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Omaha NE 68102-2247

LIC-07-0084
October 5, 2007

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

- References:
1. Docket No. 50-285
 2. Letter from OPPD (R. T. Ridenoure) to NRC (Document Control Desk), "Fort Calhoun Station, Unit No. 1, License Amendment Request, *Change to Diesel Generator Surveillance Testing*," dated December 19, 2005 (LIC-05-0113) (ML053550207)
 3. Letter from OPPD (R. T. Ridenoure) to NRC (Document Control Desk), "Retraction of License Amendment Request (LAR), *Change to Diesel Generator Surveillance Testing*," dated February 17, 2006 (LIC-06-0018) (ML060520054)

SUBJECT: Fort Calhoun Station, Unit No. 1, License Amendment Request, "Change to Diesel Generator Surveillance Testing"

Pursuant to 10 CFR 50.90, the Omaha Public Power District (OPPD) is submitting a request for an amendment to the Fort Calhoun Station (FCS), Unit No. 1 Renewed Operating License No. DPR-40. The proposed amendment requests a change to surveillance testing of the FCS emergency diesel generators (DGs) to support a modification to the DG start circuitry.

In Reference 2, OPPD submitted a similar license amendment request (LAR) proposing a change to surveillance testing of the FCS emergency DGs. Specifically, Reference 2 requested that the three remaining anticipatory DG start signals for reactor protective system (RPS) reactor trip, pressurizer pressure low signals (PPLS) and containment pressure high signal (CPHS) be removed and that the DGs start to full speed solely on a bus undervoltage condition. As a result of subsequent NRC concerns regarding the removal of the engineered safety features (ESF) start signals to the DGs (i.e., PPLS and CPHS), the LAR was retracted in Reference 3.

This LAR addresses the previous NRC concerns of removing the ESF start signals. The ESF signals (PPLS and CPHS) as proposed will provide DG full speed starting. DG full speed starting will also occur on any safety bus undervoltage condition. Sketches of the existing FCS DG starts and the proposed FCS DG starts are provided in Attachment 3 for information purposes.

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OPPD plans to install modification/engineering change (EC) 33661 during the 2008 refueling outage (RFO). Modification EC 33661 will remove the anticipatory (idle-speed) DG start signal from the RPS on a reactor trip and allow only full speed DG starting on an undervoltage condition or an ESF signal. This modification will provide greater reliability of a system important to nuclear safety, by reducing the number of components required for successful system operation. The implementation of this modification will improve engine speed control, reduce total engine kilowatt (KW) loading and reduce total fuel oil consumption.

To ensure that the surveillance test accurately reflects the modification to the DG start circuitry, a change to Technical Specification 3.7(1)c.i is required. A footnote regarding a one-time surveillance interval extension for DG No. 1 is deleted as it is historical in nature and is no longer necessary.

The enclosure provides a description of the proposed changes for revising the DG start circuitry and confirmation of applicability. OPPD concludes that the proposed amendment presents no significant hazards considerations under the standards set forth in 10 CFR 50.92(c).

Attachment 1 provides the existing TS pages marked-up to show the proposed changes. Attachment 2 provides the proposed TS "clean" pages.

OPPD requests NRC approval by April 10, 2008, with implementation prior to startup from the 2008 RFO.

There are no regulatory commitments in this letter.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated State of Nebraska official.

If you should have any questions regarding this submittal or if additional information is needed, please contact Mr. Thomas C. Matthews at (402) 533-6938.

I declare under penalty of perjury that the foregoing is true and correct. (Executed on October 5, 2007).



D. J. Bannister
Acting Site Director

DJB/DLL/dll

Enclosure: OPPD's Evaluation of the Proposed Change

- c: E. E. Collins, NRC Regional Administrator, Region IV
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**Omaha Public Power District's
Evaluation of the Proposed Change**

“Change to Diesel Generator Surveillance Testing”

- 1.0 SUMMARY DESCRIPTION
- 2.0 DETAILED DESCRIPTION
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ATTACHMENTS:

- 1. Markups of Technical Specifications Pages
- 2. Proposed Technical Specifications Pages (Clean)
- 3. Sketches of Existing and Proposed FCS DG Starts (for information only)

1.0 SUMMARY DESCRIPTION

This letter is a request to amend the Fort Calhoun Station (FCS), Unit No. 1, Renewed Operating License No. DPR-40.

