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Michael A. Krupa  
Director  
Nuclear Safety Assurance

GNRO-2005/00056

November 21, 2005

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

**SUBJECT:** Supplement to Amendment Request  
Adoption of NRC Approved Generic Changes to the Improved  
Technical Specifications  
Grand Gulf Nuclear Station, Unit 1  
Docket No. 50-416  
License No. NPF-29

**REFERENCE:** Letter GNRO-2005/00016, from George A. Williams to USNRC,  
"License Amendment Request - Adoption of NRC Approved  
Generic Changes to the Improved Technical Specifications,"  
dated March 30, 2005 (TAC No. MC6651)

Dear Sir or Madam:

By the letter referenced above, Entergy Operations, Inc. (Entergy) proposed a change to the Grand Gulf Nuclear Station, Unit 1 (GGNS) Technical Specifications (TS) to adopt selected changes resulting from the Technical Specification Task Force (TSTF) process.

On July 21, August 18, October 25, and on November 3, 2005 Entergy and members of your staff held calls to discuss some of the proposed TSTF changes. As a result of the calls, five questions were determined to need formal response. Entergy's response is contained in Attachment 1.

Entergy is proposing one technical change to the original request. By the referenced letter, Entergy proposed to modify certain Surveillance Requirements (SR) in accordance with TSTF-276 to allow the Diesel Generator (DG) surveillances to be performed at a power factor as close as practicable to the limit if grid conditions prevent meeting the limit. The current power factor limit is  $\leq 0.9$  for DG 11, DG 12, and DG 13. However, Entergy has determined that the power factor limit for DG 12 should be changed to  $\leq 0.89$ . Revised TS and associated Bases changes reflecting the more restrictive power factor limit for DG 12 are provided as Attachments 2 and 3. Entergy also requests that performance of the modified SRs for DG 12 be at the next regularly scheduled performance rather than immediately upon implementation. The change is

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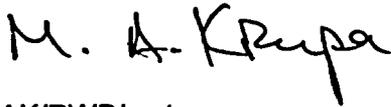
still consistent with approved TSTF. The original no significant hazards consideration included in referenced letter is not affected by any information contained in this supplemental letter.

There are two new commitments contained in this letter. The commitments are listed in Attachment 4.

If you have any questions or require additional information, please contact Ron Byrd at 601-368-5792.

I declare under penalty of perjury that the foregoing is true and correct. Executed on November 21, 2005.

Sincerely,

Handwritten signature of M. A. Krupa in black ink.

MAK/RWB/amt

Attachments:

1. Response to Request For Additional Information
2. Revised Markup of Technical Specification and Operating License Pages
3. Revised Markup of Technical Specification Bases Pages
4. List of Regulatory Commitments

cc: (See Next Page)

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cc: NRC Senior Resident Inspector  
Grand Gulf Nuclear Station  
Port Gibson, MS 39150

Dr. Bruce S. Mallett  
Regional Administrator, Region IV  
U. S. Nuclear Regulatory Commission  
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U. S. Nuclear Regulatory Commission  
Attn: Mr. Bhalchandra Vaidya MS O-7D1  
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Mr. Brian W. Amy, MD, MHA, MPH  
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Mr. D. E. Levanway (Wise Carter)  
Mr. L. J. Smith (Wise Carter)  
Mr. N. S. Reynolds  
Mr. J. N. Compton

**Attachment 1**

**To**

**GNRO-2005/00056**

**Response to Request for Additional Information**

**Response to Request for Additional Information Related to GGNS License Amendment  
Request - Adoption of NRC Approved Generic Changes to the Improved Technical  
Specifications (TAC No. MC6651)**

**Question 1:**

**TSTF-276:**

It is not clear if the power factor of  $\leq 0.9$  represents the inductive loading that Diesel Generators (DGs) 11, 12, and 13 would experience during the worst case diesel loading conditions. Please provide your basis for the power factor of  $\leq 0.9$  with supporting calculation results.

**Response 1:**

Updated FSAR Tables 8.3-1, 8.3-2 and 8.3-3 list the loads for Division 1, Division 2, and Division 3 Engineered Safety Feature (ESF) busses. During normal operation and shutdown conditions, the ESF bus loads are powered from the preferred offsite power sources. During postulated design basis accident or transient events in which the normal offsite power sources are not available, the DGs provide emergency onsite power to the respective ESF busses. A loss of offsite power (LOOP) in conjunction with a Loss of Coolant Accident (LOCA) is the worst case anticipated DG loading condition.

