STANDBY POWER CAPACITY TEST

TABLE OF CONTENTS

SECTION		PAGE
1.0	OBJECTIVE	2
2.0	REFERENCES	2
3.0	PREREQUISITES	4
4.0	PRECAUTIONS	6
5.0	CHECK-OFF LIST(S)	7
6.0	PROCEDURE	8
	6.1 Shared Unit Standby Power Capacity Test	8
	6.2 Diesel Generator Permanently Connected Load Capacity Test	13
7.0	RECORDS	15
8.0	ATTACHMENTS	15
	8.1 ESF Load Determination	
	8.2 Test Connections for Diesel Generator Capacity Test	
	8.3 Standby Power Capacity Test Sequence of Events	

PAGES CHANGED WITH THIS REVISION: 2, 3, 5, 6, 8, 14, 15
Attachment 8.2, page 1

PREPARED BY: _____ AUTHOR 1/6/84 DATE

APPROVED BY: J. B. Drost/MAW R. M. ROSENBLUM MANAGER, TECHNICAL 1/8/84 DATE

0237d/cem

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SECTION		PAGE
1.0	OBJECTIVE	2
2.0	REFERENCES	2
3.0	PREREQUISITES	4
4.0	PRECAUTIONS	6
5.0	CHECK-OFF LIST(S)	7
6.0	PROCEDURE	8
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	6.2 Diesel Generator Permanently Connected Load Capacity Test	13
7.0	RECORDS	15
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0237d/cem

REFERENCE: S0123-VI-1.0.1

ENCODE NO. AC10AC
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TCN page 1/3

TEMPORARY CHANGE NOTICE

TECHNICAL SPECIFICATION VIOLATION IF NOT PROCESSED WITHIN 14 DAYS

Station Document No. S023-SPE-017 Revision No. 1 TCN No. 1-3 (For CDM use only)

Station Document Title STANDBY POWER CAPACITY TEST

1. If required, TCN Deviation Approval: CFSM: _____ _____
Signature/If by telecon print name and so state Date/Time

2. The following change shall be in effect: (Attach a marked-up copy of the affected page(s)

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Facility design change identifier / (Indicate PFC, NCR, TPN etc. Identifier)
Implementation of the facility design change has been determined. YES ____ NO ____
(If NO, a TCN cannot be approved until the facility design change has been implemented)
E. ____ For a one time change in order to complete a test which commenced using a prior procedure revision;
Procedure No. _____, prior Rev. No. _____
F. ____ Other (e.g., CAR, NRC, Licensing Commitment - Be specific with reason)

4. Date originated JANUARY 10,1984 5. Issuance date JAN 10 1984 CDM (For CDM Use Only)
6. Does this change affect FSAR or Tech. Spec. commitments? YES ____ NO X
7. Does this change affect the nonradiological environment of any offsite area previously undisturbed during site preparation and plant construction? YES ____ NO X
8. Is the intent of the original document altered? YES ____ NO X
9. Is the document to be changed an Emergency or Abnormal Operating Instruction? YES ____ NO X
10. Does this change pose an unreviewed safety question per 10 CFR 50.59, i.e., does it increase the probability of occurrence or the consequences of an accident; create the possibility of a different accident; or reduce the Tech. Spec. margin of safety? YES ____ NO X
(IF THE ANSWER TO 6, 7, 8, 9 OR 10 IS YES, A TCN IS NOT AUTHORIZED)
11. Does this change affect licensing commitment requirements as stated in the Reference Section? YES ____ NO X
12. PREPARED BY: SC Khamankar (Signature) PAX: 56705 Organization: NSSS-ENG (Print name) 1-10-84 Date/Time
13. Copy forwarded to the Nuclear Safety Group PERFORMED BY: _____ CDM _____ Date
14. SIGNATURES REQUIRED:

INITIAL APPROVAL

REVIEWED AND APPROVED BY:* (AT LEAST ONE (1) SRO ON THE UNIT AFFECTED)

1) NA
Plant Management Staff - Unit 1 Date Time

2) K.L. JOHNSON PER TELECON 1/10/84 1955 BY M.A. HERECATHA
Plant Management Staff - Units 2&3 Date Time

Could this TCN affect or does it represent a change to a plant operation in progress? YES** ____ NO ____

3) NA
SRO - Unit 1 Date Time

Could this TCN affect or does it represent a change to a plant operation in progress? YES** X NO ____

4) J.R. GALEA 1-10-84/1953
SRO - Units 2&3 Date Time

5) NA
** Shift Supervisor - Unit 1 Date Time

6) Thaddeus A. Vogt 1/10/84 1955
** Shift Supervisor - Units 2&3 Date Time

FINAL APPROVAL

REVIEWED AND APPROVED BY:

7) NA
Quality Assurance - Unit 1 Date

8) _____
Quality Assurance - Units 2&3 Date

9) /
Cognizant Functional Station Manager Date

FINAL APPROVAL SHALL BE WITHIN 14 DAYS OF ISSUANCE

* Approval shall be by two members of the Plant Management Staff knowledgeable in the areas affected, at least one of whom holds an SRO License on the unit or units affected. (For TCN approval, members of the Plant Management Staff are defined as the supervisor in charge of the shift, or as designated in writing by the CFSM, exercising responsibility in the specific area and unit(s) addressed by the change.)
** If YES, the approval of the supervisor in charge of the shift shall be obtained, if NO see *.

REFERENCE: S0123-VI-1.8.1

ENCORE NO. ACTION 50 (CHECK FOUR PICKED OUT) 1 of 8

TEMPORARY CHANGE NOTICE

TECHNICAL SPECIFICATION VIOLATION IF NOT PROCESSED WITHIN 14 DAYS

Station Document No. S023-SPE-017 Revision No. 1 TCN No. 1-2 (For CDM use only)

Station Document Title STANDBY POWER CAPACITY TEST

1. If required, TCN Deviation Approval: CFSM: _____ Signature/If by telecon print name and so state _____ Date/Time

2. The following change shall be in effect: (Attach a marked-up copy of the affected page(s)

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3. This change cannot wait until the next revision of the Station Document and is required:
   A. X To allow performance to complete objective(s) of the Station Document
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   C. ____ To implement Tech Spec Change - Amendment No. _____ Paragraph No. _____
   D. ____ To implement facility design change (FPC, NCR, TFN, etc.)
      Facility design change identifier _____ (Indicate FPC, NCR, TFN etc. Identifier)
      Implementation of the facility design change has been determined. YES ____ NO ____
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   F. ____ Other (e.g., CAR, NRC, Licensing Commitment - Be specific with reason)

4. Date originated 1-9-83 SO 1-9-84 5. Issuance Date JAN 09 1984 CDM (For CDM Use Only)
6. Does this change affect FSAR or Tech. Spec. commitments? YES ____ NO X
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11. Does this change affect licensing commitment requirements as stated in the Reference Section? YES ____ NO X
12. PREPARED BY: E. Helms (Signature) PAE: 5670G Organization: USS (Print name) 1/9/84 Date/Time
13. Copy forwarded to the Nuclear Safety Group PERFORMED BY: _____ CDM _____ Date
14. SIGNATURES REQUIRED:

INITIAL APPROVAL

REVIEWED AND APPROVED BY:* (AT LEAST ONE (1) SRO ON THE UNIT AFFECTED) 1901

1) _____ Plant Management Staff - Unit 1 Date Time

2) K.L. Jenkins per Telecon 1/9/84 1515 Plant Management Staff - Units 2&3 Date Time

Could this TCN affect or does it represent a change to a plant operation in progress? YES** ____ NO ____

Could this TCN affect or does it represent a change to a plant operation in progress? YES** ____ NO X

3) _____ SRO - Unit 1 Date Time

4) [signature] 1-9-84/2018 SRO - Units 2&3 Date Time

5) _____ ** Shift Supervisor - Unit 1 Date Time

6) _____ ** Shift Supervisor - Units 2/3 Date Time

FINAL APPROVAL

REVIEWED AND APPROVED BY:

7) _____ Quality Assurance - Unit 1 Date

8) _____ Quality Assurance - Units 2&3 Date

9) _____ Cognizant Functional Station Manager Date

FINAL APPROVAL SHALL BE WITHIN 14 DAYS OF ISSUANCE

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** If YES, the approval of the supervisor in charge of the shift shall be obtained, if NO see *.

