



Entergy Operations, Inc.  
1448 S.R. 333  
Russellville, AR 72801  
Tel 501-858-4888

Craig Anderson  
Vice President  
Operations ANO

June 12, 2001

2CAN060102

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

Subject: Arkansas Nuclear One – Unit 2  
Docket No. 50-368  
License No. NPF-6  
Request to Modify of Emergency Diesel Generator Surveillance  
Requirements

Gentlemen:

Arkansas Nuclear One, Unit 2 (ANO-2) proposes to change several Technical Specification (TS) surveillance requirements (SRs) that relate to the emergency diesel generators (EDGs). The proposed change includes administrative and technical revisions. In accordance with guidance contained in Generic Letter (GL) 94-01, *"Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators"*, TS SR 4.8.1.1.2.a will be modified and the associated Table referenced in the TS SR deleted. The EDG special reporting requirements contained in TS 6.9.1.5.d and SR 4.8.1.1.3 will also be deleted as addressed in the GL. Additionally, ANO-2 proposes that several TS SRs required by SR 4.8.1.1.2.c can be performed during any mode of operation rather than only during shutdown. This change will discuss eliminating the "during shutdown" testing requirement for: 1) SR 4.8.1.1.2.c.9, the twenty-four hour endurance run, 2) SR 4.8.1.1.2.c.10, verification of auto connected load 2 hour rating, and 3) SR 4.8.1.1.2.c.13, the fuel transfer test via the installed cross connect lines. The deletion of SR 4.8.1.1.2.c.1 is also proposed. This SR requires the EDG be subjected to manufacturer's suggested inspections every 18 months while shutdown. This inspection program is controlled using station procedures.

The NRC has reviewed and approved similar changes for Millstone Nuclear Power Station, Unit 3 by letter dated February 2, 2001.

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

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Entergy Operations requests that the effective date for this TS change to be within 60 days of approval. ANO-2 desires to perform "on line" maintenance and inspection activities prior to the next refueling outage. To support this goal, your review and approval is requested to be complete by December 15, 2001. This will allow the planning of EDG maintenance activities in accordance with ANO's seven-week planning schedule. Although this request is neither exigent nor emergency, your prompt review is requested.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 12, 2001

Very truly yours,

A handwritten signature in black ink, appearing to read "Craig Anderson", written in a cursive style.

C. G. Anderson  
Vice President, Operations  
Arkansas Nuclear One

CGA/dm  
Attachments

U. S. NRC  
2CAN060102

cc: Mr. Ellis W. Merschoff  
Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region IV  
611 Ryan Plaza Drive, Suite 400  
Arlington, TX 76011-8064

NRC Senior Resident Inspector  
Arkansas Nuclear One  
P. O. Box 310  
London, AR 72847

Mr. Thomas W. Alexion  
NRR Project Manager Region IV/ANO-2  
U. S. Nuclear Regulatory Commission  
NRR Mail Stop 04-D-03  
One White Flint North  
11555 Rockville Pike  
Rockville, MS 20852

Mr. David D. Snellings  
Director Division of Radiation  
Control and Emergency Management  
Arkansas Department of Health  
4815 West Markham Street  
Little Rock, AR 72205

ATTACHMENT 1

TO

2CAN060102

PROPOSED TECHNICAL SPECIFICATION

AND

RESPECTIVE SAFETY ANALYSES

IN THE MATTER OF AMENDING

LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-368

## **DESCRIPTION OF PROPOSED CHANGES**

Arkansas Nuclear One, Unit 2 proposes the following changes to the ANO-2 Technical Specifications (TSs) associated with the surveillance requirements (SRs) for the emergency diesel generators (EDGs).

