Stationary Battery Room Design Review Checklist

Approved for public release; distribution unlimited

General Medical: 500A, Public Health Data

2013
Stationary Battery Room Design Review Checklist

UFC 3-520-05, Stationary Battery Areas, 14 April 2008
NFPA 1, Fire Code, 2012 Edition
NFPA 70, National Electrical Code, 2011 Edition
NFPA 10, Standard for Portable Fire Extinguishers, 2010 Edition
ISEA Z 358.1 -2009, American National Standard for Emergency Eyewash and Shower Equipment (Formerly ANSI Z 358.1)

Architectural

1. Located near the load being served (UFC 3-520-05)?

2. Are more than one type of battery chemistry (i.e. lead-acid, nickel-cadmium, etc.) being used?
   If so, are they in separate rooms (UFC 3-520-05)?

3. Are occupancy separation requirements between the battery room(s) and other portions of the building met (UFC 3-520-05, NFPA 1)?

4. Services not associated with the battery room will not pass through the room (UFC 3-520-05)?

5. The battery room is not used as access to another space. (UFC 3-520-05)

6. Is the floor covered with a slip-resistant material and acid- or alkali-resistant (UFC 3-520-05)?
   For vented cell installation, are the wall and ceiling finish acid or alkali resistant (UFC 3-520-05)?

7. Is an overhead hoist or portable material handling equipment provided for the room (UFC 3-520-05)?
HVAC

1. Is the room mechanically ventilated (UFC 3-520-05)?

2. Is the ventilation system designed to maintain hydrogen concentrations in the room below 1% concentration (UFC 3-520-05, NFPA 70E, NFPA 1)?

Equation 1:
   \[
   \text{Hydrogen rate (HR)} = \text{emission rate} \times \text{charging current per 100 Ah} \times \text{doubling factor} \times \text{cell capacity per 8 hour} \times \text{number of cells}
   \]
   \[
   \text{increment of cell}
   \]
   \[
   \text{capacity passing}
   \]
   \[
   \text{charging current}
   \]

Equation 2:
   \[
   \text{Ventilation rate (VR)} = \frac{\text{HR}}{0.01}
   \]

Note: NFPA 1 requires continuous ventilation at a rate of not less than 1cfm/ft\(^2\) of floor area of the room or cabinet.

3. Is the supply air rate 95% of the exhaust ventilation in order to maintain a negative pressure in the room (UFC 3-520-05, ACGIH 27th Ed.)?

4. Is all air exhausted directly outside (UFC 3-520-05)?

5. Is the stationary battery area located along an exterior wall? If not, it needs a dedicated exhaust duct system (UFC 3-520-05)?

6. Is makeup air being transferred from a Class 1 or Class 2 area in the facility as defined in ASHRAE 62.1 or supplied directly? If supplied directly, is it filtered (UFC 3-520-05)?

7. Are fans roof-mounted with an upwardly directed discharge (UFC 3-520-05)?

8. Is the exhaust fan spark-resistant with an explosion proof motor (UFC 3-520-05)?

9. Are the air inlets no higher than the lowest tier of the battery rack? Are the exhaust grilles located at the highest point of the room (UFC 3-520-05)?
10. Is the ductwork made of either polyvinyl chloride (PVC) or fiberglass reinforced plastic (FRP) (UFC 3-520-05)?

11. Is the HVAC system designed for continuous operation (UFC 3-520-05)?

12. Does the exhaust fan have a green indicator light to indicate proper operation (UFC 3-520-05)?

**ELECTRICAL**

1. Are battery racks, enclosures and cables bonded to ground with #6 AWG (UFC 3-520-05)?

2. Is there overcurrent protection for each battery string (UFC 3-520-05)?

3. Is there a disconnect device where the DC conductors leave the battery room (UFC 3-520-05)?

4. Are room lighting fixtures pendant or wall mounted and not provide a collection point for explosive gas (UFC 3-520-05)?

5. For rooms with vented cell batteries, are the lighting fixtures constructed with corrosion resistant materials (UFC 3-520-05)?

6. Will lighting fixture mounting interfere with the operation of lifting devices (UFC 3-520-05)?

7. Is instrumentation to measure battery, voltage with high and low alarms, battery current, and ground detection for ungrounded systems provided (UFC 3-520-05)?

**EMERGENCY FACILITIES**

1. Is there a portable or stationary water facility for rinsing eyes and skin provided within 20 feet of the battery (UFC 3-520-05, ISEA Z358.1-2009)?
FIRE PROTECTION REQUIREMENTS

1. Is a smoke detection system installed in the room/area (NFPA 1)?

2. Are portable fire extinguishers provided within and adjacent to the battery room (UFC 3-520-05, NFPA 10)?