



**Verizon NEBS™ Compliance: OPSU and BBU
NEBS Testing Requirements
Verizon Technical Purchasing Requirements
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CHANGE CONTROL RECORD:

| Version | Date | Action* | Reason for Revision |
|-------------------------------------|-------------|----------------|---|
| 1 | 2/1/2007 | New | New document. |
| 2 | 2/23/2007 | Change | Changed document number |
| 3 | 3/28/2007 | Change | Correction made to Section 8 Testing Requirements |
| 4 | 4/4/2007 | Add | Added UL-1449 Surge Protective Device testing |
| 5 | 4/17/2007 | Add | Added specific sections for UL 1449 testing |
| 6 | 8/20/2007 | Change | Grammatical Changes to Section 6 General Requirements |
| * New, Add, Delete, Change, Reissue | | | |

Trademark Acknowledgement – NEBS is a trademark of Telcordia Technologies, Inc.



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Table of Contents

| | | |
|------------|-------------------------------------|----------|
| 1.0 | PURPOSE | 5 |
| 2.0 | SCOPE | 5 |
| 3.0 | REFERENCES | 5 |
| 4.0 | ACRONYMS | 6 |
| 5.0 | DEFINITIONS | 6 |
| 6.0 | GENERAL REQUIREMENTS | 6 |
| 7.0 | PASS/FAIL REQUIREMENTS | 7 |
| 8.0 | TEST REQUIREMENTS | 7 |



1.0 PURPOSE

The purpose of this Verizon Technical Purchasing Requirement document is to provide the minimum required NEBS testing for ONT Power Supply Units (OPSU) and Battery Back-Up (BBU) Units.

As with other products that serve the network, ONT Power Supply Units and Battery Back-Up Units shall be tested to determine their safety, performance, and reliability characteristics. The supplier shall provide a production sample to a Verizon-approved Independent Testing Laboratory (ITL) for testing and shall furnish the test results to Verizon's NEBS Compliance and Quality Assurance team for review. In addition to NEBS testing, ONT Power Supply Units and Battery Back-Up Units shall comply with all applicable local, state and federal statutes and regulatory requirements prior to general deployment.

2.0 SCOPE

This document defines the NEBS test requirements for ONT Power Supply Units and Battery Back-Up Units, which may be deployed in Verizon's outside plant network. The "punchlist" of tests contained herein shall be used by equipment suppliers and the Verizon-approved Independent Test Laboratory as the baseline of tests to create the NEBS test plan. In all instances of test planning and test execution, the most recent and accepted versions of the GR standards shall be used.

3.0 REFERENCES

| | |
|---------------------------------------|---|
| GR-63-CORE | NEBS™ Requirements: Physical Protection |
| GR-418-CORE | Generic Reliability Assurance Requirements for Fiber Optic Transport Systems |
| GR-78-CORE | Generic Requirements for the Physical Design and Manufacture of Telecommunications Products and Equipment |
| GR-1089-CORE | Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment |
| SIT.NEBS.RQS.NPI.2006.040 | Verizon NEBS Compliance Clarification Document |
| SIT.NEBS.TE.NPI.2004.015 | Telecommunications Carrier Group NEBS Compliance Checklist |
| UL-1449 2nd Edition | Transient Voltage Surge Suppressors |



4.0 ACRONYMS

| | |
|-------------|------------------------------|
| BBU | Battery Back-up Unit |
| EMI | Electromagnetic Interference |
| ESD | Electro Static Discharge |
| EUT | Equipment Under Test |
| ITL | Independent Test Laboratory |
| N/A | Not Applicable |
| ONT | Optical Network Terminal |
| OPSU | ONT Power Supply Unit |
| SPD | Surge Protective Device |

5.0 DEFINITIONS

THIS SECTION INTENTIONALLY LEFT BLANK.

6.0 GENERAL REQUIREMENTS

Verizon requires that manufacturers submit their EUT and associated documentation to a Verizon approved ITL for testing and verification of conformance to the qualification test requirements in this document. For a list of Verizon approved laboratories and locations, consult the Verizon web page at <http://www.verizonnebs.com/tcppage.html>.

