

Environmental Compliance and Safety for Stationary Lead-Acid Battery Systems (SLABS)

Doug Frazier, Enviroguard, Claremont, California

The following is a review of an audit of existing Local, County, State and Federal laws, codes, ordinances and requirements regarding the environmental storage, handling, spill, containment and disposal of Stationary Lead-Acid Battery Systems (SLABS). SLABS are extensively used for interruptible power systems, telecommunications and for providing facility emergency power.

Although SLABS have been in use for decades nationally, an area of grave legal concern is the multiple uses of SLABS in private, commercial and government buildings and facilities throughout the United States.

During normal operations, SLABS are problematic from an environmental compliance, enforcement and liability standpoint. SLABS whether sealed or flooded, present a potentially large remediation and liability expense as it relates to the sulfuric acid and lead uses therein. Since sulfuric acid and lead are classified as extremely hazardous materials, the resulting battery discharge during its lifetime, portends the potential of a hazardous materials spill. Such a spill may result from the improper handling of the hazardous material discharge or a slow and undetected corrosive SLABS' breach of its containment over time. Both scenarios create a chain of events which may include opportunities for hazardous exposure to tenants, workers, employees, or visitors to the property. Accordingly, in the event that discharge becomes a spill, then the issues shift to SLABS containment and cleanup.

Such events cause us to consider the normal discharge, spill, or containment issues in tandem with an eventual occurrence. Of paramount concern for all building owners, user, tenants and agencies, responsible for the proper handling, and periodic monitoring of SLABS use, is the Uniform and National Building and Fire Codes' for storage, handling, spill, containment and disposal of hazardous materials, which provides some guidelines.

The Environmental Protection Agency, (EPA), Occupational Safety and Health Administration (OSHA) and other agencies operating under such guidelines have been increasingly looking toward more stringent standards for the storage, handling, spill containment and disposal of hazardous materials. Especially relevant has been the recent amendments to Section 64 of the Uniform Fire Code (U.F.C.) (formally known as 'Article 64').

Section 64 deals specifically with SLABS' spill containment. This adoption of the new amendment increases the scope of enforcement by including all battery types and reducing the minimum liquid capacity threshold for the Article to apply, namely:

"This change clarifies that the scope of the article applies to all battery types. Including gel cell batteries. The definition of 'lead-acid battery' includes all 'electrochemical cells interconnected to supply a nominal voltage of DC power.....' "

"The revision broadens the scope of the article to regulate battery systems over 50 gallons (189.3L) aggregate capacity rather than 100 gallons (378.5L). This was done to ensure Article 64 rather than Article 50 applies to these systems as per the original intent. The electrolytes in most batteries are sulfuric acid, which is classified as a toxic (exempt amount is 50 gallons (189.3L) when in concentrations over 12.5 percent (see IFCI's Hazardous Materials Classification Guide). Currently, Article 80 is applicable to battery systems with an electrolyte capacity between 50 gallons (189.3L) (in unsprinklered occupancies) and 100 gallons (378.5L), and Article 64 is applicable to systems over 100 gallons (378.5L). More restrictive provisions for a less hazardous commodity do not make sense. "

"The revision also deletes the requirement to apply Article 80 to battery systems with individual battery capacities in excess of 20 gallons (75.7L). The provisions of Article 64 adequately and more specifically cover the hazards to battery systems. "

Additionally, the National Fire Protection Association Section 111 (NFPA111) is expected to be implemented momentarily. The NFPA111 committee is reviewing the spill containment regulation and is considering adopting the restrictions imposed by the new Section 64 of the Uniform Fire Code, with one variation. The elimination of any minimum liquid capacity threshold.

This is a clear signal towards more stringent regulation of hazardous materials and a fundamental shift in the enforcement of spill containment, storage of hazardous materials in SLABS nationwide.