During the 2008 refueling outage (RFO), the Omaha Public Power District (OPPD) plans to install modification/engineering change (EC) 33661 to the diesel generator (DG) starting circuitry. Modification EC 33661 (Reference 6.2) will remove the anticipatory (idle-speed) DG start signal from the reactor protective system (RPS) on a reactor trip and allow only full speed DG starting on an undervoltage condition or an engineered safety features (ESF) signal. This modification requires a change to TS 3.7(1)c.i. to ensure proper DG testing.

OPPD also proposes to remove a footnote to a one-time extension of the surveillance interval for DG No. 1 (DG-1) granted by Amendment 112 (Reference 6.3). This one-time extension permitted the due date of the surveillance test to be extended from April 1988 to October 1988. This allowed the surveillance to be performed during an RFO since the performance of the surveillance during power operations could have resulted in the plant entering a limiting condition for operation (LCO) requiring a plant shutdown. This footnote is no longer pertinent and is being deleted.

For consistency with TS 3.7(1)c.i. and 3.7(1)c.ii., a period is added immediately following TS 3.7(1)c.iii.

2.0 DETAILED DESCRIPTION

TS 3.7(1)c.i. currently requires the initiation of a simulated auto-start signal to verify that the DG starts, followed by the requirements of TS 3.7(1)c.ii. for initiation of a simulated simultaneous loss of 4.16 KV supplies to buses 1A3 and 1A4.

TS 3.7(1)c.i. is revised to delete the words "followed by." Thus, TS 3.7(1)c will still require the initiation of a simulated auto-start signal to verify that the DG starts, but this will be concurrent with, not followed by, the simulated loss of 4.16 KV supplies to buses 1A3 and 1A4 as required by TS 3.7(1)c.ii.

The change to TS 3.7(1)c.i. is necessary to ensure verbatim compliance with TS 3.7(1)c during surveillance testing following installation of the modification. The proposed change will not affect the existing DG surveillance testing since the surveillance is performed at a refueling frequency. However, if approved and implemented during the 2008 RFO, the new DG testing requirements will be performed as part of the post-modification testing for the modified diesel circuitry during the 2008 RFO.

The footnote of TS 3.7(1)e. is deleted in its entirety. The footnote pertains to a one-time extension of the surveillance interval for DG-1 granted by Amendment No. 112 (Reference 6.3). This one-time extension permitted the due date of the surveillance test to be extended from April 1988 to October 1988. This allowed the surveillance to be performed during an RFO since the performance of the surveillance during power operations could have resulted in the plant entering an LCO requiring a plant shutdown. This footnote is no longer pertinent and is being deleted.

For consistency with TS 3.7(1)c.i. and 3.7(1)c.ii., a period is added immediately following TS 3.7(1)c.iii.

3.0 TECHNICAL EVALUATION

The two safety related diesel generators (DG-1 and DG-2) are required to perform their intended design function upon a loss of normal power to their respective 4.16 KV buses. The DGs are designed to automatically start, accelerate to rated speed, voltage and frequency and close on their respective bus as an emergency power source upon the loss of normal power.

Each DG is physically aligned to a 4.16 KV bus. DG-1 is aligned with bus 1A3 and DG-2 is aligned with bus 1A4. Normal power is provided from the 161 KV off-site power system transformed to 4.16 KV by transformers T1A-3 and T1A-4 and supplied to buses 1A3 and 1A4, respectively. In the event of an undervoltage condition on either bus, the aligned DG automatically starts and provides emergency power. (Reference 6.1)

The original DG starting circuitry provided full speed DG starting on an undervoltage condition and also provided several other anticipatory (idle speed) DG start signals. For example, an anticipatory (idle speed) start signal initiated by a reactor trip would start the DGs and accelerate the diesels to idle speed in anticipation of a potential loss of power to the bus.

