

September 16, 2005

NG-05-0467  
10 CFR 50.90

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

Duane Arnold Energy Center  
Docket 50-331  
License No. DPR-49

Technical Specification Change Request (TSCR-076): "Relaxation of Emergency Diesel Generator Testing Criterion"

Affected Technical Specifications: Section 3.8.1

Pursuant to 10 CFR 50.90, Nuclear Management Company, LLC (NMC) hereby requests revision to the Technical Specifications (TS) for the Duane Arnold Energy Center (DAEC). The proposed Amendment revises the Surveillance Requirements (SR) for the Emergency Diesel Generators (EDG) to provide more margin to the acceptance criterion. The new SR acceptance criterion will allow the EDG frequency to be within  $\pm 2\%$  of the rated value, i.e., 60 Hz. The current acceptance limit is nominally  $\pm 1\%$  of rated frequency. The revised acceptance criterion is consistent with the DAEC licensing basis, specifically Safety Guide 9 (i.e., original revision of Regulatory Guide 1.9), and Improved Standard TS (NUREG-1433).

The proposed Amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c). Associated TS Bases changes will be completed per the TS Bases Control Program (TS 5.5.10).

NMC requests approval of the proposed amendment by February 28, 2006. Once approved, the amendment will be implemented within 30 days. This schedule will permit the new test criterion to be implemented prior to the spring 2006 performance of SR 3.8.1.7 (EDG fast start test).

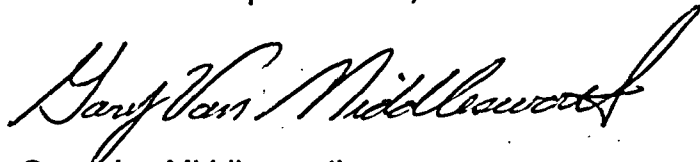
This application has been reviewed by the DAEC Operations Committee. A copy of this submittal, along with the 10CFR50.92 evaluation of "No Significant Hazards Consideration," is being forwarded to our appointed state official pursuant to 10 CFR Section 50.91.

This letter makes no new commitments or changes to any existing commitments.

If you have any questions or require additional information, please contact Mr. Tony Browning at (319) 851-7750.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 16, 2005.

A handwritten signature in black ink, reading "Gary Van Middlesworth". The signature is fluid and cursive, with the first name "Gary" and last name "Middlesworth" clearly legible.

Gary Van Middlesworth  
Site Vice President, Duane Arnold Energy Center  
Nuclear Management Company, LLC

Exhibits: A) EVALUATION OF PROPOSED CHANGE  
B) PROPOSED TECHNICAL SPECIFICATION AND BASES CHANGES  
(MARK-UP)  
C) PROPOSED TECHNICAL SPECIFICATION PAGES (RE-TYPED)

cc: Administrator, Region III, USNRC  
Project Manager, DAEC, USNRC  
Resident Inspector, DAEC, USNRC  
D. McGhee (State of Iowa)

## **EXHIBIT A**

### **EVALUATION OF PROPOSED CHANGE**

**Subject: TSCR-076 - Relaxation of Emergency Diesel Generator Testing Criterion**

- 1. DESCRIPTION**
- 2. PROPOSED CHANGE**
- 3. BACKGROUND**
- 4. TECHNICAL ANALYSIS**
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## 1. DESCRIPTION

This letter is a request to amend Operating License DPR-49 for the Duane Arnold Energy Center (DAEC). The proposed Amendment would modify the Surveillance Requirements (SR) for the Emergency Diesel Generators (EDG) to provide more margin to the acceptance criterion. The new SR acceptance criterion will allow the EDG frequency to be within  $\pm 2\%$  of the rated value, specifically  $58.8 \text{ Hz} \leq \text{frequency} \leq 61.2 \text{ Hz}$ . The current acceptance limit is nominally  $\pm 1\%$  of rated frequency (i.e.,  $59.5 \text{ Hz} \leq \text{frequency} \leq 60.5 \text{ Hz}$ ).

