

JUL 24 1984

Docket No. 50-322

APPLICANT: Long Island Lighting Company
FACILITY: Shoreham Nuclear Power Station
SUBJECT: SUMMARY OF MEETING AND REVIEW OF ALTERNATE POWER SOURCE
PROCEDURES AND TESTING AT THE SHOREHAM SITE

On July 2, 1984, representatives of the NRC staff observed a demonstration of the start-up and line-up capabilities of the alternate power sources at the Shoreham Nuclear Power Station. An evaluation of the demonstration is presented in the Supplement No. 6 to the Shoreham Safety Evaluation Report.

Representatives of Suffolk County also attended. A list of attendees is provided in Enclosure 1 and the handouts provided by the applicant are in Enclosure 2.

M. J. Campagnone, Project Manager
Licensing Branch No. 2
Division of Licensing

Enclosures: As stated

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7/24/84

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Distribution:

Docket File
LB#2 Reading
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PDR ADOCK 05000322
A PDR



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

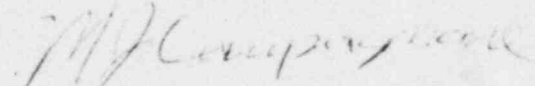
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Jim Clifford	NRC Operational Safety Engineer
Carl Woodward	NRC Reactor Engineer
John Knox	NRC Electrical Engineer
Bob Perlis	NRC Attorney
John Scarlice	LILCO OPS Manager
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Bill Gunther	LILCO Operating Engineer
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John Birkenheier	Suffolk County Attorney
John Smith	Suffolk County (Ocean Fleets Engineer Consultants)
Gary Gisonda	LILCO Supervisor Regulatory Affairs
Mari Jo Campagnone	NRC Project Manager
Ben Vaznek	LILCO

Submitted: Karl G. Swenson
Reviewed/OQA Engr.: OK [Signature]
Approved/Plant Mgr.: [Signature]

MC-1

TP Number 85.84042.3
Revision 1
Date Eff. 5/29/84
TPC _____
TPC _____
TPC _____

SUPPLEMENTAL DIESEL GENERATORS - EMD - (GM)
ELECTRICAL FUNCTIONAL TEST
PROCEDURE

1.0 PURPOSE

- 1.1 This procedure provides instructions for functionally testing the ability of the supplemental GM diesel generator sets to restore AC power to emergency systems upon an abnormal event coincident with a total loss of off-site power and the three existing TDI Diesels within 30 minutes of the blackout.
- 1.2 The mechanical preoperational tests of the supplemental diesel generator sets are not part of this procedure. They will be tested by TP 85.84042.1.
- 1.3 The storage batteries associated with the diesel units will be tested separately by TP 85.84042.4.
- 1.4 This procedure is incorporated in SM 84-042.

SR2-1021-800-6.421

INFORMATION COPY

2.0 RESPONSIBILITY

- 2.1 The Modification Engineer shall have overall responsibility for insuring the proper implementation of this procedure and evaluation of test results.
- 2.2 The Cognizant Site Engineer (CSE) shall be responsible for providing technical assistance and direction as required during the testing.
- 2.3 The Watch Engineer and operators shall be responsible for performing the actual testing, assisted as required by technicians from the I&C section. It is to be noted that the test should be covered by personnel normal to the shift, no additional personnel should be added for the purpose of this test.
- 2.4 The LILCO Systems Operations shall be responsible for switching the high voltage circuit breakers as coordinated by the Watch Engineer.
- 2.5 Operation Quality Assurance (OQA) shall monitor the testing in accordance with LILCO QA manual.

3.0 DISCUSSION

- 3.1 This procedure provides instruction for the electrical functional test of the supplemental diesel generators.

Testing will be conducted to simulate a complete loss of off-site power simultaneous with a failure of the TDI emergency diesels to start and pickup emergency loads.

The testing will demonstrate the ability of the supplemental diesels to automatically start upon a loss of voltage signal and synchronize themselves on a dead bus. (All AC power including AC to the battery charger will be unavailable prior to engine starting.) The procedure will demonstrate the ability of operators to manually isolate all non-required loads from 1R22-SWG-11 and to isolate the secondary winding of the NSST (a fault in both RSST and NSST is assumed) from the tie between the NSST secondary and emergency buses 101, 102, and 103. The procedure will demonstrate the ability of the operators to close 1R22-ACS-11-1B (supplemental diesel feeder breaker in 1R22-SWG-11) and to advise the control room of emergency diesel generator units status and availability. The remainder of the test demonstrates the ability to restore manually the required (or available) emergency loads not exceeding a full load of 1200 amps (approximately 8 MW). All the above shall be accomplished as a simulated accident and loss of power condition; and shall be accomplished in less than 30 minutes from the start of the test.

