Entergy Operations

Entergy Operations, Inc.

R. P. Barkhurst

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QA

May 8, 1991

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
Technical Specification Change Request NPF-38-114

Gentlemen:

The attached description and safety analysis requests a change to Waterford 3 Technical Specifications 3/4.8.1, A.C. Sources - Operating, and 3/4.8.2,- A.C. Sources - Shutdown. This request is respectfully submitted for your approval based on issues raised during the recent Electrical Distribution Inspection (Inspection 90-23) and information contained in the soon to be released Regulatory Guide 1.9 (Selection, Design, Qualification, Testing and Reliability of Diesel Generator Units Used as Class 1E Onsite Electrical Power Systems at Nuclear Power Plants). As indicated in the safety analysis, these changes do not involve a significant hazards consideration as defined by 10 CFR 50.92.

If there are any questions or comments, please contact T.J. Gaudet at (504) 739-6666.

Very truly yours,

RPB/DAR/ssf
Attachments: NPF-38-114
Affidavit
cc: R.D. Martin, NRC Region IV
D.L. Wigginton, NRC-NRR
E.L. Blake
R.B. McGehee
N.S. Reynolds
NRC Resident Inspectors Office
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American Nuclear Insurers

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of	)	
	)	
Entergy Operations, Incorporated	)	Docket No. 50-382
Waterford 3 Steam Electric Station	)	

AFFIDAVIT

R.P. Barkhurst, being duly sworn, hereby deposes and says that he is Vice President Operations - Waterford 3 of Entergy Operations, Incorporated; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached Technical Specification Change Request NPF-38-114; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

R.P. Barkhurst
Vice President Operations - Waterford 3

STATE OF LOUISIANA)
) ss
PARISH OF ST. CHARLES)

Subscribed and sworn to before me, a Notary Public in and for the Parish and State above named this ____ day of _____, 1991.

Notary Public

My Commission expires _____.

DESCRIPTION AND SAFETY ANALYSIS OF PROPOSED CHANGE NPF-38-114

This requests a change to Waterford 3 Technical Specifications (TSs) 3/4.8.1, A.C. Sources - Operating, and 3/4.8.2, A.C. Sources - Shutdown.

Existing Specifications

See Attachment A

Proposed Specifications

See Attachment B

Description

The following four changes are requested for TSs 3/4.8.1 and 3/4.8.2.

1. In Specifications 3.8.1b. and 3.8.2b., the existing values for the required minimum volume of fuel oil in the diesel oil feed tanks and the separate diesel generator fuel oil storage tanks are 337 and 38,760 gallons, respectively. These values are requested to be changed to 339 and 34,000 gallons.

2. In Surveillance Requirement 4.8.1.1.2c.1.c, it is required for a sample from the storage tank to have,

   > " . . . a specific gravity as specified by the manufacturer @ 60/60°F of greater than or equal to 0.80 but less than or equal to 0.99 or an API gravity @ 60°F of greater than or equal to 11 degrees but less than or equal to 47 degrees."

   A change to the minimum value for specific gravity and the maximum value for API gravity is being requested such that the new text will be,

   > " . . . a specific gravity as specified by the manufacturer @ 60/60°F of greater than or equal to 0.85 but less than or equal to 0.99 or an API gravity @ 60°F of greater than or equal to 11 degrees but less than or equal to 35 degrees."

3. Surveillance Requirement 4.8.1.1.2d.10. requires the cross connection flow-path between the diesel fuel oil storage tank and the feed tank to be verified. As a part of the operability demonstration for the diesel generators, the existing surveillance requires,

   > " . . . verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the diesel oil feed tank of each diesel via the installed cross connection lines."

   This surveillance is requested to be changed to:

   > " . . . verifying that the fuel transfer pump transfers fuel from the fuel storage tank in each train to the diesel oil feed tank of the opposite train via the installed cross connection lines."

4. The contents of Table 4.8-1 describe the test schedule for the diesel generators. A change to the surveillance frequency in the table is being requested as well as revisions to the footnotes reflecting this change.

