# Network Telemetry and Incident Report

**Incident ID:** NE-2026-007
**Status:** RESOLVED
**Severity:** HIGH
**Report Generated:** January 19, 2026 19:45 UTC

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## Executive Summary

CRITICAL power failure at Northeast Regional Network data center (Newark, NJ facility) caused 28-minute service outage affecting 54,000 subscribers in New York metro area on January 19, 2026. Root cause: Commercial power failure due to utility substation equipment malfunction combined with UPS (Uninterruptible Power Supply) battery failure preventing backup power system from maintaining operations. Service restored when utility power recovered. Incident exposed significant infrastructure vulnerabilities in backup power systems requiring immediate remediation. Estimated business impact: $180,000-$240,000 (SLA credits, operational response, reputation damage).

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## Incident Timeline

**Event Start:** January 19, 2026, 14:22 UTC (09:22 local time)
**Detection Time:** January 19, 2026, 14:22 UTC (instantaneous - complete facility power loss)
**Emergency Response Activated:** January 19, 2026, 14:23 UTC (1 minute)
**Utility Power Restored:** January 19, 2026, 14:48 UTC (26 minutes)
**Service Restoration:** January 19, 2026, 14:50 UTC (28 minutes total outage)
**Total Duration:** 28 minutes (commercial power failure)
**Customer Impact Duration:** 28 minutes (complete service outage)

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## Affected Network Region

**Primary Zone:** Northeast Regional Network - Zone NE-3C
**Geographic Coverage:** New York metro - Northern New Jersey, parts of Manhattan, Bronx
**Facility Location:** 165 Halsey Street Data Center, Newark, NJ
**Network Tier:** Tier-1 Critical Infrastructure
**Subscriber Count:** ~54,000 active mobile subscribers
**Enterprise Customers:** 82 businesses
**Annual Revenue at Risk:** $10.8M (affected subscriber base)

**Critical Services Impacted:** - Mobile broadband (5G and LTE) - complete outage - Fixed wireless access - complete outage - Enterprise direct connect circuits - complete outage - 38 cell tower sites completely offline (no alternative routing)

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## Affected Network Components

### Data Center Facility - Complete Power Loss

**Facility:** 165 Halsey Street Data Center, Newark NJ
**Facility Operator:** Third-party colocation provider (DataCenter Solutions Inc.)
**Power Status:** COMPLETE FAILURE (14:22-14:48 UTC, 26 minutes)

**Power Infrastructure:** - **Commercial Utility Power:** FAILED (external utility substation transformer failure) - **UPS (Battery Backup):** FAILED (battery bank unable to carry load) - **Diesel Generators:** Did NOT activate (insufficient time before UPS failure) - **Result:** Complete facility power loss, all equipment shut down

### Network Equipment - All Offline During Outage

**Core Routers:** - NE-3C-CORE-R01 (Juniper MX960) - OFFLINE (powered down due to facility power loss) - NE-3C-CORE-R02 (Juniper MX960) - OFFLINE (redundant pair, same facility - no diversity)

**Edge Routers:** 6 units (Cisco ASR 9000 Series) - ALL OFFLINE

**Aggregation Switches:** 12 units (Arista 7500R) - ALL OFFLINE

**Cell Tower Equipment (38 Cell Sites):** - All 38 cell towers served by this data center lost backhaul connectivity - Cell towers themselves remained powered (local backup power at tower sites) - Towers unable to reach core network → no service for subscribers - **Impact:** 54,000 subscribers with NO SERVICE

**Fiber Infrastructure:** - Physical fiber infrastructure intact (no damage) - Fiber termination equipment in data center offline due to power loss

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## Network Telemetry Summary

### Pre-Incident Performance (14:00-14:21 UTC - Normal Operations)

**Network Performance:** - **Average Latency:** 18ms (normal) - **Packet Loss:** 0.07% (normal) - **Jitter:** 2.0ms (normal) - **Throughput:** 12 Gbps average aggregate traffic - **Connection Success Rate:** 99.89% (normal)

**Device Status:** - All routers, switches, and network equipment operational - CPU and memory utilization normal - No alarms or warnings

### Incident Window (14:22-14:50 UTC - Complete Outage)

**14:22:00 UTC - Power Failure Event:** - Commercial utility power loss detected by facility monitoring - UPS activated (battery backup) but immediately began alarms - Battery bank voltage dropping rapidly (unable to support load) - UPS shutdown at 14:22:45 UTC (45 seconds after commercial power loss) - All network equipment powered down (hard shutdown - no graceful shutdown possible)

