

April 20, 2001

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

Subject: **Docket Nos. 50-361 and 50-362**  
**Diesel Generator Surveillance Testing**  
**Amendment Application Numbers 208, Supplement 1 and 193,**  
**Supplement 1, Change to Technical Specification Section 3.8**  
**"ELECTRICAL POWER SYSTEMS"**  
**San Onofre Nuclear Generating Station Units 2 and 3**

Reference: Letter to the Document Control Desk (NRC) from D. E. Nunn (SCE) dated April 6, 2001; Subject: Docket Nos. 50-361 and 50-362, Diesel Generator Surveillance Testing, Amendment Application Numbers 208 and 193, Change to Technical Specification Section 3.8, "ELECTRICAL POWER SYSTEMS," San Onofre Nuclear Generating Station Units 2 and 3

Gentlemen:

Enclosed are Supplement 1 to Amendment Application Number 208 to Facility Operating License NPF-10, and Supplement 1 to Amendment Application Number 193 to Facility Operating License NPF-15, for the San Onofre Nuclear Generating Station, Units 2 and 3, respectively. The Amendment Applications consist of Proposed Technical Specification Change Number (PCN)-525 (referenced above) as revised by, Supplement 1, which is provided in Enclosure 1 to this letter.

PCN-525 is a request to revise Technical Specification (TS) 3.8.1, "AC Sources - Operating." This TS change request is to add annotations to Surveillance Requirements 3.8.1.2, 3.8.1.3, 3.8.1.9, 3.8.1.10 and 3.8.1.19 that provide guidance to assure a diesel generator sub-component, an automatic voltage regulator (AVR), is operable and regularly tested.

These supplements are being provided to more clearly state the surveillances required to validate an AVR is operable. These supplements do not make a substantive or a technical change to our original request; they are provided to eliminate any potential confusion and to clearly state our original intent. Thus, these supplements do not affect the no significant hazards findings as originally submitted in PCN - 525, referenced above.

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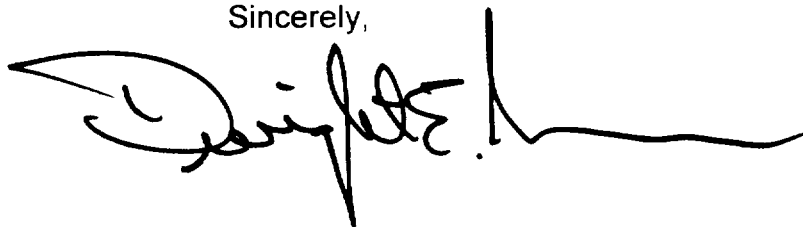
As discussed in PCN-525, each of the San Onofre Nuclear Generating Station (SONGS) diesel generators has 2 AVR's that are 100% redundant to each other. Only one AVR is required for the associated diesel generator to be operable, and only one AVR can be in service at any one time. PCN-525 proposed the addition of a note to SR 3.8.1.2 and 3.8.1.3 (which are monthly surveillances) to require that an AVR must have been in service during the performance of these surveillances during the past 60 days for that AVR to be considered operable. Our original note also mentioned SR 3.8.1.7, which is performed once every six months in lieu of SR 3.8.1.2. However, SR 3.8.1.2 already contains Note 1, which states that 3.8.1.7 may be performed in lieu of SR 3.8.1.2. Therefore, the reference to SR 3.8.1.7 is being removed from the proposed note.

The supplement to PCN-525 contains revised technical specification pages with the new note discussed above. Additionally, the supplement contains revised Bases pages, which include clarifying statements regarding these surveillances.

The Southern California Edison Company (SCE) requests these amendments be issued by July 1, 2001, and be effective 30 days after issuance. The reason for this date is to avoid taking Unit 2 off-line to perform the 24 month surveillances on the AVR's.

If you would like additional information regarding this Proposed Technical Specification Change, please call Jack Rainsberry at (949) 368-7420.

Sincerely,

A handwritten signature in black ink, appearing to read "Jack Rainsberry", with a long horizontal flourish extending to the right.

