

**POWER PLANT  
CHECK LIST AND OPERATION TEST**

**GENERAL**

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**1. GENERAL**

**1.01** This section tells how to:

- (a) Evaluate the emergency operation of a switching office or a toll repeater station in the absence of commercial power.
- (b) Report the results of this evaluation.

**1.02** This section is reissued to clarify responsibilities.

*Note:* Marginal arrows used to denote changes are omitted.

**1.03** Telephone offices or toll repeater stations are ordinarily operated by a commercial power supply. Most of these stations are also capable of operating from a noncommercial power source (such as batteries, battery-operated devices, or standby engine alternators).

**1.04** The check list (Section 002-502-914PT) and operation test (Section 002-502-915PT) will cover the complete power arrangements of any office or station, including support devices (such as lighting, air-conditioning, etc.) required for continued operation. Test requirements for individual devices are contained in other sections.

**1.05** These tests will:

- (a) Increase familiarity with power plant capabilities and operation.
- (b) Observe the interaction of power plants under controlled conditions during AC power interruptions.
- (c) Indicate the actual condition of the batteries.

**1.06** See the following sections for details of checklists and operation tests:

- Section 002-502-914PT, Check List
- Section 002-502-915PT, Operation Test

**2. CHECKLIST AND METHOD OF PROCEDURE**

**2.01** The checklist described in Section 002-502-914PT is a list (not necessarily complete) of items vital to continued operation under emergency conditions.

- (a) It is applicable to all offices maintained by Pacific Telephone and Nevada Bell.

## SECTION 002-502-913PT

(b) It is not intended to replace any other prescribed material used in making a normal test.

**2.02** Items covered by the checklist are the responsibility of the district manager. The annual and triennial checklist evaluation shall be made in all offices and repeater stations.

### 3. OPERATION TEST

**3.01** The operation test outlined in Section 002-502-915PT:

- (a) Simulates the loss of commercial power.
- (b) Places the DC plants on a controlled discharge.
- (c) Checks the operation of the office equipment under emergency power conditions.

**3.02** This test should be made only when the checklist (see 1.06) indicates that:

- (a) The power plants will operate satisfactorily and/or
- (b) In the judgement of local supervision, the office equipment will operate satisfactorily during the test.

**Note:** It is necessary to obtain approval from the supervisor responsible for the offices, or stations, before the operation test can be made (see 1.06).

**3.03** The operation test should be performed on all power plants that the checklist indicates can be expected to operate satisfactorily.

**Note:** Power plants are defined here as 24V, 301C; 48V, 302A; 12V, 425A; etc.

**3.04** Schedule the operation test in the switching offices when the battery drain is equivalent to a 4- to 6-hour discharge rate. At the repeater stations, schedule the operation test during light service-load periods to minimize unexpected service reaction. The district manager is responsible for the scheduling and the time period under which the tests are to be conducted.

**3.05** Form P 4484: Method of Procedure (MOP) should be completed before the emergency evaluation is started. It provides a listing of who is responsible for various steps of the evaluation and an orderly sequence of items to be done during the evaluation. All persons involved in evaluation should be provided a copy of the MOP. (See Exhibit 1.)

### 4. REQUIREMENTS

**4.01** All offices (including new offices, repeater stations, and major building additions in either attended or unattended locations) shall be tested.

(a) **Initial:** Evaluation checklist and operation test should be completed for a new location (maximum 12 months) under direction of power maintenance staff.

(b) **Annual:** The operation test (Section B of P 2729) and audit and administrative items (Section C of P 2729), should be completed annually by local supervision and craft. Results should be recorded on Form P 2729 and Form P 2183-B, Emergency Operation Evaluation — Office Summary Report.

(c) **Third Year:** Checklist and operation test shall be completed for all locations under direction of local supervision with technical assistance from the Power Equipment staff representatives.

**4.02** The District Manager shall be responsible for scheduling the annual operation test and forwarding the results to the maintenance staff.

### 5. REPORTS

**5.01** Use the Emergency Operation Evaluation report forms (P 2183-B — Office Summary Report and P 2183C — District Summary Report) to report unsatisfactory items found during the operation test or indicated on the checklist.

**5.02** Form P 2183-B (Exhibit 2) provides the district manager and power staff group with a record of all unsatisfactory items found at an office or repeater station.

**5.03** Form P 2183-B shall be prepared and forwarded by representatives of the district manager within 10 days after completing each checklist or operation test. (The technical power staff group should be included on the third year check list and operation test evaluation *only*).

**5.04** Form P 2183C (Exhibit 3) provides the division manager and power staff group with a district report of all significant unsatisfactory items listed on Form P 2183-B.

**5.05** Form P 2183C, a district summary, should be prepared by the district manager semiannually and forwarded through lines of organization to the division manager and power staff group. The semi-annual report should reach the division manager not later than January 15th and July 15th. Items are carried on the form until they are corrected.