## 2. PROPOSED CHANGE

The holders of license DPR-49 for the Duane Arnold Energy Center propose to amend the Technical Specifications (TS) by deleting the referenced pages and replacing them with the enclosed new pages.

### SUMMARY OF CHANGES:

<b>TS Pages</b>	<b>BASES Pages</b>
3.8-5	B 3.8-14
3.8-7	B 3.8-16
3.8-8	B 3.8-20
3.8-10	B 3.8-23

The proposed Amendment revises the Surveillance Requirements (SR) for the Emergency Diesel Generators (EDG) to provide more margin to the acceptance criterion. The new SR acceptance criterion will allow the EDG frequency to be within  $\pm 2\%$  of the rated value, specifically  $58.8 \text{ Hz} \leq \text{frequency} \leq 61.2 \text{ Hz}$ . The current acceptance limit is nominally  $\pm 1\%$  of rated frequency (i.e.,  $59.5 \text{ Hz} \leq \text{frequency} \leq 60.5 \text{ Hz}$ ).

SR 3.8.1.2, SR 3.8.1.7, SR 3.8.1.9, and SR 3.8.1.13 are revised to include this new tolerance on the allowable frequency.

Technical Specification Bases are also modified to reflect the above changes (see Exhibit B). The Bases changes are included for information only. Bases changes will be completed per the TS Bases Control Program (TS 5.5.10).

## 3. BACKGROUND

The acceptance criterion of a specific band on EDG frequency was added to the EDG Surveillance Requirements in TS as part of the DAEC's conversion to Improved Standard TS (ISTS) (Ref. 4). Prior to the ISTS, the DAEC's "custom" TS only specified that the EDG be demonstrated to "reach rated frequency and voltage within specified

time limits." The details were contained in the associated testing procedures. The criterion in the procedures at that time was  $59.5 \text{ Hz} \leq \text{frequency} \leq 60.5 \text{ Hz}$ , i.e., "rated" frequency (60 Hz)  $\pm \sim 1\%$ . Thus, during the ISTS conversion process, these DAEC-specific values were inserted into the SRs, as the acceptance criterion in the ISTS is "bracketed," which indicates plant-specific values are to be used.

#### 4. TECHNICAL ANALYSIS

The DAEC current licensing basis is Safety Guide 9 (ref. UFSAR Section 1.8.9), which states the allowable steady-state frequency for the EDG is  $\pm 2\%$  of "nominal" (60 Hz). However, the DAEC acceptance criterion stated in the TS and used in the test procedures is a more conservative band of  $\sim \pm 1\%$ . While EDG performance has historically met the more stringent requirement, recently it has become apparent that the potential exists for this to require additional maintenance in order to maintain that performance. Such additional maintenance results in unnecessary out of service time (i.e., unavailability). Consequently, NMC seeks to revise the TS criterion to be consistent with that of Safety Guide 9. Use of the Safety Guide criterion will still ensure proper performance of the EDG to meet their intended safety function in a highly reliable manner, but without introducing unnecessary corrective maintenance and associated unavailability that would otherwise be needed to continue to meet the current TS limits.

As discussed in UFSAR Sections 1.8.9 and 8.3.1.4, the DAEC EDG have been shown to perform acceptably, assuming the allowance of  $\pm 2\%$  of rated frequency stated in Safety Guide 9. As stated in the UFSAR, the ability to recover frequency is not as critical to the safety function as is the ability to maintain voltage within proper limits. The acceptance criterion for EDG voltage is not being modified as part of this request.

In addition, other Surveillances, such as SR 3.8.1.12, confirm that the ability to recover from each load step in the accident starting sequence, or in the case of SR 3.8.1.9, confirms the ability to recover from the loss of the single largest load, is acceptable. Only the allowable tolerance on frequency is being revised, no other EDG performance criteria are being changed.

This change is also consistent with existing Standard Technical Specifications for BWR/4 plants (NUREG-1433).

