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March 22, 1988
Fort St. Vrain
Unit No. 1
P-88062

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

Attention: Mr. Jose A. Calvo
Director, Project Directorate IV

Docket No. 50-267

SUBJECT: Final Draft Upgrade
Electrical Technical
Specifications
Sections 3/4.8

REFERENCE: PSC letter, Brey to
Calvo, dated 8/24/87
(P-87272)

Dear Mr. Calvo:

Enclosed is the final draft Electrical Technical Specifications, for your review as a part of the Fort St. Vrain (FSV) Technical Specification Upgrade Program (TSUP). This final draft reflects recent discussions and telephone conferences with the NRC and its reviewers. The Specifications included in Attachment 1 have been reviewed by a subcommittee of the FSV Plant Operating Review Committee (PORC) and were approved for this draft submittal. This PORC subcommittee has been assembled expressly for the TSUP reviews and its approval is a part of the overall TSUP approval process.

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PSC would like to clarify that this submittal may require further revisions prior to formal amendment application. PSC will be performing selected surveillances from the Upgraded Technical Specifications during the next scheduled shutdown. In addition, PSC is planning to install new batteries prior to the time the Upgraded Technical Specifications become effective. Changes may be required to this draft submittal based on the impact of these items. PSC considers the Specifications in Attachment 1 appropriate for inclusion in the Final Draft, currently scheduled for submittal in April 1988.

Attachment 2 provides a summary of the significant changes from the August 24, 1987 draft Electrical Technical Specifications, submitted in the referenced letter. Attachment 3 provides discussions for the remaining TSUP NRC comments that had previously been categorized as requiring PSC action.

If you have any questions on this information, please contact Mr. M. H. Holmes at (303) 480-6960.

Very truly yours,

Lawrence Brey

H. L. Brey, Manager
Nuclear Licensing
and Fuels Division

HLB/JAC/lmb

Attachments

cc: Regional Administrator, Region IV
ATTN: Mr. T. F. Westerman, Chief
Projects Section B

Mr. Robert Farrell
Senior Resident Inspector
Fort St. Vrain

Mr. Alan Udy
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Attachment 1
to P-88062

P-88062
Attachment 1

UPGRADED TECHNICAL SPECIFICATIONS

FOR AUXILIARY ELECTRIC POWER SYSTEMS

Margin marks in the attached Draft Specification indicate changes from the August 24, 1987 Draft, previously provided in P-87272.

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AUXILIARY ELECTRIC POWER SYSTEMS

3/4.8.1 AC POWER SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following AC electrical power sources shall be OPERABLE:

a. The Unit Auxiliary Transformer (UAT) and the Main Power Transformer (MPT), with or without the generator output links installed, and the Reserve Auxiliary Transformer (RAT).

b. Two separate and independent Standby Diesel Generators (SDGs) with:

1. Each diesel fuel oil day tank containing a minimum of 325 gallons of fuel,

2. A minimum of 20,000 gallons of diesel fuel in underground storage including 5,500 gallons of diesel fuel in the diesel fuel oil storage tank (T-9201) and an OPERABLE flow path(s) capable of transferring fuel oil from storage to each day tank,

3. An OPERABLE water-jacket heater for each SDG diesel engine, and

4. Lubricating oil storage containing a minimum total volume of 100 gallons of lubricating oil.

APPLICABILITY: POWER, LOW POWER, STARTUP*, and SHUTDOWN*

* Whenever CALCULATED BULK CORE TEMPERATURE is greater than 760 degrees F.

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ACTION:

a. With the UAT, the MPT, or the RAT of the above required off-site AC electrical power sources inoperable, demonstrate the OPERABILITY of the remaining off-site A.C. electrical power source by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. If either Standby Diesel Generator (SDG) has not been successfully tested within the past 24 hours, demonstrate its OPERABILITY by performing Surveillance Requirements 4.8.1.1.2.a.5 and 4.8.1.1.2.a.7 for each such SDG, separately, within 24 hours. Restore the inoperable off-site source to OPERABLE status within 24 hours, or be in at least SHUTDOWN within the next 24 hours.

b. With either SDG inoperable, demonstrate the OPERABILITY of the above required AC off-site sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour, and at least once per 8 hours thereafter. If the SDG became inoperable due to any cause other than preplanned preventive maintenance or testing and the remaining SDG has not been demonstrated OPERABLE in the previous 8 hours demonstrate the OPERABILITY of the remaining SDG by performing Surveillance Requirements 4.8.1.1.2.a.5 and 4.8.1.1.2.a.7, initiating the surveillances within 1 hour*. Restore the inoperable SDG to OPERABLE status within 72 hours or be in at least SHUTDOWN within the next 24 hours.

c. With the UAT, the MPT, or the RAT, and one SDG of the above required AC electrical power sources inoperable, demonstrate the OPERABILITY of the remaining off-site A.C. source by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour, and at least once per 8 hours thereafter. If SDG became inoperable due to any cause other than preplanned preventive maintenance or testing and the remaining SDG has not been demonstrated OPERABLE within the previous 8 hours, demonstrate its OPERABILITY by performing Surveillance Requirements 4.8.1.1.2.a.5 and 4.8.1.1.2.a.7 initiating the surveillances within 1 hour*. Restore at least one of the inoperable AC electrical power sources to OPERABLE status within 12 hours, or be in at least SHUTDOWN within the next 24 hours. Restore the UAT, the MPT and the RAT to OPERABLE status within 24 hours and both SDGs to OPERABLE status within 72 hours from the time of initial loss of OPERABILITY, or be in at least SHUTDOWN within the next 24 hours.

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* This test is required to be completed regardless of when the inoperable SDG is restored to OPERABLE.

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d. With one SDG inoperable, unless declared inoperable due to surveillance testing, perform the following in addition to ACTION b. or c.: Ensure within 2 hours that all the required SAFE SHUTDOWN COOLING systems, subsystems, trains, components, and devices that depend on the remaining OPERABLE SDG as a source are also OPERABLE, or be in at least SHUTDOWN within the next 24 hours.

e. With both SDGs inoperable, demonstrate the OPERABILITY of two off-site sources of the above required AC electrical power sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour, and at least once per 8 hours thereafter. Restore at least one of the inoperable SDGs to OPERABLE status within 2 hours, or be in at least SHUTDOWN within the next 24 hours. Restore both SDGs to OPERABLE status within 72 hours from the time of initial loss of OPERABILITY, or be in at least SHUTDOWN within the next 24 hours.

f. If results from a fuel oil sample taken per Surveillance Requirement 4.8.1.1.2.b.2 or 4.8.1.1.2.c are unacceptable, demonstrate the OPERABILITY of both SDGs, separately, by performing Surveillance Requirements 4.8.1.1.2.a.5 and 4.8.1.1.2.a.7 within 8 hours, if not performed within the last 7 days. Resample the fuel oil per Surveillance Requirement 4.8.1.1.2.b.2 or 4.8.1.1.2.c, as applicable, within 8 hours of receipt of the unacceptable result(s). If results from the second sample are unacceptable, the SDGs shall be declared inoperable. Drain the fuel oil from the contaminated tank and replace it with fresh fuel oil. Sample the fresh fuel oil per Surveillance Requirement 4.8.1.1.2.c.

g. With the diesel fuel oil storage tank (T-9201) unavailable, operation may continue provided the diesel fuel oil in underground storage tanks 1A and 1B has been demonstrated acceptable by performing Surveillance Requirements 4.8.4.d and 4.8.1.1.2.c and by performing Surveillance Requirement 4.8.1.1.2.c prior to addition of any fuel oil to these tanks. If the results from a fuel oil sample taken per Surveillance Requirement 4.8.4.d or 4.8.1.1.2.c are unacceptable, ACTION statement 3.8.1.1.f applies.

