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**W3F1-2001-0059**  
**A4.05**  
**PR**

July 10, 2001

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

Waterford 3 SES  
Docket No. 50-358  
License No. NPF-38  
Technical Specification Change Request NPF-38-233  
Emergency Diesel Generator Surveillance Requirements

Gentlemen:

In accordance with 10CFR50.90, Entergy Operations, Inc. (Entergy) is hereby proposing to amend Operating License NPF-38 for Waterford 3 by requesting the attached changes to the Technical Specifications. Waterford 3 Technical Specification surveillance requirement 4.8.1.1.2.e requires certain emergency diesel generator surveillances be performed during shutdown. The proposed change will modify this surveillance requirement to allow performance of specific surveillance requirements during any mode of plant operation. The allowance to perform these surveillance requirements when the plant is operating will provide flexibility in the scheduling of testing activities consistent with online maintenance activities and improve emergency diesel generator availability during plant shutdown periods.

The proposed change has been evaluated in accordance with 10CFR50.91(a)(1) using criteria in 10CFR50.92(c) and it has been determined that this change involves no significant hazards considerations. The bases for these determinations are included in the attached submittal.

A001

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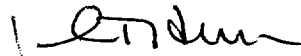
July 10, 2001

Entergy requests the effective date for this TS change be within 60 days of approval. Although this request is neither exigent nor emergency, your prompt review is requested. Performance of the emergency diesel generator 24-hour endurance run is desired prior to the next refueling outage that is scheduled to begin in March 2002.

All of the commitments contained in this submittal are identified on the attached Commitment Identification/Voluntary Enhancement Form. Should you have any questions or comments concerning this request, please contact D. Bryan Miller at (504) 739-6692.

I declare under penalty of perjury that the foregoing is true and correct.  
Executed on July 10, 2001.

Very truly yours,



J. T. Herron  
Vice President, Operations  
Waterford 3

JTH/dm/dbm/cbh

Attachments

cc: E.W. Merschoff, NRC Region IV  
N. Kalyanam, NRC-NRR  
J. Smith  
N.S. Reynolds  
NRC Resident Inspectors Office  
Louisiana DEQ/Surveillance Division  
American Nuclear Insurers

ATTACHMENT 1  
TO  
W3F1-2001-0059  
PROPOSED TECHNICAL SPECIFICATION  
AND  
RESPECTIVE SAFETY ANALYSES  
IN THE MATTER OF AMENDING  
LICENSE NO. NPF-38  
ENTERGY OPERATIONS, INC.  
DOCKET NO. 50-382

## **DESCRIPTION OF PROPOSED CHANGES**

The proposed change includes the following administrative changes:

- Surveillance Requirement (SR) 4.8.1.1.2.c.1.a) currently states: "A water and sediment content of less or equal to 0.05 volume percent." The proposed change adds "than" to the SR, as follows: "A water and sediment content of less than or equal to 0.05 volume percent."
- SR 4.8.1.1.2.h.1 currently states: "Draining each diesel generator fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution or equivalent, and." The proposed change deletes the "and" at the end of the SR. Item h.2 was deleted in Technical Specification Amendment 132; however, the deletion of the "and" at the end of h.1 was inadvertently missed.
- Note \*\* on page 3/4 8-6 needs clarification. The note currently states: "If Surveillance Requirement 4.8.1.1.2.a.4 is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at an indicated 4000-4400 kW\* for 2 hours or until internal operating temperatures have stabilized." This note was added as a result of changes allowed by Generic Letter 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation." The generic letter states: "The only requirement should be that the hot-start test is performed within 5 minutes of operating the diesel generator at its continuous rating for 2 hours or until operating temperatures have stabilized." The proposed change to the note on page 3/4 8-6 will modify the wording to clarify that the hot start is required within 5 minutes following a shutdown after temperatures are stable. The hot start has consistently been completed as required, the change simply modifies the wording to clearly reflect the requirement. The proposed wording is: "If Surveillance Requirement 4.8.1.1.2.a.4 is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at an indicated 4000-4400 kW\* for 2 hours or until internal operating temperatures have stabilized. Within 5 minutes of securing the diesel generator, perform Surveillance Requirement 4.8.1.1.2.a.4."

The following testing requirements are contained as subsets of SR 4.8.1.1.2.e, which requires that the tests be performed at least once per 18 months during shutdown. The proposed change will remove the "during shutdown" restriction for the following surveillances and will allow them to be performed during any plant mode.

- SR 4.8.1.1.2.e.1 requires that the generator be capable of rejecting a load of greater than or equal to 498 kW while maintaining voltage and frequency in specified bands.