## **5. REGULATORY SAFETY ANALYSIS**

### **5.1 No Significant Hazards Consideration**

Nuclear Management Company (NMC), LLC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 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 proposed change. The EDG are not an initiator of any accident previously evaluated. As a result, the probability of any accident previously evaluated is not significantly increased. The consequences of any accident previously evaluated are not increased, as the EDG will continue to meet their safety function, as specified in the accident analysis, in a highly reliable manner.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an 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.

No new or different accidents result from utilizing the proposed change. The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. The changes do not alter assumptions made in the safety analysis for the EDG performance. The proposed changes remain consistent with the safety analysis assumptions (e.g., UFSAR Section 8.3.1.4).

Therefore, the proposed change does 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 proposed change revises the acceptance criterion for EDG Surveillances to match that in the NRC's guidelines (Safety Guide 9) and the Improved Standard Technical Specifications (NUREG-1433, Rev 3). Because the EDG can perform to the specified

acceptance criterion as stated in the UFSAR Section 8.3.1.4, the EDG will continue to meet their specified safety function in the safety analysis, in a highly reliable manner.

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

## **CONCLUSION**

Based on the preceding 10 CFR 50.92 evaluation NMC 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.

Attorney for Licensee: Jonathan Rogoff, Esquire, General Counsel, NMC, LLC,  
700 First St., Hudson, WI, 54016

## **5.2 APPLICABLE REGULATORY REQUIREMENTS/CRITERIA**

By letter dated September 16, 2005, Nuclear Management Company, LLC (NMC) submitted a request for revision of the Technical Specifications for the Duane Arnold Energy Center (DAEC). The proposed amendment revises the Surveillance Requirements (SR) for the Emergency Diesel Generators (EDG) to provide more margin to the acceptance criterion. The new SR acceptance criterion will allow the EDG frequency to recover to within  $\pm 2\%$  of the rated value, specifically  $58.8 \text{ Hz} \leq \text{frequency} \leq 61.2 \text{ Hz}$ . The current acceptance limit is nominally  $\pm 1\%$  of rated frequency (i.e.,  $59.5 \text{ Hz} \leq \text{frequency} \leq 60.5 \text{ Hz}$ ).

### **Evaluation:**

The proposed change is consistent with the current regulations and thus, an exemption pursuant to 10 CFR 50.12 is not required. The current regulations (e.g., §50.36) do not specify the allowable frequency range for EDG; only that Surveillances are included in the TS that "assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met." The proposed change in the EDG Surveillance acceptance criteria continues to demonstrate these CFR requirements, as the EDG will continue to perform consistent with the accident analysis assumptions.

The DAEC Construction Permit was issued in 1970, prior to the issuance of 10 CFR 50, Appendix A, General Design Criteria (GDC), and thus, the DAEC was not specifically licensed to them (Ref. SECY-92-223). The following describes the DAEC UFSAR commitment to the GDCs pertinent to this application and the impact of the requested change on those commitments.

GDCs 17 and 18 deal with the design and testing of the Electrical Power Systems for the unit, both offsite and onsite power systems. The proposed change does not affect

the design of the onsite or offsite power systems, thus GDC 17 is not impacted by this change. The proposed change does involve EDG testing, which is covered by GDC 18. However, the proposed change in acceptance criteria does not impact the ability of the EDG to satisfy GDC 18, as the specific detail regarding the allowable frequency response during the testing of the "full operational sequence" is not stated in the GDC. No other changes in the design, operation or testing of the EDG are being proposed.

GDCs 37, 40, 43 and 46, all contain provisions for testing of key safety systems (other than the Electrical Power Systems), including "the performance of the full operational sequence that brings the systems into operation, including ... the transfer between normal and emergency power sources". The proposed change in EDG testing acceptance criteria does not impact this capability, as the EDG Surveillances, specifically SR 3.8.1.13, along with the various system simulated automatic actuation Surveillances, will continue to demonstrate that these GDCs are met.

