The ATM Forum

Technical Committee

Modification of Traffic Parameters for an Active Connection Signalling Specification (PNNI, AINI, and UNI) Version 2.0

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1 Introduction

[Informative]

This Addendum to ATM Forum UNI v4.0 “ATM User-Network Interface (UNI) Signalling Specification Version 4.0” [SIG 4.0], to ATM Forum PNNI v1.0 “Private Network-Network Interface Specification Version 1.0” [PNNI 1.0], to ATM Forum “PNNI v1.0 Errata and PICS” [PNNI 1.0 Errata], and to ATM Forum “ATM Inter-Network Interface (AINI) Specifications” [AINI], contains the description and specification of the Modification of Traffic Parameters for an Active Connection for PNNI, AINI and UNI interfaces. This addendum is based on ITU-T Recommendations Q.2963.1 [Q.2963.1], Q.2963.2 [Q.2963.2], and Q.2963.3 [Q.2963.3].

This is version 2.0 of the document and it supercedes version 1.0 of the document.

Section one contains information about the scope of the Modification of Traffic Parameters for an Active Connection, list of references, a table of acronyms, and a document history. Section two specifies the Modification coding requirement for UNI, PNNI, and AINI. Section three specifies the modification signalling procedures for UNI, PNNI, and AINI. Section four discusses the interactions with existing features. Section five discusses protocol interworking at the AINI. Annex A contains the PICS Proforma for UNI, Annex B contains the PICS Proforma for PNNI, and Annex C contains the PICS Proforma for AINI.

1.1 Scope

[Normative]

The scope of this document is to specify signalling for the support of Modification of Traffic Parameters of an Active Connection across private and public UNI interfaces, across PNNI interfaces, and across AINI interfaces. This is an optional feature of UNI v4.0, PNNI v1.0, and of AINI.
The modify capability allows:

- the modification of the MCR, MFS, BCT, MDCR, BCS, SCR, MBS, and PCR parameters
- the modification of those parameters which were included in the initial connection setup
- the parameters to be modified independently (e.g. can increase one and decrease another and can modify all or any subset of the original parameters)
- negotiation during modification via either the Alternative ATM traffic descriptor information element or the Minimum acceptable ATM traffic descriptor information element
- the modification of only point-to-point connections
- the modification of only UBR, VBR, GFR, and CBR connections
- multiple sequential modification requests
- only one outstanding modification request
- only the calling party to initiate modification (this avoids modification collisions)
- for the users to generate a confirmation message when the modification is complete

1.2 References

[SIG 4.0] ATM Forum Technical Committee, User-Network Interface (UNI) Signalling Specification, Version 4.0, af-sig-0061.000 , April 1996.

[PNNI 1.0] ATM Forum Technical Committee, Private Network-Network Interface Specification v1.0, af-pnni-0055.000, March 1996

[PNNI 1.0 Errata] ATM Forum Technical Committee, Private Network-Network Interface v1.0 Errata and PICS, ATM Forum af-pnni-0081.000, May 1997

[AINI] ATM Forum Technical Committee, ATM Inter-Network Interface (AINI) Specifications, ATM Forum af-cs-0125.000, April 1999

[Q.2963.1] ITU-T Recommendation Q.2963.1 (1999), Digital Subscriber Signalling System No. 2 – Connection modification: Peak cell rate modification by the connection owner.

[Q.2963.2] ITU-T Recommendation Q.2963.2 (1997), Digital Subscriber Signalling System No. 2 – Connection modification: Modification procedures for sustainable cell rate parameters.

[Q.2963.3] ITU-T Recommendation Q.2963.3 (1998), Digital Subscriber Signalling System No. 2 – Connection modification: ATM traffic descriptor modification with negotiation by the connection owner.

[Q.2762]* ITU-T Recommendation Q.2762 (1999), Broadband Integrated Services Digital Network (B-ISDN) - General Functions of Messages and Signals of the B-ISDN User Part (B-ISUP) of Signalling System No. 7

[Q.2763]* ITU-T Recommendation Q.2763 (1999), Broadband Integrated Services Digital Network (B-ISDN) - Signalling System No. 7 B-ISDN User Part (B-ISUP) - Formats and Codes

[UNI SEC] ATM Forum Technical Committee, *UNI Signalling 4.0 Security Addendum*, af- sec-0117.000, May 1999

[PNNII SEC] ATM Forum Technical Committee, *PNNI 1.0 Signalling Security Addendum*, Version 1.0, af-cs-116.000 May 1999

[PNNI GAT] ATM Forum Technical Committee, *PNNI Addendum for Generic Application Transport*, Version 1.0, af-cs-0126.000, July 1999

[TRACE] ATM Forum Technical Committee, *PNNI Addendum for Path and Connection Trace Version 1.0*, af-cs-0141.000, March 2000

[Q.2931 Amend4] ITU-T, *Amendment 4 to Recommendation Q.2931 - User-network interface (UNI) layer 3 specification for basic call/connection control*, 1999

[GFR] ATM Forum Technical Committee, *Guaranteed Frame Rate (GFR) Signalling Specification (PNNI, AINI, and UNI) Version 1.0*, af-cs-0167.000, 2001

[MDCR] ATM Forum Technical Committee, *UBR with MDCR Addendum to UNI Signalling 4.0, PNNI 1.0 and AINI*, af-cs-0147.000, 2000

[BCS] ATM Forum Technical Committee, *Behavior Class Selector Signalling Version 1.0*, af-cs-0159.000, 2000

1.3 Acronyms

AAL	ATM Adaptation Layer
ABR	Available Bit Rate
AINI	ATM Inter-Network Interface
ATM	Asynchronous Transfer Mode
BCS	Behavior Class Selector
BCT	Burst Cell Tolerance
B-ISUP	Broadband ISDN User Part
COA	CONNECTION AVAILABLE
CBR	Constant Bit Rate
GFR	Guaranteed Frame Rate
ITU-T	International Telecommunication Union-Telecommunication Standardization Sector
MBS	Maximum Burst Size
MCR	Minimum Cell Rate
MDCR	Minimum Desired Cell Rate
MFS	Maximum Frame Size
MOA	MODIFICATION ACKNOWLEDGE Message
MOD	MODIFICATION REQUEST Message
MOR	MODIFICATION REJECT Message
nrtVBR	non-real time VBR
OA&M	Operations Administration & Maintenance
PCR	Peak Cell Rate
PICS	Protocol Implementation Conformance Statement
PNNI	Private Network-Network Interface
rtVBR	real time VBR
SCR	Sustainable Cell Rate
UBR	Unspecified Bit Rate
UNI	User Network Interface
VBR	Variable Bit Rate

1.4 History

Version 2 of this document corrects the Broadband report type codepoint used and extends the modification of an active connection to cover new connection types or attributes specified in [MDCR], [BCS], and [GFR]. Specifically, the additions included beyond version 1.0 are:

- Corrected the Broadband report type specified in section 2.2.1.2 from "00000010" to "00000001",
- The Modification of MDCR and BCS for UBR connections, and
- The Modification of GFR connections (including modification of BCT, MCR, and MFS).

Outside of the correction of the Broadband report type codepoint there are no changes for the modification of other connection types (i.e. CBR, nrtVBR, rtVBR, or UBR without MDCR or BCS).

2 Coding requirements
[Normative]

2.1 Messages

Modification capability uses the following new messages.

MODIFY REQUEST
MODIFY ACKNOWLEDGE
MODIFY REJECT
CONNECTION AVAILABLE

2.1.1 Coding Requirements at the UNI

The coding of messages as specified in section 8.1 of ITU-T Recommendations Q.2963.1, Q.2963.2 and Q.2963.3 and as specified in section 3.1.11 of [Q.2931 Amend4] shall apply, with the following exceptions.

Replace all occurrences of connection owner by calling party.

8.1.1/Q.2963.1 MODIFY REQUEST
In Table 8-1/Q.2963.1:

- Add the following:

Information Element name	Reference	Direction	Type	Length
Security Services	4/UNI SEC	both	O	12-512
Generic identifier transport	2.1.1/SIG 4.0	both	O	6-33
Minimum Desired Cell Rate	3.1/MDCR	both	O (1)	13
Optional traffic attributes	2/BCS	both	O (1)	6-10

Note 1: This information element may only be included when it was included in the SETUP message for the call. A parameter of this information element may only be present in this information element if it was present in this information element in the SETUP message.

- the references for the ATM traffic descriptor is replaced by "Section 2 §4.5/Q.2931 of [SIG 4.0] and section 10.1.2.3 of [SIG 4.0]".

  Note 2 of Table 8-1/Q.2963.1 is replaced by the following:

  NOTE 2 – In this message octet groups 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16 are optional but at least one of these octet groups shall be present.

8.1.2/Q.2963.1 MODIFY ACKNOWLEDGE
Add the following to Table 8-2/Q.2963.1:

Information Element name	Reference	Direction	Type	Length
Security Services	4/UNI SEC	both	O	12-512
Generic identifier transport	2.1.1/SIG 4.0	both	O	6-33
Minimum Desired Cell Rate	3.1/MDCR	both	O(note 1)	13
Optional traffic attributes	2/BCS	both	O(note 1)	6-10

Note 1: This information element may only be included when it was included in the Modify Request message for the call. A parameter of this information element may only be present in this information element if it was present in this information element in the Modify Request message.

8.1.3/Q.2963.1 MODIFY REJECT
Add the following to Table 8-3/Q.2963.1:

Information Element name	Reference	Direction	Type	Length
Security Services	4/UNI SEC	both	O	12-512
Generic identifier transport	2.1.1/SIG 4.0	both	O	6-33

8.1.1/Q.2963.3 MODIFY REQUEST
In Table 8-1/Q.2963.3, change the reference for the ATM traffic descriptor to section 2 §4.5/Q.2931 of [SIG 4.0] and section 10.1.2.3 of [SIG 4.0], and change the reference for the Alternative ATM traffic descriptor from 8.2.1/Q.2962 to 8.1.2.1/SIG 4.0 and change the reference for the Minimum acceptable ATM traffic descriptor from 8.2.2/Q.2962 to "8.1.2.2/SIG 4.0". The following restriction applies: The Alternative ATM traffic descriptor information element may not be present for UBR calls.

The coding of the CONNECTION AVAILABLE message as specified 3.1.11 of [Q.2931 Amend4] shall apply with the following exceptions:

Add the following to Table 3-24/Q.2931:

Information Element name	Reference	Direction	Type	Length
Security Services	4/UNI SEC	both	O	12-512
Generic identifier transport	2.1.1/SIG 4.0	both	O	6-33

2.1.2 Coding Requirements at the PNNI

2.1.2.1 MODIFY REQUEST

This message is sent by Preceding side to Succeeding side to initiate connection modification. See Table 2-1.

TABLE 2-1 MODIFY REQUEST message content

Message type: MODIFY REQUEST
Significance: Global
Direction: Both

Information element	Reference	Direction	Type	Length
Protocol discriminator	6.4.2/PNNI 1.0	Both	M	1
Call reference	6.4.3/PNNI 1.0	Both	M	4
Message type	6.4.4.1/PNNI 1.0	Both	M	2
Message length	6.4.4.2/PNNI 1.0	Both	M	2
ATM traffic descriptor	6.4.5.9/PNNI 1.0	Both	M (1)	8 - 28
Notification indicator	6.4.5.27/PNNI 1.0	Both	O (2)	5 -*
Alternative ATM traffic descriptor	2.2.1.1	Both	O (3,6)	8-28
Minimum acceptable ATM traffic descriptor	2.2.1.3	Both	O (3)	8-28
Security services	4/PNNI SEC	Both	O	12-512
Generic identifier transport	6.4.5.31/PNNI 1.0	Both	O(2,4)	7-33
Generic application transport	3.1/PNNI GAT	Both	O (5)	6-512
Minimum Desired Cell Rate	3.1/MDCR	Both	O (7)	13
Optional traffic attributes	2/BCS	Both	O (7)	6-10

NOTES

1. In this message octet groups 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16 are optional but at least one of these octet groups shall be present.
2. Included if the received modify indication contains this information.
3. Either the Alternative ATM traffic descriptor information element or the Minimum acceptable ATM traffic descriptor information element, but not both, shall be included in the MODIFY REQUEST message when traffic parameters are negotiable.
4. This information element may be present up to 3 times.
5. This information element may be present up to 5 times.
6. This information element may not be present for UBR calls.
7. This information element may only be included when it was included in the SETUP message for the call. A parameter of this information element may only be present in this information element if it was present in this information element in the SETUP message.

