

Emergency Central Office Power Down/Power Up Procedures

Contents	Subject	Page
	1. General	2
	1.1 Purpose
	1.2 Filing Instructions	2
	1.3 Copyright and Responsibility.....	2
	1.4 Disclaimer
	2. Power Down	2
	2.1 Introduction
	2.2 Tools	3
	2.3 Assessing Site Condition	3
	2.4 Power Down Instructions	4
	2.5 After Power Down	7
	3. PowerUp.	8
	3.1 AC Power Up Preliminary Inspection	8
	3.2 AC Power Up Instructions	8
	3.3 Restoring Lighting	9
	3.4 DC Power Up Preliminary Inspection	10
	3.5 DC Power Up Instructions	10
	3.6 Restoration Assistance	11
	Exhibits	12
	Exhibit 1 - Composite Distribution Scheme	12
	Exhibit 2 - Power Equipment Location Guide	13

1 . General

1.1 Purpose This practice provides the necessary information and procedures to power down and power up a switching system when an evacuation order is given **by the** Emergency Operations Control Center to terminate telephone service.

Place a copy of this practice in the battery room on the battery maintenance board so any employee required to power down or power up the site has this practice to **follow**.

1.2 Filing Instructions File this practice in numerical order in your **practices** set.

1.3 Copyright and Responsibility This practice was written by the Central Office Maintenance Department and published by the Telephone Operations Administrative Services Department. For more information about this practice contact the Central Office Maintenance Department.

No part of this work may be reproduced **or copied in** any form or by any means -- graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems -- without the written permission of the Administrative Services Department, GTE Telephone Operations Headquarters, **Irving, Texas**.

1.4 Disclaimer This practice has been prepared for GTE Telephone Operations employees. GTE Telephone Operations hereby disclaims any responsibility or liability for any consequential or inconsequential damages **that may result from the use of this** practice.

2. Power Down

2.1 Introduction The following procedures must be adapted to each site and followed in the exact order given in this practice when powering down a switching system site.

If a step does not apply, skip it and go to the next step. To safeguard personnel, equipment, and the building, do not rearrange the steps.

NOTE: Before the evacuation order, the SPC sites must be instructed to do a system dump and deliver the tape to the Switching Services Operation Center or offsite storage area. If the system dump has not been done, do the dump before powering down (if time permits). Use the latest dump if you are unable to make a dump tape.

Before you begin the procedures outlined in this practice, assign a location for the equipment shown in Exhibit 1 on page 12 and record the location on Exhibit 2 on page 13. Exhibits 1 and 2 must remain with this practice and must be located as stated under **General** above. Complete Exhibit 2 as soon as you receive this document.

2. Power Down, continued

2.2 Tools

You need the following tools to perform both the power down and power up procedures:

- Flashlight.
- Fuse pullers (small and large).
- **VOM** or digital multimeter.
- Screwdriver (**4-inch**, insulated blade).
- Rubber gloves (Class **1, 10,000-volt** rating).
- Safety goggles.

2.3 Assessing Site Condition

When you receive the evacuation order, you must assess the condition of the site by answering the following questions:

- How much time is available *to do* the power down?
- Is the current power source commercial or emergency?

The power down procedures take approximately 15 to 20 minutes. If the site is on emergency power at the time the order is given, you will need a slightly longer power down time.

2. Power Down, continued

2.4 Power Down Instructions

The following chart describes how to power down the system. You must follow these steps in the exact order they are listed:

Powering Down the Switching System		
Step	Actbn	Explanation
1	Deload the switch.	<p>NOTE: Do not remove DC power from the emergency inverter.</p> <p>Using the tools listed in Section 2.2, deload the switch by:</p> <ul style="list-style-type: none">A. Removing all fuses, both main and alarm, from the following power boards:<ul style="list-style-type: none">– Power Distribution Units.– Power Distribution Unit Frames.– Power Control Units.– Power Control Frames.– In older offices, the main fuses on the main power boards fed from the buss system.B. Opening the main feed by pulling the switch to the 'open position," if the site is equipped with a:<ul style="list-style-type: none">– Disconnect Switch Unit.– Remote Power Distribution Unit Frame.– Disconnect Switch Unit Frame.C. Verifying all equipment has been removed from the DC power system.