The following power factors have been calculated for the LOOP/LOCA event:

<u>DG 11 (Division 1)</u>	<u>DG 12 (Division 2)</u>	<u>DG 13 (Division 3)</u>
0.90 @ 5.66 MVA	0.89 @ 4.77 MVA	0.92 @ 3.48 MVA

Currently, SR 3.8.1.9 (DG single-load rejection test), SR 3.8.1.10 (DG full-load rejection test), and SR 3.8.1.14 (DG 24-hour endurance test) require the Surveillances to be performed at a power factor limit of  $\leq 0.9$ . Entergy proposed to modify SRs in accordance with TSTF-276 to allow the DG Surveillances to be performed at a power factor as close as practicable to the limit if grid conditions were to prevent meeting the limit. Since the calculated power factor for DG 12 is actually 0.89, Entergy has revised the proposed change. The proposed change previously read:

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

Entergy is revising the change to read:

If performed with the DG synchronized with offsite power, it shall be performed at a power factor  $\leq 0.9$  for DG 11 and DG 13 and  $\leq 0.89$  for DG 12. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.

The change to the power factor limit for the DG 12 surveillances does not alter the intent of the proposed TSTF change and does not alter the conclusions of the No Significant Hazards Consideration (NSHC) provided in the original request. The intent of the power factor requirement as described in the TS Bases is to represent the actual inductive loading that a DG would see under design basis accident conditions. In addition, Regulatory Guide 1.9, Rev. 3, states that these tests should be performed while operating at a power factor between 0.8 and 0.9. TSTF-276 identified the power factor limit as a bracketed value which means that the limit is a plant specific value. As discussed above, the value for GGNS DG 12 has been determined to be 0.89. Therefore, the revised DG 12 power factor limit of  $\leq 0.89$  is consistent with the implementation of TSTF-276 and the standards of Regulatory Guide 1.9, Rev. 3.

The original NSHC concluded that the request to adopt TSTF-276 still afforded adequate assurance of safety when judged against regulatory standards. The NSHC also stated that the changes to the surveillance requirements continued to provide assurance that the necessary quality of systems and components would be maintained, that facility operation would be within safety limits, and that limiting conditions for operations would be met. These statements and conclusions remain valid for the DG 12 power factor limit changes associated with adoption of TSTF-276.

SR 3.0.1 requires SRs to be met in applicable MODES or other specified conditions. Failure to meet the SR either during performance of the surveillance or between surveillance performances constitutes a failure to meet the Limiting Condition for Operation (LCO). The modified SRs are therefore required to be met upon amendment implementation unless otherwise specified. The modified SRs for DG 11 and 13 are less restrictive than the current SRs and the power factor limit is not changed. Therefore, these SRs will immediately be met upon amendment implementation without the need to perform the surveillances. However, the modified SRs for DG 12 are slightly more restrictive due to the reduced power factor limit. Since documentation is not available to confirm that the DG 12 surveillances met the modified requirements during their last performance, the DG 12 surveillances would need to be revised and performed immediately upon amendment implementation. Entergy believes that performance of the DG 12 modified surveillances immediately upon implementation of the amendment is unnecessary.

The last DG 12 surveillances were performed using procedures that have a power factor limit of  $\leq .90$  which is consistent with the current SRs. Performance of the modified surveillances immediately upon implementation of the amendment at the slightly lower power factor limit of  $\leq .89$  would be unnecessary because the small difference between the power factor limits does not significantly affect the ability of the surveillances to verify that DG 12 is capable of performing its safety function. In addition, two of the three modified SRs for DG 12 are typically performed during plant refueling outages to avoid the potential for any on-line transients. The amendment is expected to be issued between refueling outages which would make immediate performance of the modified surveillances impractical. Therefore, Entergy requests that the modified SRs for DG 12 be performed at the next regularly scheduled performance rather than immediately upon implementation of the amendment.

Thus a new paragraph would be added to License Condition 2.C. (2) which states:

The Surveillance Requirements (SRs) for Diesel Generator 12 contained in the Technical Specifications and listed below, are not required to be performed immediately upon implementation of Amendment No. \_\_\_\_\_. The SRs listed below shall be successfully demonstrated at the next regularly scheduled performance.

