NIS A217-3

DMS SuperNode TR-303 Implementation Specification

NA006 Standard 02.02 March 1997

TR-303-CORE Compliance Specification For A Remote Digital Terminal Connecting To A Nortel DMS SuperNode Switch

DMS SuperNode

TR-303 Implementation

Specification

NA006 Software Release

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NOTICE

Disclaimer

Nortel reserves the right to revise the contents of this specification for any reason, including, but not limited to, conformity with standards promulgated by any public standards agency, advances in technology, or to reflect changes in requirements of communication networks, systems or applications. The provision of any capabilities described in this document is dependent on certain business decisions, resolution of which may also result in changes to, withdrawal of, or addition to, any or all of the capabilities herein.

Applicability of this document

This document defines the DMS SuperNode compliance with the generic, or multivendor, interface requirements specified by Bell Communications Research (Bellcore) publication GR-303-CORE (GR-303). It is provided as a guide for network planners and suppliers of systems and equipment designed to be compatible with Nortel's DMS SuperNode TR-303 Implementation.[1] This document represents the NA006/XPM007 software release of the DMS SuperNode. The change bars throughout this document reflect implementation enhancements made in the NA006/XPM007 software release from the DMS SuperNode's initial implementation of TR-303.

For interface requirements on connecting a TR-303 compliant RDT supporting Electronic Business Set Services (also known as P-phone) to the DMS SuperNode, please reference the Nortel document NIS V202 - “Integrated Digital Loop Carrier Interface Specification for Electronic Business Set Services”.

Ordering Information

The ordering number for this Nortel Interface Specification (NIS) is NIS A217-3 Issue 02.02. To obtain additional copies of this document, call the toll free number 1-800-347-4850.

[1] Although the latest Bellcore reference is called GR-303-CORE, the DMS Supernode’s version of this TMC-based interface is referred to as “TR-303 Multivendor Interface”. This term is primarily used for historical purposes and to differentiate from the DMS SuperNode’s CSC-based “TR-303 DMS Interface”.

REVISION HISTORY

March 1997

Document Number: NIS A217-3
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Issue: 01.01
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February 1994

Document Number: NIS A217-2
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September 1991

Document Number: NIS A217-1
Issue: 1
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Document Organization

The main body of this document is organized as a detailed compliancy assessment against section 12 of GR-303 Issue 1, revision 2. Note that section 12 of GR-303 contains the requirements for the generic interface between the Local Digital Switch (LDS) and the Remote Digital Terminal (RDT). The subsections are numbered and titled the same as GR-303 for ease of reference. Each subsection contains a brief statement of compliance, and explanatory notes as required.

Appendix A defines the DMS SuperNode compliance with the requirements in Supplement 3 of TR-303. Supplement 3 of TR-303 specifies the Embedded Operations Channel (EOC) application layer messages.

Appendix B provides additional details for operational procedures over the EOC that are implemented on the DMS SuperNode.

Appendix C provides sequence diagrams for a number of call types to illustrate the operation of the hybrid call processing method.

Definitions

The following phrases are used in this document to summarize the compliance of the DMS SuperNode implementation to the requirements in a given section of GR-303-CORE.

1. *No text* - This phrase indicates that the GR-303 document contains no text immediately following the referenced section.

2. *No requirements stated* - This phrase indicates that the text immediately following the referenced section contains no requirements. Additional text may be provided for explanatory purposes.

3. *Compliant* - This phrase indicates that the DMS SuperNode implementation of the TR-303 multivendor interface fully complies with the requirement(s) stated in the referenced section. Additional text may be provided for clarification.

4. *Compliant (revised requirements)* - This phrase indicates that the requirement(s) in the referenced section are expected to be revised in a future revision of GR-303. It further indicates that the DMS SuperNode implementation of the TR-303 multivendor interface is fully compliant with the revised requirement(s). Additional text is provided to explain the revisions.

5. *Compliant (with exceptions)* - This phrase indicates that the DMS SuperNode implementation of the TR-303 multivendor interface is compliant with the requirement(s) stated in the referenced section with some exceptions. Additional text is provided to explain the exceptions.

6. *Non-compliant* - This phrase indicates that the DMS SuperNode implementation of the TR-303 multivendor interface is not compliant with the requirement(s) stated in the referenced section at this time. Additional text may be provided to explain the lack of compliancy.

7. *Non-compliant (CSC requirement)* - This phrase indicates that this DMS SuperNode implementation of the TR-303 multivendor interface is not compliant with the requirement(s) stated in the referenced section at this time because the requirement(s) are specific to the Common Signaling Channel (CSC) protocol.

8. *Non-compliant (OIM requirement)* - This phrase indicates that the DMS SuperNode implementation of the TR-303 multivendor interface is not compliant with the requirement(s) stated in the referenced section at this time because the requirement(s) are specific to the Operations Interface Module (OIM).

9. *Not applicable (RDT requirement)* - This phrase indicates that the referenced requirement(s) are specific to the RDT and are therefore not applicable to the DMS SuperNode.

DMS SuperNode Compliancy Assessment For Section 12 of GR-303-CORE

12.0 LDS-RDT Generic Interface - Requirements and Options

12.1 Introduction

No requirements stated

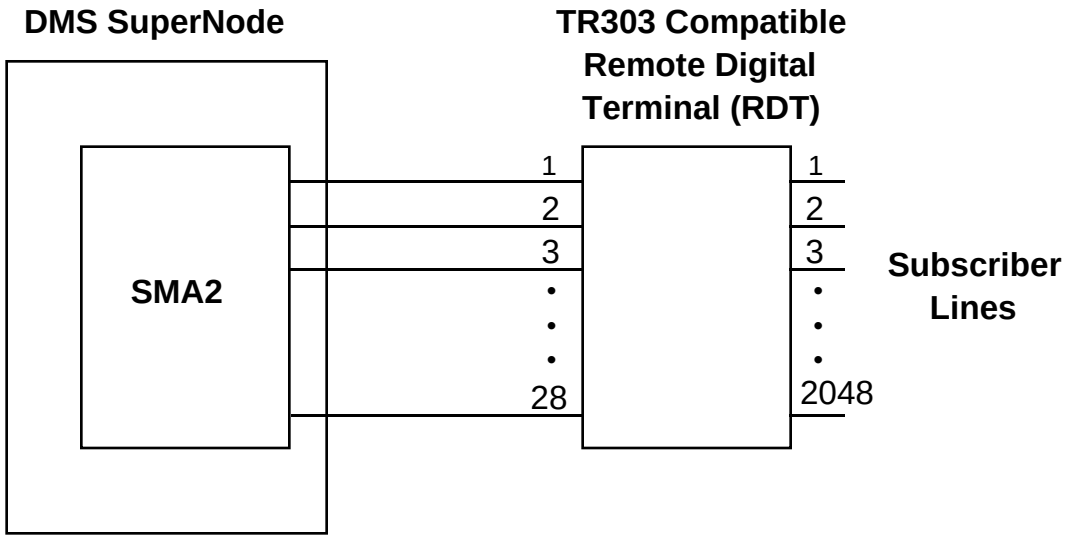
12.2 Generic IDLC Interface Requirements - Executive Summary

No requirements stated

The initial implementation of the TR-303 multivendor interface on DMS SuperNode was based on the Subscriber Carrier Module - 100 Access (SCM-100A or SMA) peripheral. This NA006/XPM007 implementation of the TR-303 multivendor interface on DMS SuperNode is based on the Subscriber Carrier Module - 100 Access - 2 (SMA2) peripheral. As shown in Figure 1, the SMA2 supports up to 28 DS1s which may be allocated on a random basis to as many as eight RDTs. From 2 to 28 DS1s may be assigned to any one RDT. This Expanded Port Version will enable the SMA2 to support up to 48 DS1s.

Note: NA006/XPM007 software will continue to work on the SMA but within its engineering restrictions (i.e. 20 DS1 limitation).

Figure 1. SMA Overview



Some of the key characteristics of the generic, or multivendor, TR-303 interface on SMA are listed below:

1. Each SMA/SMA2 supports up to eight TR-303 compatible RDTs (five if ISDN is required).

2. From 2 to 28 DS1s may be allocated to a given RDT. (Note, the total number of DS1s allocated to all RDTs on a single SMA2 must be ≤ 48.)

3. Each RDT may terminate up to 2048 subscriber lines.

4. Dynamic time-slot assignment is supported. Fixed time-slot assignment is not supported at this time.

5. The hybrid call processing signaling method is supported. This method consists of ABCD codes for call supervision and a Time-slot Management Channel (TMC) to control time-slot assignments.

6. The out of band signaling method using CSC is not supported at this time.

7. The 4:1 TDM method of accommodating ISDN Basic Access is supported.

12.3 Applications of the Generic IDLC Interface

No requirements stated

12.3.1 Selecting the Number of DS1s

No requirements stated

The implementation of the TR-303 multivendor interface on DMS SuperNode supports from 2-28 DS1s per RDT.

12.3.2 Selecting the Call Processing Signaling Method

No requirements stated

The implementation of the TR-303 multivendor interface on DMS SuperNode supports the hybrid call processing signaling method only.

12.4 Interface Functionality

No text

12.4.1 General

No requirements are stated

12.4.2 Generic Implementation of Interface Functions

No text

12.4.2.1 DS1 Facility Operations

No requirements stated

12.4.2.2 IDLC System/Terminal Operations

No requirements stated

12.4.2.3 Call Processing

R12-1 [873] *Compliant*

CR12-2 [874] *Non-compliant (CSC requirement)*

The out of band method using CSC may be supported in a future release contingent on market demand, the existence of Bellcore test capabilities, and support by other vendors. Note, the DMS SuperNode is fully capable of supporting the out of band method with no hardware changes.

R12-3 [875] *Not applicable (RDT requirement)*

12.4.2.4 Information Transport

R12-4 [876] *Compliant*

12.4.2.5 Loop Testing

No requirements stated

12.4.2.6 Summary

No requirements stated

12.4.3 LAPD Protocol

No requirements stated

12.4.3.1 General LAPD Information

No requirements stated

12.4.3.2 LAPD Functions

No requirements stated

12.4.3.3 Overview of Frame Structure and Format

R12-5 [877]*Compliant*

12.4.3.4 Commands/Responses for Data-Link Operation

R12-6 [878] *Compliant*

CR12-7 [879] *Compliant*

CO12-8 [880] *Compliant*

R12-9 [881] *Compliant*

R12-10 [882] *Not applicable (RDT requirement)*

R12-11 [883] *Compliant*

The DMS SuperNode uses and supports the use of the disconnect (DISC) command. If the RDT does not support DISC, then the message shall be ignored as stated in R12-9. In this case, a time-out will occur and the DMS SuperNode will terminate multiple frame operation.

12.4.3.5 LAPD Requirements for IDLC Systems

No requirements stated

12.4.3.5.1 Mode of Operation

R12-12 [884] *Compliant*

R12-13 [885] *Compliant*

12.4.3.5.2 Maximum Number of Outstanding I Frames (k)

R12-14 [886]*Compliant*

12.4.3.5.3 Maximum Number of Retransmissions (N200)

R12-15 [887] *Compliant*

12.4.3.5.4 Maximum Number of Octets in an I-Frame Information Field (N201)

R12-16 [888] *Compliant*

R12-17 [889] *Compliant*

12.4.3.5.5 Maximum Number of TEI Assignment Requests (N202)

No requirements stated

12.4.3.5.6 Timer T200

R12-18 [890] *Compliant*

12.4.3.5.7 Timer T201

No requirements stated

12.4.3.5.8 Timer T202

No requirements stated

12.4.3.5.9 Timer T203

R12-19 [891] *Compliant*

12.4.3.5.10 Idle Code

R12-20 [892] *Compliant*

12.4.3.5.11 SAPI/TEI Addressing Conventions

R12-21 [893] *Compliant (with exceptions)*

The SAPI/TEI addressing conventions used in the implementation of the TR-303 multivendor interface on DMS SuperNode are defined in Table 1. Note that, a number of the SAPI/TEI addresses defined by GR-303 are not supported for various reasons.

Table 1 - SAPI/TEI Addressing Conventions

SAPI	TEI	Data-Link Function	Support
0	0	TMC Call Processing	Supported
1	0	EOC and TMC Path Switching Operations	Supported
1	1	RDT - Provisioning/Memory Admin. OS	(1)
1	2	RDT - Maintenance/Surveillance OS	(1)
1	3	RDT - Testing OS	(1)
1	4	RDT - IDT	Supported
1	5	RDT - Test System Controller 1	(2)
1	6	RDT - Test System Controller 2	(2)
1	7	RDT - Test System Controller 3	(2)
1	8	user assignable	(3)
1	9	user assignable	(3)
1	10	user assignable	(3)
1	11	user assignable	(3)

(1) These SAPI/TEI addresses are not supported because they assume the existence of the Operation Interface Module (OIM) which is not provided by the DMS SuperNode at this time.

(2) These SAPI/TEI addresses are not supported because the DMS SuperNode uses SAPI = 1 and TEI = 4 for RDT line testing.

(3) These SAPI/TEI addresses are mentioned in GR-303 but are not required for IDLC functions. The implementation of the TR-303 multivendor interface on DMS SuperNode does not use any of these logical channels at this time.

R12-22 [894] *Compliant*

Only the SAPI/TEIs supported by the DMS SuperNode (see Table 1, R12-21) are put into the TEI Assigned state at IDT initialization.

R12-23 [895] *Compliant*

R12-24 [896] *Compliant*

O12-25 [897] *Compliant*

R12-26 [898]*Compliant*

R12-27 [899] *Compliant*

The DMS SuperNode establishes multiple frame operation on EOC logical data link connections SAPI = 1, TEI = 4, and SAPI = 1, TEI = 0.

O12-28 [900] *Compliant*

O12-29 [901] *Non-compliant (OIM requirement)*

R12-30 [902] *Compliant*

O12-31 [903] *Compliant*

R12-32 [904] *Compliant*

R12-33 [905] *Compliant*

CR12-34 [906] *Non-compliant (OIM requirement)*

CR12-35 [907] *Compliant*

O12-36 [908] *Compliant*

R12-37 [909] *Compliant*

12.4.3.5.12 Unrecoverable Data-Link Errors

R12-38 [910] *Compliant*

R12-39 [911] *Compliant*

12.4.3.6 Management Entity Requirements

R12-40 [912] *Compliant*

R12-41 [913] *Compliant*

R12-42 [914] *Compliant*

12.5 Requirements and Options Supporting Customer Services

No text

12.5.1 Call Processing Techniques

No text

12.5.1.1 Hybrid Signaling

R12-43 [915] *Non-compliant*

The implementation of the TR-303 multivendor interface on DMS SuperNode supports dynamic time-slot assignment for locally switched calls via the TMC. Fixed time-slot assignment for locally switched calls, wherein any of the time-slots is pre-assigned without relying on the TMC, is not supported at this time.

12.5.1.2 Out of Band Signaling

R12-44 [916] *Non-compliant*

The implementation of the TR-303 multivendor interface on DMS SuperNode supports dynamic time-slot assignment for locally switched calls via the TMC. Fixed time-slot assignment for locally switched calls, wherein any of the time-slots is pre-assigned without relying on the TMC, is not supported at this time.

12.5.2 Call Processing Messages

No requirements stated

12.5.2.1 ABCD Codes

In Table 12-3 of GR-303, all defined ABCD codes will be sent by DMS SuperNode for Loop Start, Ground Start, Coin, and Multi-party lines, except RLCF for Loop Start and Ground Start lines.

In Table 12-4 of GR-303, all defined ABCD codes will be processed by DMS SuperNode for Loop Start, Ground Start, Coin, and Multi-party lines.

R12-45 [917] *Compliant*

R12-46 [918] *Non-compliant*

Nortel may implement requirement R12-46 [918] in the future contingent on market need.

O12-47 [919] *Compliant*

R12-48 [920] *Compliant (with exceptions)*

DS0 AIS is detected on the DMS SuperNode after 80 signaling state cycles (each state cycle being 3 ms).

R12-49 [921] *Compliant (with exceptions)*

DS0 Yellow is detected on the DMS SuperNode after 80 signaling state cycles (each state cycle being 3 ms).

12.5.2.1.1 Loop Start - *ABCD Codes Received by the RDT*

R12-50 [922] *Not applicable (RDT requirement)*

R12-51 [923] *Not applicable (RDT requirement)*

R12-52 [924] *Not applicable (RDT requirement)*

CR12-53 [925] *Not applicable (RDT requirement)*

R12-54 [926] *Not applicable (RDT requirement)*

R12-55 [927] *Not applicable (RDT requirement)*

12.5.2.1.2 Loop Start - *ABCD Codes Sent to the IDT*

R12-56 [928] *Not applicable (RDT requirement)*

R12-57 [929] *Not applicable (RDT requirement)*

12.5.2.1.3 Ground Start - *ABCD Codes Received by the RDT*

R12-58 [930] *Not applicable (RDT requirement)*

R12-59 [931] *Not applicable (RDT requirement)*

CR12-60 [932] *Not applicable (RDT requirement)*

R12-61 [933] *Not applicable (RDT requirement)*

R12-62 [934] *Not applicable (RDT requirement)*

R12-63 [935] *Not applicable (RDT requirement)*

12.5.2.1.4 Ground Start - *ABCD Codes Sent to the IDT*

R12-64 [936] *Not applicable (RDT requirement)*

R12-65 [937] *Not applicable (RDT requirement)*

R12-66 [938] *Not applicable (RDT requirement)*

12.5.2.1.5 Loop Reverse Battery - *ABCD Codes Received by the RDT*

R12-67 [939] *Not applicable (RDT requirement)*

R12-68 [940] *Not applicable (RDT requirement)*

12.5.2.1.6 Loop Reverse Battery - *ABCD Codes Sent to the IDT*

R12-69 [941] *Not applicable (RDT requirement)*

R12-70 [942] *Not applicable (RDT requirement)*

12.5.2.1.7 Coin Option - *ABCD Codes Received by the RDT*

R12-71 [943] *Not applicable (RDT requirement)*

R12-72 [944] *Not applicable (RDT requirement)*

R12-73 [945] *Not applicable (RDT requirement)*

R12-74 [946] *Not applicable (RDT requirement)*

R12-75 [947] *Not applicable (RDT requirement)*

R12-76 [948] *Not applicable (RDT requirement)*

R12-77 [949] *Not applicable (RDT requirement)*

R12-78 [950] *Not applicable (RDT requirement)*

12.5.2.1.8 Coin Option - *ABCD Codes Sent to the IDT*

R12-79 [951] *Not applicable (RDT requirement)*

R12-80 [952] *Not applicable (RDT requirement)*

R12-81 [953] *Not applicable (RDT requirement)*

12.5.2.1.9 Multi-party Option - *ABCD Codes Received by the RDT*

R12-82 [954] *Not applicable (RDT requirement)*

R12-83 [955] *Not applicable (RDT requirement)*

R12-84 [956] *Not applicable (RDT requirement)*

R12-85 [957] *Not applicable (RDT requirement)*

R12-86 [958] *Not applicable (RDT requirement)*

R12-87 [959] *Not applicable (RDT requirement)*

R12-88 [960] *Not applicable (RDT requirement)*

12.5.2.1.10 Multi-party Option - *ABCD Codes Sent to the IDT*

R12-89 [961] *Not applicable (RDT requirement)*

R12-90 [962] *Not applicable (RDT requirement)*

R12-91 [963] *Not applicable (RDT requirement)*

12.5.2.1.11 FXS (Loop Start) Option - *ABCD Codes Received by the RDT*

R12-92 [964] *Not applicable (RDT requirement)*

CR12-93 [965] *Not applicable (RDT requirement)*

CR12-94 [966] *Not applicable (RDT requirement)*

R12-95 [967] *Not applicable (RDT requirement)*

R12-96 [968] *Not applicable (RDT requirement)*

R12-97 [969] *Not applicable (RDT requirement)*

12.5.2.1.12 FXS (Loop Start) Option - *ABCD Codes Sent to the DNE*

R12-98 [970] *Not applicable (RDT requirement)*

R12-99 [971] *Not applicable (RDT requirement)*

12.5.2.1.13 FXS (Ground Start) - *ABCD Codes Received by the RDT*

R12-100 [972] *Not applicable (RDT requirement)*

CR12-101 [973] *Not applicable (RDT requirement)*

CR12-102 [974] *Not applicable (RDT requirement)*

R12-103 [975] *Not applicable (RDT requirement)*

R12-104 [976] *Not applicable (RDT requirement)*

R12-105 [977] *Not applicable (RDT requirement)*

12.5.2.1.14 FXS (Ground Start) Option - *ABCD Codes Sent to the DNE*

R12-106 [978] *Not applicable (RDT requirement)*

R12-107 [979] *Not applicable (RDT requirement)*

R12-108 [980] *Not applicable (RDT requirement)*

12.5.2.1.15 FXO (Loop Start) Option - *ABCD Codes Received by the RDT*

R12-109 [981] *Not applicable (RDT requirement)*

R12-110 [982] *Not applicable (RDT requirement)*

12.5.2.1.16 FXO (Loop Start) Option - *ABCD Codes Sent to the DNE*

R12-111 [983] *Not applicable (RDT requirement)*

R12-112 [984] *Not applicable (RDT requirement)*

R12-113 [985] *Not applicable (RDT requirement)*

12.5.2.1.17 FXO (Ground Start) - *ABCD Codes Received by the RDT*

R12-114 [986] *Not applicable (RDT requirement)*

R12-115 [987] *Not applicable (RDT requirement)*

R12-116 [988] *Not applicable (RDT requirement)*

12.5.2.1.18 FXO (Ground Start) Option - *ABCD Codes Sent to the DNE*

R12-117 [989] *Not applicable (RDT requirement)*

R12-118 [990] *Not applicable (RDT requirement)*

R12-119 [991] *Not applicable (RDT requirement)*

12.5.2.2 TMC and CSC Messages

R12-120 [992] *Compliant*

12.5.2.2.1 SETUP

R12-121 [993] *Compliant*

CR12-122 [994] *Compliant*

C R12-123 [995] *Non-compliant (CSC requirement)*

C R12-124 [996] *Non-compliant (CSC requirement)*

12.5.2.2.2 SETUP ACKNOWLEDGE

R12-125 [997] *Non-compliant (CSC requirement)*

12.5.2.2.3 ALERTING

R12-126 [998] *Non-compliant (CSC requirement)*

R12-127 [999] *Non-compliant (CSC requirement)*

12.5.2.2.4 CALL PROCEEDING

R12-128 [1000] *Non-compliant (CSC requirement)*

R12-129 [1001] *Non-compliant (CSC requirement)*

12.5.2.2.5 CONNECT

R12-130 [1002] *Compliant*

CR12-131 [1003] *Compliant*

CR12-132 [1004] *Not applicable (RDT requirement)*

CR12-133 [1005] *Non-compliant (CSC requirement)*

CR12-134 [1006] *Non-compliant (CSC requirement)*

CR12-135 [1007] *Non-compliant (CSC requirement)*

12.5.2.2.6 DISCONNECT

R12-136 [1008] *Compliant*

12.5.2.2.7 RELEASE

R12-137 [1009] *Compliant*

12.5.2.2.8 RELEASE COMPLETE

R12-138 [1010] *Compliant*

12.5.2.2.9 INFORMATION

R12-139 [1011] *Compliant*

R12-140 [1012] *Not applicable (RDT requirement)*

R12-141 [1013] *Compliant*

CR12-142 [1014] *Non-compliant (CSC requirement)*

CR12-143 [1015] *Non-compliant (CSC requirement)*

CR12-144 [1016] *Not applicable (RDT requirement)*

CR12-145 [1017] *Not applicable (RDT requirement)*

CR12-146 [1018] *Not applicable (RDT requirement)*

12.5.2.2.10 NOTIFY

R12-147 [1019] *Non-compliant (CSC requirement)*

12.5.2.2.11 STATUS ENQUIRY

R12-148 [1020] *Compliant*

12.5.2.2.12 STATUS

R12-149 [1021] *Compliant*

12.5.2.2.12 CONNECT ACKNOWLEDGE

R12-150 [1022] *Compliant*

12.5.2.3 TMC and CSC Information Elements

R12-151 [1023] *Compliant*

12.5.2.3.1 Protocol Discriminator

R12-152 [1024] *Compliant*

12.5.2.3.2 Call Reference

R12-153 [1025] *Compliant*

R12-154 [1026] *Compliant*

R12-155 [1027] *Compliant*

The TR-303 multivendor interface on DMS SuperNode uses the line termination number as the Call Reference Value for each customer line in TMC messages. The provisionable association between RDT termination ports and CRVs is not supported.

R12-156 [1028] *Compliant*

R12-157 [1029] *Compliant*

R12-158 [1030] *Compliant*

12.5.2.3.3 Message Type

R12-159 [1031] *Compliant (with exceptions)*

All Message Type elements in Table12-7 of GR-303 are supported except ALERTING, CALL PROCEEDING, NOTIFY and SETUP ACKNOWLEDGE which are not used in the TMC protocol.

12.5.2.3.4 Bearer Capability

R12-160 [1032] *Compliant*

12.5.2.3.5 Cause

R12-161 [1033] *Compliant*

R12-162 [1034] *Compliant*

R12-163 [1035] *Compliant*

12.5.2.3.6 Call State

R12-164 [1036] *Compliant*

R12-165 [1037] *Compliant*

12.5.2.3.7 Channel Identification

R12-166 [1038] *Compliant*

R12-167 [1039] *Compliant*

R12-168 [1040] *Compliant*

12.5.2.3.8 Notification Indicator

R12-169 [1041] *Non-compliant (CSC requirement)*

R12-170 [1042] *Non-compliant (CSC requirement))*

12.5.2.3.9 Keypad Facility

R12-171 [1043] *Non-compliant (CSC requirement)*

R12-172 [1044] *Non-compliant (CSC requirement)*

12.5.2.3.10 Signal

R12-173 [1045] *Non-compliant (CSC requirement)*

R12-174 [1046] *Non-compliant (CSC requirement)*

12.5.2.3.11 Switchhook

R12-175 [1047] *Compliant*

R12-176 [1048] *Compliant*

12.5.3 Time-slot Management Channel Scenarios

R12-177 [1049] *Compliant*

R12-178 [1050] *Compliant*

12.5.3.1 Assignment Initiated by the IDT

R12-179 [1051] *Compliant*

R12-180 [1052] *Not applicable (RDT requirement)*

R12-181 [1053] *Compliant*

12.5.3.2 Assignment Initiated by the Customer

R12-182 [1054] *Not applicable (RDT requirement)*

R12-183 [1055] *Compliant*

R12-184 [1056] *Not applicable (RDT requirement)*

R12-185 [1057] *Compliant*

12.5.3.3 Clearing

R12-186 [1058] *Compliant*

R12-187 [1059] *Not applicable (RDT requirement)*

R12-188 [1060] *Compliant*

R12-189 [1061] *Compliant*

12.5.3.4 On-hook Transmission

R12-190 [1062] *Compliant*

The Phase Continuity requirement has been removed from TR-303, Issue 2, October 1992.

CR12-191 [1063] *Compliant*

CR12-192 [1064] *Not applicable (RDT requirement)*

R12-193 [1065] *Compliant*

R12-194 [1066] *Compliant*

12.5.4 Common Signaling Channel Scenarios

No requirements stated

12.5.4.1 General

R12-195 [1067] *Non-compliant (CSC requirement)*

R12-196 [1068] *Non-compliant (CSC requirement)*

12.5.4.2 Loop Start Circuits

No text

12.5.4.2.1 Establishment Initiated by the IDT

R12-197 [1069] *Non-compliant (CSC requirement)*

R12-198 [1070] *Not applicable (RDT requirement)*

R12-199 [1071] *Not applicable (RDT requirement)*

R12-200 [1072] *Not applicable (RDT requirement)*

CR12-201 [1073] *Non-compliant (CSC requirement)*

R12-202 [1074] *Not applicable (RDT requirement)*

12.5.4.2.2 Establishment Initiated by the CPE

R12-203 [1075] *Not applicable (RDT requirement)*

R12-204 [1076] *Non-compliant (CSC requirement)*

R12-205 [1077] *Not applicable (RDT requirement)*

R12-206 [1078] *Not applicable (RDT requirement)*

R12-207 [1079] *Non-compliant (CSC requirement)*

O12-208 [1080] *Non-compliant (CSC requirement)*

12.5.4.2.3 Clearing Initiated by the IDT

R12-209 [1081] *Non-compliant (CSC requirement)*

R12-210 [1082] *Not applicable (RDT requirement)*

R12-211 [1083] *Not applicable (RDT requirement)*

R12-212 [1084] *Non-compliant (CSC requirement)*

R12-213 [1085] *Non-compliant (CSC requirement)*

12.5.4.2.4 Clearing Initiated by the CPE

R12-214 [1086] *Not applicable (RDT requirement)*

R12-215 [1087] *Non-compliant (CSC requirement)*

R12-216 [1088] *Non-compliant (CSC requirement)*

R12-217 [1089] *Not applicable (RDT requirement)*

R12-218 [1090] *Not applicable (RDT requirement)*

R12-219 [1091] *Not applicable (RDT requirement)*

12.5.4.3 Ground Start Circuits

No text

12.5.4.3.1 Establishment Initiated by the IDT

R12-220 [1092] *Non-compliant (CSC requirement)*

R12-221 [1093] *Not applicable (RDT requirement)*

R12-222 [1094] *Not applicable (RDT requirement)*

R12-223 [1095] *Not applicable (RDT requirement)*

CR12-224 [1096] *Non-compliant (CSC requirement)*

R12-225 [1097] *Not applicable (RDT requirement)*

12.5.4.3.2 Establishment Initiated by the CPE

R12-226 [1098] *Not applicable (RDT requirement)*

R12-227 [1099] *Non-compliant (CSC requirement)*

R12-228 [1100] *Not applicable (RDT requirement)*

R12-229 [1101] *Not applicable (RDT requirement)*

R12-230 [1102] *Non-compliant (CSC requirement)*

12.5.4.3.3 Clearing Initiated by the IDT

R12-231 [1103] *Non-compliant (CSC requirement)*

R12-232 [1104] *Not applicable (RDT requirement)*

R12-233 [1105] *Not applicable (RDT requirement)*

R12-234 [1106] *Non-compliant (CSC requirement)*

R12-235 [1107] *Non-compliant (CSC requirement)*

12.5.4.3.4 Clearing Initiated by the CPE

R12-236 [1108] *Not applicable (RDT requirement)*

R12-237 [1109] *Non-compliant (CSC requirement)*

R12-238 [1110] *Non-compliant (CSC requirement)*

R12-239 [1111] *Not applicable (RDT requirement)*

R12-240 [1112] *Not applicable (RDT requirement)*

R12-241 [1113] *Not applicable (RDT requirement)*

12.5.4.4 Loop Reverse Battery Circuits

R12-242 [1114] *Not applicable (RDT requirement)*

CR12-243 [1115] *Not applicable (RDT requirement)*

O12-244 [1116] *Not applicable (RDT requirement)*

R12-245 [1117] *Not applicable (RDT requirement)*

12.5.4.4.1 Establishment

R12-246 [1118] *Non-compliant (CSC requirement)*

R12-247 [1119] *Not applicable (RDT requirement)*

R12-248 [1120] *Not applicable (RDT requirement)*

CR12-249 [1121] *Non-compliant (CSC requirement)*

CR12-250 [1122] *Non-compliant (CSC requirement)*

R12-251 [1123] *Not applicable (RDT requirement)*

12.5.4.4.2 Clearing Initiated by the IDT

R12-252 [1124] *Non-compliant (CSC requirement)*

R12-253 [1125] *Not applicable (RDT requirement)*

R12-254 [1126] *Not applicable (RDT requirement)*

R12-255 [1127] *Non-compliant (CSC requirement)*

R12-256 [1128] *Non-compliant (CSC requirement)*

12.5.4.4.3 Clearing Initiated by the CPE

R12-257 [1129] *Not applicable (RDT requirement)*

R12-258 [1130] *Non-compliant (CSC requirement)*

R12-259 [1131] *Non-compliant (CSC requirement)*

R12-260 [1132] *Not applicable (RDT requirement)*

12.5.4.4.4 Clearing Initiated by the CPE during a Basic E-911 call

R12-261 [1133] *Not applicable (RDT requirement)*

R12-262 [1134] *Non-compliant (CSC requirement)*

R12-263 [1135] *Not applicable (RDT requirement)*

R12-264 [1136] *Non-compliant (CSC requirement)*

12.5.4.4.5 Clearing Initiated by the CPE during a Expanded E-911 call - Option

R12-265 [1137] *Not applicable (RDT requirement)*

R12-266 [1138] *Non-compliant (CSC requirement)*

R12-267 [1139] *Non-compliant (CSC requirement)*

R12-268 [1140] *Not applicable (RDT requirement)*

R12-269 [1141] *Non-compliant (CSC requirement)*

R12-270 [1142] *Not applicable (RDT requirement)*

R12-271 [1143] *Not applicable (RDT requirement)*

12.5.4.5 Coin - Option

No requirements stated

12.5.4.6 Multi-party - Option

No requirements stated

12.5.4.6.1 Reverting Call Establishment

R12-272 [1144] *Not applicable (RDT requirement)*

R12-273 [1145] *Non-compliant (CSC requirement)*

R12-274 [1146] *Not applicable (RDT requirement)*

R12-275 [1147] *Not applicable (RDT requirement)*

R12-276 [1148] *Non-compliant (CSC requirement)*

R12-277 [1149] *Not applicable (RDT requirement)*

R12-278 [1150] *Non-compliant (CSC requirement)*

R12-279 [1151] *Not applicable (RDT requirement)*

R12-280 [1152] *Not applicable (RDT requirement)*

12.5.4.7 ISDN Basic Access Circuits - Option

No requirements stated

Note: This sub-section contains TMC requirements which were inadvertently placed in Section 12.5.4 "Common Signaling Channel Scenarios" of GR-303.