In consideration of the existing requirements and the direction of shift in the safety codes regarding the utilization of SLABS, it is our recommendation that all commercial property owners and all others utilizing SLABS in their facilities immediately update or undergo a full environmental audit of their properties. This audit should address hazardous discharge handling and SLABS spill containment secondary to SLABS uses. It is also our recommendations to all commercial property owners and all other SLABS users to implement full compliance with all Local, County, State and Federal laws, Codes and Regulations.

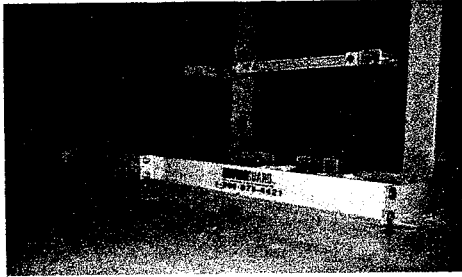
Of paramount importance is the immediate implementation and installation of all required spill containment, ventilation and personal protection fire/life/safety systems, including body and/or eye wash stations as required, for the safety of the tenants, workers, employees and visitors to commercial properties utilizing SLABS.

Not only are these measures necessary to comply with the existing applicable law and prove to be an environmentally sound decision, but they also provide for a pro-active and defensible posture in the case of an event and subsequent inquiries into that event and allocation of blame and liability.

Government agencies, environmental groups, and media, and private citizens have taken a intolerant position to any degradation or damage to the environment, including ground water or the soil, caused by the improper handling, containment or utilization of hazardous materials containing systems, such as SLABS.

Therefore, forward thinking action to curb possible hazardous environmental events is risk management responsive, as well as legally and politically correct; all of which ultimately protect people and property from a catastrophic occurrences.

*Providing Compliance and Safety Products for the
Power Storage & Conversion Industry*



Leaking Underground Storage Tanks

- 1981 Silicon Valley International Business Machine Corporation
- State of California mandated Underground Tank Registration
- State Mandated Secondary Containment
- Grandfather Clause is not Applicable

Contaminated Soil Investigations



Regulatory Overview

- Resource Conservation & Recovery Act
 - Cradle to Grave Liability
 - Reportable Quantities- sulfuric acid
 - Fines & Criminal Prosecution
- Definitions of:
 - Hazardous Waste
 - Hazardous Material
 - Extremely Hazardous Waste
 - Restricted Waste
 - Banned Hazardous Materials
 - Recyclable Waste Streams

Battery Room Fire



Enforcement Groups

- EPA Strike Team (CFR 40)
- Highway Patrol (CFR 49)
- State Department of Toxic Substance Control
- State Department of Fish & Game
- County Hazardous Material Inspectors
- Fire Prevention Inspectors
- City Building Inspectors

Site Contamination Observed by Enforcement Authorities



City & County Requirements

- Hazardous Materials Management Plan
 - Waste Stream Identification
 - Material Safety Data Sheets (MSDS)
 - Spill Response Plan
 - Evacuation Procedures
 - Identification Signs

Current Article 64 UFC

- 4 Inch High Liquid Tight Containment Wall
- 1 Inch Minimum Clearance Around the Rack
- Approved Method of Neutralization between 7.0 & 9.0 ph Range
- Ventilation Requirement
- Hazard Identification Signage

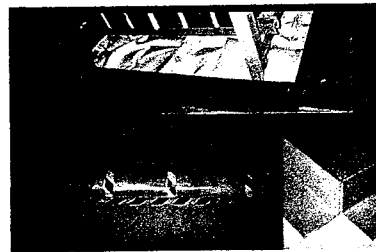
1998 Supplement to Article 64

- Includes all Battery Types- Flooded & VRLA
 - Having electrolyte capacity greater than 100 gallons in sprinklered buildings and 50 gallons in unsprinklered buildings *

NFPA Proposal 111

- All Batteries Exceeding 1 Gallon per Cell
- Containment Capacity should be 150% of the Total Battery String Capacity
- Containment System Heights would vary based on fire sprinkler output
- Spill Kits to be Present Outside Containment Area
- VRLA Batteries are Not Exempt

