IWORX-P

Interworking Controller

PXF 4222 Version 1.1

Inverse Multiplexing for ATM (IMA)

Preliminary Protocol Implementation Conformance Statement (PICS)

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Preliminary PICS

Revision History:	**2002-09-12**	DS2
Previous Version:	Preliminary PICS, DS1, 2002-08-26	

Page	**Subjects (major changes since last revision)**
all	Update according to corporate document layout rules

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Edition 2002-09-12

Published by Infineon Technologies AG,
St.-Martin-Strasse 53,
D-81541 München, Germany

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Preface

This document is the ”Inverse Multiplexing for ATM Protocol Implementation Conformance Statement (PICS)” for the IWORX-P Interworking Controller PXF 4222, Version 1.1.

This PICS answers the PICS Proforma as defined in ”Annex I, IMA Version 1.1 PICS Proforma” of the Standard ”Inverse Multiplexing for ATM (IMA) Specification Version1.1”, ATM Forum AF-PHY-0086.001.

I IMA Version 1.1 PICS Proforma

I.1 Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given protocol. Such a statement is called a Protocol Implementation Conformance Statement (PICS).

I.1.1 Scope

This annex provides the PICS proforma for the Inverse Multiplexing for ATM (IMA) Version 1.1 Specification as described in AF-PHY-0086.001[A-1] in compliance with the relevant requirements, and in accordance with the relevant guidelines, given in ISO/IEC 9646-2 [A-3].

I.1.2 Definitions

This document uses the following terms defined in ISO/IEC 9646-1[A-2]:

- A Protocol Implementation Conformance Statement (PICS) is a statement made by the supplier of an implementation or a 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 the conformance test suite specifier, which when completed for an implementation or a system, becomes the PICS, and
- A static conformance review is a review of the extent to which the static conformance requirements are met by the implementation, accomplished by comparing the PICS with the static conformance requirements expressed in the relevant protocol specification.

I.1.3 Symbols and Conventions

M: Mandatory

O: Option (may be selected to suit the implementation, provided that any requirements applicable to the options are observed).

I.1.4 Conformance

The supplier of a protocol implementation, which is claimed to conform to AF-PHY-0086.001[A-1], is required to complete a copy of the PICS proforma provided in the following sections of this annex and is required to provide the information necessary to identify both the supplier and the implementation.

I.2 Identification of the Implementation

Table a Implementation Identification

Implementation Name	Implementation Version
IWORX-P Interworking Controller PXF 4222	1.1

Table b System Under Test

SUT Name	Hardware Configuration	Operating System
EASY 4225	V 1.2	Infineon Device Driver System (DDS)

Table c Product Supplier

Name	Address
Infineon Technologies AG	St.-Martin-Strasse 53, D-81541 München, Germany

I.3 IMA PICS Proforma

I.3.1 Global Statement of Conformance

The implementation described in this PICS Proforma meets all of the mandatory requirements of the protocol specification.

Yes__

No__

Note: Answering "No" indicates non-conformance to the protocol specification. Non-supported mandatory capabilities are to be identified in the following tables, with an explanation in the "Comments" section of each table as to why the implementation is "non conforming".

I.3.2 Instructions for Completing the PICS Proforma

Each question in this section refers to a major function of the protocol. Answering "Yes" to a particular question states that the implementation supports all of the mandatory procedures for that function, as defined in the referenced section of AF-PHY-0086.001[A-1]. Answering "No" to a particular question in this section states that the implementation does not support that function of the protocol.

A supplier may also provide additional information, categorized as exceptional (X) or supplementary information. This additional information should be provided in the Support column as items labeled X<I> for exceptional or S<I> for supplementary

information, respectively for cross-reference purposes, where <I> is any unambiguous number.

I.3.3 IMA Protocol Functions

Table 21 Basic IMA Protocol (BIP) Definition Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
BIP.1	Does the implementation support a number N ($1 \leq N \leq 32$) of transmission links within an IMA group operating at the same nominal link cell rate (LCR)?		M	(R-1)	Yes S1
BIP.2	Does the implementation support the IMA interface connected to another interface over clear channel facilities (implies cells generated by transmit IMA shall only be terminated at the receive IMA)?		M	(R-2)	Yes
BIP.3	Does the interface specific TC sublayer of the implementation pass all cells to the IMA sublayer or provide an indication that a cell was received (this includes HEC errored cells)?		M	(R-3)	Yes
BIP.4	Does the implementation prohibit cell rate decoupling at the interface specific TC sublayer?		M	(R-4)	Yes
BIP.5	Does the implementation assign a LID unique within the IMA group to each Tx IMA link on each physical link?		M	(R-5)	Yes
BIP.6	Does the implementation ensure that the LID does not change while the link is a member of the IMA group?		M	(R-6)	Yes

Table 21 Basic IMA Protocol (BIP) Definition Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
BIP.7	Does the implementation distribute ATM cells arriving from the ATM layer over the N links in a cyclic round-robin fashion, and on a cell-by-cell basis?		M	(R-7)	Yes
BIP.8	Does the implementation distribute ATM cells over the links using an ascending order based on the LID assigned to each link within the IMA group?		M	(R-8)	Yes
BIP.9	Does the implementation support the ICP cell format defined in Table 2 on page 31 to convey IMA configuration, synchronization, status, and defect information to the far-end?		M	(R-9)	Yes
BIP.10	Does the implementation perform cell rate decoupling by inserting IMA Filler cells in place of ATM cells when there is no cell available at the ATM layer?		M	(R-10)	Yes
BIP.11	Does the implementation accept, on receive, ATM cells from the N links according to ascending order based on the LID received in the ICP cells on the incoming link?		M	(R-11)	Yes
BIP.12	Does the implementation, on receive, compensate for link differential delays and rebuild the original ATM cell stream?		M	(R-11)	Yes
BIP.13	Does the implementation discard received Filler cells and cells with bad HEC?		M	(R-11)	Yes
BIP.14	Does the implementation process and discard incoming ICP cells?		M	(R-11)	Yes

