generators are operable and capable of feeding their designated 4160 volt buses.

2. If one diesel generator is inoperable during power operation, repairs shall be initiated immediately and the other diesel shall be operated at least one hour every 24 hours at greater than 20% rated power until repairs are completed. The reactor may remain in operation for a period not to exceed 7 days if a diesel generator is out of service (unscheduled). If a diesel is out of service due to its periodic integrated inspection, the allowable out of service time is 14 days.

3. If both diesel generators are inoperable during power operation, the reactor shall be placed in the cold shutdown condition.

4. For the diesel generators to be considered operable:

A) There shall be a minimum of 14,000 gallons of diesel fuel in the standby diesel generator fuel tank,

OR

B) To facilitate inspection, repair, or replacement of equipment which would require full or partial draining of the standby diesel generator fuel tank, the following conditions must be met:

1) There shall be a minimum of 14,000 gallons of fuel oil contained in temporary tanker trucks, connected and aligned to the diesel generator fill station.

4.7 AUXILIARY ELECTRICAL POWER

Applicability: Applies to surveillance requirements of the auxiliary electrical supply.

Objective: To verify the availability of the auxiliary electrical supply.

Specification: A. Diesel Generator

1. Each diesel generator shall be started and loaded to not less than 20% rated power every two weeks.

2. The two diesel generators shall be automatically actuated and functionally tested during each refueling outage. This shall include testing of the diesel generator load sequence timers listed in Table 3.1.1.

3. Deleted

4. The diesel generators' fuel supply shall be checked following the above tests.

5. The diesel generators' starting batteries shall be tested and monitored using the same methodology as the station batteries, Specification 4.7.B., except the battery capacity test may be performed during the operating cycle.

6. At least once per 12 months, the diesel generator battery capacity shall be demonstrated to be able to supply the design duty loads (diesel start) during a battery service test.

B. Station Batteries

1. Weekly surveillance will be performed to verify the following:

   a. The active metallic surface of the plates shall be fully covered with electrolyte in all batteries,

   b. The designated pilot cell voltage is greater than or equal to 2.0 volts and

   c. The overall battery voltage is greater than or equal to 120 volts (Diesel battery; 112 volts).

   d. The pilot cell specific gravity, corrected to 77EF, is greater than or equal to 1.190.

2. Quarterly Surveillance will be performed to verify the following:

   a. The active metallic surface of the plates shall be fully covered with electrolyte in all batteries.

b. The voltage of each connected cell is greater than or equal to 2.0 volts under float charge and

c. The specific gravity, for each cell, is greater than or equal to 1.190 when corrected to 77EF. The electrolyte temperature of every fifth cell (Diesel; every fourth cell) shall be recorded for surveillance review.

3. At least once per 24 months during shutdown, the following tests will be performed to verify battery capacity.

a. Battery capacity shall be demonstrated to be at least 80% of the manufacturers' rating when subjected to a battery capacity discharge test to be considered operable.

b. Any battery which is demonstrated to have less than 85% of manufacturers ratings during a capacity discharge test shall be replaced during the subsequent refueling outage.

c. Station battery capacity shall be demonstrated to be able to supply the design duty cycle loads during a battery service test.

d. Battery low voltage annunciators are verified to pick up at 115 volts " 1 volt and to reset at 125 volts " 1 volt (Diesel; 112 volts " 1 volt).

Basis: The biweekly tests of the diesel generators are primarily to check for failures and deterioration in the system since last use. The manufacturer has recommended the two week test interval, based on experience with many of their engines. One factor in determining this test interval (besides checking whether or not the engine starts and runs) is that the lubricating oil should be circulated through the engine approximately every two weeks. The diesels should be loaded to at least 20% of rated power until engine and generator temperatures have stabilized (about one hour). The minimum 20% load will prevent soot formation in the cylinders and injection nozzles. Operation up to an equilibrium temperature ensures that there is no over-heat problem. The tests also provide an engine and generator operating history to be compared with subsequent engine-generator test data to identify and correct any mechanical or electrical deficiency before it can result in a system failure.

This page along with any attached pages constitutes a written safety evaluation.

