SR
Safety Classification

FERMI 2 PROCEDURE - OPERATIONS PROCEDURE - SURVEILLANCE

TITLE: CTG-11-1 MONTHLY OPERABILITY CHECK

PROCEDURE NUMBER: 24.324.01

REVISION: 0

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Technically reviewed by: Michael S Madkins Date: 11-23-85

Reviewed/concurred by: _____ Date: _____
Supv - Operational Assurance

Approved by: _____ Date: _____
Responsible Section Head or OSRO Member/Alt

Further Approval Required for Safety-Related or Superintendent-Designated Procedures:

Recommended by: _____ Date: _____
OSRO Chairman/Alternate

Approved by: _____ Date: _____
Superintendent - Nuclear Production

The following approved Procedure Change Requests are incorporated in this revision:

This revision | | does | | does not constitute periodic review.

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1.0 Purpose

1.1 To provide the detailed steps necessary to perform the required surveillance testing of the CTG-11-1 generator in accordance with Technical Specifications, Section 4.7.9.2.

1.2 To provide the detailed steps necessary to perform the Alternate Shutdown Monitoring CTG-11-1 Monthly Channel Checks in accordance with Technical Specifications, Section 4.3.10.1 and Table 4.3.10.

1.3 Required frequency is at least once every 31 days when in Condition 1, POWER OPERATION, Condition 2, STARTUP.

2.0 References

2.1 Source References

2.1.1 Fermi 2 Technical Specifications, 3/4.7.9 Appendix R Alternative Shutdown Auxiliary Systems, Section 4.3.10.1 and Table 4.3.10.

2.1.2 Plant Operations Manual (POM) 12.000.07, Plant Operations Manual Procedures

2.1.3 POM Procedure 12.000.13, Radiation Work Permit

2.1.4 POM Procedure 12.000.18, Surveillance Program

2.1.5 POM Procedure 12.000.43, Verification of Correct Performance of Operating Activities

2.1.6 Drawings

4SD721F-61	Ratcheting and Starting Means - Unit 1 only CTG #11.
4SD721F-62	Starting means CKT CTG #11.
4SD721F-64	Purge, Firing and Fuel Supply CTG #11.
4SD721F-65	Flame Detector CTG #11.
4SD721F-95	Governor Control CTG #11.
4SD721F-68	Exhaust Temp. Control CTG #11.
4SD721F-70	Temp. Indicator and Heaters CTG #11.

2.1.7 Functional System Description, Supervisory Control of the 120KV Switchyard and CTG-11 Generators at Fermi 1, 0721-2-E14

3.0 Precautions and Limitations

3.1 When operating the LOWER/RAISE Control Switch for the CTG-11 Generators voltage and governor load control, the control command will be executed as long as the control switch is held in the LOWER or RAISE position. Operator has to anticipate time lag of the controlled value after release of the control switch.

3.2 Following the power block start-up or the use of manual load controls (GOVERNOR CONTROL switch), the automatic load controls are blocked. Automatic load controls (MIN, BASE and PEAK push-buttons) are restored by giving the Power Block a second ALL START signal.

3.3 If the Power Block Master Control switch is taken to STOP a second time the units will go off ratchet gear. If the units go off the ratchet gear, it will have to be reset at the CTG-11 Control Center. When reset, the unit will go back on ratchet gear.

3.4 When a unit(s) is loaded without any warm-up period, Attachment 2 must be completed every 15 minutes for the associated unit(s).

4.0 Prerequisites

4.1 43S Keylock Switch located on CTG-11 Control subpanel in the Fermi 1 Control Room is in Fermi 2 position.

4.2 120kV circuit breaker control switch handles are removed from the Fermi 1 Control Room Panel #2.

4.3 43P Selector Switch in the CTG-11 Control Center is in the REMOTE position.

4.4 43 Selector Switch on individual unit control panel in the CTG-11 Control Center is in the REMOTE position.

4.5 Synchronizing Mode Selector Switch is in the OFF/REMOTE position on CTG-11 Control Center Power Block Panel.

4.6 Unit is ready to start as indicated by the green backlighted READY TO START indication on Panel H11-P811.

4.7 The NSS has given permission to perform this test on the Surveillance Performance Form.

4.8 Verify all radiation protection requirements are met, as listed on the Radiation Work Permit, if required.

5.0 Procedure

5.1 General Instructions

5.1.1 All controls and indications for this test are located on COP H11-P811 and Remote Shutdown Panel H21-P623, unless otherwise noted.