- SR 4.8.1.1.1.b currently states in part “Demonstrated OPERABLE at least one per 18 months during shutdown **be** transferring...” The proposed change will replace the word “be” with “by”. The change will be as follows: “Demonstrated OPERABLE at least one per 18 months during shutdown **by** transferring...” This is an administrative error and will not be included in the technical discussion of changes.
- SR 4.8.1.1.2.a currently requires that each EDG be demonstrated operable in accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS. The proposed change will delete Table 4.8-1, which requires accelerated testing of the EDGs based on EDG failures, and require performance of the specified SRs at least once per 31 days on a staggered test basis.
- SR 4.8.1.1.2.c requires performance of several SRs “during shutdown.” The proposed change will eliminate the “during shutdown” requirement from 4.8.1.1.2.c and include “during shutdown” in specific SRs. This change will allow performance of the 24-hour endurance run (SR 4.8.1.1.2.c.9), the verification that the auto connected loads to each EDG do not exceed the 2 hour rating (SR 4.8.1.1.2.c.10), and the fuel transfer test via the installed cross connect lines (SR 4.8.1.1.2.c.13) during any mode of operation. SR 4.8.1.1.2.c.9 currently requires that during the first two hours of the EDG endurance run the EDG be loaded to an indicated 3000 to 3200 Kw. The proposed change will allow this portion of the two-hour run to be performed at anytime during the endurance test. Included in SR 4.8.1.1.2.c.9 and Note 5 are references to perform SR 4.8.1.1.2.c.5 within 5 minutes after completing the 24-hour test. Since SR 4.8.1.1.2.c.9 can only be performed during shutdown, it is proposed to change the referenced SR to SR 4.8.1.1.2.a.4.
- SR 4.8.1.1.2.c.1, which requires a manufacturer’s recommended inspection of the EDGs, will be deleted.
- SR 4.8.1.1.3, which requires an annual EDG report in accordance with TS 6.9.1.5.d, will be deleted as part of the proposed change to SR 4.8.1.1.2.a. TS 6.9.1.5.d will also be deleted.

## **BACKGROUND**

### **Emergency Diesel Generators**

Arkansas Nuclear One – Unit 2 (ANO-2) is equipped with two seismically qualified, class 1E, diesel engine driven generators that supply backup electrical power to the 4160 volt (V) vital AC busses. Each engine is designed to automatically start and tie-on to its respective 4160V engineered safety features (ESF) bus in the event of a bus under voltage condition on either the 4160 V bus or its associated 480V motor control center. If the EDG is tied to the grid when a bus under voltage condition occurs, the EDG output breaker will open, the loads on the 4160 V safety bus strip (except the 480V load center), and the offsite feeder breaker will trip open. This will ensure that the loads on the safety related 4160V bus are the only loads supplied by the EDG. The EDGs also receive an auto start command on a safety injection actuation signal, but will not load unless a bus under voltage condition exists.

Each EDG is designed to start automatically upon receipt of a start demand, attain rated speed and voltage within 15 seconds, and sequentially accept ESF loads. Each EDG is sized to accommodate loads up to all anticipated ESF actuated equipment with a continuous load rating of 2850 kilowatts (kW) and a 7-day rating of 3250 kW. Under procedurally controlled conditions, the EDGs may be aligned to supply the adjacent ESF bus via cross-tie breakers or back feed the non-class 1E 4160 V feeder bus to power select non-ESF loads.

The EDGs are designed for manual operation from either the local control panel or the control room operating panel. This provision allows operation for surveillance testing, manual start, and load operations.

### **Alternate AC Diesel Generator**

In addition to the EDGs, ANO has installed a diesel generator pursuant to the requirements of 10 CFR 50.63, "*Loss of All Alternating Current Power*", paragraph (c)(2), Alternate AC Source. The Alternate AC Diesel Generator (AACDG) is a 16 cylinder, four stroke, turbocharged, diesel engine driven generator rated at 4400 kW continuous output and 5320 kW overload. It is capable of supplying 4160 V power to ANO-1 vital buses A3 or A4, or ANO-2 vital buses 2A3 or 2A4. It can also supply non-vital 4160V buses A1 for ANO-1 or 2A1 for ANO-2. The buses can be supplied in any combination as long as the total load does not exceed the engine load rating. The design consideration for the AACDG assumed the engine would be started from the control room and available to power the safety buses within 10 minutes of the diagnosis of a station blackout condition.