Changing the minimum volume required for the diesel oil feed and fuel oil storage tank are two separate issues. The minimum volume of fuel oil in the feed tank is based on the amount necessary to operate the diesel generator for sixty minutes at a full load plus a margin of ten percent. A refinement to this calculation slightly increases the minimum volume of fuel oil required in the feed tank. It appears that the original calculation is based on a typical value for specific gravity that falls in the middle of the allowed range specified in TSs. By using the more conservative minimum value for specific gravity in accordance the proposed change in this submittal, a slightly smaller energy content is defined for the fuel. This means a slight increase in fuel volume is necessary to carry the same load for the same period of time. As such, the minimum volume is requested to be changed from 337 to 339 gallons.

Changing the required minimum volume for the storage tanks will simplify the replacement of fuel oil for Entergy Operations. Required, periodic testing of the diesel generators constitutes a small but routine depletion of the fuel in the storage tank. Eventually, this reduces fuel volume to the minimum amount allowed by TSs at which time a supply truck must come onsite to cap off the tank. Since the tank's volume is approximately 41,000 gallons and the required minimum volume is 38,760 gallons, the amount of fuel oil replaced would be no more than about 2240 gallons. This represents only about a third of the capacity of one of the fuel oil trucks. By reducing the minimum required volume for the storage tank to 34,000 gallons, the volume to be replaced would be more consistent with the capacity of a fuel oil delivery truck, reducing the necessary visits from the fuel oil suppliers. This change was suggested by an inspector during a recent electrical distribution inspection.

The Diesel Generator Fuel Oil Storage and Transfer System is designed to provide oil storage capacity in each storage tank for seven days operation of one diesel generator to meet the engineered safety feature load requirements following a loss of offsite power and a design basis accident. The decrease in the minimum required volume for the storage tank represents a reduction in fuel oil supply from a seven day reserve to five days (based on the minimum specific gravity in the proposed change specified in this submittal). Despite this reduction, sufficient storage is retained to prevent interruption of diesel operation since local suppliers to Waterford 3 can replenish the fuel oil in twenty-four hours following any limiting design basis event or accident. If the diesel generator is to be run continuously, several sources of diesel oil suppliers are located in the area. All of these suppliers have more than sufficient quantities in inventory for Waterford 3 purposes. Under extremely unfavorable environmental conditions, it is possible to deliver the diesel oil by railroad. It is also possible to bring the diesel oil by barges and unload them next door at our barge loading facility at Waterford 1 and 2. Radiological levels following an accident will not prevent a delivery since they are expected to return to normal well before five days. As such, this change does not impact the safe operation, availability or reliability of the emergency diesel generators (EDGs).

The second change requested by this submittal changes the required minimum specific gravity of the EDG fuel oil storage tank sample from 0.80 to 0.85 and the minimum API gravity from 47 degrees to 35 degrees. Raising the specific gravity or reducing the API gravity increases the mass of fuel in a given volume and therefore, the energy stored (i.e., more kilowatt-hours of operation per gallon of

fuel.) Essentially, it increases the run-time of the EDG for a given volume of fuel. Establishing this surveillance is not excessively restrictive. Typically, the samples that have been taken from the tanks already meet these specifications. Regardless, tightening up this restriction will assure the fuel quality to enhance the operable run-time of the EDGs.

The third change modifies the surveillance requiring the verification of the flow-paths for the pipe lines supplying fuel to the EDGs. The existing surveillance requires,

> " . . . verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the diesel oil feed tank of each diesel via the installed cross connection lines."

The intent of this surveillance is to confirm operability of the fuel oil flow-path via the pipes connecting the fuel supply lines of the two trains. During a recent Waterford 3 inspection, interpretation of this surveillance was discussed. Entergy Operations believed this surveillance could be satisfied for Transfer Pump B2 by verifying only Alignments 1 and 2 shown in Figure 1 (likewise, the complimentary alignments for Pump A2). However, the inspectors felt the wording of this surveillance specifically required the additional verification that the pump would transfer fuel oil (via the cross connecting pipes) from the storage tank for a diesel to the feed tank of the same diesel. This corresponds to Alignment 3 in Figure 1.