5.1.2 The names of all test personnel are to be listed on Attachment 3.

5.1.3 Compare all test results with the given acceptance criteria at all times throughout the test period.

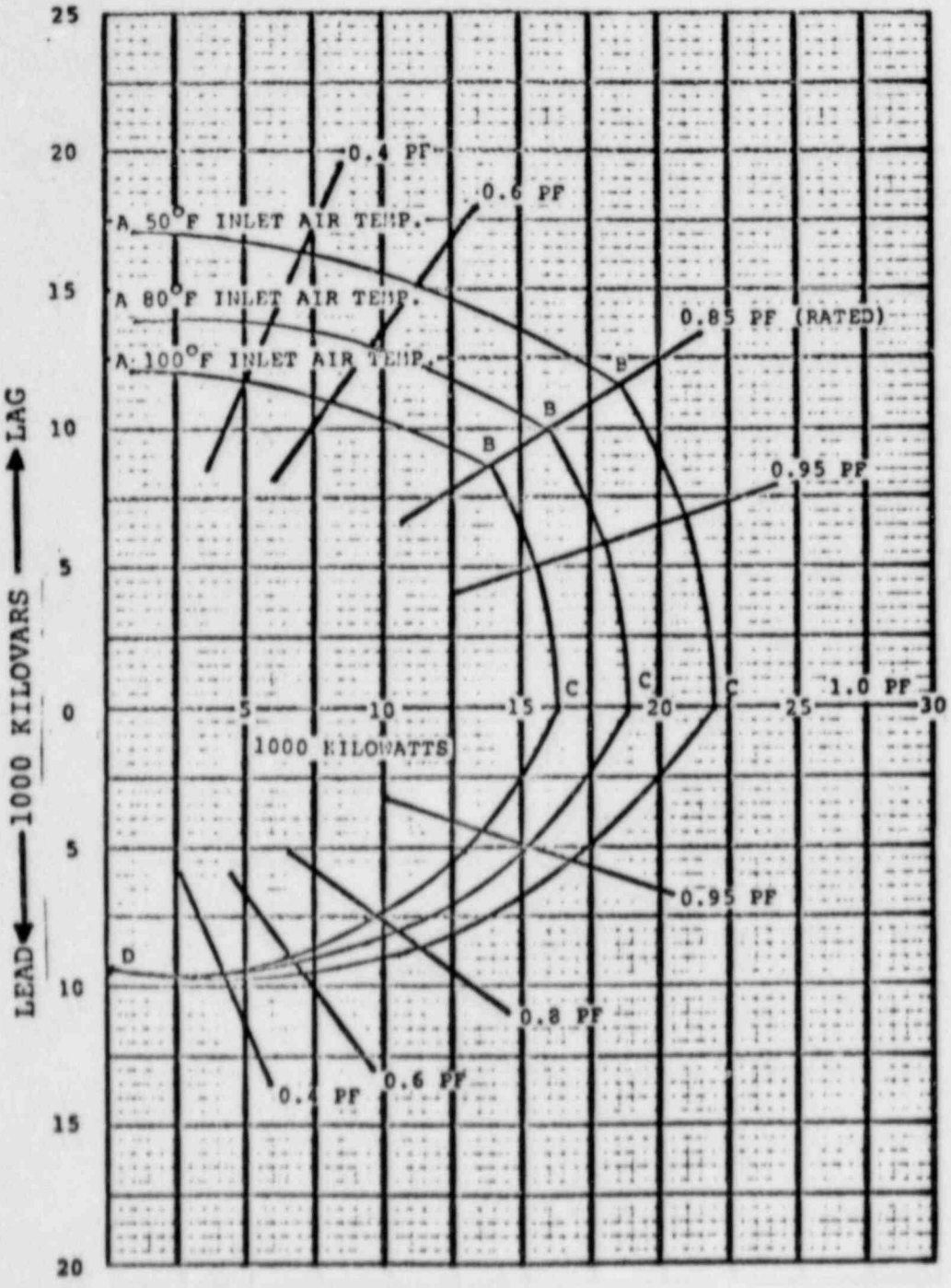
5.2 Perform the CTG-11-1 Generator Operability Verification Test in accordance with Attachment 1.