The AACDG is a non-Q, manually started and loaded alternate source of AC power. Operation and loading of the AACDG is possible from the ANO-2 control room or locally. The AACDG procedure contains instructions for operating under various

circumstances such as starting, loading, unloading, aligning to electrical buses, emergency starting/loading, and starting/loading with failure of both controlling computers. The procedure also contains instructions for the quarterly full load test and an 18-month test that verifies starting and loading in less than 10 minutes.

The AACDG is discussed in section 8.3.3 of the ANO-2 SAR.

### Offsite Power

Typically, power is supplied to the Unit 2 AC electrical buses via the unit auxiliary transformer (UAT). Two offsite power sources, startup transformer #3 (SU3) and startup transformer #2 (SU2), are available to supply power to the unit when the UAT is not available. SU3 is identical to the UAT except it is powered from offsite. SU2 is capable of supplying both ANO-1 and ANO-2. With the UAT supplying house loads, if a main turbine trip were to occur, the house loads transfer automatically to SU3.

### EDG Inspections

SR 4.8.1.1.2.c.1 requires subjecting the EDG to an inspection in accordance with procedures prepared in conjunction with its manufacture's recommendations for this class of standby service. Maintenance activities are presently performed and will continue to be performed in accordance with manufacturer's recommendations. Any change to the frequencies of the manufacturer's suggested inspections requires an evaluation of previous inspection results.

The 18-month EDG inspection activities include:

1. Remove, inspect and re-install exhaust manifolds
2. Open, clean and inspect control side air box
3. Open, clean and inspect opposite control side air box
4. Main bearing parting line checks (upper and lower mains)
5. Connecting rod bearing parting line checks (upper and lower rods)
6. Crankshaft deflection readings (lower crank)
7. Crankshaft thrust readings (lower crank)
8. Cams, cam bearing, and tappet follower inspection
9. Timing chain inspection and adjustment (if necessary)
10. Check injector timing and adjustment (if necessary)
11. Remove, pop-test/reset and re-install injection nozzles
12. Inspect gear drive to cooling pumps and oil pump
13. Water hydro of block, liners and piping
14. Cylinder inspection, exhaust port inspection
15. Vertical drive inspection
16. Vertical drive backlash on gear drive
17. Scavenging blower, clean, inspect, and measure rotor clearances
18. Engine to generator alignment check
19. Upper piston wrist pin clearance measurement

20. Change air intake filter
21. Drain crankcase, clean, inspect, and re-fill with new oil
22. Change and inspect oil filter
23. Change and inspect oil strainer
24. Change and inspect fuel oil filter
25. Clean and inspect fuel oil strainer
26. Inspect interstage coolers (clean as necessary)
27. Jacket water heat exchanger, clean and inspect
28. Air cooler heat exchanger, clean and inspect
29. Lube oil cooler, clean and inspect
30. AMOT valves (temperature control valves) control element replacement
31. Install/remove test cock valves
32. Firing pressure and compression readings
33. Install heat shields and strongbacks
34. Install air box covers
35. Install crankcase covers
36. Inspect/replace starting air filters
37. Inspect torsional dampers
38. Inspect and clean crankcase ejector
39. Check foundation bolts for tightness
40. Change governor oil, flush, set mechanical and electrical controls
41. Calibration check of pressure and temperature instruments
42. Overspeed trip test

These activities are worked around the clock and typically take approximately four to five days, depending largely on the amount of corrective maintenance required. The amount of corrective maintenance will vary from cycle to cycle, based on equipment conditions, industry issues, etc.

#### **BASIS FOR PROPOSED CHANGE**

##### **SR 4.8.1.1.2.a and Table 4.8-1**

SR 4.8.1.1.2.a requires each EDG to be demonstrated operable in accordance with the frequency specified in Table 4.8-1 on a staggered test basis. The table requires increasing the surveillance frequency based on test failures. The proposed change will delete the accelerated testing requirements. This change is made using the guidance contained in Generic Letter (GL) 94-01, "*Removal of Accelerated Testing and Special Reporting Requirements For Emergency Diesel Generators.*" The GL requires that the provisions of 10 CFR 50.65, "*Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,*" and the guidance contained in Regulatory Guide (RG) 1.160, "*Monitoring the Effectiveness of Maintenance at Nuclear Power Plants*" be implemented for the EDGs. The elements of the program include the performance of a detailed root 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. ANO is in compliance with the maintenance rule and the program elements described above. Therefore, removing the reference to Table 4.8-1 and inserting "at least once per 31 days" is consistent with the guidance contained in the GL. In addition the proposed change is in accordance with NUREG-1432, "*Standard Technical Specifications for Combustion Engineering Plants.*"