**14:22-14:50 UTC - Complete Service Outage:** - **Latency:** N/A (no connectivity) - **Packet Loss:** 100% (complete failure) - **Throughput:** 0 Gbps (no traffic flowing) - **Connection Success Rate:** 0% (all connection attempts failed) - **Customer Impact:** 54,000 subscribers with NO SERVICE - **Enterprise Impact:** 82 businesses completely offline

**Equipment Status During Outage:** - All routers: Powered off - All switches: Powered off - All optical equipment: Powered off - Cell towers: Operational but isolated (no backhaul to core network)

### Service Restoration (14:48-14:50 UTC)

**14:48 UTC - Utility Power Restored:** - Commercial power returned (utility completed substation repair) - Equipment began automatic power-up sequence

**14:48-14:50 UTC - Equipment Recovery (2 Minutes):** - Routers powered on and began boot sequence (2-3 minutes boot time) - Routing protocols reconverged (BGP, ISIS, OSPF - 30-60 seconds) - Interfaces came online, fiber connections established - Cell towers reestablished backhaul connectivity to core network - Subscriber sessions began reconnecting automatically

**14:50 UTC - Service Restored:** - Core and edge routers fully operational - All 38 cell towers reconnected and serving traffic - Subscriber devices automatically reconnected to network - Service quality returned to normal

**Post-Restoration Validation (14:50-15:30 UTC):** - Validated all 38 cell towers operational - Confirmed all routing protocols converged properly - Monitored for any equipment damage or anomalies (none found) - Customer impact assessment (trouble tickets, social media)

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## Detected Issue: Dual Power System Failure (Commercial + UPS)

### Issue Classification

**Primary Issue:** Commercial utility power failure (external cause)
**Secondary Issue:** UPS battery bank failure preventing backup power from sustaining operations
**Tertiary Issue:** Insufficient UPS runtime and generator activation failure
**Architectural Issue:** Lack of geographic diversity (all equipment in single facility)

### Root Cause Analysis

#### External Trigger: Utility Substation Equipment Failure

At 14:20 UTC, a transformer at PSE&G (Public Service Electric and Gas) electrical substation serving the Newark industrial corridor experienced catastrophic failure. Exact cause under investigation by utility company, but initial assessment indicates: - Transformer age: 28 years (approaching end-of-life) - Recent maintenance: Routine inspection completed 3 months ago, no issues identified - Failure mode: Internal insulation breakdown leading to short circuit and transformer fire - Impact: Complete loss of power to 18 industrial/commercial buildings including our data center facility

**Utility Response:** - Substation fire suppression system activated automatically - PSE&G emergency response crew dispatched immediately - Emergency transformer switching to alternate feed completed in 26 minutes - Power restored at 14:48 UTC

**Assessment:** Utility power failures are rare but inevitable. This is WHY backup power systems (UPS, generators) exist - to maintain operations during utility outages. The external utility failure is NOT the root cause of our service outage - the failure of our backup power systems is the root cause.

### Internal Failure: UPS Battery Bank Insufficient Capacity

**UPS System:** APC Symmetra PX 500kW UPS
**Design Capacity:** 500kW continuous load, 15-minute runtime at full load
**Actual Load:** 420kW (84% of UPS capacity)
**Expected Runtime:** 18-20 minutes at current load (sufficient for generator startup)

**What Should Have Happened:** 1. Commercial power fails (14:22 UTC) 2. UPS activates instantly (seamless transfer to battery power) 3. UPS powers facility for 15-20 minutes (battery runtime) 4. Diesel generators detect power loss and auto-start (30-60 seconds startup time) 5. Generators reach operating speed and voltage (90 seconds) 6. Automatic transfer switch shifts load from UPS to generators (120 seconds total) 7. Generators power facility until commercial power restored 8. Equipment remains online throughout (customers experience no outage)

**What Actually Happened:** 1. Commercial power failed (14:22 UTC) 2. UPS activated and began powering facility from batteries 3. UPS battery bank voltage dropped rapidly - much faster than expected 4. UPS alarms triggered: “Battery Low Voltage”, “Battery Fault”, "Inverter Overload" 5. UPS shut down at 14:22:45 UTC (45 SECONDS after power loss, not 15-20 minutes as designed) 6. All equipment lost power immediately (hard shutdown) 7. Generators started automatically but too late - equipment already offline 8. Generators ran idle until commercial power restored (unused capacity)

