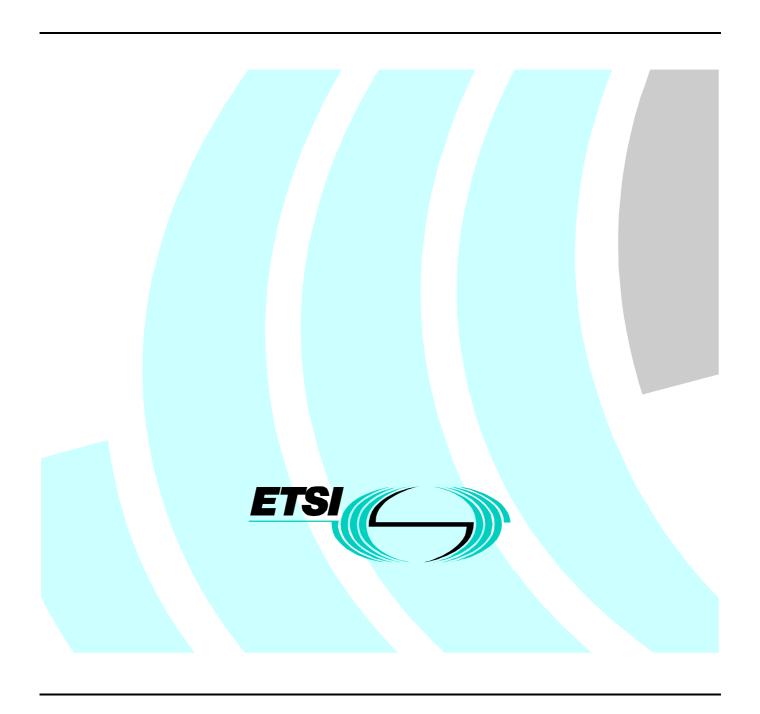# ETSI EN 300 371 V1.3.2 (2001-02)

European Standard (Telecommunications series)

Telecommunications Management Network (TMN); Plesiochronous Digital Hierarchy (PDH) information model for the Network Element (NE) view

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Telecommunications Management Network (TMN).

The present document describes the information model for Network Elements (NEs), which use the Plesiochronous Digital Hierarchy (PDH) multiplexing structure.

National transposition dates	
Date of adoption of this EN:	23 February 2001
Date of latest announcement of this EN (doa):	31 May 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 November 2001
Date of withdrawal of any conflicting National Standard (dow):	30 November 2001

Introduction

Network Operators have extensive deployments of PDH and SDH equipments in their Networks. Some are flexible and/or monitorable and do possess a standard management interface. A suitable PDH information model is required for such equipment to take advantage of the management capability provided by functional standards related to PDH interfaces of those equipments and enable it to be part of an overall managed network.

The model presented in the present document represents 4 major functional requirements:

1) Fixed PDH structures.

2) Flexible PDH structures.

3) SDH Transport over PDH bearers.

4) The monitoring of PDH Ports.

Fixed PDH Structures utilize the inheritance tree given in figure 1 and the naming tree in figure 3. As can be seen this can be used to model the rigid multiplexing structure from 64 kbits/sec to 140 Mbits/sec interfaces in line systems. An example is given in figure 7 of a 140 Mbit/s line signal multiplexed through the 34 Mbit/s and 8 Mbit/s levels to a 2 Mbit/s tributary signal which is mapped in a VC12 by a transmission system.

Flexible PDH structures use the same inheritance structure but the naming tree as in figure 2. This represents the flexible structures that may be encountered in PDH crossconnects with ports at all data rates. An example is given in figure 6.

The transport of SDH (VC12) and ATM traffic is represented by the Objects e3INTTTP and e4INTTTP for 34 Mbits/sec bearers and 140 Mbits/sec bearers respectively.

The reporting control of failures of PDH signals at the different path layers is modelled by reusing techniques specified in ITU-T Recommendation M.3100 [3] (flexible assignment of severities to a failure).

The monitoring of the PDH ports is represented by the portMode Package that defines the behaviour. This package models a port that may be enabled for monitoring or may be disabled for monitoring. In addition the port may be set for auto monitoring providing no valid signal is present on the port. The port is then automatically enabled for monitoring when a valid signal is applied for the first time.

It should also be noted that the behaviour of the operationalState is as defined by the ETSI community (different from the SDH environment) and this only applies to this PDH model. This is apparent from the notes that remain in the document. Only equipment failures, and not transmission failures, affect the attribute value.

1 Scope

The present document defines the information model to be used at the interface between Network Elements (NEs) and management systems, for the management of equipment which use the Plesiochronous Digital Hierarchy (PDH).

The present document defines:

- the information model for network elements using PDH multiplexing, including PDH interfaces of Synchronous Digital Hierarchy (SDH) network elements.

The present document does not define:

- the protocol stack to be used for message communication;

- the network level management processes;

- the application contexts;

- the conformance requirements to be met by an implementation of this information model;

- information models for other systems or equipment.

The information model defined in the present document (and the corresponding message set) is concerned with the management of NEs, the equipment by which they are implemented and the functions contained within them. More precisely, it applies to an equipment domain visible at the element manager to element interface and is only concerned with information available within that domain. Information proper to the domain of a network level management process is not included within this model.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

[1] ETSI ETS 300 337 (Edition 1): "Transmission and Multiplexing (TM); Generic frame structures for the transport of various signals (including Asynchronous Transfer Mode (ATM) cells and Synchronous Digital Hierarchy (SDH) elements) at the ITU-T Recommendation G.702 hierarchical rates of 2 048 kbit/s, 34 368 kbit/s and 139 264 kbit/s".

[2] ITU-T Recommendation G.702 (1988): "Digital hierarchy bit rates".

[3] ITU-T Recommendation M.3100 (1995): "Generic network information model".

[4] ITU-T Recommendation X.721 (1992): "Information technology - Open Systems Interconnection - Structure of management information: definition of management information".

[5] ITU-T Recommendation G.704 (1995): "Synchronous frame structures used at 1 544 kbit/s, 6 312 kbit/s, 2 048 kbit/s, 8 488 kbit/s and 44 736 kbit/s hierarchical levels".

[6] ITU-T Recommendation G.706 (1991): "Frame alignment and Cyclic Redundancy Check (CRC) procedures relating to basic frame structures defined in Recommendation G.704".

[7] ETSI ETS 300 167: "Transmission and Multiplexing (TM); Functional characteristics of 2 048 kbit/s interfaces".

[8]   ETSI ETS 300 417-5-1 (1998): "Transmission and Multiplexing (TM); Generic requirements of transport functionality of equipment; Part 5-1: Plesiochronous Digital Hierarchy (PDH) path layer functions".

[9]   ETSI ETS 300 417-1-1 (1996): "Transmission and Multiplexing (TM); Generic requirements of transport functionality of equipment; Part 1-1: Generic processes and performance".

[10]   ETSI ETS 300 417-2-1 (1997): "Transmission and Multiplexing (TM); Generic requirements of transport functionality of equipment; Part 2-1: Synchronous Digital Hierarchy (SDH) and Plesiochronous Digital Hierarchy (PDH) physical section layer functions".

3   Abbreviations

For the purposes of the present document, the following abbreviations apply.