12.5.4.7.1 Establishment

R12-281 [1153] *Compliant*

R12-282 [1154] *Not applicable (RDT requirement)*

R12-283 [1155] *Compliant*

12.5.4.7.2 Clearing

R12-284 [1156] *Compliant*

R12-285 [1157] *Not applicable (RDT requirement)*

R12-286 [1158] *Compliant*

12.5.4.8 Digital Data System (DDS) Circuits - Option

R12-287 [1159] *Non-compliant (CSC requirement)*

12.5.4.9 On-hook Transmission

R12-288 [1160] *Non-compliant (CSC requirement)*

12.5.5 Detailed TMC/CSC Procedures

No requirements stated

12.5.5.1 Null - 0

No text

12.5.5.1.1 IDT (Null - 0)

R12-289 [1161] *Compliant (with exceptions)*

The DMS SuperNode does not increment the IDLC facility blocked terminating call peg count. Nortel may implement this capability in the future contingent on market need.

R12-290 [1162] *Compliant*

R12-291 [1163] *Non-compliant (CSC requirement)*

12.5.5.1.2 RDT (Null - 0)

R12-292 [1164] *Not applicable (RDT requirement)*

R12-293 [1165] *Not applicable (RDT requirement)*

R12-294 [1166] *Not applicable (RDT requirement)*

R12-295 [1167] *Not applicable (RDT requirement)*

R12-296 [1168] *Not applicable (RDT requirement)*

12.5.5.2 Call Initiated - 1

No text

12.5.5.2.1 IDT (Call Initiated - 1)

R12-297 [1169] *Compliant*

(Note: The DMS SuperNode delivers dial-tone on the channel soon after it sends the CONNECT message to the RDT and prior to the receipt of CONNECT ACKNOWLEDGE from the RDT.)

R12-298 [1170] *Non-compliant (CSC requirement)*

R12-299 [1171] *Compliant*

(Note: The DMS SuperNode transmits a RELEASE COMPLETE to inform the RDT that the originating call has been rejected.)

R12-300 [1172] *Compliant*

R12-301 [1173] *Non-compliant (CSC requirement)*

12.5.5.2.2 RDT (Call Initiated - 1)

R12-302 [1174] *Not applicable (RDT requirement)*

R12-303 [1175] *Not applicable (RDT requirement)*

R12-304 [1176] *Not applicable (RDT requirement)*

R12-305 [1177] *Not applicable (RDT requirement)*

R12-306 [1178] *Not applicable (RDT requirement)*

O12-307 [1179] *Not applicable (RDT requirement)*

R12-308 [1180] *Not applicable (RDT requirement)*

R12-309 [1181] *Not applicable (RDT requirement)*

R12-310 [1182] *Not applicable (RDT requirement)*

12.5.5.3 Overlap Sending - 2

No text

12.5.5.3.1 IDT (Overlap Sending - 2)

R12-311 [1183] *Non-compliant (CSC requirement)*

R12-312 [1184] *Non-compliant (CSC requirement)*

R12-313 [1185] *Non-compliant (CSC requirement)*

12.5.5.3.2 RDT (Overlap Sending - 2)

R12-314 [1186] *Not applicable (RDT requirement)*

R12-315 [1187] *Not applicable (RDT requirement)*

R12-316 [1188] *Not applicable (RDT requirement)*

Note: The DMS SuperNode does not keep peg counts of call failures for originating and terminating calls due to cause=41. Nortel may implement this capability in the future contingent on market need.

12.5.5.4 Call Present - 6

No text

12.5.5.4.1 IDT (Call Present - 6)

R12-317 [1189] *Compliant*

R12-318 [1190] *Compliant*

R12-319 [1191] *Compliant*

CR12-320 [1192] *Non-compliant (CSC requirement)*

CR12-321 [1193] *Non-compliant (CSC requirement)*

CR12-322 [1194] *Non-compliant (CSC requirement)*

CR12-323 [1195] *Non-compliant (CSC requirement)*

CR12-324 [1196] *Non-compliant (CSC requirement)*

CR12-325 [1197] *Non-compliant (CSC requirement)*

R12-326 [1198] *Compliant*

12.5.5.4.2 RDT (Call Present - 6)

R12-327 [1199] *Not applicable (RDT requirement)*

R12-328 [1200] *Not applicable (RDT requirement)*

Note: The DMS SuperNode does not keep peg counts of call failures for originating and terminating calls due to cause=41. Nortel may implement this capability in the future contingent on market need.

R12-329 [1201] *Not applicable (RDT requirement)*

CR12-330 [1202] *Not applicable (RDT requirement)*

CR12-331 [1203] *Not applicable (RDT requirement)*

CR12-332 [1204] *Not applicable (RDT requirement)*

R12-333 [1205] *Not applicable (RDT requirement)*

R12-334 [1206] *Not applicable (RDT requirement)*

R12-335 [1207] *Not applicable (RDT requirement)*

12.5.5.5 Call Received - 7

No text

12.5.5.5.1 IDT (Call Received - 7)

R12-336 [1208] *Non-compliant (CSC requirement)*

R12-337 [1209] *Non-compliant (CSC requirement)*

CR12-836 [1210] *Non-compliant (CSC requirement)*

CR12-339 [1211] *Non-compliant (CSC requirement)*

CR12-340 [1212] *Non-compliant (CSC requirement)*

12.5.5.5.2 RDT (Call Received - 7)

R12-341 [1213] *Not applicable (RDT requirement)*

R12-342 [1214] *Not applicable (RDT requirement)*

CR12-343 [1215] *Not applicable (RDT requirement)*

CR12-344 [1216] *Not applicable (RDT requirement)*

12.5.5.6 Call Proceeding - 9

No text

12.5.5.6.1 IDT (Call Proceeding - 9)

R12-345 [1217] *Non-compliant (CSC requirement)*

R12-346 [1218] *Non-compliant (CSC requirement)*

R12-347 [1219] *Non-compliant (CSC requirement)*

R12-348 [1220] *Non-compliant (CSC requirement)*

12.5.5.6.2 RDT (Call Proceeding - 9)

R12-349 [1221] *Not applicable (RDT requirement)*

R12-350 [1222] *Not applicable (RDT requirement)*

R12-351 [1223] *Not applicable (RDT requirement)*

12.5.5.7 Active - 10

No text

12.5.5.7.1 IDT (Active - 10)

R12-352 [1224] *Non-compliant (CSC requirement)*

R12-353 [1225] *Non-compliant (CSC requirement)*

12.5.5.7.2 RDT (Active - 10)

R12-354 [1226] *Not applicable (RDT requirement)*

R12-355 [1227] *Not applicable (RDT requirement)*

R12-356 [1228] *Not applicable (RDT requirement)*

Note: The DMS SuperNode does not keep peg counts of call failures for originating and terminating calls due to cause=41. Nortel may implement this capability in the future contingent on market need.

R12-357 [1229] *Not applicable (RDT requirement)*

R12-358 [1230] *Not applicable (RDT requirement)*

12.5.5.8 Disconnect Request - 11

No text

12.5.5.8.1 IDT (Disconnect Request - 11)

R12-359 [1231] *Non-compliant (CSC requirement)*

R12-360 [1232] *Non-compliant (CSC requirement)*

CR12-361 [1233] *Non-compliant (CSC requirement)*

CR12-362 [1234] *Non-compliant (CSC requirement)*

CR12-363 [1235] *Non-compliant (CSC requirement)*

12.5.5.8.2 RDT (Disconnect Request - 11)

R12-364 [1236] *Not applicable (RDT requirement)*

R12-365 [1237] *Not applicable (RDT requirement)*

R12-366 [1238] *Not applicable (RDT requirement)*

R12-367 [1239] *Not applicable (RDT requirement)*

CR12-368 [1240] *Not applicable (RDT requirement)*

CR12-369 [1241] *Not applicable (RDT requirement)*

CR12-370 [1242] *Not applicable (RDT requirement)*

R12-371 [1243] *Not applicable (RDT requirement)*

12.5.5.9 Disconnect Indication - 12

No text

12.5.5.9.1 IDT (Disconnect Indication - 12)

R12-372 [1244] *Compliant*

R12-373 [1245] *Non-compliant (CSC requirement)*

R12-374 [1246] *Compliant*

12.5.5.9.2 RDT (Disconnect Indication - 12)

R12-375 [1247] *Not applicable (RDT requirement)*

12.5.5.10 Release Request - 19

No text

12.5.5.10.1 IDT (Release Request - 19)

R12-376 [1248] *Compliant*

R12-377 [1249] *Compliant*

12.5.5.10.2 RDT (Release Request - 19

R12-378 [1250] *Not applicable (RDT requirement)*

R12-379 [1251] *Not applicable (RDT requirement)*

12.5.5.11 Call Clearing

No text

12.5.5.11.1 IDT (Call Clearing)

R12-380 [1252] *Non-compliant (CSC requirement)*

R12-381 [1253] *Non-compliant (CSC requirement)*

R12-382 [1254] *Compliant*

R12-383 [1255] *Compliant*

12.5.5.11.2 RDT (Call Clearing)

R12-384 [1256] *Not applicable (RDT requirement)*

R12-385 [1257] *Not applicable (RDT requirement)*

R12-386 [1258] *Not applicable (RDT requirement)*

R12-387 [1259] *Not applicable (RDT requirement)*

12.5.5.12 Coin - Option

No requirements stated

12.5.5.12.1 IDT (Coin)

R12-388 [1260] *Non-compliant (CSC requirement)*

R12-389 [1261] *Non-compliant (CSC requirement)*

R12-390 [1262] *Non-compliant (CSC requirement)*

12.5.5.12.2 RDT (Coin)

R12-391 [1263] *Not applicable (RDT requirement)*

R12-392 [1264] *Not applicable (RDT requirement)*

12.5.5.13 Tip Party Test - Option

No text

12.5.5.13.1 IDT (Tip Party Test)

R12-393 [1265] *Non-compliant (CSC requirement)*

R12-394 [1266] *Non-compliant (CSC requirement)*

R12-395 [1267] *Non-compliant (CSC requirement)*

12.5.5.13.2 RDT (Tip Party Test)

R12-396 [1268] *Not applicable (RDT requirement)*

R12-397 [1269] *Not applicable (RDT requirement)*

12.5.5.14 Permanent Signal Procedures

R12-398 [1270] *Compliant*

R12-399 [1271] *Not applicable (RDT requirement)*

R12-400 [1272] *Compliant*

12.5.5.14.1 IDT (Permanent Signal - 100)

R12-401 [1273] *Compliant*

R12-402 [1274] *Compliant*

12.5.5.14.2 RDT (Permanent Signal - 100)

R12-403 [1275] *Not applicable (RDT requirement)*

O12-404 [1276] *Not applicable (RDT requirement)*

12.5.5.15 Call State Mismatch Procedures

No requirements stated

12.5.5.15.1 IDT (Call State Mismatch)

CR12-405 [1277] *Compliant*

CR12-406 [1278] *Compliant*

R12-407 [1279] *Compliant*

12.5.5.15.2 RDT (Call State Mismatch)

R12-408 [1280] *Not applicable (RDT requirement)*

R12-409 [1281] *Not applicable (RDT requirement)*

R12-410 [1282] *Not applicable (RDT requirement)*

12.5.5.16 Error Handling Procedures

No requirements stated

12.5.5.16.1 Protocol Discriminator Error

R12-411 [1283] *Compliant*

12.5.5.16.2 Length Error

R12-412 [1284] *Compliant*

12.5.5.16.3 Call Reference Errors

R12-413 [1285] *Compliant*

R12-414 [1286] *Compliant*

R12-415 [1287] *Not applicable (RDT requirement)*

R12-416 [1288] *Compliant*

R12-417 [1289] *Not applicable (RDT requirement)*

R12-418 [1290] *Compliant*

R12-419 [1291] *Non-compliant (CSC requirement)*

R12-420 [1292] *Not applicable (RDT requirement)*

12.5.5.16.4 Message Type Error

R12-421 [1293] *Compliant*

O12-422 [1294] *Compliant*

R12-423 [1295] *Compliant*

R12-424 [1296] *Not applicable (RDT requirement)*

R12-425 [1297] *Not applicable (RDT requirement)*

R12-426 [1298] *Compliant*

R12-427 [1299] *Non-compliant (CSC requirement)*

R12-428 [1300] *Non-compliant (CSC requirement)*

12.5.5.16.5 Mandatory Information Element Missing Error

R12-429 [1802] *Compliant*

R12-430 [1301] *Compliant*

R12-431 [1302] *Compliant*

R12-432 [1803] *Compliant*

R12-433 [1303] *Compliant*

12.5.5.16.6 Information Element Content Error

R12-434 [1304] *Compliant*

R12-435 [1305] *Compliant*

R12-436 [1306] *Compliant*

12.5.5.16.7 Unrecognized Information Element Error

O12-437 [1307] *Non-compliant*

CO12-438 [1308] *Non-compliant*
The DMS SuperNode does not support O12-437.

CR12-439 [1804] *Compliant*

12.5.5.16.8 Channel Identification Error

R12-440 [1309] *Compliant*

12.5.5.16.9 Cutoff Calls

R12-441 [1310] *Compliant*

R12-442 [1311] *Not applicable (RDT requirement)*

R12-443 [1805] *Compliant*

12.5.5.16.10 Unexpected Call Origination Requests

R12-444 [1312] *Not applicable (RDT requirement)*

R12-445 [1313] *Not applicable (RDT requirement)*

12.5.5.16.11 Call Treatment on RDT Reset

R12-446 [1314] *Compliant*

12.5.5.17 TMC/CSC Timers

No requirements stated

12.5.5.17.1 T303

R12-447 [1315] *Compliant*

R12-448 [1316] *Compliant*

R12-449 [1317] *Not applicable (RDT requirement)*

R12-450 [1318] *Not applicable (RDT requirement)*

12.5.5.17.2 T305

R12-451 [1319] *Compliant*

R12-452 [1320] *Non-compliant (CSC requirement)*

12.5.5.17.3 T308

R12-453 [1321] *Compliant*

12.5.5.17.4 T322

CR12-454 [1322] *Compliant*

12.5.5.17.5 T397

R12-455 [1323] *Not applicable (RDT requirement)*

12.5.5.17.6 T398

R12-456 [1324] *Non-compliant (CSC requirement)*

12.5.5.17.7 T399

R12-457 [1325] *Non-compliant (CSC requirement)*

12.5.5.17.8 T313

R12-458 [1326] *Compliant*

On the DMS SuperNode, the T313 timer is chosen to have the value of 500 ms.

R12-459 [1327] *Compliant*

12.5.5.17.9 T396

R12-460 [1328] *Not applicable (RDT requirement)*

R12-461 [1329] *Not applicable (RDT requirement)*

12.5.5.17.10 T395

CR12-462 [1330] *Non-compliant (CSC requirement)*

12.5.5.18 Connect Request - 8

R12-463 [1331] *Compliant*

R12-464 [1332] *Compliant*

R12-465 [1333] *Compliant*

12.5.5.19 Blocked Originating Call Procedures I

R12-466 [1334] *Non-compliant*

R12-467 [1335] *Non-compliant*

CR12-468 [1336] *Non-compliant*

CR12-469 [1337] *Non-compliant*

CR12-470 [1338] *Non-compliant*

CR12-471 [1339] *Non-compliant*

12.5.5.20 Blocked Originating Call Procedures II

R12-472 [1340] *Non-compliant*

R12-473 [1341] *Non-compliant*

CR12-474 [1342] *Non-compliant*

CR12-475 [1343] *Non-compliant*

CR12-476 [1344] *Non-compliant*

CR12-477 [1345] *Non-compliant*

12.5.6 Provisioning Scenarios

No requirements stated

12.5.7 ISDN Basic Access - Option

R12-478 [1346] *Compliant*

R12-479 [1347] *Not applicable (RDT requirement)*

R12-480 [1348] *Not applicable (RDT requirement)*

12.5.7.1 3-DS0 TDM

No requirements stated

12.5.7.2 4:1 TDM

O12-481 [1349] *Compliant*

R12-482 [1350] *Not applicable (RDT requirement)*

O12-483 [1351] *Not applicable (RDT requirement)*

12.5.8 Transmission - Voice

No text

12.5.8.1 General

No requirements stated

12.5.8.2 Transmission Level Point

No requirements stated

12.5.8.3 Return Loss

R12-484 [1352] *Not applicable (RDT requirement)*

12.5.8.4 Longitudinal Balance

R12-485 [1353] *Not applicable (RDT requirement)*

12.5.8.5 Total Loss

No requirements stated

12.5.8.5.1 Network Loss Plan

R12-486 [1354] *Compliant*

O12-487 [1355] *Not applicable (RDT requirement)*

12.5.8.5.2 Access Loss Plan

R12-488 [1356] *Compliant*

R12-489 [1357] *N*ot applicable (RDT requirement)

12.5.8.6 IDLC System Loss Tolerance

R12-490 [1358] *Not applicable (RDT requirement)*

O12-491 [1359] *Not applicable (RDT requirement)*

12.5.8.7 Frequency Response

R12-492 [1360] *Not applicable (RDT requirement)*

12.5.8.8 60 Hz Loss

R12-493 [1361] *Not applicable (RDT requirement)*

12.5.8.9 Amplitude Tracking

R12-494 [1362] *Not applicable (RDT requirement)*

12.5.8.10 Idle Channel Noise

R12-495 [1363] *Not applicable (RDT requirement)*

12.5.8.11 Signal-to-Distortion Ratio

R12-496 [1364] *Not applicable (RDT requirement)*

12.5.8.12 Intermodulation Distortion

R12-497 [1365] *Not applicable (RDT requirement)*

12.5.8.13 Single Frequency Distortion

R12-498 [1366] *Not applicable (RDT requirement)*

12.5.8.14 Peak-to-Average Ratio

R12-499 [1367] *Not applicable (RDT requirement)*

12.5.8.15 Crosstalk

R12-500 [1368] *Not applicable (RDT requirement)*

12.5.8.16 Hybrid Balance

R12-501 [1369] *Not applicable (RDT requirement)*

12.5.9 Signaling and Supervision

R12-502 [1370] *Compliant*

12.5.9.1 Service Related Timing Requirements

R12-503 [1371] *Not applicable (RDT requirement)*

CO12-504 [1372] *Not applicable (RDT requirement)*

CO12-505 [1373] *Compliant*

Normal operating conditions and traffic levels are assumed.

12.5.9.2 60 Hz Induction Immunity

R12-506 [1374] *Not applicable (RDT requirement)*

12.5.9.3 Non-locally Switched Services - Option

R12-507 [1375] *Not applicable (RDT requirement)*

12.5.9.4 Intra-RDT calls

No requirements stated

12.5.10 Multiple Interface Group (Multi-IG) Feature

No text

12.5.10.1 Multi-IG Feature Description

No requirements stated

12.5.10.2 Multi-IG Feature Benefits

No requirements stated

12.5.10.3 Requirements on an RDT for Multi-IG Feature

R12-508 [1376] *Not applicable (RDT requirement)*

R12-509 [1377] *Not applicable (RDT requirement)*

R12-510 [1378] *Not applicable (RDT requirement)*

CR12-511 [1379] *Not applicable (RDT requirement)*

CR12-512 [1380] *Not applicable (RDT requirement)*

CR12-53 [1381] *Not applicable (RDT requirement)*

R12-514 [1382] *Not applicable (RDT requirement)*

R12-515 [1383] *Not applicable (RDT requirement)*

R12-516 [1384] *Not applicable (RDT requirement)*

R12-517 [1385] *Not applicable (RDT requirement)*

O12-518 [1386] *Not applicable (RDT requirement)*

R12-519 [1387] *Not applicable (RDT requirement)*

R12-520 [1388] *Not applicable (RDT requirement)*

R12-521 [1389] *Not applicable (RDT requirement)*

R12-522 [1390] *Not applicable (RDT requirement)*

R12-523 [1391] *Not applicable (RDT requirement)*

CR12-524 [1392] *Not applicable (RDT requirement)*

R12-525 [1393] *Not applicable (RDT requirement)*

R12-526 [1394] *Not applicable (RDT requirement)*

R12-527 [1395] *Not applicable (RDT requirement)*

R12-528 [1396] *Not applicable (RDT requirement)*

12.5.10.4 Requirements for an IDT for Multi-IG Feature

R12-529 [1397] *Compliant*

12.5.11 NxDS0 Feature - Option

The DMS SuperNode does not support this optional feature at this time.

12.6 Requirements and Options Supporting Interfacing to the Digital Network

No text

12.6.1 Interface Requirements

No requirements stated

12.6.1.1 Additional DTF-Interface Requirements

R12-533 [1398] *Compliant*

R12-534 [1399] *Compliant*

R12-535 [1400] *Compliant (with exceptions)*

In the implementation of the TR-303 multivendor interface on DMS SuperNode, the use of the 4 kb/s data-link for message-oriented transmissions (e.g. one second performance reports) is not supported.

R12-536 [1401] *Compliant (with exceptions)*

If the Enhanced Network (ENET) is used, the maximum round-trip-delay is 1.31 ms which is within the 1.4 ms as stated in this requirement. If the Dual-Shelf Network (i.e. JNET) is used, the maximum round-trip-delay is 1.89 ms.

CR12-537 [1402] *Compliant*

R12-538 [1403] *Not applicable (RDT requirement)*

CR12-539 [1404] *Not applicable (RDT requirement)*

O12-540 [1405] *Compliant*

See the comments on R12-536.

CR12-541 [1406] *Non-compliant (CSC requirement)*

CR12-542 [1407] *Compliant*

R12-543 [1408] *Compliant*

R12-544 [1409] *Compliant*

R12-545 [1410] *Not applicable (RDT requirement)*

R12-546 [1411] *Compliant*

R12-547 [1412] *Compliant*

12.6.1.2 Physical Layer Requirements

R12-548 [1413] *Compliant (with exceptions)*

This implementation of the TR-303 multivendor interface on DMS SuperNode exhibits the following exceptions:

- The DMS SuperNode does not monitor the Severely Errored Framing Second (SEFS) condition. Also, line coding violation counts and path coding violation counts cannot be supported simultaneously.

- The DMS SuperNode does not support the transmission, interpretation, storage, or thresholding of Performance Report Messages (PRMs) on the 4 kb/s FDL.

R12-549 [1414] *Compliant*

R12-550 [1415] *Compliant*

R12-551 [1416] *Compliant*

12.6.1.3 Data Link Layer Requirements

R12-552 [1417] *Compliant (with exceptions)*

This implementation of the TR-303 multivendor interface on DMS SuperNode supports TMC only. CSC is not supported. Also, the DMS SuperNode will not support all of the EOC link configurations described. See section 12.4.3.5.11 for additional information.

12.6.1.3.1 ABCD Robbed-Bit Signaling

R12-553 [1418] *Compliant*

12.6.1.3.2 Call processing (TMC/CSC) DL Control

R12-554 [1419] *Compliant*

R12-555 [1420] *Compliant*

In this implementation of the TR-303 multivendor interface on DMS SuperNode, the TMC is used to transmit time-slot assignment and call processing messages.

R12-556 [1421] *Compliant*

R12-557 [1422] *Compliant*

R12-558 [1423] *Compliant*

R12-559 [1424] *Compliant*

R12-560 [1425] *Compliant*

R12-561 [1426] *Compliant*

CR12-562 [1427] *Not applicable (RDT requirement)*

R12-563 [1428] *Compliant*

R12-564 [1429] *Compliant*

R12-565 [1430] *Compliant*

R12-566 [1431] *Compliant*

R12-567 [1432] *Compliant*

12.6.1.3.3 Operations DL Control

R12-568 [1433] *Compliant*

R12-569 [1434] *Compliant*

R12-570 [1435] Compliant

R12-571 [1436] *Compliant*

R12-572 [1437] *Compliant*

R12-573 [1438] *Compliant*

CR12-574 [1439] *Not applicable (RDT requirement)*

R12-575 [1440] *Compliant*

R12-576 [1441] *Compliant*

R12-577 [1442] *Compliant*

R12-578 [1443] *Compliant*

R12-579 [1444] *Compliant*

12.6.1.4 Convergence Function

No requirements stated

12.6.1.4.1 EOC Segmentation/Reassembly Requirements

R12-580 [1445] *Compliant*

R12-581 [1446] *Compliant*

R12-582 [1447] *Compliant*

R12-583 [1448] *Compliant*

R12-584 [1449] *Non-compliant*

GR-303 states that the maximum size of an APDU that must be processed by the convergence function is 10K (10240) octets. In this implementation of the TR-303 multivendor interface on DMS SuperNode, the maximum size of an APDU that must be processed by the convergence function is 2K (2048) octets.

Nortel has conducted extensive analyses on APDU utilization. Results of these studies indicate the messages being sent by the RDT and expected to be received by the DMS SuperNode are smaller than 2K octets. To avoid unnecessary memory allocation in the RDT, as well as the DMS SuperNode, Nortel has elected to set the maximum size of the APDU at 2K octets. If in the future messages are identified that require greater than 2K octets, Nortel will expand the buffer management to accommodate that need.

CR12-585 [1450] *Compliant*

R12-586 [1451] *Compliant*

R12-587 [1452] *Compliant*

O12-588 [1453] *Compliant*

R12-589 [1454] *Compliant*

R12-590 [1455] *Compliant*

O12-591 [1456] *Compliant*

R12-592 [1457] *Compliant*

R12-593 [1458] *Compliant*

12.6.1.4.2 Error Handling Within the Convergence Function

O12-594 [1459] *Compliant*

R12-595 [1460] *Compliant*

R12-596 [1461] *Compliant*

R12-597 [1462] *Compliant*

R12-598 [1463] *Compliant*

12.6.1.5 Application Layer

R12-599 [1464] *Compliant*

R12-600 [1465] *Compliant*

The supported CMIP version on the DMS SuperNode is ISO/IEC 9596-1, 1991, i.e., version 2.

R12-601 [1466] *Compliant*

R12-602 [1467] *Compliant*

Requirements R12-603 - CR12-606 are specific to a 7 layer OSI protocol stack which has not been defined for the OS-LDS or IDT-RDT interfaces, and therefore are not applicable to the DMS SuperNode.

R12-603 [1468] *Not applicable*

CR12-604 [1469] *Not applicable*

CR12-605 [1470] *Not applicable*

CR12-606 [1471] *Not applicable*

R12-607 [1472] *Non-compliant*

The only AE-title used is managementUserId of the Event Report Control object. It is used in object creation. The DMS SuperNode does not retrieve or modify this attribute after objects are created, therefore, the syntax of AE-title is not significant and it does not affect operations. The syntax of AE-title used by the DMS SuperNode is shown in section 2.4 of Appendix B.

R12-608 [1473] *Compliant*

R12-609 [1474] *Non-compliant*

In this implementation of the TR-303 multivendor interface on DMS SuperNode, the maximum size supported for an APDU including the encoding by Basic Encoding Rules is 2K (2048) octets. See the comments on R12-584 in this document.

12.6.2 DS1 Facility Protection Switch - Option

This function has been deferred to a later release of the DMS SuperNode TR-303 Implementation.

R12-610 [1475] *Compliant*

R12-611 [1476] *Compliant*

O12-612 [1477] *Not applicable (RDT requirement)*

R12-613 [1478]*Compliant*

R12-614 [1479] *Compliant*

Calls on the affected DS1s that are in the digit collection state during the protection switching interval are disconnected to avoid misrouting.

R12-615 [1480] *Not applicable (RDT requirement)*

R12-616 [1481] *Compliant*

R12-617 [1482] *Compliant*

R12-618 [1483] *Non-compliant*

When the protection DS1 is not in use, the protection DS1 carries PCM idle tone (7F Hex) in each of the 24 DS0 channels.

R12-619 [1484] *Non-compliant*

After a successful switch to the protection DS1 has been completed, the DS1 whose signal has been moved to the protection DS1 carries the PCM idle tone (7F Hex) in each of its 24 channels.