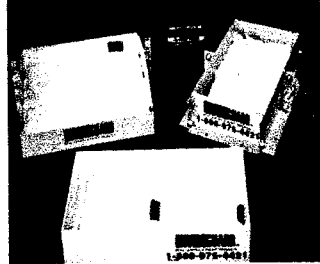
Previous Methods of Containment



- Plastic
- Concrete
- Stainless Steel
- Coated Metal

Containment Solutions for Data Centers & Telecom Sites

- Relay Racks
- Modular Design
- Customize Pans
- Concrete Systems



Identification of Spill Containment Markets

- Data Centers
- Telecommunication Sites

1999 Market Size

Data centers

- New installations - 10,000,000
- Retrofit 30,000,000

Telecommunication sites

- New installations- 15,000,000
- Retrofit 40,000,000

Selling Process

- Phase 1 Site Assessment & Design
- Phase 2 Budgeting and Scheduling
- Phase 3 Monitoring & Maintenance

Phase 1

Hazardous Materials Management Plan

- Facility Site Plan
- Storage & Use Areas
- Maximum Amount of Acid stored at each Site
- Battery Sizes & Drainage
- Presence of Contamination
- Signage/MSDS Sheets/Eye Wash Station
- Spill Clean-up Kits

Phase 2

Budgeting & Scheduling

- Develop Site by Site Inspections to meet ASTM guidelines for battery room compliance.
- Meet with Real Estate & Standards
- Establish Material Codes & Specification
- Site Compliance Schedule

Phase 3

Site Monitoring & Maintenance Schedule

- System Inspection
- Test Monitoring Probe
- Service Eyewash
- Test Hydrogen Monitoring
- Safety Product Inventory
- Issue Annual Inspection Report



Selecting a Manufacture

- Continuous Certified Laboratory Testing
- Maintains Traceability of Chemical Products
- Offers Warranty & Training Programs
- Customize CADD Support
- Maintains sufficient Product Liability Insurance
- Installer Certification Programs
- National Distribution Network

Manufacture Support

- Easy to use Sizing and Specification Manual
- Customized CADD Drawings with quotations
- Nationwide Installation and Floor Coating Services
- Certified Installer Program
- Regulatory Updates
- Wide Variety of Spill Containment Solutions
- ASTM Site Assessments and Audits

Partial List of Companies

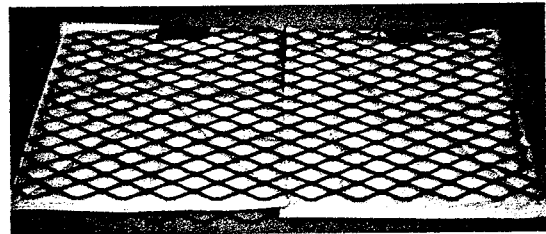
Arco	Pacific Bell
Worldcom/MCI	IBM
Sprint	Nynex
AT&T	American Express
Level 3 Communications	Bank of America
GTE	Chrysler Corp.

Proven Success

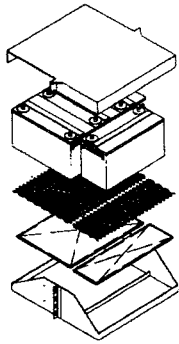
- World Trade Center
 - 110 th Floor
- I.B.M.
 - West Lake
- Disney Studios
 - Burbank
- Western Wireless
 - Hawaii



New Technology



Cost Effective Compliance for VRLA Batteries



- Clear Lexan Protective Cover
- Metal Grid with acid resistant PVC Coating
- Neutralizing & Absorbent Pads

Technical Resources

- Code of Federal Regulations 40
- Code of Federation Regulations 49
- State Department of Toxic Substance Control
- Technical Resource Center 1-800-975-4421