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1.0 Purpose

The intent of this safety evaluation is to consider the proposed actions contained in TSCR 230. These actions include removing specification 4.7.A.3 which requires a thorough inspection of each diesel generator at least once every twenty-four months during shutdown. In addition, the allowed outage time (AOT) is currently seven days in any thirty day period. This activity would delete the phrase "in any thirty day period" and extend the AOT to fourteen days for the periodic diesel inspection which would be performed while the reactor is on line. Furthermore, a provision of specification 3.7.C.2 which states that any engineered safety features (ESF) normally supported by the operable diesel must be in service has been deleted. As a clarification, the verb "become(s) inoperable" in specification 3.7.C.2 and 3 have been changed to "is" and "are", respectively. Two minor typographical errors have also been corrected. In addition, specification 4.7.A.5 has been modified to reflect the possibility of performing the surveillance during the operating cycle. Finally, specification 4.7.B.3 has been renumbered to 4.7.A.6 since it applies exclusively to EDG batteries and not station batteries. Specification 4.7.B.4 is now 4.7.B.3.

2.0 Systems Affected

2.1 Identification of Systems

The following plant systems are directly affected by this activity:

- Emergency Diesel Generators (741)

2.2 Identification of Drawings

EM 839 3039	EM 839 7907
GU 3E 862-21-1000	GU 3E 861-21-1000
GU 3E 861-21-1001	GU 3E 861-21-1002

2.3 Identification of Documents

The affected system is described in the following documents:

Oyster Creek UFSAR Section 8.3 "Onsite Power Systems"

3.0 Effects on Safety

3.1 Identification of Documents

The following documents define the safety function of the Emergency Diesel Generators (EDG):

O.C. Facility Design Safety Analysis Report (FDSAR) Appendix L
O.C. Updated Final Safety Analysis Report (UFSAR) Chapter 8
O.C. Technical Specifications Section 3.7 Bases

3.2 Safety Function

The electric power system provides power for the station auxiliaries, the control and instrumentation systems and engineered safety features during all conditions including abnormal and accident. The safety related electric power systems are provided with adequate capacity, redundancy, independence, and testability to perform their safety related function when required.

Two sources of offsite power are provided via the Jersey Central Power & Light Company (JCP&L) utility transmission system and the Atlantic Electric Company (AE) utility transmission system. A function of the Offsite Power System is to provide a backup source of ac power to the station when the main generator is incapable of supplying station loads through the auxiliary transformer.

The essential auxiliary electrical power system consists of two independent diesel generators and two independent radial distribution systems. The power sources for the essential auxiliary power supplies are sufficient in number and of such physical and electrical independence that no single probable event could interrupt all auxiliary power at one time. Upon loss of the station's main generator during normal operations, the power requirements are automatically transferred to the startup transformers. If this automatic transfer fails or if offsite power is not available, a third source of power is available to the essential auxiliary electrical power system from two Emergency Diesel Generators (EDGs). This power supply is physically independent of any normal power system. The capacity of the EDG units is adequate to carry out their safety functions.

In order to comply with 10 CFR 50.63 (Station Blackout), GPUN has added an Alternate AC (AAC) Power Supply System. The AAC capability is provided by JCP&L's combustion turbines (CTs) located at the Forked River site. The Forked River CTs supply power to Oyster Creek via an underground ductbank/trench system, a new 10 MVA, 13.8/4.16 kV, 3 phase station blackout (SBO) transformer and a new 4.16kV breaker/cubicle. The SBO system is configured such that only one of two CTs is required to supply power to Oyster Creek.

The AAC power service has been designed so that it will be available within one hour of the onset of a station blackout event and has sufficient capability and capacity to operate systems necessary to achieve and maintain the plant in a safe shutdown condition. Although not analyzed as a source of power for safety loads during any plant condition other than SBO, the CTs represent an enhancement to the power system.

3.3 Effect of Proposed Activity on the Safety Function

The proposed activity has several aspects and each must be considered separately. First, two minor typographical errors have been corrected. In specification 3.7.A.4 the word "changer" has been corrected to "charger". In specification 4.7.A.5 a lower case "b" in a reference to 4.7.B has been corrected. These changes are purely administrative in nature. As such, they have no effect on safety.