Clearly, verifying Alignments 1 and 2 and their compliments will confirm operability of each pipe segment and the associated valves between the storage tanks and the feed tanks. Verifying Alignment 3 and its compliment is unnecessary since it only provides redundant confirmation of surveillance results for Alignments 1 and 2 and their compliments. Therefore, revising the surveillance to clearly identify only paths 1 and 2 will not reduce its effectiveness.

The fourth change requested by this letter is a change to Table 4.8-1, Diesel Generator Test Schedule. Table 4.8-1 requires increasing EDG test frequency when the number of failures in a specified amount of tests is above a threshold value. The intent of this is to establish a certain success rate for tests on a problem EDG before reducing the test frequency. Unfortunately, starting and loading the diesels can be harsh events. An increased test frequency can not only compromise but can further degrade diesel generator reliability. As an on-going effort, the NRC has been considering diesel generator reliability issues in the resolution of Generic Issue (GI) B-56. Regulatory Guide (RG) 1.9 is presently being upgraded to address this GI. Although final content of the RG is still under discussion, certain issues have been resolved. Entergy understands one of the issues resolved concerns the EDG test schedule. This revision to Table 4.8-1 is based on our understanding of the new NRC position.

Present TSs define a problem diesel as one that has failed either two of the last twenty valid tests or five of the last one hundred valid tests. Once an EDG becomes "problemed", test frequency increases from at least once every thirty-one days to at least once every seven days. This frequency shall be maintained until seven consecutive failure-free demands have been performed and the number of failures in the last twenty valid demands has been reduced to one.

The revision to Table 4.8-1 is based on the upcoming revision to RG 1.9. In the NUMARC response to the draft revision to RG 1.9 (NUMARC 87-00 - Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors, Revision 1; April 6, 1990), a problem EDG is defined as an individual EDG that has experienced four or more failures in the last twenty-five demands. In this situation, restored performance of the problem EDG shall be demonstrated by conducting seven consecutive failure-free start and load-run tests. Once this is done, surveillance testing can resume on a monthly basis. In the revised surveillance, it is not necessary to also reduce the number of failures to one out of the last twenty valid demands. Nor is it necessary (as in the present TS) to define a problem EDG based on the number of failures in the last one hundred valid tests. Changes are requested to reflect this in the footnotes, also.

This revision reduces the frequency of EDGs being identified as "problemed", and therefore requires less frequent testing. Surveillance testing, in and of itself, does not enhance the reliability of the equipment; it is merely an indicator of the underlying reliability. However, reducing the starting and loading of the EDGs can reduce possible wear on EDG hardware; this will enhance EDG reliability. As such, this revision is requested in accordance with the standards to be defined in RG 1.9.

Safety Analysis

The proposed changes described above shall be deemed to involve a significant hazards consideration if there is a positive finding in any of the following areas:

1. Will the operation of the facility in accordance with these proposed changes involve a significant increase in the probability or consequence of any accident previously evaluated?

   Response: No

   Previously analyzed accidents that are potentially affected by this change are those that postulate the loss of offsite power (LOOP) concurrent with the accident (e.g., a loss of coolant accident with a LOOP). To significantly increase the probability or consequence of such an accident, this change would have to negatively impact the reliability or performance of the EDGs.

   The first revision changes the minimum volumes for the diesel oil feed tanks and storage tanks. Slightly increasing the minimum feed tank volume affects the length of time the EDGs can run before the fuel oil transfer pumps are required. This slight increase is conservative with respect to the existing capacity and therefore has no impact.