R12-620 [1485] *Compliant*

R12-621 [1486] *Compliant*

R12-622 [1487] *Compliant*

R12-623 [1488] *Compliant*

R12-624 [1489] *Compliant*

R12-625 [1490] *Compliant*

R12-626 [1491] *Compliant*

R12-627 [1492] *Compliant*

R12-628 [1493] *Compliant*

R12-629 [1494] *Compliant*

R12-630 [1495] *Compliant*

R12-631 [1496] *Compliant*

R12-632 [1497] *Compliant*

R12-633 [1498] *Compliant*

R12-634 [1499] *Compliant*

R12-635 [1500] *Compliant*

R12-636 [1501] *Compliant*

R12-637 [1502] *Compliant (with exceptions)*

When the protection DS1 is not in use, it carries the PCM idle tone (7F Hex per DS0) on its payload.

R12-638 [1503] *Compliant*

R12-639 [1504] *Compliant*

CR12-640 [1505] *Compliant*

R12-641 [1506] *Compliant*

R12-642 [1507] *Compliant*

R12-643 [1508] *Compliant*

CR12-644 [1509] *Compliant*

R12-645 [1510] *Compliant*

R12-646 [1511] *Compliant*

The DMS SuperNode detects the 16-bit messages used in the DS1 facility protection switching procedures when the same message is present in two consecutive 16-bit message patterns.

R12-647 [1512] *Compliant*

R12-648 [1513] *Compliant (with exceptions)*

In this implementation of the TR-303 multivendor interface on DMS SuperNode, the DMS SuperNode will neither send Performance Report Messages to the RDT nor process Performance Report Messages received from the RDT.

R12-649 [1514] *Compliant*

R12-650 [1515] *Compliant*

R12-651 [1516] *Compliant*

R12-652 [1517] *Compliant*

R12-653 [1518] *Compliant*

R12-654 [1519] *Compliant*

R12-655 [1520] *Not applicable (RDT requirement)*

R12-656 [1521] *Compliant*

12.6.2.1 Successful Facility Protection Switch Procedures

R12-657 [1522] *Compliant*

R12-658 [1523] *Compliant*

R12-659 [1524] *Compliant (with exceptions)*

Since the OIM is not supported in the implementation of the TR-303 multivendor interface on DMS SuperNode at this time, the operations maintenance message will be sent to the LDS Operations Interface.

CR12-660 [1525] *Compliant (with exceptions)*

Since the OIM is not supported in the implementation of the TR-303 multivendor interface on DMS SuperNode at this time, the operations maintenance message will be sent to the LDS Operations Interface.

R12-661 [1526] *Compliant*

R12-662 [1527] *Compliant*

R12-663 [1528] *Compliant*

12.6.2.2 Failed Facility Protection Switch Procedures

R12-664 [1529] *Compliant (with exceptions)*

The implementation of the TR-303 multivendor interface on DMS SuperNode exhibits some exceptions to the requirements in Section 4.7 and 4.9. See sections 12.6.1.1 and 12.6.3 of this document for an explanation of the exceptions.

R12-665 [1530] *Compliant*

R12-666 [1531] *Compliant*

12.6.2.3 Facility Protection Switching Procedures

R12-667 [1532] *Compliant*

R12-668 [1533] *Compliant*

R12-669 [1534] *Compliant*

R12-670 [1535] *Compliant*

R12-671 [1536] *Compliant*

R12-672 [1537] *Compliant*

R12-673 [1538] *Compliant*

R12-674 [1539] *Compliant*

R12-675 [1540] *Compliant*

R12-676 [1541] *Compliant*

R12-677 [1542] *Compliant*

R12-678 [1543] *Compliant*

R12-679 [1544] *Compliant*

R12-680 [1545] *Compliant*

R12-681 [1546] *Compliant*

12.6.2.4 Successful DS1 Facility Protection Release Procedures

R12-682 [1547] *Compliant*

R12-683 [1548] *Compliant (with exceptions)*

Since the OIM is not supported in the implementation of the TR-303 multivendor interface on DMS SuperNode at this time, the operations maintenance message will be sent to the LDS Operations Interface.

R12-684 [1549] *Compliant*

R12-685 [1550] *Compliant*

12.6.2.5 DS1 Facility Protection Release Procedures

R12-686 [1551] *Compliant*

R12-687 [1552] *Compliant*

R12-688 [1553] *Not applicable (RDT requirement)*

R12-689 [1554] *Not applicable (RDT requirement)*

R12-690 [1555] *Compliant*

R12-691 [1556] *Compliant*

R12-692 [1557] *Compliant*

R12-693 [1558] *Compliant*

R12-694 [1559] *Compliant*

R12-695 [1560] *Compliant*

R12-696 [1561] *Compliant*

R12-697 [1562] *Compliant*

R12-698 [1563] *Compliant*

R12-699 [1564[*Compliant*

12.6.2.6 Error Recovery for Facility Protection Switching and Release

R12-700 [1565] *Compliant*

R12-701 [1566] *Compliant*

R12-702 [1567] *Compliant*

12.6.2.7 Failure or Degradation of the Protection DS1

R12-703 [1568] *Compliant*

12.6.3 EOC and TMC/CSC Path Protection Switching

R12-704 [1569] *Non-Compliant*

The DMS SuperNode implements the functional requirements in this section using the services and information model defined in Supplement 3 of TR-TSY-000303 instead of GR-2833-CORE as conditionally required in CR12-705 [1570]. At this time, GR-2833-CORE is still under revision, and Nortel is actively participating in Bellcore forums to refine the document.

CR12-705 [1570] *Compliant*

R12-706 [1571] *Compliant*

R12-707 [1572] *Compliant*

R12-708 [1573] *Compliant*

R12-709 [1574] *Compliant*

12.6.3.1 General EOC Path and TMC/CSC Path Protection Switch Requirements

R12-710 [1575] *Compliant*

R12-711 [1576] *Compliant*

R12-712 [1577] *Compliant*

R12-713 [1578] *Compliant*

R12-714 [1579] *Compliant*

R12-715 [1580] *Compliant*

R12-716 [1582] *Compliant*

R12-717 [1582] *Compliant*

R12-718 [1583] *Compliant*

R12-719 [1584] *Compliant*

R12-720 [1585] *Compliant*

R12-721 [1586] *Compliant*

R12-722 [1587] *Compliant*

R12-723 [1588] *Compliant*

R12-724 [1589] *Compliant*

R12-725 [1590] *Compliant*

R12-726 [1591] *Compliant*

R12-727 [1592] *Compliant*

R12-728 [1593] *Compliant*

R12-729 [1594] *Compliant*

R12-730 [1595] *Compliant*

R12-731 [1596] *Compliant*

R12-732 [1597] *Compliant*

12.6.3.2 Detection of EOC and TMC/CSC Path Faults

R12-733 [1598] *Compliant*

12.6.3.2.1 Received Disconnected Mode Response Frame Counter

No requirements stated

12.6.3.2.2 Data Link Reset Counter

No requirements stated

12.6.3.2.3 Failure to Establish Multiple Frame Operation

R12-734 [1599] *Compliant*

R12-735 [1600] *Compliant*

R12-736 [1601] *Compliant*

R12-737 [1602] *Compliant*

R12-738 [1603] *Compliant*

R12-739 [1604] *Compliant*

R12-740 [1605] *Compliant*

12.6.3.2.4 Received Invalid Frame Counter

No requirements stated

12.6.3.2.5 Information Frame Received on Standby Path

R12-741 [1606] *Compliant*

O12-742 [1607] *Non-compliant*

12.6.3.2.6 Removal of Protection Switch Inhibit

R12-743 [1608] *Compliant*

12.6.3.3 Forced EOC and TMC/CSC Path Activity

R12-744 [1609] *Compliant*

12.6.3.4 EOC and TMC/CSC Path Protection Switch Messages

DMS SuperNode exhibits the following clarifications to the requirements stated in this section of GR-303:

- In order not to let the received end treat the second broadcasted request as a new path protection switching request, transmission of the second broadcasted request shall occur within 500 ms. of the first.

- In order not to let the received end treat the second broadcasted reply as an unexpected path protection switching reply, transmission of the second broadcasted reply shall occur within 500 ms. of the first.

R12-745 [1610] *Compliant*

R12-746 [1611] *Compliant*

R12-747 [1612] *Compliant*

O12-748 [1613] *Compliant*

R12-749 [1614] *Compliant*

R12-750 [1615] *Compliant*

O12-751 [1616] *Compliant*

R12-752 [1617] *Compliant*

O12-753 [1618] *Compliant*

R12-754 [1619] *Compliant*

R12-755 [1620] *Compliant*

O12-756 [1621] *Compliant*

R12-757 [1622] *Compliant*

CR12-758 [1623] *Compliant*

CR12-759 [1624] *Compliant*

12.6.3.5 EOC and TMC/CSC Path Protection Switch Procedures

DMS SuperNode exhibits the following clarifications to the requirements stated in this section of GR-303:

- If a manually initiated path switch fails, no automatic retry is provided (if desired, a new manually initiated path switch can be initiated).
- Force Mode is ignored in the context of collision mismatch. (Collision mismatch occurs when both the IDT and RDT have initiated a path switch to a different EOC path or to a different TMC path).
- For non-forced switches, multi-frame establishment on all supported Data-Link Connection Identifier of the path is a requirement for a path becoming active.

R12-760 [1625] *Compliant*

R12-761 [1626] *Compliant (with exceptions)*

Item 5 requires that if the standby path protecting the active path identified in the operations message is already active, the far end shall send an indication that an error occurred to the near end. Nortel does not consider this situation an error. The DMS SuperNode will not send a message indicating the error. Instead, it will send a message to the near end indicating that the path protection switch was completed.

R12-762 [1627] *Compliant*

R12-763 [1628] *Compliant*

R12-764 [1629] *Not applicable (RDT requirement)*

R12-765 [1630] *Compliant*

R12-766 [1631] *Compliant*

R12-767 [1632] *Compliant*

12.6.3.6 EOC and TMC/CSC Path Recovery

R12-768 [1633] *Compliant*

R12-769 [1634] *Compliant (with exceptions)*

In this implementation of the TR-303 multivendor interface on DMS SuperNode, not all SAPI/TEI combinations in Table 12-1 of GR-303 are supported. See the comments on R12-21.

R12-770 [1635] *Compliant*

12.7 Operations Requirements Across the Generic IDLC Interface

No text

12.7.1 OS/IDLC Communication Conventions

The implementation of the TR-303 multivendor interface on DMS SuperNode does not support the Operations Interface Module (OIM) as defined in section 12.7.1 of GR-303. This deviation is based on Nortel's belief that the OIM design requirements are incomplete and that uncertainty of the commitment of RDT vendors to support TL-1 messaging in the RDT exists at this time. Section 11.1 of GR-303 recognizes this problem and addresses it by defining a transitional operations architecture which makes use of existing OSs. The implementation of the TR-303 multivendor interface on DMS SuperNode fully supports this transitional architecture. For further information on this architecture, see Section 1.1 of Appendix A.

R12-771 [1636] *Non-compliant (OIM requirement)*

R12-772 [1637] *Non-compliant (OIM requirement)*

12.7.1.1 OS-to-RDT Communications

No requirements stated

12.7.1.1.1 RDT Routing

R12-773 [1638] *Non-compliant (OIM requirement)*

O12-774 [1639] *Non-compliant (OIM requirement)*

R12-775 [1640] *Non-compliant (OIM requirement)*

O12-776 [1641] *Non-compliant (OIM requirement)*

R12-777 [1642] *Non-compliant (OIM requirement)*

O12-778 [1643] *Non-compliant (OIM requirement)*

R12-779 [1809] *Non-compliant (OIM requirement)*

R12-780 [1810] *Non-compliant (OIM requirement)*

CR12-781 [1811] *Non-compliant (OIM requirement)*

R12-782 [1644] *Non-compliant (OIM requirement)*

R12-783 [1645] *Non-compliant (OIM requirement)*

12.7.1.1.2 IDT Routing

No requirements stated

12.7.1.2 RDT-to-OS Communications

No requirements stated

12.7.1.2.1 RDT Response Routing

R12-784 [1646] *Not applicable (RDT requirement)*

R12-785 [1647] *Non-compliant (OIM requirement)*

12.7.1.2.2 IDT Response Routing

No requirements stated

12.7.1.3 Automatic Message Routing

R12-786 [1648] *Non-compliant (OIM requirement)*

R12-787 [1649] *Not applicable (RDT requirement)*

R12-788 [1812] *Not applicable (RDT requirement)*

R12-789 [1650] *Not applicable (RDT requirement)*

R12-790 [1651] *Not applicable (RDT requirement)*

R12-791 [1652] *Not applicable (RDT requirement)*

R12-792 [1653] *Not applicable (RDT requirement)*

CR12-793 [1654] *Not applicable (RDT requirement)*

The implementation of the TR-303 multivendor interface on DMS SuperNode does not support the logical data links defined by SAPI = 1, TEI = 1 and SAPI = 1, TEI = 2. The DMS SuperNode expects to receive all event reports on the logical data link defined by SAPI = 1 and TEI =4.

CR12-794 [1655] *Not applicable (RDT requirement)*

CR12-795 [1656] *Not applicable (RDT requirement)*

12.7.1.4 Circuit/Equipment Identity

R12-796 [1657] *Not applicable (RDT requirement)*

R12-797 [1658] *Not applicable (RDT requirement)*

R12-798 [1659] *Not applicable (RDT requirement)*

R12-799 [1660] *Not applicable (RDT requirement)*

R12-800 [1661] *Not applicable (RDT requirement)*

R12-801 [1662] *Not applicable (RDT requirement)*

R12-802 [1663] *Not applicable (RDT requirement)*

12.7.1.4.1 OS-to-OIM Interface

R12-803 [1664] *Not compliant (OIM requirement)*

R12-804 [1665] *Not compliant (OIM requirement)*

R12-805 [1666] *Not compliant (OIM requirement)*

12.7.2 Operations Messages

No requirements stated

As explained in section 12.7.1 of this document, the implementation of TR-303 on DMS SuperNode supports a transitional operations architecture based on existing OSs (the OIM is not supported). One consequence of this approach is that the full set of operations messages defined by GR-303 is not required. The subset of operations messages that are supported by DMS SuperNode are specified in detail in Section 1.2 of Appendix A.

12.7.2.1 System Administration and Security Messages

No requirements stated

In this implementation of the TR-303 multivendor interface on DMS SuperNode, all systems administration and security functions for RDTs are handled within the switch and thus do not require messaging across the interface.

12.7.2.2 Memory Administration (Provisioning)

No requirements stated

The memory administration procedures supported by this implementation of the TR-303 multivendor interface on DMS SuperNode are defined in Section 1.2 of Appendix B. The EOC object classes and CMIS management services used for memory administration are defined in Appendix A.

12.7.2.3 System Maintenance Messages

No requirements stated

The system maintenance procedures supported by this implementation of the TR-303 multivendor interface on DMS SuperNode are defined in Section 2.0 of Appendix B. The EOC object classes and CMIS management services used for system maintenance are defined in Appendix A.

12.7.2.4 Circuit Testing (System Maintenance) Messages

No requirements stated

12.7.2.5 Test Access (System Maintenance) Messages

No requirements stated

The metallic test access procedures supported by this implementation of the TR-303 multivendor interface on DMS SuperNode are defined in Section 1.5 of Appendix B. The EOC object classes and CMIS management services used for test access are defined in Appendix A. This implementation does not support the messages required to control digital test access in the RDT.

12.7.3 Testing

No requirements stated

12.7.3.1 Switched Services Testing

No requirements stated

12.7.3.1.1 Metallic Test Access

No requirements stated

Refer to Section 1.5.1 of Appendix B for a detailed description of the procedures the DMS SuperNode uses to do metallic testing for line terminations.

12.7.3.1.2 Line Terminating Equipment Test

No requirements stated

Refer to Section 1.5.2 of Appendix B for a detailed description of the procedures the DMS SuperNode uses to do channel testing on line terminations.

12.7.3.1.3 Line Terminating Equipment Diagnostic - Option

No requirements stated

12.7.3.2 Special Service Testing

No requirements stated

This implementation of the TR-303 multivendor interface on DMS SuperNode does not support special services testing via the EOC. It is assumed that such testing is accomplished via other means, e.g. a Supervisory System.

12.7.3.3 Facility Testing

No requirements stated

This implementation of the TR-303 multivendor interface on DMS SuperNode does not support the capability to initiate a loopback at the IDT from the RDT via EOC messages. Also, loopbacks initiated from the DSX-1 are assumed to employ standard T1 fault locate methods and test equipment.

12.7.3.3.1 Far-End Loopback Procedure - With Protection Switch Option

No requirements stated

This implementation of the TR-303 multivendor interface on DMS SuperNode assumes that RDT loopback control is provided via the LDS Operations Interface (rather than a test system).

12.7.3.3.2 Far-End Loopback Procedure - Without Protection Switch

No requirements stated

This implementation of the TR-303 multivendor interface on DMS SuperNode assumes that RDT loopback control is provided via the LDS Operations Interface (rather than a test system).

12.7.3.4 Common Equipment Testing

No requirements stated

This implementation of the TR-303 multivendor interface on DMS SuperNode does not support common equipment testing via the EOC. It is assumed that such testing is accomplished via other means, e.g. a Supervisory System.

12.7.4 Maintenance Scenarios

No requirements stated

The maintenance scenarios described in the following sections assume the existence of the OIM. They are not applicable for this implementation of the TR-303 multivendor interface on DMS SuperNode. This implementation of the TR-303 multivendor interface on DMS SuperNode provides maintenance via the LDS Operations Interface rather than the OIM. Details of RDT maintenance by DMS SuperNode are contained in Section 2.0 of Appendix B.

12.7.4.1 Trouble Reporting

No requirements stated

12.7.4.2 Trouble Verification

No requirements stated

12.7.4.3 Service Protection

No requirements stated

12.7.4.4 Sectionalize and Locate Fault

No requirements stated

12.7.4.5 Verify Repair

No requirements stated

12.8 Requirements and Options Supporting System Turn-up

No text

12.8.1 Memory Administration Data Initialization for the Generic IDLC Interface

No requirements stated

12.8.2 System Start

No requirements stated

12.8.3 Power on Following Commercial AC Power Failure

R12-806 [1667] *Not applicable (RDT requirement)*

R12-807 [1668] *Not applicable (RDT requirement)*

12.8.4 Power-on Plug-in Replacement

No requirements stated

12.9 UDLC To IDLC Transition Considerations

No requirements stated

12.9.1 Signaling and Transmission Considerations

No requirements stated

References

1. TR-NWT-000303, "Integrated Digital Loop Carrier System Generic Requirements, Objectives, and Interface", Issue 2, December 1992.

2. TR-NWT-000303, "Integrated Digital Loop Carrier System Generic Requirements, Objectives, and Interface", Issue 2, Revision 1, December 1993

3. TR-TSY-000303, "IDLC System Generic Requirements. Objectives, and Interface: Operations (ROS/CMIS/ASN.1) Messages Release 1.0", Supplement 3, Issue 1, 1990; and Revision 1, August 1992.

4. Bellcore letter to DLC suppliers: "Resolution of Several Interoperability Issues", May 26, 1993.

5. Bellcore Digest of Technical Information: TR-NWT-000303 "Technical Reference Bulletins", October 1994.

6. GR-303-CORE, "Integrated Digital Loop Carrier System Generic Requirements, Objectives, and Interface", Issue 1, September 1995.

7. GR-303-CORE, "Integrated Digital Loop Carrier System Generic Requirements, Objectives, and Interface", Issue 1, Revision 2, December 1996.

List of Acronyms

AIS	Alarm Indication Signal
APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation 1
BRA	Basic Rate Access
CID	Craft Interface Device
CLASS	Custom Local Area Signaling Services
CO	Central Office
CSC	Common Signaling Channel
DC	Direct Current
DDS	Digital Data System
DLC	Digital Loop Carrier
DTF	Digital Transmission Facility
DTMF	Dual Tone Multi Frequency
EOC	Embedded Operations Channel
ESF	Extended Super Frame
FDL	Facility Data-Link
FELB	Far End Loop Back
IDLC	Integrated Digital Loop Carrier
IDT	Integrated Digital Terminal
ISDN	Integrated Services Digital Network
LDS	Local Digital Switch
MTAU	Metallic Test Access Unit

NELB	Near End Loopback
NTT	No Test Trunk
OAM&P	Operations, Administration, Maintenance & Provisioning
OHT	On Hook Transmission
OIM	Operations Interface Module
OS	Operations System
POTS	Plain Old Telephone Service
PRA	Primary Rate Access
RDT	Remote Digital Terminal
RTU	Remote Test Unit
SAPI	Service Access Point Identifier
SCCS	Switching Center Control System
SD	Signal Distribution
SMA	Subscriber Carrier Module - 100 Access
SMA2	Subscriber Carrier Module - 100 Access - 2: Expanded Port Version
TAP	Test Access Path
TDM	Time Division Multiplex
TEI	Terminal Endpoint Identifier
TLP	Transmission Level Point
TMC	Time-Slot Management Channel
TSC	Test System Controller
TSI	Time-Slot Interchange
VF	Voice Frequency
ZBTSI	Zero Byte Time-Slot Interchange

Appendix A: EOC Message Set

1.0 Introduction

This appendix defines how this implementation of the TR-303 multivendor interface on DMS SuperNode complies with the requirements in TR-303, Supplement 3. Supplement 3 specifies the EOC application layer messages used to perform Operations, Administration, Maintenance, and Provisioning (OAM&P) activities across the TR-303 multivendor interface.

1.1 Transitional Operations Architecture

This implementation of the TR-303 multivendor interface on DMS SuperNode does not support the Operations Interface Module (OIM) as defined in section 12.7.1 of GR-303. Nortel's decision not to support the OIM, at this time, is based on the belief that the design requirements are incomplete and uncertainty exists as to the commitment of RDT vendors to support TL-1 messaging in the RDT. Section 11 of GR-303 recognizes this issue and addresses it by defining a transitional operations architecture which makes use of existing OSs. The DMS SuperNode fully supports this transitional architecture as shown in Figure A-1.

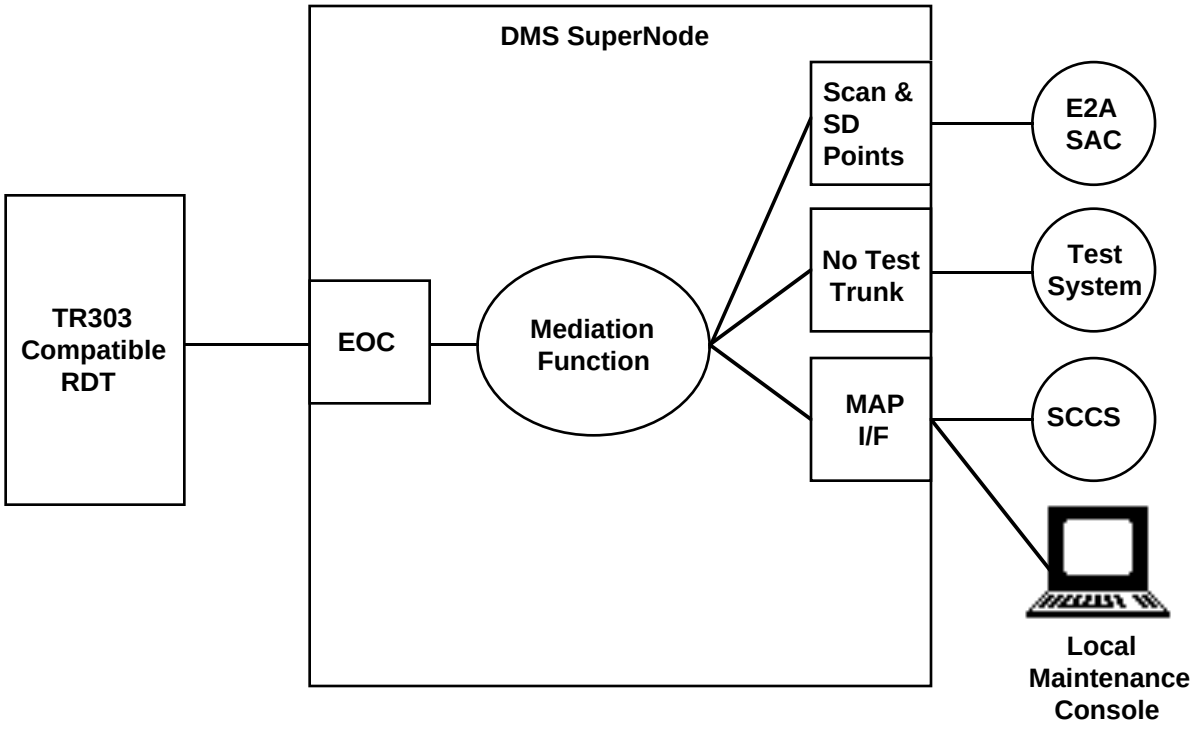
Per the requirements in section 11.2 of GR-303, the DMS SuperNode provides the following three interfaces that can be used by a telco to interface a TR-303 compliant RDT with their existing operations systems:

1. LDS Operations Interface - A standard Maintenance and Administration Position (MAP) interface provides the capability to monitor alarm information, initiate certain tests, and perform line resource provisioning for TR-303 compliant RDTs. These functions may be accessed from a local console or the Switching Center Control System (SCCS).

2. E-Telemetry Interface - A set of Scan and Signal Distribution (SD) points provides the capability to monitor RDT alarms using an E2A Telemetry Status and Command (SAC) remote.

3. Circuit Testing Interface - A No Test Trunk (NTT) provides the capability to test locally switched circuits on RDTs using any external test system which conforms to the interface specification described in Appendix A of TR-TSY-000008.

Figure A-1. Transitional Operations Architecture



1.2 EOC Message Subset

To support the transitional operations architecture, the DMS SuperNode provides a mediation function to convert between the protocols used on the EOC and the protocols used on each of the interfaces to existing OSs. Note that in the transitional architecture, the message set required on the EOC is a function of the OAM&P capabilities of the existing OSs. Since the existing OSs do not provide the full range of OAM&P capabilities defined in GR-303, this implementation of the TR-303 multivendor interface on DMS SuperNode supports only that subset of EOC messages needed to satisfy the existing OSs. Tables A-1 and A-2 provide a summary of the object classes and services that are included in this subset (as well as those that are not included).

In this implementation, where compliancy is stated in regard to object class attributes and notifications, the DMS SuperNode will support those attributes and notifications syntactically if not semantically.

The need for, and use of, actions and notifications are driven by the OAM&P applications in the switch. The approach taken in the object section that follows is to specify only those actions and notifications that are actually used by DMS SuperNode applications.

1.2.1 Remarks for Table A-1

Table A-1 provides a summary of the supported and not supported subsets of objects in this implementation of the TR-303 multivendor interface on DMS SuperNode. The following are clarifications for this table:

(1) Objects indicated by a "*" are specified for inheritance purpose only. They are non-instantiable.

(2) A non-instantiable object is included in the supported subset if one of its instantiable descendant objects is supported by the DMS SuperNode.

(3) A non-instantiable object is included in the not supported subset if none of its instantiable descendant objects is supported by the DMS SuperNode.

(4) An instantiable object is included in the supported subset if it is used by the DMS SuperNode utilizing at least one CMIS service (including M-EVENT-REPORT). One exception is the IDLC Terminal object. The DMS SuperNode does not use CMIS services on this object class. This object is merely used as the naming object for the DS1 Line Termination, Memory, and Protection Group objects.

(5) An instantiable object is included in the not supported subset if it is not used by the DMS SuperNode utilizing any CMIS service (including M-EVENT-REPORT).

1.2.2 Remarks for Table A-2

Table A-2 provides a summary of the supported and not supported subsets of management services in this implementation of the TR-303 multivendor interface on DMS SuperNode. The following are clarifications for this table:

(1) Some M-ACTIONs and M-EVENT-REPORTs are listed in the not supported subset since their associated objects are not supported by DMS SuperNode.

(2) Other M-ACTIONs are listed in the not supported subset since the DMS SuperNode does not initiate them even though their associated objects are supported.

(3) The M-EVENT-REPORTs in the not supported subset are accepted by the DMS SuperNode but are not acted upon. The M-EVENT-REPORTs in this column indicate that even if the DMS SuperNode receive these event notifications, the DMS SuperNode will ignore them as if they were not received.

Table A-1. Supported Subset Of Object Classes

The Supported Subset	The Not Supported Subset
Alarm Count List	Alarm Record
Analog Line Termination	Alerting Cadence
Channel Termination *	Audit Schedule
Circuit Pack	Backup Schedule
Cross Connection	Channel Unit Test
DS0 Channel Termination	Current Alarm Summary Schedule
DS1 Framed Path Termination	DDS Line Termination
DS1 Line Termination	DS1 Line Threshold Default Profile
Discriminator *	DS1 Path Threshold Default Profile
Equipment	Database Capture Buffer
Equipment Holder	Database Change Report
Event Report Control	Diagnostic Schedule
Framed Path Termination *	Event Log
IDLC Data Link Profile	Event Record
IDLC Data Link Termination	Exercise Schedule
IDLC Terminal	IDLC Call Processing Profile
ISDN Framed Path Termination	ISDN 3DS0 Framed Path Termination
ISDN Line Termination	ISDN FPT Default Profile
ISDN Per System Profile	Input Command
Line Termination *	Input Command Control
Memory	Line Threshold Default Profile
Metallic Test Access Path Termination	Log *
Metallic Test Access Unit	Management Operations Schedule *
Network Element	Message Log
Protection Group	Message Record
Protection Group Unit	PM Interval Profile
Quarter DS0 Channel Termination	Path Threshold Default Profile *
Termination Point *	Performance Monitoring Report Schedule
Test Access Path Termination *	
Test Access Unit *	
Test Response Circuit	

Table A-2. Supported Subset Of Management Services

The Supported Subset	*The Not Supported Subset*
M-CREATE	**M-CANCEL-GET**
M-DELETE	**M-ACTION**
M-SET	Activate External Entity
M-GET	Apply Patch
M-ACTION	Audit
Change To Monitor	Boot Processor
Change To Split Full	Current Alarm Summary Retrieving
Change To Split In	Deactivate External Entity
Change To Split Out	Diagnose
Connect Loop Around Access	Diagnose Line Unit
Connect Monitor Access	Exercise
Connect Split Out Access	Exercise Protection Switching
Connect Test Response Circuit	Fault Locate
Disconnect Test Access	Initialize And Restore
Generate Corrupted crc	Lockout Of Protection
Initialize PM Attributes	Loop Around To Diagnose TAP
Operate ISDN Loopback	Memory Backup
Operate Termination	Memory Restoration
Protection Switch	Operate Loopback
Release ISDN Loopback	Protection Bridge
Release Test Response Circuit	Protection Release
Reset Timer	Release Lockout Of Protection
M-EVENT-REPORT	Release Loop Around
Change Of Overhead Bit Report	Release Loopback
Event Reporting	Remove
	Restore
	Remove Coin Control
	Remove Patch
	Remove Ring
	Restart Processor
	Retrieve Log Entry
	Roll
	Send Coin Control
	Send Ring
	Transmit eoc Opcode
	M-EVENT-REPORT
	Attribute Change Reporting
	Automatic Protection Switch Reporting
	Object Creation Reporting
	Object Deletion Reporting
	Report TAU Initialization
	Scheduled Audit Reporting
	Scheduled Current Alarm Sum. Reporting
	Scheduled Diagnostic Reporting
	Scheduled Exercise Reporting
	Scheduled Memory Backup Reporting
	Scheduled Perf. Monitoring Reporting
	Time-Slot Map Discrepancy Reporting

1.2.3 Supported TR-303 Containment Tree

The figure below defines the Containment Tree (also known as the Name Binding Tree) for those RDT objects supported by the DMS SuperNode. Each level of indentation in the figure represents a level of containment. For example, Cross Connection is part of (is named relative to) Network Element, and DS1 Line Termination is part of IDLC Terminal. All contained objects are aligned directly beneath the containing object at the same level of indentation. For example, DS1 Line Termination, Memory, and Protection Group are all part of (are all named relative to) IDLC Terminal.

