

# Table of Contents

## Preface

## 1 Introduction

1.1 History . . . . .	1-1
1.2 Purpose and Scope . . . . .	1-2
1.3 Related Documents . . . . .	1-2
1.4 Organization . . . . .	1-2
1.5 Requirement Object Terminology . . . . .	1-3
1.6 Requirement Object Labeling Conventions . . . . .	1-4
1.6.1 Numbering of Requirement Objects . . . . .	1-4
1.6.2 Requirement Object Identification . . . . .	1-4
1.7 Revision History . . . . .	1-5
1.7.1 Changes from GR-496-CORE, Issue 1 to Issue 2 . . . . .	1-5
1.7.2 Changes from TR-NWT-000496 to GR-496-CORE, Issue 1 . . . . .	1-5
1.7.3 Requirement Object Absolute Number Assignment . . . . .	1-6

## 2 Functions and Applications

2.1 Definition and Functions of a SONET ADM . . . . .	2-1
2.2 Applications . . . . .	2-3

## 3 Network Compatibility Criteria

3.1 Physical Interfaces . . . . .	3-1
3.1.1 SONET Optical Interfaces . . . . .	3-1
3.1.2 STS-N Electrical Interfaces . . . . .	3-1
3.1.3 DS <sub>n</sub> Electrical Interfaces . . . . .	3-2
3.1.4 Other Interfaces . . . . .	3-2
3.2 Signal Formats . . . . .	3-2
3.2.1 SONET Signal Formats . . . . .	3-2
3.2.2 DS <sub>n</sub> Signal Formats . . . . .	3-2
3.2.3 Other Signal Formats . . . . .	3-2
3.3 Transmission Criteria . . . . .	3-3
3.3.1 Synchronization . . . . .	3-3
3.3.1.1 Timing Modes . . . . .	3-3
3.3.1.2 Internal Clocks . . . . .	3-4
3.3.1.3 Pointer Generation for Originating Paths . . . . .	3-4
3.3.2 Jitter and DS <sub>n</sub> Wander . . . . .	3-5
3.3.3 Framing . . . . .	3-5
3.3.4 Pointer Processing . . . . .	3-5
3.3.5 Transmission Path . . . . .	3-6
3.3.5.1 Types of Cross-Connections . . . . .	3-6
3.3.5.2 Cross-Connection Programmability . . . . .	3-9
3.3.5.3 Cross-Connection and Rearrangement Levels . . . . .	3-10
3.3.5.4 Bit and Signaling Integrity . . . . .	3-12
3.3.5.5 Maximum Transmission Delays . . . . .	3-12
3.3.5.6 Relative Transmission Delays . . . . .	3-13
3.3.5.7 Signaling Delay . . . . .	3-14

- 3.4 SONET Transmission Modes . . . . . 3-15
  - 3.4.1 Payload Mappings . . . . . 3-15
  - 3.4.2 Unequipped Channel Patterns . . . . . 3-15
- 3.5 SONET ADM Frame and Facility Maintenance . . . . . 3-15
  - 3.5.1 Orderwire . . . . . 3-16
  - 3.5.2 Alarm Surveillance . . . . . 3-17
  - 3.5.3 Intermediate-Path PM Capabilities . . . . . 3-17

**4 Feature Descriptions and Criteria**

- 4.1 Required Features . . . . . 4-1
  - 4.1.1 High-Speed OC-N Interfaces . . . . . 4-1
  - 4.1.2 Required Cross-Connection Capabilities . . . . . 4-1
  - 4.1.3 SONET ADM Frame and Facility Maintenance . . . . . 4-3
  - 4.1.4 Operations Communications Capabilities . . . . . 4-3
  - 4.1.5 Memory Administration Capabilities . . . . . 4-3
- 4.2 Optional Features . . . . . 4-3
  - 4.2.1 Additional High-Speed Interface . . . . . 4-4
  - 4.2.2 OC-M Tributary Interfaces . . . . . 4-4
  - 4.2.3 DS<sub>n</sub> and STS-N Electrical Tributary Interfaces . . . . . 4-5
  - 4.2.4 Byte-Synchronous DS1 Mapping . . . . . 4-6
  - 4.2.5 DS3 Tributary Interface with Embedded M13 Multiplexer Functionality . . . . . 4-7
  - 4.2.6 Other Tributary Interfaces . . . . . 4-7
  - 4.2.7 Programmable Cross-Connection Capabilities . . . . . 4-7
  - 4.2.8 Additional Cross-Connection Capabilities . . . . . 4-8
  - 4.2.9 Particular Add/Drop Ratios . . . . . 4-10
  - 4.2.10 SONET Automatic Protection Switching . . . . . 4-11
  - 4.2.11 Circuit Pack Protection for Tributary Interfaces . . . . . 4-12
  - 4.2.12 Upgrade Capabilities . . . . . 4-12
  - 4.2.13 Digital Test Access . . . . . 4-13
  - 4.2.14 In-Service Facility Rolling . . . . . 4-13

**5 Other Generic System Criteria**

- 5.1 System Availability Criteria . . . . . 5-1
- 5.2 Other Quality and Reliability Criteria . . . . . 5-1

**Appendix A: References**

**Appendix B: Glossary and Acronyms**

- B.1 Glossary . . . . . B-1
- B.2 Acronyms . . . . . B-2

**Requirement-Object Index**

**Deleted Requirement-Object Index**



## List of Figures

Figure 2-1	SONET ADM Terminal Configuration Example . . . . .	2-2
Figure 2-2	SONET ADM Add/Drop Configuration Example . . . . .	2-3
Figure 2-3	Interoffice Network Example . . . . .	2-4
Figure 2-4	Loop Example . . . . .	2-5
Figure 3-1	Cross-Connection Types (Illustrated for Add-Drop Configuration) .	3-9