TEMPORARY CHANGE NOTICE

TECHNICAL SPECIFICATION VIOLATION IF NOT PROCESSED WITHIN 14 DAYS

Station Document No. SO23-SPE-017 Revision No. 1 TCN No. 1-1 (For CDM use only)

Station Document Title STANDBY POWER CAPACITY TEST

1. If required, TCN Deviation Approval: CFSM: _____ Signature/If by Telecon print name and so state _____ Date/Time

2. The following change shall be in effect: (Attach a marked-up copy of the affected page(s)

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   A. X To allow performance to complete objective(s) of the Station Document
   B. ____ To effect timely implementation of policy changes within the Station Document
   C. ____ To implement Tech Spec Change - Amendment No. _____ Paragraph No. _____
   D. ____ To implement facility design change (PFC, NCR, TPN, etc.)
      Facility design change identifier _____ Indicate PFC, NCR, TPN etc. Identifier
      Implementation of the facility design change has been determined. YES ____ NO ____
      (If NO, a TCN cannot be approved until the facility design change has been implemented)
   E. ____ For a one time change in order to complete a test which commenced using a prior procedure revision; Procedure No. _____, prior Rev. No. _____
   F. ____ Other (e.g., CAR, NRC, Licensing Commitment - Be specific with reason)

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4. Date originated 1-9-84 5. Issuance Date JAN 09 1984 (For CDM Use Only)
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7. Does this change affect the nonradiological environment of any offsite area previously undisturbed during site preparation and plant construction? YES ____ NO X
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    (IF THE ANSWER TO 6, 7, 8, 9 OR 10 IS YES, A TCN IS NOT AUTHORIZED)
11. Does this change affect licensing commitment requirements as stated in the Reference Section? YES ____ NO X
12. PREPARED BY: _____ (Signature) PAX: 5670 7 Organization: I+C ENG (Print Name) 1-9-84/1200 Date/Time
13. Copy forwarded to the Nuclear Safety Group PERFORMED BY: _____ CDM _____ Date
14. SIGNATURES REQUIRED:

INITIAL APPROVAL

REVIEWED AND APPROVED BY:* (AT LEAST ONE (1) SRO ON THE UNIT AFFECTED)

1) N/A Plant Management Staff - Unit 1 Date Time

2) R. Waldo Plant Management Staff - Units 2&3 Jan 9, 1984 12:22 Date Time

Could this TCN affect or does it represent a change to a plant operation in progress? YES** ____ NO ____

3) N/A SRO - Unit 1 Date Time

Could this TCN affect or does it represent a change to a plant operation in progress? YES** ____ NO X

4) D. B. Fisher SRO - Units 2&3 1-9-84 1300 Date Time

5) N/A ** SNPE Supervisor - Unit 1 Date Time

6) ____ ** SNPE Supervisor - Units 2/3 Date Time

FINAL APPROVAL

REVIEWED AND APPROVED BY:

7) N/A Quality Assurance - Unit 1 Date

8) ____ Quality Assurance - Units 2&3 Date

9) ____ Cognizant Functional Station Manager Date

FINAL APPROVAL SHALL BE WITHIN 14 DAYS OF ISSUANCE

* Approval shall be by two members of the Plant Management Staff knowledgeable in the areas affected, at least one of whom holds an SRO License on the unit or units affected. (For TCN approval, members of the Plant Management Staff are defined as the supervisor in charge of the shift, or as designated in writing by the CFSM, exercising responsibility in the specific area and unit(s) addressed by the change.)

** If YES, the approval of the supervisor in charge of the shift shall be obtained, if NO see *.

STANDBY POWER CAPACITY TEST

1.0 OBJECTIVE

1.1 The objective of this test is to functionally verify that a diesel generator has the ability to supply the worst case emergency loads on one unit plus the worst case shutdown loads on the opposite unit using the 4.1 kV ESF bus tie.

1.2 Demonstrate that the installed diesels can satisfy REGULATORY POSITIONS 2.d and 2.e of REGULATORY GUIDE 1.81; Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants and IEEE standard 308.

1.3 Verify that a diesel generator has the capacity to support a 1000 HP HPSI pump by starting two 600 HP HPSI pumps on one train on an ESF signal while maintaining voltage of 4360 ±436 volts and frequency of 60 +1.2/-.3 Hz.

1.4 Verify the accuracy of Table 8.3-1 in the Final Safety Analysis Report by empiracally measuring various 1E loads and the Diesel Generator load while supplying the worst case accident loads.

NOTE: This test is to be performed concurrently during operational surveillance SO23-3-3.12, Integrated ESF Test.

2.0 REFERENCES

2.1 Cross-reference to Licensing Commitment Requirements

2.1.1 Final Safety Analysis Report, Section 8.3, Onsite Power Systems, Amendment 32, May 1983

2.2 Operating Instructions

2.2.1 SO23-3-3.12, Integrated ESF System Refueling Tests, Rev. 7 |R

2.2.2 SO23-2-17, Component Cooling Water System Operating Instruction, Rev. 5

2.2.3 SO23-6-2, Transferring of 4160 Volt Buses, Rev. 4

2.2.4 SO23-3-5.4.1, Loss of Offsite AC Power to a Unit, Rev. 9 |R

2.2.5 SO23-3-2.7, Safety Injection System Operation, Rev. 6

2.2.6 SO23-2-13, Diesel Generator Operation, Rev. 7

2.0 REFERENCES (Continued)

2.3 Drawings

2.3.1 32328, Elementary Diagram Electric Auxiliary - 4.16 kV Bus 3A04 Diesel Generator 3G002 Breaker, Rev 10

2.3.2 32216, Elementary Diegram Electric Auxiliary - 4.16 kV Bus 3A04 Tie Breaker (3A04), Rev 6

2.3.3 32258, Elementary Diagram Electric Auxiliary Bus 3B04 MCC 3BD Feeder Breaker, Rev. 3

2.3.4 32329, Elementary Diagram, Diesel Generator 3G002 Protection AC System, Rev. 9 R

2.3.5 32261, Sheet 1, Elementary Diagram, Electric Auxiliary Bus 3B04 MCC BQ Feeder Breaker, Rev. 4

2.3.6 32219, Elementary Diagram, Electric Auxiliary 4.16 kV Bus 3A04 Feeder Breaker (3B04), Rev. 3

2.3.7 32643, Elementary Diagram, Reactor HP Safety Injection Pump P017, Rev. 3

2.3.8 32645, Elementary Diagram, Reactor HP Safety Injection Pump P018, Rev. 3

2.3.9 SO23-302-2-451-3, Wiring Diagram Control Building Electric Auxiliary 4160 V Switchgear 3A04

2.3.10 SO23-302-2-450-4, Wiring Diagram Control Building Electric Auxiliary 4160 V Switchgear R

2.3.11 SO23-302-2-454-0 Wiring Diagram Control Building Electric Auxiliary 4160 V Switchgear 3A04

2.3.12 SO23-302-2-446-0, Wiring Diagram Control Building Electric Auxiliary 4160 V Switchgear

2.3.13 SO23-302-2-453-2, Wiring Diagram Control Building Electric Auxiliary 4160 V Switchgear 3A04

2.3.14 33763, Sht. 3, Wiring Diagram Control Building Electric Auxiliary 4160 V Switchgear 2A04, Rev. 5

2.3.15 30219 Elementary Diagram Electric Auxiliary 4.16 kV Bus 2A04 Feeder Breaker Metering, Rev. 3

2.3.16 30259 Elementary Diagram Electric Auxiliary Bus 2B04 MCC 2BY Feeder Breaker, Rev. 3

2.3.17 30260 Elementary Diagram Electric Auxiliary Bus 2B04 MCC 2BE Feeder Breaker, Rev. 3

2.0 REFERENCES (Continued)

2.3.18 30261 Elementary Diagram Electric Auxiliary Bus 2B04 MCC BQ Feeder Breaker, Rev. 4

2.3.19 SO23-403-12-69 (-10), 4700 kW, 4360 V, 3 ϕ, 60 Hz, .8 PF Emergency Diesel Generator

2.4 Other

2.4.1 Regulatory Guide 1.81, Rev. 1, Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants

2.4.2 IEEE Standard 308, Section 8, 1978

2.4.3 10 CFR 50, General Design Criterion 5, Appendix A

3.0 PREREQUISITES INITIALS/DATE

NOTE: This test is to be performed concurrently during operational surveillance SO23-3-3.12, Integrated ESF Test.