Safety Guide 6 (i.e., original revision of Regulatory Guide 1.6) deals with the electrical independence of each division of the electrical distribution system. The proposed change to the EDG testing acceptance criteria will not impact the design of the electrical distribution system, nor the associated interlocks between the onsite and offsite electrical distribution systems. Thus, the proposed change does not impact the DAEC's ability to meet Safety Guide 6, as described in UFSAR Section 1.8.6.

The proposed change in EDG testing acceptance criteria is fully consistent with that contained in the DAEC's original licensing basis - Safety Guide 9 (ref. UFSAR Section 1.8.9). Specifically, as stated in Safety Guide 9, Regulatory Position C.4:

Each diesel generator set should be capable of starting and accelerating to rated speed, in the required sequence, all the needed engineered safety feature and emergency shutdown loads. At no time during the loading sequence should the frequency and voltage decrease to less than 95% of nominal and 75% of nominal, respectively. During recovery from transients caused by step load increases or resulting from the disconnection of the largest single load, the speed of the diesel-generator set should not exceed 75% of the difference between nominal speed and the overspeed trip set point or 115% of nominal, whichever is lower. Voltage should be restored to within 10% of nominal and frequency should be restored to within 2% of nominal in less than 40% of each load sequence time interval. {emphasis added}

The revised acceptance criterion is wholly consistent with Improved Standard TS (NUREG-1433). The BASES for the SRs to LCO 3.8.1 state:

The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to  $\pm 2\%$  of the 60 Hz nominal frequency and are derived from the recommendations found in Regulatory Guide 1.9 (Ref. 3).

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 regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Therefore, we have concluded that the proposed revision to the DAEC Technical Specifications is acceptable.

## 6. ENVIRONMENTAL CONSIDERATION

10 CFR Section 51.22(c)(9) identifies certain licensing and regulatory actions which are eligible for categorical exclusion from the requirement to perform an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration; (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite; and (3) result in a significant increase in individual or cumulative occupational radiation exposure. NMC has reviewed this request and determined that the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9). Pursuant to 10 CFR Section 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of the amendment. The basis for this determination follows.

### Basis

The change meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9) for the following reasons:

1. As demonstrated in the 10 CFR 50.92 evaluation included in this exhibit, the proposed amendment does not involve a significant hazards consideration.
2. The proposed changes do not result in an increase in power level, do not increase the production, nor alter the flow path or method of disposal of radioactive waste or byproducts. There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.
3. The proposed changes do not result in changes in the level of control or methodology used for processing of radioactive effluents or handling of solid radioactive waste nor will the proposal result in any change in the normal radiation levels within the plant. There is no significant increase in individual or cumulative occupational radiation exposure.

Based on the above, NMC 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.

## 7. REFERENCES

1. Safety Guide 9 (original revision of Regulatory Guide 1.9), "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971.
2. DAEC Updated Final Safety Analysis Report (UFSAR), Section 1.8.9.
3. NUREG-1433, Rev. 3, "Standard Technical Specifications General Electric Plants, BWR/4," August, 2003.
4. DAEC ISTS Conversion (TAC NO. M97197) - License Amendment # 223, dated May 22, 1998.

**EXHIBIT B**

**PROPOSED TECHNICAL SPECIFICATION**

**AND**

**BASES CHANGES**

**(MARK-UP)**

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.1.1    Verify correct breaker alignment and indicated power availability for each offsite circuit.	7 days
SR 3.8.1.2    -----NOTES----- 1.    All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.  2.    A modified DG start involving idling and gradual acceleration to synchronous 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.  3.    When a DG is placed in an inoperable status solely for the performance of testing required by Required Actions B.3 or B.4, entry into associated Conditions and Required Actions may be delayed for up to 2 hours. ----- Verify each DG starts from standby conditions and achieves steady state voltage $\geq 3744\text{v}$ and $\leq 4576\text{v}$ and frequency $\geq 59.5\text{Hz}$ and $\leq 60.5\text{Hz}$ .	31 days