   The reduction of the minimum volume required for the storage tank (from 38,760 to 34,000 gallons) reduces the reserve from a seven day supply to five. If the diesel generator is to be run continuously, there are several sources of diesel oil suppliers within the area. Waterford 3 has purchase agreements with several local suppliers that provide delivery approximately twenty-four hours from the time of request. These suppliers have more than sufficient quantities in inventory for Waterford 3 purposes. It is improbable that additional fuel oil could not be secured and delivered within five days, even under the most severe weather conditions. Primarily,

diesel oil is brought in by truck. Under extremely unfavorable environmental conditions, it is possible to deliver the diesel oil by railroad. Also, it is possible to bring the diesel oil in barges and unload them at the barge loading facility next door at Waterford 1 and 2. As such, interruption of EDG operation following any limiting design basis event or accident is highly unlikely. The reliability and performance of the EDGs are unaffected.

The second revision increases the required minimum specific gravity and conversely reduces the required maximum API gravity for a sample taken from the storage tank. As stated, this more conservative requirement for specific gravity (and API gravity) increases the energy content in a given volume of fuel increasing the EDG run-times. It will not adversely affect the reliability or performance of the EDGs.

The third revision clarifies the description of the surveillance of the flow-paths for the EDG fuel supply. This is requested such that surveillances providing redundant information are not required. Since the revised surveillance assures all possible flow-paths are available (either directly, or by implication) between the EDG fuel storage and feed tanks and does not reduce the intended scope of the surveillance, it will not adversely affect the reliability or performance of the EDGs.

The fourth change redefines surveillance frequencies applicable to the EDGs. It is our understanding that this change is consistent with the NRC's resolution of GI B-56 - Diesel Generator Reliability. Although the intent is to establish a defined level of reliability for a problem EDG before returning its test to a standard frequency, the actual test itself does not affect reliability, nor does it improve EDG performance. However, excessive testing may harm the hardware adversely affecting reliability and performance. Since this change represents a potential reduction in the number of challenges to the system, if anything, there will be an increase in reliability of the EDG and potential improvement in performance.

Based on the above information, these revisions to the TSs will not adversely affect the reliability or performance of the EDGs. Consequently, operation of Waterford 3 in accordance with the proposed changes does not involve a significant increase in the probability or consequence of any accident previously evaluated.

2. Will the operation of the facility in accordance with these proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

To create a new or different kind of accident, these changes will have to introduce a new failure path. In this regard, these revisions are benign since they do not alter the system or its operation. Redefining the minimum tank volumes does not impact the fuel supply since the reduction is either conservative (in the case of the feed tank) or does not undermine the capability to obtain additional fuel supplies in a timely manor. Increasing the restriction on the specific gravity of the fuel oil improves EDG performance without introducing any changes to the system or its operation. The text change to the flow-path surveillance does not diminish

the intended scope of the existing surveillance and therefore, does not reduce its effectiveness. The revision to Table 4.8-1, Diesel Generator Test Schedule, to the best or our knowledge is consistent with the next revision of RG 1.9. Again, the scope of this surveillance remains unchanged by the revision to the table; hence, its effectiveness is preserved.

Based on the above information, these changes do not introduce a new failure path and therefore, will not create a new, unevaluated sequence of events. The current plant safety analyses are bounding and this revision will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Will the operation of the facility in accordance with these proposed changes involve a significant reduction in the margin of safety?

Response: No

An adjustment increasing the value for the minimum feed tank volume is insignificant and will not affect operability of the EDGs. However, the changes to the minimum storage tank volume and the restriction on specific gravity (and API gravity) may affect the length of time an EDG can operate without replacement fuel. The gravity requirement is altered to be more conservative, and therefore, will not negatively impact the run time. Decreasing the minimum required volume for the storage tank represents a reduction in fuel oil supply from a seven day reserve to five. This does not impact the availability of the EDGs following any limiting design basis event or accident since this reserve provides adequate time for local suppliers to replenish fuel without interrupting operation of the diesels. As indicated, the text changes to the flow-path surveillance and Table 4.8-1 do not diminish the intended scope of the existing surveillances and therefore, do not impact the intended capability of each EDG to be fueled from the alternate storage tank. The change to the flow-path surveillance provides clarification without altering the intent. In the proposed text it will assure operability of the fuel transfer system by requiring verification of specific paths. The reduction in test frequency does not represent a reduction in reliability since the new test frequencies will still provide sufficient determination of reliability with fewer potentially harsh challenges made to the system.

