Larry Herzlich

Larry.Herzlich@gmail.com
 (719) 964-6064
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Zero-Generation Test Plan

Assumptions:
1. Weather conditions not considered in Zero-gen conditions
2. No special adjustments required for daylight savings time
3. Zero-gen check can be done at any time of day
4. Before sunrise, generation values are reset to initial condition (daily reset)

Initialization:
- Verify generation source is online and available.
- Save previous notification status for reporting/trend purposes. Reset if alert was sent on a previous calendar day

Zero-Gen Data Acquisition:
- Normal case – request data record, determine if Zero-gen condition occurred.
- Corner case – at sunrise, generation value may return zero or near zero
- Corner case – at or after sunset, generation should be maximum for the day. Data must be captured before values are reset (see assumption #4).

Alert Handling:
- If Zero-gen condition:
    - Determine and validate alert recipients
    - Track Alerts (ACK and NAK), AlertSent, AlertAcknowledged, NotAlertAcknowledged
    - Wait period for ACK (TBD)
    - If (ACK) acknowledged, track alert and acknowledgement, reset ACK status)
    - If (NAK) not acknowledged – error or timeout waiting for ack? (Current ACK Status Flag)
        - Error: Delivery failure (network, incorrect recipient, out-of-resources) – HARD FAIL, triage required.
        - Timeout: Setup periodic alert retry (need algorithm to increase retries or back-off retries) – WaitForAcknowledgmentStatus (Current, Last)
        - Track all NAK's and retries
        - Cancel retry if explicitly requested or timeout during initial condition (daily reset)

Sample Test Cases:

1. Zero-gen data acquisition, 1/minute, manually set time-of-day and preset sunrise/sunset values; test data reset generation value during data acquisition iterations.
2. Alert handling – preset Zero-gen data acquisition to 0, preset status to < 0, preset status to > max-energy value, preset data acquisition to invalid data type (garbage).