(continued)

$\geq 58.8\text{ Hz}$  and  $\leq 61.2\text{ Hz}$

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### SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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
SR 3.8.1.7	<p>-----NOTE-----  All DG starts may be preceded by an engine prelube period.  -----</p> <p>Verify each DG starts from standby condition and achieves:</p> <p>a. in <math>\leq 10</math> seconds, voltage <math>\geq 3744V</math> and frequency <math>\geq 59.5Hz</math>; and</p> <p>b. steady state, voltage <math>\geq 3744V</math> and <math>\leq 4576V</math> and frequency <math>\geq 59.5Hz</math> and <math>\leq 60.5Hz</math>.</p>	184 days
	<div style="border: 1px solid black; padding: 2px; display: inline-block;">58.8 Hz</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 100px;">61.2 Hz</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 100px;">58.8 Hz</div>	
SR 3.8.1.8	<p>-----NOTE-----  This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR.  -----</p> <p>Verify automatic slow transfer of AC power supply from the Startup Transformer to the Standby Transformer.</p>	24 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.9 -----NOTE-----  This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR.  -----</p> <p>Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and:</p> <ol style="list-style-type: none"> <li>Following load rejection, the frequency is <math>\leq 64.5\text{Hz}</math>.</li> <li>Within 1.3 seconds following load rejection, the voltage is <math>\geq 3744\text{V}</math> and <math>\leq 4576\text{V}</math>.</li> <li>Within 3.9 seconds following load rejection, the frequency is <math>\geq 59.5\text{Hz}</math> and <math>\leq 60.5\text{Hz}</math>.</li> </ol>	<p>24 months</p> <p>58.8 Hz</p>
<p>SR 3.8.1.10 -----NOTE-----  This Surveillance shall not be performed in MODE 1, 2 or 3. However, credit may be taken for unplanned events that satisfy this SR.  -----</p> <p>Verify each DG's automatic trips are bypassed on an actual or simulated Loss of Offsite Power (LOOP) signal or on an actual or simulated ECCS initiation signal except:</p> <ol style="list-style-type: none"> <li>Engine overspeed; and</li> <li>Generator lockout.</li> </ol>	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.13 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. All DG starts may be preceded by an engine prelube period.</li> <li>2. This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR.</li> </ol> <p>-----</p> <p>Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal:</p> <ol style="list-style-type: none"> <li>a. De-energization of essential buses;</li> <li>b. Load shedding from essential buses; and</li> <li>c. DG auto-start from standby condition and:               <ol style="list-style-type: none"> <li>1. energizes permanently connected loads in <math>\leq 10</math> seconds,</li> <li>2. energizes auto-connected emergency loads in the proper timed sequence,</li> <li>3. achieves steady state voltage <math>\geq 3744V</math> and <math>\leq 4576V</math>,</li> <li>4. achieves steady state frequency <math>\geq 58.8Hz</math> and <math>\leq 61.2Hz</math>, and</li> <li>5. supplies permanently connected and auto-connected emergency loads for <math>\geq 5</math> minutes.</li> </ol> </li> </ol>	<p>24 months</p>

BASES (continued)

SURVEILLANCE  
REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with UFSAR Section 3.1.2.2.9 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are largely in accordance with the recommendations of Safety Guide 9 as discussed in UFSAR Section 1.8.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), and Regulatory Guide 1.137 (Ref. 10) or as addressed in the UFSAR.

The minimum steady state output voltage of 3744V (i.e., approximately 90% of the nominal 4160 V output voltage) is appropriate to show satisfactory DG operation. This value also provides a large margin of safety since safety related motors are capable of accelerating their loads at 70% of rated voltage. The specified maximum steady state output voltage of 4576 V or 110% of 4160 V appropriately shows satisfactory DG operation and is below the damage curve of 4000 V motors. The DGs are adjustable within the 4160 V  $\pm 10\%$  range. The specified minimum and maximum frequencies of the DG are 59.5 Hz and 60.5 Hz, respectively. These values are approximately equal to  $\pm 1\%$  of the 60 Hz nominal frequency and are conservative with respect to the recommendations found in Regulatory Guide 1.9 (Ref. 17).