AIS	Alarm Indication Signal
ASN.1	Abstract Syntax Notation No. 1
ATM	Asynchronous Transfer Mode
CTP	Connection Termination Point
EBER	Excessive Bit Error Ratio
FERF	Far End Receive Failure
LOF	Loss Of Frame
LOS	Loss Of Signal
NE	Network Element
PDH	Plesiochronous Digital Hierarchy
Pkg	Package
PPA	Plesiochronous Physical Adaptation
PPI	Plesiochronous Physical Interface
PPT	Plesiochronous Physical Termination
RDN	Relative Distinguished Name
SDH	Synchronous Digital Hierarchy
TMN	Telecommunications Management Network
TP	Termination Point
TTP	Trail Termination Point
VC-n	Virtual Container n

4   Registration supporting Abstract Syntax Notation No. 1 (ASN.1) for EN 300 371

```
ASN1TypeModule {ccitt(0) identified-organization(4) etsi(0) ets371(371) informationModel(0)
asn1Module(2) asn1TypeModule(0)}
DEFINITIONS IMPLICIT TAGS ::= BEGIN
-- EXPORT Everything
en371 OBJECT IDENTIFIER ::= {ccitt(0) identified-organization(4) etsi(0) ets371(371)
informationModel(0)}
en371ObjectClass OBJECT IDENTIFIER ::= {en371 managedObjectClass(3)}
en371Package OBJECT IDENTIFIER ::= {en371 package(4)}
en371NameBinding OBJECT IDENTIFIER ::= {en371 nameBinding(6)}
en371Attribute OBJECT IDENTIFIER ::= {en371 attribute(7)}
en371Action OBJECT IDENTIFIER ::= {en371 action(9)}
en371Notification OBJECT IDENTIFIER ::= {en371 notification(10)}
END
```

5   PDH fragment

This clause provides managed objects required to model PDH interfaces.

In this context, the IMPORTS clause specifies the object classes which can be instantiated in the scope of the present document. The IMPORT clause does not include uninstantiated super classes.

```
BEGIN
IMPORTS
alarmSeverityAssignmentProfile
FROM ASN1DefinedTypesModule {itu(0) recommendation(0) m(13) gnm(3100) informationModel(0)
                managedObjectClass (3)};
END
```

5.1   Object classes definitions

5.1.1   Electrical PDH physical interface

This clause describes the object classes required to model the PDH physical interface.

> NOTE 1: Whether these require attributes to model more features (e.g. PDH level, line code, etc.) are for further
> study.

```
pPITTPBidirectionalR1     MANAGED OBJECT CLASS
DERIVED FROM "Recommendation M.3100: 1995":trailTerminationPointBidirectional,
                    pPITTPSinkR1,
                    pPITTPSource;
REGISTERED AS {en371ObjectClass 100};


pPITTPSinkR1         MANAGED OBJECT CLASS
DERIVED FROM     "Recommendation M.3100: 1995":trailTerminationPointSink;
CHARACTERIZED BY
    "Recommendation X.721: 1992":administrativeStatePackage,
    "Recommendation M.3100: 1995":createDeleteNotificationsPackage,
    "Recommendation M.3100: 1995":stateChangeNotificationPackage,
    "Recommendation M.3100: 1995":tmnCommunicationsAlarmInformationPackage,
    "Recommendation M.3100: 1995":userLabelPackage,
    "Recommendation M.3100: 1995":alarmSeverityAssignmentPointerPackage,
    pPITTPSinkR1Pkg PACKAGE
        BEHAVIOUR
        alarmReportingControlBehaviour,
        pPITTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This managed object class represents the point where the incoming interface signal is converted
into an internal logic level and the timing is recovered from the line signal. The upStream
connectivity pointer is NULL for an instance of this class.

A communicationsAlarm notification shall be issued if a Loss of Signal (LOS) is detected. The
probableCause parameter of the notification shall indicate lossOfSignal [3].

The operational state is disabled if a failure of the equipment affecting an instance of this class
prevents the resource from operation";

        ATTRIBUTES
        pPITTPId              GET;;;
    CONDITIONAL PACKAGES
        tpSpecificPersistanceTimePkg     PRESENT IF

"the persistancy time for raising / clearing alarms can be set specifically for an instance of this
class thus superseding the values which are in effect for all termination points of a NE",

        portModePkg                          PRESENT IF

"an instance supports it"

    ;
```

```
REGISTERED AS {en371ObjectClass 101};
pPITTPSource       MANAGED OBJECT CLASS
DERIVED FROM    "Recommendation M.3100: 1995":trailTerminationPointSource;
CHARACTERIZED BY
    "Recommendation M.3100: 1995":createDeleteNotificationsPackage,
    "Recommendation M.3100: 1995":userLabelPackage,
    pPITTPSourcePkg PACKAGE
    BEHAVIOUR
    pPITTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This managed object class represents the point where the internal logic level and the timing is
converted into a line signal.

The operational state is disabled if a failure of the equipment affecting an instance of this class
prevents the resource from operation.

The downStream connectivity pointer is NULL for an instance of this class.";;

    ATTRIBUTES
    pPITTPId             GET;;;

REGISTERED AS { en371ObjectClass 3 };
```

NOTE 2: As for the attribute operationalState the decision has been taken in the ETSI/TM2 Meeting Dublin (Oct.97) that no transmission failures but equipment failures will impact the value of that attribute. This behaviour is applicable in general for the PDH TP fragment. No re-registration is considered to be necessary in the pPITTPSource class definition.

5.1.2 European PDH Alarm Indication Signal (AIS) trail termination point

This generic object class represents a particular case of termination point used in a managed element where no connectivity at respective level is provided. Instances of this object class are used when, in one layer, no flexibility is provided, but a direct adaptation to client is present.

The sink object class includes the AIS and LOF monitoring function of a respective Connection Termination Point (CTP) which is not instantiated where no connectivity on the respective level is provided.

Object classes inherited from this class are labelled according to the European PDH hierarchy (exATTP, where x = 0 stands for 64 kbit/s, x = 1 for 2 Mbit/s, x = 2 for 8 Mbit/s, x = 3 for 34 Mbit/s and x = 4 for 140 Mbit/s.)

NOTE: The possibility of adding conditional packages (present if the equipment supports the features) in order to model the capability to reveal Excessive Bit Error Ratio (EBER) is for further study.

The subclasses represent two types of combined functions:

1) En/Pne_A [10] and Pne_TT [8]
   The function En/Pne_A is the adaptation from physical section layer to the client PDH path layer (Pne) and the function Pne_TT terminates the trail in that path layer.

2) Pme/Pne_A and Pne_TT [8]
   The function Pme/Pne_A adapts from the server PDH path layer (Pme) to a framed, client PDH path layer (Pne) characteristic information (P31e_CI, P22e_CI, P12s_CI). The function Pne_TT terminates the trail in that path layers.

In both cases the management information exchanged with the combined functions is identical. As a consequence one object exATTP reflects the management view for the particular PDH path (x=1,2,3,4). Using the objects exATTP a PDH interface can be represented by a fewer number of instances than is obtained if objects are used which do not represent combined functions. These alternative representations are shown in figure 5 and figure 4, respectively.

```
ePDHATTPBidirectionalR1  MANAGED OBJECT CLASS
DERIVED FROM
    ePDHTTPBidirectionalR1,
    ePDHATTPSinkR1,
    ePDHATTPSource;
```

```
REGISTERED AS {en371ObjectClass 102 };
ePDHATTPSinkR1          MANAGED OBJECT CLASS
DERIVED FROM            ePDHTTPSinkR1;
CHARACTERIZED BY
ePDHATTPSinkR1Pkg       PACKAGE
BEHAVIOUR
ePDHATTPSinkR1Behaviour BEHAVIOUR

DEFINED AS

"This object class includes the AIS and LOF monitoring function of a respective CTP which is not
instantiated where no connectivity on the respective level is provided.

A communicationsAlarm notification shall be issued if an AIS is detected. The probableCause
parameter of the notification shall indicate aIS.

A communicationsAlarm notification shall be issued if a LOF is detected. The probableCause parameter
of the notification shall indicate lossOfFrame.

An instance of this object class is used when, in one layer, no flexibility is provided, but a
direct adaptation to client is present.

The upStream connectivity pointer attribute value of an instance of this object class is equal to
NULL";;;;

REGISTERED AS {en371ObjectClass 103 };


ePDHATTPSource       MANAGED OBJECT CLASS
DERIVED FROM         ePDHTTPSource;
CHARACTERIZED BY
ePDHTPSourcePkg PACKAGE
BEHAVIOUR
ePDHATTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"The downStream connectivity pointer attribute value of an instance of this object class is equal to
NULL.";;;;

REGISTERED AS {en371ObjectClass 5};
```

5.1.3   European PDH connection termination point

This clause describes an object class (sink, source or bi-directional) which represents the model for a generic PDH connection termination point (2, 8, 34 and 140 Mbit/s).

