

November 27, 2006

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Limerick Generating Station, Units 1 and 2  
Facility Operating License Nos. NPF-39 and NPF-85  
NRC Docket Nos. 50-352 and 50-353

**SUBJECT:** License Amendment Request  
Proposed Changes to Emergency Diesel Generator Testing Requirements

Pursuant to 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company, LLC (Exelon), proposes changes to the Technical Specifications (TS), Appendix A of Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively.

The proposed changes would modify the TS testing requirements for emergency diesel generators (EDGs) with the objective of improving EDG reliability by reducing potential equipment degradation due to excessive testing requirements. The changes are consistent with NRC regulatory guidance presented in Generic Letter 93-05, "Line-Item Technical Specifications Improvement to Reduce Surveillance Requirements for Testing During Power Operation," Generic Letter 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators," and NUREG-1433, Rev. 3.1, "Standard Technical Specifications, General Electric Plants, BWR/4."

Exelon requests approval of the proposed amendment by November 27, 2007. Upon NRC approval, the amendment shall be implemented within 60 days of issuance.

These proposed changes have been reviewed by the Plant Operations Review Committee, and approved by the Nuclear Safety Review Board.

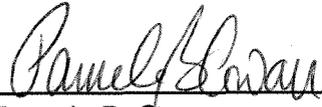
We are notifying the State of Pennsylvania of this application for changes to the Technical Specifications by transmitting a copy of this letter and its attachments to the designated State Official.

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If you have any questions or require additional information, please contact Glenn Stewart at 610-765-5529.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 27th day of November, 2006.

Respectfully,

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Pamela B. Cowan  
Director, Licensing & Regulatory Affairs  
Exelon Generation Company, LLC

- Attachments:
1. Evaluation of Proposed Changes
  2. Markup of Technical Specification Pages
  3. Markup of Technical Specification Bases Pages

cc: Regional Administrator - NRC Region I w/ attachments  
NRC Senior Resident Inspector - Limerick Generating Station "  
NRC Project Manager, NRR - Limerick Generating Station "  
Director, Bureau of Radiation Protection - Pennsylvania Department of Environmental Protection "

## **ATTACHMENT 1**

### **License Amendment Request**

**Limerick Generating Station, Units 1 and 2**

**Docket Nos. 50-352 and 50-353**

### **EVALUATION OF THE PROPOSED CHANGES**

**Subject: Proposed Changes to Emergency Diesel Generator Testing Requirements**

- 1.0 DESCRIPTION**
- 2.0 PROPOSED CHANGES**
- 3.0 BACKGROUND**
- 4.0 TECHNICAL ANALYSIS**
- 5.0 REGULATORY ANALYSIS**
- 6.0 ENVIRONMENTAL CONSIDERATION**
- 7.0 REFERENCES**

## 1.0 DESCRIPTION

Pursuant to 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company, LLC (Exelon), proposes changes to the Technical Specifications (TS), Appendix A of Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively. The changes modify the TS testing requirements for emergency diesel generators (EDGs) with the objective of improving EDG reliability by reducing potential equipment degradation due to excessive testing requirements.

Specifically, the proposed changes: (1) eliminate accelerated EDG testing in the event of a loss of one or both offsite power sources, (2) eliminate accelerated EDG testing caused by an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, (3) eliminate accelerated EDG testing in the event of an inoperable EDG provided an evaluation determines the absence of a potential common-mode failure situation, (4) eliminate repetitive 7 day accelerated EDG testing, (5) eliminate mandatory accelerated EDG testing when the inoperable EDG is returned to service prior to completing the testing, (6) eliminate the EDG test schedule table based on failure rates, (7) relax the testing criteria for the "fast start" EDG test, (8) relax the acceptance criteria for the EDG load rejection test, (9) eliminate the EDG failure report, and (10) provide Bases clarifications.

## 2.0 PROPOSED CHANGES

The proposed changes apply to Limiting Condition for Operation (LCO) 3.8.1.1, A.C. Sources - Operating, and associated Surveillance Requirements (SRs) 4.8.1.1.2 and 4.8.1.1.3. The proposed changes are shown on the markup pages provided in Attachment 2. The changes requested by this amendment application are described below.

### 2.1 Eliminate Accelerated EDG Testing for Loss of Offsite Power Source(s)

From LCO 3.8.1.1, Action statements f and g, delete the requirement to perform an EDG start test (SR 4.8.1.1.2.a.4) if one or both offsite power sources are inoperable. Revise as follows:

Delete from LCO 3.8.1.1, Action f: "and if any of the diesel generators have not been successfully tested within the proceeding 24 hours, demonstrate OPERABILITY of these diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 for one diesel at a time within 24 hours," and

Delete from LCO 3.8.1.1, Action g: "demonstrate the OPERABILITY of all of the above required diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4, for one diesel generator at a time, within 8 hours unless the diesel generators are already operating;"

**2.2 Eliminate Accelerated EDG Testing for an Inoperable Support System, an Independently Testable Component, or Preplanned Preventive Maintenance or Testing, Associated with an Inoperable EDG**

For LCO 3.8.1.1, Action statements a and d, expand on the situations that do not require accelerated EDG testing by including “an inoperable support system,” and “an independently testable component,” in addition to the current “preplanned preventive maintenance or testing,” situation. For LCO 3.8.1.1, Action statements b and h, exclude accelerated EDG testing for all three situations. These action statements involve inoperable EDG(s). Revise as follows:

For LCO 3.8.1.1, Actions a and d, delete the words “for any reason other than preplanned preventative [preventive] maintenance or testing,” and replace with the words “due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing,”

Additionally, for LCO 3.8.1.1, Actions b and h, add the words “If either of the diesel generators became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing,”

**2.3 Eliminate Accelerated EDG Testing for an Inoperable EDG Not Caused By a Common-Mode Failure**

For LCO 3.8.1.1, Action statements a, b, d, and h, involving inoperable EDG(s), eliminate accelerated testing of the other EDGs provided an evaluation determines the absence of any potential common-mode failure for the remaining EDGs. Revise as follows:

Add, “unless the absence of any potential common-mode failure for the remaining diesel generators is determined,” to LCO 3.8.1.1, Actions a, b, d, and h.

**2.4 Eliminate Repetitive 7 Day Accelerated Testing for One Inoperable EDG**

Eliminate the every 7 day accelerated EDG testing requirement from LCO 3.8.1.1, Action a, regarding one inoperable EDG. Revise as follows:

Delete “and at least once per 7 days thereafter,” from LCO 3.8.1.1, Action a.