SR 3.8.1.9,  
SR 3.8.1.10, and  
SR 3.8.1.14

SR 3.8.1.9, SR 3.8.1.10, and SR 3.8.1.14, will be performed and met within the 18 month frequency as measured from the previous performance.

Attachment 2 provides a revised mark-up of the proposed changes to TS pages 3.8-7, 3.8-8, and 3.8-12.

Attachment 3 provides revised Inserts 2 and 3 for the affected TS Bases pages. The TS Bases pages are only affected by the insert changes.

**Question 2:**

**TSTF-276**

The Note 2 for SRs 3.8.1.9 and 3.8.1.10 and Note 3 for SR 3.8.1.14 state "If performed with the DG synchronized with offsite power, it shall be performed at a power factor less than or equal to 0.9. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable." Describe the grid conditions that would not permit the power factor limit to be satisfied and how often these grid conditions are expected to occur in the future.

**Response 2:**

The use of the Note to allow a slight deviation from the power factor limit during surveillance testing is limited to times when grid conditions do not permit the power factor limit to be met. The primary intent of the allowance is to avoid testing conditions that could be harmful to the bus or to the DG. These conditions have been described in the TS Bases changes contained in TSTF-276 and in Attachment 3 of the GGNS License Amendment Request (LAR). The revised Bases describe two conditions for which the allowance may be applied. The first condition is when grid voltage is high and the additional field excitation needed to meet the power factor limit results in bus voltages that are too high. The second condition is when the excitation levels needed to meet the power factor limit are in excess of those recommended for the DG.

Entergy has not experienced any limitations in meeting the power factor limit during previous surveillances and does not anticipate such limitations in the future. The maximum specified grid voltage is 5% above nominal with a normal expected grid voltage of 2% above nominal. These grid voltages are not expected to limit the ability of the DG to meet the power factor requirement. However, if the two conditions listed above are encountered, it is expected that the allowance of the note would only be used for power factors in the range of 0.9 to 0.92.

The allowance of the Note is considered to be only a contingency for unexpected circumstances. Entergy understands that the Note is not to be used routinely or used for convenience and that the surveillances should be scheduled to meet the limit whenever possible. Since SR 3.8.1.9 and SR 3.8.1.10 are typically performed during refueling outages, the time window for performing the SRs may be limited. However, since the refueling outages are typically scheduled during off-peak seasons when power demand is lower, Entergy does not foresee any grid conditions that would prohibit meeting the power factor limit. SR 3.8.1.14, the DG 24-hour endurance run, may be performed on-line which provides more scheduling flexibility to perform the surveillance during favorable grid conditions. However, it should be noted that even though the power factor may be set below the limit at the start of the 24-hour DG run, grid conditions and the power factor could unexpectedly change during the run. The allowance of the note may also be applied to unexpected conditions that occur during performance of the surveillance.

In summary, Entergy does not foresee any specific need for use of the note in the future. The allowance of the note is considered to be only a contingency for unexpected circumstances.

**Question 3:**

**TSTF-276**

INSERT 3 of the amendment request states that "Note 3 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. .... Under certain conditions, however, Note 2 allows the surveillance to be conducted at a power factor other than  $\leq 0.9$ . .... " In INSERT 3, Note 2 should be Note 3. Please explain this discrepancy.

**Response 3:**

"Note 2" is a typographical error and has been corrected to "Note 3" as indicated in the revision to INSERT 3 in Attachment 3.

**Question 4:**

TSTF-400:

It appears that the proposed modification will eliminate verification that DG critical trips (Engine overspeed, Generator differential current, and Low lube oil pressure for DG 11 and DG 12) are not bypassed. Discuss how the staff can be assured that these critical trips will function (trips DG when condition is present in order to avert substantial damage to the DG unit and do not trip when condition is not present) unless these critical trips are periodically tested.

**Response 4:**

The proposed Technical Specification change revises Surveillance Requirement (SR) 3.8.1.13 to only require verification that the non-critical automatic trips are bypassed. It will not require the critical trips to be tested. However, plant procedures will require the DG critical trips to be tested at least once every 18 months to ensure proper functioning. In addition, the successful operation of the DGs required by more frequent Surveillances ensures that the critical trip functions are not failed in a manner that would prevent the DG from starting and performing its safety function.