58.8 Hz and 61.2 Hz

consistent

2%

(continued)



BASES

SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.7 (continued)

After completion of the SR, the fuel racks to the DG are disabled to allow purging of any residual fuel oil from the cylinders. This also renders the DG inoperable. The two hours allowed by the Note minimizes the amount of time a DG is inoperable while providing enough time to perform the required Conditional Surveillance and avoids entering the shutdown actions of Condition E or F unnecessarily.

For the purposes of this testing, the DGs are manually started from standby conditions. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce stress and wear on diesel engines during testing, the manufacturer of the DGs installed at the DAEC recommends a modified start in which the starting speed of the DG is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 2 (SR 3.8.1.2).

SR 3.8.1.7 requires that, at a 184 day Frequency, the DG starts from standby conditions and achieves required voltage and frequency (i.e. - voltage  $\geq 3744$  V and frequency  $\geq 58.8$  Hz) within 10 seconds; and achieves steady state voltage  $\geq 3744$  V and  $\leq 4576$  V and frequency  $\geq 59.5$  Hz and  $\leq 61.2$  Hz. The 10 second start requirement supports the assumptions in the design basis LOCA analysis of UFSAR, Section 15.2.1 (Ref. 12). The 10 second start requirement is not applicable to SR 3.8.1.2 (see Note 3 of SR 3.8.1.2), when a modified start procedure as described above is used. If a modified start is not used, the 10 second start requirement of SR 3.8.1.7 applies. In addition to the SR requirements, the time for the DG to reach steady state operation, unless the modified DG start method is employed, is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

The normal 31 day Frequency for SR 3.8.1.2 is consistent with Safety Guide 9. The 184 day Frequency for SR 3.8.1.7 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 7). These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.

(continued)

BASES

SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.8.1.9

58.8

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and the capability to reject the largest single load and return to the required voltage and frequency (i.e. - voltage  $\geq 3744$  V and  $\leq 4576$  V and frequency  $\geq 59.5$  Hz and  $\leq 60.5$  Hz) within predetermined periods of time (i.e., 1.3 seconds for voltage and 3.9 seconds for frequency) while maintaining an acceptable margin to the overspeed trip. The largest single load for each DG is a core spray pump motor (700 hp). This Surveillance may be accomplished by tripping its associated single largest post-accident load with the DG solely supplying the bus.

61.2

As specified by IEEE-308 (Ref. 14), 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, or 15% above synchronous speed, whichever is lower. For both DGs, this represents 64.5 Hz, equivalent to 75% of the difference between nominal speed and the overspeed trip setpoint.

The time, voltage, and frequency tolerances specified in the Bases for this SR are derived from UFSAR Table 8.3-1 (Ref. 16) recommendations for response during load sequence intervals. The voltage and frequency are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are the steady state voltage and frequency to which the system must recover following load rejection within a predetermined time period. The 24 month Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 9).

This SR is modified by a Note. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the Electrical Distribution Systems that could challenge continued steady state operation and, as a result, plant safety systems. Credit may be taken for unplanned events that satisfy this SR.

(continued)