Enclosure

cc: E. W. Merschoff, Regional Administrator, NRC Region IV  
J. G. Kramer, NRC Acting Senior Resident Inspector, San Onofre Units 2 & 3  
L. Raghavan, NRC Project Manager, San Onofre Units 1, 2, and 3  
S. Y. Hsu, Department of Health Services, Radiologic Health Branch

**ENCLOSURE 1**

**AMENDMENT APPLICATIONS**

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN CALIFORNIA	)	
EDISON COMPANY, <u>ET AL.</u> for a Class 103	)	Docket No. 50-361
License to Acquire, Possess, and Use	)	
a Utilization Facility as Part of	)	Amendment Application
Unit No. 2 of the San Onofre Nuclear	)	No. 208, Supplement 1
Generating Station	)	

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 208, Supplement 1. This amendment application consists of Proposed Technical Specification Change Number 525, Supplement 1 to Facility Operating License NPF-10.

Proposed Technical Specification Change No. 525 is a request to revise Technical Specification (TS) 3.8.1, "AC Sources - Operating." This TS change request is to add annotations to Surveillance Requirements 3.8.1.2, 3.8.1.3, 3.8.1.9, 3.8.1.10, and 3.8.1.19 that provide guidance to ensure a diesel generator sub-component, an automatic voltage regulator (AVR), is operable and regularly tested. For an AVR to be considered OPERABLE it will be required to have undergone testing per Surveillance Requirements 3.8.1.2 and 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2., and also have undergone either Surveillance Requirement 3.8.1.9, 3.8.1.10, or 3.8.1.19 within the last 24 months, plus any allowance per SR 3.0.2.

Subscribed on this 20th day of April, 2001.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By:   
Dwight E. Nunn  
Vice President  
Engineering & Technical Services

State of California

County of San Diego

On April 19, 2001 before me, Mariane Sanchez  
personally appeared Dwight E. Nunn, personally known  
to me to be the person whose name is subscribed to the within instrument and acknowledged  
to me that he executed the same in his authorized capacity, and that by his signature on the  
instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature Mariane Sanchez



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN CALIFORNIA	)	
EDISON COMPANY, <u>ET AL.</u> for a Class 103	)	Docket No. 50-362
License to Acquire, Possess, and Use	)	
a Utilization Facility as Part of	)	Amendment Application
Unit No. 3 of the San Onofre Nuclear	)	No. 193, Supplement 1
Generating Station	)	

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 193, Supplement 1. This amendment application consists of Proposed Technical Specification Change No. 525, Supplement 1 to Facility Operating License NPF-15.

Proposed Technical Specification Change No. 525 is a request to revise Technical Specification (TS) 3.8.1, "AC Sources - Operating." This TS change request is to add annotations to Surveillance Requirements 3.8.1.2, 3.8.1.3, 3.8.1.9, 3.8.1.10, and 3.8.1.19 that provide guidance to ensure a diesel generator sub-component, an automatic voltage regulator (AVR), is operable and regularly tested. For an AVR to be considered OPERABLE it will be required to have undergone testing per Surveillance Requirements 3.8.1.2 and 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2., and also have undergone either Surveillance Requirement 3.8.1.9, 3.8.1.10, or 3.8.1.19 within the last 24 months, plus any allowance per SR 3.0.2.

Subscribed on this 20th day of April, 2001.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

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Dwight E. Nunn  
Vice President  
Engineering & Technical Services

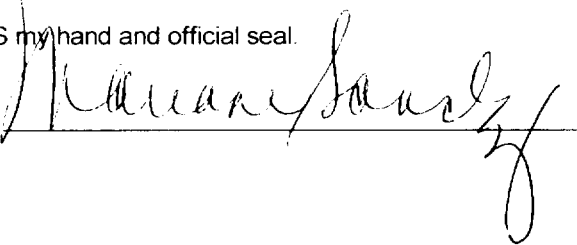
State of California

County of San Diego

On April 20, 2001 before me, Mariane Sanchez  
personally appeared Dwight E. Nunn, personally known  
to me to be the person whose name is subscribed to the within instrument and acknowledged  
to me that he executed the same in his authorized capacity, and that by his signature on the  
instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature





**DESCRIPTION OF SAFETY ANALYSIS  
OF PROPOSED CHANGE NPF-10/15-525, Supplement 1**

This is a request to revise Technical Specification (TS) 3.8.1, "AC Sources - Operating." This TS change request is to add annotations to Surveillance Requirements 3.8.1.2, 3.8.1.3, 3.8.1.9, and 3.8.1.10 that provide guidance to ensure a diesel generator (DG) sub-component, an automatic voltage regulator (AVR), is capable of performing its design function.