- SR 4.8.1.1.2.e.2 requires that the generator be capable of rejecting an indicated load of 4000-4400 kW without tripping while generator voltage is maintained less than or equal to 5023 volts during and following the load rejection.
- SR 4.8.1.1.2.e.4 requires that the diesel be capable of starting upon receipt of a safety injection actuation signal (SIAS) and then operates for greater than or equal to five minutes after receipt of the signal.
- SR 4.8.1.1.2.e.6 requires that a 24-hour emergency diesel generator (EDG) endurance run be completed.
- SR 4.8.1.1.2.e.9 requires verification that with the EDG operating in a test mode (connected to its bus), a simulated SIAS overrides the test mode by (1) returning the EDG to standby operation and (2) automatically energizes the emergency loads with offsite power.
- SR 4.8.1.1.2.e.10 requires verification that each fuel transfer pump transfers fuel to its associated diesel oil feed tank by taking suction from the opposite train fuel oil storage tank via the installed cross connect.
- SR 4.8.1.1.2.c.12 requires that four diesel generator lockout features prevent the EDG from starting only when required. The four lockout features are: turning gear engaged; emergency stop, loss of DC control power; and governor fuel oil linkage tripped.

The "during shutdown" requirement associated with the remaining SRs listed in SR 4.8.1.1.2.e will be included in the individual SR.

## **BACKGROUND**

### **System Description**

At Waterford 3, the Class 1E AC electrical power distribution systems consist of offsite and onsite sources. As required by 10 CFR 50, Appendix A, GDC 17, the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

### **Offsite Power System**

Power is supplied from the main generator to the Waterford 3 switching station through two main transformers, which are in parallel. From the switching station, two overhead lines transmit power to the Waterford switchyard, which is the point of connection to the grid. The plant electric power distribution system receives power under normal operating conditions from the main generator through two

unit auxiliary transformers. For startup and shutdown, when the main generator is unavailable, power is obtained through two startup transformers from the grid through the switchyard transmission lines and the switching station. When Waterford 3 is not operating, an additional supply path from the switching station to the plant electric power distribution system may be made available by opening links in the generator main leads and by using the main transformers and unit auxiliary transformers instead of the startup transformers.

Section 8.2 of the Waterford 3 Final Safety Analysis Report (FSAR) contains a detailed description of the offsite power system.

### Onsite Power System

The onsite power system includes three 4.16 kV ESF buses (3A3-S, 3B3-S, and 3AB3-S). Power for safety related loads is normally supplied by the non-safety related 4.16 kV buses (3A2 and 3B2) of the offsite power system. Should offsite power from either of these buses be lost, the onsite power system will receive power automatically from the appropriate diesel generator.

Each ESF bus (3A3-S or 3B3-S) is redundant to the other; each can supply sufficient power to its safety related loads to enable safe shutdown, or to mitigate the consequences of a design basis accident. The third bus, 3AB3-S, may be connected to either 3A3-S or 3B3-S, but never to both. Therefore, 3AB3-S is not considered as a third, separate source of ESF power. This bus serves only to supply power to safety related loads, which are standby to safety loads on buses 3A3-S and 3B3-S.

Section 8.3 of the Waterford 3 FSAR contains a detailed description of the onsite power system.

### Standby Power Supply – Diesel Generators

There are two emergency diesel generators (EDG), one for each ESF train. The EDG ratings are sufficient to supply reliable power to all safety-related loads in its respective train, as well as to some non-safety-related loads. The EDG controls are designed for automatic as well as manual operation. Manual operation is from either the main control room or the local EDG control panel. The choice of operating location is controlled by a "LOCAL - REMOTE" selector switch located at the engine and generator control panels with an indication of switch position provided in the main control room. Placing the selector switch in LOCAL permits manual starting of the EDG from the local EDG control panel only while placing the switch in REMOTE allows control from the main control room only. Regardless of the LOCAL - REMOTE selector switch position the EDG will start automatically upon receipt of a Safety Injection Actuation Signal (SIAS) or on loss of offsite power. If, when the EDG receives an automatic start

signal, an undervoltage condition exists on the bus the loads are sequenced on to the diesel automatically to protect the EDG from excessive starting currents.

The EDG has two modes of operation, test and emergency. Any manual diesel start signal places the diesel in TEST mode. TEST mode is used for post-maintenance testing or routine surveillance. In the TEST mode, the engine employs a large number of shutdown features. Any automatic diesel start places the diesel in the EMERGENCY mode. In this mode, most of the TEST mode protective trips are bypassed to ensure the diesel runs continuously and reliably. Automatic start signals include SIAS, safety bus undervoltage (UV), and safety bus degraded voltage.