**2.5 Eliminate Mandatory Accelerated EDG Testing if the Inoperable EDG is Returned to Service Prior to Completing the Test**

Eliminate mandatory accelerated EDG testing in LCO 3.8.1.1, Actions a and d footnotes, regarding an inoperable EDG, when the EDG is returned to service prior to completing the accelerated testing requirement. Currently, the footnote requires completion of the accelerated testing on the other EDGs for this situation within the 24 hour or 8 hour time restraint. In lieu of this footnote, the Bases section for LCO 3.8.1.1 will be revised to acknowledge that a common-mode failure evaluation will be performed when the inoperable EDG is returned to service prior to completion of a common-mode

determination. In this situation, the evaluation will not be subject to the time constraints imposed by the required action. Revise as follows:

Delete the footnote on pages 8-1, and 8-1a that reads, "Contrary to the provisions of specification 3.0.2, this test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY for failures that are potentially generic to the remaining Unit 1 (Unit 2) diesel generators and for which appropriate alternative testing cannot be designed," and

Insert the following statement into the Bases for TS 3/4 8.1:

"In the event the inoperable EDG is restored to operable status prior to completing the EDG start test (SR 4.8.1.1.2.a.4) or common-mode failure evaluation as required in Specification 3.8.1.1, the plant corrective action program shall continue to evaluate the common-mode failure possibility. However, this continued evaluation is not subject to the time constraint imposed by the action statement."

## **2.6 Eliminate the EDG Test Schedule Based On Failure Rates**

Eliminate the EDG schedule that establishes the EDG start and load test frequency based on the number of failures in the last 20 demands. Revise as follows:

Delete TS Table 4.8.1.1.2-1, Diesel Generator Test Schedule, and its associated footnotes, and insert "INFORMATION ON THIS PAGE HAS BEEN DELETED," and

Delete from SR 4.8.1.1.2.a, "frequency specified in Table 4.8.1.1.2-1," and replace with "Surveillance Frequency Control Program."

Delete the reference to TS Table 4.8.1.1.2-1 in the Index on page xiv.

## **2.7 Relax the Testing Criteria For the Fast Start EDG Test**

Eliminate the 200-second time limit from Surveillance Requirement, SR 4.8.1.1.2.h for synchronizing the EDG to the emergency bus during its fast start test. Revise as follows:

Delete from SR 4.8.1.1.2.h, "in less than or equal to 200 seconds."

## **2.8 Relax the Acceptance Criteria For the EDG Load Rejection Test**

Change the acceptance criteria for SR 4.8.1.1.2.e.2 regarding the EDG load rejection test to permit a higher electrical frequency of up to 66.5 Hz within 1.8 seconds of load rejection. Revise as follows:

Delete from SR 4.8.1.1.2.e, "while maintaining voltage at  $4285 \pm 420$  volts and frequency at  $60 \pm 1.2$  Hz and after steady state conditions are reached, voltage is maintained at  $4280 \pm 120$  volts," and

Replace with:

- a. Following load rejection, the frequency is  $\leq 66.5$  Hz;
- b. Within 1.8 seconds following the load rejection, voltage is  $4285 \pm 420$  volts, and frequency is  $60 \pm 1.2$  Hz; and
- c. After steady-state conditions are reached, voltage is maintained at  $4280 \pm 120$  volts.”

## **2.9 Eliminate the EDG Failure Report**

Eliminate the reporting requirement of SR 4.8.1.1.3 to submit a 30 day report to the NRC for all EDG failures. Revise as follows:

Delete the reporting requirement of SR 4.8.1.1.3 and replace with “Deleted.”

## **2.10 Bases Clarifications**

The TS Bases will be revised to provide clarification, where needed, of these changes. Further, several editorial changes will be made to the Bases. These Bases changes are shown in Attachment 3 and are submitted for your information only.

## **3.0 BACKGROUND**

### **3.1 Technical Background**

The two independent offsite electrical power sources are designed to provide reliable power for the plant’s auxiliary loads and the engineered safeguard loads of both LGS units, so that any single failure can affect only one power supply and cannot propagate to the other source. An alternate independent, but currently not connected, 13 kV offsite source, available as a potential source, can be connected to supply the engineered safeguard loads of both units in the event of the loss of one of the connected offsite power sources.

The two offsite power systems provide the preferred AC electric power to all Class 1E loads. In the event of total loss-of-offsite power sources, eight onsite independent EDGs (four EDGs per unit) provide the standby power for all engineered safeguard loads. As noted in Section 8.3.1.1.3 of the LGS Updated Final Safety Analysis Report (UFSAR), any combination of three-out-of-four EDGs is acceptable for a single failure. However, for Emergency Core Cooling System (ECCS) requirements, an operable configuration of two-out-of-four EDGs is also acceptable.

### **3.2 Regulatory Background**

The NRC has issued several documents providing guidance for modifying the TS surveillance requirements for EDGs as follows:

In NUREG-1366 (Reference 1), the NRC staff concluded that in some cases safety can be improved, potential equipment degradation decreased, and an unnecessary burden on personnel resources eliminated by reducing the amount of testing that the TS require

during power operations. Among the recommendations presented in NUREG-1366, were several regarding the surveillance testing of EDGs. The staff made several specific recommendations for relaxing the testing of EDGs with the objective of reducing potential equipment degradation and improving plant safety.

The NRC issued Generic Letter (GL) 93-05 (Reference 2) that complements NUREG-1366. GL 93-05 presents guidance to assist licensees in preparing a license amendment request to implement the recommendations of NUREG-1366 as line-item TS improvements. Specific language was proposed for the revised TS.

In GL 94-01 (Reference 3), the NRC advised licensees that they may request a license amendment to remove accelerated testing and special reporting requirements for the EDGs from the plant TS. The accelerated testing requirement was associated with the EDG testing frequency schedule that was dependent on the EDG failure rate. The change was contingent on adopting a maintenance program for monitoring and maintaining EDG performance in accordance with the provisions of 10 CFR 50.65 (Reference 4), and the guidance contained in Regulatory Guide 1.160 (Reference 5). The program is commonly known as the "Maintenance Rule." Specific language was proposed for the revised TS.

The following license amendments involve many of the changes proposed herein and were approved for the facilities identified: Palo Verde Nuclear Generating Station, Units 1, 2, and 3, Amendment Nos. 114/107/86 (Reference 6); McGuire Nuclear Station, Units 1 and 2, Amendment Nos. 170/152 (Reference 7); Catawba Nuclear Station, Units 1 and 2, Amendment Nos. 155/147 (Reference 8); Turkey Point, Units 3 and 4, Amendment Nos. 181/175 (Reference 9); St Lucie, Units 1 and 2, Amendment Nos. 138/78 (Reference 10); Hope Creek Generating Station, Amendment No. 144 (Reference 11); and Surry Power Station, Units 1 and 2, Amendment Nos. 241/240 (Reference 12).