- 3.2 Topics covered in this procedure:

- 4.0 Precautions
- 5.0 Prerequisites

6.0	Limitations and Actions
7.0	Materials and Test Equipment
8.0	Procedure
9.0	Acceptance Criteria
10.0	Final Conditions
11.0	References
12.0	Appendices

4.0 PRECAUTIONS

- 4.1 Operations shall continuously monitor the operation of the supplemental diesel generators throughout the entire test.
- 4.2 Insure that the NSST transformer is deenergized from the high voltage side prior to opening the switch in the calvert bus 1R21-DISC-400A, in this particular test this will be achieved by observing under voltage alarm (in annunciator 209-H) "4KV NSS BUS U V".
- 4.3 Non essential loads fed from 1R22-SWG-11 that are required to operate (for some other plant need) during the test should be energized by the RSST transformer through bus ties closure at 1R22-SWG-11 and 12.
- 4.4 All personnel non essential to the implementation of this procedure should be clear of the following areas during the duration of the test:
 - 1) Control Room
 - 2) Emergency Switchgear Rooms
 - 3) Normal Switchgear Room
 - 4) Supplemental Diesels Area
- 4.5 Grounding switch 1R21-DISC-400B shall always remain open.

5.0 PREREQUISITES AND INITIAL CONDITIONS

4KV Normal and Emergency Busses shall be lined up in accordance with Figure 1, Appendix 12.4. This will be accomplished by Steps 5.1, 5.2, 5.3, 5.4, and 5.5.

- ✓ 5.1 For the purpose of this test the NSS transformers shall be isolated from the grid and Normal Switchgear 1R22-BUS-11 shall be energized from the RSS Transformer. Verify that H.V. disconnect 1339 is "open".
- ✓ 5.2 In the normal switchgear room, 4KV normal bus supply breakers 1R22-ACB-1A-3, 1B-2, and 11-1 shall be open PTL (pull to lock). 1R22-SWGR-1A, 1B, and 12 shall be all fed through the RSST.
- ✓ 5.3 In the normal switchgear room 4KV RSST supply breaker to 1R22-SWG-11, 1R22-ACB-11-1 shall be closed. 1R22-SWG-11 shall be fed through the RSST. ACB 11-11 shall be closed.
- 5.4 In the emergency switchgear room 4KV RSST supply breakers to Emergency Bus 103 shall be open. 1R22-ACB-103-2 shall be PTL.

- ✓ 5.5 In the emergency switchgear room all 4KV TDI diesel generator 103 feeder breaker should be open. 1R22-ACB-103-8 shall be ~~in~~ TL and mode switch in lock-out.
- ✓ 5.6 For the purpose of this test, the following equipment shall be operable, all respective valves lined up in such a way as to be able to operate the equipment at approximately rated amps.

- 1) RHR PP#1E11*P-014D
- 2) RHR PP#1E11*P-014C

- ✓ 5.7 The fuel truck, with sufficient fuel for the test, shall be connected to the filling station for emergency diesel generators, ready to deliver fuel to the diesel generator day tanks.
- ✓ 5.8 The GM-EMD diesel generator engines to be utilized in the test have been satisfactorily checked out as verified by MDE.
- ✓ 5.9 A complete visual inspection of each unit has been conducted and no abnormal observations recorded. Fill in Appendix 12.6 for each unit.

EMD-DG-401	Ready	Verified (CSE)	<u>7/2/84</u>
		Verified (CSE)	Date
EMD-DG-402	Ready	Verified (CSE)	<u>7/2/84</u>
		Verified (CSE)	Date
EMD-DG-403	Ready	Verified (CSE)	<u>7/2/84</u>
		Verified (CSE)	Date
EMD-DG-404	Ready	Verified (CSE)	<u>7/2/84</u>
		Verified (CSE)	Date

- ✓ 5.10 Persons involved in conducting the test should be equipped with flash lights.
- ✓ 5.11 Channel 5 on the gal-tronics system shall be cleared for the support of the test.
- ✓ 5.12 All CSE's and other observers shall be located at their designated observation post. Except for the operators involved in conducting the test and any person dispatched by the control room to attend a specific task, no personnel should be allowed to walk in the areas covered by the test except for OQA personnel monitoring the test.
- 5.12 OCB 1310 and OCB 1330 are open.
- 5.14 Gloves and switchhook shall be available for the Calvert bus disconnect switch 1R21-DISC-400A.
- 5.15 Inform OQA of the beginning of the test.

6.0. LIMITATIONS AND ACTIONS

- 6.1 Any abnormal conditions that develop should be immediately reported to the Watch Engineer who shall make the decision to continue or abort the test.
- 6.2 This test can only be performed when plant is in cold shutdown condition.

7.0 MATERIALS AND TEST EQUIPMENT

- 7.1 No equipment other than permanently installed instrumentation shall be used to implement and monitor this test.

8.0 PROCEDURE

- 8.1 All prerequisites and initial conditions have been satisfied and any exceptions listed in Section 13.0 have been dispositioned. Fill in Appendix 12.5.

OPERATIONS Bill N... 7/2/84
Verified Date

CSE [Signature] 7/2/84
Verified Date

OQA [Signature] 7-2-84
Verified Date

8.2 Pretest Scenario

An abnormal event has just occurred, concurrently the station has lost both normal and reserve power.

- 8.2.1 TDI Emergency diesel generators 101, 102, and 103 have failed to start.
- 8.2.2 The "on-site" 20 MW gas turbine failed to auto-start and reenergize RSST.
- 8.2.3 System operator has been contacted and has indicated that power restoration is not imminent.
- 8.2.4 It is assumed that the RSST and NSST transformers are damaged.

