Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Rope Ferry Road
Waterford, CT 06385

Dominion

AUG 12 2002

Docket No. 50-336
B18651

RE: 10 CFR 50.90

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

Millstone Nuclear Power Station, Unit No. 2
License Basis Document Change Request 2-9-02
Emergency Diesel Generator Testing Requirements

Introduction

Pursuant to 10 CFR 50.90, Dominion Nuclear Connecticut, Inc. (DNC), hereby proposes to amend Operating License DPR-65 by incorporating the attached proposed changes into the Technical Specifications of Millstone Unit No. 2. DNC is proposing to change Technical Specifications 3.8.1.1, "Electrical Power Systems - A.C. Sources – Operating;" and 3.8.1.2, "Electrical Power Systems - Shutdown." A new requirement, Technical Specification 6.24, "Diesel Fuel Oil Testing Program," will be added. The index and the associated Bases for these Technical Specifications will be modified to address the proposed changes.

The proposed changes will revise the surveillance requirements for the Millstone Unit No. 2 emergency diesel generators. The new specification will define the program requirements for testing the emergency diesel generator fuel oil.

Attachment 1 provides a discussion of the proposed changes and the Safety Summary. Attachment 2 provides the Significant Hazards Consideration. Attachment 3 provides the marked-up version of the appropriate pages of the current Technical Specifications. Attachment 4 provides the retyped pages of the Technical Specifications.

Environmental Considerations

DNC has evaluated the proposed changes against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.22. DNC has determined that the proposed changes meet the criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and as such, has determined

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that no irreversible consequences exist in accordance with 10 CFR 50.92(b). This determination is based on the fact that the changes are being proposed as an amendment to a license issued pursuant to 10 CFR 50 that changes a requirement with respect to use of a facility component located within the restricted area, as defined by 10 CFR 20, or that changes an inspection or a surveillance requirement, and that the amendment request meets the following specific criteria.

(i) The proposed changes involve no Significant Hazards Consideration.

As demonstrated in Attachment 2, the proposed changes do not involve a Significant Hazards Consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released off site.

The proposed changes will revise the surveillance requirements for the emergency diesel generators and define program requirements for testing emergency diesel generator fuel oil. The proposed changes are consistent with the design basis of the plant and the associated design basis accident analyses. The proposed changes will not result in an increase in power level, will not increase the production of radioactive waste and byproducts, and will not alter the flowpath or method of disposal of radioactive waste or byproducts. Therefore, the proposed changes will not increase the type and amounts of effluents that may be released off site.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed changes will revise the surveillance requirements for the emergency diesel generators and define program requirements for testing emergency diesel generator fuel oil. The proposed changes will not result in changes in the configuration of the facility. There will be no change in the level of controls or methodology used for processing radioactive effluents or the handling of solid radioactive waste. There will be no change to the normal radiation levels within the plant. Therefore, there will be no increase in individual or cumulative occupational radiation exposure resulting from the proposed changes.

Conclusions

The proposed changes have been evaluated and we have concluded the proposed changes are safe. The proposed changes do not involve an adverse impact on public health and safety (see the Safety Summary provided in Attachment 1) and do not involve a Significant Hazards Consideration pursuant to the provisions of 10 CFR 50.92

(see the Significant Hazards Consideration provided in Attachment 2).

Site Operations Review Committee and Nuclear Safety Assessment Board

The Site Operations Review Committee and Nuclear Safety Assessment Board have reviewed and concurred with the determinations.

Schedule

DNC requests approval and issuance of this amendment by July 31, 2003, to support use of the new requirements during Refueling Outage 15, currently scheduled in October 2003, with the amendment to be implemented within 90 days of issuance.

Additional Conditions

We request the following additional condition apply to the proposed License Amendment.

> For surveillance requirements that are new in this amendment, the first performance is due at the end of the first surveillance interval that begins on the date of implementation of this amendment.

State Notification

In accordance with 10 CFR 50.91(b), a copy of this License Amendment Request is being provided to the State of Connecticut.

There are no regulatory commitments contained within this letter.

If you should have any questions on the above, please contact Mr. Ravi Joshi at (860) 440-2080.

Very truly yours,

DOMINION NUCLEAR CONNECTICUT, INC.

J. Alan Price
Site Vice President - Millstone

Sworn to and subscribed before me

this 12 day of August, 2002

Notary Public

My Commission expires

WM. E. BROWN
NOTARY PUBLIC
MY COMMISSION EXPIRES MAR. 31, 2006

Attachments (4)

cc: H. J. Miller, Region I Administrator
R. B. Ennis, NRC Senior Project Manager, Millstone Unit No. 2
NRC Senior Resident Inspector, Millstone Unit No. 2

Director
Bureau of Air Management
Monitoring and Radiation Division
Department of Environmental Protection
79 Elm Street
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Docket No. 50-336
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Attachment 1

Millstone Nuclear Power Station, Unit No. 2

License Basis Document Change Request 2-9-02
Emergency Diesel Generator Testing Requirements
Discussion of Proposed Changes and Safety Summary

License Basis Document Change Request 2-9-02
Emergency Diesel Generator Testing Requirements
Discussion of Proposed Changes and Safety Summary

Dominion Nuclear Connecticut, Inc. (DNC), hereby proposes to amend Operating License DPR-65 by incorporating the attached proposed changes into the Technical Specifications of Millstone Unit No. 2. DNC is proposing to change Technical Specifications 3.8.1.1, "Electrical Power Systems - A.C. Sources – Operating;" and 3.8.1.2, "Electrical Power Systems - Shutdown." A new requirement, Technical Specification 6.24, "Diesel Fuel Oil Testing Program," will be added. The index and the associated Bases for these Technical Specifications will be modified to address the proposed changes.

The proposed changes will revise the surveillance requirements for the Millstone Unit No. 2 emergency diesel generators (EDGs). The new specification will define the program requirements for testing the EDG fuel oil. The proposed changes to the EDG surveillance requirements are consistent with the EDG capabilities as described in the Millstone Unit No. 2 Final Safety Analysis Report (FSAR), Section 8.3, "Emergency Generators," and Safety Guide 9.[1]

Millstone Unit No. 2 Emergency Diesel Generators

The standby power sources for Millstone Unit No. 2 consist of two independent and redundant AC power EDGs driven by separate diesel engines, each capable of supplying power to the respective emergency 4160 V bus. Each EDG set has the capability to power the Engineered Safety Features (ESF) loads in rapid succession, and to continuously supply the sum of the loads needed to be powered at any one time for a loss-of-coolant accident (LOCA).

During normal power operation, the EDGs are maintained in a standby mode. The EDGs may be manually started, and will automatically start on a loss of power to the respective emergency bus or a safety injection signal. If the normal and alternate offsite power sources are not available, the EDGs are then automatically connected to the respective emergency bus and sequentially loaded. The capacity of one EDG is sufficient to meet the ESF demand. The EDG loading sequence permits the start of large loads without voltage and frequency instability.

Two physically and electrically separate, quick starting, skid-mounted EDGs are provided. Each unit consists of a 12-cylinder 900 rpm opposed piston Fairbanks Morse diesel engine, a frame 966-40 generator, a high-speed solid state exciter-regulator unit, and associated control and auxiliary equipment. The unit has a continuous rating of

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[1] Safety Guide 9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," dated March 10, 1971.

2750 kW, defined as 8760 hours of operation a year with an availability equal to or greater than 95 percent.

The ratings for each EDG are:

2750 kW Continuous
3000 kW 2000 hours
3250 kW 300 hours

The EDGs receive automatic start signals under either of the following conditions:

a. Engineered Safeguards Actuation System (ESAS) Level 1 Undervoltage Actuation from the associated 4160 V emergency bus.

b. An ESAS Safety Injection Actuation Signal (SIAS).

The generator field is automatically flashed from the 125 VDC vital system when the unit reaches 250 rpm. Within 15 seconds of the start signal, the EDG accelerates to 90 percent or greater of rated speed and 97 percent or greater of rated voltage.

If a loss of voltage occurs on a 4160 V emergency bus (with or without a concurrent SIAS), the following items occur:

a. The tie breaker between the normal and emergency bus (A304 for Bus 24C and A410 for Bus 24D) and the feeder from the Reserve Station Service Transformer to the emergency bus (A302 for Bus 24C and A411 for Bus 24D) are tripped.

b. All load feeder breakers on the emergency bus except small permanently connected loads are tripped.

c. The EDG output breaker automatically closes after the EDG reaches 90 percent or greater of rated speed and 97 percent or greater of rated voltage.

d. The closure of the EDG output breaker starts a load sequencer that closes load feeder breakers in discrete steps. During the application of load steps, the minimum generator voltage, frequency, and the recovery time to within 10% of nominal voltage and 2% of nominal frequency are within Safety Guide 9 requirements (less than 40% of each 5.5 second load sequence interval).

If a SIAS occurs with no concurrent loss of voltage on the 4160 V emergency bus, the EDG starts but does not load.

Technical Specification Changes

Each proposed Technical Specification change, identified by specification, will be discussed. The proposed changes are consistent with Safety Guide 9, which Millstone Unit No. 2 is committed to, and the requirements specified in the Millstone Unit No. 2 FSAR, Section 8.3.

Index

A change to the index is necessary as a result of the proposed addition of Technical Specification 6.24. An entry for this specification will be added to Index Page XVII.

Technical Specification 3.8.1.1

1. Surveillance Requirement (SR) 4.8.1.1.2.a will be modified to reflect changes to the monthly EDG test requirements. This will result in the following changes.

   a. The phrase "on a STAGGERED TEST BASIS" will be deleted. Performance of the monthly surveillance testing on a staggered test basis will not be required. Based on the definition of staggered test basis in the Millstone Unit No. 2 Technical Specifications, the current frequency of every 31 days on a staggered test basis requires one EDG to be tested every 15 days (31 days divided by number of EDGs). With the proposed change to eliminate staggered testing, each EDG will be tested every 31 days. There is little or no benefit to specifying performance of SR 4.8.1.1.2.a on a staggered test basis since each EDG will be tested every 31 days. There would be no change in the surveillance frequency for an individual EDG. This is consistent with standard industry practices and guidelines (NUREG-1432, SR 3.8.1.2 and SR 3.8.1.3).

   b. The second footnote (**) will be relocated to surveillance notes associated with SR 4.8.1.1.2.a.2 and SR 4.8.1.1.2.a.3. This will allow the deletion of this footnote on Page 3/4 8-2a. This will not result in any technical change to the footnote or the application of the footnote provision.

2. SR 4.8.1.1.2.a.2 will be modified by the following changes.

   a. The information associated with the modified start guidance and the requirement to meet SR 4.8.1.1.2.d.1 criteria if a modified start is not performed will be relocated to Surveillance Note 1. This will not result in any technical change to this information.

   b. Surveillance Note 2 will be added. This note will contain the information currently contained in the second footnote (**) on Page 3/4 8-2a. This will not result in any technical change.

c. The requirement to accelerate to ≥ 90% of rated speed and to ≥ 97% of rated voltage will be replaced by a requirement to achieve steady state voltage and frequency values. The voltage range is based on the nominal voltage value of 4160 V ± 10% (416 rounded to nearest 10) and nominal frequency value of 60 Hz ± 2%. These values are currently specified in SR 4.8.1.1.2.c.8.b, and are consistent with standard industry guidance (NUREG-1432, SR 3.8.1.2).

The proposed voltage criteria is less restrictive, and the frequency criteria is more restrictive. However, this is appropriate for the monthly EDG test whose purpose is to verify the ability of the EDG to start from a standby condition and achieve steady state voltage and frequency conditions. In addition, the current requirement of ≥ 90% of rated speed and to ≥ 97% of rated voltage will continue to be verified every 184 days by current SR 4.8.1.1.2.d.1.

3. SR 4.8.1.1.2.a.3 will be modified by the following changes.

a. The information associated with loading the EDG in accordance with manufacturer's recommendations will be relocated to Surveillance Note 1. This will not result in any technical change to this information.

b. Surveillance Note 2 will be added. This note states that momentary transients outside the specified load band will not invalidate this test. Although not expected to occur, this note will accommodate momentary bus load changes. Short duration bus load changes should not invalidate this test since momentary transients outside the specified band do not indicate any adverse performance issues with the ability of the EDG to operate at rated load. This less restrictive change is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3 Note 2).

c. Surveillance Note 3 will be added. This note states that this test shall be conducted on only one EDG at a time. Although not expected to occur, this note will provide additional administrative control to avoid common cause failures that might occur due to offsite circuit or grid perturbations. This more restrictive change is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3 Note 3).

d. Surveillance Note 4 will be added. This note states that this test shall be preceded by a successful EDG start as required by the monthly or semi-annual surveillance test. This more restrictive change is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3 Note 4).

e. Surveillance Note 5 will be added. This note will contain the information currently contained in the second footnote (**) on Page 3/4 8-2a. This will

not result in any technical change.

f. The requirement to load and maintain EDG loading ≥ 1300 kW will be modified to a load band of ≥ 2475 kW and ≤ 2750 kW. The load range is based on 90% to 100% of the continuous load rating (2750 kW) for the Millstone Unit No. 2 EDGs. This load range encompasses the expected EDG loading following the limiting design basis accident (large break loss of coolant accident) with a simultaneous loss of offsite power (Millstone Unit No. 2 FSAR Tables 8.3-2 and 8.3-3). The upper load limit is consistent with the value currently specified in SR 4.8.1.1.2.c.6. In addition the load band is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3).

g. The requirement for the EDG to be loaded for ≥ 60 minutes has not changed.

4. SR 4.8.1.1.2.b will be replaced by the following two surveillance requirements.

a. SR 4.8.1.1.2.b.1 will be added to require checking for, and subsequent removal of, accumulated water from the fuel oil storage tanks at least once per 92 days. This requirement and proposed frequency are consistent with the current requirements of SR 4.8.1.1.2.b with respect to water.

b. SR 4.8.1.1.2.b.2 will be added to require verification that the fuel oil properties of new and stored fuel are tested in accordance with the Fuel Oil Test Program. The requirement to verify fuel oil quality will not change. However, the specific details of test performance (e.g., fuel oil properties and frequency of performance) will be controlled by the Fuel Oil Test Program. This program will be added to the Millstone Unit No. 2 Technical Specifications as 6.24, Diesel Fuel Oil Test Program. The proposed program will address the viscosity, water, and sediment parameters currently specified in SR 4.8.1.1.2.b. The use of a program to control the testing of fuel oil is consistent with standard industry guidance (NUREG-1432, SR 3.8.3.3).

The addition of this program as Technical Specification 6.24 takes into account the proposed addition of a Bases Control Program previously requested in the letter dated November 8, 2001.[2]

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[2] J. A. Price letter to the U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit Nos. 1, 2, and 3, Technical Specification Change Request, Administrative and Editorial Changes to the Unit Nos. 1, 2, and 3 Technical Specifications," dated November 8, 2001.

5. SR 4.8.1.1.2.c will be modified by deleting the phrase "during shutdown." Instead of requiring all of the surveillances listed under SR 4.8.1.1.2.c to be performed when the plant is shutdown, each individual surveillance will contain a note, if appropriate, to restrict plant operation during test performance. The addition of a note restricting plant operation to the individual surveillances, and the exclusion of that note where appropriate will be discussed with each individual surveillance. The deletion of this phrase is a non-technical change. Any technical change to this requirement will be addressed with the individual surveillances.

6. SR 4.8.1.1.2.c.2 will be modified by adding a note to specify the plant operating restrictions associated with performance of this test. The note specifies that this surveillance shall not normally be performed in Modes 1 though 4. This is appropriate since performance of this test requires one of the emergency buses to be deenergized before the loads can be sequenced on the associated EDG. As a result, this test is not done with the plant operating in Modes 1 through 4 where two trains of equipment are typically required. The proposed note does include a provision to allow performance of portions of this test to reestablish operability provided an assessment determines that plant safety is maintained or enhanced. The proposed note is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.18, and TSTF-283, Rev. 3).