#### Automatic Tripping and Loading of Buses

The 4160 V ESF buses 3A3-S and 3B3-S have been provided with UV relays to monitor the voltage condition on these buses. If a sustained degraded voltage condition or loss of voltage on either of these buses is sensed by the respective UV relays, all the loads except one ESF power center and the 4160 V 3AB-3 bus are shed. The two tie-breakers between each offsite power source (3A2 and 3B2) and their respective ESF buses open automatically disconnecting the offsite power source. The EDG starts automatically and upon reaching full speed and rated voltage (10 seconds) the generator breaker closes. Automatic loading sequence commences when the bus UV relays reset at a pre-determined value.

If during the periodic test of the EDG an UV is sensed, the EDG output breaker and bus tie-breakers open automatically. This permits the EDG to be cleared from the bus and enables the EDG to attain the emergency standby mode. In this mode of operation, the EDG controls change automatically to the isochronous mode that maintain the engine running at a preset constant synchronous speed corresponding to 60 hertz at the generator terminals. The EDG output breaker recloses within 10 seconds and automatic loading sequence commences when the bus UV relays reset at a pre-determined value.

If an SIAS occurs during the periodic test of the EDG, the EDG output breaker will open automatically. This permits the EDG to be cleared from parallel operation with the system and enables the EDG to attain the emergency standby mode. In this mode of operation, the EDG controls change automatically to the isochronous mode that maintain the engine running at a preset constant synchronous speed corresponding to 60 hertz at the generator terminals. The EDG will tie to the bus only if an UV condition exists.

For a detailed description of the automatic tripping and loading of buses refer to Waterford 3 FSAR Section 8.3.1.1.2.8.

## Diesel Generator System Protection

A lockout relay is provided for each EDG set which is tripped by the following devices: 1) engine overspeed switch; 2) generator differential relay; 3) generator time overcurrent relay; 4) loss of generator excitation relay; 5) reverse power flow (anti-motoring) relay; 6) generator ground fault relay; and 7) engine protective devices. Operation of the lockout relay will trip the generator breaker and will stop the engine. However, when the EDG is operating as a result of loss of offsite power or SIAS, only overspeed and differential protection are permitted to shutdown the unit.

Interlocks have been provided in the closing and tripping circuits to prevent the closing of an EDG breaker under the following conditions:

- If a lockout relay is tripped, the breaker closing circuit is de-energized and the trip is energized.
- If the EDG is out of synchronism with the bus, synchronism check relays prevent closure of the incoming breaker.
- Automatic connection of the ESF loads without voltage on the associated ESF bus is prevented by a contact of the bus voltage sensing relays in the closing circuits of the individual breakers.

## Fuel Oil and Transfer System

Each EDG engine has a separate fuel oil storage and transfer system. Two completely redundant trains are provided, each consisting of a diesel oil storage tank, transfer pump, diesel oil feed tank, interconnecting piping, valves, and instrumentation and controls. Train A normally serves EDG engine A and train B normally serves EDG engine B. All necessary electrical power for the operation of each train is supplied from the associated EDG bus. Interconnecting piping with two normally closed series valves is provided between the two storage tanks to enable either of the EDG engines to be supplied from either of the tanks should one of the transfer pumps fail.

## **BASIS FOR PROPOSED CHANGE**

Changes to Surveillance Requirements (SR) 4.8.1.1.2.c.1.a, 4.8.1.1.2.h.1 and note \*\* on page 3/4 8-6 are non-technical administrative changes only therefore no technical justification is provided.

The remaining surveillance requirement changes proposed in this section will provide additional flexibility in the scheduling of maintenance activities, reduce plant refueling outage duration, and improve EDG availability when the plant is shutdown. The proposed changes will eliminate the "during shutdown" requirement associated with the following testing requirements.



SR 4.8.1.1.2.e.1

This surveillance requirement states:

“e. At least once per 18 months during shutdown by:

1. Verifying the generator capability to reject a load of greater than or equal to 498 kW while maintaining voltage at  $4160 + 420, -240$  volts and frequency at  $60 + 4.5, -1.2$  Hz.”

Although this requirement has typically been performed during shutdown, it can be performed at power. The design basis for bus voltage transients and the safety bus response to a full load rejection are discussed below. The capability of the EDG to reject full load envelopes its ability to reject a load greater than or equal to 498 kW. Therefore, the basis for eliminating the “during shutdown” requirement for this surveillance requirement is included with SR 4.8.1.1.2.e.2.

SR 4.8.1.1.2.e.2

“e. At least once per 18 months during shutdown by:

2. Verifying the generator capability to reject a load of an indicated 4000-4400 kW without tripping. The generator voltage shall not exceed 5023 volts during and following the load rejection.”