Table 21 Basic IMA Protocol (BIP) Definition Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
BIP.15	Does the implementation aggregate, on receive, the ATM cell stream to the ATM layer?		M	(R-11)	Yes
BIP.16	Does the implementation preserve the order of incoming cells?		M	(R-11)	Yes
BIP.17	Does the implementation use the ICP cell to maintain IMA protocol synchronization?		M	(R-12)	Yes
BIP.18	Does the implementation use the ICP cell to maintain link delay synchronization?		M	(R-12)	Yes
BIP.19	Does the implementation transmit first the most significant bit of each octet of the IMA OAM cell?		M	(R-13)	Yes
BIP.20	Does the implementation support the same cell header for both the Filler and ICP cell formats as defined in Table 1 on page 28 and Table 2 on page 31?		M	(R-14)	Yes
BIP.21	Does the implementation use bit 7 of octet 7 (CID field) of the Filler and ICP cells to identify the IMA OAM cell as an ICP or Filler cell?		M	(R-15)	Yes
BIP.22	Does the implementation use octets 52-53 as specified in ITU-T Recommendation I.610 [A-5] for octets 52-53 of the OAM cells of the F1/F3 flows?		M	(R-16)	Yes
BIP.23	Does the implementation support the Filler cell format defined in Table 1 on page 28?		M	(R-17)	Yes
BIP.24	Does the implementation support the ICP cell format defined in Table 2 on page 31?		M	(R-18)	Yes

Table 21 Basic IMA Protocol (BIP) Definition Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
BIP.25	Does the implementation transmit the content of the link specific fields appearing in class A over the link for which these fields apply?		M	(R-19)	Yes
BIP.26	Does the implementation transmit the same content of fields appearing in classes B and C of the ICP cell over all links within an IMA group?		M	(R-20)	Yes
BIP.27	Does the implementation use the LID bits (bits 4-0 of octet 7) in the ICP cell to identify the Link ID (range being 0 to 31)?		M	(R-21)	Yes
BIP.28	Does the implementation use the "Tx State" field, located in the Link "x" Information field in an ICP cell, to report the transmit state of the IMA link on which the NE IMA is transmitting ICP cells carrying LID = "x" ("x" being a value between 0 and 31)?		M	(R-22)	Yes
BIP.29	Does the implementation use the "Rx State", located in the Link "x" Information field in an ICP cell, to report the receive state of the incoming IMA link on which the FE IMA is transmitting ICP cells carrying LID = "x" ("x" being a value between 0 and 31)?		M	(R-23)	Yes

Table 21 Basic IMA Protocol (BIP) Definition Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
BIP.30	Does the implementation use the "Rx Defect Indicators" field, located in the Link "x" Information field in an ICP cell, to report the Rx defect indicators corresponding to the incoming IMA link on which the FE IMA is transmitting ICP cells carrying LID = "x" ("x" being a value between 0 and 31)?		M	(R-24)	Yes
BIP.31	Does the implementation always transmit ICP cells with Octet 50 unused and set to "$6A_H$" as defined in ITU-T Recommendation I.432 [A-4]?		M	(R-25)	Yes
BIP.32	Does the implementation reserve the End-to-End Channel field (Octet 51) as a proprietary channel?		M	(R-26)	Yes
BIP.33	Does the implementation set the End-to-End Channel field (Octet 51) to "0" when not using this field?		M	(R-27)	Yes
BIP.34	Does the implementation not rely on the processing of the End-to-End Channel field for any IMA functionality?		M	(R-28)	Yes
BIP.35	Does the implementation only consider the information within ICP cells exhibiting neither a HEC nor a CRC-10 error?		M	(R-29)	Yes
BIP.36	Does the implementation always transmit "03_H" over the OAM Label in the Filler and ICP cells?		M	(R-30)	Yes

Table 21 Basic IMA Protocol (BIP) Definition Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
BIP.37	If the implementation does not support the IMA version proposed by the OAM Label received from the far-end IMA unit, does the implementation report the "Config-Aborted - Unsupported IMA Version" state over the "Group Status and Control" field?		M	(R-31)	Yes
BIP.38	Does the implementation transmit IMA frames, composed of M consecutive cells, on each link within the IMA group?		M	(R-32)	Yes
BIP.39	Does the implementation send ICP cells on each link once per IMA frame, hence every M cells?		M	(R-33)	Yes
BIP.40	Does the implementation use the IFSN field in the ICP cell to indicate the sequence number of the IMA frame?		M	(R-34)	Yes
BIP.41	Does the implementation increment the IFSN field in the ICP cell from 0 to 255 and repeat the sequence?		M	(R-35)	Yes
BIP.42	Does the implementation increment the IFSN field in the ICP cell with each IMA frame on a per-link basis?		M	(R-36)	Yes
BIP.43	Within an IMA frame, does the implementation place identical IFSN values in the ICP cells sent on each link?		M	(R-36)	Yes
BIP.44	Does the implementation align the transmission of the IMA frame on all links within an IMA group?		M	(R-37)	Yes

Table 21 Basic IMA Protocol (BIP) Definition Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
BIP.45	Does the implementation use the ICP Cell Offset field (octet 9) to indicate the location of the ICP cell within the IMA frame of length M cells?		M	(R-38)	Yes
BIP.46	Does the implementation always set the value of the ICP cell offset between 0 and M-1 where M is the IMA frame length in cells?		M	(R-39)	Yes
BIP.47	Does the implementation distribute the ICP cells, from link to link within the IMA group, in an uniform fashion across the IMA frame?		O	(O-1)	Yes
BIP.48	Does the implementation select the offset of the ICP cell sent of any link when the link is assigned a LID?		M	(R-40)	Yes
BIP.49	Does the implementation retain the offset of the ICP cell sent on a given link until the link is no longer part of the group?		M	(R-40)	Yes
BIP.50	Does the implementation always use the Frame Length field in the ICP cell to indicate the value of M?		M	(R-41)	Yes
BIP.51	Does the implementation support M = 128?		M	(R-42)	Yes
BIP.52	Does the implementation support M = 32?		O	(O-2)	Yes
BIP.53	Does the implementation support M = 64?		O	(O-2)	Yes
BIP.54	Does the implementation support M = 256?		O	(O-2)	Yes
BIP.55	Does the implementation only change the value M at group start-up time?		M	(R-43)	Yes

Table 21 Basic IMA Protocol (BIP) Definition Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
BIP.56	Does the implementation use on transmit the value configured by the UM?	(O-2)	M	(CR-1)	Yes
BIP.57	Does the implementation allow different values of M in both Tx and Rx directions?	(O-2)	M	(CR-2)	Yes
BIP.58	Does the implementation synchronize its incoming links using the received M value for IMA frame synchronization?	(O-2)	M	(CR-3)	Yes
BIP.59	Does the implementation abort the start-up procedure using the corresponding code in the Group Status and Control field of the ICP cell when it does not support the received M?		M	(R-44)	n/a S2
BIP.60	Does the implementation allow to configure the value M?		O	(O-3)	Yes
BIP.61	Does the implementation set the SCCI field to the previously transmitted SCCI field value, incremented modulo 256, to indicate a change on at least one of the fields appearing in octets 12 through 49 in the transmitted ICP cell?		M	(R-45)	Yes
BIP.62	Does the implementation use the SCCI field to identify received ICP cells for processing when ICP cells are monitored on more than one link, or when the monitored link has changed?		M	(R-46)	Yes