The design basis for the anticipatory (idle speed) DG start is not definitively stated in FCS licensing or design basis documents. It is apparently a precautionary step to ensure that the DGs are already running (at idle speed) following a design basis accident (DBA) in the event that a subsequent loss of offsite power should occur. However, there is no design criterion or regulatory requirement for the DGs to be operating at idle speed following a DBA nor does any Updated Safety Analysis Report (USAR) accident analysis take credit for the anticipatory (idle speed) DG start following a DBA.

Currently, TS 3.7(1)c.i. has a provision to test the DGs using a simulated auto-start signal to verify that the diesel starts. An anticipatory start signal simulates this function and starts the DG at idle speed. TS 3.7(1)c.i. states that this is followed by the initiation of a simulated simultaneous loss of 4.16 KV power to bus 1A3 or bus 1A4 (depending on which DG is being tested) the purpose of which is to de-energize the bus and verify DG emergency loading.

Modification EC 33661 will remove the anticipatory (idle speed) DG start signal from the RPS on a reactor trip, such that the DGs start and accelerate to full speed on an undervoltage condition or an ESF signal. Removal of the RPS anticipatory (idle speed) DG start signal does not change the function of the DGs as they still provide emergency power to their respective buses when required.

In Reference 6.5, OPPD submitted a similar license amendment request (LAR) proposing a change to surveillance testing of the FCS emergency DGs. Specifically, Reference 2 requested that the three remaining anticipatory (idle speed) DG start signals, RPS reactor trip, pressurizer pressure low signals (PPLS), and containment pressure high signal (CPHS) be removed and that the DGs start to full speed solely on a bus undervoltage condition. As a result of subsequent NRC concerns regarding the removal of the ESF start signals to the DGs (i.e., PPLS and CPHS), the LAR was retracted in Reference 6.6.

This LAR responds to those previous NRC concerns of removing the ESF start signals. The ESF signals (PPLS and CPHS) as proposed will provide DG full speed starting. DG full speed starting will also occur on any safety bus undervoltage condition. Sketches of the existing FCS and proposed FCS DG starts are provided in Attachment 3 for information purposes.

Modification EC 33661 will result in the following changes to both diesel generators:

- A. Set the governor droop setting to zero which will eliminate the use of the governor travel limit switch.
- B. Disable the idle-to-full speed acceleration signal to provide improved speed control of the engine.
- C. Disable the RPS automatic anticipatory start signal to eliminate no-load diesel operation.

The modification will provide greater reliability of a system important to nuclear safety by reducing the number of components required for successful system operation as the idle speed relays will be disconnected. The implementation of this modification will improve engine speed control, reduce total engine kilowatt (KW) loading and reduce total fuel oil consumption.

The proposed amendment to TS 3.7(1)c.i. is necessary to accurately reflect actual surveillance testing of the DGs following removal of the anticipatory (idle speed) start signal. Due to the elimination of the RPS anticipatory (idle speed) start, the initiation of a simulated simultaneous loss of 4.16 KV supplies to Bus 1A3 (or Bus 1A4 depending on which DG is being tested) will now occur simultaneously with the simulated auto-start signal. Prior to modification EC 33661, the simulated auto-start signal verifying that the DG starts (to idle speed) was followed by the simulated simultaneous loss of 4.16 KV power to the bus whose DG was being tested (bus 1A3 or 1A4).

The proposed amendment to TS 3.7(1)c.i. removing the words "followed by" is necessary to accurately reflect actual surveillance testing of the DGs following removal of the RPS anticipatory (idle speed) start signal. The design basis for the anticipatory (idle speed) DG start is concluded to be a precautionary step to ensure that the DGs are already running (at idle speed) following a design basis accident (DBA) in the event that a subsequent loss of offsite power should occur. However, there is no design criterion or regulatory requirement for the DGs to be operating at idle speed following a DBA nor does any USAR accident analysis take credit for the anticipatory (idle speed) DG start following a DBA.

The Basis of TS 3.7 explains that automatic starting on loss of off-site power and automatic load shedding, diesel connection, and loading will be verified on a refueling frequency. Modification EC 33661 does not affect the Basis of TS 3.7, which is still accurate in this regard.