The EDGs are rated at 4400 kW continuous with a supplementary rating of 4840 kW for two hours in any 24-hour period. This test therefore requires the EDG to be fully loaded and operating in parallel with offsite power. To create the load rejection the EDG output breaker is opened. This results in the EDG rejecting its load and isolating from the 4160-volt vital (ESF) bus. The load is simultaneously picked up by the offsite power source.

The design basis for bus voltage transients on the safety buses is based on 4160 volts nominal voltage and consists of the following voltage conditions:

- UV protection for degrading voltage values  $\leq 3675$  volts (88.3%) provided by UV relays with inverse time characteristics (i.e., between a high of 9 seconds to a low of 2 seconds).
- UV protection for sustained degraded voltage values  $\leq 3875$  volts (93.1 %) with a time delay of 12.5 seconds.
- Rated maximum voltage for the switchgear of 4760 volts.

Review of previous full-load rejection test data indicates that voltage on the 4160-volt safety buses was within  $\pm 5\%$  of the initial test voltage and stabilized within one second. This is a relatively minor transient and well within the

capability of the loads on the vital (ESF) buses. The selected voltage range is based on the following criteria:

- The (+) 5% value is adequate to ensure stability of the safety bus and does not approach the design rating of the switchgear (4760 volts).
- The (-) 5% value is above the instantaneous Loss of Voltage Technical Specification trip setpoint of  $\geq 3245$  volts. The instantaneous Loss of Voltage trip was used for a tolerance value based on the Refueling Outage 9 EDG 100% load rejection test data that resulted in a voltage drop of approximately 2% with stabilization in about 0.5 seconds. The degraded voltage trip of 93.1% has a time delay of 12.5 seconds.

Based on the above information, performance of this surveillance requirement and SR 4.8.1.1.2.e.1 at power is acceptable.

SR 4.8.1.1.2.e.4

“e. At least once per 18 months during shutdown by:

4. Verifying that on an SIAS actuation test signal (without loss-of-offsite power) the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The steady-state generator voltage and frequency shall be  $4160 + 420, - 240$  volts and  $60 \pm 1.2$  Hz within 10 seconds after the auto-start signal; the generator voltage and frequency shall be maintained within these limits during this test.”

The design of the ESF subgroup relays offers Waterford 3 the ability to start the EDG with the SIAS actuation test signal (without loss of offsite power) during power operation without causing any loads to shed or ESF loads to start. TS SR 4.3.2.1, Table 4.3-2, item 1d requires the “testable at power” portion of the ESFAS Subgroup Relay functional test to be performed at least once every 62 days. These relays are the same relays that are tested during shutdown every 18 months. Therefore, due to the design characteristics of the ESF subgroup relays and the on line testing capability, the elimination of the “during shutdown” requirement from SR 4.8.1.1.2.e.4 is acceptable for Waterford 3.

The NRC Staff has reviewed and approved the Technical Specification Task Force (TSTF) number 283 which would allow several surveillance requirements to be performed during power operations. This test was considered as one that can be performed at power provided an ESF actuation signal to the EDGs can be generated without causing any loads to shed or ESF loads to start. As stated above, the Waterford 3 design satisfies this provision.

SR 4.8.1.1.2.e.6

"e. At least once per 18 months during shutdown by:

6. Verifying the diesel generator operates for an interval of not less than 24 hours. During 2 hours of this test, the diesel generator shall be loaded to an indicated 4700 to 4900 Kw\* and during 22 hours of this test, the diesel generator shall be loaded to an indicated 4000 to 4400 Kw.\* The generator voltage and frequency shall be 4160 +420, -240 volts and  $60 \pm 1.2$  Hz within 10 seconds after the start signal; the steady-state generator voltage and frequency shall be  $4160 \pm 420$  volts and  $60 \pm 1.2, -0.3$  Hz during this test. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2.a.4. \*\*"

The EDGs are run monthly, during power operation, to satisfy monthly Technical Specification requirements. The EDG system lineup with offsite power for the monthly test is the same as the lineup for the 24-hour endurance run. Therefore, performing the 24-hour endurance test at power does not introduce a new mode of operation. The EDG remains operable while paralleled to the electrical grid.

In the event of an emergency, with the EDG operating in the TEST mode and offsite power available, the SIAS actuation signal automatically opens the EDG output breaker and overrides the TEST mode returning the EDG to standby operation (running, not connected to the bus.) This override feature is tested every 18 months in accordance with SR 4.8.1.1.2.e.9. If a loss of offsite power occurs following the SIAS actuation, the bus UV relays will cause load shedding and allow the EDG output breaker to automatically close and the EDG will pick up the emergency loads with load sequencing as designed. (Note: Waterford 3 is licensed for concurrent SIAS actuation and loss of offsite power.)