**Why UPS Failed After 45 Seconds:**

Post-incident inspection and testing of UPS battery bank revealed: - **Battery Age:** Battery bank installed May 2019 (7.5 years old) - **Battery Design Life:** 5-7 years typical lifespan for this battery technology (VRLA - Valve Regulated Lead Acid) - **Battery Condition:** 18 of 40 battery modules showing significant capacity degradation (48-62% of rated capacity remaining) - **Battery Testing History:** Last comprehensive battery load test: November 2023 (26 months ago) - batteries passed test with 78% capacity - **Degradation Acceleration:** Battery capacity degraded from 78% (Nov 2023) to 48-62% (Jan 2026) - rapid decline in past 14 months

**Root Cause of UPS Failure:** Aged battery bank with insufficient remaining capacity to support facility load. While the UPS system itself functioned properly, the battery bank could not deliver rated capacity due to age-related degradation.

## Why Generators Didn't Save Us

**Diesel Generators:** Two Cummins 750kW diesel generators (redundant pair, either can power full facility)
**Design:** Generators auto-start upon detection of commercial power loss and UPS activation
**Startup Sequence:** 30-second start, 90-second ramp to operating voltage, 120-second automatic transfer switch cutover

**What Happened:** - Generators detected power loss and started automatically (performing as designed) - Generators reached operating speed by 14:24:00 UTC (2 minutes after power loss) - Automatic transfer switch prepared to shift load from UPS to generators - BUT: UPS had already shut down at 14:22:45 UTC (45 seconds) - BEFORE generators ready - Equipment already offline; generators running idle with no load

**Why This Matters:** UPS is designed to "bridge the gap" between commercial power loss and generator startup. Typical generator startup is 2-3 minutes. UPS with 15-20 minute runtime provides huge safety margin.

In our case, UPS failed in 45 seconds - insufficient time for generators to start and take over load. Generators worked perfectly but were irrelevant because equipment was already offline.

**Lesson:** UPS battery health is CRITICAL. If UPS runtime is insufficient, generators are useless.

## Architectural Vulnerability: Single Data Center (No Geographic Diversity)

**Current Architecture:** - ALL network equipment for Zone NE-3C located in single data center (165 Halsey St, Newark NJ) - Core routers R01 and R02 (redundant pair) both in same facility - Single point of failure: Entire zone offline if data center loses power

**Industry Best Practice:** - Geographic diversity: Redundant equipment in separate facilities (different buildings, different power feeds, different geographic areas) - Resilient to single-facility failures: Fire, power outage, natural disaster, physical security event - Automatic failover: Traffic switches to backup facility automatically

**Why We Don't Have Geographic Diversity in Zone NE-3C:** - Cost: Dual data center deployment is significantly more expensive (2x equipment, 2x data center space, additional fiber connectivity) - Legacy architecture: Zone NE-3C deployed in 2017 when our network design standards didn't mandate geographic diversity - Planned upgrade: Zone NE-3C scheduled for geographic diversity upgrade in FY 2027 budget (not yet funded)

**Today's Incident Demonstrates Risk:** Single data center design created single point of failure. When data center power failed, entire zone failed. No alternate route, no backup facility, no resilience.

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## Predicted Risk Level: HIGH (Significant Recurrence Risk Until Remediated)

### Risk Score: 7.8 / 10

**Risk Assessment Factors:** - **Severity:** HIGH - Complete service outage for 54,000 subscribers - **Duration:** MODERATE - 28 minutes (significant but not catastrophic) - **Business Impact:** HIGH - $180,000-$240,000 estimated impact (SLA credits, reputation damage) - **Recurrence Probability:** HIGH - Until UPS batteries replaced and backup power validated, another power event likely to cause similar outage - **Architectural Vulnerability:** CRITICAL - Single data center design creates persistent single point of failure

### Business Impact Assessment

**Revenue Loss:** - **Direct Loss:** $12,000 in lost service revenue during 28-minute outage - **SLA Credits:** $140,000-$180,000 in contractual credits to enterprise customers for SLA violations - **Estimated Total Impact:** $180,000-$240,000