6.0 Acceptance Criteria

6.1 The Tech Spec requirements of this test are satisfied when the CTG-11-1 generator is shown to be operable in accordance with Attachment 1. If not, refer to Tech Spec 3.7.9.

ESTIMATED REACTIVE CAPABILITY CURVE
FOR TURBINE-GENERATOR UNIT
ATB-2-POLE - 18824 KVA - 3600 RPM - 13800 VOLTS - 0.85 PF
788 ARMATURE AMPS - 250 VOLTS EXCITATION

IDENTIFICATION CTG-11 - 1



Curve AB Limited By Field Heating
Curve BC Limited By Armature Heating
Curve CD Limited By Armature Core End Heating

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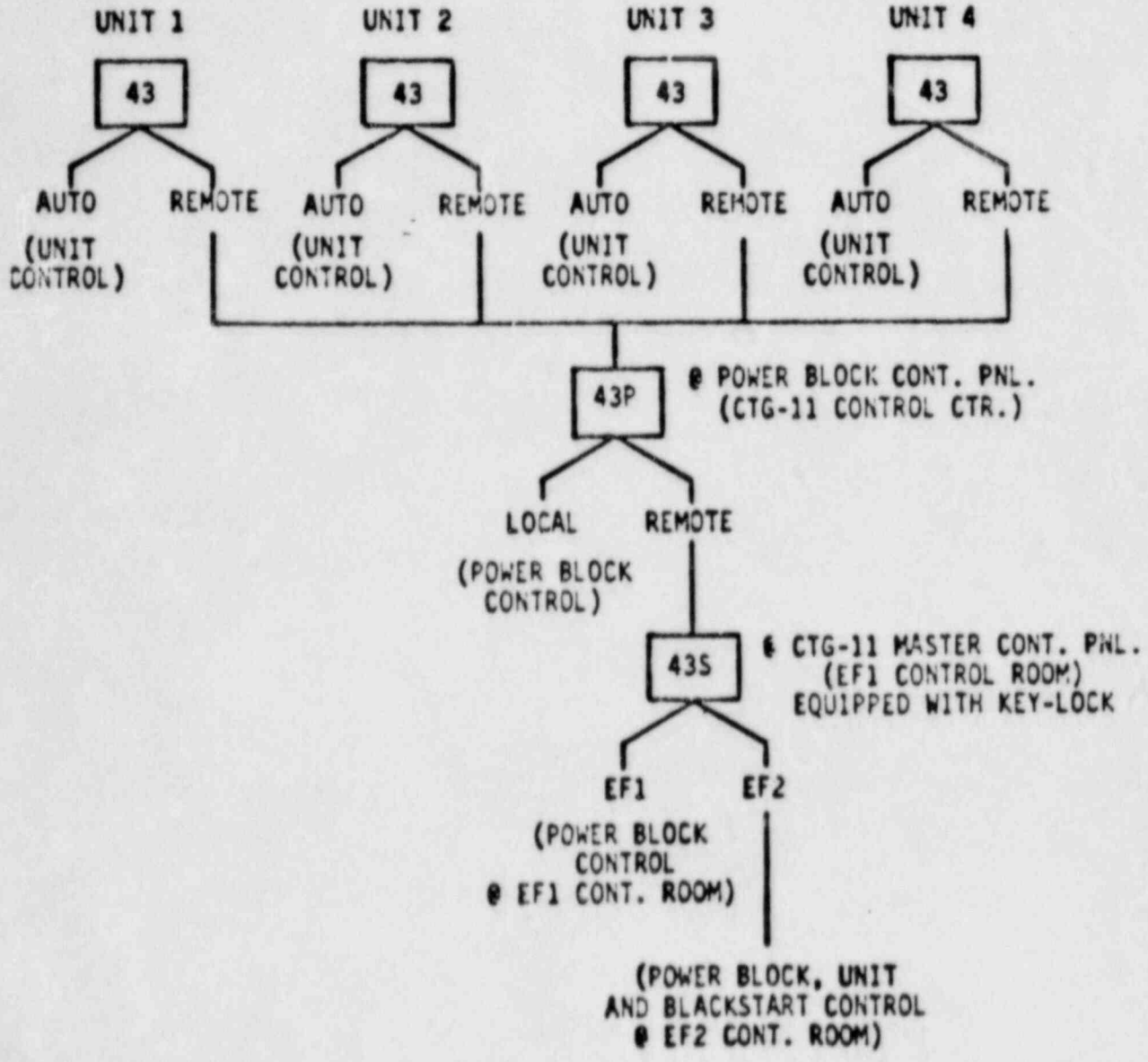
CTG-11 SELECTOR SWITCHES



