Lead-Acid Batteries Spills and First Aid Procedures

Contents

1. General

1.1 Purpose

This practice provides:

- Procedures for handling lead-acid battery spills.
- First aid procedures for sulfuric acid accidents.
- Ordering information for battery emergency spill kits.

1.2 Filing Instructions and Supersedures

File this practice in numerical order in your GE Telephone Operations practices set.

This practice supersedes and cancels:

- All policies, procedures, general instructions, letters, and memoranda which address this subject.
- Any document which provides information contrary to the information contained in this practice.
- AD900.105, Battery Safety (Lead Acid Storage Batteries).

1.3 Responsibility

This practice was published by the GTE Telephone Operations Administrative Services Department. For more information about this practice, contact the Headquarters Environmental Compliance Staff.

1.4 Disclaimer

This practice was prepared solely for the use of GE Telephone Operations. It must be used only by its employees, contractors, customers, and end users when installing, operating, maintaining, and repairing GE Telephone Operations' equipment, facilities and services. Any other use of this practice is forbidden. The information contained in **this** practice may not be applicable in all circumstances and is subject to change without notice. By using this practice me user agrees mat GTE Telephone Operations will have no liability (to me extent permitted by applicable law) for any consequential, incidental, special, or punitive damages mat may result.

2. Overview

2.1 Introduction

Following the guidelines in this practice helps to ensure that:

- The safety and health of GTE employees and the general public are protected.
- Natural resources are conserved through waste minimization and recycling.
- The environment is protected from damage resulting from battery spills.
- GTE Telephone Operations is in compliance with all applicable regulations.

2.2 Lead-Acid Batteries

Lead-acid batteries are electrochemical devices that produce direct current (DC) electricity.

Lead-acid batteries are found throughout GTE Telephone Operations in:

- Central office battery rooms.
- Vehicle maintenance facilities.
- Supply locations.

me electrolyte in a lead-acid battery is composed of approximately:

- 75% water.
- 25% sulfuric acid (H_2S0_4).

The Environmental Protection Agency (EPA) classifies sulfuric acid as an extremely hazardous substance. Lead, cadmium, and other materials found in batteries are also regulated. Batteries, therefore, must be:

- Handled safely.

  AND

- Disposed of properly.

2.3 References

The following GTE Telephone Operations Practices are referenced in this practice, and could be required for performing certain related tasks.

For Information About...	See Practice...
Battery Removal and Disposal	122-205-001
Battery Room or Area Ventilation	742-205-070

3. Safety Precautions in Working with Lead-Acid Batteries

3.1 Precautions

Lead-acid batteries can create several safety and health hazards if they are not handled properly. Take the following safety precautions when working with lead-acid batteries.

Precaution	Action	Reason
Body Protection	While handling, installing, or performing maintenance, wear: • Acid-resistant gloves. • An acid-resistant apron. • Chemical safety goggles. • Proper clothing.	Sulfuric acid is extremely corrosive and can cause severe bums.
Shock and Burn Protection	All tools and instruments must be: • Insulated. OR • Constructed of a nonconductive material. **CAUTION:** • **Remove wire-rimmed glasses, or cover with nonconductive goggles.** • **Remove all:** – **Rings.** – **Wristwatches.** – **Metalbracelets.** – **Metal necklaces.** – **Other metallic jewelry.** **If jewelry cannot be removed, cover it with insulating tape.**	Lead-acid batteries produce high voltage that can cause a shock,

(continued)

3. Safety Precautions in Working with Lead-Acid Batteries, continued

3.1 Precautions, continued

Precaution	Action	Reason
Ventilation	Battery rooms must be equipped with adequate ventilation. For specific instructions, refer to GTE Telephone Operations Practice 742-205-070.	Lead-acid batteries produce hydrogen gas, which: • Is colorless and odorless. • Can cause respiratory irritation. • Can explode when ignited. Lead-acid batteries can also produce sulfide/ hydrogen sulfide gas.
Explosion **Protection**	• All sources of spark or open flame must be kept out of battery rooms or the battery area. • Safety vents must be kept in place on all battery cells. **CAUTION: Never place metal tools on top of the cells. Shorting might cause sparks and an explosion.**	Hydrogen gas explodes when ignited.
Smoking	Smoking is not permitted: • In the battery room. • In the battery area. • While working near batteries.	Hydrogen gas explodes when ignited.