#### **4.0 TECHNICAL ANALYSIS**

The technical analysis addresses the proposed changes in the same order as presented above in Section 2.0, Proposed Changes.

##### **4.1 Eliminate Accelerated EDG Testing for Loss of Offsite Power Source (s)**

The change eliminates the requirement to perform EDG start tests within 24 hours for one inoperable offsite power source (LCO 3.8.1.1, Action f), and within 8 hours for two inoperable offsite power sources (LCO 3.8.1.1, Action g). Inoperability of one or both offsite power sources is not indicative of an increased probability that the EDGs will fail the demonstration of operability; and, this change acknowledges that the periodic testing required by SR 4.8.1.1.2.a to demonstrate EDG operability has been adequate to provide a high degree of assurance that the EDGs are operable. The change would contribute to a reduction in unnecessary challenges and potential degradation to the EDGs.

The change is consistent with the guidance of Generic Letter 93-05, Enclosure 1; NUREG-1366, Table 14.1, Section 10.1, and NUREG-1433, Rev. 3.1, Standard Technical Specifications (Reference 13).

#### **4.2 Eliminate Accelerated EDG Testing for an Inoperable Support System, an Independently Testable Component, or Preplanned Preventive Maintenance or Testing, Associated with an Inoperable EDG**

The change deletes the requirement to test the remaining EDGs when the cause of the inoperable EDG(s) is due to an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing. The intent of testing the remaining EDGs is to demonstrate whether a common-mode failure condition exists for the EDGs, and provide an increased level of assurance that the redundant EDGs are not concurrently inoperable. An inoperable support system or preplanned maintenance or testing, are situations that are not indicative of an EDG common-mode failure condition. An independently testable component involves the removal of an EDG support system from service that has the capability of being tested for operability independent of its associated EDG, and likewise is not indicative of an EDG common-mode failure condition. None of these exceptions are indicative that the other EDGs are inoperable, and the periodic testing required by SR 4.8.1.1.2.a has been adequate to ensure EDG operability.

The change would contribute to a reduction in unnecessary challenges and potential degradation to the EDGs. The change conforms to the recommended wording in Generic Letter 93-05, Enclosure 1.

#### **4.3 Eliminate Accelerated EDG Testing for an Inoperable EDG Not Caused by a Common-Mode Failure**

LCO 3.8.1.1, Actions a, b, d, and h, involving inoperable EDG(s) requires testing of the other EDGs within 24 or 8 hours without consideration of the nature of the failure. The proposed change would preclude this accelerated testing provided an evaluation is performed that determines that a potential common-mode failure does not exist for the EDGs. The intent of accelerated testing is to determine if the failure of an EDG is indicative of a generic problem (common-mode failure) that may impact operability of the other EDGs, and to provide an increased level of assurance that the redundant EDGs are not concurrently inoperable. Regarding the latter, the periodic testing required by SR 4.8.1.1.2.a has been adequate to ensure EDG operability. For the generic problem issue, the change permits an option to perform a common-mode failure evaluation in lieu of an operability test of the other EDGs. If the evaluation determines that a potential common-mode failure does not exist, unnecessary testing of the other EDGs can be avoided.

The change would contribute to a reduction in unnecessary challenges and potential degradation to EDGs. The change conforms to the recommended wording of Generic Letter 93-05, Enclosure 1, and is consistent with NUREG-1433, Rev. 3.1.

#### **4.4 Eliminate Repetitive 7 Day Accelerated Testing for One Inoperable EDG**

LCO 3.8.1.1, Action a, requires a start test for the other EDGs within 24 hours, and every 7 days thereafter, when an inoperable EDG exists. The proposed change would remove

the requirement to repeat the test every 7 days. The intent of the 24 hour test is to determine if there is a generic problem that may impact the operability of the other EDGs, and to provide an increased level of assurance that the redundant EDGs are not concurrently inoperable. A successful test of the other EDGs within 24 hours confirms the absence of a generic problem and that the other EDGs are operable. The continued operability of the other EDGs is assured by the performance of periodic testing required by SR 4.8.1.1.2.a. In the event an EDG(s) fails during the 24-hour test required by LCO 3.8.1.1, Action a, the action statements for multiple EDG failures will prescribe the required actions.

The proposed change is consistent with the guidance of NUREG-1366 and Generic Letter 93-05 to eliminate unnecessary testing, and would contribute to a reduction in unnecessary challenges and potential degradation to EDGs. The change is consistent with NUREG-1433, Rev. 3.1.

#### **4.5 Eliminate Mandatory Accelerated EDG Testing If the Inoperable EDG is Returned to Service Prior to Completing the Test**

The footnote on the bottom of pages 8-1 and 8-1a requires the accelerated testing triggered by an inoperable EDG to be completed regardless of when the inoperable EDG is restored to operability for failures that are potentially generic to the remaining EDGs. The proposed change would delete this footnote from pages 8-1 and 8-1a.

One intent of this requirement is to determine that no common-mode failure exists. Extent of condition evaluations, including consideration of the potential for a common-mode failure, are required by plant procedures in accordance with the plant corrective action program for all significant safety related deficiencies. This program requires prompt completion of the evaluation and actions to preclude its recurrence, regardless of whether the initial corrective action is completed. The corrective action program adequately assures that the necessary evaluations are completed in a timely manner, and may or may not entail additional EDG testing. The Bases will be revised to reflect the performance of this program.

The other intent of this requirement is to provide an increased level of assurance that redundant EDGs are not concurrently inoperable. However, this concern is obviated once the inoperable EDG is restored to operable status, since no EDG is currently inoperable and the inoperability of one EDG is not automatically indicative of a similar condition in another EDG unless a generic failure is suspected. The periodic testing required by SR 4.8.1.1.2.a has been adequate to ensure EDG operability.

The proposed change is consistent with the guidance of NUREG-1366 and Generic Letter 93-05 to eliminate unnecessary testing, and would contribute to a reduction in unnecessary challenges and potential degradation to the EDGs. The change is consistent with NUREG-1433, Rev. 3.1, and its associated Bases.

#### 4.6 Eliminate the EDG Test Schedule Based On Failure Rates

By letter dated September 28, 2006 (Reference 14), the NRC issued Amendment Nos. 186 and 147 for LGS, Units 1 and 2, respectively. These amendments relocated fixed periodic surveillance frequencies from TS to the Surveillance Frequency Control Program (SFCP), which are controlled in accordance with TS Section 6.8.4.j.