SR 4.8.1.1.2.c.1

The proposed change will delete the requirement to subject the EDG to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service. Performance of this inspection does not prove EDG operability. Scheduling of maintenance activities is in accordance with 10 CFR 50.65. In addition the proposed change is in accordance with NUREG-1432.

SR 4.8.1.1.2.c.9

The proposed change will remove the "during shutdown" requirement related to performing the 24 hour endurance run on the EDGs. The EDGs are run at least once every 31 days, during power operation, to satisfy TS SR 4.8.1.1.2.a. The EDG system alignment with offsite power for the monthly test is identical to the lineup for the 24-hour endurance run. Therefore, performing the 24-hour endurance test at power does not introduce a new mode of operation. The EDG remains operable while paralleled to the electrical grid. If an accident occurred while the EDG is in the test mode paralleled to the grid, the EDG output breaker will open in response to an actuation signal and will remain running and available to supply the associated emergency bus should a bus under voltage occur. If the EDG is tied to the grid when a bus under voltage condition occurs, the EDG output breaker will open, the loads on the 4160 V safety bus strip (except the 480V load center), and the offsite feeder breaker will trip open. This will ensure that the loads on the safety related 4160V bus are the only loads supplied by the EDG. SRs 4.8.1.1.2.c.5, 4.8.1.1.2.c.8, and 4.8.1.1.2.c.12 require testing this capability of the EDG. Additionally, the EDG protective features are available during the endurance test and the redundant EDG will be not be affected by test performance.

ANO-2 notes that the following defense in depth features are presently practiced during EDG surveillance activities:

Standby EDG

The testing procedures require operability of the opposite train EDG and prohibit the opposite train EDG from being in the test mode simultaneously with the tested EDG. The EDGs are not tested simultaneously except as required by SR 4.8.1.1.2.d.

### Alternate AC DG

Typically, the AACDG will be available during the performance of this test. The AACDG is capable of supplying 4160 V power to ANO-1 vital buses A3 or A4, or ANO-2 vital buses 2A3 or 2A4. It can also supply non-vital 4160V buses A1 for ANO-1 or 2A1 for ANO-2. The buses can be supplied in any combination as long as the total load does not exceed the engine load rating. The AACDG can be started from the control room and be available to power the safety buses within 10 minutes of the diagnosis of a station blackout condition. The AACDG is completely independent from off-site power and the EDGs, with the exception of the bulk fuel oil storage system. The AACDG, all support systems, and attendant electrical buses are housed in a dedicated building located outside the power block and inside the protected area fence.

### Severe Weather and Grid Stability

The current testing procedure for the EDG 24-hour endurance run requires that the system dispatcher be notified to determine if any potential grid disturbances exist that may prevent tying the EDG to the electrical grid. Additionally, ANO has a National Weather Service (NWS) monitor in the control room that alarms and provides updates in the event of severe weather. Typically, the EDG would not be placed in service during severe weather unless an accident condition warranted its use.

### Fuel Oil Supply

ANO has an above ground non-safety bulk fuel storage tank that is aligned to gravity fill the fuel storage tank that is required by TS 3.8.1.1.b.2. As part of planning and preparations to perform the above test, the fuel oil inventory will be verified acceptable. The TS minimum fuel oil volume requirements will be maintained during the performance of this test.

The desire to perform this test on line allows increased flexibility in the scheduling and performance of surveillance activities. If the endurance test is performed while at power, EDG availability during shutdown modes is improved and the outage scope is reduced.

This SR requires that during the first two hours of the test the EDG be loaded to an indicated 3000 to 3200 kW. The proposed change will allow this to be performed at anytime during the endurance test. The EDG is designed to carry this load and therefore can carry the load at anytime during the twenty-four hour run.