The proposed amendment does not affect any design related issues or the performance of the system. All technical content of the safety analyses are retained and no analysis-based safety margins are affected. There are no changes to the physical design of the plant. Based on this information, operation of Waterford 3 in accordance with the proposed changes does not involve a significant reduction in the margin of safety.

The Commission has provided guidance concerning the application of standards for determining whether a significant hazards consideration exists by providing certain examples (48 FR 14870) of amendments that are considered not likely to involve significant hazards considerations. Certain changes identified in this submittal fall under the following examples:

(ii) A change that constitutes an additional limitation, restriction, or control not presently included in the technical specifications; for example, a more stringent surveillance requirement.

(vii) A change to make a license conform to changes in the regulations, where the license change results in very minor changes to facility operations clearly in keeping with the regulations.

Changing the surveillance on the fuel sample specific gravity most closely resembles example (ii) since the proposed surveillance is more restrictive than the existing.

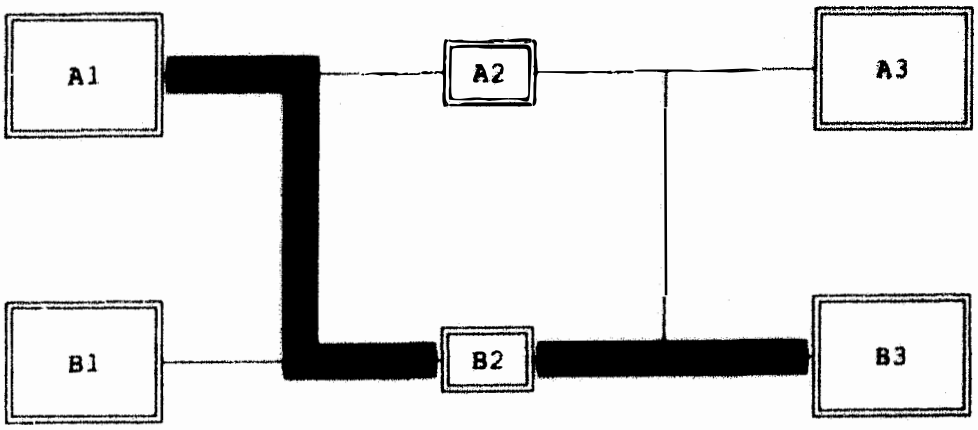
Changing the surveillance frequency requirements in Table 4.8-1 closely resembles example (vii) since it is requested in order to comply with our understanding of the Commission's resolution of EDG test frequency which will be published in the new revision of RG 1.9.

Safety and Significant Hazards Determination

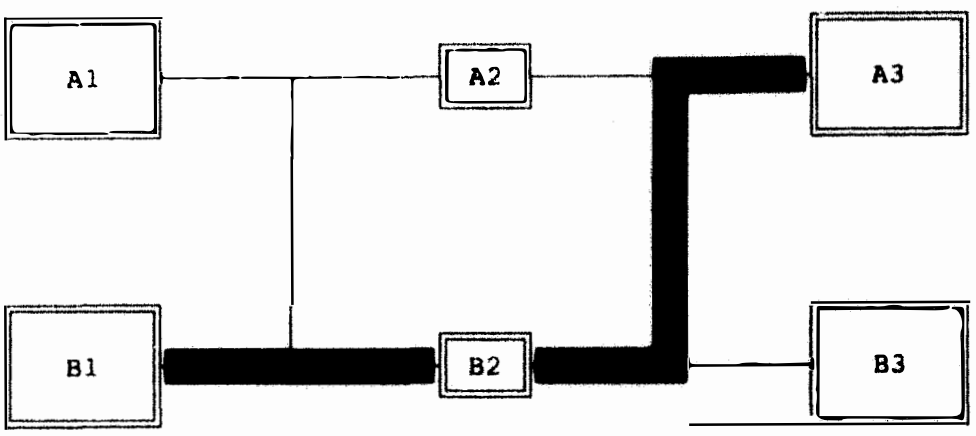
Based on the above Safety Analysis, it is concluded that: (1) the proposed change does not constitute a significant hazards consideration as defined by 10 CFR 50.92; and (2) there is a reasonable assurance that the health and safety of the public will not be endangered by the proposed change; and (3) this action will not result in a condition which significantly alters the impact of the station on the environment as described in the NRC Final Environmental Statement.