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SURVEILLANCE REQUIREMENTS

4.8.1.1.1 The required off-site sources of AC electric power shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying correct breaker alignments, indicated power availability, and

b. At least once per 18 months, during SHUTDOWN:

1. By verifying automatic transfer of house power supply from the Unit Auxiliary Transformer to the Reserve Auxiliary Transformer, and

2. By verifying that the Unit Auxiliary Transformer generator links can be tagged out and removed within 6 hours.

4.8.1.1.2 Each Standby Diesel Generator (SDG) shall be demonstrated OPERABLE:

a. In accordance with the frequency specified in Table 4.8.1-1 on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in each diesel fuel oil day tank is at least 325 gallons,

2. Verifying the total fuel oil quantity in underground storage is at least 20,000 gallons with at least 5,500 gallons in the diesel fuel oil storage tank (T-9201) in addition to the day tanks,

3. Verifying the capability to transfer fuel oil from the underground storage system to the diesel fuel oil day tank,

4. Verifying the water-jacket heaters are OPERABLE by ensuring that the coolant water is being maintained at a temperature of greater than or equal to 100 degrees F,

5. Verifying the SDG diesel engines start from the normal pre-heated condition and accelerate to normal operating speed; the SDG voltage and frequency shall be 480 plus or minus 48 volts, and 60 plus or minus 1.2 Hz,

6. Verifying the lubrication oil inventory in storage is at least 100 gallons,

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7. Verifying the SDG is synchronized, loaded to 1150 KW plus or minus 50 KW* with two diesel engines per SDG and operates for at least 60 minutes,

8. Verifying the SDG is aligned to provide standby power to the associated emergency buses, and

9. Verifying both air start receivers of the SDG are pressurized to greater than or equal to 120 psig.

b. At least once per 31 days:

1. By checking for and removing accumulated water from the fuel oil storage tanks: T-8401, T-8402, and T-9201, and

2. By obtaining a sample of fuel oil from the diesel fuel oil storage tank (T-9201) in accordance with ASTM D2276-78 and verifying that the total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM-D2276-78, method A.

c. By sampling fuel oil in accordance with ASTM-D4057 prior to addition to the diesel fuel oil storage tank (T-9201) and:

1. By verifying a clear and bright appearance with proper color when tested in accordance with ASTM-D4176-82 prior to addition to the diesel fuel oil storage tank (T-9201), and

2. By verifying within 14 days of obtaining the sample, when tested in accordance with ASTM-D975-1977.

a) A flash point equal to or greater than 125 degrees F, and

b) A kinematic viscosity at 40 degrees C of greater than or equal to 1.9 centistokes but less than or equal to 4.1 centistokes.

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* This is a steady state load

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d. At least once per 31 days by performing a CHANNEL FUNCTIONAL TEST of the SDG engine exhaust temperature "shutdown" and "declutch" function.

e. At least once per 18 months, during SHUTDOWN by:

1. Subjecting the SDG diesel engines to an inspection in accordance with the procedures prepared in conjunction with the manufacturer's recommendations.

2. Performing a CHANNEL CALIBRATION of the SDG "shutdown" and "declutch" engine protective functions.

3. Verifying the SDG capability to reject a load of greater than or equal to 202 KW while maintaining voltage at 480 plus or minus 48 volts and frequency at 60 plus or minus 1.2 Hz.

4. Verifying the SDG capability to reject a load of 1150 KW plus or minus 50 KW without tripping the SDG; the SDG voltage shall not exceed 552 volts during and following the load rejection.

5. Simulating an undervoltage relay actuation signal:

a) Verifying de-energization of the essential 480 VAC buses and load shedding from the essential 480 VAC buses,

b) Verifying the SDG diesel engines start on the auto-start signal, energize the essential 480 VAC buses within 60 seconds, start the auto-sequenced loads through the load sequencer, and OPERATE for greater than or equal to 5 minutes while the associated SDG is loaded with the programmed loads; after energization, the steady state voltage and frequency shall be maintained at 480 plus or minus 48 volts and 60 plus or minus 1.2 Hz during this test, and

c) Verifying the overload and antimotoring SDG trip functions are bypassed when the SDGs are in the auto-start mode.

6. Verifying that the auto-sequenced loads to each SDG do not exceed 1210 KW, with both SDG diesel engines operating.

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7. Verifying the SDG's capability to:

   a) Synchronize with the off-site power source while the SDG is loaded with its emergency loads upon a simulated restoration of off-site power,

   b) Transfer its loads to the off-site power source, and

   c) Be restored to standby status.

8. Verifying the SDG operates for at least 24 hours; during the first 2 hours of this test, the SDG shall be loaded to 1260 KW plus or minus 60 KW*, and during the remaining 22 hours of this test, the SDG shall be loaded to 1150 KW plus or minus 50 KW*; the SDG voltage and frequency shall be 480 plus or minus 48 volts and 60 plus or minus 1.2 Hz; within 5 minutes after completing the 24 hour test, perform Surveillance Requirement 4.8.1.1.2.a.5.

9. Verify that the load sequence timer is OPERABLE with the complete sequence loaded within plus or minus 10% of its design time.

f. At least once per 10 years, or after any modifications which could affect SDG interdependence, by starting both SDGs simultaneously, during SHUTDOWN, and verifying that both SDGs accelerate to normal operating speed.

g. At least once per 10 years by draining each underground storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution or equivalent.

h. REPORTS - Standby Diesel Generator (SDG) failures, as required by Table 4.8.1-2, shall be reported to the Commission in a Special Report pursuant to Specification 6.9.2. Additional reporting and requalification requirements shall be in accordance with Table 4.8.1-2.

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* This is a steady state load

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TABLE 4.8.1-1

STANDBY DIESEL GENERATOR TEST SCHEDULE

Number of Failures in Last 20 Valid Tests*	Test Frequency
≤ 1	At least once per 31 days
≥ 2	At least once per 7 days **
≥ 3	See Table 4.8.1-2

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* Criteria for determining number of failures and number of valid tests shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, Revision 1, August 1977, where the last 20 tests are determined on a per Standby Diesel Generator (SDG) basis.

** This test frequency shall be maintained until 7 consecutive failure free demands have been performed and the number of failures in the last 20 demands has been reduced to 1 or less.