3.1 Prior to use of an uncontrolled (pink) copy of this Station Document to perform work, verify it is current by utilizing one of the following methods:

3.1.1 Checking a controlled copy and any TCNs.

3.1.2 Accessing an SCE Document Configuration System (SDCS) TSO Terminal.

3.1.3 Referencing a current (within one week) Configuration Control Log and associated daily update.

3.1.4 Contacting CDM by telephone or through counter inquiry.

3.1.5 Obtaining an uncontrolled (pink) copy of the Station Document from CDM.

VERIFIED BY: 10/10/84

NOTE: Step 3.2 may be performed at any time and is not required for the completion of this test.

3.2 Obtain the information requested in Attachment 8.1. TCN 1-1

VERIFIED BY: /

STANDBY POWER CAPACITY TEST

3.0 PREREQUISITES (Continued) — INITIALS/DATE

3.3 Have the Station Electrical Test Department attach a multiple channel recorder to record the parameters listed in Attachment 8.2. — MSA 1/10/84 | TCN

3.4 Unit 3 is in Mode 5 or 6. If Unit 3 is in Mode 6, all reactivity changes must be suspended for the duration of this test. — EH 1-10-84 1955

3.5 No LCOAR exists against any Unit 2, Load Group B ECCS subsystems. — EH 1-10-84 1955

3.5.1 The Unit 2 LOCAR log has been reviewed and is satisfactory for the performance of this test. — EH 1-10-84 1955

3.5.2 The Unit 2 EDMR log has been reviewed and is satisfactory for the performance of this test. — EH 1-10-84 1955

3.6 Charging pump 2P191 is aligned to 2B04. — NOTE 1

3.7 The following Unit 2 Load Group A Shutdown loads are available:

3.7.1 1 CCW pump (Component Cooling Water) (2P024 or 2P025) — EH 1-10-84 2000

3.7.2 1 SWC pump (Saltwater Cooling) (2P112 or 2P114) — EH 1-10-84 2001

3.7.3 1 LPSI pump (Low Pressure Safety Injection) (2P015) — EH 1-10-84 2002

3.7.4 2 Charging pumps (2P190, 2P191) — NOTE 1

3.7.5 1 Motor Driven AFP (Auxiliary Feedwater Pump) (2P141) — EH 1-10-84 2007

3.7.6 2 Dome Circulating Fans (2A071 and 2A074) — EH 1-10-84 2015

3.8 HPSI pump 3P018 is aligned to Train A per Ref. 2.2.5, and tested per Check-Off List 2 of Ref. 2.2.1. (Mark this step N/A if Section 6.2 is not to be performed.) — EH 1-10-84 1958 | R

3.9 Unit 2 noncritical CCW loop is being supplied from Train B per Ref. 2.2.2. — EH 1-10-84 2015

NOTE 1: 2P191 CLEARED FOR MAINTENANCE

3.0 PREREQUISITES (Continued)

INITIALS/DATE

NOTE: All jumpers are to be installed with spade lugs.

3.10 Have the Station Electrical Test Department install a switched jumper accross AE7 and AE8 in cubicle 3A0416. This will permit the diesel generator to operate in the speed control mode with bus-tie breaker 3A0416 closed. Verify that the switch is open. (Ref. E.D. 32328, W.D. SO23-302-2-453-2, SO23-403-12-69)

KC 11-10-84 | R

Second Verification

11-10-84

SH 11-10-84
2010

3.11 2P-140, Turbine-driven AFP is operable.

4.0 PRECAUTIONS

4.1 Performing step 6.1.5 will enable Unit 3 4.16 kV ESF bus 3A04 tie breaker 3A0416 to be closed simultaneously with 3A0413, 3G002 diesel generator feeder breaker.

4.2 If Unit 2 is in Modes 1, 2, 3 or 4, performance of this test may exceed the provisions of LCO (Limiting Condition for Operation) 3.8.1.1 and 3.8.3.1. The duration of this test is expected to be less than 15 minutes. It may be required to initiate LCOARs (Limiting Condition for Operation Action Requirements) for the following:

11/10/84

4.2.1 Placing 2G002 in Maintenance Lockout (step 6.1.6).

4.2.2 4.16 kV ESF bus 2A04 energized from 3G002 (step 6.1.11).

4.2.3 De-energizing bus 2A04 (step 6.1.9).

NOTE: The following applies only if Unit 2 is in Modes 1, 2, 3, or 4 while 4.16 kV ESF bus 2A04 is connected to 3G002.

4.3 If Unit 2 receives a SIAS while 2A04 is connected to 3G002, immediately perform the following to restore bus 2A04 to normal status:

4.3.1 Open bus tie 2A0417 by pressing TRIP on 2HS-1660A1 at 2CR-63.

4.0 PRECAUTIONS (Continued)

4.3.2 Place 2G002 in service by performing the following:

.1 Select 2G002 to NORMAL on keyswitch 2HS-1767-1, 2G002 Maintenance on 2CR63. (1666!)

.2 Depress LOCKOUT RESET on 2HS-1661-1, Diesel Gen 2G002 Lockout Relay Reset on 2CR63.

CAUTION
=======
If 2G002 fails to start, immediately refer to SO23-3-5.4.1, Loss of Offsite AC Power to a Unit.

.3 Verify 2G002 is starting.

.4 Verify 2A0413 closes, using 2HS-1664-1 on 2CR63, energizing 2A04.

4.5 Prior to lifting the wire in step ~~6.9~~ 6.15, verify that 4.16 kV ESF bus tie breaker 2A0417 transfer switch is selected to manual. Lifting this wire removes the interlock which prevents 4.16 ESF bus tie breaker 3A0416 to be closed while Diesel Generator feeder breaker 3A0413 is closed. Having 2A0417 in manual will prevent an asynchronous auto transfer of 2A04 to 3A04 in the event of an LOVS on Unit 2. ITCN

4.6 Verify that 4.16 kV ESF bus 2A04 voltage is essentially 0 (residual voltage <30% nominal) prior to energizing 2A04 from 3A04 via the cross-tie while 3A04 is energized from 3G002.

4.7 Attachment 8.3 serves as a summary of the sequence of events performed by this test and should be referenced often to ensure test continuity.

4.8 Do not load any diesel generator greater than 5200 kW at any time during this test.

5.0 CHECK OFF LIST(S)

5.1 None

6.0 PROCEDURE

VERIFIED BY/DATE

6.1 Diesel Generator 2G002 Load Capacity Test

6.1.1 Verify that step 2.2.1 in Check-Off List 2 of SO23-3-3.12, Integrated ESF System Refueling Test, has been completed. [signature] / 1/10/04 R

6.1.2 Secure boration of the RCS by performing the following:

.1 Override and stop Charging Pump 3P-190 using 3HS-9228-1 [signature] / 1/10/04

.2 Override and stop Charging Pump 3P-191 using 3HS-9229-1 [signature] / 1/10/04

.3 Override and stop Charging Pump 3P-192 using 3HS-9230-2 [signature] /

6.1.3 Verify/place 4.16 kV ESF 3A04 bus-tie transfer switch in MANUAL using 3HS-1660B1 on 3CR63. [signature] / 1/10/04

CAUTION
=======
Hot bus transfer of 2A04 to 3A04 with 3A04 energized from 3G002 and 2A04 energized from Reserve Auxiliary Transformer 2XR1 must not occur as the voltages are asynchronous.

6.1.4 Verify/place 4.16 kV ESF 2A0417 bus-tie transfer switch in MANUAL using 2HS-1660B1 on 2CR63. [signature] / 1/10/04

.1 Open/Verify open 4.16kV ESF 2A0417 bus-tie using 2HS-1660B1. [signature] / 1/10/04

NOTE: After step 6.1.5 has been completed, the interlock between 4.16 kV ESF bus tie 3A0416 and diesel generator feeder breaker 3A0413 will be defeated.