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CTG-11-1 GENERATOR OPERABILITY VERIFICATION TEST

Step No. | Initials/Date

Note: See Enclosure 1 for CTG-11 Selector Switch diagram.

1.0 Starting:

NOTE: When a unit is loaded without any warm-up period, Attachment 2 must be completed every 15 minutes.

1.1 Depress the red backlighted START pushbutton and verify the following: _____/_____

1.1.1 The red backlighted START pushbutton is on. _____/_____

1.1.2 The green backlighted READY TO START indication goes off. _____/_____

1.1.3 The red backlighted SEQUENCE IN PROGRESS indication is on. _____/_____

NOTE: The unit will require 8-10 minutes to reach synchronous speed and to automatically synchronize.

1.2 When the unit breaker closes as indicated by a red CLOSED light verify the following

1.2.1 The red backlighted SEQUENCE IN PROGRESS indication goes off. _____/_____

1.2.2 The red backlighted SEQUENCE COMPLETE indication is on. _____/_____

CTG-11-1 GENERATOR OPERABILITY
VERIFICATION TEST

Step No.		Initials/Date
1.2.3	Unit MW output increases to 3-5 MW (Minimum).	/
	NOTE: The automatic synchronizing will adjust voltage to 107-121V and the frequency to 59-61 Hz, as noted on Panel H11-P811.	

2.0 Loading:

NOTE(1): There are two sets of controls available to adjust the MW output of the CTG-11 Generators (MANUAL AND AUTOMATIC).

NOTE(2): Following the power block start-up or the use of manual load controls (GOVERNOR CONTROL switch), the automatic load controls are blocked. Automatic load controls (MIN, BASE and PEAK push-buttons) are restored by giving the power block a second ALL START signal.

Manual - Governor Control Switches on the unit control subpanel.

Automatic - Load Selection - Minimum, Base or Peak on the Power Block Control subpanel.

NOTE(3): At this point the operator must decide to operate the unit load in Manual or Automatic.

2.1 Manual Load Control

NOTE: When operating the Lower/Raise control switches for the unit voltage and Governor Load controls, the operator should be aware that the command signal is present as long as the switch is held in the LOWER or RAISE position. The operator has to anticipate time lag of the controlled value after release of the control switch.

2.1.1 Turn the Governor Control Switch to RAISE and increase load to Base load (13-15 MW). /

CTG-11-1 GENERATOR OPERABILITY
VERIFICATION TEST

Step No.		Initials/Date
2.1.2	Adjust VARS as indicated on the individual Megavar (MVAR) indicator using the Voltage Control switch. Maintain voltage and VARS within the capability curve (see Enclosure 2).	____/____
2.2	Automatic Load Control:	
NOTE:	After the unit breaker closes the unit will load to Minimum load (3-5 MW).	
2.2.1	Depress the red backlighted START pushbutton and release.	____/____
NOTE:	The previous step allows the automatic load control to be used.	
2.2.2	Verify the unit load increased to Base load (13-15 MW).	____/____
2.3	CTG-11-1 Channel Checks (To be performed while unit is running.)	
2.3.1	CTG-11-1 Volts	
a.	Record CTG-11-1 volts from H21-P623 _____V	____/____
b.	Record CTG-11-1 volts from H11-P811 _____V	____/____
c.	Verify Channel Check acceptable if readings taken above are within 10% of THE CONTROL ROOM INDICATOR. _____% Difference	____/____
2.3.2	CTG-11-1 Frequency	
a.	Record CTG-11-1 frequency from H21-P623 _____Hz	____/____
b.	Record CTG-11-1 frequency from H11-P811 _____Hz	____/____

