

Table of Contents

1 Introduction

1.1 Purpose and Scope	1-1
1.2 Telecommunications Service Provider (TSP) Role	1-1
1.3 Equipment Manufacturer Role	1-2
1.4 Application Guidelines	1-3
1.4.1 Central Offices (COs) and Similar Facilities	1-3
1.4.2 Commercial Buildings	1-3
1.4.3 Non-Environmentally Controlled Locations	1-3
1.4.4 Other Locations	1-3
1.5 Reasons for GR-63-CORE, Issue 4	1-4
1.6 Structure and Use of This Document	1-4
1.7 Related Documents	1-5
1.8 Requirements Terminology	1-6
1.9 Requirement Labeling Conventions	1-7
1.9.1 Numbering of Requirement and Related Objects	1-7
1.9.2 Requirement, Conditional Requirement, and Objective Identification	1-8
1.10 Supplier-Provided Documentation	1-8

2 Facility and Space Planning Requirements

2.1 Equipment Frames and Lineup Conformity	2-1
2.2 Floor Plans	2-2
2.3 Vertical Space Allocation	2-5
2.3.1 Equipment Frame Dimensions—Special Cases	2-6
2.3.2 Equipment Frame Floor Loading	2-7
2.4 Space Planning for Distributing Frames (DFs)	2-7
2.5 Space Planning for Centralized DC Power Plant Equipment	2-8
2.6 Cable Distribution Systems (CDSs)	2-10
2.6.1 CDS Requirements	2-10
2.6.1.1 General	2-10
2.6.1.2 Overhead Cable Distribution	2-10
2.6.1.3 Cable Distribution Under Raised Floor	2-11
2.6.2 Cable Pathways Over Equipment Frame Areas	2-11
2.6.2.1 Elements of Allocation Plan	2-11
2.6.2.2 System Cable Racks	2-13
2.6.2.3 Via Cable Racks	2-13
2.6.2.4 Lights	2-13
2.6.3 Cable Pathways Over Distributing Frame (DF) Areas	2-13
2.6.4 CDS Floor Load and Support	2-13
2.7 Operations Support Systems (OSSs)	2-14
2.8 Cable Entrance Facility (CEF)	2-15
2.8.1 CEF Spatial Requirements	2-15
2.8.2 CEF Loading Requirements	2-15
2.9 Summary of Equipment Allocations	2-16
2.10 Equipment Room Cooling Systems	2-16
2.10.1 Central Cooling Systems	2-17
2.10.2 Distributed Cooling Systems	2-17

2.10.3 Hot Aisles and Cold Aisles	2-18
2.11 Airborne Contaminants Within the Equipment Room	2-18
2.11.1 Contamination Classes	2-19
2.11.2 Gaseous Contamination Levels	2-19
2.11.3 Measurement of Contaminant Levels	2-21
2.12 Illumination of Equipment Spaces	2-22
2.12.1 Illumination Criteria for Central Office (CO) Lighting Systems	2-22
2.12.1.1 Quantity of Light	2-22
2.12.1.2 Luminance Ratios	2-24
2.12.1.3 Color of Light	2-24
2.12.2 Illumination Test Method for Central Office (CO) Lighting Systems	2-24
2.12.2.1 Test 1—Console Illumination, Readability, and Glare Tests	2-25
2.12.2.2 Test 2—Lighting System Tests	2-27
3 Equipment Spatial Design Requirements for Frames and Chassis	
3.1 Equipment Frame Nomenclature	3-1
3.2 Equipment Frame Floor Mounting	3-3
3.3 Equipment Frame Junctioning	3-5
3.4 Equipment Frame Dimensions	3-5
3.4.1 Equipment Frame Dimensions—Open-Style Racks	3-5
3.4.2 Equipment Frame Dimensions—Other Rack Styles	3-6
3.4.3 Equipment Frame Dimensions—Shipping	3-6
3.4.4 Equipment Frame End Guards	3-7
3.4.5 Equipment Frame Dimensions—Special Cases	3-7
3.5 Equipment Frame Cable Management Provisions	3-7
3.5.1 Equipment Frame Interface With Cable Rack	3-7
3.6 Equipment Frame Weight	3-10
3.7 Equipment Frame Support of CDS and Lights	3-10
3.8 AC Convenience Outlets Within Equipment Frames	3-10
3.9 Other Frame Types—Distributing and Interconnecting Frames (DFs and IFs)	3-11
3.9.1 Distributing Frames (DFs)	3-11
3.9.2 Interconnecting Frames (IFs)	3-11
3.10 DC Power Plant Equipment Frames	3-12
3.11 Equipment-Chassis Mounting Requirements	3-12
4 Network Equipment—Environmental Criteria	
4.1 Temperature, Humidity, and Altitude Criteria	4-1
4.1.1 Transportation and Storage Environmental Criteria	4-2
4.1.1.1 Low-Temperature Exposure and Thermal Shock	4-2
4.1.1.2 High-Relative-Humidity Exposure	4-2
4.1.1.3 High-Temperature Exposure and Thermal Shock	4-3
4.1.2 Operating Temperature and Humidity Criteria	4-3
4.1.3 Altitude	4-5
4.1.4 Temperature Margin Evaluation	4-6
4.1.5 Fan-Cooled Equipment Criteria	4-7
4.1.5.1 Equipment Fan-Performance Criteria	4-7
4.1.5.2 Equipment Fan-Filter Criteria	4-7
4.1.6 Heat Dissipation and Energy Efficiency	4-9
4.1.7 Surface Temperature	4-11