SR 4.8.1.1.2.a requires periodic EDG testing, including an EDG start and load test, at a frequency specified in TS Table 4.8.1.1.2-1. TS Table 4.8.1.1.2-1, Diesel Generator Test Schedule, requires this EDG testing to be performed in accordance with the Surveillance Frequency Control Program. SFCP Table 4.8.1.1.2-1, Diesel Generator Test Schedule, specifies a frequency of either 31 days or 7 days depending on the number of EDG failures within the last 20 valid demands. The change proposed by this 2006 amendment request, involving EDG testing requirements, removes TS Table 4.8.1.1.2-1 in its entirety, and revises SR 4.8.1.1.2.a, from a surveillance frequency perspective, to require EDG testing in accordance with the Surveillance Frequency Control Program consistent with Amendment Nos. 186 and 147. Once the amendment requested by this letter is approved, SFCP Table 4.8.1.1.2-1 will also be deleted consistent with the deletion of the TS Table, and the SFCP will specify that EDG testing relative to SR 4.8.1.1.2.a be performed on a frequency of 31 days consistent with GL 94-01. Any future changes to the surveillance frequency in the SFCP will be controlled in accordance with the requirements of TS Section 6.8.4.j.

The methodology used for evaluating changes to surveillance frequencies within the SFCP, as required by TS Section 6.8.4.j, recognizes that EDG failure rates and testing frequencies are assessed in accordance with the maintenance rule, 10 CFR 50.65, and the guidance of Regulatory Guide 1.160. Under the maintenance rule, increased EDG failure rates could trigger accelerated testing, i.e., a more frequent testing schedule than currently specified in SFCP Table 4.8.1.1.2-1. The elements of the maintenance rule program include the performance of a detailed cause analysis of individual EDG failures, effective corrective actions taken in response to individual EDG failures, and implementation of EDG preventive maintenance consistent with the maintenance rule.

Generic Letter 94-01 recommends removing the accelerated EDG testing requirements of TS Table 4.8.1.1.2-1 (and SFCP Table 4.8.1.1.2-1 in the case of LGS) provided the licensee implements the requirements of the maintenance rule, 10 CFR 50.65. LGS has implemented a program in accordance with the maintenance rule. Accordingly, the proposed change conforms to the guidance of Generic Letter 94-01, and would contribute to a reduction in unnecessary challenges and potential degradation to EDGs. The change is consistent with NUREG-1433, Rev. 3.1.

#### 4.7 Relax the Testing Criteria for the Fast Start EDG Test

SR 4.8.1.1.2.h requires a fast start test of the EDG, followed by synchronization to the emergency bus and fully loaded within 200 seconds. The proposed change would permit loading in accordance with manufacturer's recommendations in lieu of a 200-second loading constraint. The change reduces the potential for engine wear. Additionally, placing a time limitation on the operator to accomplish this loading results in

an increased potential for error and subsequent unavailability of the EDG. The starting, loading, subsequent full load operation, and automatic start and load tests required by other TS surveillances are adequate to confirm the EDG's capability without the 200-second loading requirement.

The test, as currently required, contributes to adverse EDG reliability by requiring EDG loading at a rate faster than that recommended by the engine manufacturer.

The guidance in NUREG-1366, Section 10.1, and Generic Letter 93-05, Enclosure 1, deletes the time constraint from the EDG load test. NUREG-1433, Rev. 3.1, SR 3.8.1.3, (EDG loading test) bases the loading rate on the manufacturer's recommendations in lieu of a prescribed time. Further, NUREG-1433, SR 3.8.1.7 (fast start test) does not require a rapid loading test after the fast start test. The proposed change is consistent with the above guidance, and would contribute to a reduction in unnecessary degradation to the EDGs.

#### **4.8 Relax the Acceptance Criteria For the EDG Load Rejection Test**

SR 4.8.1.1.2.e requires a test of the EDG's capability to reject a load of greater than or equal to that of its single largest post-accident load, and specifies the voltage and frequency limits. The proposed change would relax the frequency limit during the 1.8 second interval immediately following load rejection. The current limit is overly constrictive, increasing the potential for unplanned maintenance and post maintenance testing. This increases EDG challenges and potential degradation. Further, the increased potential for maintenance may result in an unnecessary plant shutdown. With a larger frequency margin, degradation can be adequately identified and the appropriate maintenance scheduled during a planned outage.

The LGS RHR pump motor represents the single largest post-accident load. SR 4.8.1.1.2.e requires verification that upon rejection of the RHR pump motor load, the voltage is maintained at  $4285 \pm 420$  volts and frequency at  $60 \pm 1.2$  Hz and after steady state conditions are reached, voltage is maintained at  $4280 \pm 120$  volts. Consistent with Regulatory Guide (RG) 1.9 (Reference 15), the proposed change would allow a higher frequency of 66.5 HZ during the first 1.8 seconds following load rejection.

Consistent with RG 1.9, the load rejection test is acceptable if the EDG speed does not exceed the nominal (synchronous) speed (900 rpm) plus 75% of the difference between nominal speed and the overspeed trip setpoint (1030 rpm) or 115% of nominal, whichever is lower. This computes to be 66.5 Hz for the LGS EDGs. Consistent with RG 1.9, the 1.8 seconds specified is equal to 60% of the 3-second load sequence interval associated with sequencing the next load following the RHR pumps in response to an undervoltage on the electrical bus concurrent with a LOCA. The change is acceptable because, based on RG 1.9 recommendations, it provides assurance that EDG frequency does not exceed predetermined limits and that frequency stability is sufficient to support proper load sequencing following a rejection of the largest single load. The change is consistent with NUREG-1433, Rev. 3.1, SR 3.8.1.9.

#### **4.9 Eliminate the EDG Failure Report**

SR 4.8.1.1.3 requires a special report to the NRC within 30 days of all EDG failures. The proposed change would delete this reporting requirement. The change conforms with the recommendations of Generic Letter 94-01 which permits removal of this reporting requirement provided licensees continue to comply with the reporting requirements of 10 CFR 50.72 and 50.73 to report EDG failures as applicable. Further, the change does not impact the safe operation of the plant since the report is submitted after the EDG failure has occurred and does not require NRC approval.

#### **4.10 Bases Clarifications**

The TS Bases changes provide clarification, where needed, of the above changes along with some editorial changes.

#### **4.11 Conclusions**

Proposed changes 4.1 through 4.8 are consistent with the recommendations of the NRC guidance referenced, and enhance plant safety by reducing unnecessary challenges and potential degradation to the EDGs. Further, the changes eliminate an unnecessary burden on personnel resources by reducing the amount of testing that the TS require during power operations. Proposed change 4.9 is an administrative change that is consistent with the recommendation of the NRC guidance referenced. Finally, proposed change 4.10 provides Bases clarifications. None of the proposed changes impact the current allowable out-of-service times for inoperable AC power sources.