Object classes inherited from this class are labelled according to the European PDH hierarchy (exCTP, where x = 0 stands for 64 kbit/s, x = 1 for 2 Mbit/s, x = 2 for 8 Mbit/s, x = 3 for 34 Mbit/s and x = 4 for 140 Mbit/s).

The subclasses represent two types of adaptation functions:

  1) En/Pne_A or En/Pnx_A [10]
     The function En/Pne_A adapts from physical section layer (En) to a framed PDH path layer characteristic information (P4e_CI, P31e_CI, P22e_CI, P12s_CI).
     The function En/Pnx_A adapts from physical section layer (En) to an unframed PDH path layer characteristic information (Pnx_CI), which is a signal of non-specified content [10].

  2) Pme/Pne_A or Pme/Pnx_A [8]
     The function Pme/Pne_A adapts from the server PDH path layer (Pme) to a framed, client PDH path layer (Pne) characteristic information (P31e_CI, P22e_CI, P12s_CI). The function Pme/Pnx_A adapts from the server PDH path layer (Pme) to an unframed PDH path layer characteristic information (Pnx_CI), which is a signal of non-specified content [8].

```
ePDHCTPSinkR1         MANAGED OBJECT CLASS
DERIVED FROM          "Recommendation M.3100: 1995":connectionTerminationPointSink;
CHARACTERIZED BY
"Recommendation M.3100: 1995":createDeleteNotificationsPackage,
"Recommendation M.3100: 1995":operationalStatePackage,
"Recommendation M.3100: 1995":stateChangeNotificationPackage,
"Recommendation M.3100: 1995":tmnCommunicationsAlarmInformationPackage,
"Recommendation M.3100: 1995":alarmSeverityAssignmentPointerPackage,
ePDHCTPSinkR1Pkg PACKAGE
```

```
        BEHAVIOUR
        alarmReportingControlBehaviour,
        ePDHCTPSinkR1Behaviour   BEHAVIOUR

DEFINED AS

"This object class represents the termination of a PDH connection and models the adaptation sink
function in different PDH path layers represented by subclasses of this class.

An instance of this object class shall be used when, in one layer, flexibility is available or when
there is no termination of a client characteristic information (Pnx-CI).

The attribute framedSignalMode may have the values 'active' and 'inactive'. An attributeValueChange
notification is issued when the value is modified and the inherited conditional package
attributeValueChangeNotificationPackage is instantiated.

If the value is set 'active', then the adaptation processing of a framed signal is provisioned and
the detection of the defects LOF and AIS is enabled. A communicationsAlarm notification shall be
issued if an AIS is detected. The probableCause parameter of the notification shall indicate aIS
[3]. A communicationsAlarm notification shall be issued if an LOF is detected. The probableCause
parameter of the notification shall indicate lossOfFrame [3]. In case of defect detection the
consequent action aSSF (all-ONES) is performed.

If the value is set 'inactive', then this adaptation function is deactivated assuming the reception
of an unframed signal (characteristic information Pnx_CI).

An attributeValueChange notification is issued when the value of the attribute frameStatus is
changed and the inherited conditional package attributeValueChangeNotificationPackage is
instantiated.

The operational state is disabled if a failure of the equipment affecting an instance of this class
prevents the resource from operation.";;

    ATTRIBUTES
ePDHCTPId               GET,
framedSignalMode    GET-REPLACE,
frameStatus          GET;
;;
    CONDITIONAL PACKAGES
tpSpecificPersistanceTimePkg    PRESENT IF

"the persistency time for raising / clearing alarms can be set specifically for an instance of this
class thus superseding the values which are in effect for all termination points of a NE";

REGISTERED AS {en371ObjectClass 104 };


ePDHCTPSource   MANAGED OBJECT CLASS
DERIVED FROM     "Recommendation M.3100: 1995":connectionTerminationPointSource;
CHARACTERIZED BY
"Recommendation M.3100: 1995":createDeleteNotificationsPackage,
ePDHCTPSourcePkg    PACKAGE
BEHAVIOUR
ePDHCTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a PDH hierarchy connection.

The operational state is disabled if a failure of the equipment affecting an instance of this class
prevents the resource from operation.";;

    ATTRIBUTES
ePDHCTPId       GET;;;

REGISTERED AS {en371ObjectClass 8};
```

NOTE 1: As for the attribute operationalState, no transmission failures but equipment failures will impact the value of that attribute. This behaviour is applicable in general for the PDH TP fragment. No re-registration is considered to be necessary in the ePDHCTPSource class definition.

NOTE 2: The superclass ePDHCTPBidirectionalR1 (not instantiated) needs not to be defined since the instantiable bidirectional subclasses e*CTPBidirectionalR1 should inherit from ePDHCTPSinkR1 and / Source only. Note that the superclass CTPBidirectional inherits from cTPSink / Source without special properties added.

5.1.3.1 Monitoring European PDH connection termination point

```
eMonitoringCTPSink        MANAGED OBJECT CLASS
DERIVED FROM              ePDHCTPSinkR1;
CHARACTERIZED BY
    eMonitoringCTPSinkPkg      PACKAGE
    BEHAVIOUR
    pathTerminationMonitoringBehavior,
    eMonitoringCTPSinkBeh      BEHAVIOUR

DEFINED AS

"An instance incorporates the monitoring capabilities of the trail termination sink function (TTm-
Sk) defined at the path layer represented by the subclass of this class. The monitoring capabilities
do not apply in case of unframed signals expected when the inherited attribute framedSignalMode is
set to value 'inactive'";;

;;

REGISTERED AS {en371ObjectClass 105};
```

> NOTE: No eMonitoringCTPSource class is introduced since the existing definition of the eCTPSource class is equivalent.

5.1.4 European PDH trail termination point

This clause describes an object class (sink, source or bidirectional) which represents the model for a generic PDH trail termination point (2, 8, 34 and 140 Mbit/s).

Object classes inherited from this class are labelled according to the European PDH hierarchy (exTTP, where x = 1 stands for 2 Mbit/s, x = 2 for 8 Mbit/s, x = 3 for 34 Mbit/s and x = 4 for 140 Mbit/s).

These subclasses represent the trail termination functions Pne_TT [8] which terminate the trails at the corresponding PDH path layers 2/8/34/140 Mbit/s (n=12, 22, 31, 4, respectively).

```
ePDHTTPSinkR1             MANAGED OBJECT CLASS
DERIVED FROM       "Recommendation M.3100: 1995":trailTerminationPointSink;
CHARACTERIZED BY
    "Recommendation X.721: 1992":administrativeStatePackage,
    "Recommendation M.3100: 1995":createDeleteNotificationsPackage,
    "Recommendation M.3100: 1995":stateChangeNotificationPackage,
    "Recommendation M.3100: 1995":tmnCommunicationsAlarmInformationPackage,
    "Recommendation M.3100: 1995":alarmSeverityAssignmentPointerPackage,


    ePDHTTPSinkR1Pkg          PACKAGE
        BEHAVIOUR
        alarmReportingControlBehaviour,
        pathTerminationMonitoringBehavior,
    ePDHTTPSinkR1Behaviour  BEHAVIOUR

DEFINED AS

"This object class represents the termination sink of a PDH trail.

The operationalState is disabled when a failure of the equipment affecting an instance of this class
prevents the resource from operation.";;

        ATTRIBUTES
        ePDHTTPId            GET;;;
    CONDITIONAL PACKAGES
        tpSpecificPersistanceTimePkg        PRESENT IF
"the persistancy time for raising / clearing alarms can be set specifically for an instance of this
class thus superseding the values which are in effect for all termination points of a NE";
```

```
REGISTERED AS {en371ObjectClass 106 };
ePDHTTPSource   MANAGED OBJECT CLASS
DERIVED FROM    "Recommendation M.3100: 1995":trailTerminationPointSource;
CHARACTERIZED BY
    "Recommendation M.3100: 1995":createDeleteNotificationsPackage,
    ePDHTTPSourcePkg PACKAGE
        BEHAVIOUR
        ePDHTTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a PDH hierarchy trail.

The operational state is disabled if a failure of the equipment affecting an instance of this class
prevents the resource from operation.";;

        ATTRIBUTES
        ePDHTTPId        GET;;;

REGISTERED AS {en371ObjectClass 11};
```