2.1.2.2 MODIFY ACKNOWLEDGE

This message is sent by Succeeding side to Preceding side to indicate the modify request is accepted. See Table 2-2.

TABLE 2-2 **MODIFY ACKNOWLEDGE message content**

Message type: MODIFY ACKNOWLEDGE Significance: Global Direction: Both				
Information element	Reference	Direction	Type	Length
Protocol discriminator	6.4.2/PNNI 1.0	Both	M	1
Call reference	6.4.3/PNNI 1.0	Both	M	4
Message type	6.4.4.1/PNNI 1.0	Both	M	2
Message length	6.4.4.2/PNNI 1.0	Both	M	2
ATM traffic descriptor	6.4.5.9/PNNI 1.0	Both	O (1)	8 - 28
Notification indicator	6.4.5.27/PNNI 1.0	Both	O (2)	5 -*
Broadband report type	2.2.1.2	Both	O (2,3)	5
Security services	4/PNNI SEC	Both	O	12-512
Generic identifier transport	6.4.5.31/PNNI 1.0	Both	O (2,4)	7-33
Generic application transport	3.1/PNNI GAT	Both	O (5)	6-512
Minimum Desired Cell Rate	3.1/MDCR	Both	O (6)	13
Optional traffic attributes	2/BCS	Both	O (6)	6-10

NOTES

1. Included to specify the traffic parameter values allocated for the modification if one or more traffic parameters were negotiable in the MODIFY REQUEST message.
2. Included if the received modify acknowledge indication contains this information.
3. Included when the addressed user requires confirmation of the success of modification in the addressed user to calling user direction.
4. This information element may be present up to 3 times.
5. This information element may be present up to 5 times.
6. This information element may only be included when it was included in the Modify Request message for the call. A parameter of this information element may only be present in this information element if it was present in this information element in the Modify Request message.

2.1.2.3 MODIFY REJECT

This message is sent by Succeeding side to Preceding side to indicate the modify request is rejected. See Table 2-3.

TABLE 2-3 MODIFY REJECT message content

Message type: MODIFY REJECT Significance: Global Direction: Both				
Information element	Reference	Direction	Type	Length
Protocol discriminator	6.4.2/PNNI 1.0	Both	M	1
Call reference	6.4.3/PNNI 1.0	Both	M	4
Message type	6.4.4.1/PNNI 1.0	Both	M	2
Message length	6.4.4.2/PNNI 1.0	Both	M	2
Notification indicator	6.4.5.27/PNNI 1.0	Both	O (1)	5 -*
Cause	6.4.5.27/PNNI 1.0	Both	M	6-34
Security services	4/PNNI SEC	Both	O	12-512
Generic identifier transport	6.4.5.31/PNNI 1.0	Both	O (1,2)	7-33
Generic application transport	3.1/PNNI GAT	Both	O (3)	6-512

NOTES
1. Included if the received modify indication contains this information.
2. This information element may be present up to 3 times
3. This information element may be present up to 5 times

2.1.2.4 CONNECTION AVAILABLE

This message is sent by Preceding side to Succeeding side when sent by the modification requesting user. See Table 2-4.

TABLE 2-4 CONNECTION AVAILABLE message content

Message type: CONNECTION AVAILABLE Significance: Global Direction: Both				
Information element	Reference	Direction	Type	Length
Protocol discriminator	6.4.2/PNNI 1.0	Both	M	1
Call reference	6.4.3/PNNI 1.0	Both	M	4
Message type	6.4.4.1/PNNI 1.0	Both	M	2
Message length	6.4.4.2/PNNI 1.0	Both	M	2
Notification indicator	6.4.5.27/PNNI 1.0	Both	O (1)	5 -*
Security services	4/PNNI SEC	Both	O	12-512
Broadband report type	2.2.1.2	Both	O (1)	5
Generic identifier transport	6.4.5.31/PNNI 1.0	Both	O (1,2)	7-33
Generic application transport	3.1/PNNI GAT	Both	O (3)	6-512

NOTES
1. Included if the received modify indication contains this information.
2. This information element may be present up to 3 times.
3. This information element may be present up to 5 times.

2.1.3 Coding Requirements at the AINI

Section 2.1.2 of this document applies to AINI.

2.2 Coding of specific message types and specific information elements

2.2.1 Coding of specific message types and specific information elements at the UNI

The coding of information elements as specified in sections 7.2 and 8.2 of ITU-T Recommendations Q.2963.1, Q.2963.2, and Q.2963.3 and as specified in section 4.5.25 of [Q.2931 Amend4] shall apply with the following exceptions.

2.2.1.1 Alternative ATM traffic descriptor

The modifications to the Alternative traffic descriptor information element specified in 8.2.2.2/Q.2963.3 shall apply with the following exception:

In the first paragraph replace 8.2.1/Q.2962 by 8.1.2.1/SIG 4.0.

2.2.1.2 Broadband report type

The coding of the Broadband report type information element as specified in section 4.5.25 of [Q.2931 Amend4] shall apply with the following exceptions:

In table 4-23/Q.2931, only codepoint "00000001" is applicable.

2.2.1.3 Minimum Acceptable ATM traffic descriptor

The modifications to the Minimum Acceptable ATM traffic descriptor information element specified in 8.2.2.3/Q.2963.3 shall apply with the following exception:

In the first paragraph replace 8.2.2/Q.2962 by 8.1.2.2/SIG 4.0.

2.2.1.4 Message Type

The modifications to the Message type information element specified in 8.2.1/Q.2963.1 shall apply with the following addition:

The coding of the message type information element for the CONNECTION AVAILABLE messages is specified in Table 4-2/Q.2931 of [Q.2931 Amend4].

2.2.2 Coding of specific message types and specific information elements at the PNNI

2.2.2.1 Call State

The following call state code points are added: to octet 5 in section 6.4.5.14/PNNI 1.0.
PNNI call state value (octet 5) (Note)

Bits						*Meaning*
6	5	4	3	2	1	
0	0	1	1	0	1	NN13 - Modify requested
0	0	1	1	1	0	NN14 - Modify received

2.2.2.2 Alternative ATM traffic descriptor

See section 2.2.1.1.

2.2.2.3 Broadband report type

See section 2.2.1.2.

2.2.2.4 Minimum Acceptable ATM traffic descriptor

See section 2.2.1.3.

2.2.2.5 Message Type

Section 6.4.4.1/PNNI 1.0 applies with the following additions:

The modifications to the Message type information element specified in 8.2.1/Q.2963.1 shall apply, and

The coding of the message type information element for the CONNECTION AVAILABLE messages in Table 4-2/Q.2931 of [Q.2931 Amend4] shall apply.

2.2.3 Coding of specific message types and specific information elements at the AINI

Section 2.2.2 of this document applies to AINI.

3 Signalling Procedures [Normative]

3.1 Modification Procedures for UNI

When modifying the traffic parameters of a point-to-point call at the UNI, the ITU-T Recommendations Q.2963.1, Q.2963.2 and Q.2963.3 shall apply, with the exceptions stated in this section.

The modification capability is not applicable to ABR connections. The modification capability is applicable to CBR, real time VBR, non-real time VBR, GFR, and UBR connections.

3.1.1 Q.2963.1 Exceptions

Note: the revisions to [Q.2963.1] specified in [Q.2963.2] and [Q.2963.3] apply.

3.1.2 Q.2963.2 Exceptions

Note: the revisions to [Q.2963.2] specified in [Q.2963.3] apply.

Replace all occurrences of connection owner by calling party.

5.2/Q.2963.2 Modification of a point-to-point connection
Delete the last paragraph (Note: The paragraph is not applicable since the OAM traffic descriptor information element is not supported in [SIG 4.0]).

3.1.3 Q.2963.3 Exceptions

Replace all occurrences of connection owner by calling party.

3.2 Modification Procedures for PNNI

When modifying the bandwidth parameters of a point-to-point call, the transit entity procedures in ITU-T Recommendations Q.2963.1, Q.2963.2 and Q.2963.3 shall apply, with the exceptions stated in this section.

The modification capability is not applicable to ABR connections. The modification capability is applicable to CBR, real time VBR, non-real time VBR, GFR, and UBR connections.

3.2.1 Q.2963.1 Exceptions

Note: the revisions to [Q.2963.1] specified in [Q.2963.2] and [Q.2963.3] apply.
Only Sections 9 and 13.1 of [Q.2963.1] apply with the following revisions:

1. Replace all occurences of U/N13 with NN13.
2. Replace all occurences of U/N14 with NN14.
3. In 9.2.2/Q2963.1, replace "start Timer T334" with "optionally start Timer T334.
4. Insert the following at the beginning of section 9.3/Q.2963.1:
   If the optional Timer T334 is not supported then while in the active state, a CONNECTION AVAILABLE message shall be transported transparently.

   Otherwise, if Timer T334 is supported then the following applies:

3.2.2 Q.2963.2 Exceptions

Note: the revisions to [Q.2963.2] specified in [Q.2963.3] apply.
Only Sections 5 and 9 of [Q.2963.2] apply with the following revisions:
Replace all occurrences of connection owner by calling party.

5.2/Q.2963.2 Modification of a point-to-point connection
Delete the last paragraph (Note: The paragraph is not applicable since the OAM traffic descriptor information element is not supported in [PNNI 1.0]).

3.2.3 Q.2963.3 Exceptions

Only Sections 5 and 9 of [Q.2963.3] apply with the following revisions.
Replace all occurrences of connection owner by calling party.

3.3 Modification Procedures for AINI

Section 3.2 of this document applies to AINI.

4 Interactions with other capabilities [Normative]

4.1 Interactions with other capabilities at the UNI

4.1.1 Security Capability

The Security Services information element is added to all the new messages to allow security procedures during connection modification.

4.1.2 Generic Identifier Transport

The Generic identifier information element is added to all the new messages since these may be end-to-end messages.

4.1.3 New States

As a general rule, existing procedures that apply for the active state shall apply for the Modify requested and Modify received state and a call would be maintained while in one of these states when an AAL connection reset or AAL connection release occurred (see 5.6.9/Q.2931 and 5.6.10/Q.2931)).

In the Modify requested state or in the Modify received:

- Whenever a STATUS message is sent the Call state shall be the current state.
- The procedures in section 2 §5.6.9/Q.2931 and §5.6.10/Q.2931 of [SIG 4.0] for the active state shall apply for calls in the modify requested or modify received states.

4.2 Interactions with other capabilities at the PNNI

4.2.1 Security Capability

The Security Services information is added to all the new messages to allow security procedures during connection modification.

4.2.2 Generic Identifier

The Generic identifier information element is added to all the new messages since these may be end-to-end messages.

4.2.3 Generic Application Transport

The Generic application transport information element is added to all the new messages.

4.2.4 Path and Connection Trace

In section 5.3 /[TRACE], it is stated that a TRACE CONNECTION message may be rejected when the call is not in the Active state. This condition shall be modified such that the TRACE CONNECTION message is not rejected when the call is in the Active, Modify Requested, or Modify Received state.

4.2.5 New States

As a general rule the existing procedures that apply for the active state shall apply for the Modify requested and Modify received state (e.g. a connection trace would not be rejected because the call was in one of these 2 states (see 5.3/[TRACE]) and a call would be maintained while in one of these states when an AAL connection reset or AAL connection release occurred (see 5.6.9/Q.2931 and 5.6.10/Q.2931)).

In the Modify requested state or in the and Modify received:

- Whenever a STATUS message is sent the Call state shall be the current state.
- The procedures in 6.5.6.9/PNNI 1.0 and 6.5.6.10/PNNI 1.0 for the active state shall apply for calls in the modify requested or modify received states.
- See section 4.2.4 for interactions with Connection Trace.

4.3 Interactions with other capabilities for AINI

Interactions as specified for PNNI apply at the AINI except for the Path and Connection Trace.