### **5.0 REGULATORY ANALYSIS**

#### **5.1 No Significant Hazards Consideration**

Exelon has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.90, "Issuance of amendment," as discussed below:

- 1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?**

Response: No

The proposed changes are associated with the testing and reporting requirements of the eight (four on each unit) Emergency Diesel Generators (EDGs). The changes will eliminate unnecessary EDG testing requirements that contribute to potential mechanical degradation of the EDGs. The changes are based on the NRC guidance and recommendations provided in Generic Letter 93-05 or Generic Letter 94-01, or are consistent with NUREG-1433. The change to the reporting requirement is administrative in nature.

The probability of an accident is not increased by these changes because the EDGs are not assumed to be initiators of any design basis event. Additionally, the proposed changes do not involve any physical changes to plant systems, structures, or components (SSC), or the manner in which these SSC are operated, maintained, or controlled. The consequences of an accident will not be increased because the changes to the EDGs and associated support systems still provide a high degree of assurance that their operability is maintained.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

**2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?**

Response: No.

The proposed changes do not alter the physical design, safety limits, or safety analysis assumptions, associated with the operation of the plant. Accordingly, the proposed changes do not introduce any new accident initiators, nor do they reduce or adversely affect the capabilities of any plant structure or system in the performance of their safety function.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

**3. Do the proposed changes involve a significant reduction in a margin of safety?**

Response: No.

The proposed changes to the EDGs either: (1) modify the test acceptance criteria, (2) modify the accelerated testing schedules, or (3) eliminate a reporting requirement. The change to the test acceptance criteria is based on the recommendations of Regulatory Guide 1.9, and the change to the reporting requirement is enveloped by other NRC reporting requirements. The other changes are consistent with NRC guidance, and reduce unnecessary testing and improve EDG reliability. Requirements to assure that a common-mode failure has not affected the remaining operable EDGs have been maintained. The existing routine testing frequency, unaffected by these changes, has been shown to be adequate for assuring the EDGs are operable based on operating experience. The proposed changes do not impact the assumptions of any design basis accident, and do not alter assumptions relative to the mitigation of an accident or transient event.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above, Exelon concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of “no significant hazards consideration” is justified.

## 5.2 Applicable Regulatory Requirements/Criteria

10 CFR 50.36, paragraph (c)(2)(ii)(C), Criterion 3, states that a technical specification limiting condition for operation of a nuclear reactor must be established for systems that are part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. The proposed TS change involves the onsite power system that is required by 10 CFR 50, Appendix A, GDC 17, to provide the independence and redundancy to ensure an available source of power to the systems identified in Criterion 3 above.

The proposed changes are associated with the testing and reporting requirements of the eight (four on each unit) EDGs. The changes will eliminate unnecessary EDG testing requirements that contribute to potential mechanical degradation of the EDGs. The changes are based on the NRC guidance and recommendations provided in Generic Letter 93-05 or Generic Letter 94-01, or are consistent with NUREG-1433. The change to the reporting requirement is administrative in nature.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission’s regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

## 6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

## 7.0 REFERENCES

1. NUREG-1366, “Improvements to Technical Specifications Surveillance Requirements,” dated December 1992.

2. Generic Letter 93-05, "Line-Item Technical Specifications Improvement to Reduce Surveillance Requirements for Testing During Power Operation," dated September 27, 1993.
3. Generic Letter 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators," dated May 31, 1994.
4. 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."
5. Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."
6. Palo Verde Nuclear Generating Station, Units 1, 2, and 3, Docket Nos. 50-528/529/530, Amendment Nos. 114/107/86, dated October 6, 1997.
7. McGuire Nuclear Station, Units 1 and 2, Docket Nos. 50-369/370, Amendment Nos. 170/152, dated November 12, 1996.
8. Catawba Nuclear Station, Units 1 and 2, Docket Nos. 50-413/414, Amendment Nos. 155/147, dated October 30, 1996.
9. Turkey Point, Units 3 and 4, Docket Nos. 50-250/251, Amendment Nos. 181/175, dated December 28, 1995.
10. St Lucie, Units 1 and 2, Docket Nos. 50-335/389, Amendment Nos. 138/78, dated June 29, 1995.
11. Hope Creek Generating Station, Docket No. 50-354, Amendment No. 144, dated March 17, 2003.
12. Surry Power Station, Units 1 and 2, Docket Nos. 50-280/281, Amendment Nos. 241/240, dated April 5, 2005.
13. NUREG-1433, Vol. 1, Rev. 3.1, "Standard Technical Specifications General Electric Plants, BWR/4," published December 2005.
14. Limerick Generating Station, Units 1 and 2, Docket Nos. 50-352/353, Amendment Nos. 186/147, dated September 28, 2006.
15. NRC Regulatory Guide 1.9, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," Rev. 2, December 1979.

**ATTACHMENT 2**

**License Amendment Request**

**Limerick Generating Station, Units 1 and 2  
Docket Nos. 50-352 and 50-353**

**Proposed Changes to  
Emergency Diesel Generator Testing Requirements**

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## 3/4.8 ELECTRICAL POWER SYSTEMS

### 3/4.8.1 A.C. SOURCES

#### A.C. SOURCES - OPERATING

#### LIMITING CONDITION FOR OPERATION

---

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Four separate and independent diesel generators, each with:
  1. A separate day tank containing a minimum of 200 gallons of fuel,
  2. A separate fuel storage system containing a minimum of 33,500 gallons of fuel, and
  3. A separate fuel transfer pump.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

#### ACTION:

- a. With one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1a. within 24 hours and at least once per 7 days thereafter. ~~If the diesel generator became inoperable for any reason other than preplanned preventative maintenance or testing due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing,~~ demonstrate the OPERABILITY of the remaining operable diesel generators by performing Surveillance Requirement 4.8.1.1.2a.4 for one diesel generator at a time, within 24 hours\* ~~and at least once per 7 days thereafter, unless the absence of any potential common-mode failure for the remaining diesel generators is determined.~~ Restore the inoperable diesel generator to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.
- b. With two diesel generators of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1a, within 1 hour and at least once per 8 hours thereafter. ~~If either of the diesel generators became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing,~~ demonstrate the OPERABILITY of the remaining diesel generators by performing Surveillance Requirement 4.8.1.1.2a.4 for one diesel generator at a time, within 8 hours, ~~unless the absence of any potential common-mode failure for the remaining diesel generators is determined.~~ Restore at least one of the inoperable diesel generators to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.

