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**M. S. Tuckman**
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January 14, 2000

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

Subject: Duke Energy Corporation
Catawba Nuclear Station, Units 1 and 2
Docket Numbers 50-413 and 50-414
McGuire Nuclear Station, Units 1 and 2
Docket Numbers 50-369 and 50-370
Proposed Technical Specifications (TS) Amendment
TS 3.8.1, AC Sources - Operating
Catawba TAC Numbers MA6962 and MA6963
McGuire TAC Numbers MA7004 and MA7005

Reference: Letter from M.S. Tuckman to NRC, same subject, dated November 3, 1999

A telephone conference call was held on January 6, 2000 between representatives of Duke Energy Corporation and the NRC regarding the subject reference amendment request. This letter is intended to serve as documentation of that conference call and to docket responses to the questions asked by the NRC during the call. The questions and answers thereto are contained in the attachments to this letter.

Inquiries on this matter should be directed to L.J. Rudy at (803) 831-3084 (Catawba) or P.T. Vu at (704) 875-4302 (McGuire).

Very truly yours,

M. S. Tuckman

M.S. Tuckman

Attachments

A001

M.S. Tuckman, being duly sworn, states that he is Executive Vice President of Duke Energy Corporation; that he is authorized on the part of said corporation to sign and file with the Nuclear Regulatory Commission this amendment to the Catawba Nuclear Station Facility Operating Licenses Numbers NPF-35 and NPF-52 and Technical Specifications; and that all statements and matters set forth herein are true and correct to the best of his knowledge.

M.S. Tuckman

M.S. Tuckman, Executive Vice President

Subscribed and sworn to me: JAN 14, 2000
Date

Mary P. Nelms

Notary Public

My commission expires: JAN 22, 2001
Date

SEAL

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Catawba Document Control File 801.01
Catawba RGC Date File
ELL-EC05O

**ATTACHMENT 1**

**DUKE ENERGY CORPORATION RESPONSE TO NRC QUESTIONS FROM JANUARY 6, 2000 CONFERENCE CALL**

**TECHNICAL SPECIFICATION CHANGE RELATED TO DIESEL GENERATOR TESTING**

**CATAWBA AND MCGUIRE UNITS 1 &2**

**Reference: Letter, M. S. Tuckman to NRC, 11/3/99**

**Question 1**

**You have not demonstrated that performing Surveillance Requirements (SRs) 3.8.1.10, 13 and 14 during power operation does not create any perturbation on the electrical distribution system. We believe performing these surveillances during power operation could create a perturbation on the electrical distribution system and could impact the operation of the normally connected loads. Provide justification for the proposed request to perform these surveillances at any operational level and the reason why you do not want to perform them at shutdown.**

**Duke Response**

Duke has evaluated the response of the emergency busses during performance of load rejection tests following maintenance activities involving work on the DG governor and/or the voltage regulator. This test has been performed 19 times at Catawba following such activities (3 times with the unit on line and 16 times with the unit off line). This test has been performed 9 times at McGuire following such activities (1 time with the unit on line and 8 times with the unit off line). The response for all tests, whether conducted on line or off line, was the same. There were no perturbations observed during any of the tests. Voltage and frequency response was as expected. There have been no instances of transients leading to spurious breaker trips on the essential bus or any other switchgear as a result of performing this test at any time.

Duke would prefer to be able to perform these TS surveillances during innages for both plants for the following reasons:

1. Prior to an outage, plant practice is to align all normal offsite power to the essential switchgear to the online unit. The purpose of this is to ensure that any work in the outage unit's transformer yard or outage unit's side of the switchyard does not affect power availability to the outage unit's essential switchgear or shutdown cooling. This practice was developed as a result of a loss of offsite power event at another industry plant. In reference to the DG, there is more of a likelihood that if there was a problem with DG testing in the outage, that it could affect the electrical distribution for both units. Therefore, by conducting these

surveillances with the unit on line, all power alignments are normal and all power inputs from the switchyard to the plant are separated.
2. Performing these surveillances with the unit on line will help maximize DG availability during outage periods when certain risk-significant evolutions occur (e.g., mid-loop operations).
3. Performing these surveillances with the unit on line will result in greater flexibility to schedule other critical outage-related work.
4. Performing these surveillances with the unit on line will allow them to be scheduled during periods when there are fewer activities occurring.