The footnote to TS 3.7(1)e. was placed into the FCS TS by Amendment No. 112 (Reference 6.3) to permit a one-time extension of the surveillance interval for DG No. 1. Diesel generators are tested at 18-month intervals to be consistent with the maximum anticipated interval

between refueling outages. The selection of an 18-month interval was based on engineering judgment to achieve the dual goals of the need to conduct periodic surveillance tests but not interfere substantially with unit availability.

OPPD requested and was granted a one-time extension of the surveillance test interval from April 1988 to October 1988 to coincide with the 1988 RFO. The extension was granted (Reference 6.3) because performance of the surveillance in April 1988 would have been during power operations that could have resulted in the plant entering a LCO requiring a plant shutdown. Since the footnote is historical in nature, it is unnecessary and should be deleted. Deletion of the TS 3.7(1)e. footnote is an administrative change that removes a surveillance interval extension that is historical in nature and no longer serves a purpose in the FCS TS.

The addition of a period following TS 3.7(1)c.iii is an administrative change to achieve consistent punctuation.

In summary, the proposed changes do not alter, degrade, or prevent actions described or assumed in any accident analysis. The proposed changes do not revise any previous assumptions evaluating radiological consequences or affecting any fission product barriers, nor do they increase any challenges to safety systems. Therefore, the proposed changes do not increase or have any impact on the consequences of events described and evaluated in Chapter 14 of the FCS Updated Safety Analysis Report (USAR).

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

FCS was licensed for construction prior to May 21, 1971, and at that time committed to the draft General Design Criteria (GDC). The draft GDC are contained in Appendix G of the FCS USAR and are similar to 10 CFR 50 Appendix A, General Design Criteria for Nuclear Power Plants.

The draft GDC that govern ESF and emergency power are Criterion 15, Criterion 24 and Criterion 39 from USAR Appendix G.

Criterion 15 - Engineered Safety Features Protection System states:

“Protection systems shall be provided for sensing accident situations and initiating the operation of necessary engineered safety features.”

This criterion is met. Protection systems are provided for sensing accident conditions which result in a loss of reactor coolant system pressure, pressurization of the reactor containment building, and abnormally high radiation levels in the reactor containment building.

Operation of the safety injection system is initiated by either low reactor coolant system pressure or high containment pressure.

Operation of the containment spray system is initiated by coincident low reactor coolant system pressure and high containment pressure. Containment air recirculation and cooling units not already in operation are started by either loss of reactor coolant system pressure or pressurization of the reactor containment building. Complete isolation of the containment building is initiated by high containment pressure, or low reactor coolant system pressure. Isolation of containment building vents only is initiated by high containment radiation.

The current simulated auto-start signals (PPLS and CPHS) are test switches and only start the DGs to idle speed as long as offsite power remains available. These idle speed start signals are anticipatory in nature and do not require the DGs to connect to their respective buses as long as offsite power remains available. However, a safety injection actuation signal (SIAS) accident signal (which is actuated by PPLS or CPHS), and a subsequent degraded voltage condition will automatically initiate an offsite power low signal (OPLS), increase the DG speed from idle to full speed, and provide power to the bus. Implicit in GDC 15 is that the necessary ESF equipment starts and runs when accident situations demand. The criterion does not require that the DGs start and operate in "spinning reserve" mode. With the proposed modification, the DGs will go to full speed on an undervoltage condition or on an accident condition (SIAS) with a subsequent degraded bus voltage condition if normal offsite power for ESF equipment is degraded or unavailable. The DGs are part of the essential auxiliary support systems for engineered safeguards, but they do not have to be running to be considered operable. FCS is currently in compliance with Criterion 15 and will remain in compliance following implementation of EC 33661.

Criterion 24 – Emergency power for Protection Systems, states:

"In the event of loss of all offsite power, sufficient alternate sources of power shall be provided to permit the required functioning of the protection systems."

This criterion is met. Emergency power is available from two completely independent diesel generator (DG) sets and from two completely independent 125 V d-c systems for essential d-c loads.