6.1.5 Request the Station Electrical Test Department to lift and isolate wire C32 from termination AE14 in 3A0416 (Reference E.D. 32328 and W.D. SO23-302-2-453-2). [signature] / 1/10/04 R

Second Verification Aubuchon / 1/10/04 per telecon

TCN 1-3 page 2 of 3

6.0 PROCEDURE (Continued) VERIFIED BY/DATE

6.1.6 Place 2G002 in MAINTENANCE LOCKOUT using keyswitch 2HS-1767-1 on 2CR63. 1/10/24

6.1.7 Close the switch in the jumper installed in 3A0416 cubicle. (This will maintain the diesel generator in speed control mode with 3A0416 closed). 1/10/24

6.1.8 Press SYNC on 2HS-1660A1 on 2CR63, 2A0417 Bus-tie. 1/10/24

.1 Press CLOSE on 2HS-1660A1 on 2CR63, 2A0417 Bus-tie. 1/10/24

.2 Press SYNC on 2HS-1660A1. 1/10/24

6.1.9 Press SYNC on 3HS-1660A1 on 3CR63, 3A0416 Bus tie. 1/10/24

.1 Select ESF A SYNC MASTER CONTROL 3HS-1627-1 to ON on 3CR63. 1/10/24 TCN

NOTE: Perform steps 6.1.10.1, 6.1.10.2, 6.1.11, and 6.1.11.1 in rapid succession.

6.1.10 Adjust 3G002 voltage using 3HS-1669-1 DIESEL GEN 3G002 VOLTAGE REGULATOR CONTROL, and 3G002 GEN 3G002 GOVERNOR CONTROL to match the incoming frequency and voltage so that the synch scope is moving slowly in the clockwise direction. 1/10/24

.1 When the synch scope is within 5 minutes of the straight up position, depress CLOSE on 3HS-1660A1, 4.16 kV BUS 3A04 Bus tie. 1/10/24

.2 Open the switch in the jumper installed in 3A0416 cubicle and verify "Droop In" illuminated on 3Z-L-1768-1 in 3CR63. 1/10/24

.3 Remove 3A0416 from the synchronizing circuit. 1/10/24

Perform 6.1.11 on the ~~attached~~ next page.

6.1.12 Verify in-service/start the following Unit 2 loads and record the flow rates as required (these loads represent the worst case shutdown loads. Ref. 2.1.1):

.1 SWC pump (circle one) 2P-112/(3P-307) with flow as read from 2FI-6400 _____ gpm. 1/10/24

.2 CCW pump (circle one) (2P-024)/2P-025 with flow as read from 2FI-6277 on 2CR64 _____ gpm (Critical loop A) and 2FI-6312 on 2CR64 (Noncritical loop) _____ gpm. 1/10/24

.3 AFW pump P-141 with flow as read from 2FI-4725-1 _____ gpm. 1/10/24

.4 Charging pump 2P-190 1/10/24

6.0 PROCEDURE (Continued)

		VERIFIED BY/DATE
6.1.12.5	Charging pump 2P-191 with flow as read from 2FI-0212 _____gpm.	~~[illegible]~~ / ~~1/10/84~~
.6	Upper Dome Air Circulating Fan 2A-071	/ 1/10/84
.7	Upper Dome Air Circulating Fan 2A-074	/ 1/10/84
.8	Containment Emergency Fan 2E-399	/ 1/10/84
.9	Containment Emergency Fan 2E-402	/ 1/10/84
.10	AFW Pump Room Fan 2A-394	/ 1/10/84
.11	Safety Equipment Building Pump Room Air Conditioning Units 2E-417 and 2E-517	/ 1/10/84
.12	Fuel Handling Building Accident Air Conditioning Units 2E-370	/ 1/10/84
.13	Fuel Handling Building Pump Room Emergency Air Conditioning Unit 2E-441	/ 1/10/84
.14	~~Intake~~ Structure Cooling Fans 2A-370 and 2A-373 2A373 ONLY	/ 1/10/84
.15	Charging Pump Area Air Conditioning Units 2E-437 and 2E-438	/
.16	BAMU Pump Area Emergency Air Conditioning Units 2E-439 and 2E-440	/ 1/10/84
.17	CCW Building Pump Room Emergency Air Conditioning Units 2E-453 and 2E-454	/ 1/10/84
.18	Control Room Cabinet Emergency Air Conditioning Unit 2E-424	/ 1/10/84
.19	1E-Pressurizer heaters, red train, using 2HS-0100F1	/ 1/10/84
6.1.13	Start Charging Pump 3P-190 by pressing START on 3HS-9228-1 on 3CR58	/ 1/10/84
6.1.14	Start Charging Pump 3P-191 by pressing START on 3HS-9229-1 on 3CR58	/ 1/10/84

6.0 PROCEDURE (Continued)

6.1.15 Diesel Generator S22420MG002 has supplied emergency AC power to the Unit 3, Load Group A, ECCS subsystem loads required to mitigate the worst case accident and supplied emergency power to the Unit 3, Load Group A, ECCS subsystem load required for the worst case shutdown scenario. MSH 1/10/84

6.1.16 Record the following Diesel Generator data at 3A0413:

3G002 Volts: ABØ 4380
BCØ 4380
CAØ 4380

3G002 Vars: 3.25 mV

3G002 Watts: 3990

3G002 Amperes: AØ 680
BØ 680
CØ 680

3G002 Frequency: 60 MSH 1/10/84

6.1.17 Secure Unit 3 RCS boration by performing step ~~2.2.1.1~~ 2.2.2 in Check-Off List ½ in SO23-3-3.12. MSH 1/10/84 T

6.1.18 Synchronize 2A04 to Reserve Auxiliary Transformer 2XR1 as follows (Ref. 2.2.3).

.1 Select ESF A SYNC MASTER CONTROL, 2HS-1627-1 to ON on 2CR63. MSH 1/10/84

.2 Place the Reserve Auxiliary Transformer 2XR1 feeder breaker to 2A0418 in the sync circuit by depressing SYNC on 2HS-1659-1. MSH 1/10/84

.3 Adjust 3G002 voltage using 3HS-1669-1, DIESEL GEN 3G002 VOLTAGE REGULATOR CONTROL, and 3G002 frequency using 3HS-1671-1, DIESEL GEN 3G002 GOVERNOR CONTROL to match the incoming frequency and voltage so that the synch scope is moving slowly in the clockwise direction. MSH 1/10/84

6.0 PROCEDURE (Continued)

VERIFIED BY/DATE

CAUTION
=======
Perform steps 6.1.18.4 and 6.1.18.5 in rapid succession. This will ensure smooth transfer of diesel generator operating mode from speed control to droop control. Failure to do so may result in motoring of the diesel generator.

6.1.18.4 When the synch scope is within 5 minutes of the straight up position, depress CLOSE on 2HS-1659-1, 4.16 kV BUS 2A04 RES AUX XFMR 2XR1 FDR BKR, 2A0418. 11/10/84

.5 Open the switch in the jumper installed in 3A0416 cubicle to transfer the diesel generator from speed control mode to droop control mode. Verify "Droop In" illuminated on 3ZL-1768-1 on 3CR63. 11/10/84

6.1.18.6 Verify proper voltage on 2A04, then remove 3A0418 from the sync circuit. 11/10/84

CAUTION
=======
Perform steps 6.1.18.8 and 6.1.18.7 in rapid succession. This will ensure smooth transfer of diesel generator operating mode from droop control to speed control.

.7 Open 2A04 bus-tie 2A0417 by pressing TRIP on 2HS-1660A-1. 11/10/84

.8 CLOSE ~~Open~~ the switch in the jumper installed in cubicle 3A0416 and verify 3G002 in speed control by observing "Droop In" not illuminated on 3ZL-1768-1 on 3CR63. 11/10/84 TCN

6.1.19 Stop the strip chart recorder started in step 6.1.8. 11/10/84

NOTE: Do not secure Dome Air Circulating Fans unless they have been in service for 15 minutes.