When the Local Distinguished Name is used to address an object, the anchor point is Network Element.

0. Root
    1. Network
        2. Network Element
            3. Alarm Count List
            3. Analog Line Termination
            3. Cross Connection
            3. Equipment
                4. Equipment Holder
            3. Equipment Holder
                4. Circuit Pack
                4. Equipment Holder
            3. Event Report Control
            3. IDLC Terminal
                4. DS1 Line Termination
                    5. DS1 Framed Path Termination
                        6. DS0 Channel Termination
                            7. Quarter DS0 Channel Term
                4. IDLC Data Link Profile
                4. IDLC Data Link Termination
                4. Memory
                4. Protection Group
                    5. Protection Group Unit
            3. ISDN Line Termination
                4. ISDN Framed Path Termination
                    5. DS0 Channel Termination
                    5. Quarter DS0 Channel Termination
            3. ISDN Per System Profile
            3. Memory
            3. Metallic Test Access Unit
                4. Metallic Test Access Path Termination
            3. Test Response Circuit

1.3 Communications Roles

In TR-303, communications over the EOC takes place using the services provided by the Common Management Information Service Element (CMISE). The CMISE services consist of a set of fundamental transactions that can be performed by a managing system on a managed system. The managed system is modeled as a collection of managed objects, each of which has various attributes and behavior.

In the target operations architecture (using OIM), the OSs assume the role of managing systems while both the IDT and the RDT operate as managed systems. In the transitional operations architecture (no OIM), the IDT serves as the managing system and the RDT serves as the managed system. (Note, the IDT is still a managed system with respect to the OSs but since CMISE is not used on the interfaces to existing OSs, this relationship is not important to the discussion.)

The managing and managed roles have an impact on the way that compliancy with TR-303, Supplement 3 is interpreted and specified. In the transitional operations architecture, DMS SuperNode is considered the managing system for all CMISE transactions conducted across the TR-303 interface. Thus, in this document, compliancy is always specified from the perspective of a managing system.

2.0 Scope Of This Appendix

Since the majority of the requirements in TR-303, Supplement 3 are found in sections 3 and 4, this appendix defines compliancy for only those sections. Exceptions to requirements found in other sections of Supplement 3 are identified within the context of the compliancy assessment for sections 3 and 4.

3.0 Organization Of This Appendix

The information which follows uses the sections and headings from TR-303, Supplement 3 as the basis for its structure. Each subsection specifies the compliancy of the DMS SuperNode implementation against the requirements found in the corresponding subsection of Supplement 3.

Note that:

(1) Subsections which correspond to object classes and services not included in the supported subset are left out.

(2) The headings for Mandatory Group Attributes and Optional Group Attributes are not included since group attributes are not supported for any object class.

DMS SuperNode Compliancy Assessment For Sections 3 and 4 of TR-TSY-000303, Supplement 3

3.0 Object Class Summary

No requirements stated

3.1 Inheritance Hierarchy

No requirements stated

The implementation of the TR-303 multivendor interface on DMS SuperNode assumes a transitional operations architecture in which the interfaces between the Operations Systems and the DMS SuperNode do not use CMISE messages. Therefore, Figure 3-2 "Object Class Inheritance Hierarchy at the IDT" described in this section of TR-303 Supplement 3 is not applicable.

In Figure 3-1, "Object Class Inheritance Hierarchy at the RDT", of TR-303 Supplement 3, every object inherits from the Top object. According to ANSI T1.214-1990, the Top object has the mandatory attribute "objectClass." The DMS SuperNode ignores this attribute as if it does not exist. The DMS SuperNode expects the RDT to ignore this attribute as well.

3.2 Object Class Summary Forms

No requirements stated

3.2.3 Analog Line Termination

MANAGED OBJECT CLASS:	**Analog Line Termination**
Object Class Label:	**analogLineTermination**

BEHAVIOR DEFINITIONS

Compliant

Instances of Analog Line Termination are part of Network Element.

The DMS SuperNode creates/deletes instances of this object class to manage analog line terminations that are associated with locally switched services. Instances of this object class may also be inherently created by the RDT or created by another management entity such as an OS. It should be understood, however, that the DMS SuperNode does not check RDT lines provisioning data for consistency with the provisioning data in the switch unless the Analog Line Termination object instances are created by the DMS SuperNode.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

Only the "Call Reference Value" and "Redlined" attributes are supported.

Attribute Restrictions:

Analog Line Term Id: *Compliant*

Current Problem List: *Not applicable*

The DMS SuperNode uses the new object "Alarm Count List" specified in Section 3.2.59, Appendix A, to examine RDT alarm counts.

Call Reference Value: *Compliant*

Flash Detection: *Not applicable*

In this implementation, the DMS SuperNode does not support the Common Signaling Channel.

Redlined: *Compliant*

The DMS SuperNode includes this attribute with the value FALSE in the M-Create request.

NOTIFICATIONS

In this implementation, only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

Only the following actions are initiated by the DMS SuperNode:

- Connect Test Response Circuit, and
- Release Test Response Circuit.

3.2.6 Channel Termination

MANAGED OBJECT CLASS:	**Channel Termination**
Object Class Label:	**channelTermination**

BEHAVIOR DEFINITIONS

No requirements stated

This object is specified for inheritance purpose only.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

In this implementation, all of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

No actions are requested of instances of this object class.

3.2.8 Circuit Pack

MANAGED OBJECT CLASS:	**Circuit Pack**
Object Class Label:	**circuitPack**

BEHAVIOR DEFINITIONS

Compliant

Instances of Circuit Pack are part of Equipment Holder.

The DMS SuperNode assumes that Circuit Pack objects are automatically created at the RDT upon the detection of the physical presence of a circuit pack, and automatically deleted upon the removal of the circuit pack. The DMS SuperNode is not responsible for creating or deleting instances of this object.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

None of the specified attributes is supported.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

In this implementation, only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

In this implementation, none of the actions are initiated by the DMS SuperNode.

3.2.9 Cross Connection

MANAGED OBJECT CLASS:	**Cross Connection**
Object Class Label:	**crossConnection**

BEHAVIOR DEFINITIONS

Compliant

Instances of Cross Connection are part of Network Element.

The DMS SuperNode uses this object class to establish semi-permanent connections within the RDT for the D-Channels associated with ISDN Basic Access, and for non-switched and non-locally-switched services.

ATTRIBUTES

Naming Attribute:

Compliant

When an instance of this object is created by the DMS SuperNode, the RDT must use the with-automatic-instance-naming convention to provide a value for the ID.

Mandatory Attributes:

Compliant

Optional Attributes:

The only optional attribute "Redlined" is supported.

Attribute Restrictions:

Redlined: *Compliant*

The DMS SuperNode includes this attribute with the value of FALSE in the M-Create request.

NOTIFICATIONS

In this implementation, all of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

In this implementation, none of the actions are initiated by the DMS SuperNode.

3.2.12 DS0 Channel Termination

MANAGED OBJECT CLASS:	**DS0 Channel Termination**
Object Class Label:	**ds0ChannelTermination**

BEHAVIOR DEFINITIONS

Compliant

Instances of DS0 Channel Termination are part of DS1 Framed Path Termination or ISDN Framed Path Termination.

The DMS SuperNode creates/deletes instances of this object class for the B1 and B2 channels of an ISDN Basic Access line (assumes the use of the 4:1 TDM multiplexing method).

The DMS SuperNode assumes that the DS0 Channel Terminations associated with all DS1 Framed Path Terminations are inherently or automatically created at the RDT.

If a DS0 of a DS1 between the IDT and RDT is chosen for assigning Quarter DS0s, the DMS SuperNode will first assign those 4 Quarter DS0s before it selects another DS0 for assigning Quarter DS0s. This implementation has the advantage of maximum utilization of DS0 bandwidth management.

ATTRIBUTES

Naming Attribute:

Compliant

For a DS0 Channel Termination object that represents a time-slot within a DS1, the value of the DS0 Channel Term Id attribute shall equal the time-slot number (1-24). For a DS0 Channel Termination object that represents the B1 or B2 channel of a basic rate ISDN line, the value of the DS0 Channel Term Id attribute for the B1 channel shall equal 1 and the value of the DS0 Channel Term Id attribute for the B2 channel shall equal 2.

Mandatory Attributes:

Compliant

Optional Attributes:

None of the specified optional attributes is supported.

Attribute Restrictions:

Far End Address: *Not applicable*

In this implementation, the DMS SuperNode does not support DS0 cross connection between the IDT and RDT.

NOTIFICATIONS

In this implementation, all of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

In this implementation, neither of the actions are initiated by the DMS SuperNode.

3.2.13 DS1 Line Termination

MANAGED OBJECT CLASS:	**DS1 Line Termination**
Object Class Label:	**ds1LineTermination**

BEHAVIOR DEFINITIONS

Compliant

Instances of DS1 Line Termination representing DS1s between the RDT and IDT are part of IDLC Terminal.

The DMS SuperNode assumes that DS1 Line Termination objects representing the DS1s between the RDT and IDT are inherently created at the RDT. The number of DS1 Line Termination objects to be inherently created is the maximum number of DS1s (<= 28) the RDT can accommodate, even though some of the DS1s are not installed initially. The DMS SuperNode is not responsible for creating or deleting instances of this object.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

None of the specified attributes is supported.

Attribute Restrictions:

DS1 Line Term Id: *Compliant*

The valid values for this attribute are 1 through 28 representing the DS1 line numbers.

Current Problem List: *Not applicable*

The DMS SuperNode uses the new object "Alarm Count List" specified in Section 3.2.59, Appendix A, to examine RDT alarm counts.

Call Reference Value: *Not applicable*

At this time, the DMS SuperNode does not support DS1 extensions.

NOTIFICATIONS

Only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

In this implementation, none of the actions are initiated by the DMS SuperNode.

3.2.15 DS1 Framed Path Termination

MANAGED OBJECT CLASS:	**DS1 Framed Path Term.**
Object Class Label:	**ds1FramedPathTermination**

BEHAVIOR DEFINITIONS

Compliant

Instances of DS1 Framed Path Termination are part of DS1 Line Termination.

The DMS SuperNode assumes that DS1 Framed Path Termination objects are inherently created at the IDLC RDT. The number of DS1 Framed Path Termination objects to be inherently created is the maximum number of DS1s (<= 28) the RDT can accommodate, even though some of the DS1s are not installed initially. The DMS SuperNode is not responsible for creating or deleting instances of this object.

ATTRIBUTES

Naming Attribute:

Compliant

The value of the DS1 Framed Path Term Id attribute shall equal the value of the DS1 Line Term Id attribute of the DS1 Line Termination object containing the DS1 Framed Path Termination object.

Mandatory Attributes:

Compliant

Optional Attributes:

The following optional attributes are supported:

CV Hr Current,
CV FE Hr Current,
CV Hr Previous,
CV FE Hr Previous,
ES Hr Threshold,
ES Hr Current,
ES FE Hr Current,
ES Hr Previous,
ES FE Hr Previous,

ES Hr History,
ES FE Hr History,
ES Day Threshold,
ES Day Current,
ES FE Day Current,
ES Day Previous,
ES FE Day Previous,
SES Hr Threshold,
SES Hr Current,
SES FE Hr Current,
SES Hr Previous,
SES FE Hr Previous,
SES Day Threshold,
SES Day Current,
SES FE Day Current,
SES Day Previous, and
SES FE Day Previous.

Attribute Restrictions:

Current Problem List: *Not applicable*

The DMS SuperNode uses the new object "Alarm Count List" specified in Section 3.2.59, Appendix A, to examine RDT alarm counts.

Inhibit PM: *Not applicable*

The DMS SuperNode does not manipulate this attribute.

ES, CV, SEFS, and SES performance monitoring:
Compliant (with exceptions)

The DMS SuperNode does not manipulate the SEFS attributes in this category.

CSS performance monitoring: *Not applicable*

At this time, the DMS SuperNode does not support DS1 extensions.

NOTIFICATIONS

Only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

Neither of the actions is initiated by the DMS SuperNode.

3.2.20 Discriminator

MANAGED OBJECT CLASS:	**Discriminator**
Object Class Label:	**discriminator**

BEHAVIOR DEFINITIONS

Compliant

(Note that TR-303 states that "a Discriminator may be part of an NE or an Equipment", but in fact it cannot since it is not an instantiable class).

ATTRIBUTES

Naming Attribute:

This object class has no naming attribute since no instances can be created.

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

No notifications are generated for instances of this object class.

ACTIONS

No actions are requested of instances of this object class.

3.2.21 Equipment

MANAGED OBJECT CLASS:	**Equipment**
Object Class Label:	**equipment**

BEHAVIOR DEFINITIONS

Compliant

Instances of Equipment are part of Network Element.

The DMS SuperNode assumes that Equipment objects are inherently created at the RDT. The DMS SuperNode is not responsible for creating or deleting instances of this object.

The implementation of the TR-303 multivendor interface on DMS SuperNode only receives and processes Event Reporting notifications on instances of this object class. No other CMIS services are used by the DMS SuperNode on instances of this object class.

ATTRIBUTES

Naming Attribute:

Compliant

The DMS SuperNode supports the INTEGER type and Printable String, with a value of 'RT' , for Equipment Id.

Mandatory Attributes:

Compliant

Optional Attributes:

None of the specified attributes is supported.

Attribute Restrictions:

Current Problem List: *Not applicable*

The DMS SuperNode uses the new object "Alarm Count List" specified in Section 3.2.59, Appendix A, to examine RDT alarm counts.

NOTIFICATIONS

Only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

None of the actions are initiated by the DMS SuperNode.

3.2.22 Equipment Holder

MANAGED OBJECT CLASS:	**Equipment Holder**
Object Class Label:	**equipmentHolder**

BEHAVIOR DEFINITIONS

Compliant

Instances of Equipment Holder are part of Network Element or Equipment Holder, or Equipment.

The DMS SuperNode assumes that Equipment Holder objects are inherently created at the IDLC RDT. The DMS SuperNode is not responsible for creating or deleting instances of this object.

The implementation of the TR-303 multivendor interface on DMS SuperNode only receives and processes Event Reporting notifications for instances of this object class. The DMS SuperNode does not make use of any other CMIS services with respect to this object class.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

None of the specified attributes is supported.

Attribute Restrictions:

Current Problem List: *Not applicable*

The DMS SuperNode uses the new object "Alarm Count List" specified in Section 3.2.59 , Appendix A, to examine RDT alarm counts.

Protection Group Pointer: *Not applicable*

The DMS SuperNode does not support Protection Group for Equipment Holder.

NOTIFICATIONS

Only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

No actions are requested of instances of this object class.

3.2.25 Event Report Control

MANAGED OBJECT CLASS:	**Event Report Control**
Object Class Label:	**eventReportControl**

BEHAVIOR DEFINITIONS

Compliant

Instances of Event Report Control are part of Network Element.

If instances of this object class exist, it is assumed that all Event Reporting notifications generated against objects are to be filtered by instances of this object class. Only the Event Reports satisfying the criteria of the Discriminator Construct are sent to the manager. If instances of this object class do not exist, then all Event Reports are sent to the manager.

The DMS SuperNode creates two instances of this object class at the RDT using M-CREATEs. The details of these creations are described in Section 2.4 of Appendix B of this document.

ATTRIBUTES

Naming Attribute:

Compliant

The DMS SuperNode uses only the INTEGER syntax for the eventReportControlId when creating instances of this object class at the RDT.

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

This object class has no attribute restriction.

NOTIFICATIONS

No notifications are generated for instances of this object class.

ACTIONS

No actions are requested of instances of this object class.

3.2.27 Framed Path Termination

MANAGED OBJECT CLASS:	**Framed Path Termination**
Object Class Label:	**framedPathTermination**

BEHAVIOR DEFINITIONS

Compliant

This object is specified for inheritance purpose only.

ATTRIBUTES

Naming Attribute:

This object class has no naming attribute.

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

All of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

No actions are requested of instances of this object class.

3.2.29 IDLC Data Link Profile

MANAGED OBJECT CLASS:	**IDLC Data Link Profile**
Object Class Label:	**idlcDLProfile**

BEHAVIOR DEFINITIONS

Compliant

Instances of IDLC Data Link Profile are part of IDLC Terminal.

The DMS SuperNode assumes that one instance of the IDLC Data Link Profile object is inherently created at the RDT. The DMS SuperNode is not responsible for creating or deleting instances of this object.

The implementation of the TR-303 multivendor interface on DMS SuperNode only receives and processes Event Reporting notifications for instances of the IDLC Data Link Profile object class. The DMS SuperNode does not make use of any other CMIS services with respect to this object class.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

The Event Reporting notifications are processed by the DMS SuperNode.

ACTIONS

No actions are requested of instances of this object class.

3.2.30 IDLC Data Link Termination

MANAGED OBJECT CLASS:	**IDLC Data Link Termination**
Object Class Label:	**idlcDLTermination**

BEHAVIOR DEFINITIONS

Compliant

Instances of IDLC Data Link Termination are part of IDLC Terminal.

The DMS SuperNode assumes that IDLC Data Link Termination objects are inherently created at the RDT. The DMS SuperNode is not responsible for creating or deleting instances of this object.

The implementation of the TR-303 multivendor interface on DMS SuperNode only receives and processes Event Reporting notifications for instances of the IDLC Data Link Termination object class. The DMS SuperNode does not make use of any other CMIS services with respect to this object class.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

The Event Reporting notifications are processed by the DMS SuperNode.

ACTIONS

None of the actions are initiated by the DMS SuperNode.

3.2.31 IDLC Terminal

MANAGED OBJECT CLASS:	**IDLC Terminal**
Object Class Label:	**idlcTerminal**

BEHAVIOR DEFINITIONS

Compliant

Instances of IDLC Terminal are part of Network Element.

The DMS SuperNode assumes that an instance of this object class is inherently created at the RDT with Terminal ID = 1. The DMS SuperNode is not responsible for creating or deleting instances of this object class.

In the implementation of the TR-303 multivendor interface on DMS SuperNode this object class is used for naming purposes only. The DMS SuperNode does not make use of any CMIS services with respect to this object class.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

The only optional attribute "DS1VT Count" is not supported.

Attribute Restrictions:

Signaling Method: *Compliant*

This attribute must have the value "tmc".

NOTIFICATIONS

All of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

No actions are requested of instances of this object class.

3.2.34 ISDN Framed Path Termination

MANAGED OBJECT CLASS:	**ISDN Framed Path Termination**
Object Class Label:	**isdnFramedPathTermination**

BEHAVIOR DEFINITIONS

Compliant

Instances of ISDN Framed Path Termination are part of ISDN Line Termination.

The DMS SuperNode creates/deletes instances of this object class to manage locally switched 4:1 TDM ISDN Basic Access.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

The following optional attributes are supported:

Channel Selection,
CV Hr Current,
CV FE Hr Current,
CV Hr Previous,
CV FE Hr Previous,
ES Hr Threshold,
ES Hr Current,
ES FE Hr Current,
ES Hr Previous,
ES FE Hr Previous,
ES Hr History,
ES FE Hr History,
ES Day Threshold,
ES Day Current,
ES FE Day Current,
ES Day Previous,
ES FE Day Previous,
SES Hr Threshold,
SES Hr Current,

SES FE Hr Current,
SES Hr Previous,
SES FE Hr Previous,
SES Day Threshold,
SES Day Current,
SES FE Day Current,
SES Day Previous, and
SES FE Day Previous.

Attribute Restrictions:

Current Problem List: *Not applicable*

The DMS SuperNode uses the new object "Alarm Count List" specified in Section 3.2.59, Appendix A, to examine RDT alarm counts.

The attributes for generic segmented performance monitoring, interim segmented performance monitoring, and interim path performance monitoring: *Compliant*

Note: ISDN Line Maintenance on the DMS SuperNode only supports generic segmented performance monitoring.

NOTIFICATIONS

Only the Event Reporting and Change Of Overhead Bit Report notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

Only the following actions are initiated by the DMS SuperNode:

- Operate ISDN Loopback,
- Release ISDN Loopback,
- Generate Corrupted crcs, and
- Initialize PM Attributes.

3.2.35 ISDN Line Termination

	ISDN Line Termination
MANAGED OBJECT CLASS:	**isdnLineTermination**
Object Class Label:	

BEHAVIOR DEFINITIONS

Compliant

Instances of ISDN Line Termination are part of Network Element.

The DMS SuperNode creates/deletes instances of this object class to manage locally switched ISDN Basic Access lines. The DMS SuperNode allows instances of this object class and all objects directly or indirectly contained in this object (i.e. ISDN Framed Path Termination, DS0 Channel Terminations for the B1 and B2 Channels, and Quarter DS0 Channel Termination for the D-Channel) to be inherently created by the RDT or created by another management entity such as an OS. It should be understood, however, that the DMS SuperNode does not check RDT lines provisioning data for consistency with the provisioning data in the switch unless the ISDN Line Termination object instances are created by the DMS SuperNode.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

Only the "Call Reference Value" attribute is supported.

Attribute Restrictions:

Current Problem List: *Not applicable*

The DMS SuperNode uses the new object "Alarm Count List" specified in Section 3.2.59, Appendix A, to examine RDT alarm counts.

Call Reference Value: *Compliant*

NOTIFICATIONS

Only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

Neither of the actions (Remove, Restore) are initiated by the DMS SuperNode.

3.2.36 ISDN Per System Profile

MANAGED OBJECT CLASS:	**ISDN Per System Profile**
Object Class Label:	**isdnPerSystemProfile**

BEHAVIOR DEFINITIONS

Compliant

Instances of ISDN Per System Profile are part of Network Element.

The DMS SuperNode creates one instance of this object class at the RDT using an M-CREATE.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

This object class has no mandatory attributes.

Optional Attributes:

Only the DSL SES Definition optional attribute is supported.

Attribute Restrictions:

ISDN L3 Err Per Dly Thresh: *Not applicable*
The DMS SuperNode does not manipulate this attribute.

NOTIFICATIONS

All of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

No actions are requested of instances of this object class.

3.2.39 Line Termination

MANAGED OBJECT CLASS:	**Line Termination**
Object Class Label:	**lineTermination**

BEHAVIOR DEFINITIONS

Compliant

This object is specified for inheritance purpose only.

ATTRIBUTES

Naming Attribute:

This object class has no naming attribute.

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

No actions are requested of instances of this object class.

ACTIONS

Neither of the actions (Remove, Restore) are initiated by the DMS SuperNode.

3.2.43 Memory

MANAGED OBJECT CLASS:	**Memory**
Object Class Label:	**memory**

BEHAVIOR DEFINITIONS

Compliant

Instances of Memory are part of Network Element or IDLC Terminal.

The DMS SuperNode assumes that Memory objects are inherently created at the RDT. The DMS SuperNode is not responsible for creating or deleting instances of this object.

The implementation of the TR-303 multivendor interface on DMS SuperNode only receives and processes Event Reporting notifications for instances of the Memory object class. The DMS SuperNode does not make use of any other CMIS services with respect to this object class.

ATTRIBUTES

Naming Attribute:

Compliant

The DMS SuperNode only supports the INTEGER type for Memory ID. It does not support the Printable String type for this naming attribute.

Mandatory Attributes:

Compliant

Optional Attributes:

None of the specified attributes is supported.

Attribute Restrictions:

Current Problem List: *Not applicable*

The DMS SuperNode uses the new object "Alarm Count List" specified in Section 3.2.59, Appendix A, to examine RDT alarm counts.

NOTIFICATIONS

The Event Reporting notifications are processed by the DMS SuperNode.

ACTIONS

None of the actions are initiated by the DMS SuperNode.

3.2.46 Metallic Test Access Path Termination

MANAGED OBJECT CLASS:	**Metallic Test Access Path Termination**
Object Class Label:	**metTestAccPathTerm**

BEHAVIOR DEFINITIONS

Compliant

Instances of Metallic Test Access Path Termination are part of Metallic Test Access Unit.

The DMS SuperNode assumes that one instance of the Metallic Test Access Path Termination object class is inherently created at the RDT with an Id = 1. The DMS SuperNode is not responsible for creating or deleting instances of this object.

The DMS SuperNode uses the services in the M-ACTION section on instances of this object class to perform metallic tests on customer loops through the selected test access path.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

All of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

Only the following actions are initiated by the DMS SuperNode:

- Change to Split Full,
- Change to Monitor,
- Disconnect Test Access,
- Connect Monitor Access,
- Connect Split Out Access,
- Change to Split Out,
- Change to Split In, and
- Reset Timer.

3.2.47 Metallic Test Access Unit

MANAGED OBJECT CLASS:	**Metallic Test Access Unit**
Object Class Label:	**mtau**

BEHAVIOR DEFINITIONS

Compliant

Instances of Metallic Test Access Unit are part of Network Element.

The DMS SuperNode assumes that one instance of the Metallic Test Access Unit object class is inherently created at the RDT with an Id = 1. The DMS SuperNode is not responsible for creating or deleting instances of this object.

The DMS SuperNode uses the Connect Loop Around Access M-ACTION on instances of this object class to obtain a test access path, and to connect the Facility pair to the corresponding Equipment pair of the secured test access path. This loop around operation is needed to verify the integrity of the test access path before metallic tests are performed on the customer loops.

ATTRIBUTES

Naming Attribute:

Compliant

The DMS SuperNode supports only the INTEGER type for MTAU Id. The Printable String type is not supported.

Mandatory Attributes:

Compliant

Optional Attributes:

None of the specified attributes is supported.

Attribute Restrictions:

Current Problem List: *Not applicable*

The DMS SuperNode uses the new object "Alarm Count List" specified in Section 3.2.59, Appendix A, to examine RDT alarm counts.

NOTIFICATIONS

Only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

Only the following action is initiated by the DMS SuperNode:

- Connect Loop Around Access.

3.2.48 Network Element

MANAGED OBJECT CLASS:	**Network Element**
Object Class Label:	**networkElement**

BEHAVIOR DEFINITIONS

Compliant

The DMS SuperNode assumes that one instance of the Network Element object class is inherently created at the RDT. The DMS SuperNode is not responsible for creating or deleting instances of this object.

For the information model in TR-303, the Network Element is chosen as the anchor point when addressing an object. In other words, the Distinguished Name of an object is implemented as the Local Distinguished Name started at the object one level below Network Element. The Network Element itself is represented by the empty SEQUENCE**.**

ATTRIBUTES

Naming Attribute:

Compliant

The DMS SuperNode only supports the INTEGER type for Network Element Id. It does not support the Printable String type for this naming attribute. The DMS SuperNode assumes the user can only change from an integer value to an integer value for Network Element Id.

Mandatory Attributes:

Compliant

Optional Attributes:

None of the specified attributes is supported.

Attribute Restrictions:

Current Problem List: *Not applicable*

The DMS SuperNode uses the new object "Alarm Count List" specified in Section 3.2.59, Appendix A, to examine RDT alarm counts.

System clock: *Not applicable*

The DMS SuperNode does not manipulate this attribute.

System Location: *Not applicable*

The DMS SuperNode does not manipulate this attribute.

External Entity Type: *Not applicable*

The DMS SuperNode does not manipulate this attribute.

External Entity Operation State: *Not applicable*

The DMS SuperNode does not manipulate this attribute.

NOTIFICATIONS

Only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

None of the actions are initiated by the DMS SuperNode.

3.2.52 Protection Group

MANAGED OBJECT CLASS:	**Protection Group**
Object Class Label:	**protectionGroup**

BEHAVIOR DEFINITIONS

Compliant

Instances of Protection Group Unit are part of IDLC Terminal.

The DMS SuperNode assumes that Protection Group objects associated with the EOC and TMC are inherently created at the RDT. The DMS SuperNode does not create or delete instances of this object class.

Instances of this object class are used by DMS SuperNode to activate EOC or TMC path protection switching using the Protection Switch M-ACTION.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

Neither of the specified attributes is supported.

Attribute Restrictions:

Protection Object Class: *Not applicable*

The DMS SuperNode does not support this attribute.

NOTIFICATIONS

All of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

Only the following action is initiated by the DMS SuperNode:

- Protection Switch.

3.2.53 Protection Group Unit

MANAGED OBJECT CLASS:	**Protection Group Unit**
Object Class Label:	**protectionGroupUnit**

BEHAVIOR DEFINITIONS

Compliant (with exceptions)

Instances of Protection Group Unit are part of Protection Group.

The DMS SuperNode assumes that Protection Group Unit objects associated with the EOC and TMC are inherently created at the RDT. The DMS SuperNode does not create or delete instances of this object class.

Instances of this object class are used by DMS SuperNode to activate EOC or TMC path protection switching using the Protection Switch M-ACTION.

The following exceptions are exhibited on the DMS SuperNode for this object class:

The implementation on the DMS SuperNode of the inhibit state of a data link path follows the guideline of Item 2 of Section 12.6.3.1 in TR-303 Revision 4, August 1991. The guideline specifies that the inhibit state of the protecting and protected units has a value of either "inhibited" or "not inhibited". (Note: The specification of this state in Section 5.1.184 of Supplement 3 distinguishes a 1:n protection system from an m:n protection system, and puts a restriction on the value of this attribute. The restriction is that for the protecting unit in a 1:n protection system, only the value "not applicable" is valid. For a protecting unit in an m:n protection system, the value "inhibited" is allowed.)

On the DMS SuperNode, For EOC and TMC/CSC Protection Group Unit objects, the attribute value restriction for the Inhibit Switch is interpreted as would be the case for a m:n protection system rather than a 1:n protection system. Therefore, the default value of Inhibit Switch for both Protecting and Protected units is "not inhibited". Application of "inhibited" to either unit is possible and prohibits switch actions from making it become the Protected unit. The value "not applicable" is not allowed for the protecting and protected units.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

None of the specified attributes is supported.

Attribute Restrictions:

Priority: *Not applicable*
The DMS SuperNode does not support this attribute.

Protection Object Class: *Not applicable*
The DMS SuperNode does not support this attribute.

Protection Switch Condition: *Not applicable*
The DMS SuperNode does not support this attribute.

Protection Group Unit Number: *Not applicable*
The DMS SuperNode does not support this attribute.

NOTIFICATIONS

All of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

No actions are requested of instances of this object class.

3.2.54 Quarter DS0 Channel Termination

MANAGED OBJECT CLASS:	**Quarter DS0 Channel Termination**
Object Class Label:	**quarterDS0ChannelTermination**

BEHAVIOR DEFINITIONS

Compliant

Instances of Quarter DS0 Channel Termination are part of DS0 Channel Termination or ISDN Framed Path Termination.

