SECTION 1

POWER SYSTEMS

ENGINEERING AND OPERATIONAL REVIEW

GENERAL INSTRUCTIONS

AND SUMMARY PROCEDURES

1. GENERAL

1.01 These Power Systems Practices set forth the Engineering and Operational Review to be conducted on power equipment. These sections cover the instructions and procedures for testing and evaluating the engineering arrangements and operational capability of central office or radio repeater station ac and dc power plants. Service continuity is thereby assured during commercial ac power outage or low ac power conditions. This section covers the general instructions. Sections 2 through 4 cover detailed instructions and procedures describing a method of checking the complete power arrangement of any station. It includes the proper connection to the essential bus of selected support devices and equipment (such as lighting, air handling, etc.) required for continued operation under emergency conditions. Table A is a listing of all sections.

1.02 Whenever this section is reissued, the reason for reissue will be given in this paragraph.

1.03 The power engineering and operational review is a team effort on the part of operating company network power engineering, network operations, and building engineering personnel. One or more review teams should be designated to schedule and coordinate this activity.

1.04 The engineering evaluation portion of the office check should be made prior to the operational tests, by a member of the review team. Assistance from the area power engineer and local operations personnel may be required. These engineering reviews are in no way to take the place of acceptance tests or routine checks.

TABLE A

SECTION	TITLE	BSP NUMBER
1	GENERAL INSTRUCTIONS AND SUMMARY PROCEDURES	155-003-000
2	EQUIPMENT ENGINEERING CHECKLIST	155-003-001
3	BUILDING ENGINEERING CHECKLIST	155-003-002
4	POWER PLANTS OPERATIONAL REVIEW	155-003-003

1.05 It is important that the local craft actually do all the operational testing with the review team providing only essential supervision and evaluating the results. When troubles are found, they should be listed immediately giving the item number, trouble and action. (See Table B). The decision to repair immediately or bypass will be a function of the effect the trouble would have on the performance of the test. If the correction of the problem will obviously be lengthy and the remaining test depends on its correction, the task force should reschedule the office for a future date, with a reasonable interval to accomplish the repair.

1.06 The office being tested and the review team should each have an accurate digital voltmeter and an ac-dc clamp-on ammeter to permit simultaneous trouble shooting and continued office evaluation.

TABLE B

ACTION ITEM SUMMARY

OFFICE _____

CITY _____

DATE _____

ITEM NO.	TROUBLE	ACTION	RESPON-SIBILITY	PROPOSED COMPLETE DATE	COMPLETE DATE

1.07 The principal features of the power evaluation are:

(a) ***Pretest Nonoperational Checks:*** A review to assure that the office drawings and power maintenance records are up-to-date and that operating instructions are available.

(b) ***Engineering Review:*** An evaluation of the building and equipment engineering aspects of the ac and dc power plants for the telecommunication loads, the ac transfer switchgear and building ac service. An inventory of all power equipment is called for, particularly the plant capacity, rating, and quantity of dc charging units, standby engine alternators and battery reserve and comparison to actual loads.

(c) ***Individual Plant Operation Tests:*** A series of operational tests to measure and verify satisfactory operation of individual power plants and major power components.

(d) ***Power Failure Simulation Tests:*** An overall operational test to assure satisfactory operation of the complete power arrangement, including support devices and equipment required for continued operation under emergency conditions.

(e) ***Evaluation Audit:*** An audit in the form of a detailed description of items requiring corrective action listed in order of urgency and an evaluation of power plant engineering, installation and utilization.

1.08 The principal benefits gained in performing these tests are maximum utilization of equipment and the exposure of potential power related problems. Such power problems might not be apparent from individual routine tests, but could be critical during a commercial power failure. The uncovering of these problems under controlled test conditions enables corrective action to be taken before out-of-service conditions occur.

1.09 These tests also benefit specific engineering and operating groups by providing an update of the status of the equipment and drains in the building. For instance, they will provide:

(a) Engineering with a snapshot view of current drain measurements and an evaluation of power requirements for future equipment additions.

(b) Maintenance with operational test results of the complete power arrangement including ancillary equipment which may not normally be individually tested.

(c) Operations with "hands-on" training experience under controlled conditions which will enable them to cope with emergency situations with greater confidence.

2. REQUIREMENTS

2.01 A complete Engineering and Operational Review should be made of all central office and repeater stations initially and at least every three years thereafter.

2.02 Subsequent to the complete initial review, only the Power Failure Simulation Tests and Evaluation Audit need be made annually unless a major power addition or rearrangement was made in the interim.

3. PREPARATION

A. General

3.01 The Bell System Practices checklists and the reporting forms contained therein have been prepared as an aid for achieving the desired evaluation. While these checklists and reporting forms are comprehensive, they may not be all inclusive for every location. They may be altered as necessary to suit specific locations.

3.02 For detailed information on operation and maintenance of individual power plants or equipment, refer to the appropriate Bell System Practice. Where tests are indicated but are not covered by Bell System Practice, refer to the appropriate manufacturer's manual and/or local instructions.

B. Safety Precautions

3.03 It is essential that all personnel recognize and be alert to the hazards involved when working on power plant equipment. Standard sections for each unit of power equipment cover safety precautions to be exercised.

C. Service Protection

3.04 Advance notification of the operational tests must be given to all occupants of building, building maintenance, and to Operating Companies and Long Lines Central Offices as required by local instructions.

3.05 Sufficient personnel must be available to operate and observe equipment operation, expected local and remote alarm conditions and to record meter readings.

3.06 For those plants that are provided with the alarm surveillance and control interface option, notify the alarm surveillance and control interface central monitor at the beginning and upon completion of any alarm check. This will assure that the circuit is functioning properly and that the alarms will be retired at the central monitor upon completion of the checks.

3.07 Prior to the power failure simulation test, a check must be made of all essential ac operated equipment, such as computer systems, air handling, radio and TV amplifiers, announcement recorders, timers, clocks, AMA reel motors, pumps (fire, sump, water, etc.) TTY, TVR, and cameras. If such equipment is not backed up by standby or protected ac power, it will be necessary to obtain prior release from responsible departmental management before proceeding with the power failure simulation. Any ac operated equipment requiring resetting during and after transfer should be identified and restarted as required.

3.08 The intent of the power failure simulation test is to duplicate as close as possible actual conditions that may exist in the power and engine room in the event of a commercial power failure. To accomplish this test, commercial power is disconnected at the House Service Switchboard. It is particularly important that air conditioning and ventilation which can affect the ambient temperature and humidity in the power room be disconnected from commercial power during simulation. Essential loads are transferred to the engine as they would be during actual commercial failure.

4. EVALUATION

4.01 The review team shall meet following completion of the operational check and office engineering evaluation to discuss and tabulate results and resolve the following items listed on the action item summary sheet.

(a) Action to be taken on each item

(b) Assignment of responsibility for corrective action

(c) Proposed completion

(d) Completion of action item summary sheet and distribution.

Representatives of the following groups should be considered:

- Review team (optional)
- Network Power Staff
- Division Power Staff
- Building
- Engineering
- C.O. Chief Switchman
- Craftsmen involved in test.

4.02 On completion of review, the action item summary, Table B, should be forwarded to all district level personnel associated with the review team. Responsibility to insure that all deficiencies are corrected rests with the district level operation manager or other appropriately designated manager.