FIGURE 1

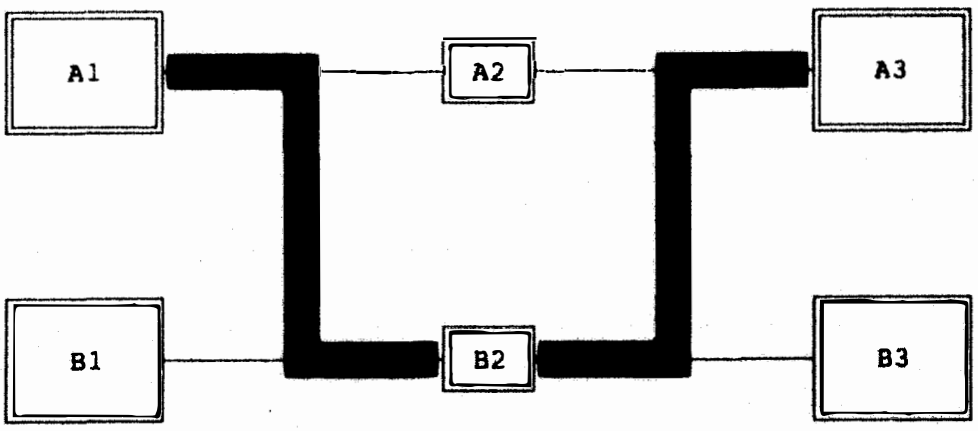
EDG Piping Alignment 1



EDG Piping Alignment 2



EDG Piping Alignment 3



For Trains A, B:

A1, B1 ≡ Fuel oil storage tank
A2, B2 ≡ Fuel transfer pump
A3, B3 ≡ Feed tank

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ATTACHMENT A

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. Diesel oil feed tanks containing a minimum volume of 337 gallons of fuel, and

2. A separate diesel generator fuel oil storage tank containing a minimum volume of 38,760 gallons of fuel, and

3. A separate fuel transfer pump.

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

ACTION:

a. With one offsite circuit of 3.8.1.1a inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter. If either diesel generator has not been successfully tested within the past 24 hours, demonstrate its OPERABILITY by performing Surveillance Requirement 4.8.1.1.2a.4 separately for each diesel generator (unless it is already operating) within 24 hours. Restore the offsite A.C. circuit 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 3.8.1.1b inoperable, demonstrate the OPERABILITY of the offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1a (separately for each offsite A.C. circuit) within 1 hour and at least once per 8 hours thereafter. If the diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator (unless it has been successfully tested in the last 24 hours) by performing Surveillance Requirement 4.8.1.1.2a.4 within 24 hours. Restore the 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.

c. With one offsite A.C. circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; and, if the diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2a.4 within 8 hours (unless it is already operating). Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in

5. Verifying the generator is synchronized (10 seconds), subsequently loaded to an indicated 4200-4400 Kw* in less than or equal to 176 seconds,** and operates for at least an additional 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 diesel oil feed tanks.

c. At least once per 92 days and from new fuel oil prior to addition to the storage tanks, by obtaining a sample of fuel oil in accordance with ASTM-D270-1975, and by verifying that the sample meets the following minimum requirements and is tested within the specified time limits:

1. As soon as sample is taken (or prior to adding new fuel to the storage tank) verify in accordance with the test specified in ASTM-D975-77 that the sample has:

   a) A water and sediment content of less or equal to 0.05 volume percent.

   b) A kinematic viscosity @ 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes.

   c) A specific gravity as specified by the manufacturer @ 60/60°F of greater than or equal to 0.80 but less than or equal to 0.99 or an API gravity @ 60°F of greater than or equal to 11 degrees but less than or equal to 47 degrees.