7. SR 4.8.1.1.2.c.3 will be modified by the following changes.

   a. The current restriction to perform this test "during shutdown" will not be retained. This test can be performed either by using the associated EDG as the sole source of power to the respective emergency bus, or when operating in parallel with the electrical grid. Historically, this test has been performed when the plant is shut down by paralleling to the grid. The required load is established and the EDG output breaker is then opened. The effect on the electrical distribution system and the electrical grid has been insignificant. A test very similar to this surveillance requirement was performed while the plant was operating (Mode 1) in January 2002. The test was performed following an EDG preventative maintenance inspection and governor replacement to demonstrate operability of the governor. (The EDG inspection was performed utilizing the recently approved 14 day allowed outage time for one EDG.) The effect on the electrical distribution system and the electrical grid was insignificant. Since historical performance of tests to demonstrate the ability of the EDG to withstand a partial load rejection have had an insignificant effect on the electrical distribution system and the electrical grid, there is no reason to restrict test performance to only the shutdown modes of operation. In addition, the 14 day allowed outage time for one EDG provides ample time to perform this test following an EDG preventative maintenance inspection.

b. A Surveillance Note will be added to specify the desired power factor if this test is performed while paralleled to the grid. The note will specify a lagging power factor. The intent is to establish load conditions as close as possible to design basis conditions. The note will allow test performance at a power factor other than specified, but as close as practical to the specified value. The proposed note is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.9, except for clarifying the limit is associated with a lagging power factor).

c. The proposed test will require the rejection of a load greater than or equal to the single largest post-accident load. A numeric load value will no longer be specified since that value may change. Currently, the Millstone Unit No. 2 FSAR (Tables 8.3-2 and 8.3-3) indicates the largest load is the high pressure safety injection pump (365 kW). This more restrictive change (current value specified is 250 kW) is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.9).

d. The required frequency value will change from 60 Hz $\pm$ 3 Hz to just $\leq$ 63 Hz. The upper limit has not changed, but the lower limit has been deleted. The loss of load will cause an increase in frequency as EDG speed increases. Therefore, it is important to specify an upper limit. However, the loss of load will not cause an initial reduction in frequency, so no lower limit is necessary. (A frequency band will be specified to verify proper governor response.) The proposed frequency requirement is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.9).

e. Post load rejection voltage and frequency bands, consistent with the bands proposed for SR 4.8.1.1.2.a.2, will be specified. The proposed voltage band is more restrictive than the current band ($\pm$ 420 V vs. $\pm$ 500 V). The proposed frequency band is also more restrictive than the current band ($\pm$ 1.2 Hz vs. $\pm$ 3 Hz), and the upper limit of 63 Hz is retained in the proposed 4.8.1.1.2.c.3.a. The proposed voltage and frequency bands are consistent with standard industry guidance (NUREG-1432, SR 3.8.1.9).

The proposed voltage and frequency bands include a maximum time period (within 2.2 seconds) by which the EDG is required to restore voltage and frequency. The proposed value is based on the requirement in Safety Guide 9 to restore voltage to "within 10% of nominal" and frequency "within 2% of nominal in less than 40% of each load sequence time interval." The load sequence time interval, as specified in SR 4.8.1.1.2.c.2 is 5.5 seconds. Specifying the proposed time period requirement to be within 40% of 2.2 seconds (i.e., less than or equal to) instead of less than 40% of 2.2 seconds will not result in any significant numeric difference in the acceptance criteria while maintaining

consistency with other surveillance requirements. This more restrictive change to add a maximum time period is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.9, except the time requirement is based on 40% of the load sequence time interval instead of 60%).

8. SR 4.8.1.1.2.c.4 will be modified by the following changes.

   a. The current restriction to perform this test "during shutdown" will not be retained. This test, at the proposed higher load of $\geq$ 2475 kW and $\leq$ 2750 kW, will be performed when the associated EDG is operating in parallel with the electrical grid. Historically, this test has been performed when the plant is shut down by paralleling to the grid. The required load is established and the EDG output breaker is then opened. The effect on the electrical distribution system and the electrical grid has been insignificant. A test very similar to the current surveillance requirement (1300 kW) was performed while the plant was operating (Mode 1) in January 2002. The test was performed following an EDG preventative maintenance inspection and governor replacement to demonstrate operability of the governor. (The EDG inspection was performed utilizing the recently approved 14 day allowed outage time for one EDG.) The effect on the electrical distribution system and the electrical grid was insignificant. In addition, during the March 2002 monthly surveillance test of the A EDG, the associated EDG output breaker tripped on reverse power following a rapid loss of EDG electrical load. The EDG was loaded to approximately 2600 kW before the transient occurred. The effect on the electrical distribution system and the electrical grid was insignificant from the resultant loss of EDG electrical load. Since historical performance of tests to demonstrate the ability of the EDG to withstand a 1300 kW load rejection, as well as the recent equipment malfunction which resulted in the loss of load equivalent to the proposed value have had an insignificant effect of the electrical distribution system and the electrical grid, there is no reason to restrict test performance to only the shutdown modes of operation. In addition, the 14 day allowed outage time for one EDG provides ample time to perform this test following an EDG preventative maintenance inspection.

   b. A Surveillance Note will be added to specify the desired power factor if this test is performed while paralleled to the grid. The note will specify a lagging power factor. The intent is to establish load conditions as close as possible to design basis conditions. The note will allow test performance at a power factor other than specified, but as close as practical to the specified value. The proposed note is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.10, except for clarifying the limit is associated with a lagging power factor).

c. The proposed test will require the rejection of a load $\geq$ 2475 kW and $\leq$ 2750 kW. The load range is based on 90% to 100% of the continuous load rating (2750 kW) for the Millstone Unit No. 2 EDGs. The ability to withstand a full load rejection without tripping is consistent with the Millstone Unit No. 2 FSAR, Section 8.3. This is a more restrictive change since the current value specified is 1300 kW. The proposed load value is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.10).

d. The acceptance criteria for the proposed test will specify that the EDG does not trip following the load rejection, instead of the current requirement to not trip on overspeed. This is a more restrictive change since this will encompass the overspeed trip, as well as other EDG trips. The proposed acceptance criteria is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.10).

The acceptance criteria will not contain a maximum voltage limit as specified in NUREG 1432, SR 3.8.1.10. A voltage limit following a full load rejection is not specified in either the Millstone Unit No. 2 FSAR or Safety Guide 9.

9. SR 4.8.1.1.2.c.5 will be modified by the following changes.

a. A Surveillance Note will be added to specify the plant operating restrictions associated with performance of this test. The note specifies that this surveillance shall not normally be performed in Modes 1 through 4. This is appropriate since performance of this test requires one of the emergency buses to be deenergized before the loads can be sequenced on the associated EDG. As a result, this test is not done with the plant operating in Modes 1 through 4 where two trains of equipment are typically required. The proposed note does include a provision to allow performance of portions of this test to reestablish operability provided an assessment determines that plant safety is maintained or enhanced. The proposed note is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.19, and TSTF-283, Rev. 3).

b. The proposed test will specify performance by use of an actual or simulated actuation signal. The current test only specifies use of a simulated signal. This will provide additional flexibility in test performance. It will not result in any technical change to how this protective feature functions. This is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.19).

c. The requirements currently contained in SR 4.8.1.1.2.c.5.a will be contained in the proposed SR 4.8.1.1.2.c.5.a and SR 4.8.1.1.2.c.5.b. These requirements have not changed.

d. The requirements currently contained in SR 4.8.1.1.2.c.5.b will be contained in the proposed SR 4.8.1.1.2.c.5.c and associated subordinate requirements. The requirement for the EDG to start from a standby condition has not changed. However, the following modifications have been made to the subordinate requirements.

1) Requirement 5.c.1 has been modified by adding a requirement to energize the permanently connected loads in $\leq$ 15 seconds. The 15 second criteria is consistent with the required time for the EDG to be ready to accept load (i.e., sufficient voltage and frequency to allow the EDG output breaker to close) which is specified in SR 4.8.1.1.2.d.1. This more restrictive change is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.19).

2) Requirement 5.c.2 has not changed. This requirement will verify proper sequencing of the automatically connected loads.

3) Requirement 5.c.3 has been modified by adding a voltage band, consistent with the band proposed for SR 4.8.1.1.2.a.2. This more restrictive change is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.19).

4) Requirement 5.c.4 has been modified by adding a frequency band, consistent with the band proposed for SR 4.8.1.1.2.a.2. This more restrictive change is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.19).

5) Requirement 5.c.5, which verifies the EDG operates for $\geq$ 5 minutes after the EDG is loaded, has not changed. It has been clarified to specify permanently connected and auto-connected loads, but this does not change the intent of this requirement. This is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.19).

e. The current requirement contained in SR 4.8.1.1.2.c.5.c will be relocated to a new SR 4.8.1.1.2.c.6, which will replace the current SR 4.8.1.1.2.c.6. This change will be discussed next.

10. SR 4.8.1.1.2.c.6 will be modified by the following changes.

a. The current requirement contained in SR 4.8.1.1.2.c.6 will be deleted. This surveillance verifies the ability of the EDG to operate at the continuous load rating of $\geq$ 2750 kW for $\geq$ 60 minutes. This requirement is no longer necessary due to the proposed modifications to SRs

4.8.1.1.2.a.3 and 4.8.1.1.2.d.3 which will require the EDG to operate at ≥ 2475 kW and ≤ 2750 kW for ≥ 60 minutes. Although the current surveillance test requires the EDG to be loaded to or above the continuous rating of 2750 kW, the proposed surveillance tests will only require loading between 90% and 100% of the continuous load rating. It is appropriate for EDG reliability to specify a load band up to and including, but not exceeding, the continuous load rating. The use of a 90-100% continuous load rating band is a less restrictive change, but it is consistent with standard industry guidance (refer to discussion of proposed changes to SRs 4.8.1.1.2.a.3 and 4.8.1.1.2.d.3).

b. A new surveillance, SR 4.8.1.1.2.c.6, will be added to contain the requirements currently specified in SR 4.8.1.1.2.c.5.c.

c. A Surveillance Note will be added to specify the plant operating restrictions associated with performance of this test. The note specifies that this surveillance shall not normally be performed in Modes 1 through 4. This is appropriate since performance of this test requires an EDG to be removed from service and the generation of an ESF actuation signal in conjunction with a loss of offsite power signal. These same signals are required for performance of SR 4.8.1.1.2.c.5.c, and this test is normally performed at the same time. The proposed plant operating restrictions are the same as proposed for SR 4.8.1.1.2.c.5.c. The proposed note does include a provision to allow performance of portions of this test to reestablish operability provided an assessment determines that plant safety is maintained or enhanced. The proposed note is consistent with, but more restrictive than, standard industry guidance which only restricts performance in Modes 1 and 2 (NUREG-1432, SR 3.8.1.13, and TSTF-283, Rev. 3).

d. The proposed test will specify performance by use of an actual or simulated ESF actuation signal in conjunction with a loss of offsite power signal. The current test only specifies use of a safety injection actuation signal. Both of these signals are required to automatically bypass all of the EDG trips except those specified. The use of actual or simulated signals instead of just simulated signals will provide additional flexibility in test performance. It will not result in any technical change to how this protective feature functions. The proposed wording is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.13), except that the term "each" will not be used with respect to the EDG trips that are bypassed. These trips are bypassed either by use of a blocking contact in the engine control circuitry or by electrical supply breaker position in the EDG output breaker control circuit. It is only necessary to verify proper operation of the blocking arrangement by actuating one of the bypassed trips. If the term "each" was included this would imply that all bypassed

trips must be actuated to test this blocking function. The additional testing to actuate the other bypassed trips would be redundant and would not verify any additional aspect of the circuit with respect to the ability to bypass certain EDG trips.

e. The requirements contained in 6.a through 6.d have not changed. These requirements are currently specified in SR 4.8.1.1.2.c.5.c.

11. The current SR 4.8.1.1.2.c.7 will be deleted. This surveillance verifies that the auto-connected loads to each EDG do not exceed the 2000 hour rating of 3000 kW. This is a verification that the plant has been designed properly. It is done by an engineering calculation that sums the electrical loads for all auto-connected EDG loads and verifies the total is $\leq$ 3000 kW. It is not performed by running an actual test. As such it does not demonstrate EDG operability and does not need to be contained in Technical Specifications. The design change process, in accordance with 10 CFR 50.59, provides adequate control to ensure plant design changes, such as an increase in EDG loading, are properly evaluated. In addition, this type of test is not contained in NUREG-1432.

It should be noted that the EDG load is verified to be < 2600 kW during performance of the test for SR 4.8.1.1.2.c.5 (EDG auto load test following ESF actuation signal and loss of offsite power). However, during performance of this test, the ESF pumps are typically run on recirculation flow, which results in a lower EDG load.

12. A new surveillance, SR 4.8.1.1.2.c.7, will be added. This new surveillance is identical to SR 4.8.1.1.2.c.5, as proposed to be changed, except for the required actuation signal (actual or simulated). This surveillance will verify proper operation of the emergency power system following a loss of offsite power, while the required actuation signal (actual or simulated) for SR 4.8.1.1.2.c.5 is a loss of offsite power in conjunction with an ESF actuation signal. This more restrictive change is consistent with NUREG-1432, SR 3.8.1.11.

The proposed test will contain two Surveillance Notes. Surveillance Note 1 will contain the same plant operating restrictions as SR 4.8.1.1.2.c.5. This is appropriate since the proposed test also requires a loss of offsite power signal.

Surveillance Note 2 will specify that the start of the diesel generator from a standby condition is not required if this surveillance is performed in conjunction with SR 4.8.1.1.2.c.5. Millstone Unit No. 2 currently performs a similar test for each EDG following the EDG auto start test required by SR 4.8.1.1.2.c.5. The proposed note will allow this practice to continue, minimizing the impact of the test addition. Without this note, test performance would be delayed 6 to 12 hours as the EDG is allowed to cool down by ambient losses. The additional delay will increase shutdown risk since restoration of the plant from the test

configuration, and subsequent equipment availability will be delayed by the same amount of time. In addition, it is not necessary to test the ability of the EDG to auto start from a standby condition for this test since that ability will have already been verified by SR 4.8.1.1.2.c.5, which will have just been performed if the note's exclusion is utilized. If this test is performed by itself, the EDG will be required to start from a standby condition.

13. SR 4.8.1.1.2.c.8 will be modified by the following changes.

a. The current restriction to perform this test "during shutdown" will not be retained. Since this test only checks that the EDG starts on an ESF signal (SIAS) and that signal, by itself, will not cause the EDG to load, there will be no impact on either the electrical distribution system or the electrical grid. The ESAS module that develops the EDG actuation signal also sends an actuation signal to several Reactor Building Closed Cooling Water (RBCCW) System valves. These valves are associated with heat exchangers that can be removed from service, or that will not be adversely affected by the associated valve actuation. Since this test will have no effect on either the electrical distribution system or the electrical grid, and there will be no adverse effect on the RBCCW components affected by the associated valves, there is no reason to restrict test performance to only the shutdown modes of operation. In addition, the 14 day allowed outage time for one EDG provides ample time to perform this test following an EDG preventative maintenance inspection.

b. The proposed test will specify performance by use of an actual or simulated ESF actuation signal. The current test specifies use of a actual or simulated Safety Injection Actuation Signal (SIAS) without a loss of offsite power. Since a SIAS is an ESF signal, the proposed change will not affect test performance or how this protective feature functions. It is not necessary to specify what ESF signal is used in the surveillance. In addition, it is not necessary to specify without a loss of offsite power since this is implied by the proposed wording. The Bases for this specification will be expanded to discuss this test.

c. The requirements contained in 8.a through 8.d have not changed with the exception the EDG will be required to operate greater than or equal to 5 minutes instead of the current requirement to operate greater than 5 minutes. This will not result in any significant numeric difference in the acceptance criteria while maintaining consistency with the other surveillance requirements.

d. The requirements contained in 8.e and 8.f verify that the emergency bus loads remain energized from the offsite power system. The ESF actuation signal, a SIAS, will not by itself cause the EDG to load. The proposed

requirements are more prescriptive than, but consistent with, the requirement for the EDG to operate in "Standby" for > 5 minutes as currently specified SR 4.8.1.1.2.c.8.a. This change is consistent with the structure proposed in SR 4.8.1.1.2.c.5 and SR 4.8.1.1.2.c.7. It is not a technical change.