4.1.8	Equipment Airflow	4–12
4.2	Fire Resistance	4–13
4.2.1	Fire-Resistance Rationale	4–14
4.2.2	Equipment Assembly Fire Tests	4–14
4.2.2.1	Frame-Level Fire-Resistance Criteria	4–15
4.2.2.2	Shelf-Level Fire-Resistance Criteria	4–16
4.2.2.3	Smoke and Self-Extinguishment Criteria	4–17
4.2.3	Use of Fire-Resistant Materials, Components, Wiring, and Cable	4–18
4.2.3.1	Material/Components Fire-Resistance Criteria	4–18
4.2.3.2	Wire and Cable Between Frames	4–20
4.2.3.3	Optical Fiber Cable Trays and Raceways	4–22
4.2.3.4	Ignitability Requirements for Ancillary Materials	4–22
4.3	Equipment Handling Criteria	4–23
4.3.1	Packaged Equipment Shock Criteria	4–24
4.3.1.1	Category A Containers	4–24
4.3.1.2	Category B Containers	4–24
4.3.2	Unpackaged Equipment Shock Criteria	4–25
4.4	Earthquake, Office Vibration, and Transportation Vibration	4–25
4.4.1	Earthquake Environment and Criteria	4–25
4.4.1.1	Earthquake Environment	4–25
4.4.1.2	Physical Performance Criteria	4–28
4.4.1.3	Functional Performance	4–28
4.4.2	Framework and Anchor Criteria	4–29
4.4.3	Wall-Mounted Equipment Anchor Criterion	4–30
4.4.4	Office Vibration Environment and Criteria	4–30
4.4.4.1	Office Vibration Environment	4–30
4.4.4.2	Physical Performance Criteria	4–31
4.4.4.3	Functional Performance Criteria	4–31
4.4.5	Transportation Vibration Criteria	4–31
4.4.5.1	Transportation Environment	4–31
4.5	Airborne Contaminants	4–33
4.5.1	Environmentally Controlled Space and Sealed Network Cabinets	4–33
4.5.1.1	Ventilated Outside Plant (OSP) Equipment	4–34
4.6	Acoustic Noise	4–34
4.7	Illumination Criteria for Network Equipment	4–35
4.7.1	Surface Reflectance and Color	4–35
4.7.2	Glare	4–36

5 Network Equipment—Environmental Test Methods

5.1	Temperature, Humidity, and Altitude Test Methods	5–1
5.1.1	Transportation and Storage Test Methods	5–4
5.1.1.1	Low-Temperature Exposure and Thermal Shock	5–5
5.1.1.2	High-Relative-Humidity Exposure	5–6
5.1.1.3	High-Temperature Exposure and Thermal Shock	5–8
5.1.2	Operating Temperature and Relative Humidity	5–9
5.1.3	Operating Altitude	5–12
5.1.4	Temperature Margin Determination	5–14
5.1.5	Operation With Fan Failure	5–15
5.1.6	Rate of Heat-Dissipation Calculation Procedure	5–15
5.1.7	Surface Temperature Test Procedures	5–19