**Existing Technical Specifications Pages:**

Unit 2: See Attachment A

Unit 3: See Attachment B

**Proposed Technical Specifications Pages:** (Redline and Strikeout)

Unit 2: See Attachment C

Unit 3: See Attachment D

**Proposed Technical Specifications Pages:**

Unit 2: See Attachment E

Unit 3: See Attachment F

**Proposed Bases Pages (for information only):**

Unit 2: See Attachment G

Unit 3: See Attachment H

**Description of Change:**

Add the following note to Surveillance Requirements (SRs) 3.8.1.2 and 3.8.1.3

- To ensure Operability of an AVR, it must have been aligned to the DG during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2.

Add the following Note to Surveillance Requirements SR 3.8.1.9, and SR 3.8.1.10, and SR 3.8.1.19.

- To ensure Operability of an AVR, it must have been aligned to the DG during the performance of either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months, plus any allowance per SR 3.0.2



**Attachment C**  
**(Proposed Technical Specification Pages)**  
**(Redline and Strikeout)**  
**SONGS Unit 2**

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.2 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Performance of SR 3.8.1.7 satisfies this SR.</li> <li>2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.</li> <li>3. A modified DG start involving idling and gradual acceleration to rated speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.</li> <li>4. To ensure Operability of an AVR, it must have been aligned to the DG during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2.</li> </ol> <p>-----</p> <p>Verify each DG starts from standby conditions and achieves:</p> <ol style="list-style-type: none"> <li>a. Steady state voltage &gt; 4297 V and ≤ 4576 V; and</li> <li>b. Steady state frequency &gt; 59.7 Hz and ≤ 61.2 Hz.</li> </ol>	<p>As specified in Table 3.8.1-1</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.3 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. DG loadings may include gradual loading as recommended by the manufacturer.</li> <li>2. Momentary transients outside the load range do not invalidate this test.</li> <li>3. This Surveillance shall be conducted on only one DG at a time.</li> <li>4. This SR shall be preceded by, and immediately follow without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.7.</li> <li>5. To ensure Operability of an AVR, it must have been aligned to the DG during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2.</li> </ol> <p>-----</p> <p>Verify each DG is synchronized and loaded, and operates for &gt; 60 minutes at a load &gt; 4450 kW and ≤ 4700 kW.</p>	<p>As specified in Table 3.8.1-1</p>
<p>SR 3.8.1.4 Verify each day tank contains &gt; 30 inches of fuel oil.</p>	<p>31 days</p>
<p>SR 3.8.1.5 Check for and remove accumulated water from each day tank.</p>	<p>31 days</p>
<p>SR 3.8.1.6 Verify the fuel oil transfer system operates to transfer fuel oil from storage tank to the day tank.</p>	<p>31 days</p>

(continued)

**Attachment D**  
**(Proposed Technical Specification Pages)**  
**(Redline and Strikeout)**  
**SONGS Unit 3**

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.2 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Performance of SR 3.8.1.7 satisfies this SR.</li> <li>2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.</li> <li>3. A modified DG start involving idling and gradual acceleration to rated speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.</li> <li>4. To ensure Operability of an AVR, it must have been aligned to the DG during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2.</li> </ol> <p>-----</p> <p>Verify each DG starts from standby conditions and achieves:</p> <ol style="list-style-type: none"> <li>a. Steady state voltage &gt; 4297 V and ≤ 4576 V; and</li> <li>b. Steady state frequency &gt; 59.7 Hz and ≤ 61.2 Hz.</li> </ol>	<p>As specified in Table 3.8.1-1</p>

(continued)

## SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	<p>-----NOTES-----</p> <ol style="list-style-type: none"> <li>1. DG loadings may include gradual loading as recommended by the manufacturer.</li> <li>2. Momentary transients outside the load range do not invalidate this test.</li> <li>3. This Surveillance shall be conducted on only one DG at a time.</li> <li>4. This SR shall be preceded by, and immediately follow without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.7.</li> <li>5. To ensure Operability of an AVR, it must have been aligned to the DG during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2.</li> </ol> <p>-----</p> <p>Verify each DG is synchronized and loaded, and operates for &gt; 60 minutes at a load &gt; 4450 kW and ≤ 4700 kW.</p>	As specified in Table 3.8.1-1
SR 3.8.1.4	Verify each day tank contains > 30 inches of fuel oil.	31 days
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	31 days
SR 3.8.1.6	Verify the fuel oil transfer system operates to transfer fuel oil from storage tank to the day tank.	31 days