14. A new surveillance, SR 4.8.1.1.2.c.9, will be added. This new surveillance will verify the ability of an EDG to immediately restart after operation. The proposed hot start surveillance requires the EDG to be restarted within 5 minutes following at least one hour of operation at a loading of $\geq$ 2475 kW and $\leq$ 2750 kW. This more restrictive change is consistent with NUREG-1432, SR 3.8.1.15.

    The test prerequisites are contained in the note to this surveillance. Included in that note is a provision that states momentary transients outside the specified load band will not invalidate this test. Although not expected to occur, this note will accommodate momentary bus load changes. Short duration bus load changes should not invalidate this test since momentary transients outside the specified band will not have any adverse impact on the requirement for the EDG to be "hot" before the restart test is performed.

    The specified load band and the provision concerning momentary transients outside the specified load band are consistent with the changes proposed for SR 4.8.1.1.2.a.3. The requirements to reach $\geq$ 90% of rated speed and $\geq$ 97% of rated voltage in $\leq$ 15 seconds are consistent with current SR 4.8.1.1.2.c.8.c, and the proposed voltage and frequency bands are consistent with current SR 4.8.1.1.2.c.8.b.

15. SR 4.8.1.1.2.d.2 will be modified by relocating the EDG loading requirements to SR 4.8.1.1.2.d.3, which will be added. A requirement to achieve steady state voltage and frequency values will replace the relocated EDG loading requirements. The voltage and frequency band values are currently specified in SR 4.8.1.1.2.c.8.b, and are consistent with standard industry guidance (NUREG-1432, SR 3.8.1.2).

16. SR 4.8.1.1.2.d.3 will be added to specify the EDG loading requirements, which are currently contained in SR 4.8.1.1.2.d.2. This will result in the following changes.

    a. The information associated with the loading the EDG in accordance with manufacturer's recommendations will be relocated to the Surveillance Note 1. This will not result in any technical change to this information.

    b. Surveillance Note 2 will be added. This note states that momentary transients outside the specified load band will not invalidate this test. Although not expected to occur, this note will accommodate momentary

bus load changes. Short duration bus load changes should not invalidate this test since momentary transients outside the specified band do not indicate any adverse performance issues with the ability of the EDG to operate at rated load. This less restrictive change is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3 Note 2).

c. Surveillance Note 3 will be added. This note states that this test shall be conducted on only one EDG at a time. Although not expected to occur, this note will provide additional administrative control to avoid common cause failures that might occur due to offsite circuit or grid perturbations. This more restrictive change is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3 Note 3).

d. Surveillance Note 4 will be added. This note states that this test shall be preceded by a successful EDG start as required by the monthly or semi-annual surveillance test. This more restrictive change is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3 Note 4).

e. The requirement to load and maintain EDG loading $\geq$ 1300 kW will be modified to a load band of $\geq$ 2475 kW and $\leq$ 2750 kW. The load range is based on 90% to 100% of the continuous load rating (2750 kW) for the Millstone Unit No. 2 EDGs. This load range encompasses the expected EDG loading following the limiting design basis accident (large break loss of coolant accident) with a simultaneous loss of offsite power (Millstone Unit No. 2 FSAR Tables 8.3-2 and 8.3-3). The upper load limit is consistent with the value currently specified in SR 4.8.1.1.2.c.6. In addition, the load band is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3).

f. The requirement for the EDG to be loaded for $\geq$ 60 minutes will not change.

Technical Specification 3.8.1.2

SR 4.8.1.2 will be revised to be consistent with the proposed changes previously identified. The proposed changes are discussed below.

1. SR 4.8.1.1.2.c.6 will be added to the list of excluded surveillance requirements. The requirements contained in the proposed SR 4.8.1.1.2.c.6 are currently contained in SR 4.8.1.1.2.c.5.c. Since SR 4.8.1.1.2.c.5 is currently listed as an excluded surveillance, the addition of SR 4.8.1.1.2.c.6 will not result in any technical change.

2. SR 4.8.1.1.2.c.7 will be added to the list of excluded surveillance requirements. The current SR 4.8.1.1.2.c.7, which verifies the auto connected EDG loads do

not exceed 3000 kW, has been replaced by a new surveillance test that verifies proper EDG operation following a loss of offsite power. The proposed SR 4.8.1.1.2.c.7 is similar to SR 4.8.1.1.2.c.5 which verifies proper EDG operation following an ESF actuation (SIAS) in conjunction with a loss of offsite power. Both SR 4.8.1.1.2.c.5 and SR 4.8.1.1.2.c.7 rely on the EDG sequencer to sequence loads onto the EDG. Since the EDG sequencer is not required to be operable in Modes 5 and 6 and SR 4.8.1.1.2.c.5 is already excluded, it is appropriate to also exclude SR 4.8.1.1.2.c.7.

3. The reference to SR 4.8.1.1.2.d.2 as an excluded surveillance test will be changed to SR 4.8.1.1.2.d.3. This is consistent with the proposed changes to SR 4.8.1.1.2.d previously discussed which relocated the requirements of SR 4.8.1.1.2.d.2 to SR 4.8.1.1.2.d.3. This is not a technical change.

Technical Specification 6.24

This new Technical Specification will specify the requirements for the Fuel Oil Test Program. This program addresses the testing requirements to ensure the quality of the EDG fuel oil supply. The program description is consistent with NUREG-1432, Specification 5.5.13, except for the following plant specific changes.

1. Requirement a.3, a clear and bright appearance with proper color, will be changed to require water and sediment $\leq$ 0.05%. This is consistent with the current surveillance, SR 4.8.1.1.2.b, which specifies a check for water and sediment. There is no requirement for Millstone Unit No. 2 to verify clear and bright appearance with proper color. In addition, the proposed requirement to verify water and sediment is consistent with the Millstone Unit No. 3 Technical Specifications, SR 4.8.1.1.2.e.1.d, which was changed by License Amendment No. 118.[3]

2. Requirement c., ASTM D-2276, Method A-2 or A-3, will be changed to ASTM D-2276, Method A. There is no requirement for Millstone Unit No. 2 to verify total particulate. This more restrictive change is consistent with Millstone Unit No. 3 Technical Specifications, SR 4.8.1.1.2.f. As such this will allow the continued use of a common fuel oil test program for both Millstone Unit No. 2 and Unit No. 3.

Technical Specification Bases

The Bases for these Technical Specifications will be modified for consistency with the proposed changes. In addition, the Bases will be expanded to describe the associated surveillance requirements.

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[3] V. L Rooney (NRC) Letter to Northeast Nuclear Energy Company, "Issuance of Amendment (TAC NO M92196)," Millstone Unit No 3, dated July 26, 1995

Safety Summary

The proposed changes will revise the surveillance requirements for the Millstone Unit No. 2 EDGs. A new specification will be added to define the program requirements for testing of the EDG fuel oil. The proposed changes to the EDG surveillance requirements are consistent with the EDG capabilities as described in the Millstone Unit No. 2 FSAR, Section 8.3, and Safety Guide 9. An evaluation of the safety implications of the proposed changes, grouped by specification, is presented below.

Technical Specification 3.8.1.1

EDG performance will be evaluated by verifying steady state EDG voltage and frequency values are within required bands based on ± 10% nominal voltage (4160 V ± 420 V) and ± 2% nominal frequency (60 Hz ± 1.2 Hz). The addition of the proposed bands to numerous surveillance requirements will provide additional assurance the EDGs will perform as assumed for design basis accident mitigation. There will be no adverse effect on plant safety. The proposed bands are consistent with standard industry guidance (NUREG-1432). (SRs 4.8.1.1.2.a.2, 4.8.1.1.2.c.3, 4.8.1.1.2.c.5, 4.8.1.1.2.c.7, 4.8.1.1.2.c.9, and 4.8.1.1.2.d.2)

The deletion of the phrase "during shutdown" from SR 4.8.1.1.2.c initially removed the requirement to perform all of the associated surveillance requirements only when the plant is shut down. Each subordinate surveillance requirement has been evaluated to determine the appropriate plant restrictions. The Mode restrictions for SR 4.8.1.1.2.c.2, SR 4.8.1.1.2.c.5, and SR 4.8.1.1.2.c.6 (which was SR 4.8.1.1.2.c.5.c) have not changed. Mode restrictions have been removed from the EDG tests that verify the ability of the EDG to withstand the rejection of the single largest load and a rated load rejection, as well as start but not load in response to an ESF actuation signal (SIAS). That evaluation has concluded performance of these tests will have an insignificant effect on the electrical distribution system, the electrical grid, and any associated plant systems. Since there will be no adverse effect on plant safety, there is no reason to restrict test performance to only the shutdown modes of operation. In addition, the 14 day allowed outage time for one EDG provides ample time to perform this test following an EDG preventative maintenance inspection. This will reduce EDG unavailability during refueling outages and improve shutdown risk.

A provision will be added to allow performance of portions of the surveillance test that contain Mode restrictions to reestablish operability provided an assessment determines that plant safety is maintained or enhanced. The required assessment will ensure there will be no adverse effect on plant safety. The proposed provision is consistent with standard industry guidance (NUREG-1432 and TSTF-283, Rev. 3). (SRs 4.8.1.1.2.c.2, 4.8.1.1.2.c.5, 4.8.1.1.2.c.6, and 4.8.1.1.2.c.7)

The requirement to perform the monthly EDG testing on a staggered test basis (SR 4.8.1.1.2.a) will not be retained. Based on the definition of staggered test basis in the

Millstone Unit No. 2 Technical Specifications, there is little or no benefit to specifying performance on a staggered test basis. Removal of this requirement will not result in any change in testing frequency for an individual EDG. Elimination of testing on a staggered test basis for the EDGs is consistent with standard industry practices and guidelines.

Surveillance tests will be added to verify the capability of the EDGs to start from a hot condition (SR 4.8.1.1.2.c.9) and the ability of the EDGs to start and load if only a loss of power signal is present (SR 4.8.1.1.2.c.7). These more restrictive changes will provide additional assurance the EDGs will perform as assumed for design basis accident mitigation. Mode restrictions have been added, as appropriate, to ensure the effect of test performance on the electrical distribution system and the electrical grid is minimized. The proposed surveillance tests are consistent with standard industry guidance (NUREG-1432).

The acceptance criteria for the monthly EDG test (SR 4.8.1.1.2.a.2) will be modified by replacing the requirement to accelerate to $\geq$ 90% of rated speed and to $\geq$ 97% of rated voltage with a requirement to achieve steady state voltage and frequency values. The proposed voltage criteria is less restrictive, and the frequency criteria is more restrictive. However, this is appropriate for the monthly EDG test whose purpose is to verify the ability of the diesel generator to start from a standby condition and achieve steady state voltage and frequency conditions. In addition, the current requirement of $\geq$ 90% of rated speed and to $\geq$ 97% of rated voltage will continue to be verified every 184 days by current SR 4.8.1.1.2.d.1. This approach is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.2).

The acceptance criteria for the 31 day and 184 day EDG test (SR 4.8.1.1.2.a.3 and SR 4.8.1.1.2.d.3) will be modified by replacing the requirement to load to $\geq$ 1300 kW with a load band of $\geq$ 2475 kW and $\leq$ 2750 kW. The load range is based on 90% to 100% of the continuous load rating (2750 kW) for the Millstone Unit No. 2 EDGs. This load range encompasses the expected EDG loading following the limiting design basis accident (large break loss of coolant accident) with a simultaneous loss of offsite power (Millstone Unit No. 2 FSAR Tables 8.3-2 and 8.3-3). The upper load limit is consistent with the value currently specified in SR 4.8.1.1.2.c.6. This more restrictive change is appropriate for these EDG tests that verify the ability of the EDG to synchronize with the offsite electrical system and accept loads greater than or equal to the equivalent of the maximum expected accident loads. In addition, the load band is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3).

A surveillance note will be added that states momentary transients outside the specified load band will not invalidate this test. Although not expected to occur, this note will accommodate momentary bus load changes. Short duration bus load changes should not invalidate this test since momentary transients outside the specified band do not indicate any adverse performance issues with the ability of the EDG to operate at rated load. This less restrictive change is consistent with standard industry guidance

(NUREG-1432, SR 3.8.1.3 Note 2).

A surveillance note will be added to SR 4.8.1.1.2.a.3 and SR 4.8.1.1.2.d.3 that states the test shall be conducted on only one EDG at a time. Although not expected to occur, this more restrictive change will provide additional administrative control to avoid failures that might occur due to offsite circuit or grid perturbations from affecting both EDGs simultaneously. This is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3 Note 3).

A surveillance note will be added to SR 4.8.1.1.2.a.3 and SR 4.8.1.1.2.d.3 that states that this test shall be preceded by a successful EDG start as required by the monthly or semi-annual surveillance test. This more restrictive change will provide additional administrative control to ensure the required EDG load test is not performed unless the EDG has started properly. It is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.3 Note 4).

The replacement of specific fuel oil testing requirements with a requirement to verify the fuel oil properties of new and stored fuel in accordance with the Fuel Oil Test Program (SR 4.8.1.1.2.b) will not change the requirement to verify fuel oil quality. The addition of a Fuel Oil Test Program (Technical Specification 6.24) will provide the necessary administrative control to ensure the testing of fuel oil is performed in accordance with standard industry guidance. In addition, the new surveillance to check for and subsequently remove accumulated water from the fuel oil storage tanks will provide additional assurance the stored diesel fuel oil will not degrade. There will be no adverse effect on the quality of the fuel oil used by the EDGs.

The EDG load rejection values have been changed. SR 4.8.1.1.2.c.3 will require the rejection of a load greater than or equal to the single largest post-accident load, and SR 4.8.1.1.2.c.4 will require the rejection of a load $\geq$ 2475 kW and $\leq$ 2750 kW. The proposed load rejection values have increased (250 kW vs. approximately 365 kW, 1300 kW vs. 2475 kW to 2750 kW), but they are consistent with the EDG capabilities specified in the Millstone Unit No. 2 FSAR and Safety Guide 9. These more restrictive changes will provide additional assurance the EDGs will perform as required. In addition, past performance of the Millstone Unit No. 2 EDGs to reject equivalent load values indicates there will be no adverse effect on plant safety.

A surveillance note will be added to specify the desired power factor when performing the load rejection tests (SR 4.8.1.1.2.c.3 and SR 4.8.1.1.2.c.4) while paralleled to the grid. This more restrictive change will provide additional administrative control to establish load conditions as close as possible to design basis conditions, while allowing test performance at a power factor other than specified, but as close as practical to the specified value. It is consistent with standard industry guidance (NUREG-1432, SR 3.8.1.9).

The acceptance criteria for a partial load rejection (SR 4.8.1.1.2.c.3) will be changed.

An upper frequency limit (63 Hz) will be specified, but the lower frequency limit (57 Hz) will be removed. A lower limit is not necessary since the loss of load will cause the EDG to speed up, not slow down. In addition, post load rejection voltage and frequency bands, consistent with the bands proposed for the monthly EDG test (SR 4.8.1.1.2.a.2) will be specified. The proposed voltage band is more restrictive than the current band ($\pm$ 420 V vs. $\pm$ 500 V). The proposed frequency band is also more restrictive than the current band ($\pm$ 1.2 Hz vs. $\pm$ 3 Hz), and the upper limit of 63 Hz is retained in the proposed 4.8.1.1.2.c.3.a. The proposed voltage and frequency bands include a maximum time period (within 2.2 seconds) by which the EDG is required to restore voltage and frequency. The proposed recovery time is consistent with the EDG capabilities specified in the Millstone Unit No. 2 FSAR and Safety Guide 9. The use of "within" instead of "less than" in the acceptance criteria will provide consistency between surveillance requirements. It will have an insignificant impact on the acceptance criteria. These more restrictive changes will provide additional assurance the EDGs will perform as required.