6.0 PROCEDURE (Continued)

VERIFIED BY/DATE

6.1.20 Secure loads, as required, that were placed in service per step 6.1.12. 1/10/84

6.1.21 Request the Station Electrical Test Department to terminate the wire lifted per step 6.1.5. 1/10/84

Second Verification JOHN AUBUCHON 1/10/84 PER TELECON

6.1.22 Request the Station Electrical Test Department to remove the switched jumper intalled in step 3.10. 1/10/84

Second Verification 1/10/84 JOHN AUBUCHON

6.1.23 After the interlock between the bus-tie and the diesel has been reinstalled, perform the following:

.1 Place 2G002 in NORMAL using keyswitch 2HS-1767-1 on 2CR63. 1/10/84

.2 Depress LOCKOUT RESET on 2HS-1668-1, Diesel Gen 2G002 Lockout Relay Reset on 2CR63. 1/10/84 TCN 6

6.1.23.3 Place the 4.16 kV ESF 2A04 bus-tie transfer switch in AUTO using 2HS-1560B1 on 2CR63. 1/10/84

6.1.24 Perform operability test on 2G002 using Ref. 2.2.6. 1/11/84

6.2 Diesel Generator Permanently Connected Load Capacity Test

CAUTION
=======
Ensure the switch in the jumper to be installed is open. Closing the switch will auto start HPSI pump 3P017.

NOTE: Step 6.2.1 may be performed prior to the completion of section 6.1.

6.2.1 Request the Station Electrical Test Department to install a switched jumper in the following location:

6.0 PROCEDURE (Continued)

VERIFIED BY/DATE

6.2.1 .i	Across terminations BR1 and BR2 (P1 and P41) in 3A0409 (Ref. E.D. 32643 and 32645, W.D. SO23-302-2-446-0)	____/____
		____/____
		SECOND VERIFICATION DATE
6.2.2	Open/verify open the switch in the jumper.	____/____
6.2.3	Rack in HPSI pump, 3P017, on Train A and close the D.C. breaker and ready the pump for service per SO23-3-2.7.	____/____
6.2.4	Verify step 2.2.3 in Check-Off List 2 in SO23-3-3.12 has been completed.	____/____
6.2.5	Station an operator at the switched jumper previously installed and establish communications.	____/____
6.2.6	Perform step 2.2.4 and 2.2.5 in Check-Off List 2 in SO23-3-3.12.	____/____
6.2.7	Have the operator close the switch in the jumper after verifying the diesel generator breaker 3A0413 has opened and 4.16 kV ESF bus 3A04 has shed all its loads.	____/____
6.2.7.1	PERFORM STEPS 2.2.6 AND 2.2.7 IN CHECK-OFF LIST 2 IN SO23-3-3.12	____/____
6.2.8	Verify that two HPSI pumps start when 3A04 is energized. 2.2.8	____/____
6.2.9	Secure HPSI pump 3P017 on Train A from 3CR57 after step ~~2.2.9~~ has been completed in Check-Off List ~~1~~ 2 in SO23-3-3.12.	____/____
6.2.10	Open the switch in the jumper.	____/____
6.2.11	Have operations open the D.C. breaker and rack out the breaker of HPSI pump 3P017 on Train A.	____/____
6.2.12	Have the Station Electrical Test Department remove the jumper installed in step ~~6.2.2.~~ 6.2.1.	____/____
		____/____
		SECOND VERIFICATION DATE

6.0 PROCEDURE (Continued) VERIFIED BY/DATE

6.2.13 Analyze the strip chart recorder traces and record the information below:

		Min	Max	Time (0 sec=time when 2A0413 closed)
.1	Voltage - 4.16 kV	____	____	____
.2	Voltage - 480 V	____	____	____
.3	Frequency - Hz	____	____	____

3G002 has started two HPSI pumps while maintaining voltage and frequency within the acceptance criteria listed in 1.3.

RECORDED BY: _____ / _____

6.2.14 Return to step ~~2.2.6~~ 2.2.9 in Check-Off List 2 in SO23-3-3.12, Integrated ESF System Refueling Test. _____ / _____

6.2.15 Notify the Shift Supervisor that this test has been completed. _____ / _____

VERIFIED BY: _____ / _____
Shift Supervisor

6.2.16 Remove the multiple channel recorder and terminations installed per step 3.~~2~~3. _____ / _____ NA

7.0 RECORDS

7.1 None

8.0 ATTACHMENTS

8.1 ESF Load Determination

8.2 Test Connections for Diesel Generator Capacity Test

8.3 Standby Power Capacity Test Sequence of Events

ESF LOAD DETERMINATION

1.0 DISCUSSION

The objective of this attachment is to measure the as-built loads of certain ESF components when in service at their rated capacities.

Load calculations are made using the following formula:

$$L = \frac{(I_{A\emptyset} + I_{B\emptyset} + I_{C\emptyset})}{3} \times V \times PF \times \sqrt{3}$$

TCN

where

L = Load in watts

$I_{A\emptyset}$ = A$\emptyset$ current in amps

$I_{B\emptyset}$ = B$\emptyset$ current in amps

$I_{C\emptyset}$ = C$\emptyset$ current in amps

V = Bus Voltage

PF = Cosine of the phase angle or Power Factor. Power Factor may be obtained from the equipment description in the FSAR, Station Manual, or from field measurements.

2.0 PROCEDURE

VERIFIED BY

2.1 Auxiliary Building Emergency Chiller

2.1.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of Chiller E335 or E336. _____ / _____

2.1.2 Chiller tested (circle one): E335, E336

Date _____ Time _____ _____ / _____

2.0 PROCEDURE — VERIFIED BY

2.1.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.1.4 Bus voltage measured _____ volts ____/____

2.1.5 Phase angle measured: _____ ____/____

2.1.6 Load Calculation ____/____

2.2 Low Pressure Safety Injection Pump (LPSI)

2.2.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of LPSI pump 2/3 P015, P016 at approximately 4150 gpm. ____/____

2.2.2 LPSI pump tested (circle one): 2P015, 2P016, 3P015, 3P016

gpm _____ (FE0306)

Date _____ Time _____ ____/____

2.2.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.2.4 Bus voltage measured _____ volts ____/____

2.2.5 Phase angle measured: _____ ____/____

2.2.6 Load calculation ____/____

2.3 High Pressure Safety Injection Pump (HPSI)

2.3.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of HPSI pump, 2/3 P017, P018 or P019 at approximately 650 gpm. ____/____

2.0 PROCEDURE

VERIFIED BY

2.3.2 HPSI pump tested: (circle one) 2P017, 2P018, 2P019, 3P017, 3P018, 3P019

gpm _____ Date _____ Time _____ ____/____

2.3.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.3.4 Bus voltage measured _____ volts ____/____

2.3.5 Phase angle measured: _____ ____/____

2.3.6 Load calculation: ____/____

2.4 Containment Spray Pump

2.4.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of a Containment Spray pump 2P012, 2P013 3P012 or 3P013 at approximately 1900 gpm. ____/____

2.4.2 Containment Spray pump tested (circle one):

2P012, 2P013,

3P012, 3P013 ____/____

gpm _____ Date _____ Time _____

2.4.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.4.4 Bus voltage measured _____ volts ____/____

2.4.5 Phase angle measured: _____ ____/____

2.4.6 Load calculation: ____/____

2.5 Saltwater Cooling (SWC) Pump

2.5.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of SWC pump, 2P112, 2P113, 2P114, 2P307, 3P112, 3P113, 3P114 or 3P307 at approximately 17,000 gpm. ____/____

2.0 PROCEDURE — VERIFIED BY

2.5.2 SWC pump tested (circle one):

2P112, 2P113, 2P114, 2P307,

3P112, 3P113, 3P114, 3P307 ____/____

gpm _____ Date _____ Time _____ ____/____

2.5.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.5.4 Bus voltage measured _____ volts ____/____

2.5.5 Phase angle measured: _____ ____/____

2.5.6 Load calculation: ____/____

2.6 Component Cooling Water (CCW) Pump

2.6.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of a CCW pump 2P024, 2P025 2P026, 3P024, 3P025 or 3P026 while it is supplying the noncritical loop. ____/____

2.6.2 CCW pump tested (circle one):

2P024, 2P025, 2P026

3P024, 3P025, 3P026

gpm _____ Date _____ Time _____ ____/____

2.6.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.6.4 Bus voltage measured _____ volts ____/____