**Question 2**

**Indicate if you intend to propose any administrative controls to be imposed during the on-line performance of SRs 3.8.1.10, 13 and 14, such as plans to preclude performing these surveillances during unstable grid conditions or during other maintenance and test conditions that could have adverse effects on the offsite power system or plans for restricting additional maintenance or testing of required safety systems that depend on the remaining diesel generator as a source of emergency power.**

**In addition, please indicate if any probabilistic risk assessment was made to support this request, and if so, provide the results of such study.**

**Duke Response**

Normal risk management practices would ensure that these surveillances would not be scheduled during periods where the potential for grid or bus disturbances exists (e.g., during severe weather conditions or maintenance activities affecting the bus). Specific administrative controls for DG operations during potential unstable offsite grid conditions are contained in the plant-specific operating procedures for the DGs. In addition, specific administrative controls for the scheduling of maintenance and testing activities affecting the DG and its related train safety systems have been established. These controls include the establishment of specific train work weeks and system work weeks. Cross-train work or testing must be specifically reviewed and approved by site management. Controls are in place to avoid high-risk combinations of equipment being taken out of service at the same time. During development and execution of maintenance and testing activities, a review of the effects across all units and shared systems is conducted. In addition, a Probabilistic Risk Assessment (PRA) is performed. Site-specific PRA matrices have been developed that identify combinations of equipment, that when taken out of service, can: 1) increase the chances of a transient; 2) reduce the reliability

of accident mitigation functions; 3) increase the risk of core damage; or 4) reduce the reliability of containment.

The overall PRA analysis results for Catawba and McGuire are not sensitive to whether these surveillances are performed during innage or outage periods. The PRA treats the DG as available during the conduct of these surveillances. The design of the DG will allow it to function as designed and supply emergency loads in the event it were called to do so while a surveillance is being conducted. Therefore, the impact on DG reliability from a PRA standpoint is insignificant and the proposed change is acceptable according to the criteria established in EPRI TR-105396 (PSA Applications Guide), RG 1.174 (An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis), and RG 1.177 (An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications).

**Question 3**

**Provide a description of offsite power line-up to safety-related buses that will be used during 24-hour endurance testing. Discuss whether the potential exists for perturbations during the test to affect the operability of both safety buses.**

**Duke Response**

Updated Final Safety Analysis Report (UFSAR) Figure 8-01 for Catawba and Figure 8-3 for McGuire provide a comprehensive description of the safety-related bus arrangement and its interface with the switchyard. At Catawba and McGuire, the two safety-related busses on each unit are completely separate and independent. Therefore, a problem on one bus will not propagate to any other bus.

It was also indicated during the conference call that if a loss of offsite power were to occur while the surveillance is being conducted, the tested DG will remain available. The DG instantaneous overcurrent trip (50DGT) relay is designed to function as follows: If the DG is being tested and a loss of offsite power should occur, the DG will attempt to pick up the load until an instantaneous overcurrent relay trips the DG breaker. At this point, the DG will continue to run in a standby mode and the sequencer will initiate load shedding and will automatically apply the appropriate loads. This is described in UFSAR Section 8.3.1.1.3.1 for Catawba and Section 8.3.1.1.7 for McGuire. Relaying coordination is performed to ensure the DG breaker is the first to open. This scenario does not lock out the DG breaker. The DG breaker is only locked out for a blackout condition that is caused by a fault or breaker failure condition on the 4160 VAC bus. These are not failures that would be caused

by paralleling the DG to the offsite source during innage periods.

If a LOCA signal were to occur while the surveillance is being conducted, the LOCA signal would override the test mode of the DG. SR 3.8.1.17 for Catawba and McGuire indicate that the DG would be returned to standby operation and the emergency loads would be automatically energized from offsite power.

**Question 4**

**Proposed request to perform SR 3.8.1.9 and SR 3.8.1.14 at a unity or lagging power factor within the DG unit capability. We realize that if the bus voltage during testing is already high due to high grid voltage, increasing the DG VAR output may cause the bus voltage to exceed allowable limits. We have previously accepted the following wording in the technical specification with clarification in the Basis that these surveillances will be performed under inductive load conditions that are as close to design-basis conditions as possible subject to offsite power conditions:**

> **"Verify each DG, when connected to its bus in parallel with offsite power and operating with maximum kVAR loading that offsite power conditions permit, operates for ≥24 hours...."**

**Please indicate your intention to perform these SRs as close to design conditions as possible.**

**Duke Response**

Catawba wishes to withdraw that portion of the amendment request that proposes to delete the power factor requirement. The proposed request was originally made in response to a concern regarding overvoltage conditions on the bus during the test. Catawba believes that if the remainder of the amendment request to allow the testing to be performed during innage periods is granted, then the deletion of the power factor requirement will not be necessary. If the surveillances are conducted during innage periods when bus voltage is normally lower, then the overvoltage condition should not be realized. In addition, the expected power factor during accident conditions is approximately 0.91. Therefore, the TS requirement of ≤ 0.9 power factor would represent a conservative requirement. Catawba therefore withdraws that portion of the amendment request which sought deletion of the power factor requirement. Included in this supplement are revised marked-up and reprinted TS and Bases pages

which retain the power factor requirement. These pages should replace those contained in the reference submittal for Catawba.