5 Protocol Interworking at the AINI

Three configurations are considered

1. PNNI -> AINI -> B-ISUP
2. B-ISUP -> AINI -> PNNI
3. PNNI ->AINI ->PNNI

5.1 Interworking between AINI and B-ISUP

5.1.1 Interworking specification for successful modification procedures (point-to-point calls)

5.1.1.1 Arrow diagrams

5.1.1.1.1 AINI to B-ISUP

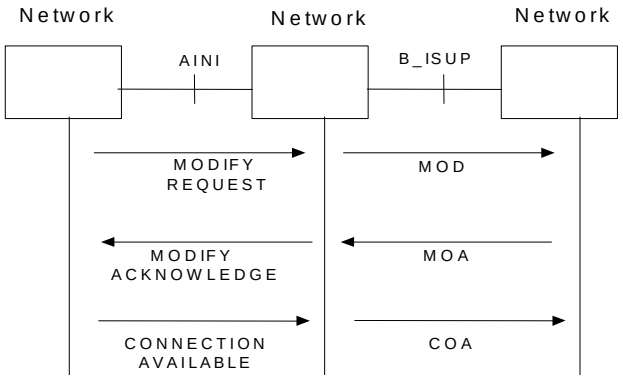

Figure 1. Example of Successful Modification with Negotiation (AINI -> B-ISUP)

5.1.1.1.2 B-ISUP to AINI

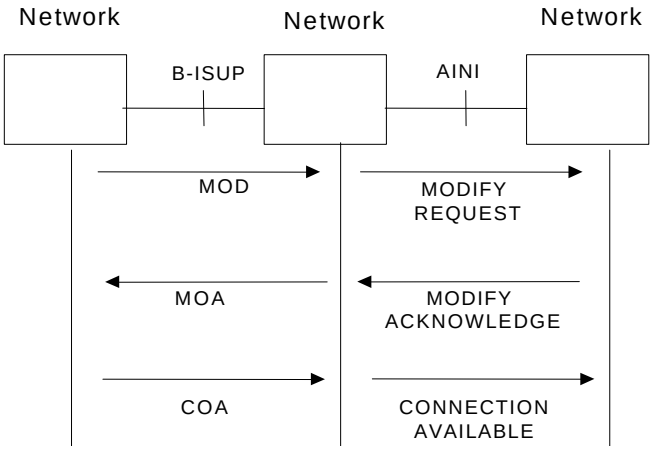

Figure 2. Example of successful Modification (B-ISUP ->AINI)

5.1.1.2 Mapping of the AINI MODIFY REQUEST Message and the B-ISUP Modify Request (MOD)

5.1.1.2.1 AINI to B-ISUP

AINI to B-ISUP	
MODIFY REQUEST	**MOD**
Message Type	Message Type
Message length	Message length
ATM traffic descriptor	ATM cell rate and/or Additional ATM cell rate (Note 1)
Notification indicator	Notification
Alternative ATM traffic descriptor	Alternative ATM cell rate
Minimum Acceptable ATM Traffic Descriptor	Minimum ATM cell rate
Security services	Not carried
Generic identifier transport	Not carried
Generic application transport	Not carried
Minimum Desired Cell Rate (Note 2)	Not carried
Optional traffic attributes (Note 2)	Not carried

NOTES:
1. The PCR parameters (if present) are mapped to/from the ATM cell rate and the SCR or MBS parameters (if present) are mapped to/from the Additional ATM cell rate.
2. If the only parameters being modified are the MDCR parameter or the BCS parameter then this message should not be mapped into B-ISUP. Instead at the AINI interface, a MODIFY ACKNOWLEDGE message should be sent towards the modify requesting user.

5.1.1.2.2 B-ISUP to AINI

B-ISUP to AINI	
MOD	**MODIFY REQUEST**
Message Type	Message Type
Message length	Message length
Message compatibility information	Not carried
ATM cell rate and/or Additional ATM cell rate (Note 1)	ATM traffic descriptor
Notification	Notification indicator
Alternative ATM traffic descriptor	Alternative ATM traffic descriptor
Minimum ATM cell rate	Minimum ATM traffic descriptor

NOTES:
1. The PCR parameters (if present) are mapped to/from the ATM cell rate and the SCR or MBS parameters (if present) are mapped to/from the Additional ATM cell rate.

5.1.1.3 Mapping of the AINI MODIFY ACKNOWLEDGE with the B-ISUP Modify Acknowledge (MOA)

5.1.1.3.1 AINI to B-ISUP

AINI to B-ISUP	
MODIFY ACKNOWLEDGE	**MOA**
Message Type	Message Type
Message length	Message length
ATM traffic descriptor	ATM cell rate and/or Additional ATM cell rate (Note 1)
Notification indicator	Notification
Broadband Report type	Report type
Security services	Not carried
Generic identifier transport	Not carried
Generic application transport	Not carried
Minimum Desired Cell Rate	Not carried
Optional traffic attributes	Not carried

NOTES:
1. The PCR parameters (if present) are mapped to/from the ATM cell rate and the SCR or MBS parameters (if present) are mapped to/from the Additional ATM cell rate.

5.1.1.3.2 B-ISUP to AINI

B-ISUP to AINI	
MOA	**MODIFY ACKNOWLEDGE**
Message Type	Message Type
Message length	Message length
Message compatibility information	Not carried
ATM cell rate and/or Additional ATM cell rate (Note 1)	ATM traffic descriptor
Notification	Notification indicator
Report type	Broadband Report type

NOTES:
1. The PCR parameters (if present) are mapped to/from the ATM cell rate and the SCR or MBS parameters (if present) are mapped to/from the Additional ATM cell rate.

5.1.1.4 Mapping of the AINI CONNECTION AVAILABLE Message with the B-ISUP Connection Available Message (COA)

5.1.1.4.1 AINI to B-ISUP

AINI to B-ISUP	
CONNECTION AVAILABLE	**COA**
Message Type	Message Type
Message length	Message length
Notification indicator	Notification
Broadband Report type	Report type
Security services	Not carried
Generic identifier transport	Not carried
Generic application transport	Not carried

5.1.1.4.2 B-ISUP to AINI

B-ISUP to AINI	
COA	**CONNECTION AVAILABLE**
Message Type	Message Type
Message length	Message length
Message compatibility information	Not carried
Notification	Notification indicator
Report type	Broadband Report type

5.1.2 Interworking specification for MODIFICATION REJECT procedures

5.1.2.1 Arrow diagrams

5.1.2.1.1 AINI to B-ISUP

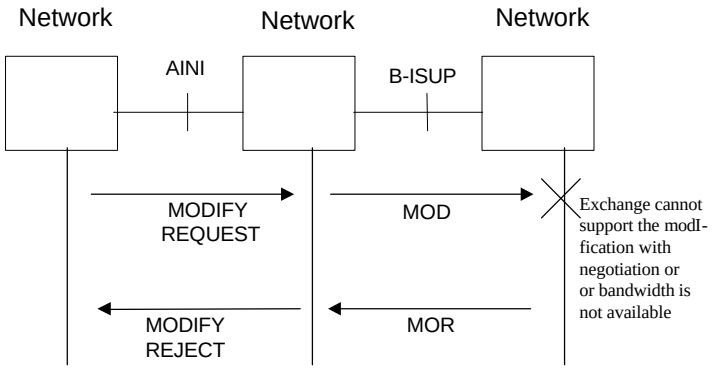

Figure 3. Example of unsuccessful Modification with negotiation (AINI ->B-ISUP)

5.1.2.1.2 B-ISUP to AINI

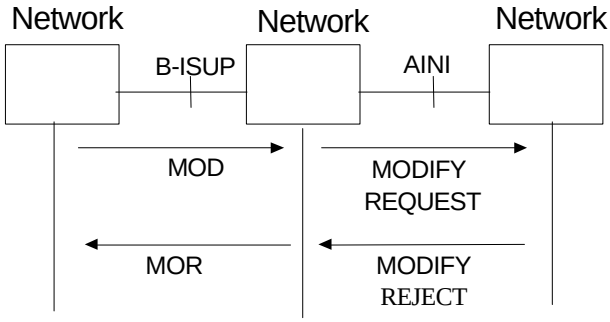

Figure 4. Unsuccessful modification (B-ISUP -> AINI)

5.1.2.2 Mapping of the AINI MODIFY REJECT Message with the B-ISUP Modify Reject (MOR)

5.1.2.2.1 AINI to B-ISUP

AINI to B-ISUP	
MODIFY REJECT	**MOR**
Message Type	Message Type
Message length	Message length
Notification indicator	Notification
Cause	Cause Indicators
Security services	Not carried
Generic identifier transport	Not carried
Generic application transport	Not carried

5.1.2.2.2 B-ISUP to AINI

B-ISUP to AINI	
MOR	**MODIFY REJECT**
Message Type	Message Type
Message length	Message length
Message compatibility information	Not carried
Cause Indicators	Cause
Notification	Notification indicator

5.2 Interworking between AINI and PNNI

All PNNI 1.0 messages are mapped to their equivalent counterparts in AINI messages, and all AINI messages are mapped to their equivalent counterparts in PNNI 1.0.

Annex A Protocol Implementation Conformance Statement (PICS) for UNI 4.0 Modification of an Active Connection

A.1 Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented. Such a statement is called a Protocol Implementation Conformance Statement (PICS). For further details on PICS see the Implementation Conformance Statement Proforma Style Guide [A.7].

A.1.1 Scope

This document provides the PICS proforma for the UNI portion of the *Modification of Traffic Parameters for an Active Connection Signalling Specification (PNNI, AINI, and UNI) Version 2.0*, in compliance with the relevant requirements, and in accordance with the relevant guidelines, given in ISO/IEC 9646-7 [A.2]. In most cases, statements contained in notes in the specification, which were intended as information, are not included in the PICS.

A.1.2 Normative References

[A.1] ISO/IEC 9646-1: 1994, Information technology – Open systems interconnection – Conformance testing methodology and framework – Part 1: General Concepts (See also ITU Recommendation X.290 (1995)).

[A.2] ISO/IEC 9646-7: “Information technology – Open systems interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements”.

[A.3] ATM User-Network Interface (UNI) Signalling Specification, Version 4.0, af-sig-0061.000, July 1996.

[A.4] ITU-T Recommendation Q.2963.1 (1999), Digital Subscriber Signalling System No. 2 – Connection modification: Peak cell rate modification by the connection owner.

[A.5] ITU-T Recommendation Q.2963.2 (1997), Digital Subscriber Signalling System No. 2 – Connection modification: Modification procedures for sustainable cell rate parameters.

[A.6] ITU-T Recommendation Q.2963.3 (1998), Digital Subscriber Signalling System No. 2 – Connection modification: : ATM traffic descriptor modification with negotiation by the connection owner.

[A.7] ATM Forum Technical Committee, "Implementation Conformance Statement Proforma Style Guide", af-test-0137-000, February 2000.

[A.8] Guaranteed Frame Rate (GFR) Signalling Specification (PNNI, AINI, and UNI), af-cs-0167.000

[A.9] UBR with MDCR Addendum to UNI Signalling 4.0, PNNI 1.0 and AINI, af-cs-0147.000

[A.10] Behavior Class Selector Signalling Version 1.0, af-cs-0159.000

A.1.3 Definitions

This document uses the following terms defined in ISO/IEC 9646-1 [A.1]:

- A Protocol Implementation Conformance Statement (PICS) is a statement made by the supplier of an implementation or system, stating which capabilities have been implemented for a given protocol.

- A PICS proforma is a document, in the form of a questionnaire, designed by the protocol specifier or conformance test suite specifier, which when completed for an implementation or system becomes the PICS.

A.1.4 Acronyms

AAL	ATM Adaptation Layer
ABR	Available Bit Rate
AINI	ATM Inter-Network Interface
ATM	Asynchronous Transfer Mode
BCS	Behavior Class Selector
BCT	Burst Cell Tolerance
B-ISUP	Broadband ISDN User Part
COA	CONNECTION AVAILABLE
CBR	Constant Bit Rate
GFR	Guaranteed Frame Rate
ITU-T	International Telecommunication Union-Telecommunication Standardization Sector
IUT	Implementation Under Test
M	Mandatory requirements (these are to be observed in all cases)
MBS	Maximum Burst Size
MCR	Minimum Cell Rate
MDCR	Minimum Desired Cell Rate
MFS	Maximum Frame Size
MOA	MODIFICATION ACKNOWLEDGE Message
MOD	MODIFICATION REQUEST Message
MOR	MODIFICATION REJECT Message
nrtVBR	non-real time VBR
N/A	Not supported, not applicable, or the conditions for status are not met.
O	Optional (may be selected to suit the implementation, provided that any requirements applicable to the options are observed)
O.n	Optional, but support is required for either at least one or only one of the options in the group labeled with the same numeral "n".
OA&M	Operations Administration & Maintenance
PCR	Peak Cell Rate
PICS	Protocol Implementation Conformance Statement
PNNI	Private Network-Network Interface
rtVBR	real time VBR
SCR	Sustainable Cell Rate
SUT	System Under Test
UBR	Unspecified Bit Rate
UNI	User Network Interface
VBR	Variable Bit Rate

A.1.5 Conformance

The supplier of a protocol implementation, which is claimed to conform to the ATM Forum UNI signalling Addendum for the support of Modification is required to complete a copy of the PICS proforma provided in this document and is required to provide the information necessary to identify both the supplier and the implementation.