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TABLE 4.8.1-2

ADDITIONAL RELIABILITY ACTIONS

No. of Failures in Last 20 Valid Tests	No. of Failures in Last 100 Valid Tests	Action
3	6	Within 30 days, prepare and maintain a report for NRC audit, describing the SDG diesel engine reliability improvement program implemented at the site. Minimum requirements for the report are indicated in Attachment 1 to this table.
5	11	Declare the SDG inoperable and perform a requalification test program for the affected SDG diesel engine. Requalification test program requirements are indicated in Attachment 2 to this table.
N/A	N/A	Submit a yearly data report on the SDG reliability.

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ATTACHMENT 1 TO TABLE 4.8.1-2

REPORTING REQUIREMENT

As a minimum, the reliability improvement program report for NRC audit shall include:

A. A summary of all tests (valid and invalid) that occurred within the time period over which the last 20/100 valid tests were performed.

B. An analysis of failures and determination of root causes of failures.

C. An evaluation of each of the recommendations of NUREG/CR-0660, "Enhancement of Onsite Emergency Diesel Generator Reliability in Operating Reactors," with respect to their application to the Plant.

D. An identification of all actions taken, or to be taken, to correct the root causes of failures defined in B above and to achieve a general improvement of SDG reliability.

E. The schedule for implementation of each action from D above.

F. An assessment of the existing reliability of electric power to essential equipment.

Upon completion of the initial report detailing the SDG reliability improvement program at the site, as defined above, prepare only a supplemental report within 30 days after each failure during a valid demand, for as long as the affected SDG diesel engine continues to violate the criteria (3/20 or 6/100) for the reliability improvement program remedial action. The supplemental report need only update the failure/demand history for the affected SDG since the last report for that SDG. The supplemental report shall also present an analysis of the failure(s) with a root cause determination, if possible, and shall delineate any further procedural, hardware, or operational changes to be incorporated into the SDG improvement program and the schedule for implementation of those changes.

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ATTACHMENT 2 TO TABLE 4.8.1-2

STANDBY DIESEL GENERATOR REQUALIFICATION PROGRAM

A. Perform 7 consecutive successful demands, as specified in Surveillance Requirement 4.8.1.1.2.a, without a failure within 30 days of the SDG being restored to OPERABLE status, and 14 consecutive successful demands without a failure within 75 days of the SDG being restored to OPERABLE status.

B. If a failure occurs during the first 7 tests in the requalification test program, perform 7 successful demands without an additional failure within 30 days of the SDG being restored to OPERABLE status and 14 consecutive successful demands without a failure within 75 days of the SDG being restored to OPERABLE status.

C. If a failure occurs during the second 7 tests (tests 8 through 14) of A., above, perform 14 consecutive demands without an additional failure within 75 days of the failure.

D. If a second failure occurs during the requalification test program, be in at least SHUTDOWN within 24 hours.

E. During requalification testing, the SDG should not be tested more frequently than at 24-hour intervals.

F. After a SDG has been successfully requalified, subsequent repeated requalification tests will not be required for that SDG under the following conditions:

1. The number of failures in the last 20 valid demands is less than 5.

2. The number of failures in the last 100 valid demands is less than 11.

3. In the event that following successful requalification of a SDG, the number of failures is still in excess of the remedial action criteria (1. and/or 2. above) the following exception will be allowed until the SDG is no longer in violation of the remedial action criteria (1. and/or 2. above):

   Requalification testing will not be required provided that after each valid demand the number of failures in the last 20 and/or 100 valid demands has not increased. Once the SDG is no longer in violation of the remedial action criteria above, the provisions of those criteria alone will prevail.

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AUXILIARY ELECTRIC POWER SYSTEMS

3/4.8.1 AC POWER SOURCES

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.1.2 As a minimum, the following AC electrical power sources shall be OPERABLE:

a. Either the Reserve Auxiliary Transformer (RAT) or the Unit Auxiliary Transformer (UAT) and Main Power Transformer (MPT); and

b. One Standby Diesel Generator (SDG) with:

1. The diesel fuel oil day tank containing a minimum of 325 gallons of fuel,

2. A minimum of 10,000 gallons of diesel fuel in underground storage, and an OPERABLE flow path(s) capable of transferring fuel oil from storage to the day tank,

3. An OPERABLE water-jacket heater for each SDG diesel engine, and

4. Lubricating oil storage containing a minimum total volume of 50 gallons of lubricating oil.

APPLICABILITY: STARTUP*, SHUTDOWN*, and REFUELING

* Whenever CALCULATED BULK CORE TEMPERATURE is less than or equal to 760 degrees F.

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ACTION: With less than the above minimum required AC electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, control rod movement resulting in positive reactivity changes, or movement of IRRADIATED FUEL. Initiate corrective actions to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2 No additional surveillance requirements are required other than those surveillances identified per Surveillance Requirements 4.8.1.1.1 and 4.8.1.1.2.

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BASIS FOR SPECIFICATION LCO 3.8.1 / SR 4.8.1

The OPERABILITY of the AC electrical power sources during POWER, LOW POWER, STARTUP and SHUTDOWN (whenever CALCULATED BULK CORE TEMPERATURE is greater than 760 degrees F) ensures that sufficient power will be available, as required to perform the intended safety functions under postulated abnormal and accident conditions. The minimum specified requirements for independent and redundant AC electrical power sources are adequate to satisfy the basis of General Plant Design Criteria No. 24 and No. 39 as stated in Appendix C of the FSAR.

Specification 3.0.5 provides the methodology and necessary data to determine the appropriate time interval to reach a CALCULATED BULK CORE TEMPERATURE of 760 degrees F. If the active core remains below this temperature, which corresponds to the design maximum core inlet temperature, then the design core inlet temperature cannot be exceeded and there can be no damage to fuel or PCRV internal components regardless of the amount, including total absence, or reversal, of PRIMARY COOLANT FLOW.

The means of providing AC electrical power to plant auxiliaries during normal operation is through the Unit Auxiliary Transformer (UAT) energized by the main turbine-generator. The UAT can also be energized from the high voltage transmission lines through the station switchyard via the Main Power Transformer (MPT), after the generator links have been removed to isolate the main turbine generator. The UAT is connected to the 4160 VAC Buses 1 and 3, which are connected to the essential 480 VAC Buses 1 and 3, respectively.

Off-site AC electrical power during STARTUP, SHUTDOWN or loss of the UAT or MPT is supplied through the Reserve Auxiliary Transformer (RAT). The RAT is energized from the high voltage transmission lines via the station switchyard. The RAT is connected to the 4160 VAC Bus 2, which connects to essential 480 VAC Bus 2. Upon loss-of-power from the UAT, power supply to the plant auxiliaries is automatically transferred to the RAT.

On-site AC electrical power is supplied by two Standby Diesel Generators (SDGs), either of which has the capability to power all electrical auxiliaries that are essential for SAFE SHUTDOWN COOLING. Each DG supplies essential 480 VAC Bus 1 or Bus 3, with the first-in SDG also energizing essential 480 VAC Bus 2.

A diesel fuel supply of 16,150 gallons is adequate to provide for operation of one SDG for one week, under required load conditions to shutdown the plant and to maintain it in a safe condition. This reserve capacity provides ample time for obtaining additional fuel from off-site sources.