> NOTE: As for the attribute operationalState the decision has been taken in the ETSI/TM2 Meeting Dublin
> (Oct.97) that no transmission failures but equipment failures will impact the value of that attribute. This
> behaviour is applicable in general for the PDH TP fragment. No re-registration is considered to be
> necessary in the ePDHTTPSource class definition.

```
ePDHTTPBidirectionalR1            MANAGED OBJECT CLASS
DERIVED FROM
    "Recommendation M.3100: 1995":trailTerminationPointBidirectional,
    ePDHTTPSinkR1,
    ePDHTTPSource;
CHARACTERIZED BY
    ePDHTTPBidirectionalR1Pkg   PACKAGE
        BEHAVIOUR
        ePDHTTPBidirectionalR1Behaviour BEHAVIOUR

DEFINED AS

"The Far End Receiver Failure is signalized by a bidirectional trail termination that is represented
by an instance of this (sub-)class if a Server Signal Fail condition is detected.";;;;

REGISTERED AS {en371ObjectClass 107};
```

5.1.5   European PDH TTP's for transport SDH VC's and ATM cells

This generic object class models the PDH trail used to transport SDH VC's and ATM cells and the label Int stands for
interworking.

The subclasses represent the combined functions En/Pns_A [10] and Pns_TT [8].
The function En/Pns_A is the adaptation from physical section layer to the client PDH path layer (Pns) and the function
Pns_TT terminates the trail in that path layer (n=31,4).

```
ePDHIntTTPSinkR1              MANAGED OBJECT CLASS
  DERIVED FROM               ePDHATTPSinkR1;
  CHARACTERIZED BY
   ePDHIntTTPSinkR1Pkg     PACKAGE
        BEHAVIOUR
        ePDHIntTTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a ETS 300 337 [1] trail transporting ATM cells or SDH elements.

A communicationsAlarm notification shall be issued if the trail trace received (TR byte) does not
match the trail trace expected. The probableCause parameter of the notification shall indicate trail
trace mismatch.

A communicationsAlarm notification shall be issued if the signal label received contains the all'0'
code. The probableCause parameter of the notification shall indicate 'unequipped'.";;
ATTRIBUTES
        trTrailTraceExpected              GET-REPLACE,
        trTrailTraceReceived              GET;;;
```

```
REGISTERED AS {en371ObjectClass 108 };
ePDHIntTTPSource            MANAGED OBJECT CLASS
DERIVED FROM                ePDHATTPSource;
CHARACTERIZED BY
    ePDHIntTTPSourcePkg      PACKAGE
        BEHAVIOUR
        ePDHIntTTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a ETS 300 337 [1] trail transporting ATM cells or SDH elements.";;
        ATTRIBUTES
        trTrailTraceSend                        GET-REPLACE;;;

REGISTERED AS { en371ObjectClass 14 };


ePDHIntTTPBidirectionalR1   MANAGED OBJECT CLASS
DERIVED FROM                ePDHATTPBidirectionalR1,
                            ePDHIntTTPSinkR1,
                            ePDHIntTTPSource;

REGISTERED AS {en371ObjectClass 109 };
```

5.1.6   140 Mbit/s object classes

```
e4ATTPSinkR1        MANAGED OBJECT CLASS
DERIVED FROM    ePDHATTPSinkR1;
CHARACTERIZED BY
    e4ATTPSinkR1Pkg PACKAGE
        BEHAVIOUR
        e4ATTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 140 Mbit/s trail.";;;;
REGISTERED AS {en371ObjectClass 110 };


e4ATTPSource        MANAGED OBJECT CLASS
DERIVED FROM    ePDHATTPSource;
CHARACTERIZED BY
    e4ATTPSourcePkg PACKAGE
        BEHAVIOUR
        e4ATTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 140 Mbit/s trail.";;;;

REGISTERED AS {en371ObjectClass 17};


e4ATTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    ePDHATTPBidirectionalR1,
    e4ATTPSinkR1,
    e4ATTPSource;

REGISTERED AS {en371ObjectClass 111 };


e4CTPSinkR1         MANAGED OBJECT CLASS
DERIVED FROM    ePDHCTPSinkR1;
CHARACTERIZED BY
    e4CTPSinkR1Pkg PACKAGE
        BEHAVIOUR
        e4CTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 140 Mbit/s connection.";;;;
```

```
REGISTERED AS {en371ObjectClass 112 };
e4CTPSource         MANAGED OBJECT CLASS
DERIVED FROM    ePDHCTPSource;
CHARACTERIZED BY
    e4CTPSourcePkg PACKAGE
        BEHAVIOUR
        e4CTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 140 Mbit/s connection.";;;;

REGISTERED AS {en371ObjectClass 20};


e4CTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    e4CTPSinkR1,
    e4CTPSource;

REGISTERED AS {en371ObjectClass 113 };


e4MonitoringCTPSink MANAGED OBJECT CLASS
DERIVED FROM          eMonitoringCTPSink;
CHARACTERIZED BY
    e4MonitoringCTPSinkPkg      PACKAGE
    BEHAVIOUR
    e4MonitoringCTPSinkBeh      BEHAVIOUR

DEFINED AS

"An instance of this class represents the adaptation sink function but incorporates the monitoring
capabilities of a 140Mbit/s path termination sink function";;;;

REGISTERED AS {en371ObjectClass 114 };


e4MonitoringCTPBidirectional       MANAGED OBJECT CLASS
DERIVED FROM                       e4MonitoringCTPSink,
e4CTPSource;

REGISTERED AS {en371ObjectClass 115 };


e4TTPSinkR1         MANAGED OBJECT CLASS
DERIVED FROM    ePDHTTPSinkR1;
CHARACTERIZED BY
    e4TTPSinkR1Pkg PACKAGE
        BEHAVIOUR
        e4TTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 140 Mbit/s trail.";;;;

REGISTERED AS {en371ObjectClass 116 };


e4TTPSource         MANAGED OBJECT CLASS
DERIVED FROM    ePDHTTPSource;
CHARACTERIZED BY
    e4TTPSourcePkg PACKAGE
        BEHAVIOUR
        e4TTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 140 Mbit/s trail.";;;;
```

```
REGISTERED AS {en371ObjectClass 23};
e4TTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    ePDHTTPBidirectionalR1,
    e4TTPSinkR1,
    e4TTPSource;

REGISTERED AS {en371ObjectClass 117 };


e4IntTTPSinkR1            MANAGED OBJECT CLASS
  DERIVED FROM       ePDHIntTTPSinkR1;
    CHARACTERIZED BY
     e4IntTTPSinkR1Pkg PACKAGE
          BEHAVIOUR
          e4IntTTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a ETS 300 337 [1] 140 Mbit/s trail transporting ATM cells or SDH
elements.";;;;

REGISTERED AS {en371ObjectClass 118 };


e4IntTTPSource  MANAGED OBJECT CLASS
DERIVED FROM    ePDHIntTTPSource;
CHARACTERIZED BY
    e4IntTTPSourcePkg  PACKAGE
          BEHAVIOUR
          e4IntTTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a ETS 300 337 [1] 140 Mbit/s trail transporting ATM cells or SDH
elements.";;;;

REGISTERED AS { en371ObjectClass 26};


e4IntTTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    ePDHIntTTPBidirectionalR1,
    e4IntTTPSinkR1,
    e4IntTTPSource;

REGISTERED AS {en371ObjectClass 119 };
```