2.6.5 Phase angle measured: _____ ____/____

2.6.6 Load calculation: ____/____

2.7 Auxiliary Feedwater Pump (AFW)

2.7.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of a motor-driven AFW pump, 2P141, 2P504, 3P141, 3P504 at approximately 700 gpm. ____/____

2.0 PROCEDURE

VERIFIED BY

2.7.2 AFW pump tested (circle one):

2P141, 2P504, 3P141, 3P504

gpm _____ Date _____ Time _____ ____/____

2.7.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.7.4 Bus voltage measured _____ volts ____/____

2.7.5 Phase angle measured: _____ ____/____

2.7.6 Load calculation: ____/____

2.8 Charging Pump

2.8.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of a Charging pump, 2P190, 2P191, 2P192, 3P190, 3P191, 3P192. ____/____

2.8.2 Charging pump tested (circle one):

2P190, 2P191, 2P192,

3P190, 3P191, 3P192

gpm _____ Date _____ Time _____ ____/____

2.8.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.8.4 Bus voltage measured _____ volts ____/____

2.8.5 Phase angle measured: _____ ____/____

2.8.6 Load calculation: ____/____

2.9 Control Room Emergency Air Conditioning Unit

2.9.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of a Control Room Emergency Air Conditioning Unit, E418 or E419. ____/____

2.0 PROCEDURE VERIFIED BY

2.9.2 Emergency Air Conditioning Unit tested (circle one):

E418 or E419

gpm _____ Date _____ Time _____ ____/____

2.9.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.9.4 Bus voltage measured _____ volts ____/____

2.9.5 Phase angle measured: _____ ____/____

2.9.6 Load calculation: ____/____

2.10 Battery Charger

2.10.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of a Battery Charger, 2B001, 2B002, 2B003, 2B004, 3B001, 3B002, 3B003, 3B004. ____/____

2.10.2 Battery Charger tested (circle one):

2B001, 2B002, 2B003, 2B004

3B001, 3B002, 3B003, 3B004

Date _____ Time _____ ____/____

2.10.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.10.4 Bus voltage measured _____ volts ____/____

2.10.5 Phase angle measured: _____ ____/____

2.10.6 Load calculation: ____/____

2.11 Upper Dome Air Circulating Fan

2.11.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of an Upper Dome Air Circulating Fan, 2A071, 2A072, 2A073, 2A074, 3A071, 3A072, 3A073, 3A074. ____/____

2.0 PROCEDURE

VERIFIED BY

2.11.2 Upper Dome Air Circulating Fan tested (circle one):

2A071, 2A072, 2A073, 2A074

3A071, 3A072, 3A073, 3A074

Date _____ Time _____ _____/_____

2.11.3 Phase current measured:

A _____ B _____ C _____ _____/_____

2.11.4 Bus voltage measured _____ volts _____/_____

2.11.5 Phase angle measured: _____ _____/_____

2.11.6 Load calculation: _____/_____

2.12 Containment Emergency Fan

2.12.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of a Containment Emergency Fan, 2E399, 2E400, 2E401, 2E402, 3E399, 3E400, 3E401, 3E402. _____/_____

2.12.2 Containment Emergency Fan tested (circle one):

2E399, 2E400, 2E401, 2E402

3E399, 3E400, 3E401, 3E402

Date _____ Time _____ _____/_____

2.12.3 Phase current measured:

A _____ B _____ C _____ _____/_____

2.12.4 Bus voltage measured _____ volts _____/_____

2.12.5 Phase angle measured: _____ _____/_____

2.12.6 Load calculation: _____/_____

2.13 Emergency Chiller Water Pump

2.13.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of an Emergency Chiller Water Pump, 2P160, 2P162, 3P160, 3P162 at approximately 650 gpm. _____/_____

2.0 PROCEDURE

VERIFIED BY

2.13.2 Emergency Chiller Water Pump tested (circle one):

2P160, 2P162, 3P160, 3P162

Date _____ Time _____ ____/____

2.13.3 Phase current measured:

A _____ B _____ C _____ ____/____

gpm _____ Discharge Pressure _____

2.13.4 Bus voltage measured _____ volts ____/____

2.13.5 Phase angle measured: _____ ____/____

2.13.6 Load calculation: ____/____

2.14 Diesel Radiator Fan

2.14.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of a Diesel Radiator Fan, 2E546, 2E550, 2E547, 2E549, 3E546, 3E550, 3E547, and 3E549. ____/____

2.14.2 Diesel Radiator Fan tested (circle one):

2E546, 2E550, 2E547, 2E544

3E546, 3E547, 3E549, 3E550

Date _____ Time _____ ____/____

2.14.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.14.4 Bus voltage measured _____ volts ____/____

2.14.5 Phase angle measured: _____ ____/____

2.14.6 Load calculation: ____/____

2.15 Diesel Generator Building Emergency Supply Fan

2.15.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of a Diesel Generator Building Emergency Supply Fan, 2A274, 2A275, 2A276, 2A277, 3A274, 3A275, 3A276, 3A277. ____/____

2.0 PROCEDURE — VERIFIED BY

2.15.2 Diesel Generator Building Emergency Supply Fan tested (circle one):

2A274, 2A275, 2A276, 2A277

3A274, 3A275, 3A276, 3A277

Date _____ Time _____ ____/____

2.15.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.15.4 Bus voltage measured _____ volts ____/____

2.15.5 Phase angle measured: _____ ____/____

2.15.6 Load calculation: ____/____

2.16 Boric Acid Makeup Pump (BAMU Pump)

2.16.1 Request the Station Electrical Test Department to measure the phase current and bus voltage of a BAMU Pump, 2P174, 2P175, 3P174, or 3P175 at approximately 200 gpm flow. ____/____

2.16.2 BAMU Pump tested (circle one):

2P174, 2P175, 3P174, 3P175

Date _____ Time _____ ____/____

2.16.3 Phase current measured:

A _____ B _____ C _____ ____/____

2.16.4 Bus voltage measured _____ volts ____/____

2.16.5 Phase angle measured: _____ ____/____

2.16.6 Load calculation: ____/____

7 of 8
TCN 1-1

TEST CONNECTIONS FOR DIESEL CAPACITY TEST

1.1 Connect/verify connected the following load group A parameters to a visicorder(s) or equivalent multiple-input recorder to monitor and record test data.

NOTE: All connections are to be made with spade lugs so that the permanent wiring will not be disconnected while connecting/disconnecting test equipment.

Item	Bkr. No.	Parameter (Terminations)	Trace No.	W.D. #	E.D. #
A.	3A0414	Diesel Generator 3G002 Frequency RA42(F2) RA43(F1)		33763-2/ SO23-302-2-451-3	32329
B.	3A0414	Diesel Generator 3G002 Voltage RA22(1B31) RA23(1B32)		33763-2/ SO23-302-2-451-3	32329
C.	3A0413	Diesel Generator 3G002 Breaker Position RX1(P11) RX6(C13)		33763-2/ SO23-302-2-450-4	32328
D.	3A0413	Diesel Generator 3G002 Current RY39(1I2) RY40(1I1)		33763-2/ SO23-302-2-450-4	32329
E.	2A0417 ~~3A0416~~	Bus Tie 3A04 Current RX25(A1) ~~RX25~~ Rx26 (A11)		31763 SH 17 ~~33763-3/~~ ~~SO23-302-2-453-2~~	30216 ~~32216~~
F.	3A0417	MCC 3B04 Current RX1(A1) RX2(A11)		33763-3/ SO23-302-2-454-0	32219
G.	2A0420	MCC 2B04 Current RX1(A1) RX2(A11)		31763-20	30219
H.	2B0415	MCC 2BY Current Clamp on Ammeter		N/A	30259
I.	2B0414	MCC 2BE AØ Current Clamp on Ammeter		N/A	30260
J.	3B0415	MCC 3BY AØ Current Clamp on Ammeter		N/A	30259

R

TCN

	Bkr. No.	Parameter (Terminations)	Trace No.	W.D. #	E.D. #
K.	3B0414	MCC 3BE AØ Current Clamp on Ammeter	_____	N/A	30260
L.	2/3B0417	MCC BQ AØ Current Clamp on Ammeter	_____	N/A	30261/ 32261
M.	3B0407	MCC 2BD AØ Current Clamp on Ammeter	_____	N/A	32258

NOTE: ITEMS H. THROUGH M. ARE OPTIONAL. | TCN

N. 2A0415 2A04 4.16KV Voltage 127F1 Resid. Voltage relay studs B and 9 _____ S023-302-2 452-2 ~~N/A~~ 3220 | TCN

O. 2B04 480v Voltage Bus UV device 27CV-2 studs B and 9 _____ N/A 30263 | TCN

Sequence of Events Summary

The following is a summary of the sequence of events during the performance of SO23-SPE-017, Standby Power Capacity Test.