In the event of a loss-of-offsite power, with the EDG operating in the TEST mode, the UV relays will automatically open the bus tie breakers, open the EDG output breaker, initiate load shedding, and override the TEST mode returning the EDG to standby operation (running, not connected to the bus.) The EDG output breaker will reclose within 10 seconds and emergency loads will sequence onto the bus as designed.

Even though, as discussed above, the EDG will remain operable throughout the 24-hour endurance test, Waterford 3 performed a bounding assessment of the risk associated with performing the 24-hour endurance tests on-line assuming the EDG was inoperable throughout the test. The diesel generator unavailability in the Waterford 3 Probabilistic Safety Assessment (PSA) model was increased to account for an additional 30 hours of out of service time per cycle (18 months). Thirty hours includes some time margin to allow for test setup and restoration. The diesel generator unavailability values in the model were increased by 2.85E-

3. The resulting increase in core damage frequency (CDF) was  $9\text{E-}8$  per year, which is a small risk according to the guidance in Regulatory Guide 1.174 (less than  $1\text{E-}6$  per year). Since the Large Early Release Frequency (LERF) for Waterford 3 is more than a factor of 10 lower than the CDF, the increase in LERF for the proposed 24 hour tests is in the  $\text{E-}9$  range, which is also a small risk by Regulatory Guide 1.174 (less than  $1\text{E-}7$  per year). These risk values are conservative because they include the assumption that the EDG is totally unavailable during the test, when in fact, the EDG will be operable.

A similar change was requested by Millstone Nuclear Power Station, Unit No. 3, which was reviewed and approved by the NRC Staff on February 2, 2001 (TAC No. MA9661). Catawba (TAC Nos. MA6962, MA6963), Salem (TAC Nos. MA6154, MA6155), and LaSalle (TAC Nos. MA8828, MA8829) have also received approval to perform this test on line.

#### Severe Weather and Grid Stability

Waterford 3 has a National Weather Service (NWS) monitor in the control room that alarms and provides updates in the event of severe weather. Typically, the EDG would not be placed in service during severe weather unless an emergency condition warranted its use. Severe weather could introduce grid instability. Waterford 3 currently has an abnormal operating procedure that provides guidance in the event of severe weather. A procedure improvement will be made to include precautions to consider grid stability and severe weather prior to performing the EDG 24-hour endurance test.

#### Fuel Oil Supply

The volume of fuel oil normally maintained in the storage tank above the minimum TS level (38,760 gallons) is not sufficient to allow the EDG to run for 24 hours without dropping below the minimum 38,760 gallon requirement. The TS allows the minimum fuel oil level to be less than 38,760 gallons and greater than 38,000 gallons for a period not to exceed 5 days provided replacement fuel oil is on site within the first 48 hours. Current procedures allow for filling the storage tank with the EDG running. Arrangements will be made such that the storage tank level is maintained above the "5 day" TS minimum (38,000 gallons) during the test.

#### Standby EDG

Waterford 3 has procedural requirements that prohibit both EDGs from being in service for testing simultaneously except when satisfying TS SR 4.8.1.1.2.g.

SR 4.8.1.1.2.e.9

“e. At least once per 18 months during shutdown by:

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.”

The design of Waterford 3 ESF subgroup relays allows the EDG to receive an SIAS while at power without rendering any ESF loads inoperable. The test would have similar results as the full load rejection. The EDG is tied to the grid in the test mode. Upon receipt of the simulated SIAS the EDG output breaker opens. The EDG, then, returns to standby operation and the loads on the safety bus are supplied by offsite power. As described above in the full load rejection, the safety buses are designed to withstand the transient.

The NRC has reviewed and approved TSTF 283, which included concurrence that this test could possibly be performed at power providing the ESF actuation signal did not cause any ESF loads to start or become inoperable. The design at Waterford 3 meets this criteria.

SR 4.8.1.1.2.e.10

“e. At least once per 18 months during shutdown by:

10. Verifying that each fuel transfer pump transfers fuel to its associated diesel oil feed tank by taking suction from the opposite train fuel oil storage tank via the installed cross connect.”

This test is performed by aligning the “A” fuel transfer pump suction to the “B” fuel oil storage tank or, the “B” fuel transfer pump suction to the “A” fuel oil storage tank. Only one train is tested at a time. The train, which is being tested, is considered inoperable. The test alignment requires the normal fuel transfer suction valve to be closed and two cross-connect valves to the opposite train to be opened. When an increase in volume is observed in the associated train's Diesel Oil Feed Tank, the transfer pump is secured and the valves realigned. This test can be performed in less than two hours. Operations personnel are stationed in the vicinity of the components that require realignment for restoration of the system. The test can be performed within the current allowed outage time.