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The ACTION requirements for various allowable levels of degradation of the electrical power sources provide restrictions upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources is consistent with the initial conditions/assumptions of the FSAR, and is based upon maintaining at least one of the redundant sets of on-site AC and DC electrical power sources and associated distribution systems operable during accident conditions which postulate the loss of all off-site power, compounded by a single failure of the other redundant on-site sources.

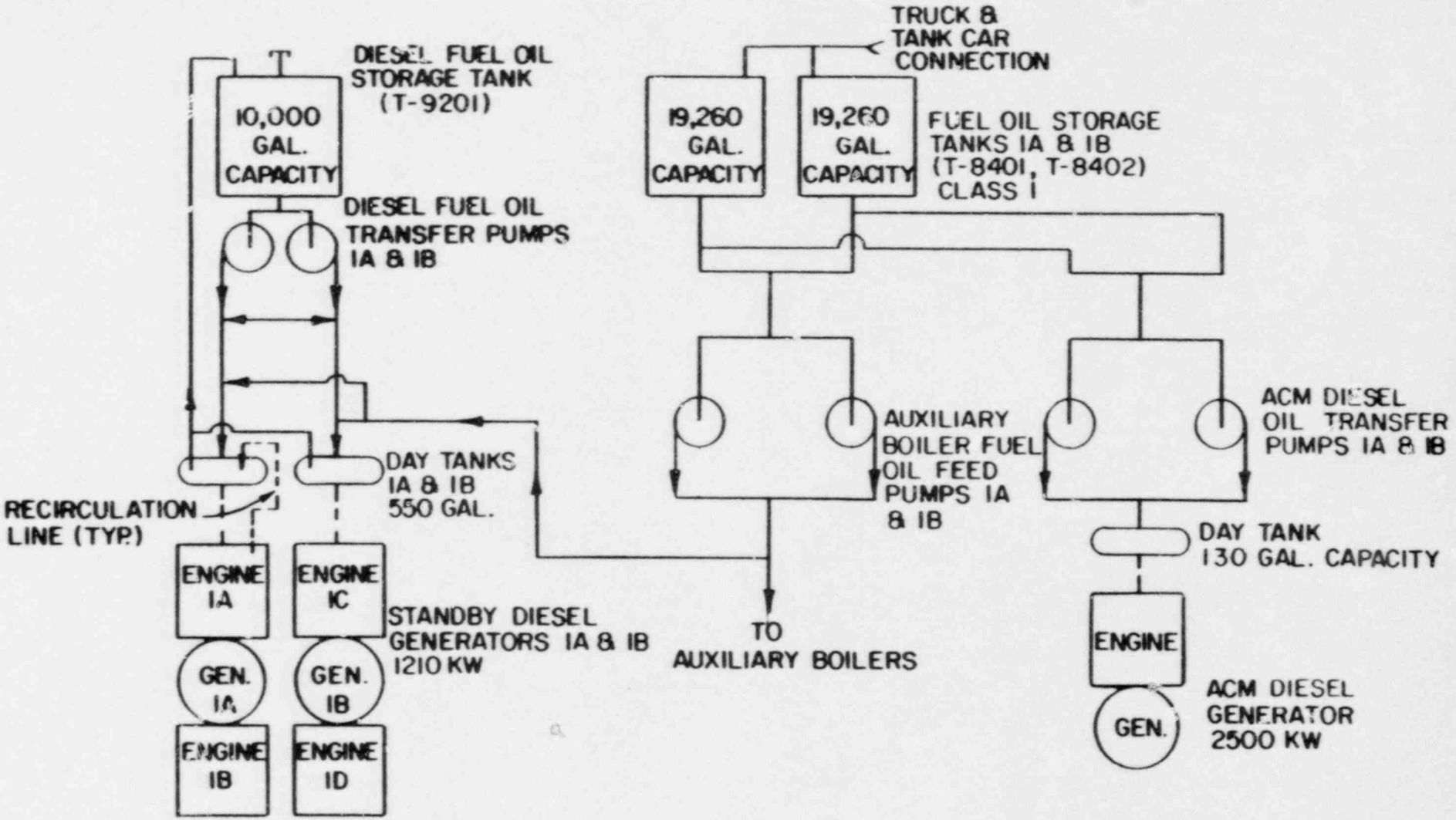
The term verify as used in the ACTION statements means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. The term ensure as used in ACTION statement 3.8.1.1.d allows 2 hours to verify OPERABLE or to restore to OPERABLE status affected equipment, with any additional ACTION not required, if in compliance.

The surveillance requirements are adequate to demonstrate the OPERABILITY of the off-site and on-site AC electrical power sources, such that their intended safety functions under postulated abnormal and accident conditions can be performed.

In particular, the surveillance requirements for the SDGs are consistent with the intent of Regulatory Guide 1.108 "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants", Revision 1, August 1977 and Generic Letter 84-15 "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability".

The SDGs are required to reach rated speed, voltage and frequency on demand. If an SDG does not reach these parameters or if the SDG fails to start due to depletion of the starting air receivers, the SDG start is considered a failure.

The SDG fuel oil sampling requirements are sufficient to assess fuel oil quality at Fort St. Vrain. With over 10 years of diesel generator operational experience, there have been no fuel oil related failures of the SDGs. Fuel oil is distributed between a diesel fuel oil storage tank for the SDGs and a shared tank arrangement with the Auxiliary Boiler. The turnover of diesel fuel in the underground storage tanks during SHUTDOWN, STARTUP and LOW POWER; the performance of surveillance requirements 4.8.4.d; and the performance of surveillance requirements 4.8.1.1.2.b and 4.8.1.1.2.c demonstrate the quality of diesel fuel oil in underground storage. Figure 3.8.1-1, Diesel Fuel Oil Systems, shows the tank and related piping arrangements.



DIESEL FUEL OIL SYSTEM

FIG. 3.8.1-1

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AUXILIARY ELECTRIC POWER SYSTEMS

3/4.8.2 DC POWER SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum, the following independent DC electrical power sources shall be OPERABLE:

a. Battery no. 1A and 1 dedicated battery charger,

b. Battery no. 1B and 1 dedicated battery charger, and

c. Battery no. 1C and 1 dedicated battery charger.

APPLICABILITY: POWER, LOW POWER, STARTUP,* and SHUTDOWN*

ACTION:

a. With one of the required batteries inoperable, verify the associated DC load is energized with a dedicated battery charger within 2 hours. If the battery is inoperable due to any cause other than an equalizing charge being performed, restore the inoperable battery to OPERABLE status within 24 hours or be in at least SHUTDOWN within the next 24 hours. If the battery is inoperable due to an equalizing charge being performed, restore the battery to OPERABLE status within 5 days or be in at least SHUTDOWN within the next 24 hours.**

b. With one dedicated battery charger inoperable, restore the inoperable dedicated battery charger to OPERABLE status within 24 hours or be in at least SHUTDOWN within the next 24 hours.

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* Whenever CALCULATED BULK CORE TEMPERATURE is greater than 760 degrees F.