The second aspect of the proposed activity is the deletion of Specification 4.7.A.3 which requires that each diesel generator be thoroughly inspected at least once per 24 months during shutdown. Inspection of the diesels is prudent and in accord with vendor recommendation. However, a review of the Standard Technical Specifications (STS) General Electric Plants, BWR/4 reveals no requirement to inspect diesel generators periodically. The NRC has accepted the STS as the generic template for safe operation. Therefore, moving the inspection requirements to other controlled documents is acceptable. The Bases of T.S. 3.7 "Auxiliary Electrical Power" states that the general objective is "to assure an adequate supply of power with at least one active and one standby source of power available for operation of equipment required for a safe plant shutdown". The Bases describe four active and two standby (EDG) sources of power excluding the plant's main generator since it is not available during shutdown. If this activity were approved, EDG inspection could be done with the reactor online and with at least two (including one active and one standby) sources of power available. The minimum power requirement cited in the Bases would, therefore, be met or exceeded.

The Bases also cite the probability analysis in Appendix "L" to Amendment 3 of the FDSAR which is based on one diesel and shows that even with only one diesel, the probability of requiring engineered safety features at the same time as the second diesel fails is quite small ("the probability of having power available following a loss-of-coolant accident is 0.99999 or greater."). Since that analysis was performed, the reliability of the diesels has been enhanced further thus reducing the probability of diesel failure. Inspecting the diesels with the reactor on line can actually result in a net safety benefit. The performance of the inspected diesel can be expected to be enhanced for the remainder of the operating cycle within which it is inspected. Also, availability of both diesels during plant shutdown will be increased. Furthermore, internal resources could be utilized to perform the inspection without the additional resource demands present during shutdown. These same resources could then be used during shutdown to perform other safety-related activities.

Specification 4.7.A.5 states that the diesel generator batteries will be tested and monitored "the same as the station batteries". While this will continue to be true, the specification has been expanded to reflect the possibility that the battery capacity test may be performed with the reactor on line. In addition, specification 4.7.B.3, which concerns the battery service test of the diesel generator batteries, has been moved (otherwise unchanged) to 4.7.A.6. In its current location it is included with the station batteries. Placing the specification with the diesel generator requirements is more appropriate.

Another aspect of the proposed activity involves the AOT for the EDGs. The phrase "in any 30 day period" would be deleted from the specification concerning EDG AOT. The review of the STS showed that, while describing EDG AOTs for various conditions, each occurrence is treated as a separate occurrence and places no further constraints. Since the NRC has approved the STS action statements and other requirements, eliminating this phrase is acceptable.

In addition, an extension of the AOT from 7 days to 14 days for the periodic integrated inspection of the diesels is proposed. The Bases of OCTS 3.7 does not mention the AOT in any context. It is, therefore, not considered in the margin of safety for this specification. To assess the impact of extending the AOT, a risk model was prepared based on the Oyster Creek Probabilistic Risk Analysis (OCPRA) risk model. The total percent difference between the AOT of 7 days and the AOT of 7 and 14 days is a 3.85 % increase in the total core damage frequency which equates to an absolute core damage frequency increase of 1.2E-7 per year. Using the EPRI "PSA Application Guide" (TR-105396, August 1995), Figure 4.1: Quantitative Screening Criteria for Permanent Changes Impacting CDF, this proposed technical specification change is classified as Non-Risk-Significant.

Furthermore, the evaluation is conservative in nature. Planned maintenance of the diesel generators provides heightened awareness of the potential mitigative factors which is not reflected in the risk evaluation. In addition, the On-Line Maintenance risk management procedure would provide guidance which would yield greater assurance that the remaining diesel generator and combustion turbines are available, which is also not reflected in the risk evaluation.

Based on this analysis, it can be concluded that extending the AOT to 14 days for the biennial integrated inspection of the EDGs will not negatively impact the safety function of the diesels.

Specification 3.7.C.2 also includes a provision that none of the Engineered Safety Feature (ESF) equipment normally served by the operable EDG can be out of service. While this is an important consideration, all ESFs which have LCOs are also covered by specification 3.0.B. which addresses normal and emergency power sources and applies to all LCOs. That portion of specification 3.7.C.2 is, therefore, redundant for the ESFs which have LCOs. Section 6.1 of the Oyster Creek UFSAR contains a list of 11 ESFs and section 6.8 lists 6 others. Not all of the ESFs have LCOs, however.

