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***Improving System Reliability
with Installation Quality Control***

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Training and Education



Quality Issues

- Installer qualification
- Storage after delivery
- Connections
- Connection resistance
- Commissioning procedures
- Acceptance testing

Quality Issue - Installer Qualification

- Many contractors that win battery installation bids are not qualified
 - Limited or no previous experience
 - Do not read installation manuals
 - Assumptions made
- This is a sure-fire way to lead to maintenance issues long after the installer is off the job

Quality Issue - Installer Qualification

- Suggested acceptance criteria
 - Installers should be routinely engaged in the business of installation, testing and maintenance of stationary batteries
 - Require references

Quality Issue - Storage After Delivery

- Flooded
 - Antimony – 3 months after shipment and below 90°F
 - Calcium – 6 months after shipment and below 90°F

Quality Issue - Storage After Delivery

- VRLA
 - 32° to 50°F.
 - 9 months
 - 51° to 77°F
 - 6 months
 - 78° to 92°F
 - 3 months
- Remember – tall VRLA cells must be turned horizontally for a freshening charge
- Contact the battery manufacturer if storage will exceed these guidelines

Quality Issue – Connections

- Connections are frequently assembled without preparing contacting surfaces
- Intercell connectors and terminals must be clean and free of oxidation before corrosion inhibitor is applied
- If it's not approved in the installation manual, don't use it!
 - Glyptol
 - Cu/Al joint compound
 - Copper coat
 - Petroleum jelly

Quality Issue- Connection Resistance

- The only way to verify connection integrity is to measure its resistance with a micro-ohmmeter or other suitable instrument
- Benchmark data is very important so it can be trended as the battery ages

Quality Issue – Commissioning Procedures

- Commissioning procedures are highly misunderstood
- Assumptions
 - Charge for 72 hours at 2.33 vpc
 - Charge for a day and run the discharge test
 - Set on float and forget

Quality Issue – Commissioning Procedures

- The time required to fully commission a new battery is based on *numerous* conditions
 - State of charge
 - Physical size of cells
 - Available charge potential
 - Ambient temperature
 - Specific gravity rating
- Read the installation instructions!
- **A battery will likely fail an acceptance test if it is not properly commissioned**

Quality Issue – Acceptance Testing

- Acceptance testing is frequently not performed
- Why?
 - Not in job specification
 - No one new to require it
 - Costs too much
 - Think it is unnecessary
 - It's new, it's got to work, right?
- Capacity must be benchmarked or future tests will have little meaning

Summary

- Require qualified installation crews
- Follow storage guidelines
- Prepare intercell connections in accordance with installation instructions
- Benchmark connection resistance values for trending
- Perform the correct commissioning charge
- Conduct an acceptance test