This SR and the associated Note 5 reference that SR 4.8.1.1.2.c.5 must be performed within 5 minutes of completing the 24-hour EDG run. It is not possible for ANO-2 to perform SR 4.8.1.1.2.c.5 while on line. Therefore, it is proposed that SR 4.8.1.1.2.a.4 be performed within 5 minutes of completing the 24 hour run or as allowed by Note 5.

SR 4.8.1.1.2.a.4 requires that the EDG starts from a standby condition and accelerates to at least 900 rpm in  $\leq 15$  seconds. The proposed change is consistent with NUREG-1432 and the guidance contained in Generic Letter 93-05, "*Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation.*"

SR 4.8.1.1.2.c.10

The proposed change will remove the "during shutdown" restriction. This SR ensures that the auto-connected loads to each EDG do not exceed the 2-hour rating of the EDGs. This is performed using engineering calculations. These calculations can be reviewed and revised at any time. Deleting the restriction to perform this test only during shutdown will allow flexibility in scheduling manpower.

SR 4.8.1.1.2.c.13

The proposed change will remove the "during shutdown" restriction. Verification that the fuel transfer pumps can transfer fuel from each fuel storage tank to each day tank via the installed cross connect can be performed during any mode of operation. The test requires opening two in series discharge cross connect valves, starting the fuel transfer pumps on each train and observing a change in level in each of the fuel oil day tanks. One EDG will be considered inoperable during the performance of this test. The test can be completed in less than two hours. Removing this test from the shutdown outage scope will increase flexibility in scheduling manpower.

SR 4.8.1.1.3 and TS 6.9.1.5.d

The proposed change will delete the EDG data report, which provides the number of valid tests and the number of valid failures for each EDG. Deletion of this reporting requirement is in conjunction with the proposed change to SR 4.8.1.1.2.a and deletion of Table 4.8-1 and is accordance with GL 94-01.

**DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION**

Energy Operations, Inc. is proposing that the Arkansas Nuclear One, Unit 2 (ANO-2) Operating License be amended to include the following changes to the Surveillance Requirements (SRs) associated with the Emergency Diesel Generators (EDGS):

- SR 4.8.1.1.2 will be modified to require performance at least every 31 days. The current SR requires accelerated testing frequencies listed in Table 4.8-1. The change in test frequency is based on the number of failures associated with various EDG components. This change as well as the deletion of Table 4.8-1 is in accordance with Generic Letter (GL) 94-01, "*Removal of Accelerated Testing and Special Reporting*

*Requirements For Emergency Diesel Generators*” and is consistent with “*Standard Technical Specifications Combustion Engineering Plants*,” NUREG-1432.

- SR 4.8.1.1.8.c.1 will be deleted. This SR requires that the EDG be subjected to an inspection in accordance with procedures prepared in conjunction with its manufacturer’s recommendations. Completion of this SR does not prove operability. The inspections are maintenance activities and controlled under existing maintenance procedures and scheduled tasks. The proposed change is consistent with NUREG-1432.
- SR 4.8.1.1.2.c.9 will be modified to allow performance of the 24-hour endurance run during any mode of operation. The EDG is operable during the performance of this test. If the EDG is needed in response to a safety injection actuation signal (SIAS), the EDG output breaker is designed to open and reclose if an accompanying under voltage condition exists. This SR currently requires that during the first two hours of the test the EDG be loaded to an indicated 3000 to 3200 Kw. The EDG is designed to carry this load at anytime during operation and therefore, performance of this portion of the surveillance does not have to be limited to the first two hours of the test. The proposed change will eliminate the requirement to perform this during the first two hours of the twenty four hours, although still require the EDG to be loaded to an indicated 3000 to 3200 Kw for two hours. Also included in the SR is a proposed change to the referenced SR 4.8.1.1.2.c.5 which is referred to in SR 4.8.1.1.2.c.9 and associated note 5. GL 93-05, “*Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation*,” contains guidance that allows changing this referenced SR to SR 4.8.1.1.2.a.4.
- SR 4.8.1.1.2.c.10 will be changed to allow performance during any mode of operation. This SR provides verification that the auto-connected loads to each diesel generator do not exceed the 2 hour rating of 3135 Kw. Existing engineering calculations are reviewed and revised, as needed to satisfy this SR. Performance of this SR does not require the plant to be shutdown.
- SR 4.8.1.1.2.c.13 will be amended to remove the "during shutdown" restriction. This SR tests the ability of the fuel transfer system to provide fuel from each of the fuel storage tanks to the day tank of each of the EDGs via an installed cross connect. One EDGs will be considered inoperable during the approximate two hours it takes to perform of this test.
- SR 4.8.1.1.3 and Specification 6.9.1.5.d will be deleted in accordance with GL 94-01.