Table 21 Basic IMA Protocol (BIP) Definition Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
BIP.63	Does the implementation process the fields in octets 12 through 49 if the SCCI field has advanced beyond the SCCI value of the last processed ICP cell?		M	(R-46)	Yes
BIP.64	Does the implementation select the IMA ID at group start-up time?		M	(R-47)	Yes
BIP.65	Does the implementation transmit the IMA ID in the IMA ID field?		M	(R-48)	Yes
BIP.66	Does the implementation allow to configure the value of IMA ID?		O	(O-4)	No S3
BIP.67	Does the implementation use the "Group Symmetry Mode" field, specified in Table 2 on page 31, to indicate the symmetry of the IMA group?		M	(R-49)	Yes
BIP.68	Does the implementation ensure that the symmetry of the group is only established or changed at group start-up time?		M	(R-50)	Yes
BIP.69	Does the implementation support the Symmetrical Configuration and Operation mode?		M	(R-51)	Yes
BIP.70	Does the implementation support the Symmetrical Configuration and Asymmetrical Operation mode?		O	(O-5)	Yes
BIP.71	Does the implementation support the Asymmetrical Configuration and Operation mode?		O	(O-6)	Yes

Table 21 Basic IMA Protocol (BIP) Definition Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
BIP.72	Does the implementation abort the start-up procedure using the appropriate code defined in the "Group Status and Control" field of the ICP cell (as specified in Table 2 on page 31) if the NE does not support the symmetry mode proposed by the FE?		M	(R-52)	Yes
BIP.73	Does the implementation abort the start-up procedure using the appropriate code defined in the "Group Status and Control" field of the ICP cell (as specified in Table 2 on page 31) if the symmetry mode proposed by the FE and the configured symmetry mode of the NE do not match?		M	(R-52)	Yes
BIP.74	In order to allow a fast recovery when (O-5) or (O-6) is used at the NE and when the FE IMA unit can only be configured to the "Symmetrical Configuration and Operation" mode, does the implementation adjust to "Symmetrical Configuration and Operation".		O	(O-7)	Yes
BIP.75	Does the implementation support only the valid combinations of group symmetry modes at each end of the IMA virtual link as specified in Table 4 on page 36?		M	(R-53)	Yes
BIP.76	Does the implementation allow configuration of the group mode?		O	(O-8)	Yes

Note: S1: N (1 ≤ N ≤ 8).
S2: supports all values for M.
S3: IMA ID is assigned by FW internally (Range 0..3).

Table 22 QoS Requirements Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
QOS.1	Does the implementation support all ATM traffic/QoS classes supported by the ATM layer?		M	(R-54)	Yes

Note: none

Table 23 CTC and ITC Operation Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
CIT.1	Does the implementation indicate to the FE in which transmit clock mode it is running in the ”Transmit Clock Mode” field in the ICP cell?		M	(R-55)	Yes
CIT.2	Does the implementation support the CTC mode in the transmit direction?		M	(R-56)	Yes
CIT.3	Does the implementation only indicate to the FE that it is in the CTC mode when all the ”transmit” clocks of the links in the group are derived from the same source?		M	(R-57)	Yes
CIT.4	Does the implementation support the ITC mode in the transmit direction?		O	(O-9)	Yes
CIT.5	Does the implementation indicate that it is in the ITC mode even if all the transmit clocks of the links in the group are derived from the same source?		O	(O-10)	No
CIT.6	Does the implementation use the cell stuffing procedure to prevent link transmit buffer under-run or over-run?	(O-9)	M	(CR-4)	Yes

Table 23 CTC and ITC Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
CIT.7	Does the implementation indicate a stuff event in the ICP cell preceding a stuff event using the mandatory LSI codes specified in Table 2 on page 30?		M	(R-58)	Yes
CIT.8	Does the implementation perform stuffing by repeating the ICP cell containing the LSI code indicating that "this cell is 1 out of 2 ICP cells comprising the stuff event"?		M	(R-59)	Yes
CIT.9	Does the implementation also indicate an incoming stuff event in the fourth, third, and second ICP preceding the stuff event using the optional LSI codes?		O	(O-11)	Yes
CIT.10	At any given link, does the implementation ensure it does not introduce a stuff event more than once every 5*M ICP, Filler and ATM layer cells?		M	(R-60)	Yes
CIT.11	Does the implementation remove one of any two consecutive ICP cells with LSI code indicating "this cell is 1 out of the 2 ICP cells comprising the stuff event"?		M	(R-61)	Yes
CIT.12	Does the implementation ensure that the SICP cell is not counted as a cell for the purposes of determining the IMA round-robin sequence?		M	(R-61)	Yes
CIT.13	Does the implementation support CTC and ITC modes on receive?		M	(R-62)	Yes
CIT.14	Does the implementation inform the UM of a mismatch between the FE and NE IMA transmit clock modes?		M	(R-63)	Yes

Table 23 CTC and ITC Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
CIT.15	Does the implementation ensure that a restart is not caused if the implementation detects a mismatch between the FE and NE Transmit clock modes?		M	(R-63)	Yes
CIT.16	Does the implementation rely on at least one ICP cell with a correct CRC-10 in order to process the incoming stuff cell indication code (this is recommended)?		O	(O-12)	Yes

Note: none

Table 24 IMA Data Cell (IDC) Rate Implementation Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IDC.1	Does the implementation ensure on transmit that a Filler cell is not injected if an ATM layer cell is available for scheduling?		M	(R-64)	Yes
IDC.2	Does the implementation only check on transmit that an ATM layer cell is available and accept that cell only when the Tx IDCC ticks?		M	(R-64)	Yes
IDC.3	Does the implementation only select the TRL from the set of links whose transmit state is Active?		M	(R-65)	Yes
IDC.4	If there is no link in the Active state, does the implementation select one of the links in the Usable state, if any, or one of the links in the Unusable state otherwise?		M	(R-66)	Yes