The acceptance criteria for the full load rejection test will specify that the EDG does not trip following the load rejection, instead of the current requirement to not trip on overspeed. This more restrictive change, which encompasses the overspeed trip, will provide additional assurance the EDGs will perform as required.

The acceptance criteria for the EDG to operate following a start on an ESF actuation signal (SR 4.8.1.1.2.c.8.d) will be changed from greater than 5 minutes to greater than or equal to 5 minutes. This less restrictive change will provide consistency between surveillance requirements. It will have an insignificant impact on the acceptance criteria and will not adversely impact EDG performance.

The EDG tests that rely on the generation of an actuation signal (loss of offsite power and/or ESF) will be changed to specify performance by use of an actual or simulated actuation signal. The use of an actual or simulated signal will provide additional flexibility in test performance. The proposed changes will standardize terminology between tests and specify the required actuation signals. In addition, the Bases will be expanded to discuss the required actuation signals. This will provide additional assurance the EDGs will respond properly for each event.

An additional acceptance criteria, energize the permanently connected loads in $\leq$ 15 seconds, will be added to the EDG test that verifies proper operation following a loss of offsite power and ESF actuation (SR 4.8.1.1.2.c.5). The 15 second criteria is consistent with the required time for the EDG to be ready to accept load (i.e., sufficient voltage and frequency to allow the EDG output breaker to automatically close) which is specified in SR 4.8.1.1.2.d.1. This more restrictive change will provide additional assurance the EDGs will perform as required.

The requirement to verify the ability of the EDG to operate at a continuous load rating of $\geq$ 2750 kW for $\geq$ 60 minutes will be deleted since this requirement is longer

necessary. The proposed modifications to the monthly (SR 4.8.1.1.2.a.3) and 184 days (4.8 1.1.2.d.3) surveillance requirements will require the EDG to operate at $\geq$ 2475 kW and $\leq$ 2750 kW for $\geq$ 60 minutes. Although the current surveillance test requires the EDG to be loaded to or above the continuous load rating of 2750 kW, the proposed surveillance tests will only require loading between 90% and 100% of the continuous load rating. This less restrictive change will have no adverse effect on EDG reliability since it is appropriate to specify a load band up to and including, but not exceeding, the continuous load rating. There will be no adverse effect on plant safety. The use of a 90-100% continuous rating load band, which encompasses the expected EDG loading following the limiting design basis accident, is consistent with standard industry guidance NUREG-1432, SR 3.8.1.3).

The deletion of the surveillance test that verifies the auto-connected loads to each EDG do not exceed the 2000 hour rating of 3000 kW will have no adverse effect on the ability of the EDGs to perform as required for event mitigation. This is a verification of plant design, not EDG performance, since the emergency bus loads will not change over time unless more loads are added. As such it does not demonstrate EDG operability and does not need to be contained in Technical Specifications. The design change process, in accordance with 10 CFR 50.59, provides adequate control to ensure plant design changes, such as an increase in EDG loading, are properly evaluated. There will be no adverse effect on plant safety. In addition, this type of test is not contained in NUREG-1432.

The addition of a new surveillance requirement (SR 4.8.1.1.2.c.7) to verify proper operation of the emergency power system following a loss of offsite power will provide additional assurance the EDGs will perform as assumed for design basis accident mitigation. The proposed test will contain the same plant operating restrictions as the current test of EDG response following a loss of offsite power in conjunction with an ESF actuation signal. This will ensure there will be no adverse effect on plant safety. This more restrictive change is consistent with NUREG-1432, SR 3.8.1.11.

The new surveillance requirement (SR 4.8.1.1.2.c.7) to verify proper operation of the emergency power system following a loss of offsite power will include an additional surveillance note that states the start of the diesel generator from a standby condition is not required if this surveillance is performed in conjunction with SR 4.8.1.1.2.c.5. This is consistent with how Millstone Unit No. 2 currently performs a similar test. The proposed note will allow this practice to continue, minimizing the impact of the test addition. Without this note, test performance would be delayed as the EDG is allowed to cool by ambient losses. The additional delay will increase shutdown risk since plant restoration, and subsequent equipment availability, will be delayed. The proposed note will enhance overall plant safety with no adverse impact on EDG reliability. If this test is to be performed by itself, the EDG will be required to start from a standby condition. While the proposed exception is a less restrictive change, the overall change to add this new surveillance requirement is a more restrictive change.

The addition of a new surveillance requirement (SR 4.8.1.1.2.c.9) to verify the ability of an EDG to immediately restart after operation will provide additional assurance the EDGs will perform as assumed for design basis accident mitigation. The test prerequisites are contained in the note to this surveillance. Included in that note is a provision that states momentary transients outside the specified load band will not invalidate this test. The momentary load transient provision and the specified acceptance criteria are consistent with current and proposed surveillance requirements. This more restrictive change is consistent with NUREG-1432, SR 3.8.1.15.

Technical Specification 3.8.1.2

SR 4.8.1.2 has been revised to be consistent with the proposed changes previously discussed for SR 4.8.1.1.2. These changes include non-technical numbering changes, and the exclusion of a new surveillance requirement (SR 4.8.1.1.2.c.7). This new surveillance test is similar to SR 4.8.1.1.2.c.5 which verifies proper EDG operation following an ESF actuation (SIAS) in conjunction with a loss of offsite power. Both of these tests rely on the EDG sequencer to sequence loads onto the EDG. Since the EDG sequencer is not required to be operable in Modes 5 and 6, and SR 4.8.1.1.2.c.5 is already excluded, it is appropriate to also exclude SR 4.8.1.1.2.c.7.

Technical Specification 6.24

This new Technical Specification will specify the requirements for the Fuel Oil Test Program. Use of this program, as required by the proposed change to SR 4.8.1.1.2.b, will provide the necessary administrative control to ensure the quality of the EDG fuel oil supply is maintained. The use of a program to contain the EDG fuel oil testing requirements is consistent with NUREG-1432, Specification 5.5.13, except for the two changes associated with water and sediment, and total particulate concentration. The proposed changes are consistent with the current Millstone Unit No. 2 requirement to verify water and sediment and with a previous approved change to the Millstone Unit No. 3 Technical Specifications. The more restrictive addition of the requirement to check total particulate concentration is consistent with the Millstone Unit No. 3 Technical Specifications. This will allow the continued use of a common fuel oil test program for both Millstone Unit No. 2 and Unit No. 3. The proposed Fuel Oil Test Program will ensure the EDGs will perform as assumed for design basis accident mitigation. There will be no adverse effect on plant safety.

Miscellaneous Changes

The editorial changes proposed (e.g., renumbering a requirement, modifying an index page, relocating a footnote requirement, relocating requirements to surveillance notes, relocating part of a surveillance requirement to be a separate surveillance requirement, clarifying the EDGs loads required to be energized for at least 5 minutes, clarifying the EDGs loads that should remain energized by offsite power) will not result in any technical changes to the associated requirements.

Bases Changes

The Bases for these Technical Specifications will be expanded to describe the associated surveillance requirements and to include technical information that was not included in the proposed surveillance requirements. This approach, to include additional information that describes the surveillance requirements in the associated Bases, is consistent with NUREG-1432.

Conclusion

The proposed changes to the Technical Specifications and Bases will provide assurance the EDGs will function as assumed to mitigate the design basis events. There will be no adverse effect on the availability or operation of the associated equipment, and there will be no adverse effect on plant operation. The plant response to the design basis accidents will not change. The proposed changes are consistent with the Millstone Unit No. 2 FSAR, and with industry/NRC guidance contained in Safety Guide 9 and NUREG-1432. The risk of a plant transient due to the proposed surveillance testing will not be adversely affected by the proposed changes. Therefore, there will be no adverse impact on public health and safety. Thus, the proposed changes are safe.

Docket No. 50-336
B18651

Attachment 2

Millstone Nuclear Power Station, Unit No. 2

License Basis Document Change Request 2-9-02
Emergency Diesel Generator Testing Requirements
Significant Hazards Consideration

License Basis Document Change Request 2-9-02
Emergency Diesel Generator Testing Requirements
Significant Hazards Consideration

Description of License Amendment Request

Dominion Nuclear Connecticut, Inc. (DNC), hereby proposes to revise the Millstone Unit No. 2 Technical Specifications as described in this License Amendment Request. The proposed changes will revise the surveillance requirements for the Millstone Unit No. 2 emergency diesel generators. A new specification will be added to define the program requirements for testing of the emergency diesel generator fuel oil. The index and the Bases for the affected Technical Specifications will also be modified. Refer to Attachment 1 of this submittal for a detailed discussion of the proposed changes.

Significant Hazards Consideration

In accordance with 10 CFR 50.92, DNC has reviewed the proposed changes and has concluded that they do not involve a Significant Hazards Consideration (SHC). The basis for this conclusion is that the three criteria of 10 CFR 50.92(c) are not compromised. The proposed changes do not involve an SHC because the changes would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed Technical Specification changes associated with revising the surveillance requirements for the Millstone Unit No. 2 emergency diesel generators and adding a new specification to define the program requirements for testing of the emergency diesel generator fuel oil will not cause an accident to occur and will not result in any change in the operation of the associated accident mitigation equipment. The ability of the equipment associated with the proposed changes to mitigate the design basis accidents will not be affected. The proposed Technical Specification surveillance requirements are sufficient to ensure the required accident mitigation equipment will be available and function properly for design basis accident mitigation. In addition, the design basis accidents will remain the same postulated events described in the Millstone Unit No. 2 Final Safety Analysis Report, and the consequences of those events will not be affected. Therefore, the proposed changes will not increase the probability or consequences of an accident previously evaluated.

   The additional proposed changes to the Technical Specifications (e.g., renumbering a requirement, modifying an index page, relocating a footnote requirement, relocating requirements to surveillance notes, relocating part of a surveillance requirement to be a separate surveillance requirement, clarifying the

EDGs loads required to be energized for at least 5 minutes, clarifying the EDGs loads that should remain energized by offsite power) will not result in any technical changes to the current requirements. Therefore, these additional changes will not increase the probability or consequences of an accident previously evaluated.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed changes to the Technical Specifications do not impact any system or component that could cause an accident. The proposed changes will not alter the plant configuration (no new or different type of equipment will be installed) or require any unusual operator actions. The proposed changes will not alter the way any structure, system, or component functions, and will not alter the manner in which the plant is operated. There will be no adverse effect on plant operation or accident mitigation equipment. The response of the plant and the operators following an accident will not be different. In addition, the proposed changes do not introduce any new failure modes. Therefore, the proposed changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Involve a significant reduction in a margin of safety.

   The proposed Technical Specification changes associated with revising the surveillance requirements for the Millstone Unit No. 2 emergency diesel generators and adding a new specification to define the program requirements for testing of the emergency diesel generator fuel oil will not cause an accident to occur and will not result in any change in the operation of the associated accident mitigation equipment. The equipment associated with the proposed Technical Specification changes will continue to be able to mitigate the design basis accidents as assumed in the safety analysis. The proposed surveillance requirements are adequate to ensure proper operation of the affected accident mitigation equipment. In addition, the proposed changes will not affect equipment design or operation, and there are no changes being made to the Technical Specification required safety limits or safety system settings. The proposed Technical Specification changes will provide adequate control measures to ensure the accident mitigation functions are maintained. Therefore, the proposed changes will not result in a reduction in a margin of safety.

   The additional proposed changes to the Technical Specifications (e.g., renumbering a requirement, modifying an index page, relocating a footnote requirement, relocating requirements to surveillance notes, relocating part of a surveillance requirement to be a separate surveillance requirement, clarifying the EDGs loads required to be energized for at least 5 minutes, clarifying the EDGs

loads that should remain energized by offsite power) will not result in any technical changes to the current requirements. Therefore, these additional changes will not result in a reduction in a margin of safety.

Docket No. 50-336
B18651

Attachment 3

Millstone Nuclear Power Station, Unit No. 2

License Basis Document Change Request 2-9-02
Emergency Diesel Generator Testing Requirements
Marked Up Pages

License Basis Document Change Request 2-9-02
Emergency Diesel Generator Testing Requirements
Marked Up Pages

The following Technical Specification and associated Bases pages have been proposed to be changed.

Technical Specification Section Number	Title(s) of Section(s)	Page and Revision Numbers
	Index	XVII Amend. 264
3/4.8.1.1	Electrical Power Systems A.C. Sources - Operating	3/4 8-2a Amend. 231 3/4 8-3 Amend. 259 3/4 8-4 Amend. 231
3/4.8.1.2	Electrical Power Systems Shutdown	3/4 8-5 Amend. 231
3/4.8	Electrical Power Systems Bases	B 3/4 8-1c Amend. 261

3/4.8.1 A.C. SOURCES

NO CHANGE
FOR INFORMATION ONLY

OPERATING

January 4, 2002

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 a separate fuel oil supply tank containing a minimum of 12,000 gallons of fuel.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Inoperable Equipment	Required Action
a. One offsite circuit	a.1 Perform Surveillance Requirement 4.8.1.1.1 for remaining offsite circuit within 1 hour prior to or after entering this condition, and at least once per 8 hours thereafter. AND a.2 Restore the inoperable offsite circuit to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

NO CHANGE
FOR INFORMATION ONLY
January 4, 2002

Inoperable Equipment	Required Action
b. One diesel generator	b.1 Perform Surveillance Requirement 4.8.1.1.1 for the offsite circuits within 1 hour prior to or after entering this condition, and at least once per 8 hours thereafter. AND b.2 Demonstrate OPERABLE diesel generator is not inoperable due to common cause failure within 24 hours or perform Surveillance Requirement 4.8.1.1.2.a.2 for the OPERABLE diesel generator within 24 hours. AND b.3 Verify the steam-driven auxiliary feedwater pump is OPERABLE (MODES 1, 2, and 3 only). If this condition is not satisfied within 2 hours, be in a least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours. AND b.4 (Applicable only if the 14 day allowed outage time specified in Action Statement b.5 is to be used.) Verify the required Millstone Unit No. 3 diesel generator(s) is/are OPERABLE and the Millstone Unit No. 3 SBO diesel generator is available within 1 hour prior to or after entering this condition, and at least once per 24 hours thereafter. Restore any inoperable required Millstone Unit No. 3 diesel generator to OPERABLE status and/or Millstone Unit No. 3 SBO diesel generator to available status within 72 hours or be in HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours. AND b.5 Restore the inoperable diesel generator to OPERABLE status within 72 hours (within 14 days if Action Statement b.4 is met) or be in HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

ACTION (Continued)

NO CHANGE
FOR INFORMATION ONLY
January 4, 2002

Inoperable Equipment	Required Action
c. One offsite circuit AND One diesel generator	c.1 Perform Surveillance Requirement 4.8.1.1.1 for remaining offsite circuit within 1 hour and at least once per 8 hours thereafter. AND c.2 Demonstrate OPERABLE diesel generator is not inoperable due to common cause failure within 8 hours or perform Surveillance Requirement 4.8.1.1.2.a.2 for the OPERABLE diesel generator within 8 hours. AND c.3 Verify the steam-driven auxiliary feedwater pump is OPERABLE (MODES 1, 2, and 3 only). If this condition is not satisfied within 2 hours, be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours. AND c.4 Restore one inoperable A.C. source to OPERABLE status within 12 hours or be in HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours. AND c.5 Restore remaining inoperable A.C. source to OPERABLE status following the time requirements of Action Statements a or b above based on the initial loss of the remaining inoperable A.C. source.
d. Two offsite circuits	d.1 Restore one of the inoperable offsite sources to OPERABLE status within 24 hours or be in HOT STANDBY within the next 6 hours. AND d.2 Following restoration of one offsite source restore remaining inoperable offsite source to OPERABLE status following the time requirements of Action Statement a above based on the initial loss of the remaining inoperable offsite source.