1. Station Electrical Test to install and make operable test recorders.
2. LOVS concurrent with SIAS, CRIS, CCAS, CSAS, EFAS-1, and EFAS-2. (Step 2.2.1 in Check-Off List 1 in SO23-3-3.12).
3. Place red train transfer switch in manual. (6.1.3 and 6.1.4)
4. Remove bus-tie breaker and diesel generator breaker interlock on Unit 3. (6.1.5)
5. Place 2G002 in MAINTENANCE LOCKOUT. (6.1.6)
6. Start test recorder. (6.1.8)
7. De-energize 2A04, (6.1.9)
8. Energize 2A04 from 3G002 using bus-tie. (6.1.11)
9. Place worst case shutdown loads in-service on Unit 2. (6.1.12)
10. Take required test data. (6.1.16)
11. Parallel and connect 2A04 to 2XR1. (6.1.18)
12. Open bus-tie. (6.1.18)
13. Stop test recorder. (6.1.19)
14. Replace bus-tie breaker and diesel generator breaker interlock. (6.1.21)
15. Return 2G002 to NORMAL. (6.1.22)
16. Return bus-tie breaker transfer switches to AUTO. (6.1.22)
17. Have Station Electrical Test install switched jumper to defeat Kirk key interlock in 3P017 control circuit. (6.2.1)
18. Verify open/open switch in jumper. (6.2.2)

19. Rack in 3A0409 and close D.C. breaker. (6.2.3)

20. Emergency loads in-service energized from diesel generators for greater than 15 minutes. (2.2.2 in Check-Off List 1 in SO23-3-3.12)

21. Start strip chart recorder (6.2.6)

22. Open diesel generator breakers. (2.2.4 in Check-Off List 1 in SO23-3-3.12)

23. Close switch in jumper after bus strips. (6.2.7)

24. Secure 3P017 after loads have sequenced. (6.2.9)

25. Stop test recorder. (2.2.8 in Check-Off List 1 in SO23-3-3.12)

26. Remove jumper, rack out 3A0404. (6.2.11 and 6.2.12)

ENCLOSURE VI

ENCLOSURE VII

CONFORMANCE WITH NRC GUIDELINES

The following Regulatory Guides and General Design Criteria were reviewed during the evaluation of the proposed Emergency Diesel Generator Cross-Connect design change. The proposed change was found to be in conformance with the guidance or requirements of each as currently committed to by SCE for SONGS 2 and 3:

- 10 CFR 50, Appendix A, GDC 5, 17, 18, 33, 34, 35, 38, 41, 44, revised as of January 1, 1985.
- Regulatory Guide 1.6 (Safety Guide 6), "Independence Between Redundant Standby (Onsite) Power Sources and Between Their Distribution Systems," Rev. 0, March 1987.
- Regulatory Guide 1.32, "Criteria for Safety-Related Electric Power Systems for Nuclear Power Plants," Rev. 1, March 1976.
- Regulatory Guide 1.93, "Availability of Electric Power Sources," December 1974.
- Regulatory Guide 1.47, "Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems," Rev. 0, May 1973.
- Regulatory Guide 1.75, "Physical Independence of Electric Systems," Rev. 1, January 1975.
- Regulatory Guide 1.81, "Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants," Rev. 1, January 1975.

Specifically, with respect to GDC 5, "Sharing of Structures, Systems and Components," and GDC 17, "Electric Power Systems," the following information is provided.

- General Design Criterion (GDC) 5 requires that:

  "Structures, systems, and components important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units."

As supported by the Failure Modes and Effects Analysis (FMEA) and single failure evaluation performed for the proposed cross-connect, as well as the review of SONGS Units 2 and 3 FSAR safety analyses, implementation of the proposed diesel generator cross-connect will not impair the ability of the plant ESF systems and components to perform their intended safety functions, nor will it compromise:

- The integrity of the reactor coolant pressure boundary;

- The capability to shut down the reactor and maintain it in a safe condition; or

- The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guideline exposure of 10 CFR 100.

Therefore, it was determined that the proposed design change complies with the requirements of GDC 5.

o General Design Criterion 17 requires (in part) that:

> "An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.
>
> The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure . . .
>
> Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies."

The results of the FMEA and single failure evaluation performed for the proposed cross-connect coupled with the review of SONGS Units 2 and 3 FSAR safety analyses demonstrate the compliance of the proposed cross-connect with the requirements of GDC 17. The safety function of the emergency standby power systems will not be impaired by implementation of the proposed design change. The proposed cross-connect will not compromise:

- The integrity of the reactor coolant pressure boundary;

- The capability to shut down the reactor and maintain it in a safe condition; or

- The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guideline exposure of 10 CFR 100.

Therefore, it was determined that the proposed design change complies with the requirements of GDC 17.

APPLICATION OF SINGLE FAILURE CRITERION TO SHARED SYSTEMS

The sequence of events for a loss of offsite power with the proposed design change installed and one of the transfer enable switches in the AUTO position would be:

- o preferred source lost
- o backup preferred source lost
- o associated diesel generator not available
- o opposite unit diesel generator in same train supplies power to vital buses
- o vital loads are supplied in both units.

The single failure analysis and the failure modes and effects analysis evaluated the failure of each component in the ESF power supply system (i.e. diesel generator, tie breaker, feeder breaker, vital bus etc.). These evaluations showed that the worst case single failure was the loss of a vital bus (either through loss of a cross-tied diesel generator, cross-tie breaker, feeder breaker or bus failure) which has been analyzed for in the FSAR previously and found not to impact the safety of the plant, since in each case at least one train of ESF equipment was available.

SCE's interpretation of the Single Failure Criterion satisfying the guidance of SRP Section 3.8.1.111.4, Regulatory Guide 1.81 C.2.b., and SECY-77-439 is the application of a single failure to the onsite emergency AC electric system, a part of which is the shared portion of the system. Further, per Regulatory Guide 1.81 C.2.b, one of the single failures considered in the evaluation of the set of possible single failures should be "a false or spurious accident signal at the system level in the non-accident unit."

It should be noted here that SCE's interpretation somewhat parallels the design basis for Prairie Island Units 1 and 2 where there are two diesel generators cross-connected to support both units. Prairie Island FSAR Section 8.4.1 discusses application of the Single Failure Criterion as follows:

> ". . . the question becomes whether it is credible to assume that in addition to the most restrictive single failure already assumed, if one diesel generator fails to start, another single failure must be hypothesized to occur generating the spurious safety injection signal in such a manner as to deny the unit with the accident adequate diesel power to supply its Engineered Safety Features. The probability of these two single failures occurring simultaneously is so low as to represent no hazard to the public."

In addition, Section 9.1.2.3 of the Grand Gulf Nuclear Station Units 1 and 2 FSAR describes the shared standby service water system. Specifically, the design basis is:

"The system operation analysis for Mode III is based on the following assumptions:

a. LOCA occurs in one unit, assumed to be Unit 1.

b. Normal shutdown of the other unit, Unit 2.

c. Total loss of offsite power for both units.

d. Worst single active failure occurs in the unit experiencing a LOCA. The worst active failure for this analysis is the loss of one of the two standby diesel generators which removes one of the standby service water loops from operation. The Unit 1 A standby diesel generator is assumed to fail.

e. No makeup water is available to the SSW cooling tower basins for 30 days

f. Worst 30-day site meteorology for heat rejection.

These assumptions will result in the greatest heat rejection rate for the ultimate heat sink during the most severe meteorology for cooling tower heat rejection.