5.1.7   34 Mbit/s object classes

```
e3ATTPSinkR1          MANAGED OBJECT CLASS
DERIVED FROM    ePDHATTPSinkR1;
CHARACTERIZED BY
    e3ATTPSinkR1Pkg PACKAGE
          BEHAVIOUR
          e3ATTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 34 Mbit/s trail.";;;;

REGISTERED AS {en371ObjectClass 120 };


e3ATTPSource          MANAGED OBJECT CLASS
DERIVED FROM    ePDHATTPSource;
CHARACTERIZED BY
    e3ATTPSourcePkg PACKAGE
          BEHAVIOUR
          e3ATTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 34 Mbit/s trail.";;;;
```

```
REGISTERED AS {en371ObjectClass 29};
e3ATTPBidirectionalR1   MANAGED OBJECT CLASS
DERIVED FROM
    ePDHATTPBidirectionalR1,
    e3ATTPSinkR1,
    e3ATTPSource;

REGISTERED AS {en371ObjectClass 121 };


e3CTPSinkR1         MANAGED OBJECT CLASS
DERIVED FROM    ePDHCTPSinkR1;
CHARACTERIZED BY
    e3CTPSinkR1Pkg PACKAGE
        BEHAVIOUR
        e3CTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 34 Mbit/s connection.";;;;

REGISTERED AS {en371ObjectClass 122 };


e3CTPSource         MANAGED OBJECT CLASS
DERIVED FROM    ePDHCTPSource;
CHARACTERIZED BY
    e3CTPSourcePkg PACKAGE
        BEHAVIOUR
        e3CTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 34 Mbit/s connection.";;;;

REGISTERED AS {en371ObjectClass 32};


e3CTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    e3CTPSinkR1,
    e3CTPSource;

REGISTERED AS {en371ObjectClass 123 };


e3MonitoringCTPSink MANAGED OBJECT CLASS
DERIVED FROM            eMonitoringCTPSink;
CHARACTERIZED BY
    e3MonitoringCTPSinkPkg      PACKAGE
    BEHAVIOUR
    e3MonitoringCTPSinkBeh      BEHAVIOUR

DEFINED AS

"An instance of this class represents the adaptation sink function but incorporates the monitoring
capabilities of a 34Mbit/s path termination sink function";;;;

REGISTERED AS {en371ObjectClass 124 };


e3MonitoringCTPBidirectional       MANAGED OBJECT CLASS
DERIVED FROM        e3MonitoringCTPSink,
                        e3CTPSource;

REGISTERED AS {en371ObjectClass 125 };


e3TTPSinkR1         MANAGED OBJECT CLASS
DERIVED FROM    ePDHTTPSinkR1;
CHARACTERIZED BY
    e3TTPSinkR1Pkg PACKAGE
        BEHAVIOUR
        e3TTPSinkR1BehaviourPkg BEHAVIOUR
DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 34 Mbit/s trail.";;;;
```

```
REGISTERED AS {en371ObjectClass 126 };
e3TTPSource        MANAGED OBJECT CLASS
DERIVED FROM    ePDHTTPSource;
CHARACTERIZED BY
    e3TTPSourcePkg PACKAGE
        BEHAVIOUR
        e3TTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 34 Mbit/s trail.";;;;

REGISTERED AS {en371ObjectClass 35};


e3TTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    ePDHTTPBidirectionalR1,
    e3TTPSinkR1,
    e3TTPSource;

REGISTERED AS {en371ObjectClass 127 };


e3IntTTPSinkR1      MANAGED OBJECT CLASS
  DERIVED FROM  ePDHIntTTPSinkR1;
   CHARACTERIZED BY
    e3IntTTPSinkR1Pkg  PACKAGE
        BEHAVIOUR
        e3IntTTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a ETS 300 337 [1] 34 Mbit/s trail transporting ATM cells or SDH
elements.";;;;

REGISTERED AS {en371ObjectClass 128 };


e3IntTTPSource  MANAGED OBJECT CLASS
DERIVED FROM    ePDHIntTTPSource;
CHARACTERIZED BY
    e3IntTTPSourcePkg  PACKAGE
        BEHAVIOUR
        e3IntTTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a ETS 300 337 [1] 34 Mbit/s trail transporting ATM cells or SDH
elements.";;;;

REGISTERED AS { en371ObjectClass 38};


e3IntTTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    ePDHIntTTPBidirectionalR1,
    e3IntTTPSinkR1,
    e3IntTTPSource;

REGISTERED AS  {en371ObjectClass 129 };
```

5.1.8   8 Mbit/s object classes

```
e2ATTPSinkR1        MANAGED OBJECT CLASS
DERIVED FROM    ePDHATTPSinkR1;
CHARACTERIZED BY
    e2ATTPSinkR1Pkg  PACKAGE
        BEHAVIOUR
        e2ATTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 8 Mbit/s trail.";;;;
```

```
REGISTERED AS {en371ObjectClass 130 };
e2ATTPSource        MANAGED OBJECT CLASS
DERIVED FROM    ePDHATTPSource;
CHARACTERIZED BY
    e2ATTPSourcePkg PACKAGE
        BEHAVIOUR
        e2ATTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 8 Mbit/s trail.";;;;

REGISTERED AS {en371ObjectClass 41};


e2ATTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    ePDHATTPBidirectionalR1,
    e2ATTPSinkR1,
    e2ATTPSource;

REGISTERED AS {en371ObjectClass 131 };


e2CTPSinkR1        MANAGED OBJECT CLASS
DERIVED FROM    ePDHCTPSinkR1;
CHARACTERIZED BY
    e2CTPSinkR1Pkg  PACKAGE
        BEHAVIOUR
        e2CTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 8 Mbit/s connection.";;;;

REGISTERED AS {en371ObjectClass 132 };


e2CTPSource        MANAGED OBJECT CLASS
DERIVED FROM    ePDHCTPSource;
CHARACTERIZED BY
    e2CTPSourcePkg PACKAGE
        BEHAVIOUR
        e2CTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 8 Mbit/s connection.";;;;

REGISTERED AS {en371ObjectClass 44};


e2CTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    e2CTPSinkR1,
    e2CTPSource;

REGISTERED AS {en371ObjectClass 133 };


e2MonitoringCTPSink MANAGED OBJECT CLASS
DERIVED FROM            eMonitoringCTPSink;
CHARACTERIZED BY
    e2MonitoringCTPSinkPkg    PACKAGE
    BEHAVIOUR
    e2MonitoringCTPSinkBeh    BEHAVIOUR

DEFINED AS

"An instance of this class represents the adaptation sink function but incorporates the monitoring
capabilities of a 8Mbit/s path termination sink function";;;;
```

```
REGISTERED AS {en371ObjectClass 134 };
e2MonitoringCTPBidirectional        MANAGED OBJECT CLASS
DERIVED FROM                        e2MonitoringCTPSink,
e2CTPSource;

REGISTERED AS {en371ObjectClass 135 };


e2TTPSinkR1        MANAGED OBJECT CLASS
DERIVED FROM    ePDHTTPSinkR1;
CHARACTERIZED BY
    e2TTPSinkR1Pkg PACKAGE
        BEHAVIOUR
        e2TTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 8 Mbit/s trail.";;;;

REGISTERED AS {en371ObjectClass 136 };


e2TTPSource        MANAGED OBJECT CLASS
DERIVED FROM    ePDHTTPSource;
CHARACTERIZED BY
    e2TTPSourcePkg PACKAGE
        BEHAVIOUR
        e2TTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 8 Mbit/s trail.";;;;

REGISTERED AS {en371ObjectClass 47};


e2TTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    ePDHTTPBidirectionalR1,
    e2TTPSinkR1,
    e2TTPSource;

REGISTERED AS {en371ObjectClass 137 };
```