4. First Aid

4.1 Actions to Take

The sulfuric acid found in battery electrolyte is corrosive and can damage or destroy skin tissue. Inhaling vapors might cause irritation to the respiratory system.

The following chart outlines first aid actions to take when working with a lead-acid battery.

If...	Then...
Electrolyte comes in contact with the skin	1. Remove all contaminated clothing. 2. Flush the skin immediately with water for 15 minutes. If sufficient water is not available, use all bottles of neutralizing solution on the Battery Maintenance Safety Board. 3. Seek medical attention for large bums.
Electrolyte comes in contact with the eyes	1. Hold the eyelids open. 2. Flush the eyes immediately with water for 15 minutes. If sufficient water is not available, use all bottles of neutralizing solution on the Battery Maintenance Safety Board. 3. Seek medical attention immediately.
Battery electrolyte is inhaled	1. Move to where there is fresh air. 2. Seek medical attention immediately.
Battery electrolyte is ingested	• Do **NOT** induce vomiting. • Drink large amounts of milk. • Seek medical attention immediately.

4.2 First Aid Instruction Sign

Instruction signs (see Exhibit 1) containing first aid instructions concerning lead-acid batteries are available from the Area Safety and Environmental Compliance Staff.

The central office maintenance supervisor is responsible for ensuring that a copy of the instructions is posted in the immediate vicinity of the Battery Maintenance Safety Board.

NOTE: Additional signs can be obtained from the Area Safety and Environmental Compliance Staff.

5. Battery Emergency Spill Kit

5.1 Introduction

GTE standard battery emergency spill kits are available in two sizes, with two standards for each size.

5.1.1 Ordering Information

The following chart provides ordering information for the spill kits.

Order the...	By Specifying Item ID...
Portable Spill Kii with Can (large kit)	355532 or 354042.
Wall-Mounted Spill Kit (small kit)	367122 or 357176.

5.1.2 Updating Obsolete Spill Kits

If a location has an obsolete spill kit (Item ID 881725), employees can:

- Use the existing spill kit, substituting soda ash for neutralizing agent.

  OR

- Upgrade to the new kit. Contact Vallen Safety Supply Company at (800) 442-3113 or (214) 242-2055 for instructions.

5.2 Location Requirements

A large spill kit must be:

- Located at:
  - All supply points.
  - Other locations as required to ensure that a kit is within 50 miles of all locations where lead-acid batteries are used.
- On site whenever batteries are:
  - Installed.
  - Serviced.
  - Removed from service.

Small spill kits must be located at all other locations where batteries are used.

NOTE: State or local emergency response regulations might require a large spill kit at all locations. Contact your Area Safety and Environmental Compliance Staff for more information.

5.3 Posting Location Sign

Signs specifying the location of emergency battery spill kits (see Exhibit 2) are available from the Area Safety and Environmental Compliance Staff.

The central office maintenance supervisor is responsible for ensuring that a sign **is** posted specifying the location of the emergency battery spill kit. The sign must:

- Be posted in the immediate vicinity of the Battery Safety Board.
- Give the precise location of the closest large spill kit(s).

NOTE: Additional signs can be obtained from the Area Safety and Environmental Compliance Staff.

5.4 Contents

Contents of the large and small kits are listed below.

5.4.1 Large Kit

Each Portable Spill Kit with Cart (Item ID 355532 or 354042) contains:

- Coveralls.
- Chemical goggles.
- Acid-resistant gloves.
- Acid-resistant boots.
- Face shield.
- Neutralizing agent.
- 20-gallon disposal container.
- Disposal bags.
- Shovel.
- Squeegee.
- Broom.
- Barricade tape.
- Duct tape.
- Warning sign.
- Spill and first aid procedures.

5.4.2 Small Kit

Each Wall-Mounted Spill Kii (Item ID 357122 or 357176) contains:.

- Neutralizing agent.
- Disposal bags.
- Spill and first aid procedures.

6. Responding to a Lead-Acid Battery Spill

6.1 Procedure

The following chart outlines the steps to take when a lead-acid battery spill or leak occurs.