** A battery can be disconnected from the distribution system for up to 5 consecutive days and 10 cumulative days during any 92 day period, if an equalizing charge is being performed.

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SURVEILLANCE REQUIREMENTS

4.8.2.1 Each required DC electrical power source shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1. The Category A limits in Table 4.8.2-1 are met, and

2. The total battery terminal voltage is greater than or equal to 120.4 volts on float charge.

b. At least once per 92 days, and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1. The Category B limits in Table 4.8.2-1 are met,

2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than or equal to 150 micro-ohms, and

3. The average electrolyte temperature of at least 20% of the cells is above 60 degrees F.

c. At least once per 18 months by verifying that:

1. The cells, cell plates, battery racks, and cell-to-cell and terminal connections show no visual indication of physical damage or abnormal deterioration,

2. The cell-to-cell and terminal connections are clean, tight, and coated with anti-corrosion material, and

3. The resistance of each cell-to-cell and terminal connection is less than or equal to 150 micro-ohms.

4. The battery charger will supply at least:

   a) 325 (+0, -25) amperes for at least 4 hours for battery chargers 1A and 1B,

   b) 200 (+0, -25) amperes for at least 4 hours for battery charger 1C, and

   c) 370 (+0, -25) amperes for at least 4 hours for battery charger 1D.

d. At least once per 18 months, during SHUTDOWN, by verifying that the battery capacity is adequate to supply and maintain in an OPERABLE status all of the emergency loads for the design duty cycle when the battery is subjected to a service discharge test.

e. At least once per 60 months, during SHUTDOWN, by:

   1. A performance discharge test on batteries 1A and 1B, separately, (at an average discharge rate of 310 amperes) over a period of 4 hours, or until the average battery terminal voltage reaches 1.81 volts/cell; the test shall be acceptable if, after 3.2 hours the battery is capable of producing at least 310 amperes, and the average battery terminal voltage is greater than 1.81 volts/cell.

   2. A performance discharge test on battery 1C (at an average discharge rate of 183 amperes) over a period of 4 hours, or until the average battery terminal voltage reaches 1.81 volts/cell; the test shall be acceptable if, after 3.2 hours the battery is capable of producing at least 183 amperes and the average battery terminal voltage is greater than 1.81 volts/cell.

   Once per 60 month interval, the performance discharge test may be performed in lieu of the battery service discharge test in Surveillance Requirement 4.8.2.1.d.

f. At least once per 18 months, during SHUTDOWN, by a performance discharge test of battery capacity on any battery that shows signs of abnormal degradation or has reached 85% of the service life expected for the application. Abnormal degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

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TABLE 4.8.2-1

BATTERY SURVEILLANCE REQUIREMENTS

	CATEGORY A (1)	CATEGORY B (2)	
	Pilot Cell	Connected Cell(s)	
Parameter	Limits	Limits	Allowable value (3)
Electrolyte Level	Greater than minimum level indication mark, and less than one quarter inch above maximum level indication mark.	Greater than minimum level indication mark, and less than one quarter inch above maximum level indication mark.	Above top of plates, and not overflowing.
Float Voltage	≥ 2.13 volts	≥ 2.13 volts (4)	≥ 2.07 volts
Specific Gravity (5)	≥ 1.205 (6)	≥ 1.195 for each connected cell.	Each connected cell not more than .020 below the average of all connected cells.
		Average of all connected cells > 1.205.	Average of all connected cells > 1.195. (6)

'( )' refer to notes on following page.

Notes for Table 4.8.2-1:

(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided the Category A and B parameter(s) are restored to within limits within the next 6 days.

(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.

(3) If any Category B parameter is not within its allowable value, declare the battery inoperable.

(4) Measured cell voltages of cells warmer than average may be corrected for electrolyte temperature, if measured cell voltage is less than the acceptance criteria.

(5) Corrected for electrolyte temperature and level.

(6) Or battery charging current is less than 2 amperes when on float charge.

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AUXILIARY ELECTRIC POWER SYSTEMS

3/4.8.2 DC POWER SOURCES

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.2.2 As a minimum, two of the following independent DC electrical power sources shall be OPERABLE:

a. Battery no. 1A and 1 dedicated battery charger, or

b. Battery no. 1B and 1 dedicated battery charger, or

c. Battery no. 1C and 1 dedicated battery charger.

APPLICABILITY: STARTUP*, SHUTDOWN*, and REFUELING

ACTION: With only one of the above batteries or only one dedicated battery charger OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, control rod movement resulting in positive reactivity changes or movement of IRRADIATED FUEL. Initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.2.2 The required DC electrical power sources shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.1.

* Whenever CALCULATED BULK CORE TEMPERATURE is less than or equal to 760 degrees F.

BASIS FOR SPECIFICATION LCO 3.8.2 / SR 4.8.2

The OPERABILITY of the DC electrical power sources during POWER, LOW POWER, STARTUP, and SHUTDOWN (whenever CALCULATED BULK CORE TEMPERATURE is greater than 760 degrees F) ensures that sufficient power will be available, as required to perform the intended safety functions under postulated abnormal and accident conditions. Batteries 1A and 1B are each adequate to supply the required safe shutdown DC loads for not less than 4 hours, while battery 1C supplies a DC power source for one channel of the PPS loads, following the loss of all AC power. The batteries provide the source of power, through the inverters and static transfer switches, to the AC instrument power buses. The minimum specified requirements for independent and redundant DC electrical power sources are adequate to satisfy the basis of General Plant Design Criteria No. 24 and No. 39 as stated in Appendix C of the FSAR.

Specification 3.0.5 provides the methodology and necessary data to determine the appropriate time interval to reach a CALCULATED BULK CORE TEMPERATURE of 760 degrees F. If the active core remains below this temperature, which corresponds to the design maximum core inlet temperature, then the design core inlet temperature cannot be exceeded and there can be no damage to fuel or PCRV internal components regardless of the amount, including total absence, or reversal, of PRIMARY COOLANT FLOW.

The FSV DC electrical power system consists of three batteries and four battery chargers. Two batteries, 1A and 1B, are connected to DC buses, 1A and 1B, respectively, and the third battery, 1C, is connected directly to inverter/static transfer switch, 1C. Three battery chargers, 1A, 1B, and 1C, energized from the essential 480 VAC buses, maintain batteries 1A, 1B, and 1C, respectively, on float charge during normal operation. The fourth battery charger, 1D, is utilized to supply bus 1A, or bus 1B or inverter 1C, through bus ties, while maintaining independence between the other DC power sources and the DC loads. The use of either battery chargers, 1A, 1B, or 1C or backup battery charger, 1D to supply the associated DC load, constitutes a dedicated battery charger.

The ACTION requirements for various allowable levels of degradation of the electrical power sources provide restrictions upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources is consistent with the initial conditions/assumptions of the FSAR, and are based upon maintaining at least one of the redundant sets of on-site AC and DC electrical power sources and associated distribution systems operable during accident conditions which postulate the loss of all off-site power, compounded by a single failure of the other redundant on-site sources.