A.2 Identification of the Implementation

Date of the Statement

_____

Implementation Under Test (IUT) Identification

IUT Name: _____

IUT Version: _____

_____

System Under Test (SUT) Identification

SUT Name: _____

Hardware Configuration: _____

_____

_____

Operating System: _____

Product supplier

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

Email Address:_____

Additional Information: _____

Client (if different from product supplier)

Name: _____

Address:

_____

_____

Telephone Number: _____

Facsimile Number: _____

Email Address:_____

Additional Information: _____

PICS Contact Person

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

Email Address:_____

Additional Information: _____
_____
_____
_____

Identification of the protocol

This PICS proforma applies to the following standard:

UNI portion of af-cs-0148.001, *Modification of Traffic Parameters for an Active Connection Signalling Specification (PNNI, AINI, and UNI) Version 2*.0.

A.3 PICS Proforma

A.3.1 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No) _____

Note: Answering "No" indicates non-conformance to the protocol specification. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conforming, on pages attached to the PICS proforma.

A.3.2 Instructions for Completing the PICS Proforma

The supplier of the implementation shall complete the PICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support column entries provided, using the specified notation.

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO-IEC 9646-7 [A.2], are used for the support column:

Y or y supported by the implementation.

N or n not supported by the implementation.

N/A, n/a or -no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

The following notations, defined in ISO/IEC 9646-7 [A.2] are used for the status column:

M mandatory - the capability is required to be supported.

O optional - the capability may be supported or not.

N/A not applicable - in the given context, it is impossible to use the capability.

X prohibited (excluded) - there is a requirement not to use this capability in the given context.

O.i qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer, which identifies a unique group of related optional items and the logic of their selection, which is defined immediately following the table.

A.4 Roles

Item	Major role: Does the implementation support...	Conditions for status	Status	Reference	Support
R 1.1	the user role?		O.1		Yes__No__
R 1.2	the network role?		O.1		Yes__No__
R 2.1	the requirements for the modification requesting entity?	R1.1 R1.2	O.2 M	3.7/Q.2963.1	Yes__No__
R 2.2	requirements for the responding entity?	R1.1 R1.2	O.2 M	3.8/Q.2963.1	Yes__No__
R 3.1	requirements for the transit entity?		O.3	3.6/Q.2963.1	Yes__No__
R 3.2	requirements for the terminating entity?		O.3	3.5/Q.2963.1	Yes__No__
O.1	support of at least one of these options is required				
O.2	support of at least one of these options is required				
O.3	support of at least one of these options is required				
Comments:					

A.5 Major Capabilities

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
MC 1.1	Modification of the PCR?		M	1	Yes__No__
MC 1.2	Modification of the SCR?		M	1	Yes__No__
MC 1.3	Modification of the MBS?		M	1	Yes__No__
MC 1.4	Modification of the BCS?	BCS [A.10]	O	1	Yes__No__
MC 1.5	Modification of the MDCR?	MDCR [A.9]	O	1	Yes__No__
MC 1.6	Modification of the MFS, MCR, and BCT?	GFR [A.8]	O	1	Yes__No__
MC 2	Confirmation of modification	NOT (R3.1 and R2.2) R3.1 and R2.2	M O	1	Yes__No__ Yes__No__
MC3	Negotiation, using alternative ATM Traffic Descriptor	SIG 4.0 Sec 8	O	1	Yes__No__
MC4	Negotiation, using Minimum acceptable ATM Traffic Descriptor	SIG 4.0 Sec 8	O	1	Yes__No__
Comments: Modification includes increase and decrease					

A.6 Requesting Entity

A.6.1 Messages Received

Item	Does the IUT support …	Condition for status	Status	Reference	Support
MR 1	MODIFY ACKNOWLEDGE?		M	2.1	Yes__No__
MR 2	MODIFY REJECT?		M	2.1	Yes__No__
Comments:					

A.6.2 Messages Transmitted

Item	Does the IUT support …	Condition for status	Status	Reference	Support
MT 1	MODIFY REQUEST?		M	2.1	Yes__No__
MT 2	CONNECTION AVAILABLE		M	2.1	Yes__No__
Comments:					

A.6.3 Requesting entity Information Elements

The tables in this subsection ask questions related to the support of information elements in messages received and transmitted by the IUT.

A.6.3.1 Requesting entity Information Elements Received

A.6.3.1.1 Modify Acknowledge Information Elements Received

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
IER 2.1	Protocol discriminator?		M	2.1	Yes__No__
IER 2.2	Call reference?		M	2.1	Yes__No__
IER 2.3	Message type?		M	2.1	Yes__No__
IER 2.4	Message length?		M	2.1	Yes__No__
IER 2.5	ATM traffic descriptor?	MC3 OR MC4	M	2.1	Yes__No__
IER 2.6	Notification indicator?		O	2.1	Yes__No__
IER 2.7	Broadband report type?		M	2.1	Yes__No__
IER 2.8	Security services?		O	2.1	Yes__No__
IER 2.9	Generic identifier transport?		O	2.1	Yes__No__
IER 2.10	Minimum Desired Cell Rate?	MDCR [A.9]	M	2.1.	Yes__No__
IER 2.11	Optional traffic attributes?	BCS [A.10]	M	2.1.	Yes__No__
Comments:					

A.6.3.1.2 Modify Reject Information Elements Received

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
IER 3.1	Protocol discriminator?		M	2.1	Yes__No__
IER 3.2	Call reference?		M	2.1	Yes__No__
IER 3.3	Message type?		M	2.1	Yes__No__
IER 3.4	Message length?		M	2.1	Yes__No__
IER 3.6	Notification indicator?		O	2.1	Yes__No__
IER 3.7	Cause?		M	2.1	Yes__No__
IER 3.8	Security services?		O	2.1	Yes__No__
IER 3.9	Generic identifier transport?		O	2.1	Yes__No__
Comments:					

A.6.3.2 Requesting entity Information Elements Transmitted

Indicating support for an item in the tables in this subsection, states that the implementation has the ability to generate, and to transmit in the specified message, the information elements listed. Such support does not necessarily mean that the indicated information element is included in every instance of the transmitted message.

A.6.3.2.1 Modify Request Information Elements Transmitted

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
IET 1.1	Protocol discriminator?		M	2.1	Yes__No__
IET 1.2	Call reference?		M	2.1	Yes__No__
IET 1.3	Message type?		M	2.1	Yes__No__
IET 1.4	Message length?		M	2.1	Yes__No__
IET 1.5	ATM traffic descriptor?		M	2.1	Yes__No__
IET 1.6	Notification indicator?		O	2.1	Yes__No__
IET 1.7	Alternative ATM traffic descriptor?	MC3	M	2.1	Yes__No__
IET 1.8	Minimum acceptable ATM traffic descriptor?	MC4	M	2.1	Yes__No__
IET 1.9	Security services?		O	2.1	Yes__No__
IET 1.10	Generic identifier transport?		O	2.1	Yes__No__
IET 1.11	Minimum Desired Cell Rate?	MDCR [A.9]	M	2.1.	Yes__No__
IET 1.12	Optional traffic attributes?	BCS [A.10]	M	2.1.	Yes__No__
Comments:					

A.6.3.2.2 Connection Available Information Elements Transmitted

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
IET 4.1	Protocol discriminator?		M	2.1	Yes__No__
IET 4.2	Call reference?		M	2.1	Yes__No__
IET 4.3	Message type?		M	2.1	Yes__No__
IET 4.4	Message length?		M	2.1	Yes__No__
IET 4.5	Notification indicator?		O	2.1	Yes__No__
IET 4.6	Security services?		O	2.1	Yes__No__
IET 4.7	Generic identifier transport?		O	2.1	Yes__No__
Comments:					

A.7 Responding entity

The tables provided in this section need only to be completed for responding entity implementations, where item R2.2 in Section A.4 table is supported.

A.7.1 Messages received

Item	Does the IUT support …	Condition for status	Status	Reference	Support
MR 1	MODIFY REQUEST?		M	2.1	Yes__No__
MR 2	CONNECTION AVAILABLE	R3.1 R3.2	M O	2.1	Yes__No__
Comments:					

A.7.2 Messages Transmitted

Item	Does the IUT support …	Condition for status	Status	Reference	Support
MT 1	MODIFY REJECT?		M	2.1	Yes__No__
MT 2	MODIFY ACKNOWLEDGE?		M	2.1	Yes__No__
Comments:					

A.7.3 Responding entity Information Elements

The tables in this subsection ask questions related to the support of information elements in messages received and transmitted by the IUT.

A.7.3.1 Responding entity Information Elements Received

A.7.3.1.1 Modify Request Information Elements Received

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
IER 1.1	Protocol discriminator?		M	2.1	Yes__No__
IER 1.2	Call reference?		M	2.1	Yes__No__
IER 1.3	Message type?		M	2.1	Yes__No__
IER 1.4	Message length?		M	2.1	Yes__No__
IER 1.5	ATM traffic descriptor?		M	2.1	Yes__No__
IER 1.6	Notification indicator?		O	2.1	Yes__No__
IER 1.7	Alternative ATM traffic descriptor?	MC3	M	2.1	Yes__No__
IER 1.8	Minimum acceptable ATM traffic descriptor?	MC4	M	2.1	Yes__No__
IER 1.9	Security services?		O	2.1	Yes__No__
IER 1.10	Generic identifier transport?		O	2.1	Yes__No__
IER 1.11	Minimum Desired Cell Rate?	MDCR [A.9]	M	2.1.	Yes__No__
IER 1.12	Optional traffic attributes?	BCS [A.10]	M	2.1.	Yes__No__
Comments:					

A.7.3.1.2 Connection Available Information Elements Received

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
IER 4.1	Protocol discriminator?		M	2.1	Yes__No__
IER 4.2	Call reference?		M	2.1	Yes__No__
IER 4.3	Message type?		M	2.1	Yes__No__
IER 4.4	Message length?		M	2.1	Yes__No__
IER 4.5	Notification indicator?		O	2.1	Yes__No__
IER 4.6	Security services?		O	2.1	Yes__No__
IER 4.7	Generic identifier transport?		O	2.1	Yes__No__
Comments:					

A.7.3.2 Responding entity Information Elements Transmitted

Indicating support for an item in the tables in this subsection, states that the implementation has the ability to generate, and to transmit in the specified message, the information elements listed. Such support does not necessarily mean that the indicated information element is included in every instance of the transmitted message.

A.7.3.2.1 Modify Acknowledge Information Elements Transmitted

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
IET 2.1	Protocol discriminator?		M	2.1	Yes__No__
IET 2.2	Call reference?		M	2.1	Yes__No__
IET 2.3	Message type?		M	2.1	Yes__No__
IET 2.4	Message length?		M	2.1	Yes__No__
IET 2.5	ATM traffic descriptor?	MC3 OR MC4	M	2.1	Yes__No__
IET 2.6	Notification indicator?		O	2.1	Yes__No__
IET 2.7	Broadband report type?	R3.1 R3.2	M O	2.1	Yes__No__
IET 2.8	Security services?		O	2.1	Yes__No__
IET 2.9	Generic identifier transport?		O	2.1	Yes__No__
IET 2.10	Minimum Desired Cell Rate?	MDCR [A.9]	M	2.1.	Yes__No__
IET 2.11	Optional traffic attributes?	BCS [A.10]	M	2.1.	Yes__No__
Comments:					

A.7.3.2.2 Modify Reject Information Elements Transmitted

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
IET 3.1	Protocol discriminator?		M	2.1	Yes__No__
IET 3.2	Call reference?		M	2.1	Yes__No__
IET 3.3	Message type?		M	2.1	Yes__No__
IET 3.4	Message length?		M	2.1	Yes__No__
IET 3.5	Notification indicator?		O	2.1	Yes__No__
IET 3.6	Cause?		M	2.1	Yes__No__
IET 3.7	Security services?		O	2.1	Yes__No__
IET 3.8	Generic identifier transport?		O	2.1	Yes__No__
Comments:					

A.8 Timers

Indicating support for an item in table below states that the implementation has a timer that operates in accordance with the description in section 13.1 of Q.2963.1 as an initiating entity, in section 13.2 of Q.2963.1 as a responding entity, or in section 13.3/Q.2963.1 as a transit entity, as appropriate.