2. Verify an impurity level of less than 2 mg of insolubles per 100 ml when tested in accordance with ASTM-D2274-70; analysis shall be completed within 7 days after obtaining the sample but may be performed after the addition of new fuel oil; and

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*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 of the manufacturer or momentary variation due to changing bus loads shall not invalidate the test.

**The diesel generator fast loading requirement (176 sec) shall be performed at least once per 184 days in these surveillance tests. For all other surveillance tests, load the diesel generator at a rate consistent with the manufacturer's recommendations.

SURVEILLANCE REQUIREMENTS (Continued)

8. 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.

9. 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 energizes the emergency loads with offsite power.

10. Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the diesel oil feed tank of each diesel via the installed cross connection lines.

11. Verifying that the automatic load sequence timer is OPERABLE with the time of each load block within ±10% of the sequenced load block time.

12. Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:

    a) turning gear engaged
    b) emergency stop
    c) loss of D.C. control power
    d) governor fuel oil linkage tripped

e. At the first refueling outage, and thereafter, at intervals not to exceed 24 months, subject the diesels to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.

f. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting the diesel generators simultaneously, during shutdown, and verifying that the diesel generators accelerate to at least 600 rpm (60 ± 1.2 Hz) in less than or equal to 10 seconds.

g. At least once per 10 years by:

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

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, where the last 20 and 100 tests are determined on a per diesel generator basis. For the purposes of this test schedule, only valid tests conducted after the Operating License issuance date shall be included in the computation of the "last 100 valid tests". Entry into this test schedule shall be made at the 31 day test frequency. Increased test frequency for one diesel generator shall not affect the test frequency for the remaining diesel generator, even under the STAGGERED TEST BASIS criteria.

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

***For 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 successful completion of 14 consecutive tests in a single series; 10 of these tests shall be in accordance with Surveillance Requirement 4.8.1.1.2a.4,5 and 4 of these tests shall include the fast loading requirement described in the double-asterisked (**) note to surveillance requirement 4.8.1.1.2a.5. If this criterion is not satisfied during the first series of tests, any alternate criterion used to trans-value the failure count to zero may only be implemented with prior approval by the NRC.

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 diesel oil feed tank containing a minimum volume of 337 gallons of fuel,

2. The diesel fuel oil storage tanks containing a minimum volume of 38,760 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 fuel storage 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 Surveillance Requirements of 4.8.1.1.1, 4.8.1.1.2, (except for Surveillance Requirement 4.8.1.1.2a.5.) and 4.8.1.1.3.

NPF-38-114

ATTACHMENT B

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. Diesel oil feed tanks containing a minimum volume of 337 DEL / ADD: 339 gallons of fuel, and ADD: 34,000

2. A separate diesel generator fuel oil storage tank containing a minimum volume of 38,760 DEL gallons of fuel, and

3. A separate fuel transfer pump.

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

ACTION:

a. With one offsite circuit of 3.8.1.1a inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter. If either diesel generator has not been successfully tested within the past 24 hours, demonstrate its OPERABILITY by performing Surveillance Requirement 4.8.1.1.2a.4 separately for each diesel generator (unless it is already operating) within 24 hours. Restore the offsite A.C. circuit 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 3.8.1.1b inoperable, demonstrate the OPERABILITY of the offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1a (separately for each offsite A.C. circuit) within 1 hour and at least once per 8 hours thereafter. If the diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator (unless it has been successfully tested in the last 24 hours) by performing Surveillance Requirement 4.8.1.1.2a.4 within 24 hours. Restore the 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.