Table 24 IMA Data Cell (IDC) Rate Implementation Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IDC.5	Does the implementation only select or change the TRL during the following situations: • during group start-up, • when the previously selected TRL's transmit state changes from Active to any other state (e.g., Usable, Unusable, or Not In Group) while another link's transmit state is Active or • when the previously selected TRL's transmit state changes from Usable to Unusable or Not In Group while another link's transmit state is Active or Usable?		M	(R-67)	Yes
IDC.6	Does the implementation indicate the selected or changed TRL to the FE over the "Transmit Timing Information" field in the ICP cell?		M	(R-68)	Yes
IDC.7	Does the implementation derive the Tx IDCC from the selected TRL according to Equation 1 on page 40?		M	(R-69)	Yes
IDC.8	When running in the CTC mode, does the implementation introduce a stuff event every 2048 ICP, Filler and ATM layer cells on all links?		M	(R-70)	Yes
IDC.9	Does the implementation introduce a stuff event every 2048 ICP, Filler and ATM layer cells on the TRL?	(O-9)	M	(CR-5)	Yes
IDC.10	Does the implementation introduce stuff events on links other than the TRL in order to compensate for the timing difference between the TRL and the other links?	(O-9)	M	(CR-6)	Yes

Table 24 IMA Data Cell (IDC) Rate Implementation Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IDC.11	Does the implementation remove CDV attributed to the presence of ICP cells by a mechanism equivalent to providing a small smoothing buffer into which cells are placed after reordering and after removing ICP cells?		M	(R-71)	Yes
IDC.12	If the TRL is in the Working state and the FE has, for at least 100 milliseconds, identified a given link as the TRL, does the implementation derive the Rx IDCR using the incoming link indicated by the FE as the TRL?		M	(R-72)	Yes S1
IDC.13	Does the implementation have an equivalent behavior to the following: when the IMA data cell clock at the receiver ticks, one cell is removed from the smoothing buffer; if the cell is a Filler cell, then the Filler cell is discarded and nothing passed to the ATM layer; if the cell is not a Filler cell, then it is passed to the ATM layer?		M	(R-73)	Yes

Note: S1: TRL is selected by means of the first valid ICP cell

Table 25 Link Differential Delay (LDD) Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
LDD.1	Does the implementation introduce a differential delay among the constituent links of a maximum of 2.5 cell times at the physical link rate?		M	(R-74)	Yes
LDD.2	Does the implementation tolerate up to at least 25 milliseconds of link differential delay on receive?		M	(R-75)	Yes
LDD.3	Does the implementation allow configuring the link differential delay tolerance?		O	(O-13)	Yes

Note: none

Table 26 IMA Interface Operation (IIO) Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IIO.1	Does the implementation support the Tx LSM defined in Table 8 on page 52?		M	(R-76)	Yes
IIO.2	Does the implementation support the Rx LSM defined in Table 9 on page 53?		M	(R-77)	Yes
IIO.3	Does the implementation signal the current state of the Tx LSM to the FE IMA unit via the ICP cells?		M	(R-78)	Yes
IIO.4	Does the implementation perform the actions corresponding to the Tx LSM sub-states?		M	(R-78)	Yes
IIO.5	Does the implementation update the Tx LSM according the occurrence of the events listed in Table 8 on page 52?		M	(R-78)	Yes

Table 26 IMA Interface Operation (IIO) Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IIO.6	Does the implementation treat sequentially the incoming events that trigger the Tx LSM, although the order of treatment is implementation specific if these events appear simultaneously?		M	(R-78)	Yes
IIO.7	Does the implementation signal the current state of the Rx LSM to the FE IMA unit via the ICP cells?		M	(R-78)	Yes
IIO.8	Does the implementation perform the actions corresponding to the Rx LSM sub-states?		M	(R-78)	Yes
IIO.9	Does the implementation update the Rx LSM according the occurrence of the events listed in Table 9 on page 53?		M	(R-78)	Yes
IIO.10	Does the implementation treat sequentially the incoming events that trigger the Rx LSM, although the order of treatment is implementation specific if these events appear simultaneously?		M	(R-78)	Yes
IIO.11	Does the implementation report any change of the Tx and Rx LSMs within the next 2*M (where M is the M used by the IMA transmitter) cells on that link over the "Tx State" and "Rx State" fields of the Link Information field (refer to Table 3 on page 32)?		M	(R-79)	Yes
IIO.12	Does the implementation use one of the Unusable encodings when reporting the Unusable state?		M	(R-80)	Yes

Table 26 IMA Interface Operation (IIO) Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IIO.13	Does the implementation use "Inhibited", "Failed", "Fault" or "Mis-connected" as a reason when reporting the Unusable state?		O	(O-14)	Yes
IIO.14	Does the implementation re-evaluate the TX and Rx LSMs state upon each incoming ICP cell with new state indication?		M	(R-81)	Yes
IIO.15	Does the implementation allow the valid combinations of Tx and Rx LSM states and disallow the invalid combinations when running in the Symmetrical Configuration and Operation mode?		M	(R-82)	Yes
IIO.16	Does the implementation allow the valid combinations of Tx and Rx LSM states and disallow the invalid combinations when running in the Symmetrical Configuration and Asymmetrical Operation mode?		M	(R-82)	Yes
IIO.17	Does the implementation allow all combinations of Tx and Rx LSM states when running in the Asymmetrical Configuration and Operation mode?		M	(R-82)	Yes
IIO.18	Does the implementation report any GSM states, with the exception of the Not Configured state, to the FE group using the corresponding value defined in the "Group Status and Control" field?		M	(R-83)	Yes
IIO.19	Does the implementation always send over each link the same value in the "Group Status and Control" field for at least 2 consecutive IMA frames?		M	(R-84)	Yes

Table 26 IMA Interface Operation (IIO) Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IIO.20	Does the implementation validate the Rx OAM Label, Rx M, and Rx IMA ID over at least one link before moving into the Start-up-Ack state?		M	(R-85)	Yes
IIO.21	Does the implementation use the validated Rx OAM Label, Rx M, and Rx IMA ID to achieve IMA frame synchronization as defined in Section 11 on page 68?		M	(R-86)	Yes
IIO.22	Does the implementation ensure that at least P_{Tx} links in the transmit direction and P_{Rx} links in the received direction can be moved into the Active state before moving the GSM into the Operational state?		M	(R-87)	Yes
IIO.23	Does the implementation ensure that P_{Tx} is greater than zero?		M	(R-88)	Yes
IIO.24	Does the implementation ensure that P_{Rx} is greater than zero?		M	(R-88)	Yes
IIO.25	Does the implementation ensure that P_{Tx} and P_{Rx} are equal when the configured in the Symmetrical Configuration and Operation mode?		M	(R-89)	Yes
IIO.26	Does the implementation allow configuration of the value of P_{Tx}?		O	(O-15)	Yes
IIO.27	Does the implementation allow configuration of the value of P_{Rx}?		O	(O-15)	Yes
IIO.28	Does the implementation report the Config-Aborted state for at least one second when the configuration requested by the FE is unacceptable?		M	(R-90)	Yes
IIO.29	Does the implementation support the GSM state transitions as defined in Table 13 on page 60?		M	(R-91)	Yes