**Customer Satisfaction:** - 420 trouble tickets opened during incident (typical: 10-15 per hour) - 1,240 calls to customer support (overwhelmed support systems) - Social media complaints and negative sentiment (moderate volume) - Customer churn risk: 1-2% of affected subscribers (540-1,080 subscribers = $270,000-$540,000 annual revenue at risk)

**Enterprise Customer Impact:** - 82 businesses completely offline during incident - Financial services, healthcare, retail most impacted - Several customers demanding meetings to discuss reliability concerns - Contract renewal risk: 8-12 enterprise customers at risk of non-renewal or migration to competitors

**Reputation Damage:** - Local news coverage (28-minute outage in NJ/NY metro area) - Industry reputation: Reliability concerns among enterprise prospects - Competitive vulnerability: Competitors highlighting our outage in sales pitches

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## Root Cause Explanation: Summary

**Primary Root Cause:**
Dual failure of backup power systems (UPS battery bank + generator timing) due to aged UPS batteries unable to bridge gap between commercial power loss and generator startup.

**Contributing Factors:** 1. **External:** Utility substation transformer failure (external cause, unavoidable) 2. **UPS Battery Age:** Battery bank 7.5 years old, significantly beyond 5-7 year design life 3. **Insufficient Battery Testing:** Last load test 26 months ago; didn't detect rapid degradation in past 14 months 4. **Single Facility Architecture:** No geographic diversity; single data center failure = complete zone failure

**Accountability:** - **External Utility Failure:** NOT our responsibility (PSE&G transformer failure) - **UPS Battery Management:** Our responsibility - failed to proactively replace aging batteries - **Architectural Vulnerability:** Our responsibility - single data center design known risk

**Preventable:** YES - With proper UPS battery lifecycle management, this outage would NOT have occurred. UPS would have sustained operations for 15-20 minutes, generators would have taken over, equipment would have remained online, customers would have experienced ZERO service impact.

**Cost of Prevention vs. Cost of Incident:** - Battery replacement cost: $80,000 (proactive replacement) - Incident cost: $180,000-$240,000 (reactive response after failure) - **Lesson:** Proactive maintenance is 2-3x cheaper than reactive incident response

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## Remediation Actions

### Immediate Response (Completed - January 19)

**1. Service Restoration (14:48-14:50 UTC)** - Utility power restored by PSE&G - Equipment automatically powered up and service restored - Validated all systems operational

**2. UPS Battery Inspection (January 19, 15:00-18:00 UTC)** - Comprehensive inspection of UPS battery bank - Load testing of individual battery modules - Identified 18 of 40 modules significantly degraded (48-62% capacity) - Remaining 22 modules marginal (68-82% capacity) - **Assessment:** Entire battery bank requires immediate replacement

**3. Customer Communication (January 19, 14:30-20:00 UTC)** - Immediate service notification acknowledging outage - Follow-up messages confirming service restoration - Apology to affected customers - Enterprise customer personal outreach (account managers contacted each business)

### Emergency Actions (Next 24-72 Hours)

**4. Emergency UPS Battery Replacement - CRITICAL Priority:** IMMEDIATE
**Timeline:** 48-72 hours (emergency procurement and installation)
**Action:** - Emergency procurement of replacement battery bank (APC Symmetra PX compatible batteries) - Expedited shipping (overnight delivery, premium cost justified) - Installation during emergency maintenance window (January 21, 2026, 02:00-06:00 UTC) - Comprehensive load testing post-installation
**Cost:** $120,000 (emergency procurement premium + expedited shipping + after-hours installation labor)
**Expected Outcome:** Restore UPS to design specifications (15-20 minute runtime at full load)

**5. Generator Functionality Validation (January 20-21) Priority:** HIGH
**Action:** - Comprehensive testing of diesel generators (startup, load transfer, sustained operation) - Validate automatic transfer switch functionality - Test full load-transfer sequence (UPS → Generators) - Exercise generators under load for 2 hours (validate sustained operation)
**Cost:** $8,000 (testing contractor + fuel consumption)
**Expected Outcome:** Confirm generators can sustain facility operations during extended utility outages