ACTION (Continued)

March 12, 1999

Inoperable Equipment	Required Action
e. Two diesel generators	e.1 Perform Surveillance Requirement 4.8.1.1.1 for the offsite circuits within 1 hour and at least once per 8 hours thereafter. AND e.2 Restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours. AND e.3 Following restoration of one diesel generator restore remaining inoperable diesel generator to OPERABLE status following the time requirements of Action Statement b above based on the initial loss of the remaining inoperable diesel generator.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Verify correct breaker alignment and indicated power available for each required offsite circuit at least once per 24 hours.

4.8.1.1.2 Each required diesel generator shall be demonstrated OPERABLE:*

a. At least once per 31 days ~~on a STAGGERED TEST BASIS~~ by:

1. Verifying the fuel level in the fuel oil supply tank,

INSERT A

2. Verifying the diesel starts from standby conditions and accelerates to ≥ 90% of rated speed and to ≥ 97% of rated voltage.** A modified start involving idling and gradual acceleration to synchronous speed may be used as recommended by the manufacturer. If a modified start, as just defined, is not used, the requirements of Surveillance Requirement 4.8.1.1.2.d.1 apply for this test.

3. Verifying the generator is synchronized and loaded in accordance with the manufacturer's recommendations to ≥ 1300 kW and operates with a load ≥ 1300 kW for ≥ 60 minutes.**

*All diesel starts may be preceded by an engine prelube period.

~~**Performance of Surveillance Requirement 4.8.1.1.2.d satisfies this Surveillance Requirement.~~

INSERT A - Page 3/4 8-2a

2.

NOTES

1. A modified diesel generator start involving idling and gradual acceleration to synchronous speed may be used as recommended by the manufacturer. When modified start procedures are not used, the requirements of SR 4.8.1.1.2.d.1 must be met.

2. Performance of SR 4.8.1.1.2.d satisfies this Surveillance Requirement.

Verifying the diesel generator starts from standby conditions and achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.

3.

NOTES

1. Diesel generator loading may include gradual loading as recommended by the manufacturer.

2. Momentary transients outside the load range do not invalidate this test.

3. This test shall be conducted on only one diesel generator at a time.

4. This test shall be preceded by and immediately follow without shutdown a successful performance of SR 4.8.1.1.2.a.2, or SRs 4.8.1.1.2.d.1 and 4.8.1.1.2.d.2.

5. Performance of SR 4.8.1.1.2.d satisfies this Surveillance Requirement.

Verifying the diesel generator is synchronized and loaded, and operates for $\geq$ 60 minutes at a load $\geq$ 2475 kW and $\leq$ 2750 kW.

SURVEILLANCE REQUIREMENTS (Continued)

INSERT B

b. At least once per 92 days by verifying that a sample of diesel fuel from each of the three fuel oil storage tanks, obtained in accordance with ASTM D4057, is within the acceptable limits specified in Table 1 of ASTM D975 when checked for viscosity, water and sediment.

c. At least once per 18 months ~~during shutdown~~ by:

1. Deleted

2. Verifying that the automatic time delay sequencer is OPERABLE with the following settings:

INSERT C

Sequence Step	Time After Closing of Diesel Generator Output Breaker (Seconds)	
	Minimum	Maximum
1 (T_1)	1.5	2.2
2 (T_2)	T_1 + 5.5	8.4
3 (T_3)	T_2 + 5.5	14.6
4 (T_4)	T_3 + 5.5	20.8

INSERT D

3. Verifying the generator capability to reject a load of $\geq$ 250 kw and maintain voltage at 4160 $\pm$ 500 volts and frequency at 60 $\pm$ 3 Hz.

4. Verifying the generator capability to reject a load of 1300 Kw without exceeding the overspeed trip setpoint.

5. Simulating a loss of offsite power in conjunction with a safety injection actuation signal, and:

   a) Verifying deenergization of the emergency busses and load shedding from the emergency busses,

   b) Verifying the diesel starts from standby conditions on the autostart signal, energizes the emergency busses with permanently connected loads, energizes the auto-connected emergency loads through the load sequencer and operates for $\geq$ 5 minutes while its generator is loaded with the emergency loads.

INSERT B - Page 3/4 8-3

The diesel fuel oil supply shall be checked by:

1. Checking for and removing accumulated water from each fuel oil storage tank at least once per 92 days.

2. Verifying fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program in accordance with the Diesel Fuel Oil Testing Program.

INSERT C - Page 3/4 8-3

NOTE
This surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

INSERT D - Page 3/4 8-3 (Page 1 of 5)

3.

NOTE

If performed with the diesel generator synchronized with offsite power, this surveillance shall be performed at a power factor $\leq$ 0.9 lagging. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.

Verifying the diesel generator capability to reject a load greater than or equal to its associated single largest post-accident load and:

a. Following load rejection, the frequency is $\leq$ 63 Hz,

b. Within 2.2 seconds following load rejection, the voltage is $\geq$ 3740 V and $\leq$ 4580 V, and

c. Within 2.2 seconds following load rejection, the frequency is $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.

4.

NOTE

If performed with the diesel generator synchronized with offsite power, this surveillance shall be performed at a power factor $\leq$ 0.9 lagging. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.

Verifying the diesel generator does not trip following a load rejection of $\geq$ 2475 kW and $\leq$ 2750 kW.

INSERT D - Page 3/4 8-3 (Page 2 of 5)

5.

NOTE
This surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

Verifying on an actual or simulated loss of offsite power in conjunction with an actual or simulated Engineered Safety Feature actuation signal:

a. De-energization of emergency buses,

b. Load shedding from emergency buses,

c. Diesel generator auto-starts from standby condition and:

1. energizes permanently connected loads in $\leq$ 15 seconds,

2. energizes auto-connected loads through the load sequencer,

3. achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V,

4. achieves steady state frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz and,

5. energizes permanently connected and auto-connected loads for $\geq$ 5 minutes.

INSERT D - Page 3/4 8-3 (Page 3 of 5)

6.

NOTE
This surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

Verifying diesel generator automatic trips are bypassed on an actual or simulated loss of offsite power in conjunction with an actual or simulated Engineered Safety Feature actuation signal except:

a. Engine overspeed,

b. Generator differential current,

c. Voltage restraint overcurrent, and

d. Low lube oil pressure (switches to 2 out of 3 logic).

INSERT D - Page 3/4 8-3 (Page 4 of 5)

7.

NOTES

1. This surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

2. The start of the diesel generator from a standby condition is not required if this surveillance is performed in conjunction with SR 4.8.1.1.2.c.5.

Verifying on an actual or simulated loss of offsite power signal:

a. De-energization of emergency buses,

b. Load shedding from emergency buses,

c. Diesel generator auto-starts from standby condition and:

   1. energizes permanently connected loads in $\leq$ 15 seconds,

   2. energizes auto-connected loads through the load sequencer,

   3. achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V,

   4. achieves steady state frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz and,

   5. energizes permanently connected and auto-connected loads for $\geq$ 5 minutes.

INSERT D - Page 3/4 8-3 (Page 5 of 5)

8. Verifying on an actual or simulated Engineered Safety Feature actuation signal the diesel generator auto-starts from a standby condition and:

   a. Achieves $\geq$ 90% of rated speed and $\geq$ 97% of rated voltage in $\leq$ 15 seconds,

   b. Achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V,

   c. Achieves steady state frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz,

   d. Operates for $\geq$ 5 minutes,

   e. Permanently connected loads remain energized from the offsite power system, and

   f. Auto-connected loads remain energized from the offsite power system as appropriate for plant conditions.

9.

NOTE
This surveillance shall be performed within 5 minutes of shutting down the diesel generator after the diesel generator has operated $\geq$ 1 hour loaded $\geq$ 2475 kW and $\leq$ 2750 kW. Momentary transients outside the load range do not invalidate this test.

Verifying the diesel generator starts and:

   a. Accelerates to $\geq$ 90% of rated speed and $\geq$ 97% of rated voltage in $\leq$ 15 seconds, and

   b. Achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.

SURVEILLANCE REQUIREMENT (Continued)

c) Verifying that on the safety injection actuation signal, all diesel generator trips, except engine overspeed, generator differential current, voltage restraint overcurrent, and low lube oil pressure (2 out of 3) are automatically bypassed.

6. Verifying the diesel generator operates for ≥ 60 minutes while loaded to ≥ 2750 kw.

7. Verifying that the auto-connect loads to each diesel generator do not exceed the 2000 hour rating of 3000 kw.

8. Verifying that on an actual or simulated Safety Injection Actuation Signal (SIAS) without a loss of offsite power:

   a. The diesel generator starts from standby conditions on the auto-start signal and operates on Standby for greater than 5 minutes;
   b. The generator frequency and voltage shall reach 58.8 to 61.2 Hertz, and 3740 to 4580 VAC, and be maintained during this test;
   c. The diesel start time (time to reach 90% of rated speed and 97% of rated voltage) shall be less than or equal to 15 seconds.

d. At least once per 184 days by:

   1. Verifying the diesel starts from standby conditions and accelerates to ≥ 90% of rated speed and to ≥ 97% of rated voltage within 15 seconds after the start signal.

   2. Verifying the generator is synchronized and loaded in accordance with the manufacturer's recommendations to ≥ 1300 kW and operates with a load ≥ 1300 kW for ≥ 60 minutes.

INSERT E

INSERT E - Page 3/4 8-4

2. Verifying the diesel generator achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.

3.

NOTES

1. Diesel generator loading may include gradual loading as recommended by the manufacturer.
2. Momentary transients outside the load range do not invalidate this test.
3. This test shall be conducted on only one diesel generator at a time.
4. This test shall be preceded by and immediately follow without shutdown a successful performance of SRs 4.8.1.1.2.d.1 and 4.8.1.1.2.d.2, or SR 4.8.1.1.2.a.2.

Verifying the diesel generator is synchronized and loaded, and operates for $\geq$ 60 minutes at a load $\geq$ 2475 kW and $\leq$ 2750 kW.

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 a fuel oil supply tank containing a minimum of 12,000 gallons of fuel.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes or movement of irradiated fuel assemblies.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE per Surveillance Requirements 4.8.1.1.1 and 4.8.1.1.2, except for testing pursuant to Surveillance Requirements 4.8.1.1.2.a.3, 4.8.1.1.2.c.2, 4.8.1.1.2.c.5, and 4.8.1.1.2.d.~~2~~3.

4.8.1.1.2.c.6, 4.8.1.1.2.c.7,

The OPERABILITY of the A.C. and D.C. power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criteria 17 of Appendix "A" to 10 CFR 50.

The required circuits between the offsite transmission network and the onsite Class 1E distribution system (Station Busses 24C, 24D, and 24E) that satisfy Technical Specification 3.8.1.1.a (MODES 1, 2, 3, and 4) consist of the following circuits from the switchyard to the onsite electrical distribution system:

a. Station safeguards busses 24C and 24D via the Unit 2 Reserve Station Service Transformer and bus 24G; and

b. Station bus 24E via the Unit 3 Reserve Station Service Transformer or Unit 3 Normal Station Service Transformer (energized with breaker 13T and associated disconnect switches open) and bus 34A or 34B.

If the plant configuration will not allow Unit 3 to supply power to Unit 2 from the Unit 3 Reserve Station Service Transformer or Unit 3 Normal Station Service Transformer within 3 hours, Unit 2 must consider the second offsite source inoperable and enter the appropriate action statement of Technical Specification 3.8.1.1 for an inoperable offsite circuit.

This is consistent with the GDC 17 requirement for two offsite sources. Each offsite circuit is required to be available in sufficient time following a loss of all onsite alternating current power supplies and the other offsite electric power circuit to assure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. The first source is required to be available within a few seconds to supply power to safety related equipment following a loss of coolant accident. The second source is not required to be available immediately and no accident is assumed to occur concurrently with the need to use the second source. However, the second source is required to be available in sufficient time to assure the reactor remains in a safe condition. The 3 hour time period is based on the Millstone Unit No. 2 Appendix R analysis. This analysis has demonstrated that the reactor will remain in a safe condition (i.e., the pressurizer will not empty) if charging is restored within 3 hours.

In MODES 1 through 4 (Technical Specification 3.8.1.1), the Unit 2 Normal Station Service Transformer can be used as the second offsite source after the main generator disconnect links have been removed and the backfeed lineup established.

The required circuit between the offsite transmission network and the onsite Class 1E distribution system (Station Busses 24C, 24D, and 24E) that satisfies Technical Specification 3.8.1.2.a (MODES 5 and 6) consists of the following circuit from the switchyard to the onsite electrical distribution system:

a. Station safeguards bus 24C or 24D via the Unit 2 Reserve Station Service Transformer and bus 24G; or

b. Station safeguards bus 24C or 24D via the Unit 2 Normal Station Service Transformer and bus 24A or 24B after the main generator disconnect links have been removed and the backfeed lineup established; or

c. Station bus 24E via the Unit 3 Reserve Station Service Transformer or Unit 3 Normal Station Service Transformer (energized with breaker 13T and associated disconnect switches open) and bus 34A or 34B.

When the plant is operating with the main generator connected to the grid, the output of the main generator will normally be used to supply the onsite Class 1E distribution system. During this time the required offsite circuits will be in standby, ready to supply power to the onsite Class 1E distribution system if the main generator is not available. When shut down, only one of the offsite circuits will normally be used to supply the onsite Class 1E distribution system. The other offsite circuit, if required, will be in standby. Verification of the required offsite circuits consists of checking control power to the breakers (breaker indicating lights), proper breaker position for the current plant configuration, and voltage indication as appropriate for the current plant configuration.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one of each of the onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source.

Technical Specification 3.8.1.1 Action Statements b and c provide an allowance to avoid unnecessary testing of the other OPERABLE diesel generator. If it can be determined that the cause of the inoperable diesel generator does not exist on the OPERABLE diesel generator, Surveillance Requirement 4.8.1.1.2.a.2 does not have to be performed. If the cause of inoperability exists on the other OPERABLE diesel generator, the other OPERABLE diesel generator would be declared inoperable upon discovery, Action Statement e would be entered, and appropriate actions will be taken. Once the failure is corrected, the common cause failure no longer exists, and the required Action Statements (b, c, and e) will be satisfied.

If it cannot be determined that the cause of the inoperable diesel generator does not exist on the remaining diesel generator, performance of Surveillance Requirement 4.8.1.1.2.a.2, within the allowed time period, suffices to provide assurance of continued OPERABILITY of the diesel generator. If the inoperable diesel generator is restored to OPERABLE status prior to the determination of the impact on the other diesel generator, evaluation will continue of the possible common cause failure. This continued evaluation is no longer under the time constraint imposed while in Action Statement b or c.

The determination of the existence of a common cause failure that would affect the remaining diesel generator will require an evaluation of the current failure and the applicability to the remaining diesel generator. Examples that would not be a common cause failure include, but are not limited to:

1. Preplanned preventive maintenance or testing, or

2. An inoperable support system with no potential common mode failure for the remaining diesel generator, or

3. An independently testable component with no potential common mode failure for the remaining diesel generator.

If one Millstone Unit No. 2 diesel generator is inoperable in MODES 1 though 4, Action Statements b.3 and c.3 require verification that the steam-driven auxiliary feedwater pump is OPERABLE (MODES 1, 2, and 3 only). If the steam-driven auxiliary feedwater pump is inoperable, restoration within 2 hours is required or a plant shutdown to MODE 4 will be necessary. This requirement is intended to provide assurance that a loss of offsite power event will not result in degradation of the auxiliary feedwater safety function to below accident mitigation requirements during the period one of the diesel generators is inoperable. The term verify, as used in this context, means to administratively check by examining logs or other information to determine if the steam-driven auxiliary feedwater pump is out of service for maintenance or other reasons. It does not mean to perform Surveillance Requirements needed to demonstrate the OPERABILITY of the steam-driven auxiliary feedwater pump.