The DMS SuperNode creates/deletes instances of this object class as part of the provisioning process for an ISDN Basic Access line. Instances of Quarter DS0 Channel Termination are cross connected within the RDT to provide a nailed up path for the D-Channel between the ISDN line card and a DS1 transmission facility.

ATTRIBUTES

Naming Attribute:

Compliant

For a Quarter DS0 Channel Termination object that represents a time-slot within a DS0, the value of the Quarter DS0 Channel Term Id attribute shall equal the time-slot number (1-4). For a Quarter DS0 Channel Termination object that represents the D channel of a BRA ISDN line, the value of the Quarter DS0 Channel Term Id attribute shall equal 1.

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

All of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

Neither of the actions are initiated by the DMS SuperNode.

3.2.55 Termination Point

MANAGED OBJECT CLASS:	**Termination Point**
Object Class Label:	**terminationPoint**

BEHAVIOR DEFINITIONS

Compliant

This object is specified for inheritance purpose only.

ATTRIBUTES

Naming Attribute:

This object class has no naming attribute.

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

All of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

No actions are requested of instances of this object class.

3.2.56 Test Access Path Termination

MANAGED OBJECT CLASS:	Test Access Path Termination
Object Class Label:	testAccPathTerm

BEHAVIOR DEFINITIONS

Compliant

This object is specified for inheritance purpose only.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

All of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

Only the following actions are initiated by the DMS SuperNode on Metallic Test Access Termination:

- Change to Split Full,
- Change to Monitor, and
- Disconnect Test Access.

3.2.57 Test Access Unit

MANAGED OBJECT CLASS:	**Test Access Unit**
Object Class Label:	**tau**

BEHAVIOR DEFINITIONS

Compliant

(Note that TR-303 states that "a TAU is part of an NE or an Equipment", but in fact it cannot be since it is not an instantiable class).

ATTRIBUTES

Naming Attribute:

This object class has no naming attribute.

Mandatory Attributes:

Compliant

Optional Attributes:

None of the specified attributes is supported.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

Only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

ACTIONS

Only the following action is initiated by the DMS SuperNode on Test Access Unit:

- Connect Loop Around Access.

3.2.58 Test Response Circuit

MANAGED OBJECT CLASS:	**Test Response Circuit**
Object Class Label:	**trc**

BEHAVIOR DEFINITIONS

Compliant

Instances of Test Response Circuit are part of Network Element.

The DMS SuperNode assumes that Test Response Circuit objects are inherently created at the RDT. The DMS SuperNode is not responsible for creating or deleting instances of this object.

The DMS SuperNode uses the Operate Termination M-ACTION on instances of this object to direct the Test Response Circuit to apply test terminations during channel testing.

ATTRIBUTES

Naming Attribute:

Compliant

Mandatory Attributes:

Compliant

Optional Attributes:

This object class has no optional attributes.

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

All of the notifications specified in this section are ignored by the DMS SuperNode.

ACTIONS

Only the following action is initiated by the DMS SuperNode:

- Operate Termination.

3.2.59 Alarm Count List

MANAGED OBJECT CLASS:	**Alarm Count List**
Object Class Label:	**alarmCountList**

Note: This object class is a Nortel extension to the implementation of the TR-303 multivendor interface on the DMS SuperNode. It is required to enable the DMS SuperNode to provide alarm summary displays related to the RDT.

BEHAVIOR DEFINITIONS

This object class is a class of managed objects containing the summary of alarms which have not been cleared at the RDT. The alarm counts are composed of combinations of alarm types and severities. For this object, the alarm types include Indeterminate, Transmission, Equipment, Environmental, Software, Service, ThresholdAlert, and ScheduledMgmtOpns, and the severities include Indeterminate, Warning, Minor, Major, and Critical.

Instances of this object class maintain, among others, the following relationships with other object classes: Instances of this object are part of Network Element.

Instances of this object class can neither be automatically created nor deleted.

(R) After system initialization, the CMIS M-CREATE and M-DELETE shall be used to create and delete instances of this object class. The Alarm Count Info attribute may be omitted in the M-CREATE when creating an instance of this object class.

(R) One instance of this object class may be inherently created at the RDT with Alarm Count List Id = 1 at system initialization time.

(R) The RDT shall set the alarm count values in this object to accurately reflect the currently active alarms at the RDT when an instance of this object class is created.

(R) If the Alarm Count Info attribute is changed, the RDT shall send an Event Reporting notification using the M-EVENT-REPORT service to the managing system. Multiple changes within an interval of 20 seconds can be conveyed in a single report. The Event Reporting notification shall include the following event argument:

monitoredAttributes = alarmCountInfo and its values

ATTRIBUTES

Naming Attribute:

Alarm Count List Id (alarmCountListId)

Mandatory Attributes:

Alarm Count Info (alarmCountInfo)

Optional Attributes:

Event Report Control Pointers (eventReportControlPointers)

Attribute Restrictions:

No restrictions are placed on attributes for instances of this object class.

NOTIFICATIONS

The CMIS M-EVENT-REPORT can be invoked to report the following events in the non-confirmed mode:

Object Creation Reporting,
Object Deletion Reporting,
Event Reporting.

ACTIONS

No actions are requested of instances of this object class.

Note: In the implementation of the TR-303 multivendor interface on DMS SuperNode:

- The optional attribute Event Report Control Pointers is not supported;
- Only the Event Reporting notifications are processed by the DMS SuperNode. All other notifications are ignored.

The RDT may choose to inherently create one instance of this object. The DMS SuperNode will send an M-CREATE request to the RDT at initialization or re-initialization. If the object does not exist, the RDT shall create an instance of the object. If the object already exists, the RDT shall return an M-CREATE with "Duplicate Managed Object Instance" error.

Specifications of the two attributes are provided below.

Alarm Count Info: This attribute contains the current alarm counts of the RDT. It includes all alarms which have occurred at the RDT and have not been cleared. This attribute is read only by external systems.

Alarm Count List Id : This attribute is used for naming instances of the Alarm Count List object class. Its value is an integer. For external systems, this attribute is read-only.

The ASN.1 specifications for the object Alarm Count List are provided below.

```
mviObjectClass    OBJECT IDENTIFIER  ::= { iso  member-body  canada (124)  bnr (113527)
                                          fiberWorld (1)  oam (1)  managedObjectClass (3) }

mviAttribute      OBJECT IDENTIFIER  ::= { iso  member-body  canada (124)  bnr (113527)
                                          fiberWorld (1)  oam (1)  attribute (7) }

mviNameBinding OBJECT IDENTIFIER  ::= { iso  member-body  canada (124)  bnr (113527)
                                          fiberWorld (1)  oam (1)  nameBinding (6) }


alarmCountList M-OBJECT-CLASS

    DERIVED FROM                        top
    CHARACTERIZED BY
        BEHAVIOR DEFINITIONS            { -- see above -- }
        ATTRIBUTES {
            alarmCountListId            GET,
            alarmCountInfo              GET
        }
        OPERATIONS
            CREATE
                with-automatic-instance-naming
            DELETE
        NOTIFICATIONS {
        objectCreationReporting,
        objectDeletionReporting,
        eventReporting
        }
        OPTIONAL ATTRIBUTES {
        eventReportControlPointers      GET-REPLACE     ADD-REMOVE
        }
::= { mviObjectClass 303 }


alarmCountInfo ATTRIBUTE
        SINGLE-VALUED
        WITH ATTRIBUTE SYNTAX     AlarmCountInfo
        MATCHES FOR EQUALITY
::= { mviAttribute 1542 }
```

```
alarmCountListId ATTRIBUTE
        SINGLE-VALUED
        WITH ATTRIBUTE SYNTAX       INTEGER
        MATCHES FOR EQUALITY
::= { mviAttribute 1543 }


AlarmCountInfo ::= SEQUENCE {
        indeterminateCounts         [0]  AlarmSeverityCounts,
        equipmentCounts             [1]  AlarmSeverityCounts,
        transmissionCounts          [2]  AlarmSeverityCounts,
        environmentalCounts         [3]  AlarmSeverityCounts,
        softwareCounts              [4]  AlarmSeverityCounts,
        serviceCounts               [5]  AlarmSeverityCounts,
        thresholdAlertCounts        [6]  AlarmSeverityCounts,
        scheduledMgmtOpnsCounts     [7]  AlarmSeverityCounts,
        total                       [8]  INTEGER -- total of the above 8 counts
}


AlarmSeverityCounts ::= SEQUENCE {
        indeterminate   [0]  INTEGER,
        warning[1]  INTEGER,
        minor           [2]  INTEGER,
        major           [3]  INTEGER,
        critical        [4]  INTEGER,
        total           [5]  INTEGER -- total of the above 5 counts
}


alarmCountList-networkElement NAME-BINDING
        SUBORDINATE OBJECT CLASS  alarmCountList
        NAMED BY
        SUPERIOR OBJECT CLASS networkElement
        WITH ATTRIBUTES alarmCountListId
::= { mviNameBinding 371 }
```

4.0 Management Service Requirements

No requirements stated

In defining compliancy to the service requirements in this section it is important to note that with the exceptions of notification report and Path Protection Switching, the DMS SuperNode is always an *invoking* service user and never a *performing* service user. This is a consequence of the transitional operations architecture discussed in Section 1.0. The following table summarizes the Invoker and Performer roles for CMISE services:

Service	Invoker	Performer	Mode
M-ACTION	LDS	RDT	Confirmed
M-CREATE	LDS	RDT	Confirmed
M-DELETE	LDS	RDT	Confirmed
M-GET	LDS	RDT	Confirmed
M-SET	LDS	RDT	Confirmed
M-EVENT-REPORT	RDT	LDS	non-Confirmed
*M-ACTION	RDT	LDS	Confirmed

* There is only one M-ACTION for this category. It happens when the RDT initiates a EOC or TMC Path Protection Switching by sending the Protection Switch M-ACTION to the LDS.

In addition, the RDT is required to support the following CMIS functional units:

Kernel,
Multiple object selection,
Filter,
Multiple reply.

In other words, the RDT is required to support all functional units, except the Extended Service functional unit, as described in Section 7 "Functional Units" of ISO/IEC 9595, 1991.

The DMS SuperNode supports invoke_identifiers, for all CMIS messages, that are in the range of 0 (zero) to 2**31 -1. Any CMIS message sent to the DMS SuperNode that has an invoke_identifier outside that range will be discarded.

4.1 Service Forms

No text

4.1.1 Sample Service Forms

No requirements stated

4.1.2 Error Codes

No requirements stated

4.2 M-CREATE

Service:	
CMISE Service:	M-CREATE
Related Object Classes:	
Analog Line Termination	ISDN Framed Path Termination
Cross Connection	ISDN Line Termination
DS0 Channel Termination	ISDN Per System Profile
Event Report Control	Quarter DS0 Channel Term.

BEHAVIOR DEFINITION

Compliant

SUPPLIED PARAMETERS

Compliant

Managed Object Instance: For object instances other than Cross Connection, the DMS SuperNode explicitly provides the ID of the object instance to be created in the M-CREATE request. For Cross Connection instances, with-automatic-instance-naming is used. In this case, the DMS SuperNode includes the Superior Object Instance (i.e. the Network Element) in the M-CREATE message.

Attribute List: When the DMS SuperNode sends an M-CREATE request, the Attribute List parameter may not contain values for all of the mandatory attributes supported by the DMS SuperNode. If a mandatory attribute value is not included in the Attribute List parameter, the RDT shall assign a predefined value (e.g. mandatory initial value, default value, or local means). For example, when the DMS SuperNode creates an Analog Line Termination, the value for the Line Circuit Address attribute is not included in the Attribute List parameter of M-CREATE. The RDT must provide a value for this attribute.

ERRORS

Compliant

Under rare circumstances it is conceivable that the switch could lose knowledge of Cross Connections previously established in the RDT. The DMS SuperNode will automatically recover from this condition but in the process it may attempt to create a Cross Connection that already exists. To properly address this possibility the RDT must respond with an error upon receiving an M-CREATE for a Cross Connection whose fromTermination or toTermination is already involved in an existing Cross Connection. This error message must contain the following information:

Error Code = Processing Failure
Error Parameter:
Managed Object Class = Cross Connection
Managed Object Instance = The instance of the Cross Connection that uses either of the from/to termination
Specific Error = Improper Condition
Error Parameter = The from/to termination(s) of the cross connect indicated by the Managed Object Instance

4.3 M-DELETE

Service:	
CMISE Service:	M-DELETE
Related Object Classes:	
Analog Line Termination	ISDN Framed Path Termination
Cross Connection	ISDN Line Termination
DS0 Channel Termination	Quarter DS0 Channel Term.

BEHAVIOR DEFINITION

Compliant

SUPPLIED PARAMETERS

Compliant

Access Control: The DMS SuperNode does not use this parameter in the M-DELETE request. As a result the DMS SuperNode will not be able to delete an object instance that has a Redlined attribute with a value of YES.

ERRORS

Compliant

4.4 M-SET

Service:	
CMISE Service:	M-SET
Related Object Classes:	
Analog Line Termination	Event Report Control
Cross Connection	ISDN Framed Path Termination

BEHAVIOR DEFINITION

Compliant

The DMS SuperNode may set the following attributes which are provided in the "Modification List" parameter of M-SET:

- Analog Line Termination:
  genSigFuncCode (set to wire2 GS, or wire2 LS)

- Cross Connection:
  connectionType (set to twoWay)

- Event Report Control:
  discriminatorState (set to TRUE or FALSE)

- ISDN Framed Path Termination:
  esHrThreshold (set to an INTEGER value of 40)
  esDayThreshold (set to an INTEGER value of 100)
  sesHrThreshold (set to an INTEGER value of 10)
  sesDayThreshold (set to an INTEGER value of 25)
  esHrHistory (set to the value of Empty Set)
  esFEHrHistory (set to the value of Empty Set)
  esHrPrevious (set to the value of 0)
  esFEHrPrevious (set to the value of 0)
  esDayPrevious (set to the value of 0)
  esFEDayPrevious (set to the value of 0)
  sesHrPrevious (set to the value of 0)
  sesFEHrPrevious (set to the value of 0)
  sesDayPrevious (set to the value of 0)
  sesFEDayPrevious (set to the value of 0)

SUPPLIED PARAMETERS

Compliant

ERRORS

Compliant

4.5 M-GET

Service:	
CMISE Service:	M-GET
Related Object Classes:	
Alarm Count List	Event Report Control
Analog Line Termination	ISDN Framed Path Termination
Cross Connection	ISDN Line Termination

BEHAVIOR DEFINITION

Compliant

The DMS SuperNode will get the following attributes which are provided in the "Attribute Identifier List" parameter of M-GET:

- Alarm Count List:
  alarmCountInfo

- Analog Line Termination:
  genSigFuncCode,
  callRefValue,
  primaryServiceState,
  secondaryServiceState

- Cross Connection:
  fromTerminationId,
  toTerminationId,
  connectionType

- Event Report Control:
  discriminatorState

• ISDN Framed Path Termination:
  ltOHStates,
  ntOHStates,
  channelSelection,
  esHrThreshold,
  esDayThreshold,
  sesHrThreshold,
  sesDayThreshold
  cvHrCurrent,
  cvFeHrCurrent,
  cvHrPrevious,
  cvFeHrPrevious,
  esHrCurrent,
  esFeHrCurrent,
  esHrPrevious,
  esFeHrPrevious,
  esHrHistory,
  esFeHrHistory,
  esDayCurrent,
  esFeDayCurrent,
  esDayPrevious,
  esFeDayPrevious,
  sesHrCurrent,
  sesFeHrCurrent,
  sesHrPrevious,
  sesFeHrPrevious,
  sesDayCurrent,
  sesFeDayCurrent,
  sesDayPrevious, and
  sesFeDayPrevious.

• ISDN Line Termination:
  callRefValue

The DMS SuperNode sends M-GET requests with only the attribute(s) it needs. It is expected that the RDT will reply with only the requested attribute(s). Extra attributes are ignored by the DMS SuperNode.

SUPPLIED PARAMETERS

Compliant

ERRORS

Compliant

4.7 M-ACTION

Service:	
CMISE Service:	**M-ACTION**
Action Type:	
Related Object Classes:	

BEHAVIOR DEFINITION

Compliant

SUPPLIED PARAMETERS

Compliant

ERRORS

Compliant

4.7.5 Change To Monitor

Service:	**Change To Monitor**
CMISE Service:	**M-ACTION**
Action Type:	**changeToMonitor**
Related Object Classes: **Metallic Test Access Path Term.**	

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situations:

- Processing Failure - Improper Condition: The MTAPT is out of service
- Processing Failure - Improper Condition: The channel unit is not equipped
- Processing Failure - Error Description: This M-ACTION is out of sequence

4.7.6 Change To Split Full

Service:	**Change To Split Full**
CMISE Service:	**M-ACTION**
Action Type:	**changeToSplitFull**

Related Object Classes:
Metallic Test Access Path Term.

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situations:

- Processing Failure - Improper Condition: The MTAPT is out of service
- Processing Failure - Improper Condition: The channel unit is not equipped
- Processing Failure - Error Description: This M-ACTION is out of sequence

4.7.7 Change To Split In

Service:	**Change To Split In**
CMISE Service:	**M-ACTION**
Action Type:	**changeToSplitIn**

Related Object Classes:
Metallic Test Access Path Term.

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situations:

- Processing Failure - Improper Condition: The MTAPT is out of service
- Processing Failure - Improper Condition: The channel unit is not equipped
- Processing Failure - Error Description: This M-ACTION is out of sequence

4.7.8 Change To Split Out

Service:	**Change To Split Out**
CMISE Service:	**M-ACTION**
Action Type:	**changeToSplitOut**

Related Object Classes:
Metallic Test Access Path Term.

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situations:

- Processing Failure - Improper Condition: The MTAPT is out of service
- Processing Failure - Improper Condition: The channel unit is not equipped
- Processing Failure - Error Description: This M-ACTION is out of sequence

4.7.9 Connect Loop Around Access

Service:	**Connect Loop Around Access**
CMISE Service:	**M-ACTION**
Action Type:	**connLoopAroundAcc**

Related Object Classes:
Metallic Test Access Unit

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

- Termination Point Id: The Line Termination Id (CRV) of the line to be accessed.
- Configuration Code: The value of 2WA.
- Test Access Path Termination Id: The Local Distinguished Name of the MTAPT with TAPT = 1.

ACTION RESULT

Compliant (with exceptions)

The optional parameter Terminate Leave Status is not supported. If the RDT includes this parameter in the response to this action, the DMS SuperNode will ignore this parameter but will process the other returned parameters.

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situation:

- Processing Failure - Improper Condition: The MTAPT is out of service
- Processing Failure - Already In Condition: The TAU has already assigned an MTAU to the circuit.

4.7.10 Connect Monitor Access

Service:	**Connect Monitor Access**
CMISE Service:	**M-ACTION**
Action Type:	**connMonitorAcc**
Related Object Classes:	
Metallic Test Access Path Term.	

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situations:

- Processing Failure - Improper Condition: The MTAPT is out of service
- Processing Failure - Improper Condition: The channel unit is not equipped
- Processing Failure - Error Description: This M-ACTION is out of sequence

4.7.11 Connect Split Out Access

Service:	**Connect Split Out Access**
CMISE Service:	**M-ACTION**
Action Type:	**connSplitOutAcc**

Related Object Classes:
Metallic Test Access Path Term.

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situations:

- Processing Failure - Improper Condition: The MTAPT is out of service
- Processing Failure - Improper Condition: The channel unit is not equipped
- Processing Failure - Error Description: This M-ACTION is out of sequence

4.7.12 Connect Test Response Circuit

Service:	**Connect Test Response Circuit**
CMISE Service:	**M-ACTION**
Action Type:	**connectTRC**
Related Object Classes: **Analog Line Termination**	

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situations:

- Processing Failure - Improper Condition: The MTAU or TRC is out of service
- Processing Failure - Improper Condition: The channel unit is not equipped
- Processing Failure - Error Description: This M-ACTION is out of sequence

4.7.17 Disconnect Test Access

Service:	**Disconnect Test Access**
CMISE Service:	**M-ACTION**
Action Type:	**discTestAccess**
Related Object Classes:	
Metallic Test Access Path Term.	

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situation:

• Processing Failure - Already In Condition: No test access is connected

4.7.21 Generate Corrupted crc

Service:	**Generate Corrupted crc**
CMISE Service:	**M-ACTION**
Action Type:	**generateCorruptedcrc**
Related Object Classes: **ISDN Framed Path Termination**	

BEHAVIOR DEFINITION

Compliant

The DMS SuperNode assumes that ISDN Basic Rate Access configurations support only the point-to-point *eoc(es)*. The master node that terminates the *eoc* is the LULT in the RDT, and the slave node that terminates the *eoc* is the NT1.

ACTION ARGUMENT

Compliant

For the Corruption Location argument, the only Location values utilized by the DMS SuperNode are as follows:

- end ::= nearEnd (The corrupted *crcs* are to be generated at the RDT)
- line ::= 0 (The corrupted *crcs* are to be generated at the NT1)

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situations:

- Processing Failure - Improper Condition: Corruption location is out of service
- Processing Failure - Already In Condition: Test is in progress

4.7.23 Initialize PM Attributes

Service:	**Initialize PM Attributes**
CMISE Service:	**M-ACTION**
Action Type:	**InitializePMAttributes**

Related Object Classes:
ISDN Framed Path Termination

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

The DMS SuperNode will initiate this action with either of the following two values in its PM Attributes action argument:

- all PM attributes - (assumes that all current, previous, and history PM attributes will be initialized to zero at the RDT), or
- all current PM attributes - (assumes that all current PM attributes will be initialized to zero at the RDT).

ACTION RESULT

Compliant

ERRORS

Compliant

4.7.28 Operate ISDN Loopback

Service:	**Operate ISDN Loopback**
CMISE Service:	**M-ACTION**
Action Type:	**operateISDNLoopback**
Related Object Classes: **ISDN Framed Path Termination**	

BEHAVIOR DEFINITION

Compliant

The DMS SuperNode assumes that ISDN Basic Rate Access configurations support only the point-to-point *eoc(es)*. The master node that terminates the *eoc* is the LULT in the RDT, and the slave node that terminates the *eoc* is the NT1.

ACTION ARGUMENT

Compliant

For the Corruption Location argument, the only Location values utilized by the DMS SuperNode are as follows:

- end ::= nearEnd (The loopback is to be performed at the RDT), and
- line ::= 0 (The loopback is to be performed at the NT1).

For the Channel argument, the values are:

- Channel ::= 011 (To loopback B1),
- Channel ::= 101 (To loopback B2), and
- Channel ::= 000 (To loopback B1, B2 and D).

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situations:

- Processing Failure - Improper Condition: The channel unit is not equipped
- Processing Failure - Already In Condition: Test is in progress
- Processing Failure - Improper Condition: The channel to loopback is busy

4.7.30 Operate Termination

Service:	**Operate Termination**
CMISE Service:	**M-ACTION**
Action Type:	**operateTermination**
Related Object Classes: **Test Response Circuit**	

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

ACTION RESULT

Compliant

ERRORS

Compliant

4.7.33 Protection Switch

Service:	**Protection Switch**
CMISE Service:	**M-ACTION**
Action Type:	**protectionSwitch**
Related Object Classes:	
Protection Group	

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

(For data link Path Protection Switching, the Protected Unit Name argument indicates the link to be switched from.)

ACTION RESULT

Compliant

ERRORS

Compliant

If the DMS SuperNode receives this M-ACTION requesting a path protection switch from the RDT after it has sent this M-ACTION to the RDT requesting a path protection switch but before it has received a reply message, the DMS SuperNode will send a M-ACTION response with the error "Processing Failure - Improper Condition" to the RDT (see R12-763 of GR-303).

Besides common error codes for M-ACTION, the RDT should report the following special situations:

- Invalid Object Instance: The Protection Group does not match the path type at the receiving end.
- Processing Failure - Improper Condition: The protecting path which is to become active is busy, out of service, or inhibited.

The DMS SuperNode will respond the same if it is the receiving end of the Protection Switch M-ACTION.

4.7.34 Release ISDN Loopback

Service:	**Release ISDN Loopback**
CMISE Service:	**M-ACTION**
Action Type:	**releaseISDNLoopback**
Related Object Classes: **ISDN Framed Path Termination**	

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

For the Corruption Location argument, the only Location values utilized by the DMS SuperNode are as follows:

- end ::= nearEnd (The loopback is to be performed at the RDT), and
- line ::= 0 (The loopback is to be performed at the NT1).

For the Channel argument, the values are:

- Channel ::= 011 (To loopback B1),
- Channel ::= 101 (To loopback B2), and
- Channel ::= 000 (To loopback B1, B2 and D).

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situation:

- Processing Failure - Already In Condition: No ISDN loopback is in progress

4.7.38 Release Test Response Circuit

Service:	**Release Test Response Circuit**
CMISE Service:	**M-ACTION**
Action Type:	**releaseTRC**

Related Object Classes:
Analog Line Termination

BEHAVIOR DEFINITION

Compliant

ACTION ARGUMENT

Compliant

ACTION RESULT

Compliant

ERRORS

Compliant

Besides common error codes for M-ACTION, the RDT should report the following special situation:

• Processing Failure - Already In Condition: No TRC is connected

4.7.49 Reset Timer

Service:	**Reset Timer**
CMISE Service:	**M-ACTION**
Event Type:	**resetTimer**

Related Object Classes:
Metallic Test Access Path Term.

BEHAVIOR DEFINITION

The DMS SuperNode uses this service to reset the 75-second activity timer associated with a particular test access path and test operation. It is used when long or indefinite holding time is required for a given test in the absence of other test access activity.

ACTION ARGUMENT

A NULL argument is supplied.

ACTION RESULT

A NULL confirmation is returned when this action is completed.

ERRORS

Besides common error codes for M-ACTION, the RDT should report the following special situation:

• Processing Failure - Improper Condition: The MTAPT is out of service

4.8 M-EVENT-REPORT

Service:	
CMISE Service:	**M-EVENT-REPORT**
Event Type:	
Related Object Classes:	

BEHAVIOR DEFINITION

Compliant

SUPPLIED PARAMETERS

Compliant

ERRORS

No requirements stated

4.8.3 Change of Overhead Bit Report

Service:	**Change of Overhead Bit Report**
CMISE Service:	**M-EVENT-REPORT**
Event Type:	**changeOfOverheadBitsReport**

Related Object Classes:
ISDN Framed Path Termination

BEHAVIOR DEFINITION

Compliant

EVENT ARGUMENT

Compliant

The DMS SuperNode complies with the changeOfOverheadBitsReport event argument syntax change as stated in Bellcore's Technical Reference Bulletin 3, dated October 1994. This syntax change, as stated by Bellcore and implemented in the DMS SuperNode, is defined as follows:

```
ChangeOfOHBitsReptArg ::= SEQUENCE {
        oldState        NTOHStates,
        newState        NTOHStates
        }
```

EVENT RESULT

No requirements stated

ERRORS

No requirements stated

4.8.4 Event Reporting

Service:	**Event Reporting**
CMISE Service:	**M-EVENT-REPORT**
Event Type:	**eventReporting**

Related Object Classes:

Alarm Count List	**IDLC Data Link Profile**
Analog Line Termination	**IDLC Data Link Termination**
Circuit Pack	**ISDN Framed Path Termination**
DS1 Framed Path Termination	**ISDN Line Termination**
DS1 Line Termination	**Memory**
Equipment	**Metallic Test Access Unit**
Equipment Holder	**Network Element**

BEHAVIOR DEFINITION

Compliant

EVENT ARGUMENT

Compliant (with exceptions)

The following optional arguments are not supported:

Trend Indication,
Protection Indication,
Protection Object,
Threshold.

If the RDT includes the above arguments in Event Reporting, the DMS SuperNode will ignore them but will process other returned arguments.

EVENT RESULT

No requirements stated

ERRORS

No requirements stated

The ProblemData argument of Event Reporting is specified in Supplement 3 of TR-303 as follows:

```
ProblemData ::= SEQUENCE {
        identifier      [0] OBJECT IDENTIFIER,
        critical        [1] BOOLEAN DEFAULT FALSE,
        item            [2] ANY DEFINED BY identifier
        }
```

To enhance the information supplied by the Event Reporting service a new attribute called Problem Info has been defined. When used in the context of Event Reporting, the "identifier" field of ProblemData must have the value of the object identifier for Problem Info. Problem Info is defined as follows:

Problem Info (problemInfo)

This attribute provides information on the nature of the condition which caused the event reporting service to be invoked. It includes a text description of the condition, a flag indicating whether the condition is service affecting, the alarm severity, and a problem identifier. The alarm severity is used in the context of current problem list. The problem Id is used in the context of Event Reporting to allow a managing system to unambiguously match an event report with an alarm severity of CLEAR with the original event report which caused the alarm to be raised.

```
problemInfo ATTRIBUTE
        SINGLE-VALUED
        WITH ATTRIBUTE SYNTAX       ProblemInfo
        BEHAVIOUR                   {-- See above --}
::= { idlcAttribute 406 }
```

```
ProblemInfo ::= SEQUENCE {
        problemText         [0]  PrintableString,
        serviceAffecting    [1]  BOOLEAN OPTIONAL,      -- TRUE if event affects service
        alarmSeverity       [2]  AlarmSeverity OPTIONAL, -- mandatory for current problem list
        problemId           [3]  INTEGER OPTIONAL        -- mandatory if event logging
                                                         -- is not supported
}
```

(Note: The DMS SuperNode only prints the first 61 characters of problemText.)

Appendix B: Operational Procedures

This Appendix describes how the Management Services defined in Appendix A are used to implement the various operational procedures employed by the DMS SuperNode in managing locally switched services on an RDT.

1.0 Line Maintenance

1.1 Generic Service State Model

This section presents certain aspects of the TR-303 generic state model which, from a DMS SuperNode perspective, may affect interoperability.

In TR-303, the service state of an object is represented by two attributes. These attributes are the Primary Service State and the Secondary Service State. The Primary Service State attribute reflects the internal capability of an object to provide its functions. The Secondary Service State attribute provides additional information about an object's ability to provide service as indicated by the Primary Service State attribute value. The Secondary Service State attribute is set-valued.

If the Primary Service State of an object is In Service, the DMS SuperNode will not examine the Secondary Service State of that object. If the Primary Service State is Out Of Service and the Secondary Service State list contains "swtch(41)", the DMS SuperNode will control service restoration, as appropriate.

If the Secondary Service State of an object contains any of the following values, the DMS SuperNode assumes that the hardware associated with that object is not present or is not functioning:

ueq (4),
fef (5),
mea (8),
dgn (15),
tstf (39).

Where applicable, the guidelines for Primary Service State and Secondary Service State as specified in TR-NWT-1093 Issue 1 September 1993 "Generic State Requirements for Managing Network Elements" are supported by the DMS SuperNode.

Scenarios of Service State Model Use in Provisioning of Unequipped or Mismatched Hardware.

If the DMS SuperNode sends an M-CREATE to provision a service on an unequipped slot in the RDT, the RDT should create the line with Primary Service State = oos and Secondary Service State attributes = ma,ueq.