CAUTION:
- **Contact with an electrolyte** spill can **cause severe damage to skin tissue. Third degree bums can occur.**
- **Inhalation of vapors can cause:**
  - **Irritation of the respiratory system.**
  - **Pulmonary damage.**

Step	Responding to a Lead-Acid Battery Spill
1	Ventilate the area by: • Opening any available doors or windows. • Turning on me exhaust fan.
2	Locate the Battery Emergency Spill Kit. **NOTE:** A **Battery Spill Kit sign (see Exhibit 2) specifying where the kit is located must be close to the Battery Maintenance Safety Board.**
3	Put on: • Safety goggles. • Other personal protective equipment appropriate for me situation, as described in the following chart.

If...	Then Put on...
You will be working around the spilled electrolyte	Acid-resistant gloves and apron.
You must walk through spilled electrolyte	Acid boots.

CAUTION: D o **not proceed with the next step until:**
- **me large spill kit is available.**

  AND
- **You have obtained the proper protective equipment to do the work safely.**

4	Use the barricade tape and/or danger sign to isolate the area from unprotected employees. **NOTE:** **Duct tape and barricade tape are included in the large spill kii.**

(continued)

6. Responding to a Lead-Acid Battery Spill, continued

6.1 Procedure, continued

Step	Responding to a Lead-A&d Battery Spill
5	Contain the spill by using neutralizing agent to: • Dike/dam the free electrolyte. • Neutralize the free electrolyte. Pour the neutralizing agent around the spill to form a dam that will prevent the electrolyte from spreading or escaping through a floor drain. If electrolyte is still leaking or spilling from the battery, proceed according to the following chart.

If the Battery...	Then Try to...
Has tipped over and sufficient manpower is available	Stand the battery upright. **CAUTION: Do not attempt to lift a heavy battery without help.**
Has a leak	Plug the leak.

6	Clean up the spill by doing the following: **A.** If me battery room is equipped with a small spill kit, obtain a large spill kit (Item ID 355532 or 354042) before attempting clean-up procedures. **NOTE:** A **sign specifying me kit location should be close to the Battery Maintenance Safety Board.** B. Sprinkle a generous amount of neutralizing agent over me spill to absorb and neutralize me electrolyte. The mixture should form a thick, dry paste. C. Use a shovel, broom, and dust pan to sweep me neutralized material into me disposal bag. D. Seal me disposal bag with duct tape. E. Wash me spill area with a large amount of water. Flush the water down me drain.
7	Contact the: • Central Office Maintenance supervisor to inform him or her of the problem. • Battery vendor or Central Office Engineering to have the leading or damaged cell removed and/or replaced.
8	Report the spill and and/or dispose of the waste. **NOTE: See Section 7.3 for disposal and reporting requirements.**

6. Responding to a Lead-Acid Battery Spill, continued

6.2 Clean-Up Instructions

A card detailing the procedure for cleaning up a battery spill (see Exhibit 3) is available from the Area Safety and Environmental Compliance staff.

COE Maintenance is responsible for posting a copy of these instructions in the immediate vicinity of the Battery Safety Board.

NOTE: Additional signs can be obtained from the Area Safety and Environmental Compliance Staff.

7. Disposal and Reporting Requirements

7.1 EPA Requirements

Federal, state, and local environmental regulations govern the following activities associated with hazardous and regulated waste:

- Storage.
- Disposal.
- Reporting requirements.

7.2 GTE Policy

It is GTE Telephone Operations' policy that all lead-acid batteries be:

- Recycled.

  OR
- Reclaimed by an EPA-licensed facility.

Refer to GTE Telephone Operations Practice 122-205-001 for specific instructions.

7.3 Disposal and Reporting Requirements

Disposal and reporting requirements depend on:

- The location of me spill.
- The quantity of me regulated material mat spilled.
- Whether the material entered me sewer or a storm drain.

Use the following guidelines for reporting and disposing of lead-acid battery spills.

If the Spill Is..	Then...
Less than one gallon of electrolyte	Place the neutralized material in a trash receptacle. No reporting is required.
One gallon or more of electrolyte	Contact the GTE Area Environmental Compliance staff for instructions on reporting and properly disposing of the material.

NOTE: Spill quantities are diicult to gauge. Use good judgment to determine the appropriate response to a spill or leak.

8. Supplementary Reading

8.1 Additional Information

The following chart provides sources of supplementary information related to this practice.