(continued)

**Attachment E**  
**(Proposed Technical Specification Pages)**  
**SONGS Unit 2**

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.2 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Performance of SR 3.8.1.7 satisfies this SR.</li> <li>2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.</li> <li>3. A modified DG start involving idling and gradual acceleration to rated speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.</li> <li>4. To ensure Operability of an AVR, it must have been aligned to the DG during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2.</li> </ol> <p>-----</p> <p>Verify each DG starts from standby conditions and achieves:</p> <ol style="list-style-type: none"> <li>a. Steady state voltage &gt; 4297 V and ≤ 4576 V; and</li> <li>b. Steady state frequency &gt; 59.7 Hz and ≤ 61.2 Hz.</li> </ol>	<p>As specified in Table 3.8.1-1</p>

(continued)



SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.3 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. DG loadings may include gradual loading as recommended by the manufacturer.</li> <li>2. Momentary transients outside the load range do not invalidate this test.</li> <li>3. This Surveillance shall be conducted on only one DG at a time.</li> <li>4. This SR shall be preceded by, and immediately follow without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.7.</li> <li>5. To ensure Operability of an AVR, it must have been aligned to the DG during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2.</li> </ol> <p>-----</p> <p>Verify each DG is synchronized and loaded, and operates for &gt; 60 minutes at a load &gt; 4450 kW and ≤ 4700 kW.</p>	<p>As specified in Table 3.8.1-1</p>
<p>SR 3.8.1.4 Verify each day tank contains &gt; 30 inches of fuel oil.</p>	<p>31 days</p>
<p>SR 3.8.1.5 Check for and remove accumulated water from each day tank.</p>	<p>31 days</p>
<p>SR 3.8.1.6 Verify the fuel oil transfer system operates to transfer fuel oil from storage tank to the day tank.</p>	<p>31 days</p>

(continued)

**Attachment F**  
**(Proposed Technical Specification Pages)**  
**SONGS Unit 3**

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.2 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Performance of SR 3.8.1.7 satisfies this SR.</li> <li>2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.</li> <li>3. A modified DG start involving idling and gradual acceleration to rated speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.</li> <li>4. To ensure Operability of an AVR, it must have been aligned to the DG during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2.</li> </ol> <p>-----</p> <p>Verify each DG starts from standby conditions and achieves:</p> <ol style="list-style-type: none"> <li>a. Steady state voltage &gt; 4297 V and ≤ 4576 V; and</li> <li>b. Steady state frequency &gt; 59.7 Hz and ≤ 61.2 Hz.</li> </ol>	<p>As specified in Table 3.8.1-1</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.3 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. DG loadings may include gradual loading as recommended by the manufacturer.</li> <li>2. Momentary transients outside the load range do not invalidate this test.</li> <li>3. This Surveillance shall be conducted on only one DG at a time.</li> <li>4. This SR shall be preceded by, and immediately follow without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.7.</li> <li>5. To ensure Operability of an AVR, it must have been aligned to the DG during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2.</li> </ol> <p>-----</p> <p>Verify each DG is synchronized and loaded, and operates for &gt; 60 minutes at a load &gt; 4450 kW and ≤ 4700 kW.</p>	<p>As specified in Table 3.8.1-1</p>
<p>SR 3.8.1.4     Verify each day tank contains &gt; 30 inches of fuel oil.</p>	<p>31 days</p>
<p>SR 3.8.1.5     Check for and remove accumulated water from each day tank.</p>	<p>31 days</p>
<p>SR 3.8.1.6     Verify the fuel oil transfer system operates to transfer fuel oil from storage tank to the day tank.</p>	<p>31 days</p>

(continued)

**Attachment G**  
**(Proposed Bases Pages)**  
**SONGS Unit 2**

BASES (continued)

SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.7 (continued)