The independent diesel generator supply systems are located in the plant and are connected to separate buses. Both generator sets independently start automatically upon loss of auxiliary power and are ready to accept load within 10 seconds of loss of normal supply power. Starting power is self-contained within each DG. Each DG has sufficient capacity to start in sequence the loads required for the ESF equipment for the maximum hypothetical accident concurrent with loss of outside power. This capacity is adequate to provide a safe and orderly plant shutdown and maintain the plant in a safe condition.

Each of the two 125 V d-c batteries is capable of supplying essential station d-c loads for 8 hours and may be charged by the generator power supply.

Facilities are included to permit periodic starting and running of the DGs without interrupting plant operation. The DGs are synchronized to the bus and loaded periodically to ensure readiness for emergency services.

Criterion 39 – Emergency Power for Engineered Safety Features states:

“Alternate power systems shall be provided and designed with adequate independency, redundancy, capacity and testability to permit the functioning required of the engineered safety features (ESF). As a minimum, the onsite power system and the offsite power system shall each independently provide this capacity assuming a failure of a single active component in each power system.”

This criterion is met. Offsite power to the plant is available via the 161 kV line and after the unit is tripped, via backfeed from the 345 kV system through the main and unit auxiliary transformers.

When the unit is tripped and the 161 kV supply is not available, the motor-operated disconnect switch in the generator main leads is opened and the supply to the unit auxiliary transformers is re-established. Switch operation is accomplished by a motor operator supplied from the station battery. Onsite power is provided by two diesel generator sets. Each independent diesel generator set is adequate for supplying the minimum ESF equipment for the maximum hypothetical accident concurrent with loss of outside power.

Station batteries provide onsite power for instrument and control systems. These batteries are subject to rigorous inspection and maintenance. Periodically, the charger voltage is manually lowered to test the batteries capability to assume load at the appropriate bus voltage.

The diesel generator facilities permit periodic starting and running during normal plant operations.

4.2 Precedent

There was no industry precedent identified related to license amendments for required TS changes to the DG surveillance testing requirements as a result of modifications to the diesel generator (DG) starting circuitry.

4.3 Significant Hazards Consideration

The Omaha Public Power District (OPPD) has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10CFR 50.92, “Issuance of Amendment,” as discussed below:

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

Response: No.

The removal of the anticipatory (idle speed) diesel generator (DG) start signal on a reactor protective system (RPS) reactor trip does not adversely affect the design function of the DGs and thus is not an initiator of any previously evaluated accidents.

No Updated Safety Analysis Report (USAR) accident analyses take credit for the anticipatory (idle speed) DG start following a design basis accident (DBA). The DGs provide emergency power to their respective 4.16 KV buses and will continue to do so after the proposed modification is installed. Upon the occurrence of an undervoltage condition on the bus or an engineered safety features (ESF) signal, the modification provides a full speed DG start to achieve rated voltage and frequency. The safety function of the DGs is not altered by the installation of the modification. The associated Technical Specification (TS) change allows surveillance testing to reflect the way that the DGs start and load onto their respective buses following the modification.

Deletion of a footnote containing historical information pertaining to a one-time surveillance interval extension and the punctuation correction are administrative changes. These administrative changes do not increase the probability or consequences of any accident previously evaluated.

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

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

Response: No.

The removal of the anticipatory (idle speed) diesel generator (DG) start signal on an RPS reactor trip does not adversely affect the design function of the DGs and thus does not create the possibility of a new or different kind of accident. There are no USAR accident analyses which take credit for the anticipatory (idle speed) DG start following a DBA. The DGs provide emergency power to their respective 4.16 KV buses and will continue to do so after the proposed modification is installed. Upon the occurrence of an undervoltage condition on the bus or an ESF signal, the modification provides a full speed DG start to achieve rated voltage and frequency. The safety function of the DGs is not altered by the installation of this modification. The associated TS change allows surveillance testing to reflect the way that the DGs start and load onto their respective buses following the modification.

Deletion of a footnote containing historical information pertaining to a one-time surveillance interval extension and the punctuation correction are administrative changes that do not create the possibility of a new or different kind of accident from any previously evaluated.

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

3. **Does the proposed amendment involve a significant reduction in a margin of safety?**

Response: No.