5.1.9   2 Mbit/s object classes

```
e1ATTPSinkR1        MANAGED OBJECT CLASS
DERIVED FROM    ePDHATTPSinkR1;
CHARACTERIZED BY
    e1ATTPSinkR1Pkg  PACKAGE
    BEHAVIOUR
    e1ATTPSinkR1Behaviour BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 2 Mbit/s trail.";;

    ATTRIBUTES
    frameStatus    GET;
    ;;
CONDITIONAL PACKAGES
    crcMonitoringPkg            PRESENT IF

"an instance supports CRC-4 procedures [6] and [7]";

REGISTERED AS {en371ObjectClass 138 };


e1ATTPSourceR1        MANAGED OBJECT CLASS
DERIVED FROM        ePDHATTPSource;
CHARACTERIZED BY
    e1ATTPSourceR1Pkg PACKAGE
        BEHAVIOUR
        e1ATTPSourceR1BehaviourPkg BEHAVIOUR
```

```
DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 2 Mbit/s trail.

The attribute crcOperationMode contained in the conditional package crcOperationPkg determines the
operation of the 2 Mbit/s trail termination source. The value 'disabled' sets the transmitted Si-
bits (bit 1 of the frame) to the binary '1' state [5].

The value 'forced' configures CRC-4 procedure. The value 'automatic' triggers the modified CRC-4
multiframe algorithm in order to allow interworking of equipments with and without a CRC-4
capability [6].";;

;;

CONDITIONAL PACKAGES
    crcOperationPkg PRESENT IF

"an instance supports CRC-4 procedures [6] and [7]";

REGISTERED AS {en371ObjectClass 139 };


e1ATTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    ePDHATTPBidirectionalR1,
    e1ATTPSinkR1,
    e1ATTPSourceR1;
CHARACTERIZED BY
    e1ATTPBidirectionalR1Pkg    PACKAGE
    BEHAVIOUR
    e1ATTPBidirectionalR1Beh    BEHAVIOUR

DEFINED AS

"Either both or none of the inherited conditional packages crcMonitoringPkg and crcOperationPkg
should be instantiated.

The attribute crcOperationMode contained in the conditional package crcOperationPkg determines the
operation of the 2 Mbit/s trail termination. The value 'disabled' sets the transmitted Si-bits (bit
1 of the frame) to the binary '1' state and disables processing of the Si-bits in the receive
signal [5].

The value 'forced' configures CRC-4 procedure with consequent actions [6]: in case of loss of CRC4-
submultiframe all-ONES (aTSF) is inserted downstream and Far End Receiver Failure (FERF) is
signalized upstream (as in case of LOF). A communicationsAlarm notification is emitted with
probableCause 'lossOfMultiFrame' [3].
The value 'automatic' triggers the modified CRC-4 multiframe algorithm in order to allow
interworking of equipments with and without a CRC-4 capability [6]. If this procedure fails then
further CRC-4 processing is inhibited and transmitted E-bits are kept in binary state '0'.";;;;

REGISTERED AS {en371ObjectClass 140 };


e1CTPSinkR1              MANAGED OBJECT CLASS
    DERIVED FROM    ePDHCTPSinkR1;
    CHARACTERIZED BY
    e1CTPSinkR1Pkg  PACKAGE
        BEHAVIOUR
        e1CTPSinkR1BehaviourPkg BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 2 Mbit/s connection..";;;;
```

```
REGISTERED AS {en371ObjectClass 141 };
e1CTPSource          MANAGED OBJECT CLASS
DERIVED FROM    ePDHCTPSource;
CHARACTERIZED BY
    e1CTPSourcePkg PACKAGE
        BEHAVIOUR
        e1CTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 2 Mbit/s connection.";;;;

REGISTERED AS {en371ObjectClass 53};


e1CTPBidirectionalR1 MANAGED OBJECT CLASS
DERIVED FROM
    e1CTPSinkR1,
    e1CTPSource;

REGISTERED AS {en371ObjectClass 142 };


e1MonitoringCTPSink MANAGED OBJECT CLASS
DERIVED FROM          eMonitoringCTPSink;
CHARACTERIZED BY
    e1MonitoringCTPSinkPkg      PACKAGE
    BEHAVIOUR
    e1MonitoringCTPSinkBeh      BEHAVIOUR

DEFINED AS

"An instance of this class represents the adaptation sink function but incorporates the monitoring
capabilities of a 2Mbit/s path termination sink function. The conditional package crcMonitoring (if
instantiated) is in effect when the inherited attribute framedSignalMode is set to value
'active'.";;

;;

    CONDITIONAL PACKAGES
    crcMonitoringPkg          PRESENT IF
    "an instance supports CRC-4 procedures [6] and [7]";

REGISTERED AS {en371ObjectClass 143 };


e1MonitoringCTPBidirectional       MANAGED OBJECT CLASS
DERIVED FROM                       e1MonitoringCTPSink,
                                       e1CTPSource;
CONDITIONAL PACKAGES
    iSDNPackage PRESENT IF

"The 2 MBit/s PDH port is configured as ISDN.";

REGISTERED AS {en371ObjectClass 144 };


e1TTPSinkR1       MANAGED OBJECT CLASS
DERIVED FROM    ePDHTTPSinkR1;
CHARACTERIZED BY
    e1TTPSinkR1Pkg  PACKAGE
    BEHAVIOUR
    e1TTPSinkR1Behaviour    BEHAVIOUR

DEFINED AS

"This object class terminates a CCITT Recommendation G.702 [2] 2 Mbit/s trail.";;;

;
CONDITIONAL PACKAGES
    crcMonitoringPkg          PRESENT IF

"an instance supports CRC-4 procedures [6] and [7]";
```

```
REGISTERED AS {en371ObjectClass 145 };
e1TTPSourceR1       MANAGED OBJECT CLASS
DERIVED FROM        ePDHTTPSource;
CHARACTERIZED BY
    e1TTPSourceR1Pkg    PACKAGE
    BEHAVIOUR
    e1TTPSourceR1Behaviour BEHAVIOUR

DEFINED AS

"This object class originates a CCITT Recommendation G.702 [2] 2 Mbit/s trail.

The attribute crcOperationMode contained in the conditional package crcOperationPkg determines the
operation of the 2 Mbit/s trail termination source. The value 'disabled' sets the transmitted Si-
bits (bit 1 of the frame) to the binary '1' state [5].

The value 'forced' configures CRC-4 procedure. The value 'automatic' triggers the modified CRC-4
multiframe algorithm in order to allow interworking of equipments with and without a CRC-4
capability [6].";;

    ;;

CONDITIONAL PACKAGES
    crcOperationPkg     PRESENT IF

"an instance supports CRC-4 procedures [6] and [7]";

REGISTERED AS {en371ObjectClass 146 };


e1TTPBidirectionalR1    MANAGED OBJECT CLASS
DERIVED FROM            ePDHTTPBidirectionalR1,
                        e1TTPSinkR1,
                        e1TTPSourceR1;
CHARACTERIZED BY
    e1TTPBidirectionalR1Pkg PACKAGE
    BEHAVIOUR
    e1TTPBidirectionalR1Beh BEHAVIOUR

DEFINED AS

"Either both or none of the inherited conditional packages crcMonitoringPkg and crcOperationPkg
should be instantiated.

The attribute crcOperationMode contained in the conditional package crcOperationPkg determines the
operation of the 2 Mbit/s trail termination. The value 'disabled' sets the transmitted Si-bits (bit
1 of the frame) to the binary '1' state and disables processing of the Si-bits in the receive
signal [5].

The value 'forced' configures CRC-4 procedure with consequent actions [6]: in case of loss of CRC4-
submultiframe all-ONES (aTSF) is inserted downstream and Far End Receiver Failure (FERF) is
signalized upstream (as in case of LOF). A communicationsAlarm notification is emitted with
probableCause 'lossOfMultiFrame' [3].

The value 'automatic' triggers the modified CRC-4 multiframe algorithm in order to allow
interworking of equipments with and without a CRC-4 capability [6]. If this procedure fails then
further CRC-4 processing is inhibited and transmitted E-bits are kept in binary state '0'.";;;;

REGISTERED AS {en371ObjectClass 147 };
```