A similar change was reviewed and approved for Millstone Nuclear Power Station, Unit 3 on February 2, 2001 (TAC No. MA9661).

SR 4.8.1.1.2.e.12

"e. At least once per 18 months during shutdown by:

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"

Performance of this test prevents the EDG from starting and therefore the EDG, which is being tested, is considered inoperable during the testing evolution. Control of the EDG is transferred to LOCAL during the performance of this SR. Each of the above features is established one at a time. The operator, then, attempts to start the EDG from the local control panel and verifies the EDG does not start. After each function is tested it is restored to its normal configuration before proceeding to the next function. The test can be performed in less than two-hours which is well within the current allowed outage time.

The NRC has reviewed and approved a similar change for Millstone Nuclear Power Station, Unit 3 (TAC No. MA9661) and Catawba Nuclear Stations, Units 1 and 2 (TAC No. MA6962 and MA9663.)

### **DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION**

Energy is proposing that the Waterford 3 Operating License be amended to eliminate the “during shutdown” restriction from several of the Technical Specification (TS) Surveillance Requirements (SR) associated with the Emergency Diesel Generators (EDGs). Additionally, the proposed change includes three non-technical administrative changes to the EDG SRs.

The following changes are proposed:

1. TS SR 4.8.1.1.2.c.1.a) – Insert the word “than” to correct a clerical error.
2. TS SR 4.8.1.1.2.e – Eliminate the during shutdown restriction for the following SRs:
  - SR 4.8.1.1.2.e.1 – EDG partial load rejection.
  - SR 4.8.1.1.2.e.2 – EDG full load rejection.
  - SR 4.8.1.1.2.e.4 – Safety Injection Actuation Signal (SIAS) relay logic test associated with the EDG.
  - SR 4.8.1.1.2.e.6 – 24-hour endurance run.
  - SR 4.8.1.1.2.e.9 – Injection of a simulated SIAS to the EDG while it is operating in the test mode connected to the bus.
  - SR 4.8.1.1.2.e.10 – Capability of the fuel transfer pumps to take suction via the installed cross connect valves from the opposite train diesel fuel oil storage tank.
  - SR 4.8.1.1.2.e.12 – EDG lockout features prevent EDG from starting when required.
3. TS SR 4.8.1.1.2.e – Relocate the during shutdown restriction such that it remains applicable to the following SRs.
  - SR 4.8.1.1.2.e.3 – Simulated loss-of-offsite-power.
  - SR 4.8.1.1.2.e.5 – Simulated loss-of-offsite-power in conjunction with an SIAS.
  - SR 4.8.1.1.2.e.7 – Auto-connected and permanently connected loads do not exceed 2000-hour rating.
  - SR 4.8.1.1.2.e.8 – Capability of EDG to transfer loads to offsite source.
  - SR 4.8.1.1.2.e.11 – Automatic load sequence timer operability.
4. Add wording, “Within 5 minutes of securing the diesel generator, perform Surveillance Requirement 4.8.1.1.2.a.4.” to end of Note \*\* related to SR 4.8.1.1.2.e.6 to clarify.

5. SR 4.8.1.1.2.h – correct minor clerical error by deleting “and” at the end of the sentence.

An evaluation of the proposed change has been performed in accordance with 10CFR50.91(a)(1) regarding no significant hazards considerations using the standards in 10CFR50.92(c). A discussion of these standards as they relate to this amendment request follows:

- 1. Will operation of the facility in accordance with this proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?**

The EDG is designed to operate in the event of a loss of offsite power or upon receipt of a SIAS. No modifications or design changes are proposed to the EDG in conjunction with this proposed TS change. Periodic testing of the EDG starting circuitry, lockout relays, capability to reject a load and maintain voltage and frequency, ability to run for 24-hours, and various other tests prove the EDG is qualified to function upon demand. The changes proposed will allow several SRs to be performed in modes other than only during shutdown. A review of each of these has been performed. The system alignment needed to achieve these tests is the same whether the test is performed during shutdown or during power operations. When performing SR 4.8.1.1.2.e.1, 2, 4, 6 and 9 the EDG is operable and capable of performing its intended function if called upon. When performing SR 4.8.1.1.2.e.10 and 12 the EDG that is being tested is inoperable for less than two hours, which is well within the allowable outage time. While performing these SRs operations personnel are available to quickly respond to align the EDG as needed for an unexpected event. Additionally, the equipment covered by these specifications are not accident initiators and can not cause an accident.

Therefore, this change does not involve a significant increase in the probability or consequences of any accident previously evaluated.