The removal of the anticipatory (idle speed) diesel generator (DG) start signal on an RPS reactor trip does not adversely affect the design function of the DGs and thus does not involve a significant reduction in a margin of safety. There are no USAR accident analyses which take credit for the anticipatory (idle speed) DG start following a DBA. The DGs provide emergency power to their respective 4.16 KV buses and will continue to do so after installation of the proposed modification. Upon the occurrence of an undervoltage condition on the bus or an ESF signal, the modification provides a full speed DG start to achieve rated voltage and frequency. The safety function of the DGs is not altered by the installation of this modification. The associated TS change allows surveillance testing to reflect the way that the DGs will start and load onto their respective buses following the modification.

Deletion of a footnote containing historical information pertaining to a one-time surveillance interval extension and the punctuation correction are administrative changes that do not reduce a margin of safety.

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

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

4.4 Conclusion

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

5.0 ENVIRONMENTAL CONSIDERATION

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amount of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

- 6.1 Fort Calhoun Station Updated Safety Analysis Report (USAR) Sections 7.3.4.2, 8.3.4, 8.4.1, and 8.4.2.
- 6.2 Modification EC 33661, “Diesel Generator DG-1 and DG-2 Governor Change.”

- 6.3 Letter from NRC (A. Bournia) to OPPD (R. L. Andrews) dated April 19, 1988, "Fort Calhoun Station, Unit No. 1 – Amendment No. 112 to Facility Operating License No. DPR-40 (TAC No. 67466)."
- 6.4 FCS USAR Appendix G, "Responses to 70 Criteria."
- 6.5 Letter from OPPD (R. T. Ridenoure) to NRC (Document Control Desk), "Fort Calhoun Station, Unit No. 1, License Amendment Request, Change to Diesel Generator Surveillance Testing," dated December 19, 2005 (LIC-05-0113) (ML053550207).
- 6.6 Letter from OPPD (R. T. Ridenoure) to NRC (Document Control Desk), "Retraction of License Amendment Request (LAR), Change to Diesel Generator Surveillance Testing," dated February 17, 2006 (LIC-06-0018) (ML060520054).

**MARK-UP
OF
TECHNICAL SPECIFICATION
PAGE**

TECHNICAL SPECIFICATIONS

3.0 SURVEILLANCE REQUIREMENTS

3.7 Emergency Power System Periodic Tests (Continued)

- i. ~~Initiation of a simulated auto-start signal to verify that the diesel~~ ~~starts~~ ~~followed by.~~
- ii. Initiation of a simulated simultaneous loss of 4.16 KV supplies to bus 1A3 (1A4). Proper operation will be verified by observation of:
 - (1) De-energization of bus 1A3 (1A4).
 - (2) Load shedding from bus (both 4160 V and 480 V).
 - (3) Energization of bus 1A3 (1A4).
 - (4) Automatic sequence start of emergency load, and
 - (5) Operation of ≥ 5 minutes while its generator is loaded with the emergency load.
- iii. Verification that emergency loads do not exceed the 2000-HR KW rating of the engine.⁽²⁾
- d. Manual control of diesel generators and breakers shall also be verified during refueling shutdowns.
- e. Each diesel generator shall be given a thorough inspection on a refueling (R) frequency in accordance with the manufacturer's recommendations for this class of standby service.*
- f. The fuel oil transfer pumps shall be verified to be operable each month.

(2) Station Batteries

- a. Every month the voltage of each cell (to the nearest 0.01 volt), the specific gravity, and temperature of a pilot cell in each battery shall be measured and recorded.⁽³⁾⁽⁴⁾
- b. Every three months the specific gravity of each cell, the temperature reading of every fifth cell, and the amount of water added shall be measured and recorded. During the first refueling outage and every third refueling outage thereafter the batteries shall be subjected to a rated load discharge test.
- c. At monthly intervals the third battery charger, which is capable of being connected to either of the two D.C. distribution buses, shall be paralleled in turn to each D.C. bus. In each case, load shall be transferred to this reserve battery charger by switching out the normal charger. The reserve charger shall be run on load for 30 minutes on each bus and the system shall finally be returned to normal.