**Question 5:**

TSTF-264

The GGNS TS Bases description of required overlap between Source Range Monitors (SRMs) and Intermediate Range Monitors (IRMs) differs from that described in NUREG-1434, *Improved Technical Specifications, General Electric Plants, BWR/6, Rev. 3*. Explain why the GGNS required overlap as described in the TS Bases is adequate.

**Response 5:**

The NUREG-1434 Bases for the Channel Check requirements of SR 3.3.1.1.1 states, "Overlap between SRMs and IRMs similarly exists when, prior to withdrawing the SRMs from the fully inserted position, IRMs are above mid-scale on Range 1 before SRMs have reached the upscale rod block." The GGNS TS Bases states, "Overlap between SRMs and IRMs similarly exists when, prior to withdrawing the SRMs from the fully inserted position, IRMs are above 2/40 on Range 1 before SRMs have reached the upscale rod block."

The difference in overlap requirements resulted from the GGNS original licensing basis and concerns raised at other Boiling Water Reactors over difficulty with meeting the mid-scale requirement. Prior to conversion to the Improved Technical Specification (ITS) format, the GGNS TS Bases stated that the SRMs could be retracted once the IRMs were on scale. The TS also required a one-half decade overlap for IRMs and SRMs. This requirement was intended to be relocated to the TS Bases as part of the ITS conversion. However, the NUREG-1434 standard description of overlap was adopted instead. Entergy later revised the TS Bases to change "mid-scale on Range 1" to "2/40 on Range 1" (i.e., on-scale) to be consistent with the previous licensing basis.

The IRMs are intended to measure neutron flux from the upper portion of the SRM scale to the lower portion of the power range monitors. This ensures that continuous monitoring capability is provided for monitoring neutron flux during reactor startup and heatup operations. The IRM system consists of eight channels of which six are required to be operable to support the Reactor Protection System and Rod Block functions. The IRMs cover a span of power indication of about 0.0001% to 40% power. The span is broken up into 10 ranges of indication (1-10). The IRM odd ranges indicate on a 0 - 40 scale while the even ranges indicate on a 0 - 125 scale. As reactor power increases, the IRMs must be ranged up to keep the readings on scale. An IRM downscale condition of 5/125 of scale (approximately equivalent to 2/40 of scale) indicates a possible channel malfunction or that reactor power has decreased to below the range of indication selected for that channel. Rod withdrawal under either condition could lead to an unsafe operating condition; therefore a downscale condition is alarmed and rod withdrawal is automatically blocked until the downscale condition is cleared.

Range 1 provides an indication, on a 0 - 40 scale, that the instruments are responding to very low flux levels. The downscale alarm and rod block function is bypassed when IRMs are set to Range 1. Although Range 1 is not designed with a downscale trip function, it may likewise be considered to be on-scale if the readings are above 2/40 of scale.

Plant procedures require all of the operable IRM channels to indicate above 2/40 of scale prior to the SRM readings reaching the upscale rod block setpoint. The SRM scale reads from  $10^{-1}$  to  $10^5$  counts per second (cps). The upscale rod block setpoint is set at  $1 \times 10^5$  cps which provides one decade of margin before reaching the end-of-scale. All operable IRM channels simultaneously reading at least 2/40 of scale provides sufficient confidence that the IRMs are responding to neutron flux and providing overlap with the SRM readings such that continuous monitoring capability is assured.

**Attachment 2**

**To**

**GNRO-2005/00056**

**Revised Markup of Technical Specification  
and Operating License Pages**

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.8</p> <p>-----NOTE-----            This Surveillance shall not be performed in MODE 1 and 2. However, credit may be taken for unplanned events that satisfy this SR.            -----</p> <p>Verify manual transfer of unit power supply from the normal offsite circuit to required alternate offsite circuit.</p>	<p>18 months</p>
<p>SR 3.8.1.9</p> <p>-----NOTES-----</p> <p>1. Credit may be taken for unplanned events that satisfy this SR.</p> <p>2. If performed with DG synchronized with offsite power, it shall be performed at a power factor <math>\leq 0.9</math>.</p> <p>-----</p> <p>Verify each DG rejects a load greater than or equal to its associated single largest post accident load and engine speed is maintained less than nominal plus 75% of the difference between nominal speed and the overspeed setpoint or 15% above nominal, whichever is lower.</p>	<p>18 months</p>

(continued)

2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor  $\leq 0.9$  for DG 11 and DG 13 and  $\leq 0.89$  for DG 12. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.