The normal 31 day Frequency for SR 3.8.1.2 (see Table 3.8.1-1, "Diesel Generator Test Schedule," in the accompanying LCO) and the 184 day Frequency for SR 3.8.1.7 are consistent with Regulatory Guide 1.9 (Ref. 3). These frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing. Note 4 - This note discusses operability of the diesel generator subcomponent Automatic Voltage Regulator (AVR). The AVR is an integral part of the DG, however, each DG has 2 AVRS that are 100% redundant to each other. Only one AVR may be inservice at any one time. To ensure operability of each AVR, the AVRS must have been in service during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days plus any allowance per SR 3.0.2. SR 3.8.1.2 is modified by NOTE 1 to indicate that SR 3.8.1.7 satisfies all of the requirements of SR 3.8.1.2. This note is applicable for AVR operability. Also, each AVR must have been in service for either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months plus any allowance per SR 3.0.2. During the 24 month test dynamic performance of the AVR is measured to confirm it is acceptable for all required AVR transients. Based on the design of the AVR, its intended function and the maintenance history, the above specified surveillance schedule will assure the AVRS are capable of performing their intended function.

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads listed in Reference 2. This capability is verified by performing a load test between 90 to 100% of rated load, for an interval of not less than 60 minutes, consistent with the requirements of Regulatory Guide 1.9 (Ref. 3). The lower load limit of 4450 kW is 94.7% of the DG continuous rating (4700 kW). The 94.7% limit is based on design basis loading and includes instrument uncertainty plus margin. Instrument uncertainty is not applied to the upper load limit. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the surveillance is performed with DG kVAR output that offsite power system conditions permit during testing without exceeding equipment ratings (i.e., without creating an overvoltage condition on the ESF buses, over excitation condition on the ESF buses, over excitation condition in the generator, or overloading the DG main feeder). The kVAR loading requirement during this test is met, and the equipment ratings are not exceeded, when the DG kVAR output is increased such that:

(continued)

BASES (continued)

SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.3 (continued)

- a. kVAR is  $> 3000$  and  $\leq 3200$  or
- b. the excitation current is  $> 3.8$  A and  $\leq 4.0$  A or
- c. the ESF bus voltage is  $> 4530$  V and  $\leq 4550$  V or
- d. DG feeder current is  $> 730$  A and  $\leq 750$  A

This method of establishing kVAR loading ensures that, in addition to verifying the load carrying capability (kW) of the diesel engine, the reactive power (kVAR) and voltage regulation capability of the generator is verified to the extent practicable, consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3) and Information Notice 91-13 (Ref. 16).

The normal 31 day Frequency for this Surveillance (Table 3.8.1-1) is consistent with Regulatory Guide 1.9 (Ref. 3).

This SR is modified by ~~four~~ five Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary DG load transients do not invalidate this test. Note 3 indicates that this Surveillance should be conducted on only one DG at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates that a successful DG start must precede this test to credit satisfactory performance. Note 5 - This note discusses operability of the diesel generator subcomponent Automatic Voltage Regulator (AVR). The AVR is an integral part of the DG, however, each DG has 2 AVRS that are 100% redundant to each other. Only one AVR may be inservice at any one time. To ensure operability of each AVR, the AVRS must have been in service during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days plus any allowance per SR 3.0.2. SR 3.8.1.2 is modified by NOTE 1 to indicate that SR 3.8.1.7 satisfies all of the requirements of SR 3.8.1.2. This note is applicable for AVR operability. Also, each AVR must have been in service for either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months plus any allowance per SR 3.0.2. During the 24 month test dynamic performance of the AVR is measured to confirm it is acceptable for all required AVR transients. Based on the design of the AVR, its intended function and the maintenance history, the above specified surveillance schedule will assure the AVRS are capable of performing their intended function.

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is at or above the level selected to ensure adequate fuel oil for a minimum of 1 hour of DG operation at

(continued)

BASES (continued)

SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.9 (continued)

while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the system must recover following load rejection. The 24 month Frequency is consistent with the recommendation of Regulatory Guide 1.9 (Ref. 3).

In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, testing is performed by rejecting an inductive load with kW and kVAR greater than or equal to the single largest post-accident load (683 kW, 369 kVAR). These test conditions are consistent with the power factor requirements of Regulatory Guide 1.9 (Ref. 3) and the recommendations of Information Notice 91-13 (Ref. 16).