Table 26 IMA Interface Operation (IIO) Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IIO.30	Does the implementation determine and report that the group is up when both the local and remote GSMs are Operational?		M	(R-92)	Yes
IIO.31	Does the implementation determine and report that the group is down when either the local or the remote GSM is not operational?		M	(R-92)	Yes
IIO.32	Does the implementation report the proper reasons why the GSM is not operational?		M	(R-92)	Yes
IIO.33	Does the implementation report the highest priority reason according to Table 14 on page 61?		M	(R-92)	Yes
IIO.34	Does the implementation report the entrance of the GTSM into the Down state to the UM and ATM Layer Management?		M	(R-93)	Yes
IIO.35	Is the report of the entrance of the GTSM into the Down state the only notification to the ATM Layer Management about Physical Layer defects or failures?		M	(R-93)	n/a S1
IIO.36	Does the implementation report the return of the GTSM to the Up state to the UM and ATM Layer Management?		M	(R-94)	n/a S1
IIO.37	Does the implementation ensure it does not drop any ATM layer cells when adding or recovering links while the GSM is maintained in the Operational state?		M	(R-95)	Yes

Table 26 IMA Interface Operation (IIO) Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IIO.38	Does the implementation ensure that it does not drop any ATM layer cells when deleting or inhibiting links while the GSM is maintained in the Operational state?		M	(R-96)	Yes
IIO.39	When running the group start-up procedure, does the implementation ensure that all accepted links have their states changed to Tx=Usable in the same update of the ICP cell?		M	(R-97)	Yes
IIO.40	When running the group start-up procedure and after the Tx state of all accepted links has been reported in a previous update of the ICP cell, does the implementation ensure that all accepted links have their states changed to Rx=Active in the same update of the ICP cell?		M	(R-98)	Yes
IIO.41	When running the group start-up procedure and after the Rx state of all accepted links has been reported in a previous update of the ICP cell, does the implementation ensure that all accepted links have their states changed to Tx=Active in the same update of the ICP cell?		M	(R-99)	Yes
IIO.42	When running the group start-up procedure, does the implementation wait a minimum of one second, unless all the configured links are being reported Tx=Usable by FE, before reporting links Rx=Active?		M	(R-100)	Yes

Table 26 IMA Interface Operation (IIO) Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IIO.43	When running the group start-up procedure, does the implementation wait a minimum of one second, unless all the configured links are being reported Rx=Active by FE, before reporting links Tx=Active?		M	(R-101)	Yes
IIO.44	Does the implementation synchronize the insertion of new links or recovered links added using the slow recovery mechanism, defined in Section 12.1.3.1 on page 74, within the IMA RR?		M	(R-102)	Yes
IIO.45	Does the implementation execute only one LASR procedure per IMA group at any time (even if more than one link is inserted at the same time)?		M	(R-103)	Yes
IIO.46	Does the implementation delay the insertion of one or more new links or a possible slow link recovery when the LASR is in progress until the link addition procedure is completed or aborted?		M	(R-104)	Yes
IIO.47	When running the LASR procedure, does the implementation ensure that all the inserted links have their states changed to Tx=Usable in the same update of the ICP?		M	(R-105)	Yes

Table 26 IMA Interface Operation (IIO) Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IIO.48	When running the LASR procedure and after the Tx state of all accepted links has been reported Usable in a previous update of the ICP cell, does the implementation ensure that all the inserted links have their states changed to Rx=Active in the same update of the ICP cell?		M	(R-106)	Yes
IIO.49	When running the LASR procedure and after the Rx state of all accepted links has been reported Active in a previous update of the ICP cell, does the implementation ensure that all the inserted links have their states changed to Tx=Active in the same update of the ICP cell?		M	(R-107)	Yes
IIO.50	When running the LASR procedure, does the implementation wait a minimum of one second, unless all the inserted links are being reported Tx=Usable by FE, before reporting links Rx=Active?		M	(R-108)	Yes
IIO.51	When running the LASR procedure, does the implementation wait a minimum of one second, unless the inserted links are being reported Rx=Active by FE, before reporting links Tx=Active?		M	(R-109)	Yes

Note: S1: to be implemented by the application.

Table 27 IMA Frame Synchronization (IFS) Mechanism Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IFS.1	Does the implementation perform IMA frame synchronization on each link, based on the IFSM defined in Figure 19 on page 69 and Table 16 on page 69?		M	(R-110)	Yes
IFS.2	Does the implementation operate the IFSM for each link independently of any link defects and link delay compensation?		M	(R-111)	Yes
IFS.3	Does the implementation support the default value 2 for Alpha(α)?		M	(R-112)	Yes
IFS.4	Does the implementation support the default value 2 for Beta(β)?		M	(R-112)	Yes
IFS.5	Does the implementation support the default value 1 for Gamma(γ)?		M	(R-112)	Yes
IFS.6	Does the implementation support the value 1 for Alpha(α)?		O	(O-16)	Yes
IFS.7	Does the implementation support the value 1 for Beta(β)?		O	(O-16)	Yes
IFS.8	Does the implementation support the value 3 for Beta(β)?		O	(O-16)	Yes
IFS.9	Does the implementation support the value 4 for Beta(β)?		O	(O-16)	Yes
IFS.10	Does the implementation support the value 5 for Beta(β)?		O	(O-16)	Yes
IFS.11	Does the implementation support the value 2 for Gamma(γ)?		O	(O-16)	Yes
IFS.12	Does the implementation support the value 3 for Gamma(γ)?		O	(O-16)	Yes
IFS.13	Does the implementation support the value 4 for Gamma(γ)?		O	(O-16)	Yes
IFS.14	Does the implementation support the value 5 for Gamma(γ)?		O	(O-16)	Yes

Table 27 IMA Frame Synchronization (IFS) Mechanism Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IFS.15	Does the implementation assume that any occurrence of HEC/CRC errored cell in the ICP cell position was an ICP cell?		M	(R-113)	Yes
IFS.16	Does the implementation ignore the cell content of a HEC/CRC errored cell in the ICP cell position?		M	(R-113)	Yes
IFS.17	Does the implementation go into the Hunt state from any other state when no longer getting cells from the physical layer?		O	(O-17)	Yes S1
IFS.18	Does the implementation maintain IMA frame synchronization for cases 1, 2, 3, and 6 identified in Figure 20 on page 71?		M	(R-114)	Yes
IFS.19	Does the implementation maintain IMA frame synchronization for case 4 identified in Figure 20 on page 71?		O	(O-18)	Yes
IFS.20	Does the implementation maintain IMA frame synchronization for case 5 identified in Figure 20 on page 71?		O	(O-18)	Yes
IFS.21	Does the implementation maintain IMA frame synchronization for case 7 identified in Figure 20 on page 71 when passing stuff indication over more than one of the previous ICP cells and when Beta(β) is greater than 2?		O	(O-19)	No

Note: S1: needs receive clock.