Test configuration: The Equipment Under Test (EUT) shall be fully configured and performing its designated functions during the application of NEBS testing. The EUT and all associated documentation (installation and operating manuals), mounting and grounding schemes shall be provided to the test laboratory by the vendor prior to test commencement. All equipment interfaces shall be monitored for functionality and the test plan shall include the pass/fail criteria for each interface or service type.

In addition to the specific test requirements listed below, products must comply with GR-78-CORE, *Generic Requirements for the Physical Design and Manufacture of Telecommunications Products and Equipment*. Vendors may self-declare their product's compliance to GR-78-CORE by submitting a completed copy of Appendix B of the Telecommunication Carrier Group Checklist. Current versions of the TCG Compliance Checklist and the Verizon NEBS Clarification document can be found on the Verizon web page <http://www.verizonnebs.com/index.html - chklist>.



Surge Protection: OPSUs or BBUs that contain surge protection circuitry shall be tested to and comply with a subset of tests from UL-1449. Testing is to be performed on the fully assembled OPSU or BBU and the test reports shall be provided to Verizon. The specific sections of UL-1449, hereafter termed UL-1449 Prime, to be covered by testing is found in Section 8 of this document.

7.0 PASS/FAIL REQUIREMENTS

The EUT shall be configurable as documented in the manufacturer’s installation procedures and shall operate reliably over its intended life cycle. The product shall operate as intended during immunity and susceptibility testing (EMI, Operational Temperature and Relative Humidity, Altitude, etc.) and the test report shall include failure thresholds, if any, so that proper risk analysis can be made. The product shall meet all defined limits in the NEBS standards and the references listed above.

8.0 TEST REQUIREMENTS

| | | |
|---------------------------|---|---|
| GR-1089-CORE | Sec 2 – ESD | Test |
| GR-1089-CORE | Sec 3 - EMI | Test |
| GR-1089-CORE | Sec. 4 – Lightning and AC Power Fault | Test |
| GR-1089-CORE | Sec. 5 – Steady State Power Induction | N/A |
| GR-1089-CORE | Sec. 6 – DC Potential Difference | N/A |
| GR-1089-CORE | Sec. 7 – Electrical Safety | Test |
| GR-1089-CORE | Sec. 8 - Corrosion | N/A |
| GR-1089-CORE | Sec. 9 – Bonding and Grounding | Test |
| GR-1089-CORE | Sec. 10 – Criteria for DC Power Port of Telecommunications Load Equipment | N/A |
| | | |
| GR-63-CORE | Sec. 4.1.1 – Transportation and Storage Environmental Criteria | Test |
| GR-63-CORE | Sec. 4.1.2 – Operating Temperature Criteria | Test Operating temperature range -20 ⁰ C to 55 ⁰ C |
| GR-63-CORE | 4.1.3 – Altitude | Test |
| GR-63-CORE | 4.1.7 – Surface Temperature | Test |
| GR-63-CORE | 4.2 – Fire Resistance | Test |
| GR-63-CORE | 4.3.1 – Packaged Equipment Shock Criteria | Test |
| GR-63-CORE | 4.3.2 – Unpackaged Equipment Shock Criteria | Test |
| GR-63-CORE | 4.4.1 – Earthquake Environment and Criteria | Test |
| GR-63-CORE | 4.4.4 – Office Vibration Environment and Criteria | Test |
| GR-63-CORE | 4.4.5 – Transportation Vibration Criteria | Test |
| GR-63-CORE | 4.5 – Airborne Contaminants, Outdoor Levels | Test |
| GR-63-CORE | 4.7 - Illumination | Test |
| | | |
| Additional Testing | Cold Temperature Charge | Discharge battery to 20% residual charge; |



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|----------------------|--|--|
| | | attempt to charge the battery while ambient temperature remains at -20 ⁰ C; |
| | Cold Temperature Start | Disconnect the AC power to the OPSU, forcing the BBU unit to power ONT while ambient temperature is at -20 ⁰ C. |
| | Thermal Cycling Per GR-418-CORE, Section 4.8 (30 days), -20 to +65 ⁰ C | Test |
| UL-1449 Prime | Section 31 – Leakage Current Test Section 32 – Dielectric Voltage-Withstand Test Section 34 – Measured Limiting Voltage Test Section 35 – Surge Current Test Section 36 – Overvoltage Test Section 37 – Abnormal Overvoltage Test | Test to be performed on OPSU and BBU combination |