This SR is modified by ~~a~~ two Notes. ~~which~~ Note 1 acknowledges that credit may be taken for unplanned events that satisfy this SR. Note 2 - This note discusses operability of the diesel generator subcomponent Automatic Voltage Regulator (AVR). The AVR is an integral part of the DG, however, each DG has 2 AVRS that are 100% redundant to each other. Only one AVR may be inservice at any one time. To ensure operability of each AVR, the AVRS must have been in service during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days plus any allowance per SR 3.0.2. SR 3.8.1.2 is modified by NOTE 1 to indicate that SR 3.8.1.7 satisfies all of the requirements of SR 3.8.1.2. This note is applicable for AVR operability. Also, each AVR must have been in service for either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months plus any allowance per SR 3.0.2. During the 24 month test dynamic performance of the AVR is measured to confirm it is acceptable for all required AVR transients. Based on the design of the AVR, its intended function and the maintenance history, the above specified surveillance schedule will assure the AVRS are capable of performing their intended function.

SR 3.8.1.10

This Surveillance demonstrates the DG capability to reject a load equal to 90% to 100% of its continuous rating without overspeed tripping or exceeding the predetermined voltage limits. The lower load limit of 4450 kW is 94.7% of the DG continuous rating (4700 kW). The 94.7% limit is based on design basis loading and includes instrument uncertainty plus margin. Instrument uncertainty is not applied to the upper load limit.

(continued)



## BASES (continued)

SURVEILLANCE  
REQUIREMENTSSR 3.8.1.10 (continued)

This SR is modified by ~~a two~~ Notes, which Note 1 acknowledges that credit may be taken for unplanned events that satisfy this SR. Note 2 - This note discusses operability of the diesel generator subcomponent Automatic Voltage Regulator (AVR). The AVR is an integral part of the DG, however, each DG has 2 AVRS that are 100% redundant to each other. Only one AVR may be inservice at any one time. To ensure operability of each AVR, the AVRs must have been in service during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days plus any allowance per SR 3.0.2. SR 3.8.1.2 is modified by NOTE 1 to indicate that SR 3.8.1.7 satisfies all of the requirements of SR 3.8.1.2. This note is applicable for AVR operability. Also, each AVR must have been in service for either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months plus any allowance per SR 3.0.2. During the 24 month test dynamic performance of the AVR is measured to confirm it is acceptable for all required AVR transients. Based on the design of the AVR, its intended function and the maintenance history, the above specified surveillance schedule will assure the AVRs are capable of performing their intended function.

SR 3.8.1.11

As required by Regulatory Guide 1.9 (Ref. 3), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of selected loads and energization of the permanently connected loads from the DG. The permanently connected loads are the Class 1E 480 V Loadcenters and MCCs. It is recognized that certain consequential loads may also start following a loss of offsite power and therefore it is important to demonstrate that the DG operates properly with these loads. The consequential loads are sequenced on the DG following a LOVS with the same time delays as for a LOVS with a SIAS. Therefore, the ability of the DG to operate with the consequential loads is appropriately demonstrated by the existing Surveillance Requirement simulating a loss of offsite power in combination with a SIAS (Surveillance Requirement 3.8.1.19). Since there are no auto-connected shutdown loads, the Regulatory Guide 1.9 (Ref. 3) requirements for sequencing of auto-connected shutdown loads do not apply (Ref. 17). This surveillance further demonstrates the capability of the DG to automatically achieve the required voltage and frequency, to close the DG output breaker and connect to the ESF bus, and to reset the 4.16 kV bus undervoltage relay logic within the specified time.

(continued)

BASES (continued)

SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.8.1.19 (continued)

unplanned events that satisfy this SR. Note 3 - This note discusses operability of the diesel generator subcomponent Automatic Voltage Regulator (AVR). The AVR is an integral part of the DG, however, each DG has 2 AVRS that are 100% redundant to each other. Only one AVR may be in service at any one time. To ensure operability of each AVR, the AVRS must have been in service during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days plus any allowance per SR 3.0.2. SR 3.8.1.2 is modified by NOTE 1 to indicate that SR 3.8.1.7 satisfies all of the requirements of SR 3.8.1.2. This note is applicable for AVR operability. Also, each AVR must have been in service for either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months plus any allowance per SR 3.0.2. During the 24 month test dynamic performance of the AVR is measured to confirm it is acceptable for all required AVR transients. Based on the design of the AVR, its intended function and the maintenance history, the above specified surveillance schedule will assure the AVRS are capable of performing their intended function.

SR 3.8.1.20

This Surveillance demonstrates that the DG starting independence has not been compromised. This Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously.

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.b, Regulatory Guide 1.137 (Ref. 10), paragraph C.2.f, and Regulatory Guide 1.9 (Ref. 3).