**5.06** Order the following forms for the emergency operation evaluation:

- Form P 2183-B: Emergency Operation Evaluation — Office Summary Report
- Form P 2183C: Emergency Operation Evaluation — District Summary Report
- Form P 2726: Work Sheet, Power Plant Data
- Form P 2727: Work Sheet, Bell System Practices — Power Plant
- Form P 2729: Check Point List
- Form P 2730: Battery Discharge Record
- Form P 4484: Method of Procedure — Emergency Operation Evaluation — Telephone Power.



4. **Assignments:** The following personnel should be at their assigned locations prior to start of test.

\_\_\_\_\_ Equip. Supvr. will have complete control of this MOP. No sequence step will proceed without his approval. Call immediately in case of abnormal condition.

- \_\_\_\_\_ Observe alarms in switch room
- \_\_\_\_\_ Operate AC switchgear
- \_\_\_\_\_ Operate Emergency Alternator
- \_\_\_\_\_ Operate Power Plant
- \_\_\_\_\_ Observe – 48V Plant Operation
- \_\_\_\_\_ Observe other DC Plant Operation

**Operation Test**

<u>Step</u>	<u>Time</u>	<u>Employee</u>	<u>Action</u>
1.	_____	_____	Place 500 type plants on battery to eliminate unnecessary transfers.
2.	_____	_____	Simulate an AC power failure condition by interrupting the commercial AC supply to the entire office, including any power failure sensing circuits
3A*	_____	_____	Observe the following – 1. Engine cranking time 2. Engine transfer time 3. Proper transfer of all equipment that usually transfers under emergency operating conditions. 4. Indications on switchgear control panels.
4A*	_____	_____	Continue to operate office and equipment loads from emergency engine, taking frequent readings of engine performance gauges.
5A*	_____	_____	When the engine reaches normal operating condition proceed with the battery load test by turning off the charging units until each plant is on discharge for 90 minutes.
6A*	_____	_____	Observe end cell switch or CEMF contactor. Record time and voltage at which end cells are cut in.

\* Auto-start engines

<u>Step</u>	<u>Time</u>	<u>Employee</u>	<u>Action</u>
3M**	_____	_____	Observe the following – 1. Cut in end cells or CEMF cells of each battery plant. Record time and voltage at which cells are cut in.  2. Start and transfer of ringing machine.  3. Transfer of vital ac circuits to emergency ac supplies.
4M**	_____	_____	Set AC switches of charging equipment to "OFF" position
5M**	_____	_____	Start the emergency engine alternator. Follow the step by step procedures to start the engine. Take frequent readings of engine performance gauges.
6M**	_____	_____	Place essential ac-operated telephone equipment and building load (including lighting) on engine.
7.	_____	_____	Retire alarms (record alarms unable to retire)
8.	_____	_____	Immediately after start of discharge, observe the voltage constantly until voltage stabilizes and record the following:  (a) Lowest voltage reached immediately after discharge starts.  (b) Recovery voltage (voltage at which the battery stabilizes)
9.	_____	_____	Continue to read and record voltages and load at 10-minute intervals during discharge. Do not allow the plants to discharge below the voltage limits noted on the Battery Discharge Record (P-2730).
10.	_____	_____	De-energize auxiliary end cell charging unit

\*\* Manual start engines

<u>Step</u>	<u>Time</u>	<u>Employee</u>	<u>Action</u>
11.	_____	_____	Check intercell straps and battery connections for load unbalance or excessive voltage drop.
12.	_____	_____	At the completion of the 90 minute discharge test -- Manually place each power plant on the engine alternator until the rated output is reached. Hold for 15 minutes to test breaker, wiring and engine alternator.
13.	_____	_____	Watch for overloads and record KW load on engine alternator with all charging units connected.
14.	_____	_____	In the case of plants equipped with end cell, CEMF cell, or contactor equipment, record voltage at which they restore.
15.	_____	_____	Upon completion of the 15 minute load test on the engine, close the main circuit breaker and restore all plants to commercial power source.
16.	_____	_____	Observe the sequencing of charging equipment.
17.	_____	_____	Transfer building power and lights to commercial source.
18.	_____	_____	Shut down the emergency engine using the emergency - stop feature. CAUTION: Reset emergency shutdown linkage where necessary.
19.	_____	_____	Recharge all battery plants including end cells, as soon as possible after the battery discharge test.
20.	_____	_____	Prepare a report covering the emergency operation evaluations within 10 days as covered in 002-502-913PT.

APPROVED:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



EMERGENCY OPERATION EVALUATION — OFFICE SUMMARY REPORT		
CHECK POINT NUMBER	EXPLANATION OF UNSATISFACTORY ITEM	ACTION TAKEN TO CORRECT

District: \_\_\_\_\_

Office: \_\_\_\_\_

Date: \_\_\_\_\_

Note: Check point list items marked with an asterisk (\*) are items which, if unsatisfactory, may jeopardize emergency operation.

**FORM P 2183C (9-67)**  
**EMERGENCY OPERATION EVALUATION — DISTRICT SUMMARY REPORT**

OFFICE	CHECK POINT NUMBER	EXPLANATION OF UNSATISFACTORY ITEM	ACTION TAKEN TO CORRECT

**District:** \_\_\_\_\_

**Date:** \_\_\_\_\_