### Short-Term Actions (1-4 Weeks)

**6. Backup Power System Comprehensive Audit - All Facilities (January 22-February 15) Priority:** CRITICAL
**Action:** Audit UPS and generator systems at ALL data center facilities network-wide: - Inspect UPS battery banks (age, capacity, test history) - Test generators (startup, load transfer, sustained operation) - Review maintenance schedules and testing procedures - Identify facilities requiring immediate battery replacement or generator repair
**Cost:** $180,000 (audit contractor + remediation of identified issues)
**Expected Outcome:** Identify and remediate backup power vulnerabilities across network before failures occur

**7. Enhanced Backup Power Monitoring (February 2026) Priority:** HIGH
**Action:** Deploy real-time UPS battery monitoring systems providing: - Continuous battery voltage, current, temperature monitoring - Predictive analytics for battery health and remaining capacity - Automated alerting when battery degradation detected - Integration with network monitoring systems for unified visibility

**Cost:** $60,000 (monitoring hardware + software + installation)
**Expected Outcome:** Early detection of battery degradation (months before failure); proactive replacement before service impact

**8. Proactive Battery Lifecycle Management Program (February 2026 - Ongoing)**
**Priority:** HIGH
**Action:** Implement formal battery lifecycle management program: - Proactive battery replacement at 5-year intervals (before end-of-life degradation) - Quarterly battery load testing (vs. current 18-24 month intervals) - Predictive replacement based on capacity testing (replace when <80% capacity, don't wait for failure) - Budget allocation for proactive battery replacement ($400,000/year network-wide)
**Cost:** $400,000/year ongoing (battery replacement across network)
**Expected Outcome:** Eliminate UPS battery failures; ensure reliable backup power at all facilities

### Medium-Term Actions (1-6 Months)

**9. Geographic Diversity for Zone NE-3C (March-June 2026) Priority:** HIGH
**Timeline:** 16-20 weeks
**Action:** Deploy geographically diverse data center for Zone NE-3C: - Lease space in secondary data center (Edison, NJ - 15 miles from Newark primary facility) - Deploy redundant core routers, edge routers, switches in secondary facility - Diverse fiber connectivity between facilities and to cell towers - Active-active load balancing (50/50 traffic distribution between facilities) - Automatic failover if either facility loses power
**Cost:** $2.4M (equipment + fiber + data center space for 3 years)
**Expected Outcome:** Resilient to single-facility failures (power, fire, physical access); maintain service even if primary data center completely offline

**10. Enhanced Power Infrastructure - Primary Facility (April-May 2026) Priority:** MEDIUM
**Action:** Work with data center provider (DataCenter Solutions Inc.) to enhance facility power infrastructure: - Dual utility feeds from separate substations (diverse power sources) - Enhanced UPS capacity (increase from 500kW to 750kW, larger battery bank) - Generator fuel capacity increase (48-hour runtime vs. current 24-hour) - Enhanced monitoring and testing procedures
**Cost:** $180,000 (our portion; data center provider shares cost with other tenants)
**Expected Outcome:** More resilient primary facility; multiple layers of power redundancy

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## Expected Impact if Unresolved

### Near-Term Risk (If UPS Batteries Not Replaced - Next 30 Days)

**Probability:** VERY HIGH (60-80%)
**Impact:** REPEAT OUTAGE with similar severity

UPS batteries are now known to be severely degraded (48-62% capacity on worst modules). Next utility power event (lightning strike, transformer failure, planned maintenance) will result in same UPS failure and service outage.

**Expected Frequency:** Utility power events occur 2-4 times per year in Newark industrial area (lightning, equipment failures, planned maintenance). Without battery replacement, each event likely to cause 20-30 minute outage.

**Business Impact:** - 2-4 similar outages per year (28-minute average = 56-112 minutes annual downtime) - $360,000-$960,000 annual cost (SLA credits, customer churn, operational response) - Severe reputation damage after repeated outages - Enterprise customer exodus (cannot tolerate repeated outages)

**Mitigation:** IMMEDIATE battery replacement (scheduled January 21) eliminates this risk.

### Medium-Term Risk (If Geographic Diversity Not Implemented -

### Next 6-12 Months)

**Probability:** MEDIUM (30-40%)
**Impact:** SINGLE-FACILITY FAILURE causing extended outage

Without geographic diversity, any single-facility failure (not just power) causes complete zone outage: - Fire or physical damage to data center building - HVAC failure causing equipment overheating shutdown - Network connectivity failure (if building loses upstream fiber connections) - Natural disaster (flooding, severe weather) - Physical security incident

**Example Scenario:** Data center HVAC failure during summer heat wave: - Equipment overheats, automatic thermal shutdown - Service offline for 6-12 hours until HVAC restored or emergency cooling deployed - 54,000 subscribers offline for extended period - Business impact: $600,000-$1,200,000+

**Mitigation:** Geographic diversity ($2.4M investment) eliminates single-facility vulnerability. Secondary facility maintains service if primary facility has any type of failure.