If the DMS SuperNode sends an M-CREATE to provision a service on a slot which has incorrect hardware in it; e.g. provision a POTS line on an ISDN line card; the RDT should create the line with Primary Service State = oos and Secondary Service State attributes = ma, fef.

1.2 Lines Provisioning by the RDT or an OS

The DMS SuperNode is compatible with operations environments where provisioning for RDT lines is accomplished through inherent creation by the RDT or creation by other management entities (Supervisory System or Operations System). When operating in such an environment, the DMS SuperNode provisioning process for analog and ISDN line terminations is inhibited with one exception. The DMS SuperNode must always provision D-Channel cross connections and cross connections for any non-locally switched or non-switched services that pass through the SMA.

1.3 Lines Provisioning by the DMS SuperNode

This section provides the EOC messaging sequences for provisioning lines for locally switched services. These sequences are valid for RDTs managed by the DMS SuperNode that do not have lines provisioning turned off (due to inherent creation or creation by another management entity).

Creation of an Analog Line Termination messaging sequence:

1. Send a CREATE Analog Line Termination object request to the RDT with the following attributes provided:
   - analogLineTermId (with the same value as callRefValue),
   - primaryServiceState (with the value of In Service),
   - genSigFuncCode (with the value of either wire2 GS, or wire2 LS),
   - alarmSeverityAssignmentList (with the value of Empty Set),
   - callRefValue, and
   - redlined (with the value of False).
2. Look for RDT CREATE Response. If the duplicated object instance failure response is received, a delete message is sent to the RDT to remove the duplicated Analog Line Termination. Then a create message is sent again to re-create the object instance. If any other failure response is received, a log is generated at the DMS SuperNode to report the failure. In this case, the line is internally marked so as to prevent it from being placed in service.

The callRefValue (CRV) will be contained within the Office Equipment (OE) or Line Equipment Number (LEN) attribute that is provisioned in the DMS SuperNode as part of the service activation message when a locally switched service is created by an OS. The RDT shall be capable of mapping the CRV value to a unique physical location which is expected to be kept in the lineCircuitAddress attribute of the object. (This mapping can be designed into the RDT or done through a table provisioned in the RDT before circuit provisioning begins.)

The Analog Line Termination object contains Line Circuit Address of type PrintableString as one of its mandatory attributes. The content of the Line Circuit Address value (the physical address) will vary among RDT suppliers and, in general, the value will be architecture dependent. Bellcore does not intend to define the syntax or semantics to be used within the PrintableString. In this implementation, the DMS SuperNode does not use the Line Circuit Address to identify an analog line. Instead, an analog line is identified by its Analog Line Term Id which has the same value as its Call Reference Value.

Deletion of an Analog Line Termination messaging sequence:

1. Send a DELETE Analog Line Termination object request to the RDT with the following attribute provided:

   • analogLineTermId.

2. Look for RDT DELETE Response. If the failure response of "no such object instance" is received, it is treated as a deletion successful case. If any other failure response is received, the DMS SuperNode generates a log to report the failure.

Updating of Analog Line Termination attributes messaging sequence:

1. Send a SET request to the Analog Line Termination object of the RDT with the corresponding value for one or the following Analog Line Termination attribute:

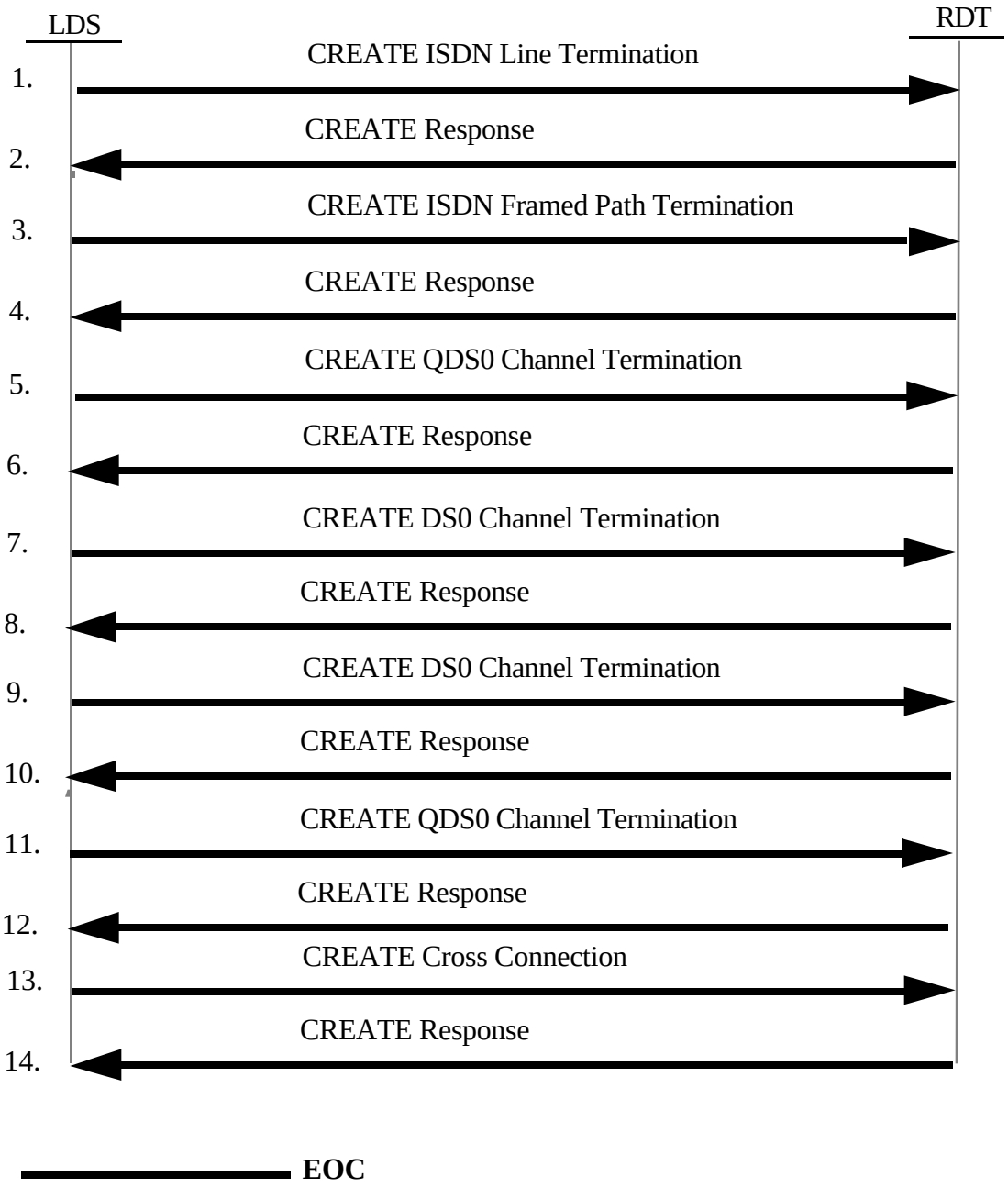
   • genSigFuncCode (with the value of either wire2 GS, or wire2 LS).

2. Look for RDT SET Response. If the RDT failed to update the Analog Line Termination object, the DMS SuperNode will generate a log to report the failure.

Examples of genSigFuncCode change are: when a ground start single party line (wire2 GS) is replaced with a multiparty line (wire2 LS), and when a multiparty line (wire2 LS) is replaced with a coin-first coin line (ground start, wire2 GS).

To update the genSigFuncCode attribute of an analog line, the DMS SuperNode does not change the Primary Service State of the object instance.

Creation of an ISDN Line Termination



Creation of an ISDN Line Termination messaging sequence:

1. Send a CREATE ISDN Line Termination object request to the RDT with the following attributes provided:
   - isdnLineTermId (with the same value as callRefValue),
   - primaryServiceState (with the value of In Service),
   - alarmSeverityAssignmentList (with the value of Empty Set), and
   - callRefValue.
2. Look for RDT CREATE Response.
3. Send a CREATE ISDN Framed Path Termination object request to the RDT with the following attributes provided:
   - isdnFramedPathTermId (with the same value as the isdnLineTermId),
   - primaryServiceState (with the value of In Service),
   - alarmSeverityAssignmentList (with the value of Empty Set),
   - ntOHStates (with the value of 0 for each of the 11 bits),
   - ltOHStates (with the value of 1 for each of the 11 bits),
   - channelSelection (with the value of 1 for each of the 3 bits),
   - cvHrCurrent (with the value of 0),
   - cvFEHrCurrent (with the value of 0),
   - cvHrPrevious (with the value of 0),
   - cvFEHrPrevious (with the value of 0),
   - esHrThreshold (with the value of 40),
   - esHrCurrent (with the value of 0),
   - esFEHrCurrent (with the value of 0),
   - esHrPrevious (with the value of 0),
   - esFEHrPrevious (with the value of 0),
   - esHrHistory (with the value of Empty Set),
   - esFEHrHistory (with the value of Empty Set),
   - esDayThreshold (with the value of 100),
   - esDayCurrent (with the value of 0),
   - esFEDayCurrent (with the value of 0),
   - esDayPrevious (with the value of 0),
   - esFEDayPrevious (with the value of 0),
   - sesHrThreshold (with the value of 10),
   - sesHrCurrent (with the value of 0),

- sesFEHrCurrent (with the value of 0),
- sesHrPrevious (with the value of 0),
- sesFEHrPrevious (with the value of 0),
- sesDayThreshold (with the value of 25),
- sesDayCurrent (with the value of 0),
- sesFEDayCurrent (with the value of 0),
- sesDayPrevious (with the value of 0), and
- sesFEDayPrevious (with the value of 0).

4. Look for RDT CREATE Response.

5. Send a CREATE QDS0 Channel Termination object (on the Access side) request to the RDT with the following attributes provided:
   - quarterDS0ChannelTermId (with the value of 1), and
   - primaryServiceState (with the value of In Service).

6. Look for RDT CREATE Response.

7. Send a CREATE DS0 Channel Termination object request to the RDT with the following attributes provided:
   - ds0ChannelTermId (with the value of 1 representing the B1 channel), and
   - primaryServiceState (with value of In Service).

8. Look for RDT CREATE Response.

9. Send a CREATE DS0 Channel Termination object request to the RDT with the following attributes provided:
   - ds0ChannelTermId (with the value of 2 representing the B2 channel), and
   - primaryServiceState (with the value of In Service).

10. Look for RDT CREATE Response.

11. Send a CREATE QDS0 Channel Termination object (on the Transport side) request to the RDT with the following attributes provided:
    - quarterDS0ChannelTermId (with an integer value of 1 through 4 corresponding to the quarter time slot contained in the DS1 facility), and
    - primaryServiceState (with the value of In Service).

12. Look for RDT CREATE Response.

13. Send a CREATE Cross Connection object request to the RDT with the following attributes provided:
    - fromTerminationId (the Distinguished Name of the access side QDS0 Channel Termination),
    - toTerminationId (the Distinguished Name of the transport-side QDS0 Channel Termination),
    - primaryServiceState (with the value of In Service),
    - connectionType (with the value of to twoWay), and
    - redlined (with the value of False).
14. Look for RDT CREATE Response with the Cross Connection ID.

If the duplicated object instance error response is received for the CREATE request, the object instance at the RDT is deleted and re-created by the DMS SuperNode. In Step 13, if a "Processing Failure - Improper Condition" error response is received, the DMS SuperNode will delete the existing Cross Connection object and then create a new Cross Connection object with the same fromTermination and toTermination. If any other error response is received for a CREATE request, all the previously created object instances associated with this ISDN line are deleted by the DMS SuperNode. In this case, the DMS SuperNode generates a log to report the failure, and the line is internally marked so as to prevent it from being placed in service.

The callRefValue (CRV) will be contained within the Office Equipment (OE) or Line Equipment Number (LEN) attribute that is provisioned in the DMS SuperNode as part of the service activation message when a locally switched service is created by an OS. The RDT shall be capable of mapping the CRV value to a unique physical location which is expected to be kept in the lineCircuitAddress attribute of the object.

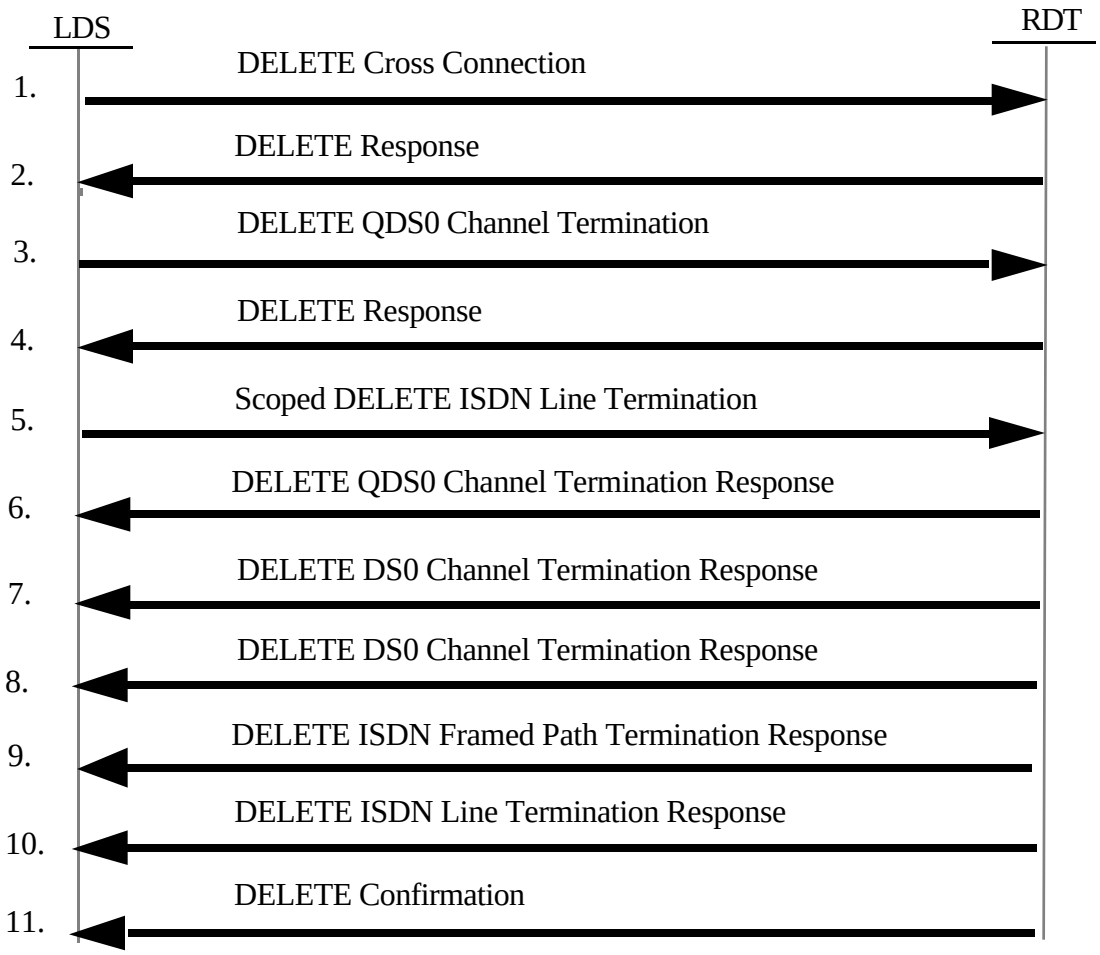
The ISDN Line Termination object contains Line Circuit Address of type PrintableString as one of its mandatory attributes. The content of the Line Circuit Address value (the physical address) will vary among RDT suppliers and, in general, the value will be architecture dependent. Bellcore does not intend to define the syntax or semantics to be used within the PrintableString. In this implementation, the DMS SuperNode does not use the Line Circuit Address to identify an analog line. Instead, an analog line is identified by its Analog Line Term Id which has the same value as its Call Reference Value.

Nail-up of B-Channels of an ISDN line messaging:

The DMS SuperNode supports the nail-up of the B1 and B2 channels of an ISDN line. When a nail-up connection is requested at the DMS SuperNode for a B-channel of an ISDN line, a M-CREATE is sent to create a Cross Connection object at the RDT. The Attribute List parameter of the M-CREATE contains the following attributes and values:

fromTerminationId:	the DN of the DS0 Channel Termination of the B-channel
toTerminationId:	the DN of the DS0 Channel Termination in DS1
primaryServiceState:	inService
connectionType:	twoWay
redlined:	false

Deletion of an ISDN Line Termination



EOC

Deletion of an ISDN Line Termination messaging sequence:

1. Send a DELETE Cross Connection object request to the RDT with the following attribute provided:

   - crossConnectionId.

2. Look for RDT DELETE Response.

3. Send a DELETE QDS0 Channel Termination object (on the Transport side) request to the RDT with the following attribute provided:

   - quarterDS0ChannelTermId.

4. Look for RDT DELETE Response.

5. Send a scoped DELETE ISDN Line Termination object request to the RDT with the following CMISE Scope/Filter combination provided:

Object Class:	ISDN Line Termination
Object Instance:	distinguishedName of ISDN Line Termination
Synchronization:	bestEffort
scope:	wholeSubtree

6. Look for RDT DELETE QDS0 Channel Termination Response.

7. Look for RDT DELETE DS0 Channel Termination Response.

8. Look for RDT DELETE DS0 Channel Termination Response.

9. Look for RDT DELETE ISDN Framed Path Termination Response.

10. Look for RDT DELETE ISDN Line Termination Response.

11. Look for RDT DELETE Confirmation.

During the deletion if the no such object instance failure response is received, it is handled as a deletion successful case. If any other failure response is received for a delete request, the DMS SuperNode generates a log to report the failure.

1.4 Automatic Reprovisioning of RDT Line Data

The DMS SuperNode will automatically reprovision lines on an RDT when an event report is received from the RDT indicating a software problem with corrupt data.

1. The RDT sends an unsolicited M-Event-Report notification to the DMS SuperNode with the following parameters, in addition to other required parameters.

Parameter	Value
ManagedObjectClass Managed Object Instance	memory memoryID = 1
Problem Type	softwareProblemType (corruptData)

2. Upon receiving this message, the DMS SuperNode initiates reprovisioning of the line data for the affected RDT.

3. Only line termination objects that the DMS originally provisioned are reprovisioned during this process.

4. The automatic reprovisioning of data is only performed for RDTs which support an unsolicited notification as stated in 1.

Lines Provisioning Audit

A lines provisioning audit consists of GET requests issued by the DMS SuperNode to the RDT in order to retrieve those line termination objects that correspond to the provisioning data stored in the DMS SuperNode. A comparison is then made with the data stored in the DMS SuperNode to ensure consistency with the provisioning data stored in the RDT. Should a mismatch occur, the DMS SuperNode will update the data contained in the RDT as appropriate. If a line termination does not already exist, then the DMS SuperNode will send a CREATE line termination request to the RDT.

The DMS SuperNode will audit RDT lines provisioning data automatically every 24 hours.

The following lines provisioning objects are audited in the TR-303 implementation of the DMS SuperNode. Within each object, a list of its attributes that will be checked via the CMIS M-GET service is provided.

- Analog Line Termination:
  genSigFuncCode,
  callRefValue

- Cross Connection:
  crossConnectionId,
  fromTerminationId,
  toTerminationId,
  connectionType

- DS0 Channel Termination:
  No attributes of this object are requested in the M-GET request.
  Only the presence of the object instance is audited.

- ISDN Framed Path Termination:

  esHrThreshold,
  esDayThreshold,
  sesHrThreshold,
  sesDayThreshold

- ISDN Line Termination:
  callRefValue

- QDS0 ChannelTermination (Access side):
  No attributes of this object are requested in the M-GET request
  Only the presence of the object instance is audited.

- QDS0 ChannelTermination (Transport side):
  No attributes of this object are requested in the M-GET request
  Only the presence of the object instance is audited.

NOTE: This function only audits the RDT TR-303 lines that were created by the DMS SuperNode. It does not audit line termination objects created by any entity other than the DMS SuperNode. This includes inherently created line termination objects at the RDT.

This audit function is not responsible for data that can be dynamically altered by management systems other than the DMS SuperNode or by the RDT itself.

ISDN Performance Monitoring

For each TR-303 RDT, the DMS SuperNode will provision one object instance of the ISDN Per System Profile.

Creation of an ISDN Per System Profile messaging sequence:

1. Send a CREATE ISDN Per System Profile object request to the RDT with the following attribute provided:
   - isdnPerSystemProfileId (with a value of 1), and
   - dslSESDefinition (with a value of 3).

2. Look for RDT CREATE Response. If the duplicated object instance failure response is received, a delete message is sent to the RDT to remove the duplicated ISDN Per System Profile. Then a create message is sent again to re-create the object instance. If any other failure response is received, the DMS SuperNode will attempt to create this object instance two more times before generating a log to report the failure.

1.5 Metallic and Channel Testing

1.5.1 Metallic Testing

This implementation of the TR-303 multivendor interface on DMS SuperNode supports metallic test access procedures which are consistent with the transitional operations architecture. It assumes that the loop testing system connects to the DMS SuperNode via a No-Test-Trunk (NTT) interface which conforms to the requirements in Appendix A of TR-TSY-000008 (TR-08).

The procedures used to perform metallic test access for locally switched services are described below. These test procedures are adapted from the procedures defined in Appendix A of TR-08. To simplify the explanation, the description assumes that all loop measurements are conducted from the Central Office via a metallic bypass pair. It should be understood, however, that loop measurements can also be made using a Remote Test Unit (RTU) at the RDT since the messages which traverse the TR-303 interface are the same regardless of the location of the measurement function.

Test Initiation Procedures

1. The test system dials the directory number of the line to be tested via the NTT.

2. DMS SuperNode responds by applying a DC Signature to NTT indicating that the line being accessed resides on an RDT.

3. The test system applies a Test (Bypass) Initiate signal.

4. DMS SuperNode does one, and only one, of the following:

    a. If there is a major alarm affecting service on the line being accessed, the DMS SuperNode applies a 500-1000 ohm leak to ground interrupted at 60 IPM on tip lead (120 IPM optional) of the NTT.

    b. If the bypass pair is not available, the DMS SuperNode applies a 500-1000 ohm leak to ground interrupted at 120 IPM on tip lead.

    c. If neither of the conditions above exists, the DMS SuperNode grounds the inhibit lead and initiates the procedures to connect the bypass pair and channel.

Procedures to Connect the Bypass Pair And Channel

1. The DMS SuperNode assigns a time-slot to the line under test using normal TMC procedures.

2. DMS SuperNode sends the ***Connect Loop Around Access*** M-Action request to the RDT to reserve the bypass pair. The RDT returns the appropriate M-Action response.

3. Depending upon the value of "splitAccCapability" parameter returned in the response to the ***Connect Loop Around Access*** request, the DMS SuperNode sends the corresponding sequences of M-Actions:

splitAccCapability	M-Action Sequence:
simFullSplit	***Connect Monitor Access Change To Split Full***
nonsimFullSplit	***Connect Monitor Access and [Change To Split In (or) Change To Split Out]***
splitOutOnly	***Connect Split Out Access***

4. The RDT connects the bypass pair to the drop and returns the appropriate M-Action response(s).

5. The DMS SuperNode sends the ***Connect Test Response Circuit*** M-Action request to the RDT.

6. The RDT connects the line termination under test to the test response circuit and returns the appropriate M-Action response. Note, the test response circuit applies the Absorb/PTPG termination to the line termination upon being connected.

7. The DMS SuperNode applies a 500-1000 ohm leak to ground on the tip lead of the NTT to indicate that the bypass pair has been connected.

8. The DMS SuperNode removes the DC signature and the 500-1000 ohm leak to ground.

9. The test system removes the Test (Bypass) Initiate signal.

10. The DMS SuperNode connects the bypass pair to the NTT.

11. While the loop testing system is performing measurements on the drop beyond the RDT, the DMS SuperNode performs channel tests to verify the proper performance of the circuit segment between the switch and the RDT. These tests are described in Section 1.5.2 of this Appendix.

12. The test system requests the channel test results by changing from a low negative sleeve condition to an open sleeve condition on the NTT.

13. The DMS SuperNode transmits the channel test results to the test system via the NTT using a combination of DC voltages and tones.

14. The test system requests test trunk disconnect by changing to a high negative sleeve lead current condition and presenting a DC open circuit condition between the tip and ring leads of the NTT.

15. The DMS SuperNode responds by initiating test trunk disconnect procedures.

Test Trunk Disconnect Procedures

1. The DMS SuperNode sends the ***Release Test Response Circuit*** M-Action request to the RDT.

2. The RDT removes the Test Response Circuit from the line termination under test and returns the appropriate M-Action response.

3. The DMS SuperNode sends the ***Disconnect Test Access*** M-Action request to the RDT to disconnect the bypass pair.

4. The RDT removes the connection to the bypass pair and restores the connection between the line termination and the drop. It then returns the appropriate M-Action response.

5. The DMS SuperNode releases all switch resources allocated to the test including the bypass pair, the time-slot assignment, and the NTT.

Procedures to Perform a Manual Test Request

The DMS SuperNode proceeds as follows, upon the initiation of a manual test request, if metallic access is available at the RDT:

1. DMS SuperNode sends the ***Connect Loop Around Access*** M-Action request to the RDT to reserve the bypass pair. The RDT returns the appropriate M-Action response.

2. Depending upon the value of "splitAccCapability" parameter returned in the response to the ***Connect Loop Around Access*** request, the DMS SuperNode sends the corresponding M-Action requests:

splitAccCapability	M-Action Requests:
simFullSplit	***Connect Monitor Access*** ***Change To Monitor*** ***Change To Split Full***
nonsimFullSplit	***Connect Monitor Access*** ***Change To Monitor and*** ***[Change To Split In (or)*** ***Change To Split Out]***
splitOutOnly	***Connect Split Out Access***

Note: Once the M-Action request 'Connect Monitor Access' has been issued, the remaining M-Action requests stated above for full split capable RDTs may be issued in any order and may be issued alternately multiple times. Example request sequences are shown below.

For simFullSplit capability

1) Connect Monitor Access
   Change to Split Full
   Change to Monitor

2) Connect Monitor Access
   Change to Monitor
   Change to Full Split

3) Connect Monitor Access
   Change to Monitor
   Change to Full Split
   Change to Monitor
   Change to Full Split
   etc.

For nonsimFullSplit capability

1) Connect Monitor Access
   Change to Monitor
   Change to Split Out

2) Connect Monitor Access
   Change to Split Out
   Change to Monitor

3) Connect Monitor Access
   Change to Split Out
   Change to Monitor
   Change to Split Out
   Change to Monitor
   etc.

Testing Via a Shared Bypass Pair

Integrated Digital Loop Carriers that share a common metallic bypass pair for line maintenance testing must incorporate an inhibit lead configuration that blocks simultaneous access to the shared bypass pair. In the DMS SuperNode central office environment, scan points (SC), and scan distribution points (SD) are defined and wired together to act as an inhibit lead that provides the mutual exclusion. Pairs of SC and SD points must be defined for each IDLC that shares the same bypass pair.

1.5.2 Channel Testing

The procedure used in this implementation of the multivendor TR-303 interface on DMS SuperNode to perform testing of line terminating equipment associated with locally switched services is described below.

1. The DMS SuperNode measures various channel transmission parameters using the Absorb/PTPG test termination which was initially applied when the Test Response Circuit was first connected to the line termination.

2. The DMS SuperNode sends the ***Operate Termination*** M-Action request to the RDT.

3. The RDT applies the "Initial Termination" indicated in the Operate Termination request and returns the appropriate M-Action response.

4. The DMS SuperNode sends an ABCD bit signaling pattern to the line termination under test.

5. The RDT test response circuit checks for the "Detect Output" signaling condition specified in the Operate Termination request. If the correct signaling condition is sensed, the test response circuit applies the "Detect Termination" specified in the Operate Termination request to the line termination under test.

6. The DMS SuperNode verifies that the "Detect Termination" has been applied by injecting tones and making measurements on the circuit under test and by checking the ABCD bit signaling pattern received from the RDT.

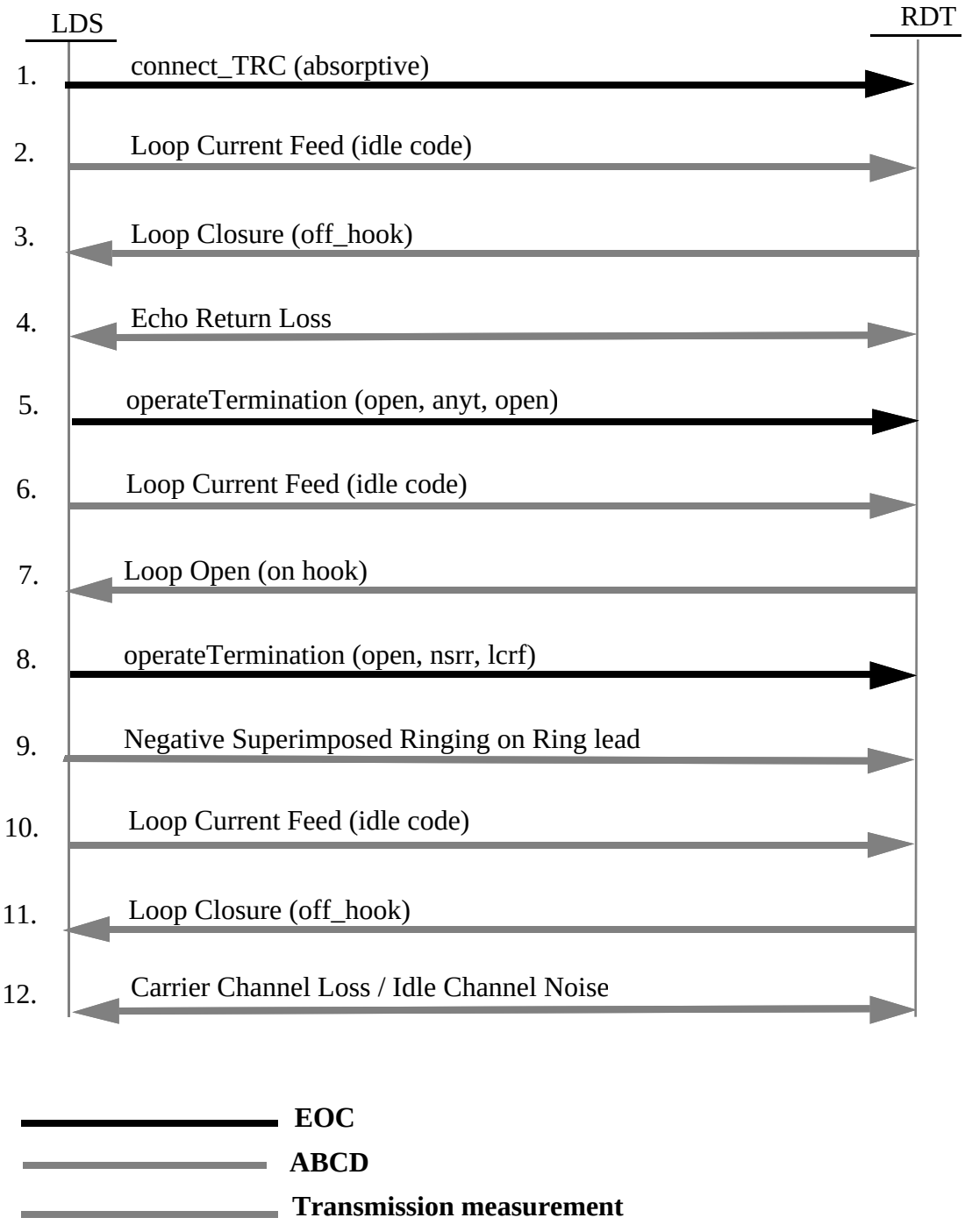
7. The DMS SuperNode sends the ***Operate Termination*** M-Action to the RDT to cause the test response circuit to release the previous termination and to establish the conditions necessary for the next test.