Table 28 IMA Interface OAM Operation Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.1	Does the implementation report the following link remote defect indicators: link defects, LIF, and LODS?		M	(R-115)	Yes S1
OAM.2	If several defects are detected at the same time, does the implementation report the defect with the highest priority, as listed in Table 17 on page 72?		M	(R-116)	Yes
OAM.3	Does the implementation report any Rx defect to the far-end IMA within the next 2*M cells to be transmitted after the defect state has been entered as specified in Section 12.1.3 on page 72 (where M is the M used by the IMA transmitter)?		M	(R-117)	Yes
OAM.4	Does the implementation perform error handling as specified in Figure 21 on page 73 and Figure 22 on page 74?		M	(R-118)	Yes
OAM.5	On a given link, does the implementation pass to the ATM layer from the IMA sublayer any cells accumulated before the occurrence of an OCD or OIF anomaly on that link?		M	(R-119)	Yes
OAM.6	Does the implementation inhibit the passing from the IMA sublayer to the ATM layer of any cells received on a link during an OCD or OIF anomaly condition reported on that link?		M	(R-120)	Yes

Table 28 IMA Interface OAM Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.7	Does the implementation replace with Filler cells all ATM layer cells received on a link after an OCD or OIF anomaly condition has been detected on that link?		M	(R-121)	Yes
OAM.8	Does the implementation only report an Rx defect in the backward direction after LIF or LODS defect state is entered?		M	(R-122)	Yes
OAM.9	Does the implementation report the LIF or LODS defect as specified in Section 12.1.2 on page 72?		M	(R-123)	Yes
OAM.10	Does the implementation detect errored ICP cells as indicated in Table 18 on page 77?		M	(R-124)	Yes
OAM.11	Does the implementation detect invalid ICP cells as indicated in Table 18 on page 77?		M	(R-124)	Yes
OAM.12	Does the implementation detect missing ICP cells as indicated in Table 18 on page 77?		M	(R-124)	Yes
OAM.13	Does the implementation report OIF events as indicated in Table 18 on page 77?		M	(R-124)	Yes
OAM.14	Does the implementation report LIF defects as indicated in Table 18 on page 77?		M	(R-124)	Yes
OAM.15	Does the implementation report LODS defects as indicated in Table 18 on page 77?		M	(R-124)	Yes
OAM.16	Does the implementation report RDI-IMA defects as indicated in Table 18 on page 77?		M	(R-124)	Yes

Table 28 IMA Interface OAM Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.17	Does the implementation increment IV-IMA for every detected errored, invalid or missing ICP cell, except during seconds when a SES-IMA or UAS-IMA condition is reported, as indicated in Table 19 on page 77?		M	(R-125)	Yes
OAM.18	Does the implementation increment OIF-IMA for each reported OIF anomaly, except during seconds when a SES-IMA or UAS-IMA condition is reported, as indicated in Table 19 on page 77?		O	(O-20)	Yes
OAM.19	Does the implementation increment SES-IMA for every one second interval containing ≥ 30 % of the ICP cells counted as IV-IMA, as indicated in Table 19 on page 77?		M	(R-126)	Yes
OAM.20	Does the implementation increment SES-IMA for every one interval of one second containing one or more link defects (for example, LOS, OOF/LOF, AIS, and LCD), except during seconds when an UAS-IMA condition is reported, as indicated in Table 19 on page 77?		M	(R-126)	Yes
OAM.21	Does the implementation increment SES-IMA for every one second interval containing one or more LIF link defects, except during seconds when an UAS-IMA condition is reported, as indicated in Table 19 on page 77?		M	(R-126)	Yes

Table 28 IMA Interface OAM Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.22	Does the implementation increment SES-IMA for every one second interval containing one or more LODS link defects, except during seconds when a UAS-IMA condition is reported, as indicated in Table 19 on page 77?		M	(R-126)	Yes
OAM.23	Does the implementation increment SES-IMA-FE for every one second interval containing one or more RDI-IMA defect, except during seconds when a UAS-IMA-FE condition is reported, as indicated in Table 19 on page 77?		M	(R-127)	Yes
OAM.24	Does the period of NE unavailability begin at the onset of 10 contiguous SES-IMA (including the first 10 seconds to enter the UAS-IMA condition), as indicated in Table 19 on page 77?		M	(R-128)	Yes
OAM.25	Does the period of NE unavailability end at the onset of 10 contiguous seconds with no SES-IMA (excluding the last 10 seconds to exit the UAS-IMA condition), as indicated in Table 19 on page 77?		M	(R-128)	Yes
OAM.26	Does the implementation increment UAS-IMA for each one second interval when the UAS-IMA condition is reported, as indicated in Table 19 on page 77?		M	(R-128)	Yes

Table 28 IMA Interface OAM Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.27	Does the period of FE unavailability begin at the onset of 10 contiguous SES-IMA (including the first 10 seconds to enter the UAS-IMA condition), as indicated in Table 19 on page 77?		M	(R-129)	Yes
OAM.28	Does the period of FE unavailability end at the onset of 10 contiguous seconds with no SES-IMA-FE (excluding the last 10 seconds to exit the UAS-IMA-FE condition), as indicated in Table 19 on page 77?		M	(R-129)	Yes
OAM.29	Does the implementation increment UAS-IMA-FE for each one second interval when the UAS-IMA-FE condition is reported, as indicated in Table 19 on page 77?		M	(R-129)	Yes
OAM.30	Does the implementation increment Tx-UUS-IMA for each second when the NE Tx LSM is Unusable, as indicated in Table 19 on page 77?		M	(R-130)	Yes
OAM.31	Does the implementation increment Rx-UUS-IMA for each second when the NE Rx LSM is Unusable, as indicated in Table 19 on page 77?		M	(R-131)	Yes
OAM.32	Does the implementation increment Tx-UUS-IMA-FE for each second when the FE Tx LSM is reported Unusable, as indicated in Table 19 on page 77?		M	(R-132)	Yes
OAM.33	Does the implementation increment Rx-UUS-IMA-FE for each second when the FE Rx LSM is reported Unusable, as indicated in Table 19 on page 77?		M	(R-133)	Yes