For Information About...	See Practice...
Central Office Equipment- Battery Maintenance Safety Board	205-005-100
Batteries – Central Office and Remote – Installation and Maintenance	205-005-200

LEAD-ACID BATTERIES: FIRST AID

Sulfuric Acid The sulfuric acid found in battery electrolyte is corrosive and can damage or destroy skin tissue. Inhalation of vapors may cause irritation to the respiratory system.

Skin Tissue If electrolyte comes in contact with the skin:

- Remove all contaminated clothing.
- Immediately flush the skin with water for 15 minutes. If sufficient water is not available, flush the skin with the neutralizing solution on the Battery Maintenance Safety Board. Use all of the neutralizing solution available.
- Seek medical attention for large bums.

Eyes If electrolyte comes in contact with the eyes:

- Hold the eyelids open.
- Immediately flush the eyes with water for 15 minutes. If sufficient water is not available, flush the eyes with the neutralizing solution on the Battery Maintenance Safety Board. Use all of the neutralizing solution available.
- Seek medical attention immediately.

Inhalation If inhalation of electrolyte vapor occurs:

- Move to where there is fresh air.
- Seek medical attention immediately.

Ingestion If ingestion of battery electrolyte occurs:

- Do NOT induce vomiting.
- Drink large amounts of milk.
- Seek medical attention immediately.

Reference 122-205-002

Exhibit 1 - First Aid Instruction Sign

BATTERY SPILL KIT

THIS FACILITY IS EQUIPPED WITH (CHECKONE) :

☐ **LARGE SPILL KIT**
☐ **SMALL SPILL KIT**

THE SPILL KIT IS LOCATED:

_____

_____

IF THIS FACILITY HAS A SMALL SPILL KIT, THE CLOSEST LARGE SPILL KIT IS LOCATED:

_____

_____

Reference 122-205-002

Exhibit 2 - Battery Spill Kit Sign

LEAD-ACID BATTERIES SPILL RESPONSE

STEP PROCEDURE

1. Ventilate the area.

- Open any available doors or windows.
- Turn on exhaust fan(s).

2 Locate the Battery Emergency Spill Kit.

A sign specifying the kit location should be close to the Battery Maintenance safety Board.

3. Put on personal protective equipment,

From the spill kit or battery maintenance safety board, put on:

- safety goggles
- Other personal protective equipment, appropriate for the situation.

IF...	THEN PUT ON...
You will be working around the spilled electrolyte	Acid resistant gloves and apron.
You must walk through spilled electrolyte,	Acid resistant boots.

CAUTION: If the large spill kit is not readily available or you need additional protective equipment to do the work safely, DO NOT proceed until the proper equipment is available.

4. **Isolate the area.**

Use the barricade tape and/or danger sign to isolate the area from unprotected employees.(Duct tape and barricade tape are included in the large spill kit.)

5. **Contain the spill.**

Use neutralizing agent (or soda ash) to dike/dam and neutralize the free electrolyte. Pour the neutralizing agent around the spill to form a dam that will prevent the electrolyte from spreading or flowing into the floor drain.

Reference 122-205-002

Exhibit 3 - Battery Spill Clean-Up Sign (page 1 of 2)

STEP PROCEDURE

6. Eliminate the source.

IF THE BATTERY...	THEN...
Has tipped over and sufficient manpower is available,	Right the battery.
Has a leak,	Plug the leak

7. **Get a large spill kit.**

If the battery room is quipped with a small spill kit, obtain a large spill kit before attempting clean up procedures. A sign specifying the kit location should be close to the Battery Maintenance Safety Board

8. Absorb and neutralize the electrolyte.

Sprinkle a generous amount of neutralizing agent over the spill to absorb and neutralize the electrolyte. The mixture should form a thick dry paste.

9. **Sweep up the neutralized material.**

Use the shovel, broom and dust pan found in the large spill kit to place the neutralized material into the disposal bag. Seal the bag with the duct tape.

10. Wash the spill area

Wash the spill area with a large amount of water. The water may be flushed down the drain.

11. **Report the spill/dispose of the waste.**

IF THE SPILL IS...	THEN...
Less than one gallon of electrolyte,	Dispose of the **neutralized** material in a trash receptacle. No reporting is required.
One gallon or more of electrolyte,	Contact the Area GTE Environmental Compliance staff for instructions on reporting and proper disposal.

Exhibit 3 - Battery Spill Clean-Up Sign (page 2 of 2)