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W3F1-2001-0122

December 20, 2001

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Waterford Steam Electric Station, Unit 3
Docket No. 50-382
Supplement to Amendment Request NPF-38-233
Emergency Diesel Generator Surveillance Requirements

REFERENCES: 1. W3F1-2001-0059, July 10, 2001
2. NRC Request for Additional Information, November 28, 2001

Dear Sir or Madam:

By letter (reference 1), Entergy Operations, Inc. (Entergy) proposed a change to the Waterford Steam Electric Station, Unit 3 (Waterford 3) Technical Specifications (TSs) to allow certain Emergency Diesel Generator surveillance tests to be performed in Modes other than shutdown. By letter (reference 2), the NRC staff requested additional information relative to Entergy's license amendment request. Entergy's response to this request is provided in Attachment 1.

Upon further review, Entergy is revising the scope of the original request made in reference 1. The original request proposed to delete the "during shutdown" restriction from seven surveillance requirements. The revised scope only includes six of the original seven surveillances. Specifically, Entergy is no longer requesting to delete the "during shutdown" restriction from Surveillance Requirement 4.8.1.1.2.e.9. The original No Significant Hazards Consideration, provided in reference 1, remains valid. Note the original No Significant Hazards Consideration does contain a specific reference to SR 4.8.1.1.2.e.9; however, the technical basis for the answers provided remains unchanged. Revised Technical Specification pages are provided in Attachment 2 and should be used in place of those previously provided in reference 1.

The proposed change includes new commitments as summarized in Attachment 3.

If you have any questions or require additional information, please contact D. Bryan Miller at 504-739-6692.

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W3F1-2001-0122

Page 2 of 2

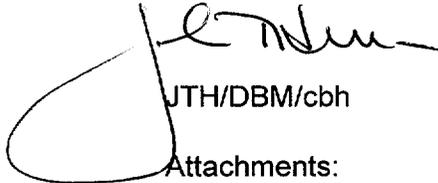
Supplement to Amendment Request NPF-38-233

Emergency Diesel Generator Surveillance Requirements

December 20, 2001

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 20, 2001.

Sincerely,



JTH/DBM/cbh

Attachments:

1. Response to Request for Additional Information
2. Revised Markup of Technical Specification Pages
3. List of Regulatory Commitments

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

W3F1-2001-0122

Response to Request for Additional Information

**Response to Request for Additional Information Related to Change Regarding
Emergency Diesel Generator Surveillance Requirements**

Question:

It is proposed that Surveillance Requirement (SR) 4.8.1.1.2.e.6 be revised to remove the "during shutdown" requirement related to the 24-hour endurance run on the emergency diesel generators (EDGs). Please explain how the EDG output breaker responds to a loss-of-offsite power (LOOP) signal alone when the EDG is in parallel with the offsite power. Also, indicate where the LOOP signal comes from when the EDG is powering the safety bus.

Response:

In the test mode, the diesel generator is protected from overload by overcurrent with voltage restraint relays, 51V-A, 51V-B, and 51V-C. The 51V relays initiate a diesel generator trip when the voltage is ≤ 80 percent and generator current is ≥ 800 amps. When a low voltage condition occurs in a range from >80 to 93.1 percent, a Loss of Voltage Signal (LOVS) will trip open the output breaker. The diesel generator will continue to run and will reclose on the bus in five seconds. The five second time delay allows motors that were running to stop prior to the reclosure. When the low voltage occurs in a range from 80 percent to a complete loss of offsite power, a relay race may occur. The race is between the overcurrent with voltage restraint relays (51V relays) and the undervoltage relays (i.e., LOVS.) If the undervoltage is of sufficient magnitude to cause the diesel generator amps to be ≥ 800 , the overcurrent with voltage restraint relays will trip the diesel generator. After the diesel generator trips, a LOVS will occur restarting the diesel generator in the emergency mode and the output breaker will close within 10 seconds. Protection from overload by overcurrent with voltage restraint relays is bypassed in the emergency mode.

The LOVS (i.e., LOOP signal) is generated via undervoltage relays 27-1, 27-2, and 27-3/A, B, and AB and undervoltage relays 27-1, 27-2, and 27-3/A1 and B1. These relays sense voltage on each 4160 V Class 1E switchgear (3A3, 3B3, and 3AB3.) The relay contacts are combined in a three out of three logic to generate a LOVS and in one out of three logic to generate an alarm on loss of instrument potential transformer fuse. A complete loss of offsite power will result in approximately a 2 second delay in LOVS actuation. Final Safety Analysis Report Figure 8.3-5 and 8.3-6 show the undervoltage relay arrangement.

The emergency diesel overcurrent trip is generated by overcurrent with voltage restraint relays 51V-A, 51V-B, and 51V-C. As indicated above, the overcurrent trip of the emergency diesel is only active in the test mode and is inactive in the emergency mode.

Question:

Additionally, if the remaining EDG were to become inoperable during this test [24-hour endurance run], would the test be aborted?