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**SURVEILLANCE REQUIREMENTS (continued)**

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.10 -----NOTE-----            1. Credit may be taken for unplanned events that satisfy this SR.</p> <p>Verify each DG operating at a power factor <math>\leq 0.9</math> does not trip and voltage is maintained <math>\leq 5000</math> V during and following a load rejection of a load <math>\geq 5450</math> kW and <math>\leq 5740</math> kW for DG 11 and DG 12 and <math>\geq 3300</math> kW for DG 13..</p>	<p>18 months</p>

(continued)

2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor  $\leq 0.9$  for DG 11 and DG 13 and  $\leq 0.89$  for DG 12. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.

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**SURVEILLANCE REQUIREMENTS (continued)**

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.14 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Momentary transients outside the load and power factor ranges do not invalidate this test.</li> <li>2. Credit may be taken for unplanned events that satisfy this SR.</li> </ol> <hr/> <p>Verify each DG operating at a power factor <math>\leq 0.9</math> operates for <math>\geq 24</math> hours:</p> <ol style="list-style-type: none"> <li>a. For DG 11 and DG 12 loaded <math>\geq 5450</math> kW and <math>\leq 5740</math> kW; and</li> <li>b. For DG 13:               <ol style="list-style-type: none"> <li>1. For <math>\geq 2</math> hours loaded <math>\geq 3630</math> kW, and</li> <li>2. For the remaining hours of the test loaded <math>\geq 3300</math> kW.</li> </ol> </li> </ol>	<p>18 months</p>

(continued)

3. If performed with the DG synchronized with offsite power, it shall be performed at a power factor  $\leq 0.9$  for DG 11 and DG 13 and  $\leq 0.89$  for DG 12. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.

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(b) SERI is required to notify the NRC in writing prior to any change in (i) the terms or conditions of any new or existing sale or lease agreements executed as part of the above authorized financial transactions, (ii) the GGNS Unit 1 operating agreement, (iii) the existing property insurance coverage for GGNS Unit 1 that would materially alter the representations and conditions set forth in the Staff's Safety Evaluation Report dated December 19, 1988 attached to Amendment No. 54. In addition, SERI is required to notify the NRC of any action by a lessor or other successor in interest to SERI that may have an effect on the operation of the facility.

C. The license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

Entergy Operations, Inc. is authorized to operate the facility at reactor core power levels not in excess of 3898 megawatts thermal (100 percent power) in accordance with the conditions specified herein.

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 168 are hereby incorporated into this license. Entergy Operations, Inc. shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

The Surveillance Requirements (SRs) for Diesel Generator 12 contained in the Technical Specifications and listed below, are not required to be performed immediately upon implementation of Amendment No. \_\_\_\_\_. The SRs listed below shall be successfully demonstrated at the next regularly scheduled performance.

SR 3.8.1.9,  
SR 3.8.1.10, and  
SR 3.8.1.14

**Attachment 3**

**To**

**GNRO-2005/00056**

**Revised Markup of Technical Specification Bases Pages**

INSERT 2

Note 2 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of  $\leq 0.9$  for DG 11 and DG 13 and  $\leq 0.89$  for DG 12. These power factors are representative of the actual inductive loading the DGs would see under design basis accident conditions. Under certain conditions, however, Note 2 allows the surveillance to be conducted at a power factor above the limit. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to within the limits results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to the limit while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain the specified power factor may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close as practicable to the limit without exceeding the DG excitation limits.

INSERT 3

Note 3 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of  $\leq 0.9$  for DG 11 and DG 13 and  $\leq 0.89$  for DG 12. These power factors are representative of the actual inductive loading the DGs would see under design basis accident conditions. Under certain conditions, however, Note 3 allows the surveillance to be conducted at a power factor above the limit. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to within the limits results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to the limit while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain the specified power factor may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close as practicable to the limit without exceeding the DG excitation limits.

**Attachment 4**

**To**

**GNRO-2005/00056**

**List of Regulatory Commitments**

**List of Regulatory Commitments**

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

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE- TIME ACTION	CONTINUING COMPLIANCE	
Plant procedures will require the DG critical trips to be tested at least once every 18 months to ensure proper functioning.		X	Within 60 days of amendment receipt.
SR 3.8.1.9, SR 3.8.1.10, and SR 3.8.1.14 will be performed and met within the 18 month frequency as measured from the previous performance.	X		Within 18 months from previous performance.