Item	Timer: Does the implementation support ...	Conditions for status	Status	Reference	Support
TM 1	T360?	R2.1	M	13/Q.2963.1	Yes__No__
TM 2	T361?	MC2 AND R2.2 AND R3.2	M	13/Q.2963.1	Yes__No__ N/A__
TM 3	T334?	R2.2 AND R3.1	M	13/Q.2963.1	Yes__No__ N/A__
Comments:					

A.9 UNI Procedural PICS for modification

Item	Does the IUT …	Condition for status	Status	Reference	Support
PROC 1	Follow the procedures of 9.1.1/Q.2963.1 as modified by 9/Q.2963.2 to request the modification of a call without negotiation?	R2.1	M	9.1.1/Q.2963.1 and 9/Q.2963.2	Yes__No__
PROC 2	Follow the procedures of 9.1.1/Q.2963.3 to request the modification of a call with negotiation?	R2.1 and (MC3 or MC4)	M	9.1.1/Q.2963.3	Yes__No__
PROC 3	On receipt of a MODIFY REQUEST message with neither an Alternative ATM traffic descriptor nor a Minimum Acceptable ATM traffic descriptor information element while in the modify requested state follow the procedures of 9.1.2/Q.2963.1?	R2.1	M	9.1.2/Q.2963.1	Yes__No__
PROC 4	On receipt of a MODIFY REQUEST message with either an Alternative ATM traffic descriptor or a Minimum Acceptable ATM traffic descriptor information element while in the modify requested state follow the procedures of 9.1.2/Q.2963.3?	R2.1 and (MC3 or MC4)	M	9.1.2/Q.2963.3	Yes__No__
PROC 5	On receipt of a MODIFY REJECT message while in the modify requested state follow the procedures of 9.1.3/Q.2963.1?	R2.1	M	9.1.3/Q.2963.1	Yes__No__
PROC 6	On receipt of a STATUS message, which indicates the active state and cause No. 97 or cause No. 101, while in the modify requested state follow the procedures of 9.1.4/Q.2963.1?	R2.1	M	9.1.4/Q.2963.1	Yes__No__
PROC 7	On expiry of Timer T360 clear the call with cause No. 102?	R2.1	M	9.1.5/Q.2963.1	Yes__No__
PROC 8	On receipt of a MODIFY REQUEST message with neither an Alternative ATM traffic descriptor nor a Minimum Acceptable ATM traffic descriptor information element while in the active state follow the procedures of 9.2.1/Q.2963.1 as modified by 9/Q.2963.2?	R2.2	M	9.2.1/Q.2963.1 and 9/Q.2963.2	Yes__No__
PROC 9	On receipt of a MODIFY REQUEST message with either an Alternative ATM traffic descriptor or a Minimum Acceptable ATM traffic descriptor information element while in the active state follow the procedures of 9.2.1/Q.2963.3?	R2.2 and (MC3 or MC4)	M	9.2.1/Q.2963.3	Yes__No__
PROC 10	On receipt of an indication that the modification without negotiation has been accepted while in the modify requested state follow the procedures of 9.2.2/Q.2963.1 as modified by 9/Q.2963.2?	R2.2 and R3.1	M	9.2.2/Q.2963.1 and 9/Q.2963.2	Yes__No__
PROC 11	On receipt of an indication that the modification with negotiation has been accepted while in the modify requested state follow the procedures of 9.2.2/Q.2963.3?	R2.2 and R3.1 and (MC3 or MC4)	M	9.2.2/Q.2963.3	Yes__No__
PROC 12	On receipt of a MODIFY REQUEST message with neither an Alternative ATM traffic descriptor nor a Minimum Acceptable ATM traffic descriptor information element while in the active state follow the procedures of 9.2.2/Q.2963.1 as modified by 9/Q.2963.2?	R2.2 and R3.2	M	9.2.2/Q.2963.1 and 9/Q.2963.2	Yes__No__

Item	Does the IUT …	Condition for status	Status	Reference	Support
PROC 13	On receipt of a MODIFY REQUEST message with either an Alternative ATM traffic descriptor or a Minimum Acceptable ATM traffic descriptor information element while in the active state follow the procedures of 9.2.2/Q.2963.3?	R2.2 and R3.2 and (MC3 or MC4)	M	9.2.2/Q.2963.3	Yes__No__
PROC 14	On receipt of a CONNECTION AVAILABLE message while Timer T361 is active follow the procedures of 9.2.3/Q.2963.1?	R3.2	M	9.2.3/Q.2963.1	Yes__No__
PROC 15	On expiry of Timer T361 follow the procedures of 9.2.3/Q.2963.1?	R3.2	M	9.2.3/Q.2963.1	Yes__No__
PROC 16	On receipt of an indication that the modification has been rejected while in the modify requested state, follow the procedures of 9.2.4/Q.2963.1?	R2.2 and R3.1	M	9.2.4/Q.2963.1	Yes__No__
PROC 17	On receipt of a MODIFY REJECT message while in the active state follow the procedures of 9.2.2/Q.2963.1?	R2.2 and R3.2	M	9.2.4/Q.2963.1	Yes__No__
PROC 18	On receipt of a MODIFY REQUEST message with both the Minimum acceptable ATM traffic descriptor and the Alternative ATM traffic descriptor information, reject the modification following the procedures in 9.2.4/Q.2963.3?	R2.2 and (MC3 or MC4)	M	9.2.4/Q.2963.3	Yes__No__
PROC 19	On receipt of a MODIFY REQUEST message with an Alternative ATM traffic descriptor information element, which is not coded according to the allowed coding, treat the Alternative ATM traffic descriptor information element as a non-mandatory information element with content error?	R2.2 and MC3	M	9.2.4/Q.2963.3	Yes__No__
PROC 20	On receipt of a MODIFY REQUEST message with Minimum Acceptable ATM traffic descriptor information element, which is not coded according to the allowed coding, treat the Minimum Acceptable ATM traffic descriptor information element as a non-mandatory information elements with content error?	R2.2 and MC4	M	9.2.4/Q.2963.3	Yes__No__
PROC 21	On receipt of a MODIFY REQUEST message with ATM traffic parameters, which are not according to the allowed combinations, while in the active state, follow the procedures of 9.2.5/Q.2963.1?	R2.2	M	9.2.5/Q.2963.1	Yes__No__
PROC 22	On receipt of a CONNECTION AVAILABLE message while in the active state, follow the procedures of 9.3/Q.2963.1?	R3.1	M	9.3/Q.2963.1	Yes__No__
Comments:					

Annex B Protocol Implementation Conformance Statement (PICS) for PNNI 1.0 Modification of an Active Connection

B.1 Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented. Such a statement is called a Protocol Implementation Conformance Statement (PICS). For further details on PICS see the Implementation Conformance Statement Proforma Style Guide [B.6].

B.1.1 Scope

This document provides the PICS proforma for the PNNI portion of the *Modification of Traffic Parameters for an Active Connection Signalling Specification (PNNI, AINI, and UNI) Version 2.0* in compliance with the relevant requirements, and in accordance with the relevant guidelines, given in ISO/IEC 9646-7 [B.2]. In most cases, statements contained in notes in the specification, which were intended as information, are not included in the PICS.

B.1.2 Normative References

[B.1] ISO/IEC 9646-1: 1994, Information technology – Open systems interconnection – Conformance testing methodology and framework – Part 1: General Concepts (See also ITU Recommendation X.290 (1995)).

[B.2] ISO/IEC 9646-7:1994, Information technology – Open systems interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements".

[B.3] ITU-T Recommendation Q.2963.1 (1999), *Digital Subscriber Signalling System No. 2 – Connection modification: Peak cell rate modification by the connection owner.*

[B.4] ITU-T Recommendation Q.2963.2 (1997), *Digital Subscriber Signalling System No. 2 – Connection modification: Modification procedures for sustainable cell rate parameters.*

[B.5] ITU-T Recommendation Q.2963.3 (1998), *Digital Subscriber Signalling System No. 2 – Connection modification:* : ATM traffic descriptor modification with negotiation by the connection owner.

[B.6] ATM Forum Technical Committee, "Implementation Conformance Statement Proforma Style Guide", af-test-0137-000, February 2000.

[B.7] Guaranteed Frame Rate (GFR) Signalling Specification (PNNI, AINI, and UNI) Version 1.0, af-cs-0167.000

[B.8] UBR with MDCR Addendum to UNI Signalling 4.0, PNNI 1.0 and AINI, af-cs-0147.000

[B.9] Behavior Class Selector Signalling Version 1.0, af-cs-0159.000

B.1.3 Definitions

This document uses the following terms defined in ISO/IEC 9646-1 [B.1]:

- A Protocol Implementation Conformance Statement (PICS) is a statement made by the supplier of an implementation or system, stating which capabilities have been implemented for a given protocol.

- A PICS proforma is a document, in the form of a questionnaire, designed by the protocol specifier or conformance test suite specifier, which when completed for an implementation or system becomes the PICS.

B.1.4 Acronyms

AAL	ATM Adaptation Layer
ABR	Available Bit Rate
AINI	ATM Inter-Network Interface
ATM	Asynchronous Transfer Mode
BCS	Behavior Class Selector
BCT	Burst Cell Tolerance
B-ISUP	Broadband ISDN User Part
COA	CONNECTION AVAILABLE
CBR	Constant Bit Rate
GFR	Guaranteed Frame Rate
ITU-T	International Telecommunication Union-Telecommunication Standardization Sector
IUT	Implementation Under Test
M	Mandatory requirements (these are to be observed in all cases)
MBS	Maximum Burst Size
MCR	Minimum Cell Rate
MDCR	Minimum Desired Cell Rate
MFS	Maximum Frame Size
MOA	MODIFICATION ACKNOWLEDGE Message
MOD	MODIFICATION REQUEST Message
MOR	MODIFICATION REJECT Message
nrtVBR	non-real time VBR
N/A	Not supported, not applicable, or the conditions for status are not met.
O	Optional (may be selected to suit the implementation, provided that any requirements applicable to the options are observed)
O.n	Optional, but support is required for either at least one or only one of the options in the group labeled with the same numeral "n".
OA&M	Operations Administration & Maintenance
PCR	Peak Cell Rate
PICS	Protocol Implementation Conformance Statement
PNNI	Private Network-Network Interface
rtVBR	real time VBR
SCR	Sustainable Cell Rate
SUT	System Under Test
UBR	Unspecified Bit Rate
UNI	User Network Interface
VBR	Variable Bit Rate

B.1.5 Conformance

The supplier of a protocol implementation, which is claimed to conform to the ATM Forum PNNI specification for Modification of an Active Connection is required to complete a copy of the PICS proforma, provided in this document and is required to provide the information necessary to identify both the supplier and the implementation.

B.2 Identification of the Implementation

Date of the Statement

_____

Implementation Under Test (IUT) Identification

IUT Name: _____

IUT Version: _____

_____

System Under Test (SUT) Identification

SUT Name: _____

Hardware Configuration: _____

_____

_____

Operating System: _____

Product Supplier

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

Email Address:_____

Additional Information: _____

Client (if different from product supplier)

Name: _____

Address:

_____

_____

Telephone Number: _____

Facsimile Number: _____

Email Address:_____

Additional Information: _____

PICS Contact Person

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

Email Address:_____

Additional Information: _____
_____
_____
_____

Identification of the protocol

This PICS proforma applies to the following:

PNNI portion of af-cs-0148.001, *Modification of Traffic Parameters for an Active Connection Signalling Specification (PNNI, AINI, and UNI) Version 2.0*.

B.3 PICS Proforma

B.3.1 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No) _____

Note: Answering "No" indicates non-conformance to the protocol specification. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conforming, on pages attached to the PICS proforma.