CTG-11-1 GENERATOR OPERABILITY
VERIFICATION TEST

Step No. Initials/Date

c. Verify Channel Check acceptable if readings taken above are within 10% of THE CONTROL ROOM INDICATOR.
_____% Difference _____/_____

2.3.3 CTG-11-1 Watts

a. Record CTG-11-1 watts from H21-P623 _____W _____/_____

b. Record CTG-11-1 watts from H11-P811 _____W _____/_____

c. Verify Channel Check acceptable if readings taken above are within 10% of THE CONTROL ROOM INDICATOR.
_____% Difference _____/_____

2.3.4 CTG-11-1 VARS

a. Record CTG-11-1 VARS from H21-P623 _____VARS _____/_____

b. Record CTG-11-1 VARS from H11-P811 _____VARS _____/_____

c. Verify Channel Check acceptable if readings taken above are within 10% of THE CONTROL ROOM INDICATOR.
_____% Difference _____/_____

3.0 Shutdown

NOTE: If the unit is at a load other than Peak load, only step 3.2 and 3.3 will be performed. If unit is at Minimum load, perform only step 3.3. If the unit is in Manual perform step 3.3 only.

3.1 Depress and release the green backlighted STOP pushbutton and verify the following: _____/_____

3.1.1 The green backlighted STOP pushbutton comes on and then goes off. _____/_____

CTG-11-1 GENERATOR OPERABILITY
VERIFICATION TEST

Step No.		Initials/Date
3.1.2	The unit load decreases to Base load (13-15 MW).	/
3.2	Depress and release the green backlighted STOP pushbutton and verify the following:	/
3.2.1	The green backlighted STOP pushbutton comes on and then goes off.	/
3.2.2	The unit load decreases to Minimum load (3-5 MW).	/
3.3	Depress and release the green backlighted STOP pushbutton and verify the following:	/
3.3.1	The unit load decreases load to 0 MW.	/
3.3.2	The unit breaker opens as indicated by the unit breaker green OPEN light on.	/
3.3.3	When the unit decreases to 0 RPM, the Ratcheting System will begin to rotate the shaft.	/

NOTE: If the unit green backlighted pushbutton is depressed again, the unit will go off ratchet gear. If the unit goes off the ratchet gear, it will have to be reset at the CTG-11 Control Center. When reset, the unit will go back on gear.

CTG-11-1 GENERATOR
OPERATIONAL DATA

DATE: _____

NOTE: All CTG Readings Should Be Taken After Approx. 10 minutes Run Time On the Respective CTG.

Component	Acceptable Range/Status	Unit 1
Unit Start Time	N/A	
Megawatts	5± .5 MW	
Megavars	<5 MVAR	
Exciter D.C. Volts	80 - 160 Volt	
Exhaust Thermocouple Temp. 1	< 750° F	
Exhaust Thermocouple Temp. 2	< 750° F	
Exhaust Thermocouple Temp. 3	< 750° F	
Exhaust Thermocouple Temp. 4	< 750° F	
Exhaust Thermocouple Temp. 5	< 750° F	
Exhaust Thermocouple Temp. 6	< 750° F	
Exhaust Thermocouple Temp. 7	< 750° F	
Exhaust Thermocouple Temp. 8	< 750° F	
Exhaust Thermocouple Temp. 9	< 750° F	
Exhaust Thermocouple Temp. 10	< 750° F	
Exhaust Thermocouple Temp. 11	< 750° F	
Exhaust Thermocouple Temp. 12	< 750° F	
MNX. Temp. T (1-12 above)	< 50° F	
Fuel Oil Press. Before Main Filter	≤ 100 psi	
Fuel Oil Press. After Main Filter	≤ 85 psi	
Fuel Oil Press. d/p	≤ 15 psi	
Lube Oil Press. Before Main Filter	≤ 40 psi	
Lube Oil Press. After Main Filter	≤ 35 psi	
Lube Oil Press. d/p	≤ 5 psi	
Vibration Detectors 1	≤ 1 in/sec	
Vibration Detectors 2	≤ 1 in/sec	
Vibration Detectors 3	≤ 1 in/sec	
Time for Unit to sync.	≤ 11 min.	
Unit Sel. SW. in remote at end of test	SAT	

OPERATOR: _____ NSO: _____

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TEST PERSONNEL

Time Completed _____
Date Completed _____

Printed names of test personnel	Initials	Signatures
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

END