~~*A one time extension has been granted for this surveillance requirement, allowing the April 1988 surveillance for Diesel Generator No. 1 to be completed in October 1988.~~

**PROPOSED
TECHNICAL SPECIFICATION PAGE
(Clean)**

TECHNICAL SPECIFICATIONS

3.0 SURVEILLANCE REQUIREMENTS

3.7 Emergency Power System Periodic Tests (Continued)

- i. Initiation of a simulated auto-start signal to verify that the diesel starts.
- ii. Initiation of a simulated simultaneous loss of 4.16 KV supplies to bus 1A3 (1A4). Proper operation will be verified by observation of:
 - (1) De-energization of bus 1A3 (1A4).
 - (2) Load shedding from bus (both 4160 V and 480 V).
 - (3) Energization of bus 1A3 (1A4).
 - (4) Automatic sequence start of emergency load, and
 - (5) Operation of ≥ 5 minutes while its generator is loaded with the emergency load.
- iii. Verification that emergency loads do not exceed the 2000-HR KW rating of the engine.⁽²⁾
- d. Manual control of diesel generators and breakers shall also be verified during refueling shutdowns.
- e. Each diesel generator shall be given a thorough inspection on a refueling (R) frequency in accordance with the manufacturer's recommendations for this class of standby service.
- f. The fuel oil transfer pumps shall be verified to be operable each month.

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- c. At monthly intervals the third battery charger, which is capable of being connected to either of the two D.C. distribution buses, shall be paralleled in turn to each D.C. bus. In each case, load shall be transferred to this reserve battery charger by switching out the normal charger. The reserve charger shall be run on load for 30 minutes on each bus and the system shall finally be returned to normal.

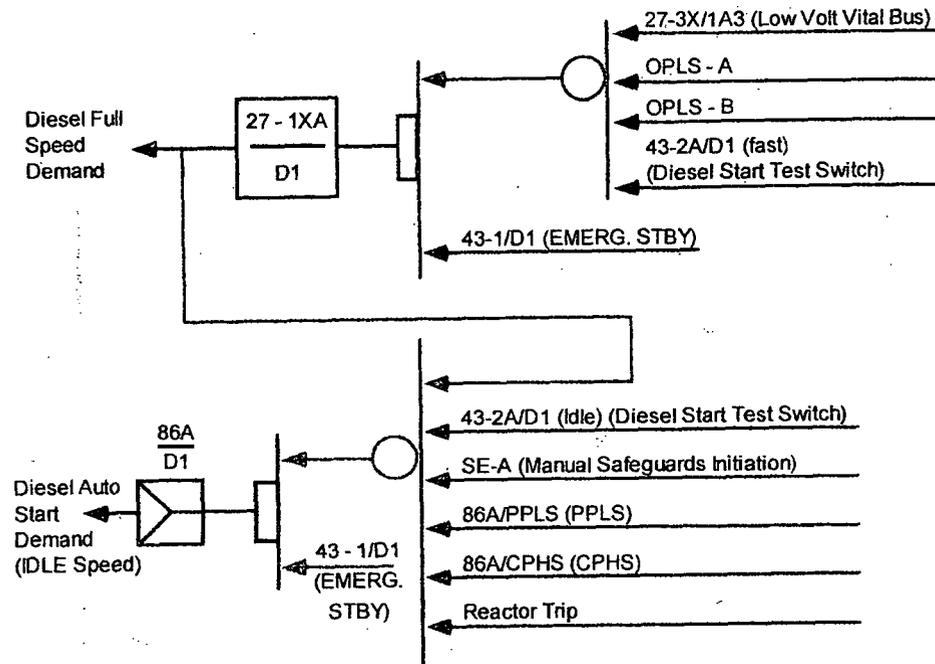
**SKETCHES
OF
EXISTING AND PROPOSED
FCS DIESEL GENERATOR STARTS**

(For Information Only)

SKETCH 1

EXISTING FCS DG STARTS

AUTO START DEMAND



SKETCH 2
PROPOSED FCS DG STARTS

AUTO START DEMAND

