WHAT A BATTERY USER NEEDS FROM A HYDROGEN SENSING UNIT

NREL Hydrogen Sensors Workshop
June 8, 2011
Chicago

BACKGROUND ON HYDROGEN GASSING FROM LEAD-ACID (AND NI-CD) BATTERIES

- Battery Gassing on Float Charge Extremely Low
  - Example Telco site with 72 extremely large cells with a total weight of over 50,000 lbs, an electrolyte quantity of over 1500 gallons, using a floor area of over 200 ft^2 only produces avg of 0.00434 cfm
- Batteries Do Not Gas on Discharge, nor During Most of Bulk Recharge
  - They Gas When their State-of-Charge is well Above 80%
- Batteries Gas More (still Relatively Minimally) when on Boost/Equalize/Finish Charging (in the Rarer Cases where that Regime is Used
  - 0.154 cfm for the Example Given Above
- Incorrect High Charge Voltage and/or Thermal Runaway (mostly in VRLA) Increases the Gassing

STRATEGIES FOR VENTILATING STATIONARY BATTERY ROOMS

- Most Battery Rooms (or Shared-Use Rooms that Contain a Relatively Significant Amount of Batteries) are Not Continuously Ventilated
  - Most Have 2-6 ach Minimum for Human Occupancy
    - That is Way More than Needed to Get Rid of Hydrogen
- Most Mechanical Codes Allow Recirculation of Battery Room Air to other Parts of the Building
  - As Long as Hydrogen is Less than 1% Concentration
  - Some Local Codes Require Direct Ventilation to the Outside
- Some Local Codes, or Company Policies, or Designs May Use a Hydrogen Sensor to Activate Ventilation

WHAT A BATTERY USER NEEDS FROM A HYDROGEN DETECTION SYSTEM

- Infrequent Calibration
  - Preferably A Year or Longer
- Long Life
  - Preferably 5-7 Years or More
- Dry Form C Contacts to Activate and De-Activate the Ventilation System
- Settable Thresholds for Activating the Relay Contacts