5.1.10   64 kbit/s object classes

```
e0CTPSink           MANAGED OBJECT CLASS
DERIVED FROM    "Recommendation M.3100: 1995":connectionTerminationPointSink;
CHARACTERIZED BY
"Recommendation M.3100: 1995":createDeleteNotificationsPackage,
"Recommendation M.3100: 1995":operationalStatePackage,
"Recommendation M.3100: 1995":stateChangeNotificationPackage,
        e0CTPSinkPkg  PACKAGE
        BEHAVIOUR
        e0CTPSinkBehaviourPkg BEHAVIOUR

DEFINED AS

"An instance of this object class terminates a 64 kbit/s connection. Where additional features are
requested and supported by the equipment, appropriate subclassing is recommended (e.g. where
monitoring is required, the  tmnCommunicationsAlarmInformationPkg should be included)";;
```

```
        ATTRIBUTES
        e0CTPId          GET;;;

REGISTERED AS {en371ObjectClass 58};


e0CTPSource         MANAGED OBJECT CLASS
DERIVED FROM     "Recommendation M.3100: 1995":connectionTerminationPointSource;
CHARACTERIZED BY
"Recommendation M.3100: 1995":createDeleteNotificationsPackage,
        e0CTPSourcePkg PACKAGE
        BEHAVIOUR
        e0CTPSourceBehaviourPkg BEHAVIOUR

DEFINED AS

"An instance of this object class originates a 64 kbit/s connection.";;

        ATTRIBUTES
        e0CTPId          GET;;;

REGISTERED AS {en371ObjectClass 59};


e0CTPBidirectional  MANAGED OBJECT CLASS
DERIVED FROM         "Recommendation M.3100: 1995":connectionTerminationPointBidirectional,
                        e0CTPSink,
                        e0CTPSource;

REGISTERED AS {en371ObjectClass 60};
```

5.2   Attributes definitions

```
pPITTPId ATTRIBUTE
WITH ATTRIBUTE SYNTAX    ASN1DefinedTypesModule1.NameType;
MATCHES FOR EQUALITY;
    BEHAVIOUR
    pPITTPIdBehaviour BEHAVIOUR

    DEFINED AS

    "This attribute is used as a Relative Distinguished Name (RDN) for naming instances of the

    pPITTP object classes.";;

REGISTERED AS {en371Attribute 1};


ePDHCTPId ATTRIBUTE
WITH ATTRIBUTE SYNTAX    ASN1DefinedTypesModule1.NameType;
MATCHES FOR EQUALITY;
    BEHAVIOUR
    ePDHCTPIdBehaviour BEHAVIOUR

DEFINED AS

"This attribute is used as a RDN for naming instances of the ePDHCTP object classes.";;

REGISTERED AS {en371Attribute 2};


ePDHTTPId ATTRIBUTE
WITH ATTRIBUTE SYNTAX    ASN1DefinedTypesModule1.NameType;
MATCHES FOR EQUALITY;
    BEHAVIOUR
    ePDHTTPIdBehaviour BEHAVIOUR

DEFINED AS

"This attribute is used as a RDN for naming instances of the ePDHTTP object classes.";;
```

```
REGISTERED AS {en371Attribute 3};
trTrailTraceExpected ATTRIBUTE
WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.TrailTrace;
MATCHES FOR EQUALITY;
     BEHAVIOUR
     trTrailTraceExpectedBehaviour BEHAVIOUR

DEFINED AS

"This attribute is used to specify the value of the expected TR byte PDH trail trace 16 bytes
message for instances of the e3IntTTP and e4IntTTP object class.";;

REGISTERED AS {en371Attribute 4};


trTrailTraceReceived ATTRIBUTE
WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.TrailTrace;
MATCHES FOR EQUALITY;
     BEHAVIOUR
     trTrailTraceReceivedBehaviour BEHAVIOUR

DEFINED AS

"This attribute is used to know the value of the incoming TR byte PDH trail trace 16 bytes message
for instances of the e3IntTTP and e4IntTTP object class.";;

REGISTERED AS {en371Attribute 5};


trTrailTraceSend ATTRIBUTE
WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.TrailTrace;
MATCHES FOR EQUALITY;
     BEHAVIOUR
     trTrailTraceSendBehaviour BEHAVIOUR

DEFINED AS

"This attribute is used to specify the value of the outgoing TR byte PDH trail trace 16 bytes
message for instances of the e3IntTTP and eg4IntTTP object class.";;

REGISTERED AS {en371Attribute 6};


e0CTPId ATTRIBUTE
WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.NameType;
MATCHES FOR EQUALITY;
     BEHAVIOUR
     e0CTPIdBehaviour BEHAVIOUR

DEFINED AS

"This attribute is used as a RDN for naming instances of the e0CTP object classes.";;

REGISTERED AS {en371Attribute 7};
```

5.2.1   Additional attributes

The following attributes definitions have to be added:

```
availableTimeSlots              ATTRIBUTE
     WITH ATTRIBUTE SYNTAX      ASN1DefinedTypesModule1.AvailableTimeSlots;
     MATCHES FOR                EQUALITY;
     BEHAVIOUR availableTimeSlotsBeh BEHAVIOUR

DEFINED AS

*This attribute is used to indicate the available Time Slots.

If a TS is set to TRUE, the corresponding Time Slot is available and vice versa.*;;
```

```
REGISTERED AS {en371Attribute 10};
burstyDegradeConsecutive     ATTRIBUTE
    WITH ATTRIBUTE SYNTAX       ASN1DefinedTypesModule1.NCSBSRange;
    MATCHES FOR                 EQUALITY;
    BEHAVIOUR                   burstyDegradeConsecutiveBehaviour;

REGISTERED AS {en371Attribute 11}

;


burstyDegradeConsecutiveBehaviour     BEHAVIOUR

DEFINED AS

"The attribute burstyDegradeConsecutive indicates the number of consecutive BAD seconds that should
be counted before the declaration of degradedSignal. It indicates also number of consecutive GOOD
seconds that are necessary for the degradedSignal clearing.";

burstyDegradeThreshold      ATTRIBUTE
    WITH ATTRIBUTE SYNTAX       ASN1DefinedTypesModule1.CapThreshold;
    MATCHES FOR                 EQUALITY;
    BEHAVIOUR                   burstyDegradeThresholdBehaviour;

REGISTERED AS {en371Attribute 12}

;


burstyDegradeThresholdBehaviour     BEHAVIOUR

DEFINED AS

"The attribute burstyDegradeThreshold contains the value that should be compared with errored blocks
in that second in order to consider that second as a GOOD one or a BAD one.";

clearingTime                ATTRIBUTE
    WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.PersistanceTime;
    MATCHES FOR             EQUALITY,
                                ORDERING;

REGISTERED AS {en371Attribute 13};


crcOperationMode            ATTRIBUTE
    WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.CRCOperationMode;
    MATCHES FOR             EQUALITY;

REGISTERED AS {en371Attribute 14 };


enableCRCMode           ATTRIBUTE
    WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.Activation;
    MATCHES FOR             EQUALITY;

REGISTERED AS {en371Attribute 15 };


framedSignalMode            ATTRIBUTE
    WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.FramedSignalMode;
    MATCHES FOR             EQUALITY;

REGISTERED AS {en371Attribute 16  };


frameStatus             ATTRIBUTE
    WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.FrameStatus;
    MATCHES FOR             EQUALITY;
    BEHAVIOUR              frameStatusBehaviour;

REGISTERED AS {en371Attribute 17}

;


frameStatusBehaviour    BEHAVIOUR
```

```
DEFINED AS

*The attribute indicates the detected framing properties of the characteristic information at the
corresponding PDH path layer. If the detection process is not activated or pending then the value is
0 (noIndication)*;

portMode                      ATTRIBUTE
    WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.PortMode;
    MATCHES FOR             EQUALITY, ORDERING;
    BEHAVIOUR
    portModeBehaviour   BEHAVIOUR

DEFINED AS

"This attribute indicates the current state of the port mode for the containing managed object
instance. The states indicated are:

        0 - Port Mode  is in the MON state.
        1 - Port Mode  is in the NMON state.
        2 - Port Mode is in the AUTO state.";;

REGISTERED AS {en371Attribute 18};


raisingTime                     ATTRIBUTE
    WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.PersistanceTime;
    MATCHES FOR             EQUALITY,
                                    ORDERING;

REGISTERED AS {en371Attribute 19};


remoteCRCIndication     ATTRIBUTE
    WITH ATTRIBUTE SYNTAX   ASN1DefinedTypesModule1.Activation;
    MATCHES FOR             EQUALITY;

REGISTERED AS { en371Attribute 20 };
```