If one Millstone Unit No. 2 diesel generator is inoperable in MODES 1 through 4, a 72 hour allowed outage time is provided by Action Statement b.5 to allow restoration of the diesel generator, provided the requirements of Action Statements b.1, b.2, and b.3 are met. This allowed outage time can be extended to 14 days if the additional requirements contained in Action Statement b.4 are also met. Action Statement b.4 requires verification that the Millstone Unit No. 3 diesel generators are OPERABLE as required by the applicable Millstone Unit No. 3 Technical Specification (2 diesel generators in MODES 1 through 4, and 1 diesel generator in MODES 5 and 6) and the Millstone Unit No. 3 SBO diesel generator is available. The term verify, as used in this context, means to administratively check by examining logs or other information to determine if the required Millstone Unit No. 3 diesel generators and the Millstone Unit No. 3 SBO diesel generator are out of service for maintenance or other reasons. It does not mean to perform Surveillance Requirements needed to demonstrate the OPERABILITY of the required Millstone Unit No. 3 diesel generators or availability of the Millstone Unit No. 3 SBO diesel generator.

When using the 14 day allowed outage time provision and the Millstone Unit No. 3 diesel generator and/or the Millstone Unit No. 3 SBO diesel generator requirements are not met, 72 hours is allowed for restoration of the required Millstone Unit No. 3 diesel generators and the Millstone Unit No. 3 SBO diesel generator. If any of the required Millstone Unit No. 3 diesel generators and/or the Millstone Unit No. 3 SBO diesel generator are not restored within 72 hours, and one Millstone Unit No. 2 diesel generator is still inoperable, Millstone Unit No. 2 is required to shut down.

The 14 day allowed outage time for one inoperable Millstone Unit No. 2 diesel generator will allow performance of extended diesel generator maintenance and repair activities (e.g., diesel inspections) while the plant is operating. To minimize plant risk when using this extended allowed outage time the following additional requirements must be met:

1. The extended diesel generator maintenance outage shall not be scheduled when adverse or inclement weather conditions and/or unstable grid conditions are predicted or present.

2. The availability of the Millstone Unit No. 3 SBO DG shall be verified by test performance within the previous 30 days prior to allowing a Millstone Unit No. 2 diesel generator to be inoperable for greater than 72 hours.

3. All activity in the switchyard shall be closely monitored and controlled. No elective maintenance within the switchyard that could challenge offsite power availability shall be scheduled.

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In addition, the plant configuration shall be controlled during the diesel generator maintenance and repair activities to minimize plant risk consistent with a Configuration Risk Management Program, as required by 10 CFR 50.65(a)(4).

During performance of Surveillance Requirements 4.8.1.1.2.a.2 and 4.8.1.1.2.d.2, the diesel generators shall be started by using one of the following signals:

1. Manual;

2. Simulated loss of offsite power in conjunction with a safety injection actuation signal;

3. Simulated safety injection actuation signal alone; or

4. Simulated loss of power alone.

The diesel generator surveillance requirements specify that the diesel generators are started from a standby condition. Standby conditions for a diesel generator means the diesel engine coolant and oil are being circulated and temperature is being maintained consistent with manufacturer recommendations.

Surveillance Requirement (SR) 4.8.1.1.2.d.1 verifies that the diesel generators will reach $\geq$ 90% of rated speed and $\geq$ 97% of rated voltage within 15 seconds after a start signal is generated. Diesel generator voltage and speed will continue to increase to rated values, and then should stabilize. The time for voltage and speed (frequency) to stabilize is periodically monitored and the trend evaluated to identify degradation of governor or voltage regulator performance when testing in accordance with the requirements of SR 4.8.1.1.2.d.1.

INSERT F - Page B 3/4 8-1c (Page 1 of 13)

Diesel Generator Testing

An engine prelube period is allowed prior to engine start for all diesel generator testing. This will minimize wear on moving parts that do not get lubricated when the engine is not running.

When specified in the surveillance tests, the diesel generators must be started from a standby condition. Standby condition for a diesel generator means the diesel engine coolant and oil are being circulated and temperature is being maintained consistent with manufacturer recommendations.

Surveillance Requirement (SR) 4.8.1.1.2.a.2

This surveillance helps to ensure the availability of the standby electrical power supply to mitigate design basis accidents and transients and to maintain the unit in a safe shutdown condition. It verifies the ability of the diesel generator to start from a standby condition and achieve steady state voltage and frequency conditions. The time for voltage and speed (frequency) to stabilize is periodically monitored and the trend evaluated to identify degradation of governor or voltage regulator performance when testing in accordance with the requirements of this surveillance.

This surveillance is modified by two notes. Note 1 allows the use of a modified start based on recommendations of the manufacturer to reduce stress and wear on diesel engines. When using a modified start, the starting speed of the diesel generators is limited, warmup is limited to this lower speed, and the diesel generators are gradually accelerated to synchronous speed prior to loading. If a modified start is not used, the 15 second start requirement of SR 4.8.1.1.2.d applies. Note 2 states that SR 4.8.1.1.2.d, a more rigorous test, may be performed in lieu of 4.8.1.1.2.a.

During performance of SR 4.8.1.1.2.a.2, the diesel generators shall be started by using one of the following signals:

1. Manual;
2. Simulated loss of offsite power in conjunction with a safety injection actuation signal;
3. Simulated safety injection actuation signal alone; or
4. Simulated loss of power alone.

The 31 day frequency for SR 4.8.1.1.2.a.2 is consistent with standard industry guidelines.

INSERT F - Page B 3/4 8-1c (Page 2 of 13)

SR 4.8.1.1.2.a.3

This surveillance verifies that the diesel generators are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the diesel generator is connected to the offsite source. Although no power factor requirements are established by this surveillance, the diesel generator is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while 1.0 is an operational limitation.

This surveillance is modified by five Notes. Note 1 indicates that diesel engine runs for this surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit will not invalidate the test. Note 3 indicates that this surveillance should be conducted on only one diesel generator at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates a prerequisite requirement for performance of this surveillance. A successful diesel generator start must precede this test to credit satisfactory performance. Note 5 states that SR 4.8.1.1.2.d, a more rigorous test, may be performed in lieu of 4.8.1.1.2.a.

The 31 day frequency for SR 4.8.1.1.2.a.3 is consistent with standard industry guidelines.

SR 4.8.1.1 2.b.1

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the three fuel storage tanks once every 92 days eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during EDG operation. Water may come from any of several sources, including condensation, rain water, contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. This surveillance is for preventative maintenance. The presence of water does not necessarily represent failure of this surveillance provided the accumulated water is removed during performance of the surveillance.

INSERT F - Page B 3/4 8-1c (Page 3 of 13)

SR 4.8.1.1.2.b.2

This surveillance requires testing of the new and stored fuel oil in accordance with the Diesel Fuel Oil Testing Program, as defined in Section 6 of the Technical Specifications.

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows (more restrictive State of Connecticut and/or equipment limits may apply):

a. Sample the new fuel oil in accordance with ASTM D4057,
b. Verify in accordance with the tests specified in ASTM D975-81 that the sample has an absolute specific gravity at 60/60 °F of $\geq$ 0.83 and $\leq$ 0.89, or an API gravity at 60 °F of $\geq$ 27 ° and $\leq$ 39 °, a kinematic viscosity at 40 °C of $\geq$ 1.9 centistokes and $\leq$ 4.1 centistokes (alternatively, Saybolt viscosity, SUS at 100 °F of $\geq$ 32.6 but $\leq$ 40.1) and a flash point $\geq$ 125 °F, and
c. Verify that the new fuel oil has water and sediment $\leq$ 0.05% when tested in accordance with ASTM D1796-83.

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO concern since the fuel oil is not added to the storage tanks. Within 31 days following the initial new fuel oil sample, the fuel oil is analyzed to establish that the other properties specified in Table 1 of ASTM D975-81 are met for new fuel oil when tested in accordance with ASTM D975-81, except that the analysis for sulfur may be performed in accordance with ASTM D1552 or ASTM D2622. The 31 day period is acceptable because the fuel oil properties of interest, even if they were not within stated limits, would not have an immediate effect on DG operation.

This surveillance ensures the availability of high quality fuel oil for the diesel generators. Fuel oil degradation during long term storage shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn properly in a diesel engine. The particulate can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure. Particulate concentrations should be determined in accordance with ASTM D2276-78, Method A, every 92 days. This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing.

INSERT F - Page B 3/4 8-1c (Page 4 of 13)

The frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between surveillance intervals.

SR 4.8.1.1.2.c.2

Under accident and loss of offsite power conditions, loads are sequentially connected to the bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the diesel generators due to high motor starting currents. The load sequence time interval tolerances ensure that sufficient time exists for the diesel generator to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding Engineered Safety Features (ESF) equipment time delays are not violated.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

This surveillance is modified by a Note. The reason for the Note is that performing the surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the surveillance in MODE 1, 2, 3, or 4 is further amplified to allow the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed surveillance, a successful surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the surveillance is performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for this assessment.

INSERT F - Page B 3/4 8-1c (Page 5 of 13)

SR 4.8.1.1.2.c.3

Each diesel generator is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This surveillance demonstrates the diesel generator load response characteristics and capability to reject the largest single load without exceeding a predetermined frequency limit. The single largest load for each diesel generator is identified in the FSAR (Tables 8.3-2 and 8.3-3).

This surveillance may be accomplished by either:

a. Tripping the diesel generator output breaker with the diesel generator carrying greater than or equal to its associated single largest post-accident load while paralleled to offsite power or while solely supplying the bus; or

b. Tripping the equivalent of the single largest post-accident load with the diesel generator solely supplying the bus.

The time, voltage, and frequency tolerances specified in this surveillance are based on the response during load sequence intervals. The 2.2 seconds specified is equal to 40% of the 5.5 second load sequence interval associated with sequencing of the largest load (Safety Guide 9). The voltage and frequency specified are consistent with the design range of the equipment powered by the diesel generator. SR 4.8.1.1.2.c.3.a corresponds to the maximum frequency excursion, while SR 4.8.1.1.2.c.3.b and SR 4.8.1.1.2.c.3.c are steady state voltage and frequency values to which the system must recover following load rejection.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

INSERT F - Page B 3/4 8-1c (Page 6 of 13)

This surveillance is modified by a Note to ensure that the diesel generator is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of $\leq$ 0.9 lagging. This power factor is representative of the actual inductive loading a diesel generator would see under design basis accident conditions. Under certain conditions, however, the note allows the surveillance to be conducted at a power factor other than $\leq$ 0.9. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to $\leq$ 0.9 results in voltages on the emergency buses that are too high. Under these conditions, the power factor should be maintained as close as practicable to 0.9 while still maintaining acceptable voltage limits on the emergency buses. In other circumstances, the grid voltage may be such that the diesel generator excitation levels needed to obtain a power factor of 0.9 may not cause unacceptable voltages on the emergency buses, but the excitation levels are in excess of those recommended for the diesel generator. In such cases, the power factor shall be maintained as close as practicable to 0.9 lagging without exceeding the diesel generator excitation limits.

SR 4.8.1.1.2.c.4

This surveillance demonstrates the diesel generator capability to reject a rated load without overspeed tripping. A diesel generator rated load rejection may occur because of a system fault or inadvertent breaker tripping. This surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the diesel generator experiences following a rated load rejection and verifies that the diesel generator will not trip upon loss of the load. While the diesel generator is not expected to experience this transient during an event, this response ensures that the diesel generator is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

This surveillance is performed by tripping the diesel generator output breaker with the diesel generator carrying the required load while paralleled to offsite power.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

INSERT F - Page B 3/4 8-1c (Page 7 of 13)

This surveillance is modified by a Note to ensure that the diesel generator is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of $\leq$ 0.9 lagging. This power factor is representative of the actual inductive loading a diesel generator would see under design basis accident conditions. Under certain conditions, however, the note allows the surveillance to be conducted at a power factor other than $\leq$ 0.9. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to $\leq$ 0.9 results in voltages on the emergency buses that are too high. Under these conditions, the power factor should be maintained as close as practicable to 0.9 while still maintaining acceptable voltage limits on the emergency buses. In other circumstances, the grid voltage may be such that the diesel generator excitation levels needed to obtain a power factor of 0.9 may not cause unacceptable voltages on the emergency buses, but the excitation levels are in excess of those recommended for the diesel generator. In such cases, the power factor shall be maintained as close as practicable to 0.9 lagging without exceeding the diesel generator excitation limits.

SR 4.8.1.1.2.c.5

In the event of a design basis accident coincident with a loss of offsite power, the diesel generators are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded. This surveillance demonstrates the diesel generator operation during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the diesel generator. It further demonstrates the capability of the diesel generator to automatically achieve the required voltage and speed (frequency) within the specified time. The diesel generator auto-start time of 15 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved. The requirement to verify the connection of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the diesel generator loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the diesel generator system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

INSERT F - Page B 3/4 8-1c (Page 8 of 13)

For the purpose of this testing, the diesel generators must be started from a standby condition. Standby condition for a diesel generator means the diesel engine coolant and oil are being circulated and temperature is being maintained consistent with manufacturer recommendations.

This surveillance is modified by a Note. The reason for the Note is that performing the surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the surveillance in MODE 1, 2, 3, or 4 is further amplified to allow portions of the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial surveillance, a successful partial surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for the assessment.

SR 4.8.1.1.2.c.6

This surveillance demonstrates that diesel generator noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation test signal. During this time, the critical protective functions (engine overspeed, generator differential current, low lube oil pressure [2 out of 3 logic], and voltage restraint overcurrent) remain available to trip the diesel generator and/or output breaker to avert substantial damage to the diesel generator unit. An EDG Emergency Start Signal (Loss of Power signal or SIAS) bypasses the EDG mechanical trips in the EDG control circuit, except engine overspeed, and switches the low lube oil trip to a 2 of 3 coincidence. The loss of power to the emergency bus, based on supply breaker position (A302, A304, and A505 for Bus 24C; A410, A411, and A505 for Bus 24D), bypasses the EDG electrical trips in the breaker control circuit except generator differential current and voltage restraint overcurrent. The noncritical trips are bypassed during design basis accidents and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The diesel generator availability to mitigate the design basis accident is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the diesel generator.

INSERT F - Page B 3/4 8-1c (Page 9 of 13)

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

This surveillance is modified by a Note. The reason for the Note is that performing the surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the surveillance in MODE 1, 2, 3, or 4 is further amplified to allow portions of the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial surveillance, a successful partial surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for the assessment.

SR 4.8.1.1.2.c.7

This surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the diesel generator. It further demonstrates the capability of the diesel generator to automatically achieve the required voltage and speed (frequency) within the specified time. The diesel generator auto-start time of 15 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved. The requirement to verify the connection and power supply of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the diesel generator loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the diesel generator system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

INSERT F - Page B 3/4 8-1c (Page 10 of 13)

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

This surveillance is modified by two Notes. The reason for Note 1 is that performing the surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the surveillance in MODE 1, 2, 3, or 4 is further amplified to allow portions of the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial surveillance, a successful partial surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for the assessment.

Surveillance Note 2 specifies that the start of the diesel generator from a standby condition is not required if this surveillance is performed in conjunction with SR 4.8.1.1.2.c.5. Since this test is normally performed in conjunction with SR 4.8.1.1.2.c.5, the proposed note will exclude the requirement to start from a standby condition to minimize the time to perform this test. This will reduce shutdown risk since plant restoration, and subsequent equipment availability will occur sooner. In addition, it is not necessary to test the ability of the EDG to auto start from a standby condition for this test since that ability will have already been verified by SR 4.8.1.1.2.c.5, which will have just been performed if the note's exclusion is to be utilized. If this test is to be performed by itself, the EDG is required to start from a standby condition.