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

The proposed change does not impact any system or component which could cause an accident. The proposed change will not alter the plant configuration (no system design modifications are required) or require any unusual operator actions. The proposed change will not alter the way any structure, system, or component functions, and will not significantly alter the manner in which the plant is operated. A review of the proposed change indicates that the required testing will be performed in a similar configuration and the interrelationship with other components is the same



whether the testing is performed at power or during shutdown. The proposed change does not introduce any new failure modes. Additionally, the response of the plant and the operators following an accident will not be significantly different as a result of these changes.

Therefore, this change does not create the possibility of a new or different kind of accident from any previously evaluated.

**3. Will operation of the facility in accordance with this proposed change involve a significant reduction in a margin of safety?**

The proposed TS change is associated with the surveillance requirements for the EDGs. The proposed change allows certain EDG surveillance requirements to be performed when the plant is at power rather than when shutdown. When performing SR 4.8.1.1.2.e.1, 2, 4, 6 and 9 the EDG is operable and capable of performing its intended function if called upon. When performing SR 4.8.1.1.2.e.10 and 12 the EDG that is being tested is inoperable for less than two hours, which is well within the allowable outage time. The proposed change will have no adverse effect on plant operation or equipment important to safety. The plant response to the design basis accidents will not change and the accident mitigation equipment will continue to function as assumed in the design basis accident analysis.

Therefore, this change does not involve a significant reduction in the margin of safety.

Therefore, based on the reasoning presented above, Entergy has determined that the requested change does not involve a significant hazards consideration.

## **ENVIRONMENTAL IMPACT EVALUATION**

Pursuant to 10CFR51.22(b), an evaluation of the proposed amendment has been performed to determine whether or not it meets the criteria for categorical exclusion set forth in 10CFR 51.22 (c) (9) of the regulations. The proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). The basis for this determination is as follows:

1. The proposed license amendment does not involve a significant hazards consideration as described previously in the evaluation.
2. This change does not result in a significant change or significant increase in the radiological doses for any Design Basis Accident. The proposed license amendment does not result in a significant change in the types or a significant increase in the amounts of any effluents that may be released off-site.
3. The proposed license amendment does not result in a significant increase to the individual or cumulative occupational radiation exposure because the proposed change will have no adverse effect on plant operation or equipment important to safety. The plant response to the design basis accidents will not change and the accident mitigation equipment will continue to function as assumed in the design basis accident analysis.

**MARKUP OF CURRENT TECHNICAL SPECIFICATIONS**

ELECTRICAL POWER SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

5. Verifying the generator is synchronized, loaded to an indicated 4000-4400 Kw\* in accordance with the manufacturer's recommendation 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<sup>than</sup> 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 0.85 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.
  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.

#This surveillance requirement shall be preceded by and immediately follow without shutdown a successful performance of 4.8.1.1.2a.4 or 4.8.1.1.2d.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

3. Verify the other properties specified in Table 1 of ASTM-D975-1977 and Regulatory Guide 1.137, Revision 1, October 1979, Position 2.a., when tested in accordance with ASTM-D975-1977; analysis shall be completed within 14 days after obtaining the sample but may be performed after the addition of new fuel oil. Failure to meet this requirement shall not affect diesel generator OPERABILITY; however, corrective action shall be initiated within 72 hours to return the fuel oil supply to within acceptable limits.
- d. At least once per 184 days a diesel generator fast start test shall be performed in accordance with TS 4.8.1.1.2a.4. Performance of the 184 day fast start test satisfies the 31 day testing requirements specified in TS 4.8.1.1.2a.4.
- e. At least once per 18 months ~~during shutdown~~ by:
  1. Verifying the generator capability to reject a load of greater than or equal to 498 kW while maintaining voltage at  $4160 \pm 420$ , -240 volts and frequency at  $60 \pm 4.5$ , -1.2 Hz.
  2. Verifying the generator capability to reject a load of an indicated 4000-4400 kW without tripping. The generator voltage shall not exceed 5023 volts during and following the load rejection.
  - During shutdown,* 3. ~~Simulating~~ a loss-of-offsite power by itself, and:
    - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
    - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses and the permanently connected loads within 10 seconds after the auto-start signal, 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 energization, the steady-state voltage and frequency of the emergency busses shall be maintained at  $4160 \pm 420$ , -240 volts and  $60 \pm 1.2$ , -0.3 Hz during this test.
  4. Verifying that on an SIAS actuation test signal (without loss-of-offsite power) the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The steady-state generator voltage and frequency shall be  $4160 \pm 420$ , -240 volts and  $60 \pm 1.2$  Hz within 10 seconds after the auto-start signal; the generator voltage and frequency shall be maintained within these limits during this test.