---

~~\*Contrary to the provisions of Specification 3.0.2, this test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY for failures that are potentially generic to the remaining Unit 1 diesel generators and for which appropriate alternative testing cannot be designed.~~

LIMITING CONDITION FOR OPERATION (Continued)

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ACTION: (Continued)

- c. With three diesel generators of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a. within 1 hour and at least once per 8 hours thereafter; and perform Surveillance Requirement 4.8.1.1.2a.4 for the remaining diesel generator, within 1 hour. Restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.
  
- d. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. ~~If the diesel generator became inoperable for any reason other than preplanned preventive maintenance or testing due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing,~~ demonstrate the OPERABILITY of the remaining diesel generators by performing Surveillance Requirement 4.8.1.1.2a.4 for one diesel generator at a time, within 8 hours<sup>\*</sup>, **unless the absence of any potential common-mode failure for the remaining diesel generators is determined.** Restore at least two offsite circuits to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.

---

~~\*Contrary to the provisions of Specification 3.0.2, this test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY for failures that are potentially generic to the remaining Unit 1 diesel generators and for which appropriate alternative testing cannot be designed.~~

## ELECTRICAL POWER SYSTEMS

### LIMITING CONDITION FOR OPERATION (Continued)

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#### ACTION: (Continued)

- f. With one offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; ~~and if any of the diesel generators have not been successfully tested within the preceding 24 hours, demonstrate OPERABILITY of these diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 for one diesel at a time, within 24 hours.~~ Restore at least two offsite circuits to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and COLD SHUTDOWN within the following 24 hours.
- g. With two of the above required offsite circuits inoperable, ~~demonstrate the OPERABILITY of all of the above required diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4, for one diesel generator at a time, within 8 hours unless the diesel generators are already operating;~~ restore at least one of the inoperable offsite circuits to OPERABLE status within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours. With only one offsite circuit restored to OPERABLE status, restore at least two offsite circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- h. With one offsite circuit and two diesel generators of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter. **‡ If either of the diesel generators became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 for one diesel generator at a time, within 8 hours, unless the absence of any potential common-mode failure for the remaining diesel generators is determined.** Restore at least one of the above required inoperable A.C. sources to OPERABLE status within 12 hours or be in a at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore at least two offsite circuits and at least three of the above required diesel generators to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.
- i. Specification 3.0.4.b is not applicable to diesel generators.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS

---

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

- a. Determined OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignments and indicated power availability, and
- b. Demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program by transferring, manually and automatically, unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each of the above required diesel generators shall be demonstrated OPERABLE:

- a. In accordance with the ~~frequency specified in Table 4.8.1.1.2-1~~ **Surveillance Frequency Control Program** on a STAGGERED TEST BASIS by:
  1. Verifying the fuel level in the day fuel tank.
  2. Verifying the fuel level in the fuel storage tank.
  3. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank.
  4. Verify that the diesel can start\* and gradually accelerate to synchronous speed with generator voltage and frequency at  $4280 \pm 120$  volts and  $60 \pm 1.2$  HZ.
  5. Verify diesel is synchronized, gradually loaded\* to an indicated 2700-2800 KW\*\* and operates with this load for at least 60 minutes.
  6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
  7. Verifying the pressure in all diesel generator air start receivers to be greater than or equal to 225 psig.

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\*This test shall be conducted in accordance with the manufacturer's recommendations regarding engine pre-lube and warmup procedures, and as applicable regarding loading and shutdown recommendations.

\*\*This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing under direct monitoring by the manufacturer or momentary variations due to changing bus loads shall not invalidate the test.

SURVEILLANCE REQUIREMENTS (Continued)

- b. By removing accumulated water:
- 1) From the day tank in accordance with the Surveillance Frequency Control Program and after each occasion when the diesel is operated for greater than 1 hour, and
  - 2) From the storage tank in accordance with the Surveillance Frequency Control Program.
- c. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:
- 1) By verifying in accordance with the tests specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:
    - a) An API Gravity of within 0.3 degrees at 60°F or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89 or an API gravity at 60°F of greater than or equal to 27 degrees but less than or equal to 39 degrees.
    - b) A kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.
    - c) A flash point equal to or greater than 125°F, and
    - d) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.
  - 2) By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.
- d. In accordance with the Surveillance Frequency Control Program by obtaining a sample of fuel oil from the storage tanks in accordance with ASTM D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, Method A, except that the filters specified in ASTM D2276-78, Sections 5.1.6 and 5.1.7, may have a nominal pore size of up to three (3) microns.
- e. In accordance with the Surveillance Frequency Control Program by:
1. Deleted
  2. Verifying each diesel generator's capability to reject a load of greater than or equal to that of its single largest post-accident load, ~~while maintaining voltage at 4285 ± 420 volts and frequency at 60 ± 1.2 hz and after steady state conditions are reached, voltage is maintained at 4280 ± 120 volts and:~~
    - a. Following load rejection, the frequency is ≤ 66.5 Hz;
    - b. Within 1.8 seconds following the load rejection, voltage is 4285 ± 420 volts, and frequency is 60 ± 1.2 Hz; and
    - c. After steady-state conditions are reached, voltage is maintained at 4280 ± 120 volts.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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- h. In accordance with the Surveillance Frequency Control Program the diesel generator shall be started\* and verified to accelerate to synchronous speed in less than or equal to 10 seconds. The generator voltage and frequency shall reach  $4280 \pm 120$  volts and  $60 \pm 1.2$  Hz within 10 seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:
- a) Manual\*\*\*
  - b) Simulated loss-of-offsite power by itself.
  - c) Simulated loss-of-offsite power in conjunction with an ECCS actuation test signal.
  - d) An ECCS actuation test signal by itself.

The generator shall be manually synchronized to its appropriate emergency bus, loaded to an indicated 2700-2800 KW\*\* ~~in less than or equal to 200 seconds,~~ and operate for at least 60 minutes. This test, if it is performed so it coincides with the testing required by Surveillance Requirement 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5, may also serve to concurrently meet those requirements as well.

~~4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission in a Special Report pursuant to Specification 6.9.2 within 30 days. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977. Deleted~~

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\*This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup procedures, and as applicable regarding loading and shutdown recommendations.

\*\*This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing under direct monitoring by the manufacturer or momentary variations due to changing bus loads shall not invalidate the test.

\*\*\*If diesel generator started manually from the control room, 10 seconds after the automatic prelube period.