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated, and temperature maintained consistent with manufacturer recommendations.

Diesel Generator Test Schedule

The DG test schedule (Table 3.8.1-1) implements the recommendations of Revision 3 to Regulatory Guide 1.9 (Ref. 3). The purpose of this test schedule is to provide timely test data to establish a confidence level associated with the goal to maintain DG reliability above 0.95 per demand.

(continued)

**Attachment H**  
**(Proposed Bases Pages)**  
**SONGS Unit 3**

## BASES (continued)

SURVEILLANCE  
REQUIREMENTSSR 3.8.1.2 and SR 3.8.1.7 (continued)

The normal 31 day Frequency for SR 3.8.1.2 (see Table 3.8.1-1, "Diesel Generator Test Schedule," in the accompanying LCO) and the 184 day Frequency for SR 3.8.1.7 are consistent with Regulatory Guide 1.9 (Ref. 3). These frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing. Note 4 - This note discusses operability of the diesel generator subcomponent Automatic Voltage Regulator (AVR). The AVR is an integral part of the DG, however, each DG has 2 AVRS that are 100% redundant to each other. Only one AVR may be inservice at any one time. To ensure operability of each AVR, the AVRS must have been in service during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days plus any allowance per SR 3.0.2. SR 3.8.1.2 is modified by NOTE 1 to indicate that SR 3.8.1.7 satisfies all of the requirements of SR 3.8.1.2. This note is applicable for AVR operability. Also, each AVR must have been in service for either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months plus any allowance per SR 3.0.2. During the 24 month test dynamic performance of the AVR is measured to confirm it is acceptable for all required AVR transients. Based on the design of the AVR, its intended function and the maintenance history, the above specified surveillance schedule will assure the AVRS are capable of performing their intended function.

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads listed in Reference 2. This capability is verified by performing a load test between 90 to 100% of rated load, for an interval of not less than 60 minutes, consistent with the requirements of Regulatory Guide 1.9 (Ref. 3). The lower load limit of 4450 kW is 94.7% of the DG continuous rating (4700 kW). The 94.7% limit is based on design basis loading and includes instrument uncertainty plus margin. Instrument uncertainty is not applied to the upper load limit. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the surveillance is performed with DG kVAR output that offsite power system conditions permit during testing without exceeding equipment ratings (i.e., without creating an overvoltage condition on the ESF buses, over excitation condition on the ESF buses, over excitation condition in the generator, or overloading the DG main feeder). The kVAR loading requirement during this test is met, and the equipment ratings are not exceeded, when the DG kVAR output is increased such that:

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BASES (continued)

SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.3 (continued)

- a. kVAR is  $> 3000$  and  $\leq 3200$  or
- b. the excitation current is  $> 3.8$  A and  $\leq 4.0$  A or
- c. the ESF bus voltage is  $> 4530$  V and  $\leq 4550$  V or
- d. DG feeder current is  $> 730$  A and  $\leq 750$  A

This method of establishing kVAR loading ensures that, in addition to verifying the load carrying capability (kW) of the diesel engine, the reactive power (kVAR) and voltage regulation capability of the generator is verified to the extent practicable, consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3) and Information Notice 91-13 (Ref. 16).

The normal 31 day Frequency for this Surveillance (Table 3.8.1-1) is consistent with Regulatory Guide 1.9 (Ref. 3).

This SR is modified by ~~four~~ five Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary DG load transients do not invalidate this test. Note 3 indicates that this Surveillance should be conducted on only one DG at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates that a successful DG start must precede this test to credit satisfactory performance. Note 5 - This note discusses operability of the diesel generator subcomponent Automatic Voltage Regulator (AVR). The AVR is an integral part of the DG, however, each DG has 2 AVRS that are 100% redundant to each other. Only one AVR may be inservice at any one time. To ensure operability of each AVR, the AVRs must have been in service during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days plus any allowance per SR 3.0.2. SR 3.8.1.2 is modified by NOTE 1 to indicate that SR 3.8.1.7 satisfies all of the requirements of SR 3.8.1.2. This note is applicable for AVR operability. Also, each AVR must have been in service for either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months plus any allowance per SR 3.0.2. During the 24 month test dynamic performance of the AVR is measured to confirm it is acceptable for all required AVR transients. Based on the design of the AVR, its intended function and the maintenance history, the above specified surveillance schedule will assure the AVRs are capable of performing their intended function.