- 8.3 Open simultaneously Circuit-Breakers 1R22-ACB-11-1 and 1R22-ACB-11-11 in 1R22 SWG-11 to cause loss of voltage on 1R22-SWG-11 and Emergency Bus 103. Observe Alarm 0085 "4KV NSS BUS UV" illuminated on annunciator 209H. Record the time: 2.06.1/2 0

STOP WATCH
HATE #455
Date Due 11/14/84

OPERATIONS Bill N... 7.2.84
Verified Date

CSE [Signature] 7.2.84
Verified Date

OQA [Signature] 7-2-84
Witness Date

8.4 Automatic Actions

- 8.4.1 In normal switchgear 1R22-SWG-11, breaker 1R22-ACB-11-1B trips (Supplemental Diesel Supply Feeder).
- 8.4.2 Supplemental diesels auto-start and synchronize and local breakers 401, 402, 403, and 404 close.

8.5 Immediate Action

NOTE: For the purpose of this test, a Cognizant Site engineer acting as an observer will be located in the EMD Switchgear with Appendix 12.1 (Step 8.5.1.1 to 8.5.1.5).

- 8.5.1 Dispatch Field Operator to Normal Switchgear Room and Emergency Switchgear Room with Attachment #2, Appendix 12.2 (Steps 8.5.2.1 to 8.5.2.14).

Record the time: 2.09.-

OPERATIONS Bill Nyan 2/2/54
Verified Date

- 8.6 Place all 4KV emergency loads on Bus 103 to PTL. This includes RHR, RB Service Water, and M50 Chillers and power to the 480V emergency buses. This is accomplished from Panels 1H11*PNL601, 602, 603, and 1H11*PNLVCI and MCB-01.

OPERATIONS Bill Nyan 2/2/54
Verified Date

- 8.7 Upon receipt of report from field Operator that Steps 8.5.2.1 through 7 have been completed (See Attachment #2, Appendix 12.2, Step 8.5.2.8. Instruct Field Operator to close breaker 1R22-ACB-11-1B (Step 8.5.2.9). Observe white light on main control board bus 11 illuminated. Note Bus voltage from indicator labeled "BUS 1A, 1B, 11, 12", "VOLTS X 1000", "1R22-SWG-1A, 1B, 11, 12". Reset 27/86 relay. Close 1R22-ACB-11-11 to establish power up to Emergency Bus 103.

Record the time: 2.09.42 6 minutes 50 seconds
Bus 11 Voltage: 4200

OPERATIONS Bill Nyan 2/2/54
Verified Date

CAUTION: Depending on the number of supplemental diesel generators available, the operator will proceed with Step 8.8. The load should not exceed 432 amps per generator and never exceed 1200 amps total load connected. Amperes can be read at EMD-SWG-400 panel or on MCB-01.

- 8.8 Proceed to manually start the following equipment:

8.8.1 Power to Emergency Bus 103 by closing breaker 1R22*ACB-103-1. Verify Bus voltage on voltmeter labelled "BUS 113 VOLTS, 1R23-SWG-113".

Record the voltage: 4200 / 479

Record the time: 2.10.- 7 minutes.

OPERATIONS Bill N. [Signature] Date
Verified

8.8.2 Start RHR PP 1E11*P-014D by closing breaker 1R22*ACB-103-6. Adjust the load by flow throttling, run at full load.

Record the time at rated flow: 4200

Record rated flow (10,000 gpm) 2.11.- 8 minutes 11 seconds.

OPERATIONS Bill N. [Signature] Date
Verified

CAUTION: If more than one generator is available, continue with the next steps. If only one diesel generator is available, increase the load to 400 amps and maintain it. Skip to Step 8.8.4.

8.8.3 Optional Step: Start RHR Pump 1E11*P-014C by closing Breaker 1R22*ACB-103-7. Throttle flow to establish maximum load.

Record the time: 2.12.-

OPERATIONS Bill N. [Signature] 7.2.84 Date
Verified

8.8.4 Record Voltage: 4200 = Record Frequency: 60 =
Record total amperage as indicated by CSE: 315 amps
Record the time: 2.13

CSE [Signature] 7.2.84 Date
Verified

OQA R. Anthony 7-2-84 Date
Verified

8.9 Power has now been restored to the essential loads. The next steps will be performed after one hour of Step 8.8.4. Record elapsed time from Step 8.7 to 8.8.2: 8.11 minutes

NOTE: This step shall be performed after 1 hour of Step 8.9.

*Step test RUN at 2:43
for equipment to other Test.*

8.10 Proceed to sequentially shut down the load as follows:

- 1) RHR PP 1E11*P-014C
 - 2) RHR PP 1E11*P-014D
 - 3) 480V Emergency Bus 113
- then proceed to shut down the following
- 4) OPEN 1R22-ACB-103-1 and PLT. (Deenergize Emerg. Bus 103)
 - 5) OPEN 1R22-ACB-11-11 and PLT.

- 6) Instruct field Operator to open breaker 1R23-ACB-11-1B and close 1R21-DISC-400A, complete Steps 8.5.2.10 and 8.5.2.11 (Appendix 12.2) and inform the Control Room.

OPERATIONS Bill Wynn 7/2/84
Verified Date

- 8.11 Upon confirmation from field Operator that Step 8.5.2.11 (Appendix 12.2) has been completed. Restore power to Bus 11 by closing Breaker 1R22-ACB-11-1.