(continued)

2. Power Down, continued

2.4 Power Down Instructions, continued

Powering Down the Switching System		
Step	Action	Explanation
2	Read the meter.	<p>NOTE: Do this step only if you have time.</p> <p>Read the site discharge ammeter to verify that DC power has been removed from the switching Office.</p> <p>If the meter reading shows:</p> <ul style="list-style-type: none">• No load, the power has been removed. Go to the next step.• A small load, the site is equipped with an emergency inverter. Go the the next step. <p>NOTE: Do not remove DC power from the emergency inverter.</p> <ul style="list-style-type: none">• A load, power has not been removed. Check the following for DC power using the VOM:<ul style="list-style-type: none">– Equipment supervisory rack.– Carrier fuse bay distribution boards.
3	Remove charging units.	<p>To remove the switch room charging units (rectifiers) from the AC and DC power systems, do the following:</p> <p>A. At each unit, turn off the charger by moving the unit switch, switches, or circuit breaker to the "off" position.</p> <p>B. At the AC service panel, trip the circuit breakers or pull the fuses to each unit.</p> <p>NOTE: Do not forget the end-cell charger unit, if applicable.</p> <p>C. Open the front or back of each unit.</p> <p>D. Open or remove the device used to connect the charger to the batteries.</p> <p>E. Store these devices in the battery maintenance cabinet.</p>

(continued)

2. Power Down, continued

2.4 Power Down Instructions, continued

Powering Down the Switching System		
Step	Action	Explanation
4	Disable end-cell switch.	<p>To disable the end-cell switch, do the following:</p> <ul style="list-style-type: none">A. Remove the motor or switch coil fuses.B. Remove fuses from the end-cell switch.C. Manually crank the switch to the cut-in position.D. Check the office voltage.<ul style="list-style-type: none">• If voltage is below 56 VDC, leave the end-cell switch in the cut-in position.• If voltage is above 56 VDC, return the end-cell switch to the original position.E. Replace the equipment cover. <p>NOTE: Do not put the fuses back in the switch.</p>
5	Make sure the emergency inverter is on DC power.	<p>To make sure the emergency inverter is switched to DC power, do the following:</p> <ul style="list-style-type: none">A. Transfer inverter to DC power.B. Verify the following equipment has power:<ul style="list-style-type: none">• Air machine.• Sump pump.• Fire detection and Halon systems.C. To protect the site from damage, install:<ul style="list-style-type: none">• Flood barriers.• Drain stops.• Any other equipment needed to protect the site.

(continued)

2. Power Down. continued

2.4 Power Down instructions, continued

Powering Down the Switching System		
Step	Action	Explanation
6	Remove the site from commercial and emergency AC power.	<p>To remove the site from commercial and emergency AC power, do the following:</p> <p>A. Power down and disable the emergency generator.</p> <p>If the site is still on commercial power, disable the emergency generator by switching the auto-start equipment to the “off” and “stop” positions.</p> <p>B. At the house service panel, where the AC circuit breaker or fuse holder is located, turn the breaker to “off” or remove the fuse.</p> <p>C. At the site transfer panel, place the normal and emergency transfer breakers in the “open” position.</p>

2.5 After Power Down

Tell the EOCC, by whatever emergency communications available, that:

- Power down is **complete**.
- You are evacuating the site.

Secure the site and leave.

3. Power Up

3.1 AC Power Up Preliminary Inspection

After the emergency situation **is over** and the EOCC has authorized you to power **up** the switching system and restore service, take the following preliminary steps:

Checking and Repotting Site Damage

Step	Action	Explanation
1	Inspect the site for damage.	<p>NOTE: Use personnel from the Central Office Power Evaluation Team, if possible.</p> <p>Inspect the entire building for damage, such as:</p> <ul style="list-style-type: none">• Water.• Downed power lines.• Structural.
2	Report damage to the EOCC.	Report any damage to the EOCC personnel and proceed on their orders.

3.2 AC Power Up Instructions

The following chart explains how to **restore** AC power:

Restoring AC Power to the Switching System

Step	Action	Explanation
1	Visually inspect for damage.	<p>Using high voltage rubber gloves and a flashlight:</p> <p>A. Visually inspect each distribution panel for damage.</p> <p>B. Trip all breakers or pull all fuses.</p>
2	Restore main circuit breaker.	At the house service panel (Number 8 on Exhibits 1 and 2), restore the main circuit.