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In Action 3.8.2.1.d a battery can be inoperable for 5 consecutive days and 10 cumulative days during a 92 day period, if an equalizing charge is being performed. An equalizing charge per the manufacturer requires a nominal 3 to 5 days to complete and is required every 2 to 3 months. At FSV a battery/battery charger is disconnected from the distribution system when an equalizing charge is being performed to preclude damage to the DC loads. Due to the fact that a battery/battery charger can readily be placed back in service by reconnecting it to the system, this configuration is not considered a significant degradation of the DC power sources or the on-site distribution system.

The Surveillance Requirement for demonstrating the OPERABILITY of the 1A, 1B and 1C batteries is based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1987, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values, and the performance of battery service discharge and performance discharge tests ensures the effectiveness of the charging system, the ability of the battery to handle high discharge rates, and the adequacy of the battery capacity with respect to the rated capacity and emergency load requirements.

Table 4.8.2-1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage, and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than or equal to 2.13 volts and 0.010 below the manufacturer's full charge specific gravity is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than or equal to 2.13 volts and not more than 0.020 below the full charge specific gravity of 1.215 with an average specific gravity of all the connected cells not more than 0.010 below the full charge specific gravity of 1.215, ensures the OPERABILITY and capability of the battery.

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Operation w th a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8.2-1 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the recommended full charge specific gravity, ensures that the decreases in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, not more than 0.040 below the full charge specific gravity, ensures that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2 07 volts, ensures the battery's capability to perform its design function.

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AUXILIARY ELECTRIC POWER SYSTEMS

3/4.8.3 ON-SITE POWER DISTRIBUTION

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.3.1 The following electrical buses shall be energized in the specified manner with tie breakers open between redundant buses:

a. Essential 480 VAC Bus 1 energized from the 4160 VAC Bus 1,**

b. Essential 480 VAC Bus 2 energized from the 4160 VAC Bus 2,**

c. Essential 480 VAC Bus 3 energized from the 4160 VAC Bus 3,**

d. 120 VAC non-interruptible Bus 1A/1A-1 energized through their respective inverter/static transfer switch from the preferred power source, 125 VDC Bus 1A,

e. 120 VAC non-interruptible Bus 1B/1B-1 energized through their respective inverter/static transfer switch from the preferred power source, 125 VDC Bus 1B,

f. 120 VAC non-interruptible Bus 1C/1C-1 energized through their respective inverter/static transfer switch from the preferred power source battery No. 1C, and 1 dedicated battery charger,

g. 125 VDC Bus 1A energized from associated battery No. 1A, and 1 dedicated battery charger, and

h. 125 VDC Bus 1B energized from associated battery No. 1B, and 1 dedicated battery charger.

APPLICABILITY: POWER, LOW POWER, STARTUP*, and SHUTDOWN*

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* Whenever CALCULATED BULK CORE TEMPERATURE is greater than 760 degrees F.

** The requirement for the tie breakers to be open between redundant buses is not applicable with respect to the 4160 VAC buses.

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ACTION:

a. With one of the required 480 VAC buses not energized in the required manner, reenergize the bus in the required manner within 8 hours or be in at least SHUTDOWN within the next 24 hours.

b. With one 120 VAC non-interruptible bus not energized in the required manner from its preferred source*:

1. Reenergize the 120 VAC non-interruptible bus from the essential 480 VAC bus backup source via the inverter/static transfer switch within 2 hours or be in at least SHUTDOWN within the next 24 hours, and

2. Reenergize the 120 VAC non-interruptible bus through the inverter/static transfer switch from its preferred source within 24 hours or be in at least SHUTDOWN within the next 24 hours.

c. With one 125 VDC bus not energized in the required manner from its associated battery and 1 dedicated battery charger, reenergize the 125 VDC bus from its associated battery and 1 dedicated battery charger within 24 hours* or be in at least SHUTDOWN within the next 24 hours.

SURVEILLANCE REQUIREMENTS

4.8.3.1 The specified buses shall be determined energized in the required manner at least once per 7 days by verifying correct breaker alignment and indicated voltage on the buses.

* A battery/battery charger can be disconnected from the distribution system for up to 5 consecutive days and for up to 10 cumulative days during a 92 day period, if an equalizing charge is being performed.

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AUXILIARY ELECTRIC POWER SYSTEMS

3/4.8.3 ON-SITE POWER DISTRIBUTION

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.3.2 As a minimum, the following electrical buses shall be energized in the specified manner with tie breakers open between redundant buses:

a. Two essential 480 VAC buses energized from the associated 4160 VAC buses,**

b. Two 120 VAC non-interruptible buses energized through their respective inverter/static transfer switch from their preferred power sources, and

c. One 125 VDC bus energized from its associated battery and 1 dedicated battery charger.

APPLICABILITY: STARTUP*, SHUTDOWN*, and REFUELING

ACTION: With any of the above minimum required electrical buses not energized in the required manner, immediately suspend all operations involving CORE ALTERATIONS, control rod movements resulting in positive reactivity changes, or movement of IRRADIATED FUEL and initiate corrective action to reenergize the required buses as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.3.2 The specified buses shall be determined energized in the required manner at least once per 7 days by verifying correct breaker alignment and indicated voltage on the buses.

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* Whenever CALCULATED BULK CORE TEMPERATURE is less than or equal to 760 degrees F.

** The requirement for the tie breakers open between redundant buses is not applicable with respect to the 4160 VAC buses.

BASIS FOR SPECIFICATION LCO 3.8.3 / SR 4.8.3

The OPERABILITY and surveillance requirements of the on-site distribution systems ensures adequate power will be available to supply essential equipment required for the safe shutdown of the facility and to mitigate and control postulated accident conditions. The BASIS for Specifications 3.8.1 and 3.8.2 contains additional information.

Specification 3.0.5 provides the methodology and necessary data to determine the appropriate time interval to reach a CALCULATED BULK CORE TEMPERATURE of 760 degrees F. If the active core remains below this temperature, which corresponds to the design maximum core inlet temperature, then the design core inlet temperature cannot be exceeded and there can be no damage to fuel or PCRV internal components regardless of the amount, including total absence, or reversal, of PRIMARY COOLANT FLOW.

In Action 3.8.3.1.b.2, battery/battery charger 1C and in Action 3.8.3.1.c, battery/battery charger 1A or 1B can be inoperable for 5 consecutive days and 10 cumulative days during a 92 day period, if an equalizing charge is being performed. An equalizing charge per the manufacturer requires a nominal 3 to 5 days to complete and is required every 2 to 3 months. At FSV a battery/battery charger is disconnected from the distribution system when an equalizing charge is being performed to preclude damage to the DC loads. Due to the fact that a battery/battery charger can readily be placed back in service by reconnecting it to the system, this configuration is not considered a significant degradation of the DC power sources or the on-site distribution system.

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AUXILIARY ELECTRIC POWER SYSTEMS

3/4.8.4 ACM DIESEL GENERATOR

LIMITING CONDITION FOR OPERATION

3.8.4 The ACM Diesel Generator shall be OPERABLE with:

a. A flow path from any fuel oil storage tank through an OPERABLE fuel oil transfer pump to the ACM diesel fuel oil day tank,

b. A minimum of 10,000 gallons of fuel oil total in fuel oil storage tanks 1A and 1B (T-8401 and T-8402), and

c. The associated switchgear and motor control center OPERABLE.