OPERATIONS Bill Wynn 7/2/84
Verified Date

- 8.12 Instruct Cognizant Site Engineer to shut down the operating Supplemental diesel generators and trip open the circuit breakers 401, 402, 403, and 404, and inform the control room.

- 8.13 Instruct field Operator to close 1R22-ACB-11-1B as soon as indication of all generators being stopped appears on the cubicle, and upon confirmation from the Cognizant Site Engineer A that all units have been shut down. Step 8.5.2.12 (Appendix 12.2)

OPERATIONS Bill Wynn 7/2/84
Verified Date

CSE [Signature] 7/2/84
Verified Date

- 8.14 Verify emergency Bus 103 is deenergized and place 1R22-ACB-103-2 in PLT.

OPERATIONS Bill Wynn 7/2/84
Verified Date

- 8.15 Instruct field Operator to proceed with Step 8.5.2.13 (Appendix 12.2) and restore the bus program in Emergency Bus 103. Allow 27/86 to trip and place 103-2 in auto after trip.

OPERATIONS Bill Wynn 7/2/84
Verified Date

- 8.16 Instruct Field Operator to locally Close 1R22-ACB-103-2 and inform Control Room. (Step 8.5.2.19)

OPERATIONS Bill Wynn 7/2/84
Verified Date

CSE [Signature] 7/2/84
Verified Date

8.17 Reset 27/86 device.

OPERATIONS Bill N. [Signature] 7/2/84
Verified Date
CSE [Signature] 7/2/84
Verified Date
OQA R. Antmora 7-2-84
Verified Date

9.0 ACCEPTANCE CRITERIA

9.1 Upon simulated loss of off-site power, the plant was successful in bringing the supplemental diesel generator(s) on line and having restored necessary emergency power in less than 30 minutes.

OPERATIONS Bill N. [Signature] Date
CSE [Signature] 7/2/84
Date
OQA R. Antmora 7-2-84
Date

10.0 FINAL CONDITIONS

10.1 Subsequent to this test, the supplemental diesel generators shall be made ready to start on the automatic dead line mode and the NSST shall be reenergized, the disconnect switch 1R21-DISC-400A closed, and emergency bus programs restored.

10.2 All lighting shall be returned to normal.

10.3 All documentation shall be given to the CSE.

11.0 REFERENCES

N/A

12.0 APPENDICES

12.1 Attachment #1, Cognizant Site Engineer Instructions

12.2 Attachment #2, Field Operator Instructions

12.3 Signature Sheet

12.4 Figure 1, Showing Line Up of Breakers as per Steps 5.1 through 5.4

12.5 Prerequisite Checklist

12.6 Daily Diesel Generator Prestart Inspection Checklist

Attachment #1
Cognizant Site Engineer

8.5.1.1 Ensure that EMD units 401, 402, 403, and 404 have started and are running. Advise the control room.

Karla A. Swenson 7-2-84
Verified (CSE) Date

8.5.1.2 Ensure that there is adequate fuel in each day tank and refill them as needed from the fuel truck.

Karla A. Swenson 7-2-84
Verified (CSE) Date

8.5.1.3 Record any abnormal situation and advise the control room of any observation.

Karla A. Swenson 7-2-84
Verified (CSE) Date

8.5.1.4 Upon restoration of power to the emergency bus 103, read and record the ammeter reading of every unit, add them up, and communicate the readings to the control room. Use ammeter EMD-AM-400. Record every 10 Minutes as a minimum.

CAUTION: Reading should never exceed 1200 amps total and no more than 430 amperes per Unit.

170
145
35

DATE = 7/02/84

TIME	AMMETER READING	SIGNATURE	REMARKS
START: 206 403 START FAILED TO SYNCH			
218	401 = 80 402 = 90 403 = X 404 = 145 TOTAL 315	K.A. Swenson	RHR C ON
224	401 = 805 kW 110A 402 = 800 kW 120A 403 = X 404 = 700 kW 140A	K.A. Swenson	370 TOTAL
235	401 = 402 = 403 = 1150 kW / 160A 404 = 1100 kW / 190A	K.A. Swenson	2 Engines AVAILABLE *NOTE
242	401 = X 402 = X 403 = 1150 kW / 165A 404 = 1100 kW / 185A	K.A. Swenson	2 Engines AVAILABLE
250	401 = X 402 = X 403 = 1150 kW / 165A 404 = 1100 kW / 185A	K.A. Swenson	2 Engines Available *NOTE Z ON
253	401 = X 402 = X 403 = 650 kW / 80A 404 = 650 kW / 115A	K.A. Swenson	C RHR TO DROP OFF NO load swing
255	401 = X 402 = X 403 = 120 kW / 5A 404 = 105 kW / 10A	K.A. Swenson	D RHR TO DROP OFF
300	401 = 402 = 403 = 404 =	K.A. Swenson	TEST terminated 403/404 manually stopped
	401 = 402 = 403 = 404 =		

8.5.1.5 Upon instruction of the control room, manually shut down the generator units and trip circuit breakers 401, 402, 403, and 404.

Note 1:

AT request of NRC - Attempt was made to RESTART 403. Switchgear Annex. Test was pushed and 401 & 402 Breakers tripped. Two RHR Pumps came on 206 AF 224 403 WAS MANUALLY STARTED AND MANUALLY SYNCHES. 401 REVERSE POWER RELAY TOOK OUT 401.