B.3.2 Instructions for Completing the PICS Proforma

The supplier of the implementation shall complete the PICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support column entries provided, using the specified notation.

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO-IEC 9646-7 [B.2], are used for the support column:

Y or y supported by the implementation.

N or n not supported by the implementation.

N/A, n/a or no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

The following notations, defined in ISO/IEC 9646-7 [B.2], are used for the status column:

M	mandatory - the capability is required to be supported.
O	optional - the capability may be supported or not.
N/A	not applicable - in the given context, it is impossible to use the capability.
X	prohibited (excluded) - there is a requirement not to use this capability in the given context.
O.i	qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer, which identifies a unique group of related optional items, and the logic of their selection, which is defined immediately following the table.

B.4 Roles

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
R 1	requirements for the transit entity?		M	3.6/Q.2963.1	Yes__No__
R 2.1	requirements for the modification requesting entity?		M	3.7/Q.2963.1	Yes__No__
R 2.2	requirements for the responding entity?		M	3.8/Q.2963.1	Yes__No__
Comments:					

B.5 Major Capabilities

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
MC 1.1	Modification of the PCR?		M	1	Yes__No__
MC 1.2	Modification of the SCR?		M	1	Yes__No__
MC 1.3	Modification of the MBS?		M	1	Yes__No__
MC 1.4	Modification of the BCS?	BCS [B.9]	O	1	Yes__No__
MC 1.5	Modification of the MDCR?	MDCR [B.8]	O	1	Yes__No__
MC 1.6	Modification of the MFS, MCR, and BCT?	GFR [B.7]	O	1	Yes__No__
MC 2	Negotiation, using Alternative ATM Traffic Descriptor		O	1	Yes__No__
MC 3	Negotiation, using Minimum Acceptable ATM Traffic Descriptor		O	1	Yes__No__
Comments: Modification includes increase and decrease					

B.6 Transit Entity

B.6.1 Messages Received

Item	Does the IUT support …	Condition for status	Status	Reference	Support
MR 1	MODIFY REQUEST?		M	2.1.2.1	Yes__No__
MR 2	MODIFY ACKNOWLEDGE?		M	2.1.2.2	Yes__No__
MR 3	MODIFY REJECT?		M	2.1.2.3	Yes__No__
MR 4	CONNECTION AVAILABLE?		M	2.1.2.4	Yes__No__
Comments:					

B.6.2 Messages Transmitted

Item	Does the IUT support …	Condition for status	Status	Reference	Support
MT 1	MODIFY REQUEST?		M	2.1.2.1	Yes__No__
MT 2	MODIFY ACKNOWLEDGE?		M	2.1.2.2	Yes__No__
MT 3	MODIFY REJECT?		M	2.1.2.3	Yes__No__
MT 4	CONNECTION AVAILABLE?		M	2.1.2.4	Yes__No__
Comments:					

B.6.3 Transit entity Information Elements

The tables in this subsection ask questions related to the support of IEs in messages received and transmitted by the IUT.

B.6.3.1 Transit entity Information Elements Received

B.6.3.1.1 Modify Request Information Elements Received

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IER 1.1	Protocol discriminator?		M	2.1.2.1	Yes__No__
IER 1.2	Call reference?		M	2.1.2.1	Yes__No__
IER 1.3	Message type?		M	2.1.2.1	Yes__No__
IER 1.4	Message length?		M	2.1.2.1	Yes__No__
IER 1.5	ATM traffic descriptor?		M	2.1.2.1	Yes__No__
IER 1.6	Notification indicator?		O	2.1.2.1	Yes__No__
IER 1.7	Alternative ATM traffic descriptor?	MC2	M	2.1.2.1	Yes__No__
IER 1.8	Minimum acceptable ATM traffic descriptor?	MC3	M	2.1.2.1	Yes__No__
IER 1.9	Security services?		O	2.1.2.1	Yes__No__
IER 1.10	Generic identifier transport?		O	2.1.2.1	Yes__No__
IER 1.11	Generic application transport?		O	2.1.2.1	Yes__No__
IER 1.12	Minimum Desired Cell Rate?	MDCR [B.8]	M	2.1.2.1	Yes__No__
IER 1.13	Optional traffic attributes?	BCS [B.9]	M	2.1.2.1	Yes__No__
Comments:					

B.6.3.1.2 Modify Acknowledge Information Elements Received

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IER 2.1	Protocol discriminator?		M	2.1.2.2	Yes__No__
IER 2.2	Call reference?		M	2.1.2.2	Yes__No__
IER 2.3	Message type?		M	2.1.2.2	Yes__No__
IER 2.4	Message length?		M	2.1.2.2	Yes__No__
IER 2.5	ATM traffic descriptor?	MC2 OR MC3	M	2.1.2.2	Yes__No__
IER 2.6	Notification indicator?		O	2.1.2.2	Yes__No__
IER 2.7	Broadband report type?		M	2.1.2.2	Yes__No__
IER 2.8	Security services?		O	2.1.2.2	Yes__No__
IER 2.9	Generic identifier transport?		O	2.1.2.2	Yes__No__
IER 2.10	Generic application transport?		O	2.1.2.2	Yes__No__
IER 2.11	Minimum Desired Cell Rate?	MDCR [B.8]	M	2.1.2.2	Yes__No__
IER 2.12	Optional traffic attributes?	BCS [B.9]	M	2.1.2.2	Yes__No__
Comments:					

B.6.3.1.3 Modify Reject Information Elements Received

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IER 3.1	Protocol discriminator?		M	2.1.2.3	Yes__No__
IER 3.2	Call reference?		M	2.1.2.3	Yes__No__
IER 3.3	Message type?		M	2.1.2.3	Yes__No__
IER 3.4	Message length?		M	2.1.2.3	Yes__No__
IER 3.5	Notification indicator?		O	2.1.2.3	Yes__No__
IER 3.6	Cause?		M	2.1.2.3	Yes__No__
IER 3.7	Security services?		O	2.1.2.3	Yes__No__
IER 3.8	Generic identifier transport?		O	2.1.2.3	Yes__No__
IER 3.9	Generic application transport?		O	2.1.2.3	Yes__No__
Comments:					

B.6.3.1.4 Connection Available Information Elements Received

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IER 4.1	Protocol discriminator?		M	2.1.2.4	Yes__No__
IER 4.2	Call reference?		M	2.1.2.4	Yes__No__
IER 4.3	Message type?		M	2.1.2.4	Yes__No__
IER 4.4	Message length?		M	2.1.2.4	Yes__No__
IER 4.5	Notification indicator?		O	2.1.2.4	Yes__No__
IER 4.6	Security services?		O	2.1.2.4	Yes__No__
IER 4.7	Generic identifier transport?		O	2.1.2.4	Yes__No__
IER 4.8	Generic application transport?		O	2.1.2.4	Yes__No__
Comments:					

B.6.3.2 Transit Entity Information Elements Transmitted

Indicating support for an item in the tables in this subsection states that the implementation has the ability to generate, and to transmit in the specified message, the information elements listed. Such support does not necessarily mean that the indicated information element is included in every instance of the transmitted message.

B.6.3.2.1 Modify Request Information Elements Transmitted

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IET 1.1	Protocol discriminator?		M	2.1.2.1	Yes__No__
IET 1.2	Call reference?		M	2.1.2.1	Yes__No__
IET 1.3	Message type?		M	2.1.2.1	Yes__No__
IET 1.4	Message length?		M	2.1.2.1	Yes__No__
IET 1.5	ATM traffic descriptor?		M	2.1.2.1	Yes__No__
IET 1.6	Notification indicator?		O	2.1.2.1	Yes__No__
IET 1.7	Alternative ATM traffic descriptor?	MC2	M	2.1.2.1	Yes__No__
IET 1.8	Minimum acceptable ATM traffic descriptor?	MC3	M	2.1.2.1	Yes__No__
IET 1.9	Security services?		O	2.1.2.1	Yes__No__
IET 1.10	Generic identifier transport?		O	2.1.2.1	Yes__No__
IET 1.11	Generic application transport?		O	2.1.2.1	Yes__No__
IET 1.12	Minimum Desired Cell Rate?	MDCR [B.8]	M	2.1.2.1	Yes__No__
IET 1.13	Optional traffic attributes?	BCS [B.9]	M	2.1.2.1	Yes__No__
Comments:					

B.6.3.2.2 Modify Acknowledge Information Elements Transmitted

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IET 2.1	Protocol discriminator?		M	2.1.2.2	Yes__No__
IET 2.2	Call reference?		M	2.1.2.2	Yes__No__
IET 2.3	Message type?		M	2.1.2.2	Yes__No__
IET 2.4	Message length?		M	2.1.2.2	Yes__No__
IET 2.5	ATM traffic descriptor?	MC2 OR MC3	M	2.1.2.2	Yes__No__
IET 2.6	Notification indicator?		O	2.1.2.2	Yes__No__
IET 2.7	Broadband report type?		M	2.1.2.2	Yes__No__
IET 2.8	Security services?		O	2.1.2.2	Yes__No__
IET 2.9	Generic identifier transport?		O	2.1.2.2	Yes__No__
IET 2.10	Generic application transport?		O	2.1.2.2	Yes__No__
IET 2.11	Minimum Desired Cell Rate?	MDCR [B.8]	M	2.1.2.2	Yes__No__
IET 2.12	Optional traffic attributes?	BCS [B.9]	M	2.1.2.2	Yes__No__
Comments:					

B.6.3.2.3 Modify Reject Information Elements Transmitted

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IET 3.1	Protocol discriminator?		M	2.1.2.3	Yes__No__
IET 3.2	Call reference?		M	2.1.2.3	Yes__No__
IET 3.3	Message type?		M	2.1.2.3	Yes__No__
IET 3.4	Message length?		M	2.1.2.3	Yes__No__
IET 3.5	Notification indicator?		O	2.1.2.3	Yes__No__
IET 3.6	Cause?		M	2.1.2.3	Yes__No__
IET 3.7	Security services?		O	2.1.2.3	Yes__No__
IET 3.8	Generic identifier transport?		O	2.1.2.3	Yes__No__
IET 3.9	Generic application transport?		O	2.1.2.3	Yes__No__
Comments:					

B.6.3.2.4 Connection Available Information Elements Transmitted

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IET 4.1	Protocol discriminator?		M	2.1.2.4	Yes__No__
IET 4.2	Call reference?		M	2.1.2.4	Yes__No__
IET 4.3	Message type?		M	2.1.2.4	Yes__No__
IET 4.4	Message length?		M	2.1.2.4	Yes__No__
IET 4.5	Notification indicator?		O	2.1.2.4	Yes__No__
IET 4.6	Security services?		O	2.1.2.4	Yes__No__
IET 4.7	Generic identifier transport?		O	2.1.2.4	Yes__No__
IET 4.8	Generic application transport?		O	2.1.2.4	Yes__No__
Comments:					

B.7 Timers

Indicating support for an item in table below states that the implementation has a timer that operates in accordance with the description in section 13.1/Q.2963.1 as a transit entity.