McGuire is continuing to evaluate this issue and will propose appropriate revisions to the power factor requirement in future correspondence.

**ATTACHMENT 2**

**REVISED MARKED-UP TS AND BASES PAGES FOR CATAWBA**

No changes this page
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SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.9 | ----------NOTE----------<br>If performed with the DG synchronized with offsite power, it shall be performed at a power factor $\leq$ 0.9.<br>----------<br><br>Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and:<br><br>a. Following load rejection, the frequency is $\leq$ 63 Hz;<br><br>b. Within 3 seconds following load rejection, the voltage is $\geq$ 3740 V and $\leq$ 4580 V; and<br><br>c. Within 3 seconds following load rejection, the frequency is $\geq$ 58.8 Hz and $\leq$ 61.2 Hz. | 18 months |
| SR 3.8.1.10 | Verify each DG does not trip and generator speed is maintained $\leq$ 500 rpm during and following a load rejection of $\geq$ 5600 kW and $\leq$ 5750 kW. | 18 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|---|---|
| SR 3.8.1.13 ----------NOTE---------- This Surveillance shall not be performed in MODE 1 or 2. ---------- Verify each DG's automatic trips are bypassed on actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ESF actuation signal except:<br>a. Engine overspeed;<br>b. Generator differential current;<br>c. Low - low lube oil pressure; and<br>d. Voltage control overcurrent relay scheme. | 18 months |
| SR 3.8.1.14 ----------NOTES---------- 1. Momentary transients outside the load and power factor ranges do not invalidate this test.<br>2. This Surveillance shall not be performed in MODE 1 or 2. ----------<br>Verify each DG operating at a power factor $\leq$ 0.9 operates for $\geq$ 24 hours loaded $\geq$ 5600 kW and $\leq$ 5750 kW. | 18 months |

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. For this unit, the single load for each DG and its horsepower rating is as follows: Nuclear Service Water pump which is a 1000 H.P. motor. This Surveillance may be accomplished by:

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

b. Tripping its associated single largest post-accident load with the DG solely supplying the bus.

As required by Regulatory Guide 1.9 (Ref. 3), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint. The value of 63 Hz has been selected for the frequency limit for the load rejection and it is a more conservative limit than required by Reference 3.

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The 3 seconds specified is equal to 60% of a typical 5 second load sequence interval associated with sequencing of the largest load. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, 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 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 10).

This SR is modified by a Note. In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, the Note requires that, if synchronized to offsite power, testing must be performed using a power factor $\leq 0.9$. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of 18 months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. This SR is modified by a Note. The reason for the Note is to minimize wear and tear on the DGs 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.

SR 3.8.1.13

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation test signal, and critical protective functions (engine overspeed, generator differential current, low-low lube oil pressure, voltage control overcurrent relay scheme) trip the DG to avert substantial damage to the DG unit. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

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

The SR is modified by a Note. The reason for the Note is that performing the surveillance would remove a required DG from service.

SR 3.8.1.14

Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(3), requires demonstration once per 18 months that the DGs can start and run

SURVEILLANCE REQUIREMENTS (continued)

continuously at full load capability for an interval of not less than 24 hours. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a power factor of $\leq 0.9$. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by two Notes. Note 2 states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the power factor limit will not invalidate the test. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems.

SR 3.8.1.15

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 11 seconds. The 11 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(5).

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The load band is provided to

**ATTACHMENT 3**

**REVISED REPRINTED TS AND BASES PAGES FOR CATAWBA**

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.13 | Verify each DG's automatic trips are bypassed on actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ESF actuation signal except:<br>a. Engine overspeed;<br>b. Generator differential current;<br>c. Low - low lube oil pressure; and<br>d. Voltage control overcurrent relay scheme. | 18 months |
| SR 3.8.1.14 | ----------NOTE----------<br>Momentary transients outside the load and power factor ranges do not invalidate this test.<br>----------<br>Verify each DG operating at a power factor $\leq$ 0.9 operates for $\geq$ 24 hours loaded $\geq$ 5600 kW and $\leq$ 5750 kW. | 18 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of 18 months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. This SR is modified by a Note. The reason for the Note is to minimize wear and tear on the DGs 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.

SR 3.8.1.13

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation test signal, and critical protective functions (engine overspeed, generator differential current, low-low lube oil pressure, voltage control overcurrent relay scheme) trip the DG to avert substantial damage to the DG unit. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

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

SR 3.8.1.14

Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(3), requires demonstration once per 18 months that the DGs can start and run

SURVEILLANCE REQUIREMENTS (continued)

continuously at full load capability for an interval of not less than 24 hours. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a power factor of $\leq 0.9$. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by a Note. The Note states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the power factor limit will not invalidate the test.

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