8. The RDT test response circuit removes the current test termination and connects the "Initial Termination" indicated in the Operate Termination request to the line termination under test. The RDT then returns the appropriate M-Action response.

9. Steps 4-8 are repeated for each subsequent test until all tests are done.

The following 6 pages contains detailed depictions of the channel test messaging sequences used for the different service types.

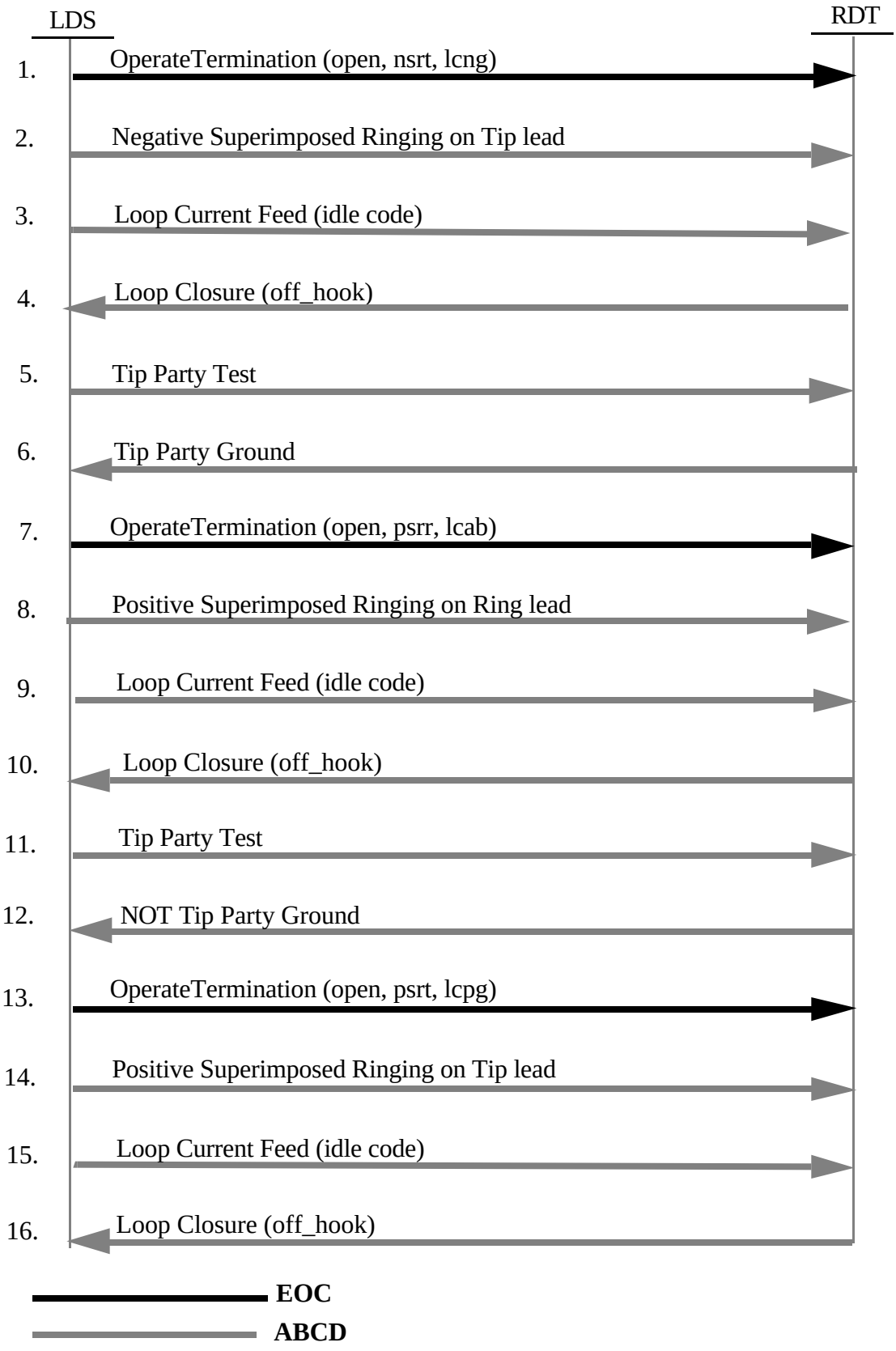
Single Party Channel Test



Single Party Channel Test messaging sequence:

1. Connect absorptive termination with positive ground to line circuit.
2. Apply Loop Current Feed ABCD bit pattern toward RDT.
3. Look for ABCD off hook response.
4. With existing termination applied, perform Echo Return Loss transmission test.
5. Remove termination from line circuit.
6. Apply Loop Current Feed ABCD bit pattern toward RDT.
7. Look for ABCD on hook response.
8. OperateTermination with initial termination open, detect negative superimposed ringing in ring with tip grounded, and then apply a loop closure reflective termination if ringing is detected.
9. Apply negative ringing ABCD bit pattern toward RDT.
10. Apply Loop Current Feed ABCD bit pattern toward RDT.
11. Look for ABCD off hook response.
12. With existing termination, perform carrier channel loss and idle channel noise.

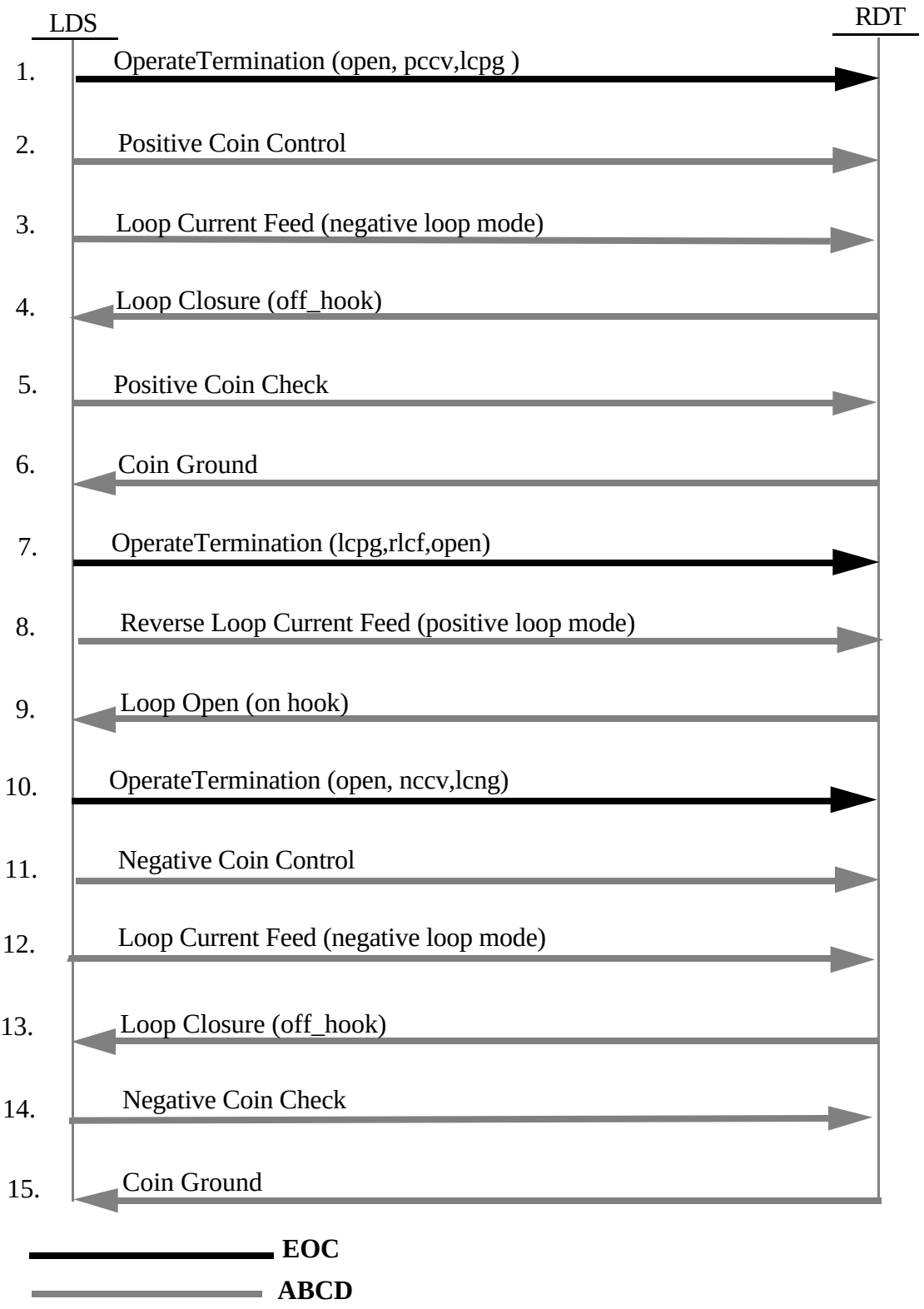
Multi-party Channel Tests



Multi-party Channel Tests messaging sequence:

1. OperateTermination with initial termination open, detect negative ringing on Tip lead, then apply reflective termination with negative ground if ringing is detected.
2. Apply negative ringing ABCD bit pattern toward RDT.
3. Apply Loop Current Feed ABCD bit pattern toward RDT.
4. Look for ABCD off hook response.
5. Apply Tip Party Test ABCD bit pattern toward RDT.
6. Look for Tip Party Ground ABCD response.
7. OperateTermination with initial termination open, detect positive ringing on Ring lead, if detected then apply absorptive termination.
8. Apply positive ringing ABCD bit pattern toward RDT.
9. Apply Loop Current Feed ABCD bit pattern toward RDT.
10. Look for ABCD off hook response.
11. Apply Tip Party Test ABCD bit pattern toward RDT.
12. RDT should not return Tip Party Ground.
13. OperateTermination with initial termination open, detect positive ringing on Tip lead, if detected then apply absorptive termination with positive ground.
14. Apply positive ringing ABCD bit pattern toward RDT.
15. Apply Loop Current Feed ABCD bit pattern toward RDT.
16. Look for ABCD off hook response.

Coin Channel Tests



Coin Channel Tests messaging sequence:

1. OperateTermination with initial termination open, detect positive coin control voltage from RDT line circuit, then apply absorptive termination with positive ground if positive coin control is detected.

2. Apply positive coin control ABCD bit pattern toward RDT.

3. Apply Loop Current Feed ABCD bit pattern toward RDT.

4. Look for ABCD off hook response from RDT.

5. Apply positive coin check ABCD bit pattern toward RDT.

6. Look for coin ground from RDT.

7. OperateTermination with initial termination set to absorptive with positive ground, detect reverse loop current feed from RDT, then apply an open termination if reverse loop current feed is detected.

8. Apply reverse loop current feed ABCD bit pattern toward RDT.

9. Look for on hook response from RDT.

10. OperateTermination with initial termination open, detect negative coin control voltage from RDT line circuit, if detected then apply reflective termination with negative ground.

11. Apply negative coin control ABCD bit pattern toward RDT.

12. Apply Loop Current Feed ABCD bit pattern toward RDT.

13. Look for ABCD off hook response from RDT.

14. Apply negative coin check ABCD bit pattern toward RDT.

15. Look for coin ground from RDT.

1.5.3 Activity Timer

As stated in Section 12.7.3 of GR-303, if the RDT has a test access established for a test system and the RDT has not received an operations message from the test system for 75 seconds, the RDT is required to release the test access and restore the line. After a test access is established for a line, The DMS SuperNode will send the Reset Timer M-ACTION every 30 seconds to maintain the test session configuration until the test is done.

2.0 RDT Maintenance

2.1 Alarms and Logs

The RDT uses the eventReporting M-EVENT-REPORT service to notify the DMS SuperNode of RDT events. The object classes that may generate eventReporting are listed in Section 4.8.4 of Appendix A.

Supplement 3 of TR-303 did not explicitly model the scan points for external alarms (e.g. A.C. power failure, open door, water, etc). To drive the scan points for the E2A Telemetry SAC remote as well as to display the alarm information on its local maintenance console, the DMS SuperNode uses the eventReporting notifications produced by the new Alarm Count List object.

Except for Alarm Count List (section 3.2.59 of Appendix A) and Memory (section 3.2.43 of Appendix A), the DMS SuperNode uses eventReporting notifications to generate logs. if the RDT does not send eventReporting for certain objects (e.g., IDLC Data Link Profile and IDLC Data Link Termination), the DMS SuperNode will not generate logs for them even if an event has occurred for the objects at the RDT.

2.3 EOC/TMC Path Protection Switching

2.3.1 Path Protection Triggers

The integrity of LAPD links is monitored for failures relating to Multiple Frame Establishment (MFE). Loss of MFE on any supported logical link of the DS0 path is recognized for the following conditions:

- Failure to establish Multiple Frame operations,
- Receipt of a LAPD disconnect (DISC) command or of a disconnected mode (DM) response frame (either solicited or unsolicited), or
- Retransmissions exceeding the N200 parameter setting.

Other events which may trigger autonomous path switching are:

- Receipt of I-Frame data on an application logical link of the standby path,
- Removal of the inhibit attribute on an in-service standby path when the designated active path is out-of-service (e.g. resulting from FORCE mode)

Messages received on the standby link during a path switch or a 10-second window after a path switch do not trigger a path protection switch.

2.3.2 Procedures

The DMS SuperNode uses the Protection Switch M-ACTION service for both switching to the standby as well as for resynchronization. In particular, the Protected Unit Name argument of this M-ACTION indicates the link to be switched from. The DMS SuperNode uses the forced mode only when a technician requests an unconditional switch. The M-ACTION is sent on both the active and standby path protection links.

If no response is received within 1 minute of a manually initiated request, no retransmission is made. The previously active path is restored for application use and the craftsperson is free to try again.

If no response is received within 1 minute or if a negative acknowledgment (e.g. protection switch request denied or other errors) is received in the context of an autonomously initiated request, then another request is sent to activate or reactivate the alternate path. If necessary, a second request to establish activity is sent within 2 minutes. Subsequent autonomous reattempts to establish activity are made continuously within a 3 minute retry schedule until the operation is successful or a higher-layer maintenance authority intervenes, such as a craftsperson, or as in the case with TMC, system-level automatic maintenance.

The RDT should implement similar procedures as those described above for the DMS SuperNode. In particular, the RDT should attempt resynchronization whenever it detects a potential mismatch condition.

2.4 The Control of Event Reports

The implementation of the TR-303 multivendor interface on DMS SuperNode creates two instances of Event Report Control at the RDT using M-Create. One instance is used to block Event Reports of DS1 performance monitoring alerts. It has the following attributes and values in the M-CREATE request:

eventReportControlId:	1
discriminatorConstruct:	not {ds1FramedPathTermId PRESENT }
managementUserId:	AP-title = object id of Network Element AE-qualifier = integer value of 4 -– SAPI/TEI = 1/4
discriminatorState:	TRUE (active)
beginTime:	immediate
endTime:	noEnding

The other instance is used to block Event Reports of ISDN performance monitoring alerts. It has the following attributes and values in the M-CREATE request:

eventReportControlId:	2
discriminatorConstruct:	not { and { isdnFramedPathTermId PRESENT }, { problemType EQUALITY anyThresholdAlert } }
managementUserId:	AP-title = object id of Network Element AE-qualifier = integer value of 4 -- SAPI/TEI = 1/4
discriminatorState:	TRUE (active)
beginTime:	immediate
endTime:	noEnding

Notes:

A. The attribute managementUserID is of type AE-title. Currently, the DMS SuperNode uses the syntax shown here for **AP-Title** and **AE-Qualifier**, however the RDT should not reject any syntax sent by the LDS. This attribute is only used at creation time and the DMS SuperNode will not audit on this attribute. The RDT may change the syntax in the object. If the RDT chooses to include this attribute in the reply to the M-CREATE, the syntax and value implemented by the DMS SuperNode should be used.

```
AE-title ::= CHOICE{
        AE-title-form1,
        AE-title-form2
        }

AE-title-form1 ::= [0] SEQUENCE {
        AP-title-form1,
        AE-qualifier-form1
        }

AE-title-form2 ::= [1] SEQUENCE {
        AP-title-form2,
        AE-qualifier-form2
        }

AP-title-form1 ::= SEQUENCE  OF RelativeDistinguishedName

AE-qualifier-form1 ::= RelativeDistinguishedName

AP-title-form2  ::=  OBJECT  IDENTIFIER

AE-qualifier-form2  ::=  INTEGER
```

The boldface attributes are the syntax actually used by the DMS SuperNode.

B. In TR-303 Supplement 3, one ProblemType is ThresholdAlert. The syntax for ThresholdAlert is defined as:

```
ThresholdAlert ::= SEQUENCE {
        triggeredThreshold      Attribute,
        triggered Attribute     Attribute       OPTIONAL
        }
```

In order to block all performance threshold alerts of ISDN lines, the discriminatorConstruct would need to contain a cumbersome filter composed of all threshold-related attributes of ISDN Framed Path Termination. To simplify the filter structure, the DMS SuperNode assumes the ThresholdAlert of the following syntax:

```
ThresholdAlert ::= CHOICE {
        anyThresholdAlert       NULL,
        specificThresholdAlert  SEQUENCE {
```

	triggeredThreshold Attribute, triggered Attribute	Attribute, Attribute	OPTIONAL
	}		
}			

2.5 Modification of ObjectSpecificError Syntax

The DMS SuperNode complies with the ObjectSpecificError syntax change as stated in Bellcore's Technical Reference Bulletin 4, dated October 1994. This syntax change, as stated by Bellcore and implemented in the DMS SuperNode, is defined as follows:

```
ObjectSpecificError ::= CHOICE {
        improperCondition              [0]  SET OF Attribute,
        corruptedMemoryError           [1]  SET OF AttributeId,
        alreadyInCondition             [2]  SET OF Attribute,
        associatedEntityUnavailable    [3]  AssociatedEntityUnavailable,
        errorDescription               [4]  PrintableString,
        containedObjectInstances       [5]  ContainedInstances
        }
```

The DMS SuperNode also complies with the ContainedInstances syntax change as stated in Bellcore's Technical Reference Bulletin 4, dated October 1994. This syntax change, as stated by Bellcore and implemented in the DMS SuperNode, is defined as follows:

```
ContainedInstances ::= SET OF ObjectInstance
```

ObjectInstance is imported from CMIP as follows:

```
ObjectInstance
FROM CMIP-1 {joint-iso-ccitt  ms(9)  cmip(1)  modules (0) protocol (3)}
```

Appendix C: Hybrid Signaling Scenarios

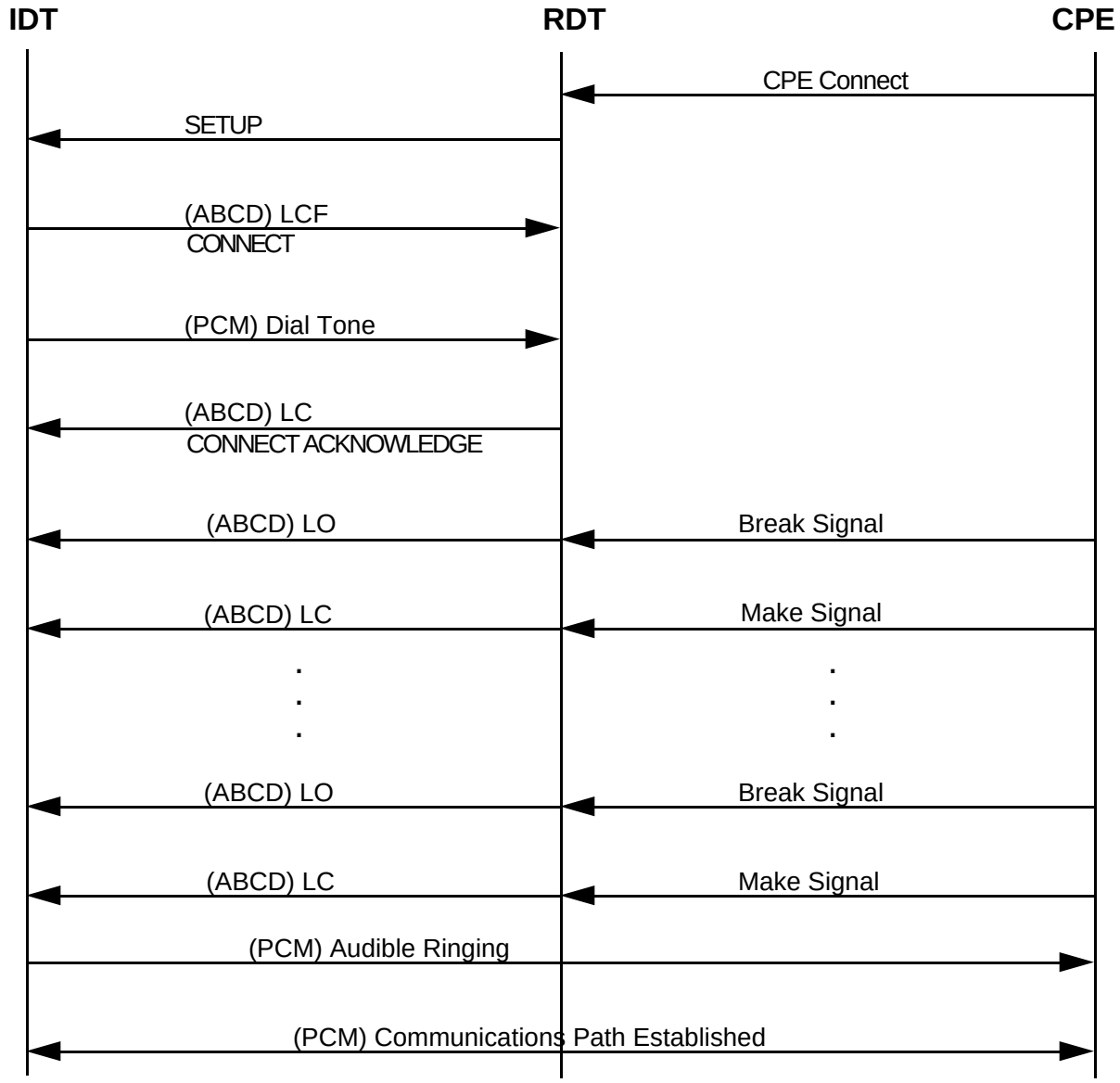
The purpose of this appendix is to provide examples that reflect the NTI interpretation of the TR-303 hybrid signaling call processing technique. This interface is presented in a series of flow diagrams depicting various call types. These diagrams are not intended to reflect every anticipated call processing scenario but to sufficiently demonstrate the basic tenets upon which the total interface has been designed. The following diagrams are presented:

1. Loop Start Call Originated at RDT (Dial Pulse Dialing)
2. Loop Start Call Originated at RDT (DTMF Dialing)
3. Loop Start Call Originated at IDT
4. Ground Start Call Originated at RDT
5. Ground Start Call Originated at IDT
6. Normal Clearing (Non-RDT Terminal Initiated)
7. Normal Clearing (RDT Terminal Initiated)
8. Loop Start Coin Call Originated at RDT (DTF)
9. Coin Call with LCO
10. Multi-Party Call (Tip Party)
11. Multi-Party Call (Ring Party)

Note:

- None of the interaction indicated between the CPE and RDT is intended to specify CPE-RDT interface requirements.
- No timing requirements are implied.
- CPE Connect indicates RDT detects dc loop current flow (low-resistance) in loop.
- CPE Seize indicates RDT detects grounding of ring conductor at terminal.
- CPE Disconnect indicates RDT detects absence of dc loop current flow (high-resistance) in loop.
- Alerting indicates RDT applies bursts of ac ringing signal superimposed on a dc voltage to the terminal.
- CPE Coin(s) Deposited indicates user of coin terminal inserted coin(s) into the hopper.
- CPE Coin(s) Disposed indicates transfer of coin(s) from hopper to either the coin vault or coin chute.

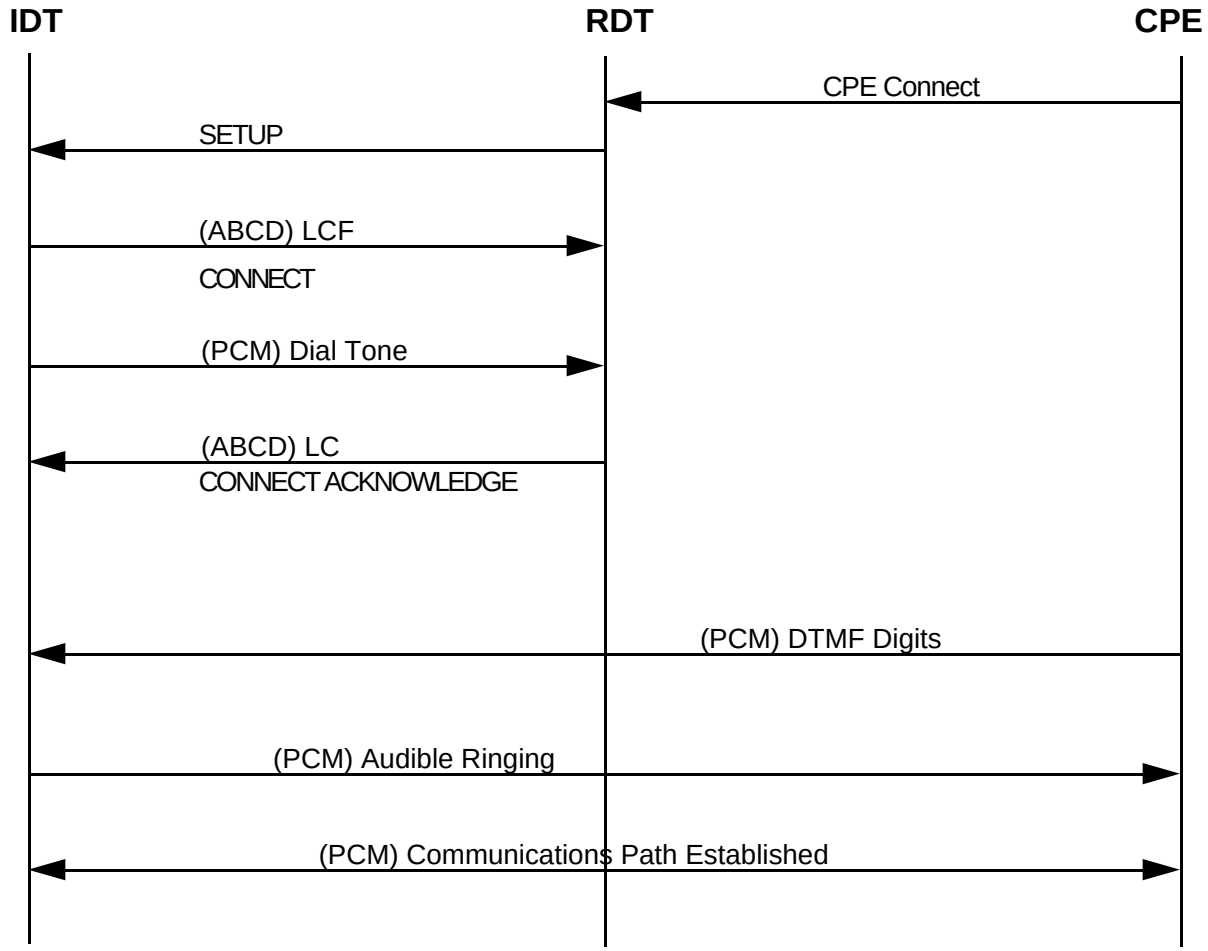
Figure 1. Loop Start Call Originated at RDT (Dial Pulse Dialing)



Note:

- Once the first complete digit is received, (PCM) dial-tone is removed and (PCM) idle-tone is applied.
- The last ABCD pattern indicated, in each direction, continues for the remainder of the call (i.e. LCF & LC).
- (PCM) Audible Ringing is removed and the communication path is established when the terminating CPE connects.

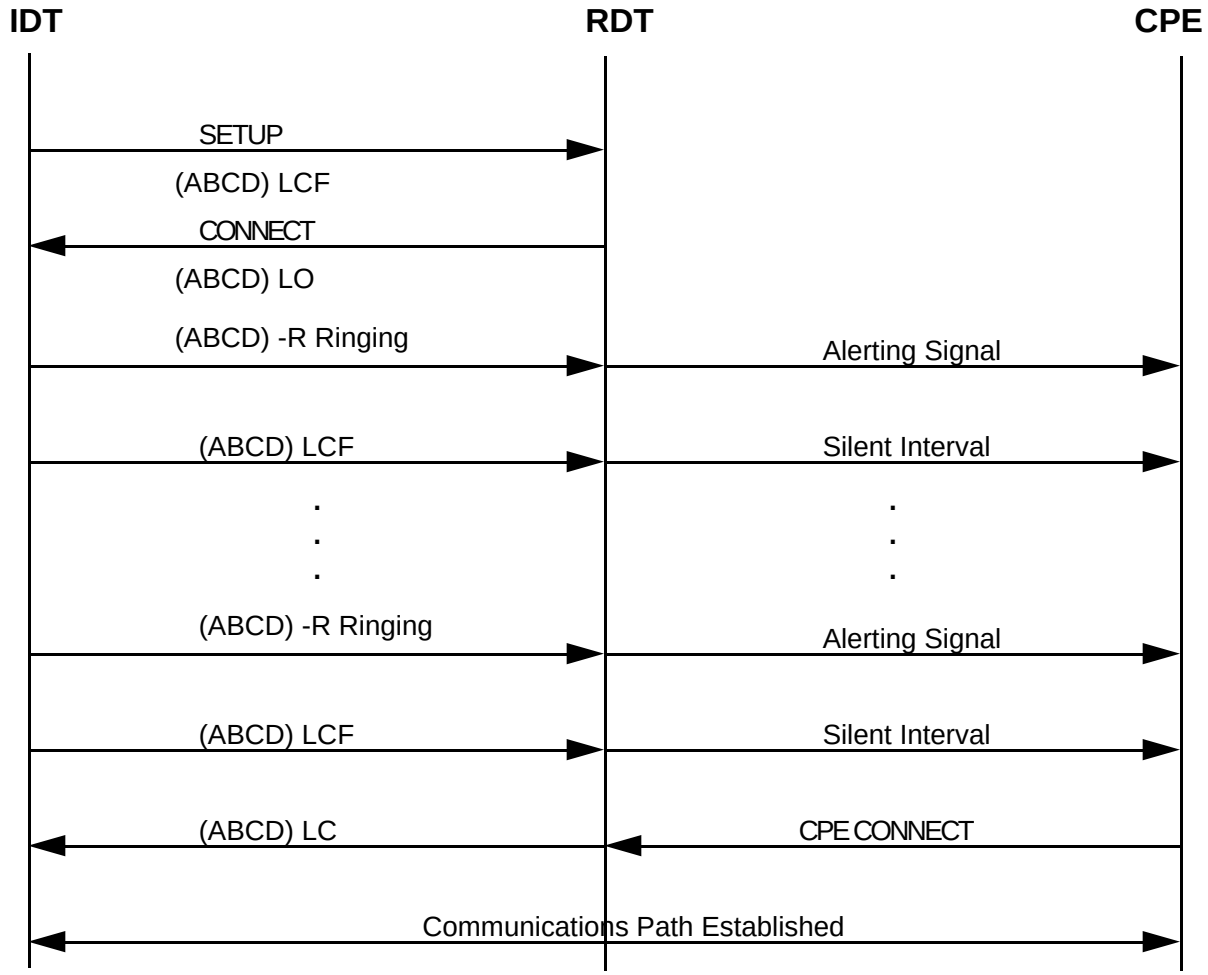
Figure 2. Loop Start Call Originated at RDT (DTMF Dialing)



Note:

- Once the first complete digit is received, (PCM) dial-tone is removed and (PCM) idle-tone is applied.
- The last ABCD pattern indicated, in each direction, continues for the remainder of the call (i.e. LCF & LC).
- (PCM) Audible Ringing is removed and the communication path is established when the terminating CPE connects.