Item	Timer: Does the implementation support ...	Conditions for status	Status	Reference	Support
TM 1	T360?	R2.1	M	13/Q.2963.1	Yes__No__ N/A__
TM 2	T334?	R2.2 AND R3.1	O	3.3 and 13/Q.2963.1	Yes__No__ N/A__
Comments:					

B.8 PNNI Procedural PICS for modification

Item	Does the IUT …	Condition for status	Status	Reference	Support
PROC 1	Follow the procedures of 9.1.1/Q.2963.1 as modified by 9/Q.2963.2 to request the modification of a call without negotiation?		M	9.1.1/Q.2963.1 and 9/Q.2963.2	Yes__No__
PROC 2	Follow the procedures of 9.1.1/Q.2963.3 to request the modification of a call with negotiation?	MC2 or MC3	M	9.1.1/Q.2963.3	Yes__No__
PROC 3	On receipt of a MODIFY REQUEST message with neither an Alternative ATM traffic descriptor nor a Minimum Acceptable ATM traffic descriptor information element while in the modify requested state follow the procedures of 9.1.2/Q.2963.1?		M	9.1.2/Q.2963.1	Yes__No__
PROC 4	On receipt of a MODIFY REQUEST message with either an Alternative ATM traffic descriptor or a Minimum Acceptable ATM traffic descriptor information element while in the modify requested state follow the procedures of 9.1.2/Q.2963.3?	MC2 or MC3	M	9.1.2/Q.2963.3	Yes__No__
PROC 5	On receipt of a MODIFY REJECT message while in the modify requested state follow the procedures of 9.1.3/Q.2963.1?		M	9.1.3/Q.2963.1	Yes__No__
PROC 6	On receipt of a STATUS message, which indicates the active state and cause No. 97 or cause No. 101, while in the modify requested state follow the procedures of 9.1.4/Q.2963.1?		M	9.1.4/Q.2963.1	Yes__No__
PROC 7	On expiry of Timer T360 clear the call with cause No. 102?		M	9.1.5/Q.2963.1	Yes__No__
PROC 8	On receipt of a MODIFY REQUEST message with neither an Alternative ATM traffic descriptor nor a Minimum Acceptable ATM traffic descriptor information element while in the active state follow the procedures of 9.2.1/Q.2963.1 as modified by 9/Q.2963.2?		M	9.2.1/Q.2963.1 and 9/Q.2963.2	Yes__No__
PROC 9	On receipt of a MODIFY REQUEST message with either an Alternative ATM traffic descriptor or a Minimum Acceptable ATM traffic descriptor information element while in the active state follow the procedures of 9.2.1/Q.2963.3?	MC2 or MC3	M	9.2.1/Q.2963.3	Yes__No__
PROC 10	On receipt of an indication that the modification without negotiation has been accepted while in the modify requested state follow the procedures of 9.2.2/Q.2963.1 as modified by 9/Q.2963.2?		M	9.2.2/Q.2963.1 and 9/Q.2963.2	Yes__No__
PROC 11	On receipt of an indication that the modification with negotiation has been accepted while in the modify requested state follow the procedures of 9.2.2/Q.2963.3?	MC2 or MC3	M	9.2.2/Q.2963.3	Yes__No__

Item	Does the IUT …	Condition for status	Status	Reference	Support
PROC 12	On receipt of an indication that the modification has been rejected while in the modify requested state follow the procedures of 9.2.4/Q.2963.1?		M	9.2.4/Q.2963.1	Yes__No__
PROC 13	On receipt of a MODIFY REQUEST message with both the Minimum acceptable ATM traffic descriptor and the Alternative ATM traffic descriptor information, reject the modification following the procedures in 9.2.4/Q.2963.3?	MC2 or MC3	M	9.2.4/Q.2963.3	Yes__No__
PROC 14	On receipt of a MODIFY REQUEST message with an Alternative ATM traffic descriptor information element, which is not coded according to the allowed coding, treat the Alternative ATM traffic descriptor information element as a non-mandatory information element with content error?	MC2	M	9.2.4/Q.2963.3	Yes__No__
PROC 15	On receipt of a MODIFY REQUEST message with Minimum Acceptable ATM traffic descriptor information element, which is not coded according to the allowed coding, treat the Minimum Acceptable ATM traffic descriptor information element as a non-mandatory information element with content error?	MC3	M	9.2.4/Q.2963.3	Yes__No__
PROC 16	On receipt of a MODIFY REQUEST message with ATM traffic parameters, which are not according to the allowed combinations while in the active state, follow the procedures of 9.2.5/Q.2963.1?		M	9.2.5/Q.2963.1	Yes__No__
PROC 17	On receipt of a CONNECTION AVAILABLE message while in the active state follow the procedures of 9.3/Q.2963.1 as modified by 3.2.1?		M	3.2.1 and 9.3/Q.2963.1	Yes__No__
Comments:					

Annex C Protocol Implementation Conformance Statement (PICS) for AINI Modification of an Active Connection

C.1 Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented. Such a statement is called a Protocol Implementation Conformance Statement (PICS). For further details on PICS see the Implementation Conformance Statement Proforma Style Guide [C.6].

C.1.1 Scope

This document provides the PICS proforma for the AINI portion of the *Modification of Traffic Parameters for an Active Connection Signalling Specification (PNNI, AINI, and UNI) Version 2.0* in compliance with the relevant requirements, and in accordance with the relevant guidelines, given in ISO/IEC 9646-7 [C.2]. In most cases, statements contained in notes in the specification, which were intended as information, are not included in the PICS.

C.1.2 Normative References

[C.1] ISO/IEC 9646-1: 1994, Information technology – Open systems interconnection – Conformance testing methodology and framework – Part 1: General Concepts (See also ITU Recommendation X.290 (1995)).

[C.2] ISO/IEC 9646-7:1994, Information technology – Open systems interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements".

[C.3] ITU-T Recommendation Q.2963.1 (1999), *Digital Subscriber Signalling System No. 2 – Connection modification: Peak cell rate modification by the connection owner.*

[C.4] ITU-T Recommendation Q.2963.2 (1997), *Digital Subscriber Signalling System No. 2 – Connection modification: Modification procedures for sustainable cell rate parameters.*

[C.5] ITU-T Recommendation Q.2963.3 (1998), *Digital Subscriber Signalling System No. 2 – Connection modification:* : ATM traffic descriptor modification with negotiation by the connection owner.

[C.6] ATM Forum Technical Committee, "Implementation Conformance Statement Proforma Style Guide", af-test-0137-000, February 2000.

[C.7] Guaranteed Frame Rate (GFR) Signalling Specification (PNNI, AINI, and UNI) Version 1.0, af-cs-0167.000

[C.8] UBR with MDCR Addendum to UNI Signalling 4.0, PNNI 1.0 and AINI, af-cs-0147.000

[C.9] Behavior Class Selector Signalling Version 1.0, af-cs-0159.000

C.1.3 Definitions

This document uses the following terms defined in ISO/IEC 9646-1[C.1]:

- A Protocol Implementation Conformance Statement (PICS) is a statement made by the supplier of an implementation or system, stating which capabilities have been implemented for a given protocol.

- A PICS proforma is a document, in the form of a questionnaire, designed by the protocol specifier or conformance test suite specifier, which when completed for an implementation or system becomes the PICS.

C.1.4 Acronyms

AAL	ATM Adaptation Layer
ABR	Available Bit Rate
AINI	ATM Inter-Network Interface
ATM	Asynchronous Transfer Mode
BCS	Behavior Class Selector
BCT	Burst Cell Tolerance
B-ISUP	Broadband ISDN User Part
COA	CONNECTION AVAILABLE
CBR	Constant Bit Rate
GFR	Guaranteed Frame Rate
ITU-T	International Telecommunication Union-Telecommunication Standardization Sector
IUT	Implementation Under Test
M	Mandatory requirements (these are to be observed in all cases)
MBS	Maximum Burst Size
MCR	Minimum Cell Rate
MDCR	Minimum Desired Cell Rate
MFS	Maximum Frame Size
MOA	MODIFICATION ACKNOWLEDGE Message
MOD	MODIFICATION REQUEST Message
MOR	MODIFICATION REJECT Message
nrtVBR	non-real time VBR
N/A	Not supported, not applicable, or the conditions for status are not met.
O	Optional (may be selected to suit the implementation, provided that any requirements applicable to the options are observed)
O.n	Optional, but support is required for either at least one or only one of the options in the group labeled with the same numeral "n".
OA&M	Operations Administration & Maintenance
PCR	Peak Cell Rate
PICS	Protocol Implementation Conformance Statement
PNNI	Private Network-Network Interface
rtVBR	real time VBR
SCR	Sustainable Cell Rate
SUT	System Under Test
UBR	Unspecified Bit Rate
UNI	User Network Interface
VBR	Variable Bit Rate

C.1.5 Conformance

The supplier of a protocol implementation, which is claimed to conform to the ATM Forum AINI specification for Modification of an Active Connection is required to complete a copy of the PICS proforma, provided in this document and is required to provide the information necessary to identify both the supplier and the implementation.

C.2 Identification of the Implementation

Date of the Statement

_____

Implementation Under Test (IUT) Identification

IUT Name: _____

IUT Version: _____

_____

System Under Test (SUT) Identification

SUT Name: _____

Hardware Configuration: _____

_____

_____

Operating System: _____

Product Supplier

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

Email Address:_____

Additional Information: _____

Client (if different from product supplier)

Name: _____

Address:

_____

_____

Telephone Number: _____

Facsimile Number: _____

Email Address:_____

Additional Information: _____

PICS Contact Person

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

Email Address:_____

Additional Information: _____
_____
_____
_____

Identification of the protocol

This PICS proforma applies to the following:

AINI portion of af-cs-0148.001, *Modification of Traffic Parameters for an Active Connection Signalling Specification (PNNI, AINI, and UNI) Version 2.0.*

C.3 PICS Proforma

C.3.1 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No) _____

Note: Answering "No" indicates non-conformance to the protocol specification. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conforming, on pages attached to the PICS proforma.

C.3.2 Instructions for Completing the PICS Proforma

The supplier of the implementation shall complete the PICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support column entries provided, using the specified notation.

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO-IEC 9646-7 [C.2], are used for the support column:

Y or y supported by the implementation.

N or n not supported by the implementation.

N/A, n/a or no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

The following notations, defined in ISO/IEC 9646-7 [C.2], are used for the status column:

M	mandatory - the capability is required to be supported.
O	optional - the capability may be supported or not.
N/A	not applicable - in the given context, it is impossible to use the capability.
X	prohibited (excluded) - there is a requirement not to use this capability in the given context.
O.i	qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer, which identifies a unique group of related optional items, and the logic of their selection, which is defined immediately following the table.

C.4 Roles

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
R 1	requirements for the transit entity?		M	3.6/Q.2963.1	Yes__No__
R 2.1	requirements for the modification requesting entity?		M	3.7/Q.2963.1	Yes__No__
R 2.2	requirements for the responding entity?		M	3.8/Q.2963.1	Yes__No__
Comments:					

C.5 Major Capabilities

Item	Does the IUT support ...	Conditions for status	Status	Reference	Support
MC 1.1	Modification of the PCR?		M	1	Yes__No__
MC 1.2	Modification of the SCR?		M	1	Yes__No__
MC 1.3	Modification of the MBS?		M	1	Yes__No__
MC 1.4	Modification of the BCS?	BCS [C.9]	O	1	Yes__No__
MC 1.5	Modification of the MDCR?	MDCR [C.8]	O	1	Yes__No__
MC 1.6	Modification of the MFS, MCR, and BCT?	GFR [C.7]	O	1	Yes__No__
MC 2	Negotiation, using Alternative ATM Traffic Descriptor		O	1	Yes__No__
MC 3	Negotiation, using Minimum Acceptable ATM Traffic Descriptor		O	1	Yes__No__
Comments: Modification includes increase and decrease					

C.6 Transit Entity

C.6.1 Messages Received

Item	Does the IUT support …	Condition for status	Status	Reference	Support
MR 1	MODIFY REQUEST?		M	2.1.2.1	Yes__No__
MR 2	MODIFY ACKNOWLEDGE?		M	2.1.2.2	Yes__No__
MR 3	MODIFY REJECT?		M	2.1.2.3	Yes__No__
MR 4	CONNECTION AVAILABLE?		M	2.1.2.4	Yes__No__
Comments:					

C.6.2 Messages Transmitted

Item	Does the IUT support …	Condition for status	Status	Reference	Support
MT 1	MODIFY REQUEST?		M	2.1.2.1	Yes__No__
MT 2	MODIFY ACKNOWLEDGE?		M	2.1.2.2	Yes__No__
MT 3	MODIFY REJECT?		M	2.1.2.3	Yes__No__
MT 4	CONNECTION AVAILABLE?		M	2.1.2.4	Yes__No__
Comments:					

C.6.3 Transit entity Information Elements

The tables in this subsection ask questions related to the support of IEs in messages received and transmitted by the IUT.