Cooling requirements for shutdown of the two units are satisfied by:

a. Unit 1 - SSW Loop A and HPCS Service Water Loop C

b. Unit 2 - SSW Loop A and SSW Loop B

The licensed Prairie Island and Grand Gulf positions are precedents which support SCE's interpretation of available regulatory guidance.

<u>COMPLIANCE WITH REG. GUIDE 1.81 POSITIONS</u>

a. Regulatory Position C.2.b regarding the application of single failures.

Regulatory Guide 1.81, Regulatory Position C.2.b, and Standard Review Plan, Section 8.3.1 , Subsection III.4, address application of the single failure criterion.

o SRP Section 8.3.1.III.4, on page 8.3.1-14, states:

"... to ensure that the selected capacity is sufficient to power the minimum ESF loads in any unit and safely shut down the remaining units in the event of an accident in one unit and a single failure or spurious or false accident signal from another unit and loss of preferred power to all the units."

- Regulatory Guide 1.81, Regulatory Position C.2.b states:

  "A single failure (a false or spurious accident signal at the system level in the non-accident unit should be considered as a single failure) should not preclude the capability to automatically supply minimum engineered safety feature (ESF) loads in any one unit and safely shut down the remaining unit, assuming a loss of the offsite power."

SCE's interpretation of the Single Failure Criterion satisfying the guidance of Regulatory Guide 1.81 C.2.b, SRP Section 3.8.1.111.4 and SECY-77-439 is the application of a single failure to the onsite emergency AC electric system, a part of which is the shared portion of the system. Further, per Regulatory Guide 1.81 C.2.b, one of the single failures considered in the evaluation of the set of possible single failures should be "a false or spurious accident signal at the system level in the non-accident unit."

b. Regulatory Position C.2.e regarding the need for procedural control of any additional operator actions (e.g., unit-to-unit enable switch position, override of spurious SIAS signal).

   Regulatory Guide 1.81, Regulatory Position C.2.e, addresses the necessity for coordination between unit operators.

   - Regulatory Guide 1.81, Regulatory Position C.2.3, states:

     "Coordination between the unit operators should not be necessary in order to meet Regulatory Positions 2.b and 2.c. Coordination required to meet Regulatory Position 2.d should be minimized."

   The issues here are:

   - Written procedures for control of the unit-to-unit load transfer enable switch for each train; and

   - Operator action to override the dual unit SIAS signal, in particular, if this is an immediate action necessary to mitigate the consequences of an accident.

     For the design change evaluated, this action is not required to mitigate the consequences of an accident. However, administrative procedures will also be required to prevent the control room operator, on the unit with the actual LOCA, from resetting the SIAS signal while the shared diesel generator is carrying LOCA loads. If the SIAS signal is reset, then a false/spurious SIAS signal, from the non-LOCA unit, would not cause the bus tie breaker to open and could overload the diesel generator.

The common control operator has responsibility for:

1) Electrical Power distribution switching equipment in Units 2 and 3
2) All four diesel generators at Units 2 and 3
3) All diesel generator tie breakers

Before any plant modification is declared operable, an evaluation of the station's Emergency Operating Instructions (EOIs) and FSAR accident analyses will be performed. This evaluation will ensure that there are no existing requirements, in either the EOIs or FSAR, that the SIAS signal be reset for accident mitigation.

c. Regulatory Position C.3 regarding the NRC preferred configuration.

Regulatory Guide 1.81, Regulatory Position C.3, states:

"In the case of multi-unit nuclear power plants for which the construction permit application was made on or after June 1, 1973, each unit should have separate and independent onsite emergency and shutdown electric systems, both a.c. and d.c., capable of supplying minimum ESF loads and the loads required for attaining a safe and orderly cold shutdown of the unit, assuming a single failure and loss of offsite power.''

The regulatory guide allows conformance to Regulatory Position C.2 or C.3 for multi-unit nuclear power plants for which the construction permit application was made <u>prior to</u> June 1, 1973, as was the case for SONGS 2 and 3. The current design does in fact meet Regulatory Position C.3, which endorses the NRC's preferred configuration. The proposed design change will involve SCE conformance to Regulatory Position C.2 which provides an alternative to C.3 deemed acceptable to the NRC.

0657H

ENCLOSURE I

AUXILIARY FEEDWATER PUMP START AT 30 SECONDS

UNIT 2 TRAIN A DIESEL (2G002)

LOAD APPLIED	VOLTS (LO/HI)	FREQUENCY (LO/HI)	TEST DATE
NORMAL LOADS	3850/4655 NOMINAL 4360	59.7/60.4 NOMINAL 60.1	05/12/86
NORMAL LOADS PLUS A SECOND CCW PUMP	3920/4725 NOMINAL 4445	59.8/60.4 NOMINAL 60.0	11/18/83
NORMAL LOADS PLUS A SECOND HPSI PUMP	4025/4850 NOMINAL 4550	60.0/60.5 NOMINAL 60.1	11/19/83

SUMMARY: As the connected load increases, the voltage and frequency dips are reduced for those loads sequenced on as the load sequence continues. The more connected load that the diesel has already accelerated to monimal voltage and frequency, the less the dips from the starting of additional loads.

LOAD SEQUENCE AT TIME ZERO

UNIT 2 TRAIN A DIESEL (2G002)

LOAD APPLIED	VOLTS (LO/HI)	FREQUENCY (LO/HI)	TEST DATE
NORMAL LOAD SEQUENCE	3850/4743 NOMINAL 4515 LIMITS 3386/5644	59.54/60.64 NOMINAL 60.08 LIMITS 57.07/63/08	05/12/86
NORMAL LOAD SEQUENCE PLUS ONE EXTRA CCW PUMP AT 1.2 SECONDS	3589.5/4900 NOMINAL 4325 LIMITS 3281/5469	59.0/60.7 NOMINAL 60.0 LIMITS 57.0/63.0	11/19/83
NORMAL LOAD SEQUENCE PLUS ONE EXTRA HPSI PUMP AT TIME ZERO	3570/5285 NOMINAL 4550 LIMITS 3412.5/5687.5	59.5/61.0 NOMINAL 60.7 LIMITS 57.1/63.1	11/19/83

ENCLOSURE IV

UNIT 3 DATE 2-16-07 (2030)

S023-3-3.12 PARAGRAPH 6.2.26 TRAIN A RUN 3

Equip ID	Trace No	Tech Spec Time	Actual Time		Circle One
G002 √Hz	10/1	< 10 sec	7.55	Sec	Sat / Unsat
A0413	6	< 10 sec	7.55	Sec	Sat / Unsat
B04		0 sec		Sec	Sat / Unsat
P018	15	0 +0.5 − 0 SEC	0.25	Sec	Sat / Unsat
P015	19	5 +/− 0.5 sec	5.05	Sec	Sat / Unsat
A071	16	5 +/− 0.5 sec	5.0	Sec	Sat / Unsat
A074	17	5 +/− 0.5 sec	5.0	Sec	Sat / Unsat
E418	18	5 +/− 0.5 sec	5.15	Sec	Sat / Unsat
P012	20	10 +/− 0.5 sec	9.85	Sec	Sat / Unsat
E546	9	10 +/− 0.5 sec	10.05	Sec	Sat / Unsat
E550	11	10 +/− 0.5 sec	9.95	Sec	Sat / Unsat
A274	12	15 +/− 0.5 sec	14.2	Sec	Sat / (Unsat)
A275	13	15 +/− 0.5 sec	14.5	Sec	Sat / Unsat
P024 (025)	21/22	15 +/− 0.5 sec	15.4	Sec	Sat / Unsat
P112 (307)	23/24	20 +1.0 −0.5 sec	19.35	Sec	Sat / (Unsat)
P141	25	30 +0.5 −1.0 sec	29.85	Sec	Sat / Unsat
E336	26	34.5 − 77.0 sec	51.85	Sec	Sat / Unsat
DC Freq Min 59.6 Hz		Max 60.3 Hz			Sat / Unsat
DC Volts Min 3850 Vac		Max 4850 Vac			Sat / Unsat
MCC BD Min 400 Vac		MCC BE Min 420 Vac			Sat / Unsat