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is at or above the level selected to ensure adequate fuel oil for a minimum of 1 hour of DG operation at

(continued)

BASES (continued)

SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.9 (continued)

while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the system must recover following load rejection. The 24 month Frequency is consistent with the recommendation of Regulatory Guide 1.9 (Ref. 3).

In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, testing is performed by rejecting an inductive load with kW and kVAR greater than or equal to the single largest post-accident load (683 kW, 369 kVAR). These test conditions are consistent with the power factor requirements of Regulatory Guide 1.9 (Ref. 3) and the recommendations of Information Notice 91-13 (Ref. 16).

This SR is modified by ~~a~~ two Notes. ~~which~~ Note 1 acknowledges that credit may be taken for unplanned events that satisfy this SR. Note 2 - This note discusses operability of the diesel generator subcomponent Automatic Voltage Regulator (AVR). The AVR is an integral part of the DG, however, each DG has 2 AVRS that are 100% redundant to each other. Only one AVR may be inservice at any one time. To ensure operability of each AVR, the AVRs must have been in service during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days plus any allowance per SR 3.0.2. SR 3.8.1.2 is modified by NOTE 1 to indicate that SR 3.8.1.7 satisfies all of the requirements of SR 3.8.1.2. This note is applicable for AVR operability. Also, each AVR must have been in service for either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months plus any allowance per SR 3.0.2. During the 24 month test dynamic performance of the AVR is measured to confirm it is acceptable for all required AVR transients. Based on the design of the AVR, its intended function and the maintenance history, the above specified surveillance schedule will assure the AVRs are capable of performing their intended function.

SR 3.8.1.10

This Surveillance demonstrates the DG capability to reject a load equal to 90% to 100% of its continuous rating without overspeed tripping or exceeding the predetermined voltage limits. The lower load limit of 4450 kW is 94.7% of the DG continuous rating (4700 kW). The 94.7% limit is based on design basis loading and includes instrument uncertainty plus margin. Instrument uncertainty is not applied to the upper load limit.

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## BASES (continued)

SURVEILLANCE  
REQUIREMENTSSR 3.8.1.10 (continued)

This SR is modified by ~~a two~~ Notes. ~~which~~ Note 1 acknowledges that credit may be taken for unplanned events that satisfy this SR. Note 2 - This note discusses operability of the diesel generator subcomponent Automatic Voltage Regulator (AVR). The AVR is an integral part of the DG, however, each DG has 2 AVRS that are 100% redundant to each other. Only one AVR may be inservice at any one time. To ensure operability of each AVR, the AVRS must have been in service during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days plus any allowance per SR 3.0.2. SR 3.8.1.2 is modified by NOTE 1 to indicate that SR 3.8.1.7 satisfies all of the requirements of SR 3.8.1.2. This note is applicable for AVR operability. Also, each AVR must have been in service for either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months plus any allowance per SR 3.0.2. During the 24 month test dynamic performance of the AVR is measured to confirm it is acceptable for all required AVR transients. Based on the design of the AVR, its intended function and the maintenance history, the above specified surveillance schedule will assure the AVRS are capable of performing their intended function.

SR 3.8.1.11

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BASES (continued)

SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.8.1.19

unplanned events that satisfy this SR. Note 3 - This note discusses operability of the diesel generator subcomponent Automatic Voltage Regulator (AVR). The AVR is an integral part of the DG, however, each DG has 2 AVRS that are 100% redundant to each other. Only one AVR may be in service at any one time. To ensure operability of each AVR, the AVRS must have been in service during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days plus any allowance per SR 3.0.2. SR 3.8.1.2 is modified by NOTE 1 to indicate that SR 3.8.1.7 satisfies all of the requirements of SR 3.8.1.2. This note is applicable for AVR operability. Also, each AVR must have been in service for either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months plus any allowance per SR 3.0.2. During the 24 month test dynamic performance of the AVR is measured to confirm it is acceptable for all required AVR transients. Based on the design of the AVR, its intended function and the maintenance history, the above specified surveillance schedule will assure the AVRS are capable of performing their intended function.

SR 3.8.1.20

This Surveillance demonstrates that the DG starting independence has not been compromised. Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously.

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This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated, and temperature maintained consistent with manufacturer recommendations.

Diesel Generator Test Schedule

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