SURVEILLANCE REQUIREMENTS (Continued)

5. *During shutdown,* Simulating a loss-of-offsite power in conjunction with an SIAS actuation test signal, and

- a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
- b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses and the permanently connected loads within 10 seconds after the auto-start signal, energizes the auto-connected emergency loads through the load sequencer and operates for greater than or equal to 5 minutes. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at  $4160 \pm 420$ , -240 volts and  $60 \pm 1.2$ , -0.3 Hz during this test.
- 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 concurrent with a safety injection actuation signal.

6. Verifying the diesel generator operates for an interval of not less than 24 hours. During 2 hours of this test, the diesel generator shall be loaded to an indicated 4700 to 4900 Kw\* and during 22 hours of this test, the diesel generator shall be loaded to an indicated 4000 to 4400 Kw.\* The generator voltage and frequency shall be  $4160 \pm 420$ , -240 volts and  $60 \pm 1.2$  Hz within 10 seconds after the start signal; the steady-state generator voltage and frequency shall be  $4160 \pm 420$  volts and  $60 \pm 1.2$ , -0.3 Hz during this test. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2.a.4.\*\*

- During shutdown,* 7. Verifying that the auto-connected loads and permanently connected loads to each diesel generator do not exceed the 2000-hour rating of 4400 kW.

\*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.

\*\*If Surveillance Requirement 4.8.1.1.2.a.4 is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at an indicated 4000-4400 kw\* for 2 hours or until internal operating temperatures have stabilized. *Within 5 minutes of securing the diesel generator, perform Surveillance Requirement 4.8.1.1.2.a.4.*

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

8. Verifying the diesel generator's capability to:

*During shutdown,*

- 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 each fuel transfer pump transfers fuel to its associated diesel oil feed tank by taking suction from the opposite train fuel oil storage tank via the installed cross connect.

*During shutdown,*

11. Verifying that the automatic load sequence timer is OPERABLE with the time of each load block within  $\pm 10\%$  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

f. 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.

g. 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 ( $60 \pm 1.2$  Hz) in less than or equal to 10 seconds.

h. 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.

**MARKUP OF TECHNICAL SPECIFICATION BASES**  
**FOR INFORMATION ONLY**



## ELECTRICAL POWER SYSTEMS

### BASES

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

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are consistent with the recommendations of Regulatory Guides 1.9 "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, and 1.108 "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, and 1.137, "Fuel Oil Systems for Standby Diesel Generators," Revision 1, October 1979. Other provisions are derived from Generic Letter 93-05 "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation" 94-01 "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators," and NUREG 1432 Standard Technical Specifications Combustion Engineering Plants.

The minimum voltage and frequency stated in the Surveillance Requirement are those necessary to ensure the diesel generator can accept the Design Basis Accident loading while maintaining acceptable voltage and frequency levels. Stable operation at the nominal voltage and frequency values is also essential to establishing diesel generator OPERABILITY, but a time constraint is not imposed. This is because a typical diesel generator will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not dampened out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the Surveillance Requirement. In lieu of a time constraint in the Surveillance Requirement, the actual time to reach steady state operation is monitored and trended. This is to ensure there is no voltage regulator or governor degradation which could cause a diesel generator to become inoperable. The 10 seconds in the Surveillance Requirement is met when the diesel generator first reaches the specified voltage and frequency, at which time the output breaker would close if an automatic actuation had occurred.

~~The diesel generator Surveillance testing performed once per 18 months during shutdown is in accordance with Regulatory Guide 1.108, Regulatory Position C.2.~~

The maximum voltage limit in Surveillance test 4.8.1.1.2.e.2 was increased to 5023 volts in response to NRC Information Notice 91-13; Inadequate Testing of Emergency Diesel Generators. A maximum voltage limit is provided to ensure that components electrically connected to the diesel generator are not damaged as a result of the momentary voltage excursion experienced during this test.

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

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests

## COMMITMENT IDENTIFICATION/VOLUNTARY ENHANCEMENT FORM

Attachment 2 to W3F1-2001-0059

Technical Specification Change Request NPF-38-233

Emergency Diesel Generator Surveillance Requirements

Page 1 of 1

COMMITMENT(S)	ONE-TIME ACTION*	CONTINUING COMPLIANCE*	SCHEDULED COMPLETION DATE (IF REQUIRED)	ASSOCIATED CR OR ER
A procedure improvement will be made to include precautions to consider grid stability and severe weather prior to performing the EDG 24-hour endurance test.		X		
Arrangements will be made such that the storage tank level is maintained above the "5 day" TS minimum (38,000 gallons) during the test.		X		
Waterford 3 has procedural requirements that prohibit both EDGs to be in service for testing simultaneously except when satisfying TS SR 4.8.1.1.2.g..		X		

\*Check one only

VOLUNTARY ENHANCEMENT(S)	ASSOCIATED CR OR ER