There are two ESFs which do not have LCOs, e.g., nitrogen inerting and control rod velocity limiter. The nitrogen inerting system is a single system which is not supported by the EDGs. The control rod velocity limiter is a device with no moving parts and no power requirement. Consequently, 3.7.C.2 does not apply to either ESF.

Of the ESFs with LCOs, only drywell H2 monitoring has a plant shutdown requirement which is less restrictive than 3.0.B. The drywell H2 monitoring specification (3.13.F.3) permits both channels to be inoperable for 7 days prior to entering a plant shutdown sequence. It would be inappropriate and contrary to the intent of that specification to require a 30 hour shutdown for potential unavailability of power. Specification 3.0.B contains a provision which permits use of the shut down requirement in the applicable specification; and it contains wording similiar to STS specification 3.8.1.B.2. Oyster Creek specification 3.7.C.2, as currently worded, creates a situation in which the actions required by this specification would be far more conserative than 3.0.B or the STS. Since the action statements associated with the LCOs of specifications 3.13.F.2 and F.3 serve to ensure adequate safety, it is unnecessary to apply a more conservative and restrictive standard.

In addition, the fire protection system, which has an LCO, is not powered by the EDGs. Similarly, the control rod housing support has an LCO but requires no electric power. Therefore, specification 3.7.C.2 does not apply to them.

Based on the foregoing discussion, the provision in specification 3.7.C.2 which concerns the ESF systems being out of service can be deleted without adverse effect on the safety function of ESFs supported by the diesels.

To enhance clarity, the verb "become(s)" in Specification 3.7.C.2 and .3 has been changed to "is" and "are", respectively. The purpose of this change is to obviate the need to interpret the meaning of "become" when entering the LCO intentionally.

3.4 State the basis for the determination that the activity will or will not increase the probability of occurrence or the consequences of an accident.

The proposed change modifies the operability of a single EDG for a limited and defined period of time and does not change the operating conditions, operating configuration or minimum amount of operating equipment assumed in the plant safety analysis for accident mitigation. The PRA risk model evaluating this change concluded that the proposed change is Non-Risk-Significant. Therefore, the proposed change will not significantly increase the probability of occurrence or consequences of an accident.

3.5 State the basis for the determination that the proposed activity does or does not create a possibility for an accident or malfunction of a different type than any previously evaluated in the SAR.

The proposed change will not change the physical plant or the modes of plant operation. It does not involve the addition or modification of equipment nor alter the design of plant systems. Therefore, it does not create the possibility of an accident or malfunction of a different type than those previously analyzed in the SAR.

3.6 State the basis for the determination that the margin of safety as defined in the bases of any Technical Specification is not reduced.

The proposed changes are designed to improve EDG reliability by providing flexibility in the scheduling and performance of preventive maintenance. The surveillance intervals are not changed and the operability requirements are

modified in an acceptable manner. The proposed change does not alter the basis of any technical specification that is related to the establishment or maintenance of a nuclear safety margin. Therefore, operation of the facility in accordance with this change would not involve a significant reduction in a margin of safety.

4.0 Effects on the Environment

The proposed activity would not change the existing interfaces with the plant environment. No plant effluents are proposed by this activity.

5.0 Conclusion

The purpose of this activity is to delete the requirement to inspect the Emergency Diesel Generators from the Oyster Creek Technical Specifications; a requirement regarding the operability of ESF equipment is also being deleted as redundent. In addition, the AOT of "seven days in any thirty day period" is being modified to seven days with no further constraints. Furthermore, an AOT of fourteen days is being added for the periodic inspection of the EDGs. Finally, a specification is being moved, some wording changes are being made to enhance clarity and minor typographical errors are being corrected. Based on the above discussion, the proposed activity will not adversely affect nuclear safety or safe plant operation; will not significantly increase the probability or consequences of an accident; will not create the possibility of an accident not previously analyzed; and will not reduce the margin of safety as defined in the basis of any technical specification. Therefore, the proposed activity does not create an unreviewed safety question as defined in 10 CFR 50.59.

This page along with any attached pages constitutes a written safety evaluation.

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