c. With one offsite A.C. circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; and, if the diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2a.4 within 8 hours (unless it is already operating). Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in

5. Verifying the generator is synchronized (10 seconds), subsequently loaded to an indicated 4200-4400 Kw* in less than or equal to 176 seconds,** and operates for at least an additional 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 diesel oil feed tanks.

c. At least once per 92 days and from new fuel oil prior to addition to the storage tanks, by obtaining a sample of fuel oil in accordance with ASTM-D270-1975, and by verifying that the sample meets the following minimum requirements and is tested within the specified time limits:

1. As soon as sample is taken (or prior to adding new fuel to the storage tank) verify in accordance with the test specified in ASTM-D975-77 that the sample has:

a) A water and sediment content of less or equal to 0.05 volume percent.

b) A kinematic viscosity @ 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes.

c) A specific gravity as specified by the manufacturer @ 60/60°F of greater than or equal to 0.80 but less than or equal to 0.99 or an API gravity @ 60°F of greater than or equal to 11 degrees but less than or equal to 47 degrees.

2. Verify an impurity level of less than 2 mg of insolubles per 100 ml when tested in accordance with ASTM-D2274-70; analysis shall be completed within 7 days after obtaining the sample but may be performed after the addition of new fuel oil; and

*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 of the manufacturer or momentary variation due to changing bus loads shall not invalidate the test.

**The diesel generator fast loading requirement (176 sec) shall be performed at least once per 184 days in these surveillance tests. For all other surveillance tests, load the diesel generator at a rate consistent with the manufacturer's recommendations.

SURVEILLANCE REQUIREMENTS (Continued)

8. 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.

9. 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 energizes the emergency loads with offsite power.

ADD: the

ADD: in each train

10. Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the diesel oil feed tank of each diesel via the installed cross connection lines.

ADD: the opposite train in

11. Verifying that the automatic load sequence timer is OPERABLE with the time of each load block within ±10% of the sequenced load block time.

12. Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:

   a) turning gear engaged
   b) emergency stop
   c) loss of D.C. control power
   d) governor fuel oil linkage tripped

e. At the first refueling outage, and thereafter, at intervals not to exceed 24 months, subject the diesels to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.

f. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting the diesel generators simultaneously, during shutdown, and verifying that the diesel generators accelerate to at least 600 rpm (60 ± 1.2 Hz) in less than or equal to 10 seconds.

g. At least once per 10 years by:

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

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 3	≤ 4	At least once per 31 days
≥ 2 4	≥ 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, where the last 20 and 100 tests are determined on a per diesel generator basis. For the purposes of this test schedule, only valid tests conducted after the Operating License issuance date shall be included in the computation of the "last 100 valid tests". Entry into this test schedule shall be made at the 31 day test frequency. Increased test frequency for one diesel generator shall not affect the test frequency for the remaining diesel generator, even under the STAGGERED TEST BASIS criteria.

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

***For 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 successful completion of 14 consecutive tests in a single series; 10 of these tests shall be in accordance with Surveillance Requirement 4.8.1.1.2a.4,5 and 4 of these tests shall include the fast loading requirement described in the double-asterisked (**) note to surveillance requirement 4.8.1.1.2a.5. If this criterion is not satisfied during the first series of tests, any alternate criterion used to trans-value the failure count to zero may only be implemented with prior approval by the NRC.

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

SHUTDOWN

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 diesel oil feed tank containing a minimum volume of 337 gallons of fuel,

ADD: 339

DEL

2. The diesel fuel oil storage tanks containing a minimum volume of 38,760 gallons of fuel, and

ADD 34,000

DEL

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 fuel storage 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 Surveillance Requirements of 4.8.1.1.1, 4.8.1.1.2, (except for Surveillance Requirement 4.8.1.1.2a.5.) and 4.8.1.1.3.