~~TABLE 4.8.1.1.2 1~~

~~DIESEL GENERATOR TEST SCHEDULE~~

<del>NUMBER OF FAILURES IN LAST 20 VALID DEMANDS*</del>	<del>TEST FREQUENCY</del>
<del>less than or equal to 1 or,</del>	<del>In accordance with the Surveillance Frequency Control Program</del>
<del>greater than or equal to 2**</del>	<del>In accordance with the Surveillance Frequency Control Program</del>

INFORMATION ON THIS PAGE HAS BEEN DELETED

~~\*Criteria for determining the number of failures and number of valid demands shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, but determined on a per diesel generator basis.~~

~~\*\*The associated test frequency shall be maintained until seven consecutive failure free demands have been performed and the number of failures in the last 20 demands have been reduced to one.~~

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### 3/4.8 ELECTRICAL POWER SYSTEMS

#### 3/4.8.1 A.C. SOURCES

##### A.C. SOURCES - OPERATING

##### LIMITING CONDITION FOR OPERATION

---

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Four separate and independent diesel generators, each with:
  1. A separate day tank containing a minimum of 200 gallons of fuel,
  2. A separate fuel storage system containing a minimum of 33,500 gallons of fuel, and
  3. A separate fuel transfer pump.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

##### ACTION:

- a. With one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1a. within 24 hours and at least once per 7 days thereafter. ~~If the diesel generator became inoperable for any reason other than preplanned preventative maintenance or testing due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing,~~ demonstrate the OPERABILITY of the remaining operable diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 for one diesel generator at a time, within 24 hours\* ~~and at least once per 7 days thereafter, unless the absence of any potential common-mode failure for the remaining diesel generators is determined.~~ Restore the inoperable diesel generator to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.
- b. With two diesel generators of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter. ~~If either of the diesel generators became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing,~~ demonstrate the OPERABILITY of the remaining diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 for one diesel generator at a time, within 8 hours, ~~unless the absence of any potential common-mode failure for the remaining diesel generators is determined.~~ Restore at least one of the inoperable diesel generators to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.

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~~\*Contrary to the provisions of Specification 3.0.2, this test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY for failures that are potentially generic to the remaining Unit 2 diesel generators and for which appropriate alternative testing cannot be designed.~~

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

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ACTION: (Continued)

- c. With three diesel generators of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and perform Surveillance Requirement 4.8.1.1.2.a.4 for the remaining diesel generator, within 1 hour. Restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.
  
- d. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter. If the diesel generator became inoperable ~~for any reason other than preplanned preventative maintenance or testing~~ **due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing**, demonstrate the OPERABILITY of the remaining diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 for one diesel generator at a time, within 8 hours\*, **unless the absence of any potential common-mode failure for the remaining diesel generators is determined**. Restore at least two offsite circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.

---

~~\*Contrary to the provisions of Specification 3.0.2, this test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY for failures that are potentially generic to the remaining Unit 2 diesel generators and for which appropriate alternative testing cannot be designed.~~

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

---

ACTION: (Continued)

- f. With one offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; ~~and if any of the diesel generators have not been successfully tested within the preceding 24 hours, demonstrate OPERABILITY of these diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 for one diesel at a time, within 24 hours.~~ Restore at least two offsite circuits to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
  
- g. With two of the above required offsite circuits inoperable, ~~demonstrate the OPERABILITY of all of the above required diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4., for one diesel generator at a time, within 8 hours unless the diesel generators are already operating;~~ restore at least one of the inoperable offsite circuits to OPERABLE status within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours. With only one offsite circuit restored to OPERABLE status, restore at least two offsite circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
  
- h. With one offsite circuit and two diesel generators of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter. **If either of the diesel generators became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 for one diesel generator at a time, within 8 hours, unless the absence of any potential common-mode failure for the remaining diesel generators is determined.** Restore at least one of the above required inoperable A.C. sources to OPERABLE status within 12 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore at least two offsite circuits and at least three of the above required diesel generators to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.
  
- i. Specification 3.0.4.b is not applicable to diesel generators.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

---

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

- a. Determined OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignments and indicated power availability, and
- b. Demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program by transferring, manually and automatically, unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each of the above required diesel generators shall be demonstrated OPERABLE:

- a. In accordance with the ~~frequency specified in Table 4.8.1.1.2-1~~ **Surveillance Frequency Control Program** on a STAGGERED TEST BASIS by:
  - 1. Verifying the fuel level in the day fuel tank.
  - 2. Verifying the fuel level in the fuel storage tank.
  - 3. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank.
  - 4. Verify that the diesel can start\* and gradually accelerate to synchronous speed with generator voltage and frequency at  $4280 \pm 120$  volts and  $60 \pm 1.2$  Hz.
  - 5. Verify diesel is synchronized, gradually loaded\* to an indicated 2700-2800 kW\*\* and operates with this load for at least 60 minutes.
  - 6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
  - 7. Verifying the pressure in all diesel generator air start receivers to be greater than or equal to 225 psig.

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\*This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup procedures, and as applicable regarding loading and shutdown recommendations.

\*\*This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing under direct monitoring by the manufacturer or momentary variations due to changing bus loads shall not invalidate the test.

SURVEILLANCE REQUIREMENTS (Continued)

- b. By removing accumulated water:
- 1) From the day tank in accordance with the Surveillance Frequency Control Program and after each occasion when the diesel is operated for greater than 1 hour, and
  - 2) From the storage tank in accordance with the Surveillance Frequency Control Program.
- c. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:
- 1) By verifying in accordance with the tests specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:
    - a) An API Gravity of within 0.3 degrees at 60°F or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89 or an API gravity at 60°F of greater than or equal to 27 degrees but less than or equal to 39 degrees.
    - b) A kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.
    - c) A flash point equal to or greater than 125°F, and
    - d) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.
  - 2) By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.
- d. In accordance with the Surveillance Frequency Control Program by obtaining a sample of fuel oil from the storage tanks in accordance with ASTM D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, Method A, except that the filters specified in ASTM D2276-78, Sections 5.1.6 and 5.1.7, may have a nominal pore size of up to three (3) microns.
- e. In accordance with the Surveillance Frequency Control Program by:
- 1) Deleted
  - 2) Verifying each diesel generator's capability to reject a load of greater than or equal to that of its single largest post-accident load, ~~while maintaining voltage at 4285 ± 420 volts and frequency at 60 ± 1.2 hz and after steady state conditions are reached, voltage is maintained at 4280 ± 120 volts. and:~~
    - a. Following load rejection, the frequency is ≤ 66.5 Hz;
    - b. Within 1.8 seconds following the load rejection, voltage is 4285 ± 420 volts, and frequency is 60 ± 1.2 Hz; and
    - c. After steady-state conditions are reached, voltage is maintained at 4280 ± 120 volts.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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h. In accordance with the Surveillance Frequency Control Program the diesel generator shall be started\* and verified to accelerate to synchronous speed in less than or equal to 10 seconds. The generator voltage and frequency shall reach  $4280 \pm 120$  volts and  $60 \pm 1.2$  Hz within 10 seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:

- a) Manual\*\*\*
- b) Simulated loss-of-offsite power by itself.
- c) Simulated loss-of-offsite power in conjunction with an ECCS actuation test signal.
- d) An ECCS actuation test signal by itself.