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

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

There are no previously evaluated accidents associated with these surveillance activities. The EDGs are not accident initiators. The EDGs provide assistance in accident mitigation. There are no technical changes related to the acceptance criteria of any of these surveillances nor are there any physical changes to plant design proposed in this amendment request. The proposed change, requesting that the frequency and scheduling aspects of the surveillance requirements be changed to accommodate improved planning capability for testing and maintenance activities, does not affect the accident analyses. Additionally, the allowance to perform testing and maintenance activities on line will improve EDG availability during periods of shutdown operations.

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

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

The proposed change does not include any physical changes to plant design or a change to any of the current SR acceptance criteria. Performance of any of these surveillance activities while at power does not render the EDGs unavailable in that they can provide station power on demand. Performance of maintenance activities and surveillance requirements while on line, which could result in the equipment being out of service, was included in the development of the Limiting Conditions for Operation (LCO). Quantitative and qualitative evaluations relative to the credit allowed for redundant components and the time allowed for corrective actions were also considered in LCO development. Performance of these activities while on line does not create any new or different kinds of accident. The capability of the EDG to respond to an accident situation while tied to the grid during testing activities is tested as required by existing surveillance requirements. These tests ensure that if tied to the grid the EDG output breaker will open and the EDG remain running in standby until an under voltage condition is observed at which time the EDG will automatically tie on to the 4160 V ESF bus.

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

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

The proposed changes are associated with surveillance requirements for the EDGs. The deletion of accelerated testing requirements provides an enhancement to safety by eliminating unnecessary testing. The remaining proposed changes allow certain EDG surveillance requirements to be performed when the plant is at

power rather than when shutdown. The operation of, and requirements for, the equipment covered by the affected TSs will remain essentially the same.

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

Therefore, based on the reasoning presented above and the previous discussion of the amendment request, Entergy Operations has determined that the requested change does not involve a significant hazards consideration.

### **ENVIRONMENTAL IMPACT EVALUATION**

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

1. The proposed license amendment does not involve a significant hazards consideration as described previously in the evaluation.
2. As discussed in the significant hazards evaluation, this change does not result in a significant change or significant increase in the radiological doses for any Design Basis Accident. The proposed license amendment does not result in a significant change in the types or a significant increase in the amounts of any effluents that may be released off-site.
3. The proposed license amendment does not result in a significant increase to the individual or cumulative occupational radiation exposure because this change does not propose a change in design of the plant. Performance of these SR activities regardless of mode does not result in a significant increase to the individual or cumulative occupational radiation exposure.

**ATTACHMENT 2**

**MARKUP OF CURRENT TECHNICAL SPECIFICATIONS**

## ELECTRICAL POWER SYSTEM

### SURVEILLANCE REQUIREMENTS

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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 at least once per 7 days by verifying correct breaker alignments, indicated power availability, and
- b. Demonstrated OPERABLE at least once per 18 months during shutdown ~~be~~ by transferring (manually and automatically) unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE: (Note 1)

- a. ~~In accordance with the frequency specified in Table 4.8-1~~ At least once per 31 days 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 can be started and transfers fuel from the storage system to the day tank.
  4. Verifying the diesel starts from a standby condition and accelerates to at least 900 rpm in  $\leq 15$  seconds. (Note 2)
  5. Verifying the generator is synchronized, loaded to an indicated 2600 to 2850 Kw and operates for  $\geq 60$  minutes. (Notes 3 & 4)
  6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
- b. At least once per 92 days by verifying that a sample of diesel fuel from the fuel storage tank obtained in accordance with ASTM-D270-65, is within the acceptable limits specified in Table 1 of ASTM D975-74 when checked for viscosity, water and sediment.