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Page 11

K.A. Swenson 7/2/84

Note 2

401/402/404 operating

403 had unit fault

annuc reset hit - took unit fault on 402 - Gen Breaker

401 - Gen Breaker
and sequenc

also on 401 reverse power relay tripped

Carl A. Swenson
7-2-84

Attachment #2
Field Operator

INITIALS

- 8.5.2.1 Remove undervoltage bus program fuses (FU-101A) located in Reactor Building Service Water Pump C cubicle #3 in IR22-SWG-103.
- 8.5.2.2 Check mobile diesel generator feeder IR22-ACB-11-1B located in IR23-SWG-11 is open.
- 8.5.2.3 Open gas turbine feeder breaker IR23-ACB-11-1A with local control switch (located in normal switchgear IR22-SWG-11).
- 8.5.2.4 Open screenwash pumps feeder breaker IR22-ACB-11-2 with local control switch (located in normal switchgear IR22-SWG-11).
- 8.5.2.5 Open 480V substation feeder breaker IR23-ACB-11-10 with local control switch (located in normal switchgear IR22-SWG-11).
- 8.5.2.6 Go to the NSST transformer in the yard and open IR21-DISC-400A switch located in the calvert bus, near the transformer secondary using gloves and switch hook.
- 8.5.2.7 Return to the normal switchgear room and observe how many supplemental diesel generators are available by observing red lights in cubicle IR22-ACB-11-1B in IR22-SWG-11.
- 8.5.2.8 Inform the control room of the number of Diesel units available and that all above steps have been completed and await further instructions.
Record the time: 1416

[Handwritten initials for each step]

OPERATIONS

Verified

Date

CSE/DESIGNER

Verified

Date

8.5.2.9 Upon instruction from the control room, close breaker 1R22-ACB-11-1B and inform the control room.
Record the time: 1417

OPERATIONS [Signature] 7/2/84
Verified Date
CSE/DESIGNEE [Signature] 7/2/84
Verified Date

8.5.2.10 Upon instruction from the control room, manually open circuit breaker 1R22-ACB-11-1B.

OPERATOR [Signature] 7/2/84
Verified Date

CAUTION: Grounding switch 1R21-DISW-400B shall always remain open.

8.5.2.11 Using gloves and switch hook, proceed to close disconnect switch 1R21-DISC-400A in the outdoor calvert bus, thus reconnecting the X coil of the NSST. Inform the control room.

OPERATOR [Signature] 7/2/84
Verified Date

8.5.2.12 As soon as green lights are on in cubicle 1R22-SWG-11-1B and upon receipt of instruction from the control room, reclose circuit breaker 1R22-ACB-11-1B and inform the control room. <1

OPERATOR [Signature] 7/2/84
Verified Date

8.5.2.13 Await for Instructions from the Control Room, then proceed to restore undervoltage bus program fuses by placing:

8.5.2.13.1 Fuse FU-101A in 1R22-ACB-103-3 cubicle

Inform the control room.



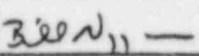


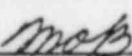
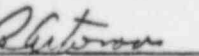

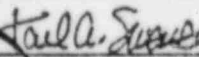


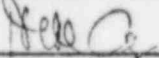
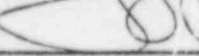

OQA [Signature] 7/2/84
Witness Date

8.5.2.14 Upon instructions from the Control Room, Manually close 1R22-ACB-103-2 in the Emergency Switchgear 103, and inform the Control Room.

OPERATOR [Signature] 7/2/84
Verified Date

SIGNATURE SHEET

All personnel signing this procedure shall fill out the following information for future reference.

Name (Printed)	Name (Signed)	Initials (Printed)	Initials (signed)	Title/ Organization	Level of Qualification (I, II, III)
M. YAZBEK		M.Y.		LEAD MOD. ENG.	II
B. Nazzari		BN		WATCH ENG	—
M. O'Brien		MOB		EO	—
R. Antonov		RA		OPA	II
K.A. Swenson		KAS		MDE	II
MM GORGEN		MMG		OPA	II
					