5.1.7.1	Infrared Measurement Equipment	5-19
5.1.7.2	Contact Measurement Equipment	5-19
5.1.7.3	Equipment Evaluation Procedures	5-19
5.2	Fire Test Methods	5-20
5.2.1	Sample Configuration	5-20
5.2.2	Testing Clarification—Circuit Board Removal	5-20
5.2.2.1	Adjacent Printed Wiring Boards (PWBs) in Close Proximity	5-20
5.2.2.1.1	Case 1—No Mezzanine Cards	5-21
5.2.2.1.2	Case 2—Mezzanine Card	5-22
5.2.2.1.3	Case 3—Larger or Multiple Mezzanine Cards	5-23
5.2.2.2	Adjacent Printed Wiring Boards (PWBs) Not in Close Proximity	5-24
5.2.3	ATIS-0600319.2008 Test Deviation—Fan-Powering Options	5-24
5.2.4	Telcordia Needle Flame Test	5-24
5.2.4.1	Application to Individual Components	5-24
5.2.4.2	In-Situ Application to Individual Components	5-25
5.2.5	Guidelines for Re-Testing to Address Product Changes	5-26
5.2.6	Test Reporting—Additions	5-27
5.3	Handling Test Methods	5-28
5.3.1	Handling Drop Tests—Packaged Equipment	5-29
5.3.1.1	Category A Container—Test Procedure	5-29
5.3.1.2	Category B Container—Test Procedure	5-32
5.3.2	Unpackaged Equipment Drop Tests	5-34
5.3.3	Test Procedure—Equipment and Field Replaceable Units (FRUs) Weighing Less Than 25 kg (55.1 lb)	5-34
5.3.4	Test Procedure—Equipment and Field Replaceable Units (FRUs) Weighing 25 kg (55.1 lb) or More	5-36
5.4	Earthquake, Office Vibration, and Transportation Vibration Test Methods	5-38
5.4.1	Earthquake Test Methods	5-38
5.4.1.1	Test Plan	5-41
5.4.1.2	Laboratory Equipment	5-41
5.4.1.3	Test Configuration	5-43
5.4.1.4	Static Test Procedure	5-45
5.4.1.5	Waveform Test Procedure	5-46
5.4.1.6	Test Report	5-47
5.4.2	Office Vibration Test Procedure	5-47
5.4.2.1	Test Procedure—All Frame-Mounted or Wall-Mounted Equipment	5-47
5.4.3	Transportation Vibration—Packaged Equipment	5-48
5.5	Airborne Contaminants Test Methods	5-50
5.5.1	Scope	5-50
5.5.2	Gaseous Contaminants Test Method	5-50
5.5.2.1	Two Cleaning Procedures for Copper Coupons	5-54
5.5.2.2	Test Procedure	5-57
5.5.2.3	Measuring Parameters	5-57
5.5.2.4	Safety Procedures for Testing Gaseous Contaminants	5-58
5.5.2.5	Performance Criteria	5-58
5.5.2.6	Test Report	5-59
5.5.3	Hygroscopic Dust Test Method	5-62
5.5.3.1	Sample Selection	5-62
5.5.3.2	Sample Handling	5-62
5.5.3.3	Test Sequence	5-62

- 5.5.3.4 Performance Criteria 5-63
- 5.5.3.5 Test Report 5-64
- 5.6 Acoustical Measurement Methodology 5-64
 - 5.6.1 Procedure for Nominal, 27°C Operating Conditions: Test Room at 27°C 5-65
 - 5.6.2 Procedure for Nominal, 27°C Operating Conditions: Test Room at Other Than 27°C 5-65
 - 5.6.3 Procedure for Nominal, 23°C Operating Conditions 5-65
 - 5.6.4 Procedure for High-Temperature Operating Conditions 5-65
- 5.7 Illumination Test Methods for Network Equipment 5-65
 - 5.7.1 Equipment Assembly—Readability, Glare, and Reflectance Tests 5-66
 - 5.7.1.1 Test Procedure—Equipment Assembly Readability and Glare . . . 5-66
 - 5.7.1.2 Test Procedure—Equipment Surface Reflectance 5-67

Appendix A: References

- A.1 Telcordia Documents A-1
- A.2 Other Referenced Documents or Material A-2
- A.3 Telcordia Document Sets—Family of Requirements (FR) and Family of Documents (FD) A-5
- A.4 Telcordia Reference Notes A-7
 - A.4.1 Contact Telcordia Customer Service A-7
 - A.4.2 Order Documents Online From the Telcordia Information SuperStore . . A-7
 - A.4.3 Web Sites for Generic Requirements Information A-8
 - A.4.4 Licensing Agreements for Telcordia Documents A-8

Appendix B: Acronyms

Requirement-Object Index