The generator shall be manually synchronized to its appropriate emergency bus, loaded to an indicated 2700-2800 KW\*\* ~~in less than or equal to 200 seconds,~~ and operate for at least 60 minutes. This test, if it is performed so it coincides with the testing required by Surveillance Requirement 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5, may also serve to concurrently meet those requirements as well.

4.8.1.1.3 ~~Reports~~ — ~~All diesel generator failures, valid or nonvalid, shall be reported to the Commission in a Special Report pursuant to Specification 6.9.2 within 30 days. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977. Deleted~~

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\*This test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup procedures, and as applicable regarding loading and shutdown recommendations.

\*\*This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing under direct monitoring by the manufacturer or momentary variations due to changing bus loads shall not invalidate the test.

\*\*\*If diesel generator started manually from the control room, 10 seconds after the automatic prelube period.

TABLE 4.8.1.1.2.1

DIESEL GENERATOR TEST SCHEDULE

NUMBER OF FAILURES IN  
LAST 20 VALID DEMANDS\*

TEST FREQUENCY

less than or equal to 1 or,

In accordance with the  
Surveillance Frequency  
Control Program

greater than or equal to 2\*\*

In accordance with the  
Surveillance Frequency  
Control Program

INFORMATION ON THIS PAGE HAS BEEN DELETED

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~~\*Criteria for determining number of failures and number of valid demands shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, but determined on a per diesel generator basis.~~

~~\*\*The associated test frequency shall be maintained until seven consecutive failure free demands have been performed and the number of failures in the last 20 demands have been reduced to one.~~

**ATTACHMENT 3**

**License Amendment Request**

**Limerick Generating Station, Units 1 and 2**

**Docket Nos. 50-352 and 50-353**

**Proposed Changes to  
Emergency Diesel Generator Testing Requirements**

**Markup of Technical Specification Bases Page Changes**

**Unit 1 TS Bases Pages**

B 3/4 8-1a

**Unit 2 TS Bases Pages**

B 3/4 8-1a

BASES

3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION SYSTEMS

only three Unit 1 4 kV emergency buses, then each of the four Unit 1 4 kV emergency buses must be supplied from at least one operable offsite source. Onsite A.C. operability requirements for common systems such as RHRSW and ESW are addressed in the appropriate system specification action statements.

A.C. Sources

~~\_\_\_\_\_ The A.C. source allowable out-of-service times are based on Regulatory Guide 1.93, "Availability of Electrical Power Sources," December 1974. As required by Specification 3.8.1.1, Action e, when one or more diesel generators are inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components, and devices, that depend on the remaining OPERABLE diesel generators as a source of emergency power, are also OPERABLE. The LPCI mode of the RHR system is considered a four train system, of which only two trains are required. The verification for LPCI is not required until two diesel generators are inoperable. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period when one or more 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 certain components are out-of-service for maintenance or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate the OPERABILITY of the component.~~

~~A Note Specification 3.8.1.1, Action i, prohibits the application of Specification 3.0.4.b to an inoperable diesel generator. There is an increased risk associated with entering an OPERATIONAL CONDITION or other specified condition in the Applicability with an inoperable diesel generator subsystem and the provisions of Specification 3.0.4.b, which allow entry into an OPERATIONAL CONDITION or other specified condition in the Applicability with the Limiting Condition for Operation not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.~~

>INSERT 1

D.C. Sources

With one division with one or two battery chargers inoperable (e.g., the voltage limit of 4.8.2.1.a.2 is not maintained), the ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring a fully qualified charger to OPERABLE status in a reasonable time period. Action a.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to the minimum established float voltage provides good assurance that, within 18 hours, the battery will be restored to its fully charged condition (Action a.2) from any discharge that might have occurred due to the charger inoperability.

A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within 18 hours, avoiding a premature shutdown with its own attendant risk.

If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current-limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for.

**License Amendment Request  
Limerick Generating Station, Units 1 and 2  
Emergency Diesel Generator Testing Requirements**

**Insert 1 for Bases Page B 3/4 8 -1a**

If it can be determined that the cause of the inoperable EDG does not exist on the remaining operable EDG(s), based on a common-mode evaluation, then the EDG start test (SR 4.8.1.1.2.a.4) does not have to be performed. If it cannot otherwise be determined that the cause of the initial inoperable EDG does not exist on the remaining EDG(s), then satisfactory performance of the start test suffices to provide assurance of continued operability of the remaining EDG(s). If the cause of the initial inoperability exists on the remaining operable EDG(s), the EDG(s) shall be declared inoperable upon discovery and the appropriate action statement for multiple inoperable EDGs shall be entered. In the event the inoperable EDG is restored to operable status prior to completing the EDG start test (SR 4.8.1.1.2.a.4) or common-mode failure evaluation as required in Specification 3.8.1.1, the plant corrective action program shall continue to evaluate the common-mode failure possibility. However, this continued evaluation is not subject to the time constraint imposed by the action statement. The provisions contained in the inoperable EDG action requirements that avoid unnecessary EDG testing are based on Generic Letter 93-05, "Line-Item Technical Specifications Improvement to Reduce Surveillance Requirements for Testing During Power Operation," dated September 27, 1993.

The time, voltage, and frequency acceptance criteria specified for the EDG single largest post-accident load rejection test (SR 4.8.1.1.2.e.2) are derived from Regulatory Guide 1.9, Rev. 2, December 1979, recommendations. The test is acceptable if the EDG speed does not exceed the nominal (synchronous) speed plus 75% of the difference between nominal speed and the overspeed trip setpoint, or 115% of nominal, whichever is lower. This computes to be 66.5 Hz for the LGS EDGs. The RHR pump motor represents the single largest post-accident load. The 1.8 seconds specified is equal to 60% of the 3-second load sequence interval associated with sequencing the next load following the RHR pumps in response to an undervoltage on the electrical bus concurrent with a LOCA. This provides assurance that EDG frequency does not exceed predetermined limits and that frequency stability is sufficient to support proper load sequencing following a rejection of the largest single load.

### BASES

#### 3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION SYSTEMS

only three Unit 2 4 kV emergency buses, then each of the four Unit 2 4 kV emergency buses must be supplied from at least one operable offsite source. Onsite A.C. operability requirements for common systems such as CREFAS, SGTS, RHRSW and ESW are addressed in the appropriate system specification action statements.

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**License Amendment Request  
Limerick Generating Station, Units 1 and 2  
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