Table 28 IMA Interface OAM Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.34	Does the implementation increment Tx-FC each time the Tx-Mis-Connected link failure condition is entered, as indicated in Table 19 on page 77?		M	(R-134)	Yes
OAM.35	Does the implementation increment Tx-FC each time the Tx-Fault link failure condition is entered, as indicated in Table 19 on page 77?		M	(R-134)	Yes
OAM.36	Does the implementation increment Rx-FC each time the LIF link failure condition is entered, as indicated in Table 19 on page 77?		M	(R-135)	Yes
OAM.37	Does the implementation increment Rx-FC each time the LODS link failure condition is entered, as indicated in Table 19 on page 77?		M	(R-135)	Yes
OAM.38	Does the implementation increment Rx-FC each time the Rx-Mis-Connected link failure condition is entered, as indicated in Table 19 on page 77?		M	(R-135)	Yes
OAM.39	Does the implementation increment Rx-FC each time the Rx-Fault link failure condition is entered, as indicated in Table 19 on page 77?		M	(R-135)	Yes
OAM.40	Does the implementation increment Tx-FC-FE each time the Tx-Unusable-FE link failure condition is entered, as indicated in Table 19 on page 77?		O	(O-21)	Yes
OAM.41	Does the implementation increment Rx-FC-FE each time the RFI-IMA link failure condition is entered, as indicated in Table 19 on page 77?		O	(O-22)	Yes

Table 28 IMA Interface OAM Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.42	Does the implementation increment Rx-FC-FE each time the Rx-Unusable-FE link failure condition is entered, as indicated in Table 19 on page 77?		O	(O-22)	Yes
OAM.43	Does the implementation increment Tx-Stuff-IMA for each stuff event inserted in the transmit direction, as indicated in Table 19 on page 77?		O	(O-23)	Yes
OAM.44	Does the implementation increment Rx-Stuff-IMA for each stuff event detected in the receive direction, except during seconds when a SES-IMA or UAS-IMA condition is reported, as indicated in Table 19 on page 77?		O	(O-24)	Yes
OAM.45	Does the implementation increment GR-UAS-IMA for each second when the GTSM is down, as indicated in Table 19 on page 77?		M	(R-136)	Yes
OAM.46	Does the implementation increment GR-FC each time the Config-Aborted group failure condition is entered, as indicated in Table 19 on page 77?		M	(R-137)	Yes
OAM.47	Does the implementation increment GR-FC each time the Insufficient-Links group failure condition is entered, as indicated in Table 19 on page 77?		M	(R-137)	Yes
OAM.48	Does the implementation increment GR-FC-FE each time the Start-up-FE group failure condition is entered, as indicated in Table 19 on page 77?		O	(O-25)	Yes

Table 28 IMA Interface OAM Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.49	Does the implementation increment GR-FC-FE each time the Config-Aborted-FE group failure condition is entered, as indicated in Table 19 on page 77?		O	(O-25)	Yes
OAM.50	Does the implementation increment GR-FC-FE each time the Insufficient-Links-FE group failure condition is entered, as indicated in Table 19 on page 77?		O	(O-25)	Yes
OAM.51	Does the implementation increment GR-FC-FE each the Blocked-FE group failure condition is entered, as indicated in Table 19 on page 77?		O	(O-25)	Yes
OAM.52	Does the implementation accumulate IMA performance parameters over 15 minute intervals?		O	(O-26)	Yes S2
OAM.53	Does the implementation accumulate IMA performance parameters over 24 hour intervals?		O	(O-27)	n/a S3
OAM.54	Does the implementation keep the current/previous and recent data?	(O-26)	M	(CR-7)	Yes S2, S3
OAM.55	Does the implementation use the current data for threshold crossing?	(O-26)	M	(CR-8)	n/a S3
OAM.56	Does the implementation keep the current/previous and recent data?	(O-27)	M	(CR-9)	n/a S3
OAM.57	Does the implementation use the current data for threshold crossing?	(O-27)	M	(CR-10)	n/a S3
OAM.58	Does the implementation report a LIF failure alarm for the persistence of a LIF defect at the NE?		M	(R-138)	Yes

Table 28 IMA Interface OAM Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.59	Does the implementation report a LODS failure alarm for the persistence of a LODS defect at the NE?		M	(R-139)	Yes
OAM.60	Does the implementation report a RFI-IMA failure alarm for the persistence of a RDI-IMA defect at the NE?		M	(R-140)	Yes
OAM.61	Does the implementation report Tx-Mis-Connected failure alarm when the Tx link is detected as mis-connected?		M	(R-141)	Yes
OAM.62	Does the implementation report Rx-Mis-Connected failure alarm when the Rx link is detected as mis-connected?		M	(R-142)	Yes
OAM.63	Does the implementation report a Tx Fault failure alarm for any implementation specific Tx fault declared at the NE?		O	(O-28)	Yes S4
OAM.64	Does the implementation report a Rx Fault failure alarm for any implementation specific Rx fault declared at the NE?		O	(O-29)	Yes S4
OAM.65	Does the implementation report a Tx-Unusable-FE failure alarm when it receives Tx-Unusable from FE?		M	(R-143)	Yes
OAM.66	Does the implementation report a Rx-Unusable-FE failure alarm when it receives Rx-Unusable from FE?		M	(R-144)	Yes

