



# **Verizon NEBS™ Compliance: NEBS Regression Testing of Separately Approved ONTs and ONT Power Supplies**

Verizon Technical Purchasing Requirements

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**CHANGE CONTROL RECORD:**

<b>Version</b>	<b>Date</b>	<b>Action*</b>	<b>Reason for Revision</b>
1	1/12/2007	New	New document.
2	2/2/2007	Change	Change made to operating temperature criteria upper thermal limit
3	4/4/2007	Add	UL-1449 Standard for Surge Protective Devices
4	3/7/2011	Change	Changed Test Requirements in section 8 for 4.1.2, 4.4.1, and 4.4.4 from System to Sub-System
* New, Add, Delete, Change, Reissue			



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## 1.0 PURPOSE

The purpose of this Technical Purchasing Requirement document is to provide the NEBS regression testing guidelines of separately NEBS approved ONTs and ONT Power Supplies when joined together to form a system.

## 2.0 SCOPE

This document defines the NEBS regression test requirements for ONT and ONT Power Supply systems, 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. For ONT Power Supplies and ONTs to be considered acceptable for deployment, some NEBS tests require both units to be tested together as a combined system.

## 3.0 REFERENCES

<b>GR-63-CORE</b>	NEBS™ Requirements: Physical Protection
<b>GR-1089-CORE</b>	Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment
<b>GR-418-CORE</b>	Generic Reliability Assurance Requirements for Fiber Optic Transport Systems
<b>SIT.NEBS.RQS.NPI.2006.040</b>	Verizon NEBS Compliance Clarification Document
<b>SIT.NEBS.TE.NPI.2004.015</b>	Telecommunications Carrier Group NEBS Compliance Checklist
<b>UL-1449</b>	Standard for Surge Protective Devices
<b>UL 60950-1</b>	Information Technology Equipment – Safety – Part 1: General Requirements



#### 4.0 ACRONYMS

<b>BBU</b>	Battery Back-up Unit
<b>EMI</b>	Electromagnetic Interference
<b>ESD</b>	Electro Static Discharge
<b>EUT</b>	Equipment Under Test
<b>FCC</b>	Federal Communications Commission
<b>ITL</b>	Independent Test Laboratory
<b>ONT</b>	Optical Network Terminal
<b>OPSU</b>	ONT Power Supply Unit
<b>SPD</b>	Surge Protective Device

#### 5.0 DEFINITIONS

THIS SECTION INTENTIONALLY LEFT BLANK.

#### 6.0 GENERAL REQUIREMENTS

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 (voice, video and data) shall be monitored for functionality and the test plan shall include the pass/fail criteria for each interface or service type. Voice quality shall be monitored where appropriate.

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> .

Surge Protection: All products that contain surge protective devices shall be tested to and comply with UL-1449. Testing is to be performed on the fully assembled product and the test reports shall be provided to Verizon.

#### 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

ONT Power Supplies must be tested with the new ONT to the applicable criteria for sections designated as “System” criteria. ONT Power Supplies, which are tested and accepted by Verizon for deployment with a previous ONT, may be considered qualified for those criteria designated as “Sub-System”. Every ONT and power supply combination will require some system-level testing before being accepted for deployment.

		System	Sub-System	Lab Entry	Notes
GR-1089-CORE	Sec 2 – ESD		X		
GR-1089-CORE	Sec 3.2 – Emission Criteria	X		FCC Title 47 Part 15	
GR-1089-CORE	Sec 3.3 – Immunity Criteria		X		
GR-1089-CORE	Sec. 4 – Lightning and AC Power Fault	X			5KV
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		X	X	
GR-1089-CORE	Sec. 8 - Corrosion				N/A
GR-1089-CORE	Sec. 9 – Bonding and Grounding		X	X	
GR-1089-CORE	Sec. 10 – DC Power Ports		X		
GR-63-CORE	Sec. 2		X		
GR-63-CORE	Sec. 4.1.1 – Transportation and Storage Environmental Criteria		X		
GR-63-CORE	Sec. 4.1.2 – Operating Temperature Criteria		X		Temperature range -20 to 55° C
GR-63-CORE	Sec. 4.1.3 – Altitude		X		
GR-63-CORE	Sec. 4.1.4 – Temperature Margin		X		
GR-63-CORE	Sec. 4.1.5 – Fan Cooling				
GR-63-CORE	Sec. 4.1.6 – Heat Dissipation		X		
GR-63-CORE	Sec. 4.1.7 – Surface Temperature		X		
GR-63-CORE	Sec. 4.2 – Fire Resistance		X	X	
GR-63-CORE	Sec. 4.3 – Equipment Handling		X		
GR-63-CORE	Sec. 4.4.1 – Earthquake Environment and Criteria		X		
GR-63-CORE	Sec. 4.4.2 – Framework & Anchor		X		
GR-63-CORE	Sec. 4.4.3 – Wall-Mounted Anchors		X		
GR-63-CORE	Sec. 4.4.4 – Office Vibration		X		



		System	Sub-System	Lab Entry	Notes
	Environment and Criteria				
<b>GR-63-CORE</b>	Sec. 4.4.5 – Transportation Vibration Criteria		X		
<b>GR-63-CORE</b>	Sec. 4.5 – Airborne Contaminants		X		Outdoor levels
<b>GR-63-CORE</b>	Sec. 4.6 – Acoustic Noise		X		
<b>GR-63-CORE</b>	Sec. 4.7 - Illumination		X		
<b>Additional Testing</b>	Cold Temperature Start	X			Disconnect the AC power to the OPSU, forcing the BBU unit to power ONT while ambient temperature is -20°C.
	Thermal Cycling, per GR-418-CORE, Section 4.8 (30 days), -20 to +65°C		X		
	Battery Reserve Testing	X			See Battery Reserve Test Plan
UL-60950-1	All Applicable Sections		X		