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#### Note 1

All planned diesel generator starts for the purposes of these surveillances may be preceded by prelube procedures.

#### Note 2

This diesel generator start from a standby condition in  $\leq 15$  sec. shall be accomplished at least once every 184 days. All other diesel generator starts for this surveillance may be in accordance with vendor recommendations.

#### Note 3

Diesel generator loading may be accomplished in accordance with vendor recommendations such as gradual loading.

#### Note 4

Momentary transients outside this load band due to changing loads will not invalidate the test. Load ranges are allowed to preclude overloading the diesel generators.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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- c. At least once per 18 months ~~during shutdown~~ by:
1. ~~Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service. Deleted~~
  2. Verifying during shutdown that the automatic sequence time delay relays are OPERABLE at their setpoint  $\pm 10\%$  of the elapsed time for each load block.
  3. Verifying during shutdown the generator capability to reject a load of greater than or equal to its associated single largest post-accident load, and maintain voltage at  $4160 \pm 500$  volts and frequency at  $60 \pm 3$  Hz.
  4. Verifying during shutdown the generator capability to reject a load of 2850 Kw without exceeding 75% of the difference between nominal speed and the overspeed trip setpoint, or 15% above nominal, whichever is lower.
  5. Simulating during shutdown a loss of offsite power by itself, and:
    - a) Verifying de-energization of the emergency busses and load shedding from the emergency busses.
    - b. Verifying the diesel starts from a standby condition on the undervoltage auto-start signal, energizes the emergency busses with permanently connected loads, energizes the auto-connected shutdown loads through the time delay relays and operates for  $\geq 5$  minutes while its generator is loaded with the shutdown loads.
  6. Verifying during shutdown that on a Safety Injection Actuation Signal (SIAS) actuation test signal (without loss of offsite power) the diesel generator starts on the auto-start signal and operates on standby for  $\geq 5$  minutes.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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7. Verifying during shutdown that all diesel generator trips, except engine overspeed, lube oil pressure, generator differential, and engine failure to start, are automatically bypassed upon a Safety Injection Actuation Signal.
8. Simulating during shutdown a loss of offsite power in conjunction with SIAS and:
  - a) Verifying de-energization of the emergency busses and load shedding from the emergency busses.
  - b) Verifying the diesel starts from a standby condition on the auto-start signal, energizes the emergency busses with permanently connected loads, energizes the auto-connected emergency (accident) loads through the Time Delay Relays and operates for  $\geq 5$  minutes while its generator is loaded with the emergency loads.
9. Verifying the diesel generator operates for at least 24 hours. During ~~the first 2~~ hours of this test, the diesel generator shall be loaded to an indicated 3000 to 3200 Kw and during the remaining 22 hours of this test, the diesel generator shall be loaded to an indicated 2600 to 2850 Kw (Notes 3 & 4). Within 5 minutes after completing this 24 hour test, ~~repeat Specification 4.8.1.1.2.c.5~~ perform 4.8.1.1.2.a.4. (Note 5)
10. Verifying that the auto-connected loads to each diesel generator do not exceed the 2 hour rating of 3135 Kw.

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Note 3

Diesel generator loading may be accomplished in accordance with vendor recommendations, such as gradual loading.

Note 4

Momentary transients outside this load band due to changing loads will not invalidate the test. Load ranges are allowed to preclude overloading the diesel generators.

Note 5

If this test is not satisfactorily completed, it is not necessary to repeat the preceding 24 hour test, instead, the diesel generator may be operated at 2600 to 2850 Kw until internal temperatures stabilize but not less than 2 hours, then perform test 4.8.1.1.2.c.5 a.4 within 5 minutes.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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11. Verifying during shutdown the diesel generator's capability to:
  - a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,
  - b) Transfer its loads to the offsite power source, and
  - c) Proceed through its shutdown sequence.
  