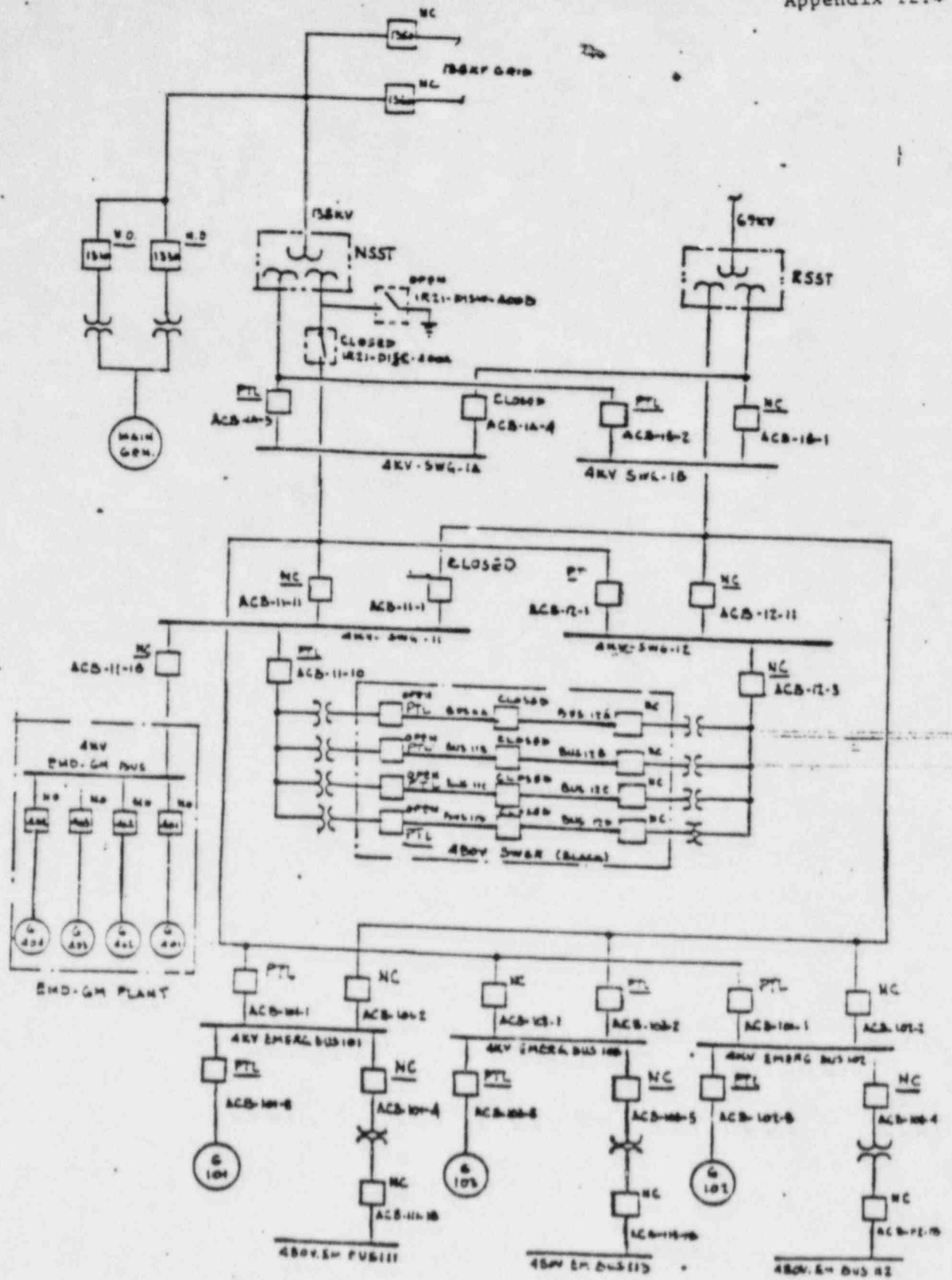


FIGURE 1
 SIMPLIFIED ONE LINE DIAGRAM SHOWING
 CIRCUIT BREAKERS LINE-UP AS PER S.1, S.2, S.3
 S.4, S.5

PREREQUISITE CHECKLIST

		<u>INITIALS</u>
1)	Circuit Breaker Line-Up (Normal Switchgear)	
	1R22-ACB-1A-3 (PTL)	<u>BN</u>
	1R22-ACB-1B-2 (PTL)	<u>BN</u>
	1R22-ACB-12-1 (PTL)	<u>BN</u>
	1R22-ACB-11-1 CLOSED	<u>BN</u>
	1R22-ACB-1A-4 CLOSED	<u>BN</u>
	1R22-ACB-11-11 CLOSED	<u>BN</u>
2)	Circuit Breaker Line-Up (Emergency Switchgear)	
	1R22-ACB-101-1 (PTL)	<u>BN</u>
	1R22-ACB-102-1 (PTL)	<u>BN</u>
	1R22-ACB-101-2 (NC)	<u>BN</u>
	1R22-ACB-102-2 (NC)	<u>BN</u>
	1R22-ACB-103-2 (PTL)	<u>BN</u>
	1R22-ACB-101-8 (indicate position) <i>open</i>	<u>BN</u>
	1R22-ACB-102-8 (indicate position) <i>open</i>	<u>BN</u>
	1R22-ACB-103-8 (PTL)	<u>BN</u>
	1R22-ACB-103-1 (NC)	<u>BN</u>
3)	Equipment Lined-Up Ready To Operate	
	1E11*P-014C and associated valves.	<u>BN</u>
	1E11*P-014D and associated valves.	<u>BN</u>

All above prerequisite steps have been accomplished and station is ready to start the test.

OPERATIONS Bill Williams 7/2/84
 Verified Date

OQA R. Pulvora 7/2/84
 Verified Date

Submitted: WE Smith
viewed/OQA Engr.: Thomas Rose
Approved/Plant Mgr.: H. Clug

MC-1

TP Number 24.307.08
Revision 1
Date Eff. 7/2/84
TPC _____
TPC _____
TPC _____

Six Month Surveillance On 20 MW Gas Turbine Generator No. 2

1.0 PURPOSE

The purpose of this surveillance is to demonstrate the ability of the 20 MW gas turbine generator to start, connect to the electrical system, and connect to actual safety related loads.

2.0 RESPONSIBILITY

The Operating Engineer shall be responsible for insuring the proper implementation of this procedure.