APPLICABILITY: POWER, LOW POWER, STARTUP, and SHUTDOWN

ACTION:

a. With the ACM Diesel Generator inoperable, restore it to OPERABLE status within 7 days (not to exceed a total of 21 days in a three month period at power for performance of maintenance) or be in at least SHUTDOWN within the next 24 hours.

b. If results from the fuel oil sample taken per Surveillance Requirement 4.8.4.d are unacceptable, demonstrate the operability of the ACM diesel generator by performing Surveillance Requirement 4.8.4.a.3 and Surveillance Requirement 4.8.4.a.4 within 8 hours, if not performed within the last 7 days. Resample the diesel fuel oil in fuel oil storage tanks 1A and 1B within 8 hours of receipt of the unacceptable sample results. If the results from the second sample are unacceptable, the ACM Diesel Generator shall be declared inoperable. Drain the fuel oil from the contaminated tank(s) and replace it with fresh fuel oil. Sample the fresh fuel oil per surveillance requirement 4.8.1.1.2.d.

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SURVEILLANCE REQUIREMENTS

4.8.4 The ACM diesel generator shall be demonstrated OPERABLE:

a. In accordance with the frequency specified in Table 4.8.4-1 by:

1. Verifying that the water jacket heater is operable by ensuring the coolant water is being maintained at a temperature of greater than or equal to 85 degrees F,

2. Verifying the fuel oil transfer pump starts and transfers fuel from the storage system to the ACM diesel fuel oil day tank,

3. Verifying the ACM Diesel Generator starts, idles, and accelerates to the engine normal operating speed; the voltage shall be 4160 plus or minus 416 volts, and the frequency shall be 60 plus or minus 1.2 Hz,

4. Verifying the ACM Diesel Generator is synchronized, loaded to 2250 KW* plus or minus 250 KW, and operates at load for at least 60 minutes, and

5. Verifying the required fuel oil quantity in the fuel oil storage tanks.

b. At least once per 7 days by:

1. Verifying that the electrolyte level of each starting battery is above the plates, and

2. Verifying that the total battery terminal voltage is greater than or equal to 126 volts on float charge.

c. At least once per 31 days, and after each operation of the SDG diesel engines where the period of operation was greater than or equal to 1 hour, by checking for and removing accumulated water from the ACM Generator Day tank.

d. At least once per 31 days, during POWER, by sampling the diesel fuel oil in fuel oil storage tanks 1A and 1B (T-8401, T-8402), in accordance with ASTM D2276-78 and verifying that the total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, method A.

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* This is a steady state load

e. At least once per 18 months by:

1. Subjecting the ACM Diesel Generator to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations.

2. Verifying that each of the required ACM loads listed on Table 4.8.4-2 can be energized via the ACM electrical distribution system.

3. Verifying that the ACM diesel fuel oil day tank level instrumentation functions properly to assure fuel oil transfer pump operation.

4. Performing a CHANNEL CALIBRATION of the ACM Diesel Generator engine protective functions.

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TABLE 4.8.4-1

ACM DIESEL GENERATOR TEST SCHEDULE

Number of Failures in Last 20 Valid Tests	Test Frequency
≤ 1	At least once per 31 days
≥ 2	At least once per 7 days*

* This test frequency shall be maintained until 7 consecutive failure free demands have been performed and the number of failures in the last 20 demands has been reduced to 1 or less.

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TABLE 4.8.4-2

ALTERNATE COOLING METHOD - DIESEL GENERATOR LOADS

a.	Fire Water Pump	(P-4501)
b.	Service Water Pump	(P-4201 or P-4202)
c.	Service Water Tower Fan	(C-4201X or C-4202X)
d.	Service Water Return Pump	(P-4203 or P-4204)
e.	PCRV Liner Cooling System Pumps (2)	(P-4601 or P-4601S) and (P-4602 or P-4602S)
f.	Circulating Water Makeup Pump	(P-4118 or P-4118S)
g.	Reactor Plant Exhaust Fan	(C-7301 or C-7302)
h.	Diesel Oil Transfer Pump	(P-4803 or P-4804)
i.	Helium Purification Cooling Water Pump	(P-4701 or P-4702)
j.	Firewater Pump House Vent Fan & Louvers	(C-7521 or C-7522)
k.	Motor Operated Valve	(HV-2301 or HV-2302)
l.	Stack Effluent Radiation Monitor	(RT-4801, RT-4802 and RT-4803)
m.	ACM Plant Lighting	
n.	Breathing Air Compressor	(C-4501 or C-4502)
o.	ACM battery charger	(N-4888)

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BASIS FOR SPECIFICATION LCO 3.8.4/SR 4.8.4

The OPERABILITY of the ACM (Alternate Cooling Method) Diesel Generator ensures that a reliable and independent source of power will be available to equipment and instrumentation in the event of disruptive faults or events, such as an incapacitating fire in the THREE-ROOM CONTROL COMPLEX or other congested cable areas. The ACM Diesel Generator provides power independent of the normal plant electrical distribution system by manually repositioning electrical transfer switches. The ACM ensures that conditions analyzed and presented in FSAR Appendix D.1 for a permanent loss of forced circulation, are not exceeded in the case of such disruptive faults or events in congested cable areas. The ACM Diesel Generator is not SAFE SHUTDOWN COOLING equipment.

The Specification is not applicable in REFUELING because the reactor is in a stable condition with low decay heat requirements, and therefore, low demands on the ACM supplied equipment.

A 7 day restoration time is required to permit maintenance and repair considering the limited availability of parts for the unique components of the ACM Diesel Generator. This time period is acceptable because of the limited nature of the specific events during which the ACM Diesel Generator is used.

The Surveillance Requirements are adequate for demonstrating the OPERABILITY of the ACM Diesel Generator to perform its intended function as described in FSAR Section 8.2.8.2. The testing of the ACM Diesel Generator simulates, where practical, the parameters of operation that would be expected if an actual demand was to be placed on the system. Weekly testing of the startup batteries ensures that adequate voltage is available to start the ACM Diesel Generator upon demand. The check that the water jacket heater is operable, increases the probability of a successful start during cold weather conditions. The check that the fuel oil system is capable of transferring fuel oil to the ACM diesel fuel oil day tank ensures fuel oil is available for ACM Diesel Generator operation. The testing of the ACM Diesel Generator demonstrates proper startup and load-carrying capability, and verifies that the required voltage and frequency are attained. This test also verifies that the components of the ACM Diesel Generator are OPERABLE.

The "ACM Diesel Generator" consists of the engine, generator, combustion air system, cooling system, fuel supply system, lubricating oil system, starting battery system, automatic and manual controls, and the diesel generator breaker. Periodic energization of the ACM loads ensures that power can be distributed from the ACM Diesel Generator to the ACM components upon demand.