C.6.3.1 Transit entity Information Elements Received

C.6.3.1.1 Modify Request Information Elements Received

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IER 1.1	Protocol discriminator?		M	2.1.2.1	Yes__No__
IER 1.2	Call reference?		M	2.1.2.1	Yes__No__
IER 1.3	Message type?		M	2.1.2.1	Yes__No__
IER 1.4	Message length?		M	2.1.2.1	Yes__No__
IER 1.5	ATM traffic descriptor?		M	2.1.2.1	Yes__No__
IER 1.6	Notification indicator?		O	2.1.2.1	Yes__No__
IER 1.7	Alternative ATM traffic descriptor?	MC2	M	2.1.2.1	Yes__No__
IER 1.8	Minimum acceptable ATM traffic descriptor?	MC3	M	2.1.2.1	Yes__No__
IER 1.9	Security services?		O	2.1.2.1	Yes__No__
IER 1.10	Generic identifier transport?		O	2.1.2.1	Yes__No__
IER 1.11	Generic application transport?		O	2.1.2.1	Yes__No__
IER 1.12	Minimum Desired Cell Rate?	MDCR [C.8]	M	2.1.2.1	Yes__No__
IER 1.13	Optional traffic attributes?	BCS [C.9]	M	2.1.2.1	Yes__No__
Comments:					

C.6.3.1.2 Modify Acknowledge Information Elements Received

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IER 2.1	Protocol discriminator?		M	2.1.2.2	Yes__No__
IER 2.2	Call reference?		M	2.1.2.2	Yes__No__
IER 2.3	Message type?		M	2.1.2.2	Yes__No__
IER 2.4	Message length?		M	2.1.2.2	Yes__No__
IER 2.5	ATM traffic descriptor?	MC2 OR MC3	M	2.1.2.2	Yes__No__
IER 2.6	Notification indicator?		O	2.1.2.2	Yes__No__
IER 2.7	Broadband report type?		M	2.1.2.2	Yes__No__
IER 2.8	Security services?		O	2.1.2.2	Yes__No__
IER 2.9	Generic identifier transport?		O	2.1.2.2	Yes__No__
IER 2.10	Generic application transport?		O	2.1.2.2	Yes__No__
IER 2.11	Minimum Desired Cell Rate?	MDCR [C.8]	M	2.1.2.2	Yes__No__
IER 2.12	Optional traffic attributes?	BCS [C.9]	M	2.1.2.2	Yes__No__
Comments:					

C.6.3.1.3 Modify Reject Information Elements Received

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IER 3.1	Protocol discriminator?		M	2.1.2.3	Yes__No__
IER 3.2	Call reference?		M	2.1.2.3	Yes__No__
IER 3.3	Message type?		M	2.1.2.3	Yes__No__
IER 3.4	Message length?		M	2.1.2.3	Yes__No__
IER 3.5	Notification indicator?		O	2.1.2.3	Yes__No__
IER 3.6	Cause?		M	2.1.2.3	Yes__No__
IER 3.7	Security services?		O	2.1.2.3	Yes__No__
IER 3.8	Generic identifier transport?		O	2.1.2.3	Yes__No__
IER 3.9	Generic application transport?		O	2.1.2.3	Yes__No__
Comments:					

C.6.3.1.4 Connection Available Information Elements Received

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IER 4.1	Protocol discriminator?		M	2.1.2.4	Yes__No__
IER 4.2	Call reference?		M	2.1.2.4	Yes__No__
IER 4.3	Message type?		M	2.1.2.4	Yes__No__
IER 4.4	Message length?		M	2.1.2.4	Yes__No__
IER 4.5	Notification indicator?		O	2.1.2.4	Yes__No__
IER 4.6	Security services?		O	2.1.2.4	Yes__No__
IER 4.7	Generic identifier transport?		O	2.1.2.4	Yes__No__
IER 4.8	Generic application transport?		O	2.1.2.4	Yes__No__
Comments:					

C.6.3.2 Transit Entity Information Elements Transmitted

Indicating support for an item in the tables in this subsection states that the implementation has the ability to generate, and to transmit in the specified message, the information elements listed. Such support does not necessarily mean that the indicated information element is included in every instance of the transmitted message.

C.6.3.2.1 Modify Request Information Elements Transmitted

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IET 1.1	Protocol discriminator?		M	2.1.2.1	Yes__No__
IET 1.2	Call reference?		M	2.1.2.1	Yes__No__
IET 1.3	Message type?		M	2.1.2.1	Yes__No__
IET 1.4	Message length?		M	2.1.2.1	Yes__No__
IET 1.5	ATM traffic descriptor?		M	2.1.2.1	Yes__No__
IET 1.6	Notification indicator?		O	2.1.2.1	Yes__No__
IET 1.7	Alternative ATM traffic descriptor?	MC2	M	2.1.2.1	Yes__No__
IET 1.8	Minimum acceptable ATM traffic descriptor?	MC3	M	2.1.2.1	Yes__No__
IET 1.9	Security services?		O	2.1.2.1	Yes__No__
IET 1.10	Generic identifier transport?		O	2.1.2.1	Yes__No__
IET 1.11	Generic application transport?		O	2.1.2.1	Yes__No__
IET 1.12	Minimum Desired Cell Rate?	MDCR [C.8]	M	2.1.2.1	Yes__No__
IET 1.13	Optional traffic attributes?	BCS [C.9]	M	2.1.2.1	Yes__No__
Comments:					

C.6.3.2.2 Modify Acknowledge Information Elements Transmitted

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IET 2.1	Protocol discriminator?		M	2.1.2.2	Yes__No__
IET 2.2	Call reference?		M	2.1.2.2	Yes__No__
IET 2.3	Message type?		M	2.1.2.2	Yes__No__
IET 2.4	Message length?		M	2.1.2.2	Yes__No__
IET 2.5	ATM traffic descriptor?	MC2 OR MC3	M	2.1.2.2	Yes__No__
IET 2.6	Notification indicator?		O	2.1.2.2	Yes__No__
IET 2.7	Broadband report type?		M	2.1.2.2	Yes__No__
IET 2.8	Security services?		O	2.1.2.2	Yes__No__
IET 2.9	Generic identifier transport?		O	2.1.2.2	Yes__No__
IET 2.10	Generic application transport?		O	2.1.2.2	Yes__No__
IET 2.11	Minimum Desired Cell Rate?	MDCR [C.8]	M	2.1.2.2	Yes__No__
IET 2.12	Optional traffic attributes?	BCS [C.9]	M	2.1.2.2	Yes__No__
Comments:					

C.6.3.2.3 Modify Reject Information Elements Transmitted

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IET 3.1	Protocol discriminator?		M	2.1.2.3	Yes__No__
IET 3.2	Call reference?		M	2.1.2.3	Yes__No__
IET 3.3	Message type?		M	2.1.2.3	Yes__No__
IET 3.4	Message length?		M	2.1.2.3	Yes__No__
IET 3.5	Notification indicator?		O	2.1.2.3	Yes__No__
IET 3.6	Cause?		M	2.1.2.3	Yes__No__
IET 3.7	Security services?		O	2.1.2.3	Yes__No__
IET 3.8	Generic identifier transport?		O	2.1.2.3	Yes__No__
IET 3.9	Generic application transport?		O	2.1.2.3	Yes__No__
Comments:					

C.6.3.2.4 Connection Available Information Elements Transmitted

Item	Does the IUT support …	Conditions for status	Status	Reference	Support
IET 4.1	Protocol discriminator?		M	2.1.2.4	Yes__No__
IET 4.2	Call reference?		M	2.1.2.4	Yes__No__
IET 4.3	Message type?		M	2.1.2.4	Yes__No__
IET 4.4	Message length?		M	2.1.2.4	Yes__No__
IET 4.5	Notification indicator?		O	2.1.2.4	Yes__No__
IET 4.6	Security services?		O	2.1.2.4	Yes__No__
IET 4.7	Generic identifier transport?		O	2.1.2.4	Yes__No__
IET 4.8	Generic application transport?		O	2.1.2.4	Yes__No__
Comments:					

C.7 Timers

Indicating support for an item in table below states that the implementation has a timer that operates in accordance with the description in section 13.1/Q.2963.1 as a transit entity.

Item	Timer: Does the implementation support ...	Conditions for status	Status	Reference	Support
TM 1	T360?	R2.1	M	13/Q.2963.1	Yes__No__ N/A__
TM 2	T334?	R2.2 AND R3.1	O	3.3 and 13/Q.2963.1	Yes__No__ N/A__
Comments:					

C.8 AINI Procedural PICS for modification

Item	Does the IUT …	Condition for status	Status	Reference	Support
PROC 1	Follow the procedures of 9.1.1/Q.2963.1 as modified by 9/Q.2963.2 to request the modification of a call without negotiation?		M	9.1.1/Q.2963.1 and 9/Q.2963.2	Yes__No__
PROC 2	Follow the procedures of 9.1.1/Q.2963.3 to request the modification of a call with negotiation?	MC2 or MC3	M	9.1.1/Q.2963.3	Yes__No__
PROC 3	On receipt of a MODIFY REQUEST message with neither an Alternative ATM traffic descriptor nor a Minimum Acceptable ATM traffic descriptor information element while in the modify requested state follow the procedures of 9.1.2/Q.2963.1?		M	9.1.2/Q.2963.1	Yes__No__
PROC 4	On receipt of a MODIFY REQUEST message with either an Alternative ATM traffic descriptor or a Minimum Acceptable ATM traffic descriptor information element while in the modify requested state follow the procedures of 9.1.2/Q.2963.3?	MC2 or MC3	M	9.1.2/Q.2963.3	Yes__No__
PROC 5	On receipt of a MODIFY REJECT message while in the modify requested state follow the procedures of 9.1.3/Q.2963.1?		M	9.1.3/Q.2963.1	Yes__No__
PROC 6	On receipt of a STATUS message, which indicates the active state and cause No. 97 or cause No. 101, while in the modify requested state follow the procedures of 9.1.4/Q.2963.1?		M	9.1.4/Q.2963.1	Yes__No__
PROC 7	On expiry of Timer T360 clear the call with cause No. 102?		M	9.1.5/Q.2963.1	Yes__No__
PROC 8	On receipt of a MODIFY REQUEST message with neither an Alternative ATM traffic descriptor nor a Minimum Acceptable ATM traffic descriptor information element while in the active state follow the procedures of 9.2.1/Q.2963.1 as modified by 9/Q.2963.2?		M	9.2.1/Q.2963.1 and 9/Q.2963.2	Yes__No__
PROC 9	On receipt of a MODIFY REQUEST message with either an Alternative ATM traffic descriptor or a Minimum Acceptable ATM traffic descriptor information element while in the active state follow the procedures of 9.2.1/Q.2963.3?	MC2 or MC3	M	9.2.1/Q.2963.3	Yes__No__
PROC 10	On receipt of an indication that the modification without negotiation has been accepted while in the modify requested state follow the procedures of 9.2.2/Q.2963.1 as modified by 9/Q.2963.2?		M	9.2.2/Q.2963.1 and 9/Q.2963.2	Yes__No__
PROC 11	On receipt of an indication that the modification with negotiation has been accepted while in the modify requested state follow the procedures of 9.2.2/Q.2963.3?	MC2 or MC3	M	9.2.2/Q.2963.3	Yes__No__

Item	Does the IUT …	Condition for status	Status	Reference	Support
PROC 12	On receipt of an indication that the modification has been rejected while in the modify requested state follow the procedures of 9.2.4/Q.2963.1?		M	9.2.4/Q.2963.1	Yes__No__
PROC 13	On receipt of a MODIFY REQUEST message with both the Minimum acceptable ATM traffic descriptor and the Alternative ATM traffic descriptor information, reject the modification following the procedures in 9.2.4/Q.2963.3?	MC2 or MC3	M	9.2.4/Q.2963.3	Yes__No__
PROC 14	On receipt of a MODIFY REQUEST message with an Alternative ATM traffic descriptor information element, which is not coded according to the allowed coding, treat the Alternative ATM traffic descriptor information element as a non-mandatory information element with content error?	MC2	M	9.2.4/Q.2963.3	Yes__No__
PROC 15	On receipt of a MODIFY REQUEST message with Minimum Acceptable ATM traffic descriptor information element, which is not coded according to the allowed coding, treat the Minimum Acceptable ATM traffic descriptor information element as a non-mandatory information element with content error?	MC3	M	9.2.4/Q.2963.3	Yes__No__
PROC 16	On receipt of a MODIFY REQUEST message with ATM traffic parameters, which are not according to the allowed combinations while in the active state, follow the procedures of 9.2.5/Q.2963.1?		M	9.2.5/Q.2963.1	Yes__No__
PROC 17	On receipt of a CONNECTION AVAILABLE message while in the active state follow the procedures of 9.3/Q.2963.1 as modified by 3.2.1?		M	3.2.1 and 9.3/Q.2963.1	Yes__No__
Comments:					