SR2-1021.200-6.421

JUL 02 1984

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3.0 DISCUSSION

- 3.1 The 20 MW gas turbine generator is required to be operable in the event of a total loss of off-site power, combined with failure of the TDI diesel generators to start.
- 3.2 This unit is required to be started, loaded, and operated supplying power to emergency loads at least once per six month interval.
- 3.3 This unit shall be controlled by the system operator.
- 3.4 This test shall be performed in a manner that satisfies the monthly surveillance, TP 24.307.07, and the biweekly 13MWe load test.

4.0 PRECAUTIONS

- 4.1 The Watch Engineer/Supervisor shall be notified immediately whenever a procedural step cannot be completed as specified herein and if any other associated problems develop.
- 4.2 Ear protection should be worn when in the vicinity of the gas turbine during operation.
- 4.3 Do not operate the generator units in excess of 20 MW.
- 4.4 Declare systems/components inoperable as required by Technical Specifications for the performance of this test. Prove redundant equipment operable as required by Tech Spec prior to removal from service of equipment/components.

5.0 PREREQUISITES

- 5.1 Obtain written authorization from the Watch Engineer/Supervisor prior to the performance of any activities associated with this procedure.
- 5.2 Verify that the revision number on the TPF being used is the same as the revision number on the procedure in the MC-2 copy and note if any temporary procedure changes are in effect.
- 5.3 Ensure that no other testing is in progress that will be affected by this testing.
- 5.4 Verify that all plant electrical loads can be supplied by the NSS transformer.
- 5.5 Declare a change in operating condition and/or specific equipment/components inoperable per Technical Specifications.
- 5.6 An operator is stationed in the switch yard to verify that motor operated air breaks MABS 8Z-616 and MASS 8Z-617 and breaker OCB 8Z-640 OPEN when the SNPS feeder at the Wildwood Substation, breaker 8DR-640 is opened.

- 5.7 Notify the Construction Manager or his designee that Power and Lighting will be lost to construction areas. Including the Colt Diesel Building during the performance of this test.

6.0 LIMITATIONS AND ACTIONS

- 6.1 When the 20 MW gas turbine generator is required to be operable, Technical Specifications (later) shall apply.

7.0 MATERIALS AND TEST EQUIPMENT

- 7.1 Calibrated stopwatch, M&TE calibrated to 1 second in 10 minutes.

8.0 PROCEDURE

- 8.1 Perform Appendix 12.1, Six Month Surveillance Test of the 20 MW Gas Turbine.

9.0 ACCEPTANCE CRITERIA

- 9.1 The gas turbine generator automatically connects to the 69 KV bus in three (3) minutes or less after the Wildwood feeder breaker is opened.
- 9.2 The 69 KV loads that are automatically disconnected on loss of voltage are opened and the 82-640 breaker is opened.
- 9.3 The control room operator has demonstrated that power can be supplied to the Emergency busses.
- 9.4 Time from when Bus 103 de-energizes until one RHR Pump is at rated flow is less than 10 minutes.

10.0 FINAL CONDITIONS

- 10.1 The 69 KV Switchyard is normalized.
- 10.2 The station electrical system is normalized.
- 10.3 All documentation completed and forwarded to the Operating Engineer.

11.0 REFERENCES

- 11.1 Technical Specification (later)
- 11.2 SSER 5, Section 8 - Electric Power
- 11.3 LILCO one line diagram Shoreham 69 KV Switchyard - 82
- 11.4 FE-1A, Electrical Diagram, Main One Line Diagram
- 11.5 TP 24.307.07 Monthly Black start test of the 20 MW Gas turbine.

12.0 APPENDICES

12.1 TPF 24.307.08, Six Month Surveillance Test of the 20 MW Gas Turbine

SIX MONTH SURVEILLANCE TEST OF THE 20 MW GAS TURBINE

	Signature	Initials	Time	Date
Authorization for Start	<u>Bill Nye</u> (Watch Engineer)	<u>BW</u>	<u>1625</u>	<u>7/2/84</u>
Initiated by	<u>W. Khanat</u>	<u>Wk</u>	<u>1625</u>	<u>7/2/84</u>
Completed by	<u>W. Khanat</u>	<u>Wk</u>	<u>1808</u>	<u>7/2/84</u>
Reviewed by	<u>Bill Nye</u> (Watch Engineer)	<u>BW</u>	<u>1810</u>	<u>7/2/84</u>

Step No.	Procedure	Initials
1.	Verify prerequisites are met.	<u>BW</u>
2.	Notify the Security Supervisor that power and lighting in yard areas and the secondary access facility will be lost during the performance of this test.	<u>BW</u>
3.	Notify all personnel in the Technical Support Facility that power and lighting will be lost during the performance of this test.	<u>BW</u>
	Notify all personnel in the 'Stone and Webster Warehouse' that lighting and power will be lost during the performance of this test.	<u>BW</u>
5.	Notify Safety and Fire Protection that lighting and power will be lost in the secondary access facility, Technical Support Center, Colt Building, and the S&W Warehouse.	<u>BW</u>
6.	The system operator has been notified and is prepared to perform this test.	<u>BW</u>
7.	The LILCO system I.C. Division has a representative on site and is prepared to support this test.	<u>N/A</u>
8.	A LILCO multi-system operator is on site if required and is prepared to normalize the 69 KV bus.	<u>BW</u>
9.	Declare systems/components inoperable as required by Technical Specifications for the performance of this test. Prove redundant equipment operable as required by Tech Spet prior to removal from service of equipment/components.	<u>BW</u>