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At least 10,000 gallons of fuel oil is required to be available in fuel oil storage tanks 1A and 1B. This requirement is normally met by satisfaction of LCO 3.8.1.1.b.2. During STARTUP and SHUTDOWN with a CALCULATED BULK CORE TEMPERATURE less than 760 degrees F, the 10,000 gallon requirement of this Specification assures OPERABILITY of the ACM diesel generator. Ensuring that a fuel oil transfer system is OPERABLE with 10,000 gallons of fuel provides for over 72 hours of ACM Diesel Generator operation with a full ACM load of 900 KW. This is considered more than adequate time for obtaining additional fuel from off-site sources.

The requirements on the fuel oil system provide adequate assurance that the ACM Diesel Generator will continue to supply reliable electric power for the duration of the ACM event. With over 10 years experience, there have been no fuel oil related failures of the ACM Diesel Generator. Fuel oil is distributed to the ACM Diesel Generator between a shared tank arrangement with the Auxiliary Boilers. Diesel Fuel Oil Systems tank and related piping arrangements are shown in Figure 3.8.1-1. The turnover of the fuel oil in the Auxiliary Boiler fuel oil storage tanks during SHUTDOWN, STARTUP, and LOW POWER and the performance of surveillance requirement 4.8.4.d during POWER ensure the quality of fuel oil in the underground storage tanks and the ACM fuel oil day tank.

Attachment 2
to P-88062

ATTACHMENT 2

This attachment contains a summary of significant changes made to the August 24, 1987 draft of the Technical Specification Upgrade Program, Auxiliary Electric Power System Technical Specifications, Section 3/4.8. Changes to the document based on discussions in meetings with the NRC on August 25, 1987, December 2, 1987, and March 15, 1988 and teleconferences with the NRC on January 11, 1988 and January 13, 1988 are not included in this Attachment.

Section	Summary of Change
Action 3.8.1.1.g	Added Action statement to allow continued operation with T-9201 based on sampling the diesel fuel oil in the underground storage tanks 1A and 1B consistent with the requirements for T-9201 and following the requirements of Action Statement 3.8.1.1.f.
3.8.1.1.b.2	Added the requirement for a minimum quantity of fuel in the diesel fuel oil storage tank (T-9201), due to the modified fuel oil surveillances, consistent with the existing Technical Specifications.
4.8.1.1.2.e.9	Revised the surveillance requirement to require the total load sequence be completed within 10% of design time versus each load block interval be within 10% of the design time.
3.8.1.2.b.2	Decreased the minimum required quantity of fuel oil from 20,000 gallons to 10,000 gallons. During shutdown periods the Auxiliary Boilers are using a continuous supply of fuel oil and maintaining a 20,000 gallon supply during shutdown would be difficult. During shutdown periods, decay heat removal requirements are reduced, along with the power requirements of some of the heat removal equipment. Also, diesel fuel is being delivered up to three times per day during this period, and if required, some of this could be dedicated for SDG use. The requirement for 10,000 gallons during shutdown periods is a new TSUP requirement, as the current FSV Tech Specs only require a minimum fuel oil quantity during power operations. This change is consistent with the quantity required, originally proposed in the November 30, 1985 draft.
3.8.1.2.b.4	Decreased the minimum required quantity of lubricating oil consistent with the reduction in quantity of diesel fuel oil required in 3.8.1.2.b.2.
Figure 3.8.1-1	Revised ACM Day Tank capacity to 130 gallons consistent with as-built design.

Section	Summary of Change
Action 3.8.2.1.a	Added clarification to specify action required with a battery inoperable due to an equalizing charge being performed.
4.8.2.1.b.2 4.8.2.1.c.3	Revised connection resistance requirement to be less than or equal to 150 micro-ohms consistent with STS.
4.8.2.1.c.4	Added tolerances to the load on the battery chargers to allow for minor variations in the load.
4.8.2.1.e	Revised voltage and current parameters to an average terminal voltage of 1.81 volts/cell, which corresponds to a total battery voltage of 105 VAC for a 58 cell battery.
Table 4.8.2-1	Revised applicability of note (4) to include only the Category B limits consistent with the STS.
Notes for Table 4.8.2-1	Revised electrolyte temperature note to allow correction when the measured cell is warmer than average. This correction factor is normally small but it may be used to confirm acceptable voltages.
4.8.4.b.2	Revised the total battery terminal voltage to 126 volts based on design.
4.8.4.d	Revised the surveillance to sample and verify the total particulate contamination in the underground storage tanks versus sampling and verifying the water and sediment content and kinematic viscosity in the day tank and underground storage tanks. The underground storage tanks fuel oil is replenished frequently due to the demand of the Auxiliary Boiler during shutdown. The reduced surveillances, as clarified in the basis are therefore acceptable. Deleted requirement to empty and clean the underground storage tanks. This is redundant to 4.8.1.1.2.g.
Table 4.8.4-1	Added test schedule to determine ACM Diesel Generator test frequency based on the number of failures in last 20 demands.

Attachment 3

to P-88062

P-88062
Attachment 3

OPEN ITEMS FOR PSC ACTION

This Attachment provides PSC's responses to the remaining open NRC comments (provided in G-86285) that were categorized during the meetings of October 27-30, 1986 as requiring PSC action (A#).

A discussion is provided for the remaining two comments that were designated as "Resolution Pending" in Attachment 3 to P-87063. The Resolutions provided herein reflect discussions held with the NRC on March 15-16, 1988.

NRC Comment: LCO 3.7.8-1:

"Adequate justification has not been submitted to justify deviation from existing ACTION requirements."

PSC Response:

PSC has revised the ACM Diesel Generator Tech Spec, and has included the current restrictions that the ACM cannot be inoperable for more than 21 days in a 3 month period. This has been added to Action a, in the Specification which has been re-numbered 3/4.8.4, to support the inclusion of the ACM Diesel Generator Technical Specifications in the Auxiliary Electric Power Systems chapter.

PSC has also revised the ACM diesel start test interval. The existing Technical Specification SR 5.2.20 requires a weekly start test. PSC has reviewed historical surveillance data and confirmed the reliability of this ACM diesel. A test schedule that requires ACM diesel testing either once per 31 days or once per 7 days, depending on the number of failures (similar to the SDG schedule) has been included.

Resolution:

PSC agreed to change Action a, as shown in the Attachment 1 Specification. A#

The change in the ACM diesel start test interval will be justified in the safety analysis accompanying the April, 1988 draft of the proposed technical specifications. C

NRC Comment: LCO 3.7.8-4:

"The deletion of oil sampling from the first draft was not justified. Also, an oil sampling ACTION statement needs to be added to tie LCO 3.7.8 to LCO 3.8.1.1 and conform with sampling of the ACM day tank in Specification 4.7.8.c."

PSC Response:

PSC has included a fuel oil sampling surveillance and appropriate ACTION in the attached revision to Specification 3/4.8.4. The ACM generator day tank is checked for accumulated water and the underground storage tanks that supply the ACM day tank are either sampled for particulate contamination or their oil is kept fresh by high oil turnover associated with auxiliary boiler operation.

Resolution:

PSC agreed to add fuel oil sampling requirements and ACTIONS, as per the Attachment 1 Specification. A#.