Response:

Because the EDG being tested is fully operable and capable of responding in an emergency, Entergy would not automatically abort the test once the EDG has been started and loaded. A decision to abort the test after it started would be dependent on a number of items such as the specific reason the remaining EDG became inoperable, the time remaining to complete the 24-hour run, 10 CFR 50.65(a)(4) risk considerations, etc. A 24-hour endurance run would not be started if the remaining EDG were inoperable.

Question:

It is stated (page 9 of 22, 3rd paragraph) that 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. Does this mean that the EDG 24-hour test will not be performed if severe weather or unstable grid conditions are predicted?

Response:

Yes. The commitment made in the original submittal will be revised to reflect that the EDG 24-hour test will not be performed if severe weather or unstable grid conditions are predicted to occur during the 24-hour test.

Question:

Also, please indicate if you intend to propose any administrative controls to preclude performing this surveillance during other maintenance and test conditions that could have adverse effects on the offsite power system or plans for restricting additional maintenance or testing of required safety systems that depend on the remaining EDG as a source.

Response:

No additional administrative controls are proposed. Entergy complies with 10 CFR 50.65 (Maintenance Rule) at Waterford 3. Per 10 CFR 50.65(a)(4), the risk that may result from proposed maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance) is assessed and managed appropriately to prevent situations adverse to safety.

Waterford 3 Station On-Line Maintenance Guidelines, section 5.1.1, requires that qualitative and quantitative reviews be performed on proposed schedules to verify that the scheduled activities represent an acceptable risk to both personnel and plant safety. These guidelines provide the following:

- Personnel involved in schedule development and implementation, such as the Work Week Manager, the Work Management Center Supervisor, and attendees at work week

countdown meetings will qualitatively review maintenance schedules to ensure that the scheduled work can be performed safely.

- Qualitative reviews are performed on equipment out-of-service and combinations of equipment out-of-service considering items such as; the potential for a plant trip, potential to affect generation, ALARA effect while on-line, environmental conditions, and manpower available.
- Quantitative reviews are also performed using the Equipment-Out-Of-Service (EOOS) program to determine the effect on core damage frequency with the scheduled equipment out of service. The EOOS computer monitor is used to perform the probabilistic safety analysis calculations in support of risk assessments for on-line maintenance activities. As part of the review process, a safety train analysis is performed to ensure that adequate separation of out-of-service engineered safety feature/safety equipment is maintained.
- Entergy also implements a Protected Train Concept at Waterford 3 that serves to prevent accidentally causing standby/required safety equipment to be inoperable/unavailable due to scheduling or personnel errors. The guideline specifies that protected train weeks shall be respected when scheduling safety system outages and opposite train work should be minimized.

The On-Line Maintenance Guidelines also require that grid load conditions be considered when scheduling and performing maintenance activities.

The Switchyard and Transmission Interface Agreement provides the necessary administrative controls for coordinating work on the offsite power system. This agreement specifies that activities directly affecting the offsite power supply to Waterford 3 be coordinated. The agreement requires, as a minimum, that the Entergy system dispatcher or maintenance crew inform the Waterford 3 Operations shift manager while planning these activities. The agreement further requires that activities that can not be planned in advance as well as the detailed conduct of planned activities be coordinated with the Waterford 3 Operations shift manager.

Question:

It is proposed that SR 4.8.1.1.2.e.9 be revised to remove the “during shutdown” requirement. This SR requires verification that with the diesel generator operating in test mode, a simulated safety injection signal overrides the test mode by 1) returning the diesel generator to standby mode and 2) automatically energizing the emergency loads with offsite power. Please explain how would you perform the second part of the test during power operation which requires energization of the emergency loads with the offsite power.

Response:

The request to remove the “during shutdown” requirement from SR 4.8.1.1.2.e.9 is being withdrawn by this letter.

Attachment 2

To

W3F1-2001-0122

Revised Markup of Technical Specification Pages

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 ^{than} 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 $4160 + 420, -240$ volts and frequency at $60 + 4.5, -1.2$ 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.
 3. *During shutdown,* 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 $4160 + 420, -240$ volts and $60 + 1.2, -0.3$ 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 $4160 + 420, -240$ volts and 60 ± 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
- Verifying deenergization of the emergency busses and load shedding from the emergency busses.
 - 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.
 - 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 ± 1.2 Hz within 10 seconds after the start signal; the steady-state generator voltage and frequency shall be 4160 ± 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.**
7. *During shutdown,* 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.

During shutdown,

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 ± 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.

Attachment 3

To

W3F1-2001-0122

List of Regulatory Commitments

List of Regulatory Commitments

The following table identifies those actions committed to by Entergy in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE- TIME ACTION	CONTINUING COMPLIANCE	
A 24-hour endurance run would not be started if the remaining EDG were inoperable.		X	Implementation
The EDG 24-hour test will not be performed if severe weather or unstable grid conditions are predicted to occur during the 24-hour test.		X	Implementation