Table 28 IMA Interface OAM Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.67	Does the implementation report a Start-up-FE failure alarm when it receives this signal from FE (the declaration of this failure alarm may be delayed to ensure the FE remains in Start-up)?		M	(R-145)	Yes
OAM.68	Does the implementation report a Config-Aborted failure alarm when the FE tries to use unacceptable configuration parameters?		M	(R-146)	Yes
OAM.69	Does the implementation report a Config-Aborted-FE failure alarm when the FE reports unacceptable configuration parameters?		M	(R-147)	Yes
OAM.70	Does the implementation report an Insufficient-Links failure alarm when less than P_{Tx} transmit links or P_{Rx} receive links are active?		M	(R-148)	Yes
OAM.71	Does the implementation report an Insufficient-Links-FE failure alarm when the FE reports that less than P_{Tx} transmit links or P_{Rx} receive links are active?		M	(R-149)	Yes
OAM.72	Does the implementation report a Blocked-FE failure alarm when the FE reports that it is blocked?		M	(R-150)	Yes
OAM.73	Does the implementation report GR-Timing-Mismatch when the FE transmit clock mode is different than the NE transmit clock mode?		M	(R-151)	Yes
OAM.74	In the case of the LIF, LODS, RFI-IMA and Fault failure alarms, does the implementation support 2.5 ± 0.5 seconds as a default persistence checking time to enter a failure alarm condition?		M	(R-152)	Yes

Table 28 IMA Interface OAM Operation Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
OAM.75	In the case of the LIF, LODS, RFI-IMA and Fault failure alarms, does the implementation support 10 ± 0.5 seconds as a default persistence clearing time to exit the failure alarm condition?		M	(R-152)	Yes
OAM.76	In the case of the LIF, LODS, RFI-IMA and Fault failure alarms, does the IMA allow configuration of other values for default persistence checking time to enter a failure alarm condition?		O	(O-30)	Yes S5
OAM.77	In the case of the LIF, LODS, RFI-IMA and Fault failure alarms, does the IMA allow configuration of other values for default persistence checking time to exit the same failure alarm condition?		O	(O-30)	Yes S5
OAM.78	Does the implementation ensure that the Tx-Fault failure alarm, as defined in (O-28) on page 79, is not cleared until the fault that led to the declaration of the alarm is no longer present for the duration specified to clear the alarm in (R-152) on page 80?	(O-28)	M	(CR-11)	Yes
OAM.79	Does the implementation ensure that the Rx-Fault failure alarm, as defined in (O-29) on page 79, is not cleared until the fault that led to the declaration of the alarm is no longer present for the duration specified to clear the alarm in (R-152) on page 80?	(O-29)	M	(CR-12)	Yes

Note: S1: LCD is the only link defect handled.
S2: accumulative for current interval.

S3: to be implemented by application.
S4: no implementation-specific faults defined.
S5: one value for all kinds of defects.

Table 29 Test Pattern Procedure (TPP) Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
TPP.1	Does the implementation activate the Test Pattern procedure in the transmit direction?		O	(O-31)	Yes
TPP.2	Does the implementation use the Test Link Command field in the ICP cell (as defined in the Tx Test Control field in Table 2 on page 31) to request the FE to activate the loop back of the test pattern contained in the Tx Test Pattern field?	(O-31)	M	(CR-13)	Yes
TPP.3	Does the implementation use the Tx LID field defined in the Tx Test Control field in Table 2 on page 31 to identify to the FE which transmit link the FE should extract the Tx Test Pattern from in the received ICP cells?	(O-31)	M	(CR-14)	Yes
TPP.4	Does the implementation send any changed values of the Test Link Command, Tx LID and Tx Test Pattern fields in ICP cells for at least 2 consecutive IMA frames over each link within the IMA group?	(O-31)	M	(CR-15)	Yes
TPP.5	Does the implementation continue to send the same values of the Test Link Command, Tx LID and Tx Test Pattern fields as long as the IMA transmitter wants the FE IMA unit to loop back the test pattern?	(O-31)	M	(CR-16)	Yes

Table 29 Test Pattern Procedure (TPP) Functions (cont'd)

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
TPP.6	Does the implementation monitor the incoming ICP cells on the links already recognized in the group to detect a change of the Test Link Command?		M	(R-153)	Yes
TPP.7	If the Test Link Command field is detected as active over the links already recognized in the group and over the test link, does the implementation copy the value of the Tx Test Pattern field received from the test link, indicated over the Tx LID field, into the Rx Test Pattern field on every subsequent ICP cell sent over all outgoing links in the group?		M	(R-154)	Yes
TPP.8	Does the implementation continue sending the same value over the Rx Test Pattern field until the IMA transmitter has received an indication to stop looping the pattern, to loop a new pattern received from the same link over the Tx Test Pattern, or to loop the test pattern received from another link (indicated over the Tx LID field)?		M	(R-155)	Yes
TPP.9	Does the implementation return the "FF_H" pattern over the Rx Test Pattern field when the incoming test command is inactive or the test link is not detected?		M	(R-156)	Yes
TPP.10	Does the implementation only handle one test pattern per IMA group at any given time?		M	(R-157)	Yes S1

Note: S1: per direction.

Table 30 IMA Interaction with Plane Management Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
IPM.1	Does the implementation process IMA group configuration indications received from the Plane Management?		M	(R-158)	Yes S1
IPM.2	Does the implementation process IMA link addition/deletion indications received from the Plane Management?		M	(R-158)	Yes S1
IPM.3	Does the implementation send IMA service operational status change indications to the Plane Management?		M	(R-158)	Yes S1
IPM.4	Does the implementation send Tx/ Rx cell rate change indications to the Plane Management?		M	(R-158)	Yes S1

Note: S1: via message interface.

Table 31 Management Information Base (MIB) Functions

Item	Protocol feature	Cond. for Status	Status Pred.	Ref.	Support
MIB.1	Does the implementation support a UM based on SNMP?		O	(O-32)	n/a S1
MIB.2	Does the implementation implement the mandatory objects in the IMA-MIBs defined in Appendix A on page 106?	(O-32)	M	(CR-17)	n/a S1
MIB.3	Does the implementation implement the optional objects in the IMA MIBs defined in Appendix A on page 106?	(O-32)	O	(O-33)	n/a S1

Note: S1: The SNMP agent is to be implemented by the application.
Information for all applicable MIB objects is provided via the message interface.

I.4 PICS Proforma References

[A-1] The ATM Forum, AF-PHY-0086.001, Inverse Multiplexing for ATM (IMA) Specification Version 1.1.

[A-2] ISO/IEC 9646-1: 1990, Information technology - Open systems interconnection - Conformance testing methodology and framework - Part 1: General concepts (See also ITU-T Recommendation X.290 (1991)).

[A-3] ISO/IEC 9646-2: 1990, Information technology - Open systems interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification (See also ITU-T Recommendation X.291 (1991)).

[A-4] ITU-T Recommendation I.432 Series, ”B-ISDN User-Network Interface - Physical Layer Specification”, April 1996.

[A-5] ITU-T Recommendation I.610, ”B-ISDN Operation and Maintenance Principles and Functions”, 1995.

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Dr. Ulrich Schumacher

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