- Transfer all loads on bus 1A and 1B from RSS to NSS feed.
Close ACB 1B-2 and Open ACB 1B-1, place in pull-to-lock. BW
Close ACB 1A-3 and Open ACB 1A-4, place in pull-to-lock. BW
11. Transfer all loads on bus 11 and 12 from RSS to NSS feed.
Close ACB 12-1 and Open ACB 12-11, place in pull-to-lock. BW
Close ACB 11-11 and Open ACB 11-1, place in pull-to-lock. BW
12. Declare Emergency diesel G-103 inoperable and place its control switch in lockout, 1R43 * pnl-DG3.. Place the generator output breaker ACB 103-8 in pull-to-lock. BW
13. Place the RSS feeder breakers for the following Emergency busses in the pull to lock position.
- ACB 101-2 BW
ACB 102-2 BW
- NOTE: The following steps will deenergize Emergency busses 103 and 113. Prior to performing these steps, transfer all active loads to the other Emergency busses or shutdown the equipment.
14. Transfer Bus 103 to RSST Feed, open NSS normal feed to bus 103 and place the breaker control switch for breaker ACB-103-1 in the pull to lock position. BW
15. Notify the system operator to open the SNPS feeder at the Wildwood substation, breaker 8DR-640. BW
16. Time the following steps.
- 16.1 Using an M&TE stopwatch, determine the time from when the indicating light on the main Control board for the Shoreham 82 OCE-640 opening goes green to when the indicating light for the gas turbine GT-002 breaker closing goes red. The time shall be equal to or less than three minutes.

M&TE 455 Time 1701 2.31 sec BW
2 min 31 sec

16.2 Using an M&TE stopwatch, determine the time from when bus 103 is de-energized until one RHR Pump is at rated flow. The time shall be equal to or less than 10 minutes. *3 minutes 50 sec.*

M&TE 442 Time 3.50 min. BN

CAUTION: During the time duration in which the gas turbine is not connected to the LILCO grid, all busses being supplied by the RSS transformer are not in synchronism with the busses being supplied by the NSS transformer.

17. Verify that the gas turbine generator No. 2 has closed onto the 69 KV bus and its operation has stabilized. BN

CAUTION: If the operation of the gas turbine generator appears to become unstable, immediately isolate the emergency busses from it.

18. Energize the emergency bus 103 and 113:

18.1 Establish communication with the emergency switchgear room. BN

18.2 Locally at the RSST supply breaker 103-2 cubicle place the RSST supply breaker switch in the CLOSED position and hold it. BN

18.3 At 1H11*MCB-01 reset the 27/86 Bus Program Reset switch and instruct the person at the local switch for the RSST breaker to return the switch to NORMAL. BN

18.4 Clear the breaker disagreement by placing the RSST supply breaker switch at 1H11*MCB-01 in the AUTO-AFTER-CLOSE position. BN

19. Verify that the Emergency busses 103 and 113 remain energized.

Bus 103 voltage 4160 BN

Bus 113 voltage 480 BN

Verify that the motor operated air breaks have opened and that breaker OCB 8Z-640 has opened.

OCB 8Z-640 ✓

BW

MABS 8Z-616 ✓

BW

MABS 8Z-617 ✓

BW

21. Apply load to GT-002 by starting RHR pumps 1E11*P-014C and/or *P-014D as specified by the Watch Engineer. Use the full flow test mode of RHR.

BW

22. At 1H11*MCB-01 monitor Bus 103 volts and amps and RSST amps and MWe indications.

BW

23. As directed by the Watch Engineer, shut down RHR pumps 1E11*P-014C and/or *P-014D that had been started in Step 21.

BW

24. Notify the system operator that the 69 KV yard can be normalized.

BW

25. After the 69 KV bus has been normalized by the system operator and power has been restored to the 616 and 617 feeds, the station electrical system shall be normalized as follows, or as directed by the Watch Engineer.

BW

26. Transfer all loads on bus 1B from NSS to RSS feed by closing ACB-1B-1 and Opening ACB-1B-2.

BW ZJK

27. Place the control switch for breaker ACB-1A-4 in the auto position.

BW ZJK

28. Transfer all loads on bus 12 from NSS to RSS feed by closing.

ACB-12-11 and Opening ACB-12-1.

BW ZJK

29. Place the control switch for breaker ACB-11-1 in the auto position.

BW ZJK

30. Return Emergency bus 103 and 113 to the NSS supply by closing.

NSS supply breaker ACB-103-1 and opening RSS supply breaker ACB-103-2.

BW ZJK

Place the RSS feeder breakers for the Emergency busses in the auto position.

ACB 101-2
ACB 103-2
ACB 102-2

2nd
Verif

<u>BN</u>	<u>NYK</u>
<u>BN</u>	<u>NYK</u>
<u>BN</u>	<u>NYK</u>

32. Return Emergency diesel G-103 to service by placing its control switch to Remote and the generator output breaker ACB-103-8 to Auto.

<u>N/A</u>	<u>(BN)</u>
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TPF 24.307.08-1 Rev. 1