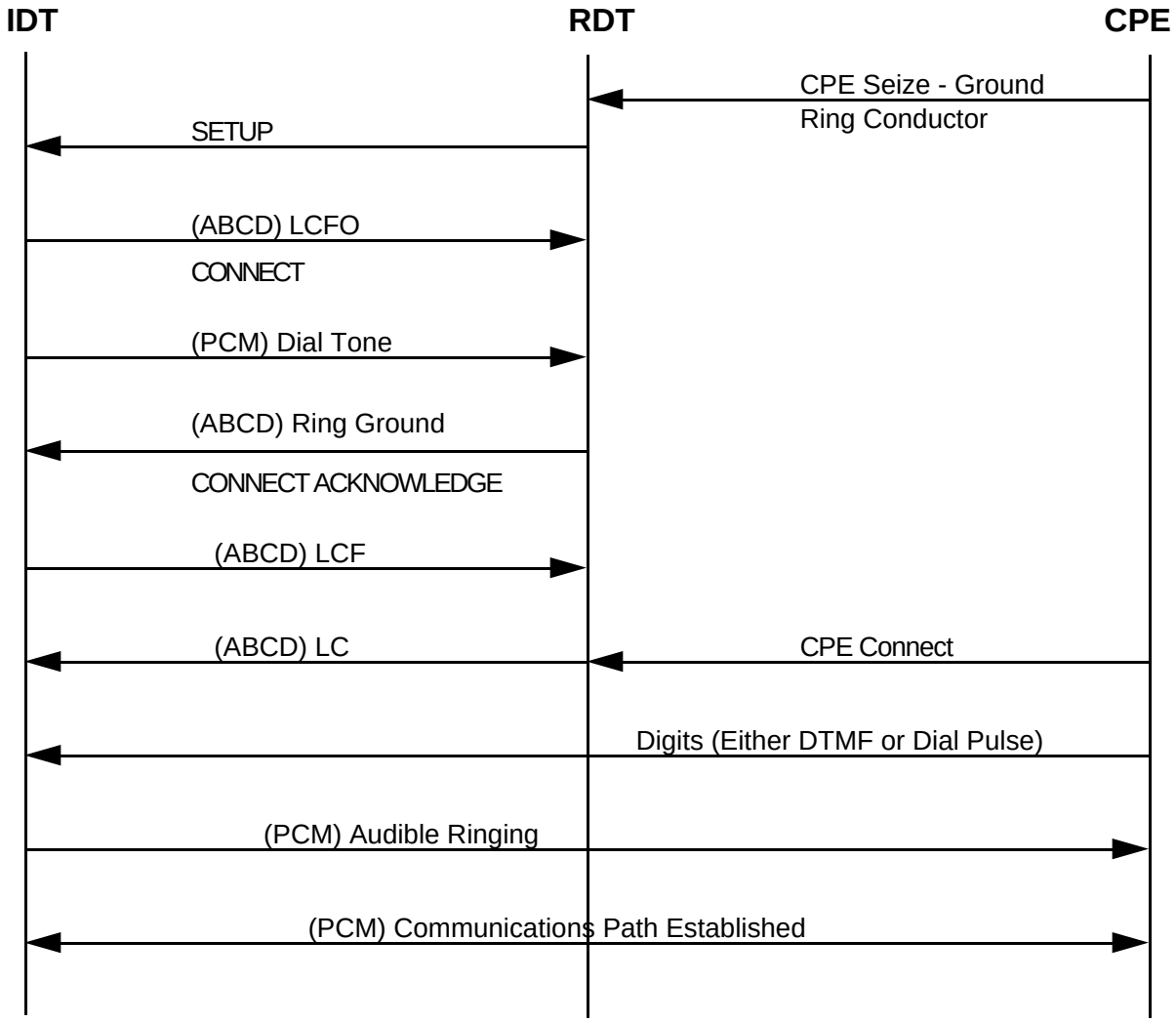
Figure 3. Loop Start Call Originated at IDT



Note:

- The last ABCD pattern indicated, in each direction, continues for the remainder of the call (i.e. LCF & LC).
- The ringing cadence can vary based on assigned service (e.g. The coded ringing cadence is 2 seconds alerting, 4 seconds silent.)

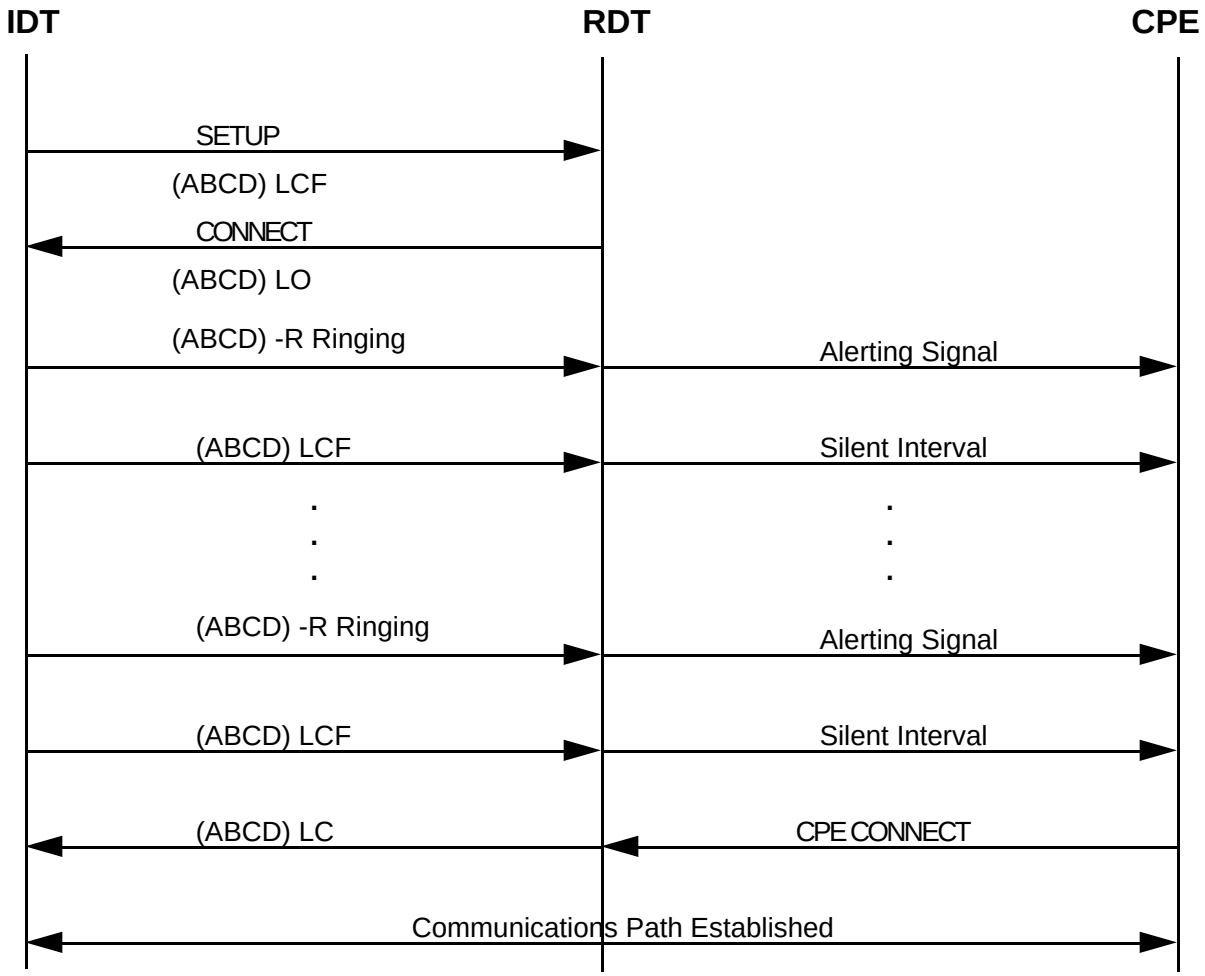
Figure 4. Ground Start Call Originated at RDT



Note:

- The last ABCD pattern indicated, in each direction, continues for the remainder of the call (i.e. LCF & LC).
- Once the first complete digit is received, (PCM) dial-tone is removed and (PCM) idle-tone is applied.
- (PCM) Audible Ringing is removed and the communication path is established when the terminating CPE connects.

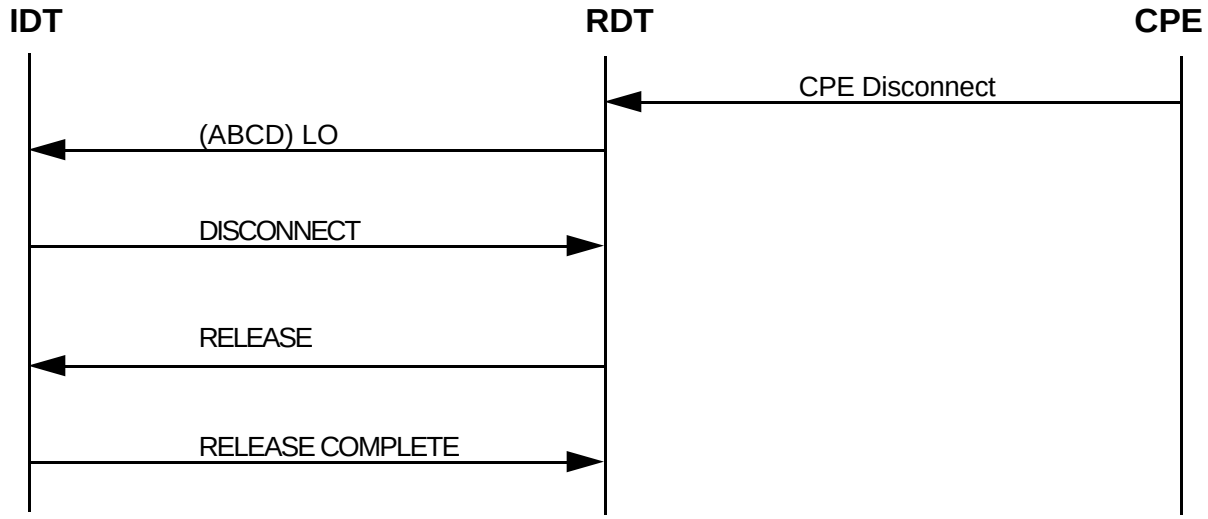
Figure 5. Ground Start Call Originated at IDT



Note:

- The last ABCD pattern indicated, in each direction, continues for the remainder of the call (i.e. LCF & LC).
- The ringing cadence can vary based on assigned service (e.g. The coded ringing cadence is 2 seconds alerting, 4 seconds silent.)

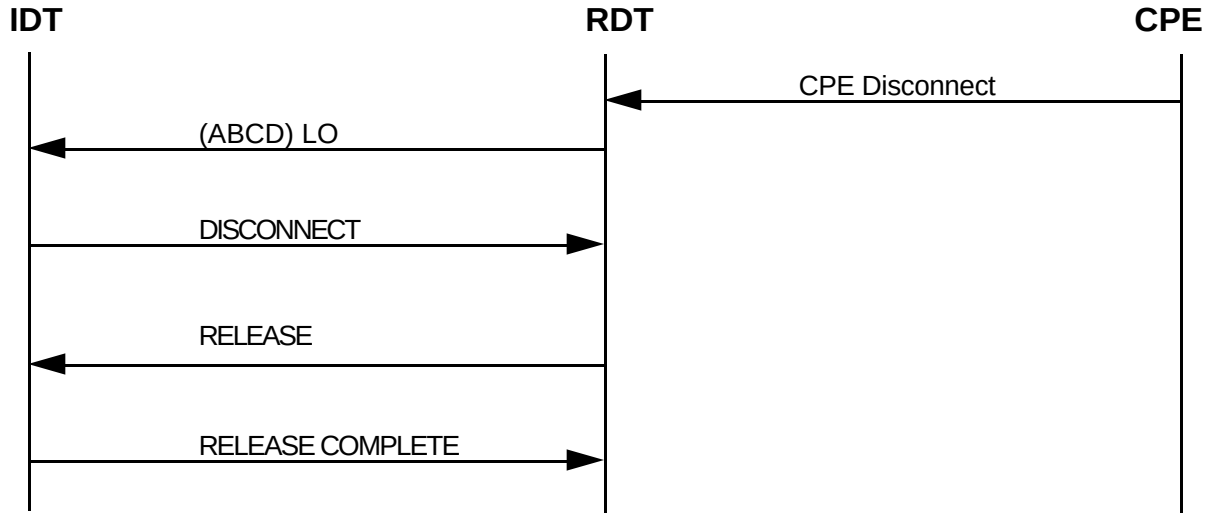
Figure 6. Normal Clearing (Non-RDT Terminal Initiated)



Note:

- Normal Call establishment precedes the occurrence of this interaction.

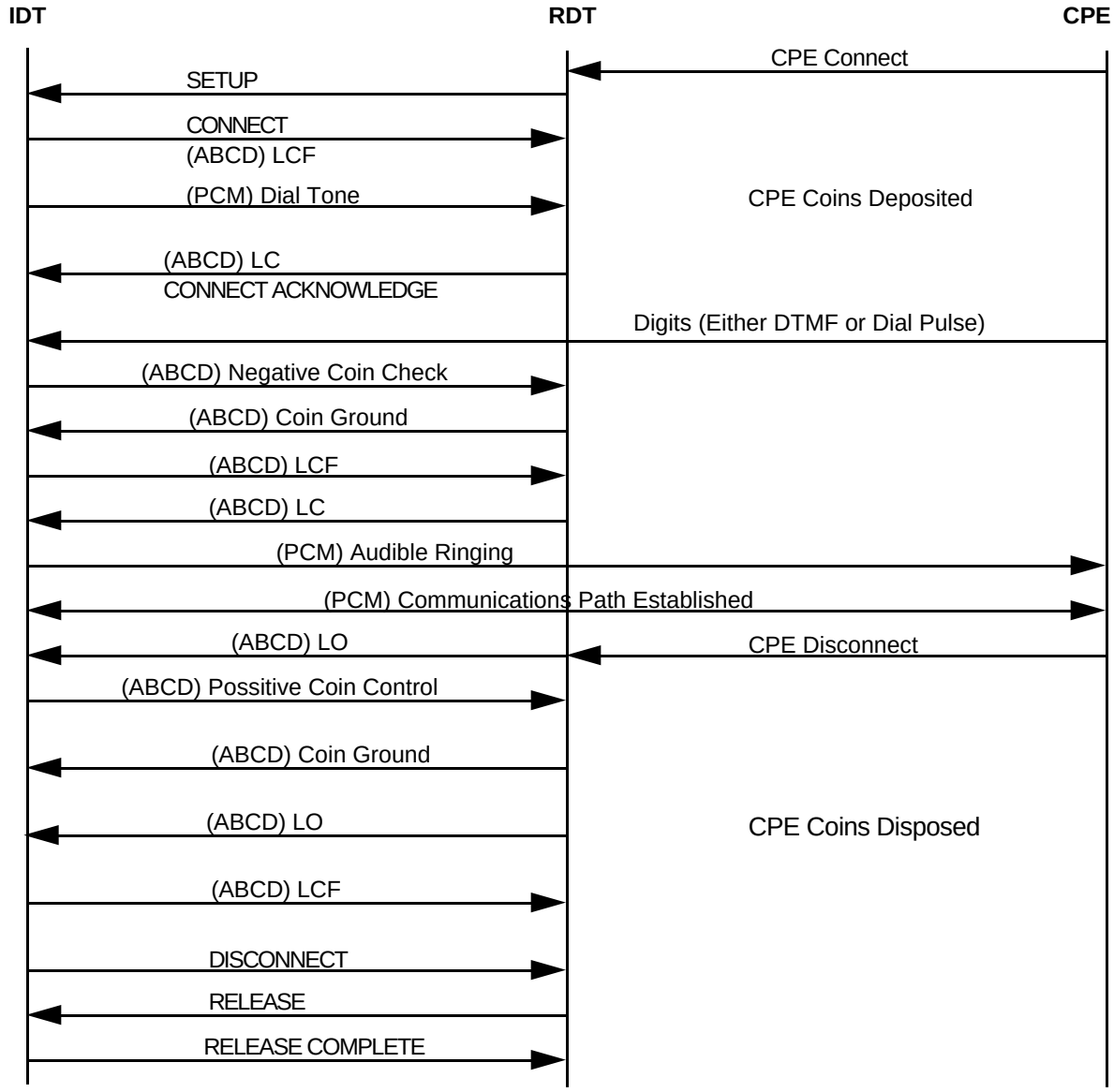
Figure 7. Normal Clearing (RDT Terminal Initiated)



Note:

- Normal Call establishment precedes the occurrence of this interaction.

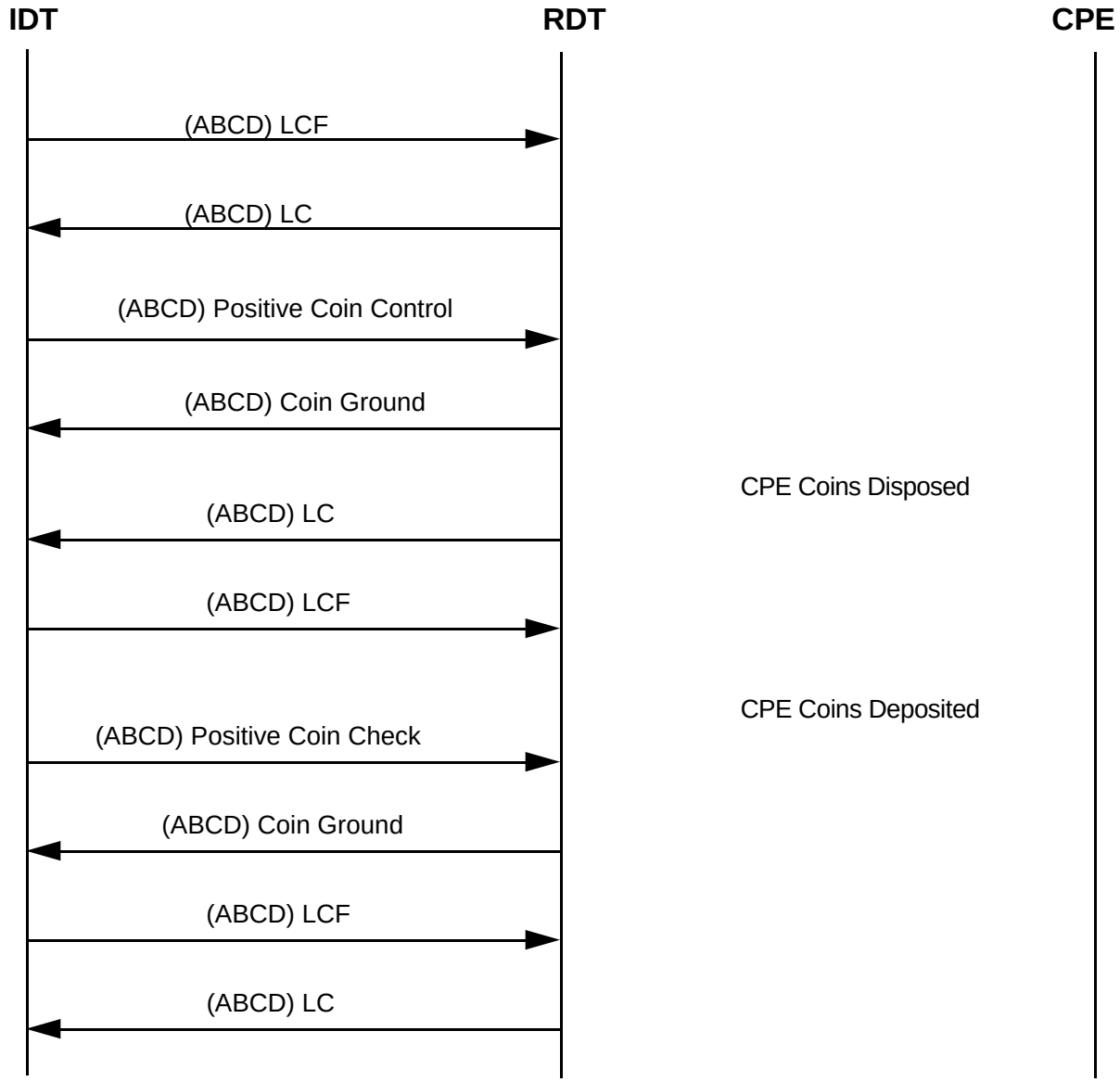
Figure 8. Loop Start Coin Call Originated at RDT (DTF)



Note:

- Initial deposit can be made anytime prior to the completion of dialing.
- Once the first complete digit is received, (PCM) dial-tone is removed and (PCM) idle-tone is applied.
- (PCM) Audible Ringing is removed and the communication path is established when the terminating CPE connects.

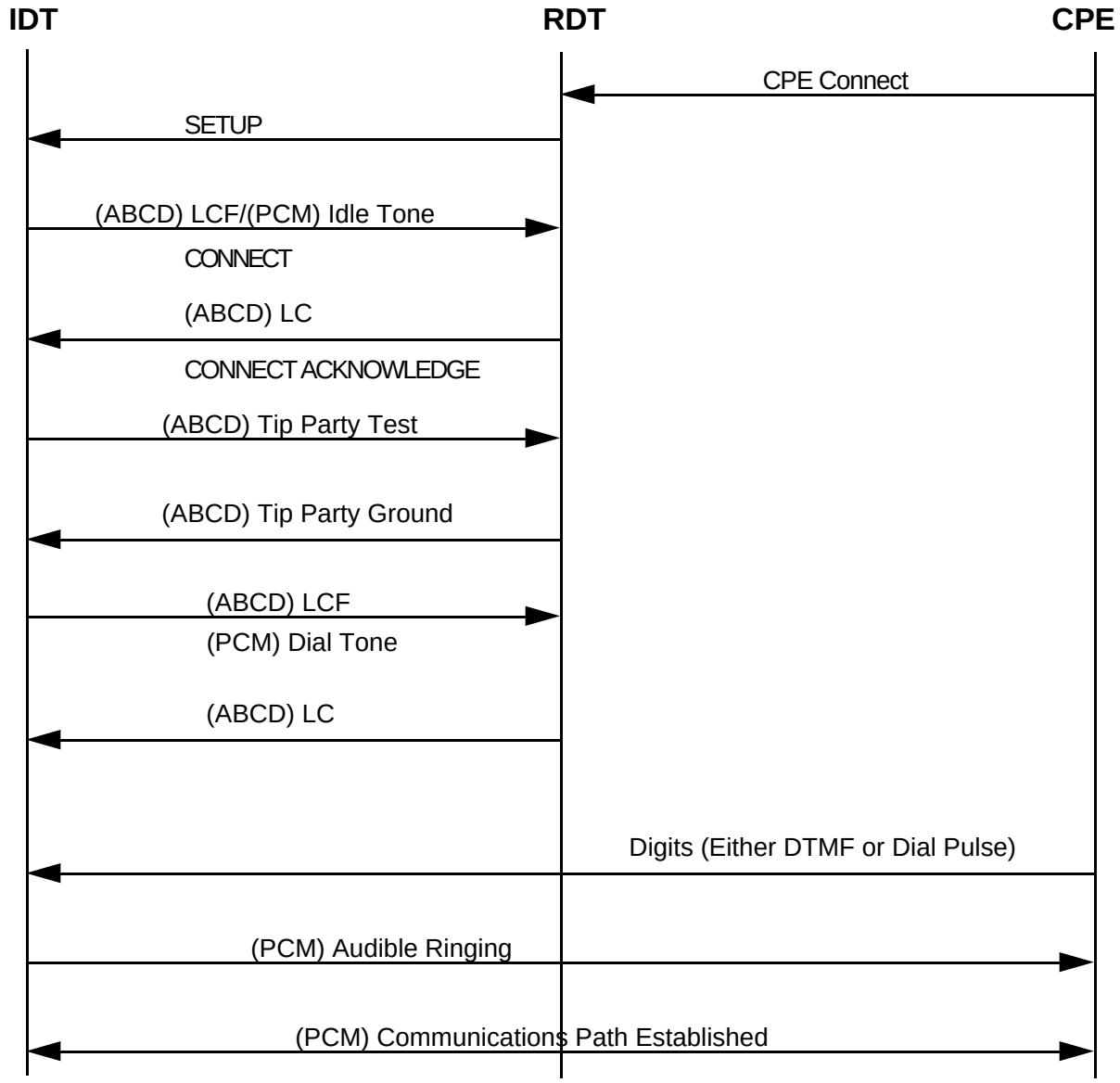
Figure 9. Coin Call with LCO



Note:

- This sequence will be repeated for every overtime deposit.
- This diagram assumes call already established & in talking state.

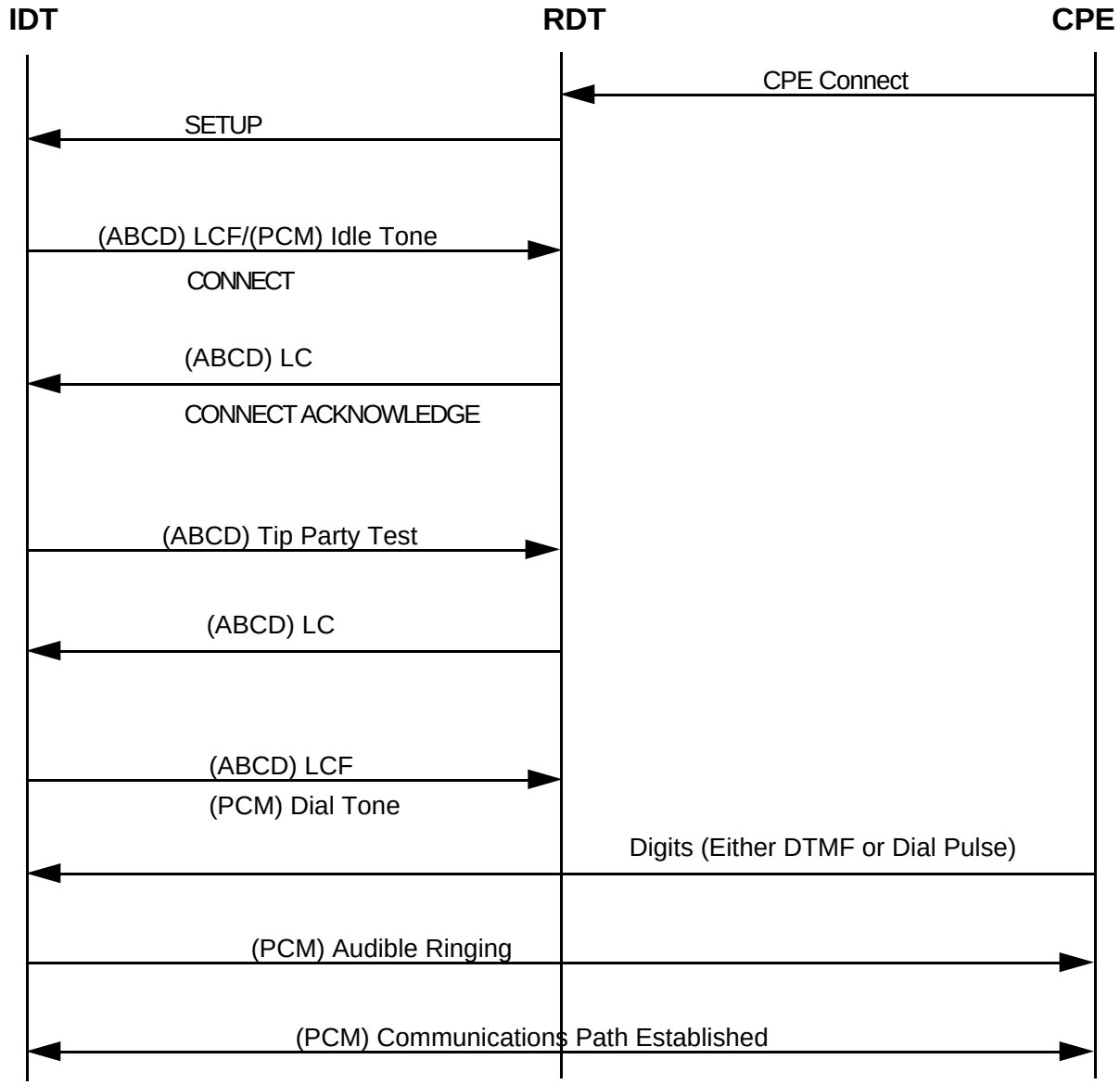
Figure 10. Multi-Party Call (Tip Party)



Note:

- The last ABCD pattern indicated, in each direction, continues for the remainder of the call (i.e. LCF & LC).
- Once the first complete digit is received, (PCM) dial-tone is removed and (PCM) idle-tone is applied.
- (PCM) Audible Ringing is removed and the communication path is established when the terminating CPE connects.

Figure 11. Multi-Party Call (Ring Party)



Note:

- The last ABCD pattern indicated, in each direction, continues for the remainder of the call (i.e. LCF & LC).
- Once the first complete digit is received, (PCM) dial-tone is removed and (PCM) idle-tone is applied.
- (PCM) Audible Ringing is removed and the communication path is established when the terminating CPE connects.

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DMS SuperNode TR-303 Implementation Specification

The ordering number for this Nortel Interface Specification (NIS) is NIS A217-3 Issue 02.02. To obtain additional copies of this document, call the toll free number 1-800-347-4850.

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