VRLA Batteries
For Green Power

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Battery a Green Power Source..

- Storage Device and consumable
- Recharge Efficiency
  - Good battery needs 1.1KWh of power for every 1KWh drawn
  - Increases with age
- Accounting cost vs Economic / Environmental cost
- Let’s not forget the MRTS justifications

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Contents

- What Battery to Choose
- Operational Issues
- New Technologies

Standby Batteries

- Flooded
  - More Foot Print
  - Requires Maintenance
  - Not suitable for remote locations

- VRLA
  - Technology – AGM & GEL
  - Plate Type – Flat & Tubular
  - Construction – Monoblock & 2V cells

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Monoblocks….

- Capacities – up to 250 ah (12V & 6V)
- Float Life – 3, 5 and 10 years
- Cycle Life
- 200 to 250 cycles at 100% DoD
- 350 to 400 cycles at 80% DoD
- 1000 to 1200 cycles at 20% DoD
- Lower Cost per ah per cell
- Applications – UPS, Telecom etc

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MONOBLOCK BATTERIES



2V cells….

- Capacities – 100 ah to 6000 ah
- Float Life – up to 20 years
- Cycle Life
- 800 to 1000 cycles at 100% DoD
- 1200 to 1600 cycles at 80% DoD
- 5000+ cycles at 20% DoD
- Relatively higher Cost per ah per cell
- Applications – UPS, Telecom, Solar, BESS etc

2V cells …

- Protective modular steel trays
  - Superior thermal management
  - Structural integrity
  - Easily shipped
  - 10 high stacks
- Easily serviced



Installation - Horizontal



A Good Solar Battery Needs

- Good Cycling Capability
- Good Charge Acceptance
- Deep Discharge Capability
- Partial state of charge operation
- Operate at relatively higher temperatures

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Solar Battery

- These depends upon
  - Thickness of the positive grid
  - Alloys used for the positive grid
  - Thermal Management

Operational Issues

Recharge Timings

- State of Charge
- Charging voltage – 2.25 to 2.40 VPC
- Charging current – 10 to 100% of rated ah

- 10 to 12 hours to 90% SOC at 2.35VPC with 10% current
- 14 to 16 hours to 90% SOC at 2.25VPC with 10% current
- Recharge possible within 3.5 to 4 hours at 2.35VPC and 100% current

Operational Issues

- Recharge Timings
  - Voltage Adjustments
  - Rectifier / charger capacity

Life Expectancy

- No of Cycles and at what DoD
- Temperature of operation
- Insufficient charging (Generation vs non-generation)

Solutions??

- Solar Panel to Reduce DoD
- Small DG to charge occasionally

Temperature Effect

- On Capacity
- On Life

- Ventilation in Outdoor shelters
- 2V cells typically better thermal managed

New Technologies

- Advanced Lead Acid Batteries
  - Increased Cycling Life
  - Less foot print / Higher energy density
- Lithium Ion Batteries
- Flow batteries

Questions?