INSERT F - Page B 3/4 8-1c (Page 11 of 13)

SR 4.8.1.1.2.c.8

This surveillance demonstrates that the diesel generator automatically starts and achieves the required voltage and speed (frequency) within the specified time (15 seconds) from the design basis actuation signal (Safety Injection Actuation Signal) and operates for $\geq$ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. Since the specified actuation signal (ESF signal without loss of offsite power) will not cause the emergency bus loads to be shed, and will not cause the diesel generator to load, the surveillance ensures that permanently connected loads and autoconnected loads remain energized from the offsite electrical power system (Unit 2 RSST or NSST, or Unit 3 RSST or NSST). In certain circumstances, many of these loads cannot actually be connected without undue hardship or potential for undesired operation. It is not necessary to verify all autoconnected loads remain connected. A representative sample is acceptable.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

For the purpose of this testing, the diesel generators must be started from a standby condition. Standby condition for a diesel generator means the diesel engine coolant and oil are being circulated and temperature is being maintained consistent with manufacturer recommendations.

SR 4.8.1.1.2.c.9

This surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from a normal surveillance, and achieve the required voltage and speed within 15 seconds. The 15 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

INSERT F - Page B 3/4 8-1c (Page 12 of 13)

This surveillance is modified by a Note. The Note ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the diesel generator. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain diesel generator OPERABILITY. The requirement that the diesel has operated for at least 1 hour at rated load conditions prior to performance of this surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test.

SRs 4.8.1.1.2.d.1 and 4.8.1.1.2.d.2

SR 4.8.1.1.2.d.1 verifies that, at a 184 day frequency, the diesel generator starts from standby conditions and achieves required voltage and speed (frequency) within 15 seconds. The 15 second start requirement supports the assumptions of the design basis LOCA analysis in the FSAR. Diesel generator voltage and speed will continue to increase to rated values, and then should stabilize. SR 4.8.1.1.2.d.2 verifies the ability of the diesel generator to achieve steady state voltage and frequency conditions. The time for voltage and speed (frequency) to stabilize is periodically monitored and the trend evaluated to identify degradation of governor or voltage regulator performance when testing in accordance with the requirements of this surveillance.

The 184 day frequency for this surveillance is a reduction in cold testing consistent with Generic Letter 84-15. This frequency provides adequate assurance of diesel generator OPERABILITY, while minimizing degradation resulting from testing. In addition, SR 4.8.1.1.2.d may be performed in lieu of 4.8.1.1.2.a.

For the purpose of this testing, the diesel generators must be started from a standby condition. Standby condition for a diesel generator means the diesel engine coolant and oil are being circulated and temperature is being maintained consistent with manufacturer recommendations.

During performance of SR 4.8.1.1.2.d.1, the diesel generators shall be started by using one of the following signals:

1. Manual;
2. Simulated loss of offsite power in conjunction with a safety injection actuation signal;
3. Simulated safety injection actuation signal alone; or
4. Simulated loss of power alone.

INSERT F - Page B 3/4 8-1c (Page 13 of 13)

SR 4.8.1.1.2.d.3

This surveillance verifies that the diesel generators are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the diesel generator is connected to the offsite source. Although no power factor requirements are established by this surveillance, the diesel generator is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while 1.0 is an operational limitation.

The 184 day frequency for this surveillance is a reduction in cold testing consistent with Generic Letter 84-15. This frequency provides adequate assurance of diesel generator OPERABILITY, while minimizing degradation resulting from testing.

This SR is modified by four Notes. Note 1 indicates that diesel engine runs for this surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit will not invalidate the test. Note 3 indicates that this surveillance should be conducted on only one diesel generator at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates a prerequisite requirement for performance of this surveillance. A successful diesel generator start must precede this test to credit satisfactory performance.

NO CHANGE FOR INFORMATION ONLY January 4, 2002

The OPERABILITY of the minimum specified A.C.and D.C. power sources and associated distribution systems during shutdown and refueling ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the facility status. If the required power sources or distribution systems are not OPERABLE in MODES 5 and 6, operations involving CORE ALTERATIONS, positive reactivity changes, or movement of irradiated fuel assemblies are required to be suspended. The required action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory provided the boron concentration of the makeup water source is greater than or equal to the boron concentration for the required SHUTDOWN MARGIN. In addition, suspension of these activities does not preclude completion of actions to establish a safe conservative plant condition.

The non-safety grade 125V D.C. Turbine Battery is required for accident mitigation for a main steam line break within containment with a coincident loss of a vital D.C. bus. The Turbine Battery provides the alternate source of power for Inverters 1 & 2 respectively via non-safety grade Inverters 5 & 6. For the loss of a D.C. event with a coincident steam line break within containment, the feedwater regulating valves are required to close to ensure containment design pressure is not exceeded.

The feedwater regulating valves require power to close. On loss of a vital D.C. bus, the alternate source of power to the vital A.C. bus via the Turbine Battery ensures power is available to the affected feedwater regulating valve such that the valve will isolate feed flow into the faulted generator. The Turbine Battery is considered inoperable when bus voltage is less than 125 volts D.C, thereby ensuring adequate capacity for isolation functions via the feedwater regulating valves during the onset of a steam line break.

The Turbine Battery Charger is not required to be included in Technical Specifications even though the Turbine Battery is needed to power backup Inverters 5 & 6 for a main steam line break inside containment coincident with a loss of a Class 1E D.C. bus. This is due to the fact that feedwater isolation occurs within seconds from the onset of the event.

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6.24 Diesel Fuel Oil Test Program

A diesel fuel oil testing program to implement required testing of both new fuel oil and stored fuel oil shall be established. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

a. Acceptability of new fuel oil for use prior to addition to storage tanks by determining that the fuel oil has:

    1. An API gravity or an absolute specific gravity within limits,

    2. A flash point and kinematic viscosity within limits for ASTM 2D fuel oil, and

    3. Water and sediment $\leq$ 0.05%.

b. Within 31 days following addition of the new fuel oil to storage tanks, verify that the properties of the new fuel oil, other than those addressed in a., above, are within limits for ASTM 2D fuel oil, and

c. Total particulate concentration of the fuel oil is $\leq$ 10 mg/l when tested every 92 days in accordance with ASTM D-2276-78, Method A.

The provisions of Surveillance Requirements 4.0.2 and 4.0.3 are applicable to the Diesel Fuel Oil Test Program test frequencies.

Docket No. 50-336
B18651

Attachment 4

Millstone Nuclear Power Station, Unit No. 2

License Basis Document Change Request 2-9-02
Emergency Diesel Generator Testing Requirements
Retyped Pages

ACTION (Continued)

Inoperable Equipment	Required Action
e. Two diesel generators	e.1 Perform Surveillance Requirement 4.8.1.1.1 for the offsite circuits within 1 hour and at least once per 8 hours thereafter. AND e.2 Restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours. AND e.3 Following restoration of one diesel generator restore remaining inoperable diesel generator to OPERABLE status following the time requirements of Action Statement b above based on the initial loss of the remaining inoperable diesel generator.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Verify correct breaker alignment and indicated power available for each required offsite circuit at least once per 24 hours.

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.2 Each required diesel generator shall be demonstrated OPERABLE:*

a. At least once per 31 days by:

1. Verifying the fuel level in the fuel oil supply tank,

2.

NOTES
1. A modified diesel generator start involving idling and gradual acceleration to synchronous speed may be used as recommended by the manufacturer. When modified start procedures are not used, the requirements of SR 4.8.1.1.2.d.1 must be met.
2. Performance of SR 4.8.1.1.2.d satisfies this Surveillance Requirement.

Verifying the diesel generator starts from standby conditions and achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.

3.

NOTES
1. Diesel generator loading may include gradual loading as recommended by the manufacturer.
2. Momentary transients outside the load range do not invalidate this test.
3. This test shall be conducted on only one diesel generator at a time.
4. This test shall be preceded by and immediately follow without shutdown a successful performance of SR 4.8.1.1.2.a.2, or SRs 4.8.1.1.2.d.1 and 4.8.1.1.2.d.2.
5. Performance of SR 4.8.1.1.2.d satisfies this Surveillance Requirement.

Verifying the diesel generator is synchronized and loaded, and operates for $\geq$ 60 minutes at a load $\geq$ 2475 kW and $\leq$ 2750 kW.

*All diesel starts may be preceded by an engine prelube period.

SURVEILLANCE REQUIREMENTS (Continued)

b. The diesel fuel oil supply shall be checked by:

1. Checking for and removing accumulated water from each fuel oil storage tank at least once per 92 days.

2. Verifying fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program in accordance with the Diesel Fuel Oil Testing Program.

c. At least once per 18 months by:

1. Deleted

2. NOTE

This surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

Verifying that the automatic time delay sequencer is OPERABLE with the following settings:

Sequence Step	Time After Closing of Diesel Generator Output Breaker (Seconds)	
	Minimum	Maximum
1 (T_1)	1.5	2.2
2 (T_2)	T_1 + 5.5	8.4
3 (T_3)	T_2 + 5.5	14.6
4 (T_4)	T_3 + 5.5	20.8

SURVEILLANCE REQUIREMENTS (Continued)

3.

NOTE
If performed with the diesel generator synchronized with offsite power, this surveillance shall be performed at a power factor $\leq$ 0.9 lagging. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.

Verifying the diesel generator capability to reject a load greater than or equal to its associated single largest post-accident load and:

a. Following load rejection, the frequency is $\leq$ 63 Hz,

b. Within 2.2 seconds following load rejection, the voltage is $\geq$ 3740 V and $\leq$ 4580 V, and

c. Within 2.2 seconds following load rejection, the frequency is $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.

4.

NOTE
If performed with the diesel generator synchronized with offsite power, this surveillance shall be performed at a power factor $\leq$ 0.9 lagging. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.

Veriyfing the diesel generator does not trip following a load rejection of $\geq$ 2475 kW and $\leq$ 2750 kW.

SURVEILLANCE REQUIREMENTS (Continued)

5. NOTE

This surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

Verifying on an actual or simulated loss of offsite power in conjunction with an actual or simulated Engineered Safety Feature actuation signal:

a. De-energization of emergency buses,

b. Load shedding from emergency buses,

c. Diesel generator auto-starts from standby condition, and:

1. energizes permanently connected loads in $\leq$ 15 seconds,
2. energizes auto-connected loads through the load sequencer,
3. achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V,
4. achieves steady state frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz and,
5. energizes permanently connected and auto-connected loads for $\geq$ 5 minutes.

6. NOTE

This surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

Verifying diesel generator automatic trips are bypassed on an actual or simulated loss of offsite power in conjunction with an actual or simulated Engineered Safety Feature actuation signal except:

a. Engine overspeed,

b. Generator differential current,

c. Voltage restraint overcurrent, and

d. Low lube oil pressure (switches to 2 out of 3 logic).

SURVEILLANCE REQUIREMENTS (Continued)

7.

NOTES

1. This surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

2. The start of the diesel generator from a standby condition is not required if this surveillance is performed in conjunction with SR 4.8.1.1.2.c.5.

Verifying on an actual or simulated loss of offsite power signal:

a. De-energization of emergency buses,

b. Load shedding from emergency buses,

c. Diesel generator auto-starts from standby condition and:

1. energizes permanently connected loads in $\leq$ 15 seconds,

2. energizes auto-connected loads through the load sequencer,

3. achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V,

4. achieves steady state frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz and,

5. energizes permanently connected and auto-connected loads for $\geq$ 5 minutes.

SURVEILLANCE REQUIREMENTS (Continued)

8. Verifying on an actual or simulated Engineered Safety Feature actuation signal the diesel generator auto-starts from a standby condition and:

   a. Achieves $\geq$ 90% of rated speed and $\geq$ 97% of rated voltage in $\leq$ 15 seconds,

   b. Achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V,

   c. Achieves steady state frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz,

   d. Operates for $\geq$ 5 minutes,

   e. Permanently connected loads remain energized from the offsite power system, and

   f. Auto-connected loads remain energized from the offsite power system as appropriate for plant conditions.

9. NOTE

   This surveillance shall be performed within 5 minutes of shutting down the diesel generator after the diesel generator has operated $\geq$ 1 hour loaded $\geq$ 2475 kW and $\leq$ 2750 kW. Momentary transients outside the load range do not invalidate this test.

   Verifying the diesel generator starts and:

   a. Accelerates to $\geq$ 90% of rated speed and $\geq$ 97% of rated voltage in $\leq$ 15 seconds, and

   b. Achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.

SURVEILLANCE REQUIREMENT (Continued)

d. At least once per 184 days by:

1. Verifying the diesel starts from standby conditions and accelerates to $\geq$ 90% of rated speed and to $\geq$ 97% of rated voltage within 15 seconds after the start signal.

2. Verifying the diesel generator achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.

3. Verifying the diesel generator is synchronized and loaded, and operates for $\geq$ 60 minutes at a load $\geq$ 2475 kW and $\leq$ 2750 kW.

NOTES

1. Diesel generator loading may include gradual loading as recommended by the manufacturer.

2. Momentary transients outside the load range do not invalidate this test.

3. This test shall be conducted on only one diesel generator at a time.

4. This test shall be preceded by and immediately follow without shutdown a successful performance of SRs 4.8.1.1.2.d.1 and 4.8.1.1.2.d.2, or SR 4.8.1.1.2.a.2.

ELECTRICAL POWER SYSTEMS

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 a fuel oil supply tank containing a minimum of 12,000 gallons of fuel.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes or movement of irradiated fuel assemblies.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE per Surveillance Requirements 4.8.1.1.1 and 4.8.1.1.2, except for testing pursuant to Surveillance Requirements 4.8.1.1.2.a.3, 4.8.1.1.2.c.2, 4.8.1.1.2.c.5, 4.8.1.1.2.c.6, 4.8.1.1.2.c.7, and 4.8.1.1.2.d.3.

The 14 day allowed outage time for one inoperable Millstone Unit No. 2 diesel generator will allow performance of extended diesel generator maintenance and repair activities (e.g., diesel inspections) while the plant is operating. To minimize plant risk when using this extended allowed outage time the following additional requirements must be met:

1. The extended diesel generator maintenance outage shall not be scheduled when adverse or inclement weather conditions and/or unstable grid conditions are predicted or present.

2. The availability of the Millstone Unit No. 3 SBO DG shall be verified by test performance within the previous 30 days prior to allowing a Millstone Unit No. 2 diesel generator to be inoperable for greater than 72 hours.

3. All activity in the switchyard shall be closely monitored and controlled. No elective maintenance within the switchyard that could challenge offsite power availability shall be scheduled.

In addition, the plant configuration shall be controlled during the diesel generator maintenance and repair activities to minimize plant risk consistent with a Configuration Risk Management Program, as required by 10 CFR 50.65(a)(4).

Diesel Generator Testing

An engine prelube period is allowed prior to engine start for all diesel generator testing. This will minimize wear on moving parts that do not get lubricated when the engine is not running.

When specified in the surveillance tests, the diesel generators must be started from a standby condition. Standby condition for a diesel generator means the diesel engine coolant and oil are being circulated and temperature is being maintained consistent with manufacturer recommendations.

SR 4.8.1.1.2.a.2

This surveillance helps to ensure the availability of the standby electrical power supply to mitigate design basis accidents and transients and to maintain the unit in a safe shutdown condition. It verifies the ability of the diesel generator to start from a standby condition and achieve steady state voltage and frequency conditions. The time for voltage and speed (frequency) to stabilize is periodically monitored and the trend evaluated to identify degradation of governor or voltage regulator performance when testing in accordance with the requirements of this surveillance.

This surveillance is modified by two notes. Note 1 allows the use of a modified start based on recommendations of the manufacturer to reduce stress and wear on diesel engines. When using a modified start, the starting speed of the diesel generators is limited, warmup is limited to this lower speed, and the diesel generators are gradually accelerated to synchronous speed prior to loading. If a modified start is not used, the 15 second start requirement of SR 4.8.1.1.2.d applies. Note 2 states that SR 4.8.1.1.2.d, a more rigorous test, may be performed in lieu of 4.8.1.1.2.a.