BASES

SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.8.1.13

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF Systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates DG operation during a Loss of Offsite Power actuation test signal (LOOP signal) in conjunction with an ECCS initiation signal (LOCA signal). This test verifies all actions encountered from the LOOP/LOCA, including the LOOP/LOCA load shedding function and energization of the essential buses and respective loads from the DG. This Surveillance also demonstrates the as-designed operation of the standby power sources during a LOOP, including: 1) de-energization of the essential buses, 2) the dead bus load shedding function, and 3) that the DG receives a start signal. This surveillance also demonstrates that the DG automatically starts from the design basis actuation signal (LOCA signal). It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency (i.e., voltage  $\geq 3744$  V and  $\leq 4576$  V and frequency  $\geq 59.5$  Hz and  $\leq 60.5$  Hz) within the specified time (10 seconds). In lieu of multiple demonstrations of DG starting and achieving the required voltage and frequency in the specified time from each of the various start signals (LOOP, LOCA and LOOP/LOCA), and operation for  $\geq 5$  minutes, testing that adequately shows the capability of the DG to start from each of the signals is acceptable. The DG auto-start time of 10 seconds is derived from requirements of the accident analysis, (Ref. 12), for responding to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes (with a LOOP signal in conjunction with a LOCA signal present) in order to demonstrate that all of the starting transients have decayed and stability has been achieved.

58.8

61.2

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The requirement to verify the connection and power supply of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these

(continued)

076

**EXHIBIT C**

**PROPOSED TECHNICAL SPECIFICATION PAGES  
(RE-TYPED)**

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	7 days
SR 3.8.1.2	<p>-----NOTE-----</p> <ol style="list-style-type: none"> <li>1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.</li> <li>2. A modified DG start involving idling and gradual acceleration to synchronous 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>3. When a DG is placed in an inoperable status solely for the performance of testing required by Required Actions B.3 or B.4, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.</li> </ol> <p>-----</p> <p>Verify each DG starts from standby conditions and achieves steady state voltage <math>\geq 3744\text{v}</math> and <math>\leq 4576\text{v}</math> and frequency <math>\geq 58.8\text{ Hz}</math> and <math>\leq 61.2\text{ Hz}</math>.</p>	31 days

(continued).

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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
SR 3.8.1.7	<p>-----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify each DG starts from standby condition and achieves:</p> <p>a. in <math>\leq 10</math> seconds, voltage <math>\geq 3744V</math> and frequency <math>\geq 58.8Hz</math>; and</p> <p>b. steady state, voltage <math>\geq 3744V</math> and <math>\leq 4576V</math> and frequency <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz.</p>	184 days
SR 3.8.1.8	<p>-----NOTE----- The Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify automatic slow transfer of AC power supply from the Startup Transformer to the Standby Transformer.</p>	24 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.9 -----NOTE----- This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and:</p> <ol style="list-style-type: none"> <li>Following load rejection, the frequency is <math>\leq 64.5\text{Hz}</math>.</li> <li>With 1.3 seconds following load rejection, the voltage is <math>\geq 3744\text{V}</math> and <math>\leq 4576\text{V}</math>.</li> <li>Within 3.9 seconds following load rejection, the frequency is <math>\geq 58.8\text{ Hz}</math> and <math>\leq 61.2\text{ Hz}</math>.</li> </ol>	<p>24 months</p>
<p>SR 3.8.1.10 -----NOTE----- This Surveillance shall not be performed in MODE 1, 2 or 3. However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify each DG's automatic trips are bypassed on an actual or simulated Loss of Offsite Power (LOOP) signal or on an actual or simulated ECCS initiation signal except:</p> <ol style="list-style-type: none"> <li>Engine overspeed; and</li> <li>Generator lockout.</li> </ol>	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.13 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. All DG starts may be preceded by an engine prelube period.</li> <li>2. This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR.</li> </ol> <p>-----</p> <p>Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal:</p> <ol style="list-style-type: none"> <li>a. De-energization of essential buses;</li> <li>b. Load shedding from essential buses; and</li> <li>c. DG auto-start from standby condition and:               <ol style="list-style-type: none"> <li>1. energizes permanently connected loads in <math>\leq 10</math> seconds,</li> <li>2. energizes auto-connected emergency loads in the proper timed sequence,</li> <li>3. achieves steady state voltage <math>\geq 3744V</math> and <math>\leq 4576V</math>,</li> <li>4. achieves steady state frequency <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz, and</li> <li>5. supplies permanently connected and auto-connected emergency loads for <math>\geq 5</math> minutes.</li> </ol> </li> </ol>	<p>24 months</p>