(continued)

3. Power Up, continued

3.2 AC Power Up Instructions, continued

Restoring AC Power to the Switching System		
Step	Action	Explanation
3	Restore commercial power.	At the site transfer panel (Number 9 on Exhibits 1 and 2), restore the commercial power breaker and make sure the emergency breaker is in the "open" or tripped-off position.
4	Check AC power.	Check the commercial AC monitor lamps. If they do not light, commercial power is not available. Use emergency power.
5	Inspect emergency generator for damage.	Inspect the emergency generator and battery for damage. CAUTION: Do not start the generator if you see any damage. Report damage to the EOCC.
6	Restore the auto-start equipment.	If commercial power is not available, restore the auto-start equipment (Number 7 on Exhibits 1 and 2). When the generator starts, transfer occurs. The site is on emergency AC power.

3.3 Restoring lighting

Lighting is the first AC equipment you need. Restore all essential circuit breakers or fuses to:

- Supply lighting.
- Run the emergency generator.
- Run other essential equipment.

3. Power Up, continued

3.4 DC Power Up Preliminary Inspection

Before you restore DC power, make a visual inspection of the:

- Building.
- Switching equipment.

Report any damage to EOCC personnel and follow their instructions.

Using the **VOM**, take a voltage reading across each cell and across Cells 1 and 23 (**23-cell** system) or Cells 1 and 24 (**24-cell** system).

CAUTION: Do not restore DC power if:

- Any cells are below 1.72 VDC.
- Office voltage is below 39.6 VDC (**23-cell** system).
- Office voltage is below 41.3 VDC (**24-cell** system).

Report voltage problems to EOCC personnel and follow their instructions.

If office voltage is satisfactory, restore DC power by following these steps:

3.5 DC Power Up Instructions

Restoring DC Power to the Switching System

Step	Action	Explanation
1	Remove the fusing.	Remove the fusing from all: <ul style="list-style-type: none">• CFB.• ESR.• End-aisle boards or positions.• DC converter bays.• Any other distribution boards that supply the switching equipment.
2	Restore the rectifier disconnect devices.	CAUTION: Use gloves and safety goggles. WARNING: First use a resistance lamp to charge the filter capacitors before you make the connection. Restore rectifier disconnect devices.

(continued)

3. Power Up, continued

3.5 DC Power Up Instructions, continued

Restoring DC Power to the Switching System		
Step	Action	Explanation
3	Restore AC power to the rectifiers.	Restore AC power to the rectifiers by energizing the circuit breakers or fuses in the AC service panel (Number3 in Exhibits 1 and 2).
4	Monitor the site voltage.	To monitor site voltage, place a VOM across Cells 1 and 23 for a 23-cell system or Cells 1 and 24 for a 24-cell system.
5	Turn on the rectifiers.	Turn on the rectifiers, making sure they do not exceed the current limit. Allow the rectifiers to charge the off ice batteries. Use a float charge.
6	Restore the motor of coil fuses.	If the site has an end-cell switch, observe the site voltage on the VOM. When the site voltage reaches 49 VDC, manually crank the end-cell switch to the cut-out position. Restore the motor or coil fuses.
7	Begin restoring power to the switching equipment.	Use the rectifier ammeters to verify when the site bad decreases to 25 percent or less capacity. When the load is correct, you can begin restoring power to the switching equipment.

3.6 Restoration Assistance

Restoring power to the switching equipment can cause serious problems and damage **to the** equipment if you do not restore it **correctly**.

Each technology must be restored by different procedures. You **need** qualified personnel to assist with the equipment restoration. Contact the Switching Services Operation Center for restoration assistance.