During performance of SR 4.8.1.1.2.a.2, the diesel generator shall be started by using one of the following signals:

1. Manual;
2. Simulated loss of offsite power in conjunction with a safety injection actuation signal;
3. Simulated safety injection actuation signal alone; or
4. Simulated loss of power alone.

The 31 day frequency for SR 4.8.1.1.2.a.2 is consistent with standard industry guidelines.

SR 4.8.1.1.2.a.3

This surveillance verifies that the diesel generators are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the diesel generator is connected to the offsite source. Although no power factor requirements are established by this surveillance, the diesel generator is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while 1.0 is an operational limitation.

This surveillance is modified by five Notes. Note 1 indicates that diesel engine runs for this surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit will not invalidate the test. Note 3 indicates that this surveillance should be conducted on only one diesel generator at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates a prerequisite requirement for performance of this surveillance. A successful diesel generator start must precede this test to credit satisfactory performance. Note 5 states that SR 4.8.1.1.2.d, a more rigorous test, may be performed in lieu of 4.8.1.1.2.a.

The 31 day frequency for SR 4.8.1.1.2.a.3 is consistent with standard industry guidelines.

BASES

SR 4.8.1.1.2.b.1

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the three fuel storage tanks once every 92 days eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during EDG operation. Water may come from any of several sources, including condensation, rain water, contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. This surveillance is for preventative maintenance. The presence of water does not necessarily represent failure of this surveillance provided the accumulated water is removed during performance of the surveillance.

SR 4.8.1.1.2.b.2

This surveillance requires testing of the new and stored fuel oil in accordance with the Diesel Fuel Oil Testing Program, as defined in Section 6 of the Technical Specifications.

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows (more restrictive State of Connecticut and/or equipment limits may apply):

a. Sample the new fuel oil in accordance with ASTM D4057,

b. Verify in accordance with the tests specified in ASTM D975-81 that the sample has an absolute specific gravity at 60/60°F of $\geq$ 0.83 and $\leq$ 0.89, or an API gravity at 60°F of $\geq$ 27° and $\leq$ 39°, a kinematic viscosity at 40°C of $\geq$ 1.9 centistokes and $\leq$ 4.1 centistokes (alternatively, Saybolt viscosity, SUS at 100°F of $\geq$ 32.6 but $\leq$ 40.1) and a flash point $\geq$ 125°F, and

c. Verify that the new fuel oil has water and sediment $\leq$ 0.05% when tested in accordance with ASTM D1796-83.

BASES

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO concern since the fuel oil is not added to the storage tanks. Within 31 days following the initial new fuel oil sample, the fuel oil is analyzed to establish that the other properties specified in Table 1 of ASTM D975-81 are met for new fuel oil when tested in accordance with ASTM D975-81, except that the analysis for sulfur may be performed in accordance with ASTM D1552 or ASTM D2622. The 31 day period is acceptable because the fuel oil properties of interest, even if they were not within stated limits, would not have an immediate effect on DG operation.

This surveillance ensures the availability of high quality fuel oil for the diesel generators. Fuel oil degradation during long term storage shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn properly in a diesel engine. The particulate can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure. Particulate concentrations should be determined in accordance with ASTM D2276-78, Method A, every 92 days. This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing.

The frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between surveillance intervals.

SR 4.8.1.1.2.c.2

Under accident and loss of offsite power conditions, loads are sequentially connected to the bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the diesel generators due to high motor starting currents. The load sequence time interval tolerances ensure that sufficient time exists for the diesel generator to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding Engineered Safety Features (ESF) equipment time delays are not violated.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

BASES

This surveillance is modified by a Note. The reason for the Note is that performing the surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the surveillance in MODE 1, 2, 3, or 4 is further amplified to allow the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed surveillance, a successful surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the surveillance is performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for this assessment.

SR 4.8.1.1.2.c.3

Each diesel generator is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This surveillance demonstrates the diesel generator load response characteristics and capability to reject the largest single load without exceeding a predetermined frequency limit. The single largest load for each diesel generator is identified in the FSAR (Tables 8.3-2 and 8.3-3).

This surveillance may be accomplished by either:

a. Tripping the diesel generator output breaker with the diesel generator carrying greater than or equal to its associated single largest post-accident load while paralleled to offsite power or while solely supplying the bus; or

b. Tripping the equivalent of the single largest post-accident load with the diesel generator solely supplying the bus.

The time, voltage, and frequency tolerances specified in this surveillance are based on the response during load sequence intervals. The 2.2 seconds specified is equal to 40% of the 5.5 second load sequence interval associated with sequencing of the largest load (Safety Guide 9). The voltage and frequency specified are consistent with the design range of the equipment powered by the diesel generator. SR 4.8.1.1.2.c.3.a corresponds to the maximum frequency excursion, while SR 4.8.1.1.2.c.3.b and SR 4.8.1.1.2.c.3.c are steady state voltage and frequency values to which the system must recover following load rejection.

BASES

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

This surveillance is modified by a Note to ensure that the diesel generator is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of $\leq$ 0.9 lagging. This power factor is representative of the actual inductive loading a diesel generator would see under design basis accident conditions. Under certain conditions, however, the note allows the surveillance to be conducted at a power factor other than $\leq$ 0.9. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to $\leq$ 0.9 results in voltages on the emergency buses that are too high. Under these conditions, the power factor should be maintained as close as practicable to 0.9 while still maintaining acceptable voltage limits on the emergency buses. In other circumstances, the grid voltage may be such that the diesel generator excitation levels needed to obtain a power factor of 0.9 may not cause unacceptable voltages on the emergency buses, but the excitation levels are in excess of those recommended for the diesel generator. In such cases, the power factor shall be maintained as close as practicable to 0.9 lagging without exceeding the diesel generator excitation limits.

SR 4.8.1.1.2.c.4

This surveillance demonstrates the diesel generator capability to reject a rated load without overspeed tripping. A diesel generator rated load rejection may occur because of a system fault or inadvertent breaker tripping. This surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the diesel generator experiences following a rated load rejection and verifies that the diesel generator will not trip upon loss of the load. While the diesel generator is not expected to experience this transient during an event, this response ensures that the diesel generator is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

This surveillance is performed by tripping the diesel generator output breaker with the diesel generator carrying the required load while paralleled to offsite power.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

BASES

This surveillance is modified by a Note to ensure that the diesel generator is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of $\leq$ 0.9 lagging. This power factor is representative of the actual inductive loading a diesel generator would see under design basis accident conditions. Under certain conditions, however, the note allows the surveillance to be conducted at a power factor other than $\leq$ 0.9. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to $\leq$ 0.9 results in voltages on the emergency buses that are too high. Under these conditions, the power factor should be maintained as close as practicable to 0.9 while still maintaining acceptable voltage limits on the emergency buses. In other circumstances, the grid voltage may be such that the diesel generator excitation levels needed to obtain a power factor of 0.9 may not cause unacceptable voltages on the emergency buses, but the excitation levels are in excess of those recommended for the diesel generator. In such cases, the power factor shall be maintained as close as practicable to 0.9 lagging without exceeding the diesel generator excitation limits.

SR 4.8.1.1.2.c.5

In the event of a design basis accident coincident with a loss of offsite power, the diesel generators are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded. This surveillance demonstrates the diesel generator operation during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the diesel generator. It further demonstrates the capability of the diesel generator to automatically achieve the required voltage and speed (frequency) within the specified time. The diesel generator auto-start time of 15 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved. The requirement to verify the connection of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the diesel generator loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the diesel generator system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when

performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

For the purpose of this testing, the diesel generators must be started from a standby condition. Standby condition for a diesel generator means the diesel engine coolant and oil are being circulated and temperature is being maintained consistent with manufacturer recommendations.

This surveillance is modified by a Note. The reason for the Note is that performing the surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the surveillance in MODE 1, 2, 3, or 4 is further amplified to allow portions of the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial surveillance, a successful partial surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for the assessment.

SR 4.8.1.1.2.c.6

This surveillance demonstrates that diesel generator noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation test signal. During this time, the critical protective functions (engine overspeed, generator differential current, low lube oil pressure [2 out of 3 logic], and voltage restraint overcurrent) remain available to trip the diesel generator and/or output breaker to avert substantial damage to the diesel generator unit. An EDG Emergency Start Signal (Loss of Power signal or SIAS) bypasses the EDG mechanical trips in the EDG control circuit, except engine overspeed, and switches the low lube oil trip to a 2 of 3 coincidence. The loss of power to the emergency bus, based on supply breaker position (A302, A304, and A505 for Bus 24C; A410, A411, and A505 for Bus 24D), bypasses the EDG electrical trips in the breaker control circuit except generator differential current and voltage restraint overcurrent. The noncritical trips are bypassed during design basis accidents and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The diesel generator availability to mitigate the design basis accident is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the diesel generator.

BASES

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

This surveillance is modified by a Note. The reason for the Note is that performing the surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the surveillance in MODE 1, 2, 3, or 4 is further amplified to allow portions of the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial surveillance, a successful partial surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for the assessment.

SR 4.8.1.1.2.c.7

This surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the diesel generator. It further demonstrates the capability of the diesel generator to automatically achieve the required voltage and speed (frequency) within the specified time. The diesel generator auto-start time of 15 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved. The requirement to verify the connection and power supply of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the diesel generator loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the diesel generator system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is

intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

This surveillance is modified by two Notes. The reason for Note 1 is that performing the surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the surveillance in MODE 1, 2, 3, or 4 is further amplified to allow portions of the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial surveillance, a successful partial surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for the assessment.

Surveillance Note 2 specifies that the start of the diesel generator from a standby condition is not required if this surveillance is performed in conjunction with SR 4.8.1.1.2.c.5. Since this test is normally performed in conjunction with SR 4.8.1.1.2.c.5, the proposed note will exclude the requirement to start from a standby condition to minimize the time to perform this test. This will reduce shutdown risk since plant restoration, and subsequent equipment availability will occur sooner. In addition, it is not necessary to test the ability of the EDG to auto start from a standby condition for this test since that ability will have already been verified by SR 4.8.1.1.2.c.5, which will have just been performed if the note's exclusion is to be utilized. If this test is to be performed by itself, the EDG is required to start from a standby condition.

SR 4.8.1.1.2.c.8

This surveillance demonstrates that the diesel generator automatically starts and achieves the required voltage and speed (frequency) within the specified time (15 seconds) from the design basis actuation signal (Safety Injection Actuation Signal) and operates for $\geq$ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. Since the specified actuation signal (ESF signal without loss of offsite power) will not cause the emergency bus loads to be shed, and will not cause the diesel generator to load, the surveillance ensures that permanently connected loads and autoconnected loads remain energized from the offsite electrical power system (Unit 2 RSST or NSST, or Unit 3 RSST or NSST). In certain circumstances, many of these loads cannot actually be connected without undue hardship or potential for undesired

operation. It is not necessary to verify all autoconnected loads remain connected. A representative sample is acceptable.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

For the purpose of this testing, the diesel generators must be started from a standby condition. Standby condition for a diesel generator means the diesel engine coolant and oil are being circulated and temperature is being maintained consistent with manufacturer recommendations.

SR 4.8.1.1.2.c.9

This surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from a normal surveillance, and achieve the required voltage and speed within 15 seconds. The 15 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA.

The 18 month frequency is based on engineering judgment, taking into consideration unit conditions required to perform the surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the surveillance when performed at the 18 month frequency. Therefore, the frequency is acceptable from a reliability standpoint.

This surveillance is modified by a Note. The Note ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the diesel generator. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain diesel generator OPERABILITY. The requirement that the diesel has operated for at least 1 hour at rated load conditions prior to performance of this surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test.

BASES

SRs 4.8.1.1.2.d.1 and 4.8.1.1.2.d.2

SR 4.8.1.1.2.d.1 verifies that, at a 184 day frequency, the diesel generator starts from standby conditions and achieves required voltage and speed (frequency) within 15 seconds. The 15 second start requirement supports the assumptions of the design basis LOCA analysis in the FSAR. Diesel generator voltage and speed will continue to increase to rated values, and then should stabilize. SR 4.8.1.1.2.d.2 verifies the ability of the diesel generator to achieve steady state voltage and frequency conditions. The time for voltage and speed (frequency) to stabilize is periodically monitored and the trend evaluated to identify degradation of governor or voltage regulator performance when testing in accordance with the requirements of this surveillance.

The 184 day frequency for this surveillance is a reduction in cold testing consistent with Generic Letter 84-15. This frequency provides adequate assurance of diesel generator OPERABILITY, while minimizing degradation resulting from testing. In addition, SR 4.8.1.1.2.d may be performed in lieu of 4.8.1.1.2.a.

For the purpose of this testing, the diesel generators must be started from a standby condition. Standby condition for a diesel generator means the diesel engine coolant and oil are being circulated and temperature is being maintained consistent with manufacturer recommendations.

During performance of SR 4.8.1.1.2.d.1, the diesel generators shall be started by using one of the following signals:

1. Manual;
2. Simulated loss of offsite power in conjunction with a safety injection actuation signal;
3. Simulated safety injection actuation signal alone; or
4. Simulated loss of power alone.

SR 4.8.1.1.2.d.3

This surveillance verifies that the diesel generators are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the diesel generator is connected to the offsite source. Although no power factor requirements are established by this surveillance, the diesel generator is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while 1.0 is an operational limitation.

The 184 day frequency for this surveillance is a reduction in cold testing consistent with Generic Letter 84-15. This frequency provides adequate assurance of diesel generator OPERABILITY, while minimizing degradation resulting from testing.

BASES

This SR is modified by four Notes. Note 1 indicates that diesel engine runs for this surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit will not invalidate the test. Note 3 indicates that this surveillance should be conducted on only one diesel generator at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates a prerequisite requirement for performance of this surveillance. A successful diesel generator start must precede this test to credit satisfactory performance.

The OPERABILITY of the minimum specified A.C.and D.C. power sources and associated distribution systems during shutdown and refueling ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the facility status. If the required power sources or distribution systems are not OPERABLE in MODES 5 and 6, operations involving CORE ALTERATIONS, positive reactivity changes, or movement of irradiated fuel assemblies are required to be suspended. The required action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory provided the boron concentration of the makeup water source is greater than or equal to the boron concentration for the required SHUTDOWN MARGIN. In addition, suspension of these activities does not preclude completion of actions to establish a safe conservative plant condition.

The non-safety grade 125V D.C. Turbine Battery is required for accident mitigation for a main steam line break within containment with a coincident loss of a vital D.C. bus. The Turbine Battery provides the alternate source of power for Inverters 1 & 2 respectively via non-safety grade Inverters 5 & 6. For the loss of a D.C. event with a coincident steam line break within containment, the feedwater regulating valves are required to close to ensure containment design pressure is not exceeded.

6.24 Diesel Fuel Oil Test Program

A diesel fuel oil testing program to implement required testing of both new fuel oil and stored fuel oil shall be established. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

a. Acceptability of new fuel oil for use prior to addition to storage tanks by determining that the fuel oil has:

   1. An API gravity or an absolute specific gravity within limits,

   2. A flash point and kinematic viscosity within limits for ASTM 2D fuel oil, and

   3. Water and sediment $\leq$ 0.05%.

b. Within 31 days following addition of the new fuel oil to storage tanks, verify that the properities of the new fuel oil, other than those addressed in a., above, are within limits for ASTM 2D fuel oil, and

c. Total particulate concentration of the fuel oil is $\leq$ 10 mg/l when tested every 92 days in accordance with ASTM D-2276-78, Method A.

The provisions of Surveillance Requirements 4.0.2 and 4.0.3 are applicable to the Diesel Fuel Oil Test Program test frequencies.