### Long-Term Risk (If Infrastructure Investment Deferred - Next 1-2 Years)

**Probability:** HIGH (70%+)
**Impact:** COMPETITIVE DISADVANTAGE and market share loss

Telecommunications customers (especially enterprise) demand high availability. Repeated outages or known infrastructure vulnerabilities drive customer churn:

**Enterprise Customer Perspective:** - "They had a 28-minute outage because UPS batteries failed" - "They don't have backup data center - single point of failure" - "What happens if data center has fire or disaster?" - "Competitors offer 99.99% SLA, these guys can't deliver" - **Result:** Contract non-renewal, migration to Verizon/T-Mobile

**Consumer Customer Churn:** - Word-of-mouth: "My carrier was offline for 30 minutes, thinking of switching" - Social media amplification of outages - Competitive marketing: "Our network is more reliable" - **Result:** 5-10% annual churn from affected zone

**Business Impact:** - Loss of 8-15 enterprise customers ($1.6-3M annual revenue) - Consumer churn: 2,700-5,400 subscribers ($1.4-2.7M annual revenue) - Reputation as "unreliable network" limiting new customer acquisition - Inability to compete for high-availability RFPs (government, financial services)

**Mitigation:** Strategic investment in infrastructure resilience (geographic diversity, backup power, monitoring) positions us as premium reliability provider, protects revenue base, enables growth.

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## Lessons Learned

### What Worked Well

1. **Rapid Detection:** Power loss detected instantly, emergency response activated immediately
2. **Automatic Recovery:** Equipment powered up automatically when utility power restored
3. **Generator Functionality:** Generators started automatically and operated correctly (though too late to prevent outage)
4. **Customer Communication:** Transparent, timely updates to affected customers

### What Failed

1. **UPS Battery Lifecycle Management:** Batteries operated 2.5 years beyond design life without proactive replacement

2. **Battery Testing Frequency:** 26-month gap between load tests insufficient to detect rapid degradation
3. **Backup Power Validation:** Didn't validate end-to-end backup power system (UPS + generator) under realistic load
4. **Architectural Resilience:** Single data center design created single point of failure

### Critical Lessons

1. **Proactive Maintenance is Cheaper:** $80,000 proactive battery replacement vs. $180,000-$240,000 incident cost
2. **Test Backup Systems Regularly:** Backup power systems must be tested frequently under realistic load (not just generators alone)
3. **Geographic Diversity is Essential:** For critical infrastructure, single-facility deployment is unacceptable risk
4. **Lifecycle Management:** All equipment has finite lifespan; proactive replacement before failure is mandatory

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## Technical Metadata

**Report Classification:** Internal Operations - Critical Incident Review
**Data Sources:** Facility power monitoring, UPS telemetry, network monitoring systems, customer trouble tickets, utility company incident reports
**Analysis Period:** January 19, 2026, 14:00-16:00 UTC (incident window + post-incident analysis)
**Contributors:** Network Operations Center, Facilities Management, Data Center Provider, UPS vendor, Network Engineering
**Review Status:** Reviewed by VP Network Operations, CTO, VP Facilities, General Counsel
**Distribution:** Executive leadership, NOC staff, Engineering teams, Facilities Management, Data Center Provider (relevant sections)

**Related Incidents:** - March 2024: Brief power event at same facility (generators successfully sustained operations - UPS batteries were healthy) - Today's incident: UPS battery degradation prevented successful backup power operation

**Follow-Up Actions:** 10+ action items assigned with critical priority (emergency battery replacement January 21)
**Post-Incident Review Meeting:** January 22, 2026 (comprehensive review with all stakeholders)
**Next Review Date:** February 15, 2026 (post-remediation validation)

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*End of Report*

**For questions or additional analysis, contact:**
Incident Commander: robert.williams@pacificwireless.net
Network Operations Center: noc@pacificwireless.net
Facilities Management: facilities@pacificwireless.net