12. Verifying during shutdown that with the diesel generator operating in a test mode (connected to its bus), a simulated safety injection signal overrides the test mode by (1) returning the diesel generator to standby operation and (2) automatically energizes the auto-connected emergency (accident) loads with offsite power.
  
13. Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the day tank of each diesel via the installed cross connection lines.
  
- d. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to at least 900 rpm in  $\leq 15$  seconds.

~~4.8.1.1.3 Reports — See Specification 6.9.1.5.d Deleted~~

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

<u>Number of Failures In</u> <u>Last 20 Valid Tests*</u>	<u>Number of Failures In</u> <u>Last 100 Valid Tests*</u>	<u>Test Frequency</u>
<u>≤ 1</u>	<u>≤ 4</u>	<u>At least once per 31 days</u>
<u>≥ 2</u>	<u>≥ 5</u>	<u>At least once per 7 days**</u>

\*Criteria for determining number of failures and number of valid tests shall be in accordance with Regulatory Guide 1.108, where the last 20/100 tests are determined on a diesel generator unit basis.

\*\*This test frequency shall be maintained until seven consecutive failure free demands have been performed and the number of failures in the last 20 valid demands has been reduced to one or less and the number of failures in the last 100 valid demands has been reduced to four or less.

ADMINISTRATIVE CONTROLS

ANNUAL REPORTS <sup>1/</sup>

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6.9.1.4 Annual reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

6.9.1.5. Reports required on an annual basis shall include:

- a. A tabulation on an annual basis for the number of station, utility and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man rem exposure according to work and job functions,<sup>2/</sup> e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignment to various duty functions may be estimates based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole body dose received from external sources shall be assigned to specific major work functions.
- b. The complete results of steam generator tube inservice inspections performed during the report period (reference Specification 4.4.5.5.b).
- c. Documentation of all challenges to the pressurizer safety valves.
- d. ~~A diesel generator data report which provides the number of valid tests and the number of valid failures for each diesel generator.~~ Deleted
- e. The results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.8. The following information shall be included: (1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded; (2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded the results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations; (3) Clean-up system flow history

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<sup>1/</sup> A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station.

<sup>2/</sup> This tabulation supplements the requirements of §20.407 of 10 CFR Part 20.

**ATTACHMENT 3**  
**MARKUP OF TECHNICAL SPECIFICATION BASES**

### 3/4.8 ELECTRICAL POWER SYSTEMS

#### BASES

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 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 redundant set of 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. ACTION requirements are consistent with Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability" and the Revised Standard Technical Specifications (NUREG 1432). The evaluation of a common cause failure (degradation that may affect the OPERABILITY of the remaining diesel generator) should be completed within 24 hours from when the affected diesel generator is determined to be inoperable.

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 unit status. Upon loss of a required power source, suspension of core alterations, the handling of irradiated fuel, and activities involving positive reactivity additions act to minimize the probability of the occurrence of postulated events. Suspension of these activities shall not preclude placing fuel assemblies in a safe position.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9 "Selection of Diesel Generator Set Capacity for Standby Power Supplies", March 10, 1971, and 1.108 "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants", Revision 1, August 1977, and Generic Letters 84-15, 93-05, and 94-01. Load Ranges provided in surveillances are allowed to avoid routine overloading of diesel generators. Load in excess of these load ranges for special testing, momentary variation due to changing bus loads, or short term variations shall not invalidate surveillance tests. For the purpose of surveillance testing, the term "standby condition" is defined as the approximate temperature range of the jacket cooling water and engine lube oil sump normally maintained by the engine keep warm system. An exception to this definition is the engine conditions that exist when performing the hot restart test following the 24 hour EDG endurance run. When performing this test, the engine is near normal operating temperature when in a "standby condition". Additionally, this definition includes the allowance to perform engine prelubrication prior to all planned test starts.

~~The Diesel Generator Test Schedule, Table 4.8-1 has been developed for the purpose of determining testing requirements based on the number of failures and valid tests using the example provided in Generic Letter 84-15 using a per diesel generator unit basis. The criteria of R.G.1.108 position C.2.c is used for criterial determination.~~