Applications Bulletin

MARKETING

TO : MGE Representatives **Date :** January 30, 2000

FROM : Alan Katz - Three Phase Product Manager **File :**

cc :

SUBJECT : BATTERY BANK SPILL CONTAINMENT

The following bulletin is intended for informational purposes only and should not be used to professionally advise or inform any persons about the issue or requirements of spill containment.

Battery Spill Containment Codes

As of July 1999, the Unified Fire Code (UFC) which covers most States west of the Mississippi has enacted Article 64. Article 64 states that any lead acid battery systems having an "electrolyte capacity" of more than (fifty) 50 gallons shall require adequate spill containment systems. Many inspectors consider even sealed or VRLA batteries to be subject to these requirements. Keep in mind that while these codes are in effect, they are subject to the interpretation of your local officials.

While the UFC covers most of the western USA, the two other regional jurisdictions (BOCA in the Northeast and the Standard Fire Code in the Southeast) are not far behind in enacting similar codes. On a National level the NFPA (National Fire Protection Association) is expected to introduce far more stringent requirements which may require containment on systems having as little as one gallon of "electrolyte" on site (See 1998 Proposed Fire Code Results in NFPA III 1999 Requirements). Many in the industry are trying to lobby the NFPA to increase the threshold, as one gallon is a very small volume to require a containment system.

Spill containment as it relates to typical large UPS sites entails the following:

- Secondary containment (4" high sealed barrier surrounding the battery banks)
- Chemical resistant floor sealant (i.e. epoxy coating or liner)
- Neutralization device (i.e. pillows with neutralization formula)

Other safety requirements may include:

- Proper signage (reference to high voltage and hazardous materials documentation)
- Eyewash station and personal protection
- Proper ventilation
- Smoke detection

Spill Containment Solutions

MGE can offer certified spill containment for UPS sites either existing or future. As a rough estimate, spill containment systems cost around 5% of the price of the battery bank. To obtain a quote on a spill containment systems call an MGE TSS representative.

Encl. : Article 64 - Uniform Fire Code

Article 64
UNIFORM FIRE CODE

Supplement

SECTION 6401 – SCOPE

6401.99.1, Item 22: This change clarifies that the scope of the article applies to all battery types. Including Valve Regulated Lead Acid (VRLA) and 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 (189.3 L) aggregate capacity reducing the prior 100 gallons (378.5 L) minimum that previously existed. This was done to ensure Article 64 rather then Article 50 applies to these systems per the original intent. The electrolyte in stationary lead acid battery systems (SLABS) contain sulfuric acid, which is classified as toxic when in concentrations over 12.5 percent (IFCI's *Hazardous Materials Classification Guide).* Currently, Article 80 is applicable to battery systems with an electrolyte capacity between 50 gallons (189.3L) and 100 gallons (378.5L) in unsprinkled occupancies. The adoption of Article 64 Supplement 1999 more specifically addresses hazards related to battery systems and is now applicable to all systems over 50 gallons (189.3 L).

ARTICLE 64 - STATIONARY LEAD-ACID BATTERY SYSTEMS

SECTION 6401 - SCOPE

Stationary lead-acid battery systems having a liquid capacity of more than 100 gallons (378.5 L) used for facility standby power, emergency power or uninterrupted power supplies shall be in accordance with Article 64. Stationary lead-acid battery systems with individual lead-acid batteries exceeding 20 gallons (75.7 L) each shall also comply with Article 80.

SECTION 6402 - DEFINITIONS

For definitions of LEAD-ACID BATTERY and STATIONARY LEAD-ACID BATTERY SYSTEM, see Article 2.

SECTION 6403 - PERMITS

6403.1 General. For a permit to install or operate battery systems with stationary lead-acid batteries, see Section 105.8, permit b.1.

6403.2 Design Submittals. Prior to installation, plans shall be submitted and approved.

SECTION 6403 - INSTALLATION AND MAINTENANCE

6404.1 General. Installation and maintenance of battery systems shall be in accordance with nationally recognized standards. See Section 9003, Standards a.2.10 and a.2.11, and Section 6404.

6404.2 Safety Venting. Batteries shall be provided with safety venting caps.

6404.3 Occupancy Separation. In other than A,E,I and R Occupancies, battery systems shall be located in a room separated from other portions of the building by a minimum one-hour-resistive occupancy separation. In A,E,I and R Occupancies, battery systems shall be located in a room separated from other portions of the building by a two-hour-fire-resistive occupancy separation.

6404.4 Spill Control. Each rack of batteries, or group of racks shall be provided with a liquid tight 4.0 inch (101.6mm) spill-control barrier which extends at least 1 inch (25.4mm) beyond the battery rack in all directions.

6404.5 Neutralization. An approved method to neutralize spilled electrolyte shall be provided. The method shall be capable of neutralizing a spill from the largest lead acid battery to a pH between 7.0 and 9.0.

6404.6 Ventilation. Ventilation shall be provided in accordance with the Mechanical Code and the following:

1. The ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0% of the total volume of the room in accordance with nationally recognized standards, or

2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute square foot (.51L/s per m^2) of floor area of the room.

6404.7 Signs. Doors into rooms or buildings containing stationary lead-acid battery systems shall be provided with approved signs. The signs shall state that the room contains lead-acid battery systems, that the battery room contains energized electrical circuits and that the battery electrolyte solutions are corrosive liquids.

6404.8 Seismic Protection. Battery systems shall be seismically braced in accordance with the Building Code.

6505.9 Smoke Detection. An approved automatic smoke detection system shall be installed in such areas and supervised by an approved central proprietary or remote station service or local alarm which will give an audible signal at a constantly attended location.