Exhibits

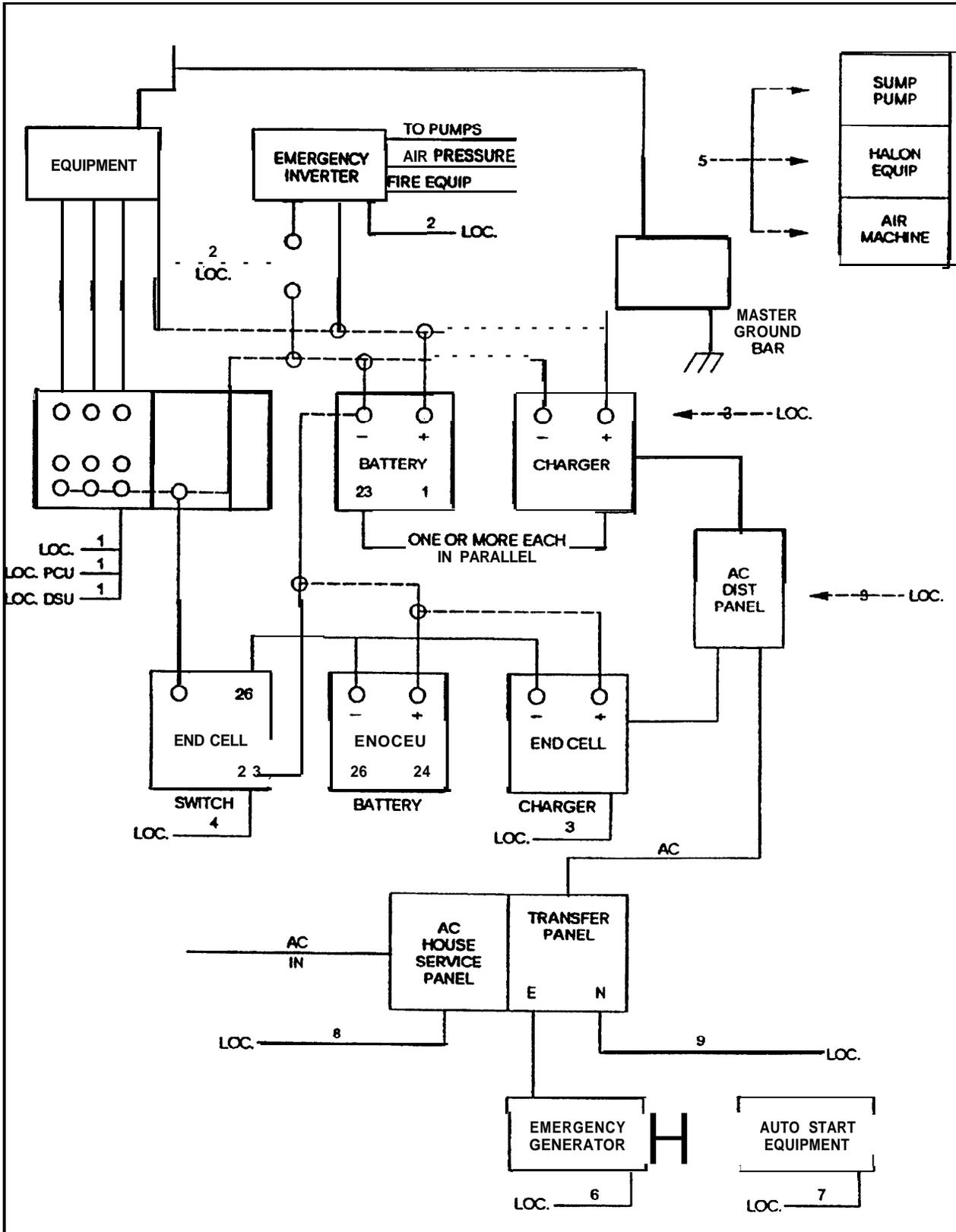


Exhibit 1 – Composite Distribution Scheme

POWER EQUIPMENT LOCATION GUIDE

1. Location of all distribution boards:

2. Location of emergency inverter and DC fuse:

3. Location of site rectifiers:

4. Location of end-cell switch and fuses:

5. Location of sump pump: _____
Location of **Halon** equipment: _____
Location of air machine: _____

6. Location of emergency generator:

7. Location of generator "auto start" equipment:

8. Location of main AC service panel and circuit breaker:

9. Location of transfer panel and normal/emergency breakers:

10. Identify and record any manufacturers' recommendation and/or caution for power up or down of **SPC** switches.

Exhibit 2 – Power Equipment Location Guide