5.3   Name bindings definitions

```
pPITTPSinkR1-managedElement NAME BINDING
        SUBORDINATE OBJECT CLASS pPITTPSinkR1 AND SUBCLASSES;
        NAMED BY SUPERIOR OBJECT CLASS "Recommendation M.3100: 1995":managedElement AND SUBCLASSES;
        WITH ATTRIBUTE pPITTPId;
        CREATE
                WITH-REFERENCE-OBJECT,
                WITH-AUTOMATIC-INSTANCE-NAMING;
        DELETE
                DELETES-CONTAINED-OBJECTS;

REGISTERED AS {en371NameBinding 50 };


pPITTPSource-managedElement NAME BINDING
        SUBORDINATE OBJECT CLASS pPITTPSource AND SUBCLASSES;
        NAMED BY SUPERIOR OBJECT CLASS "Recommendation M.3100: 1995":managedElement AND SUBCLASSES;
        WITH ATTRIBUTE pPITTPId;
        CREATE
                WITH-REFERENCE-OBJECT,
                WITH-AUTOMATIC-INSTANCE-NAMING;
        DELETE
                DELETES-CONTAINED-OBJECTS;

REGISTERED AS { en371NameBinding 2 };


ePDHTTPSinkR1-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHTTPSinkR1 AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     "Recommendation M.3100: 1995":managedElement AND SUBCLASSES;
    WITH ATTRIBUTE            ePDHTTPId;
        BEHAVIOUR ePDHTTPSinkR1-managedElementBehaviour BEHAVIOUR
```

```
DEFINED AS

"The subordinate managed object may be automatically instantiated when the superior managed object
is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 51 };


ePDHTTPSource-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHTTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    "Recommendation M.3100: 1995":managedElement AND SUBCLASSES;
    WITH ATTRIBUTE          ePDHTTPId;
       BEHAVIOUR ePDHTTPSource-managedElementBehaviour BEHAVIOUR

DEFINED AS

"The subordinate managed object may be automatically instantiated when the superior managed object
is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 4};


ePDHCTPSinkR1-pPITTPSinkR1 NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHCTPSinkR1 AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    pPITTPSinkR1 AND SUBCLASSES;
    WITH ATTRIBUTE          ePDHCTPId;
    BEHAVIOUR
       ePDHCTPSinkR1-pPITTPSinkR1Behaviour BEHAVIOUR

DEFINED AS

"The subordinate managed object may be automatically instantiated when the superior managed object
is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 52 };


ePDHCTPSource-pPITTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHCTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    pPITTPSource AND SUBCLASSES;
    WITH ATTRIBUTE          ePDHCTPId;
    BEHAVIOUR
       ePDHCTPSource-pPITTPSourceBehaviour BEHAVIOUR

     DEFINED AS

     "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 6};


e0CTPSink-pPITTPSinkR1 NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    pPITTPSinkR1 AND SUBCLASSES;
    WITH ATTRIBUTE          e0CTPId;
    BEHAVIOUR
       e0CTPSink-pPITTPSinkR1Behaviour BEHAVIOUR

     DEFINED AS

     "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 53 };


e0CTPSource-pPITTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    pPITTPSource AND SUBCLASSES;
    WITH ATTRIBUTE          e0CTPId;
    BEHAVIOUR
       e0CTPSource-pPITTPSourceBehaviour BEHAVIOUR
```

```
    DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 8};


ePDHCTPSinkR1-ePDHTTPSinkR1 NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHCTPSinkR1 AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    ePDHTTPSinkR1 AND SUBCLASSES;
    WITH ATTRIBUTE           ePDHCTPId;
    BEHAVIOUR
       ePDHCTPSinkR1-ePDHTTPSinkR1Behaviour BEHAVIOUR

     DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 54 };


ePDHCTPSource-ePDHTTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHCTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    ePDHTTPSource AND SUBCLASSES;
    WITH ATTRIBUTE           ePDHCTPId;
    BEHAVIOUR
       ePDHCTPSource-ePDHTTPSourceBehaviour BEHAVIOUR

     DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 10};


e0CTPSink-e1TTPSinkR1 NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    e1TTPSinkR1 AND SUBCLASSES;
    WITH ATTRIBUTE           e0CTPId;
    BEHAVIOUR
      e0CTPSink-e1TTPSinkR1Behaviour BEHAVIOUR

     DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 55 };


e0CTPSource-e1TTPSourceR1    NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    e1TTPSourceR1 AND SUBCLASSES;
    WITH ATTRIBUTE           e0CTPId;
    BEHAVIOUR
      e0CTPSource-e1TTPSourceR1Behaviour BEHAVIOUR

     DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;
```

```
REGISTERED AS {en371NameBinding 12};
ePDHATTPSinkR1-pPITTPSinkR1 NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHATTPSinkR1 AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    pPITTPSinkR1 AND SUBCLASSES;
    WITH ATTRIBUTE           ePDHTTPId;
    BEHAVIOUR
        ePDHATTPSinkR1-pPITTPSinkR1Behaviour BEHAVIOUR

        DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 56 };


ePDHATTPSource-pPITTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHATTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    pPITTPSource AND SUBCLASSES;
    WITH ATTRIBUTE           ePDHTTPId;
    BEHAVIOUR
        ePDHATTPSinkR1-pPITTPSourceBehaviour BEHAVIOUR

        DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 14};


e0CTPSink-e1ATTPSinkR1 NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    e1ATTPSinkR1 AND SUBCLASSES;
    WITH ATTRIBUTE           e0CTPId;
    BEHAVIOUR
        e0CTPSink-e1ATTPSinkR1Behaviour BEHAVIOUR

        DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 57 };


e0CTPSource-e1ATTPSourceR1 NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    e1ATTPSourceR1 AND SUBCLASSES;
    WITH ATTRIBUTE           e0CTPId;
    BEHAVIOUR
        e0CTPSource-e1ATTPSourceR1Behaviour BEHAVIOUR

        DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 16};


e3ATTPSinkR1-e4ATTPSinkR1 NAME BINDING
    SUBORDINATE OBJECT CLASS e3ATTPSinkR1 AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    e4ATTPSinkR1 AND SUBCLASSES;
    WITH ATTRIBUTE           ePDHTTPId;
    BEHAVIOUR
        e3ATTPSinkR1-e4ATTPSinkR1Behaviour BEHAVIOUR

        DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;
```

```
REGISTERED AS {en371NameBinding 58 };
e3ATTPSource-e4ATTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS e3ATTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     e4ATTPSource AND SUBCLASSES;
    WITH ATTRIBUTE            ePDHTTPId;
    BEHAVIOUR
        e3ATTPSource-e4ATTPSourceBehaviour BEHAVIOUR

     DEFINED AS

     "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 18};


e2ATTPSinkR1-e3ATTPSinkR1 NAME BINDING
    SUBORDINATE OBJECT CLASS e2ATTPSinkR1 AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     e3ATTPSinkR1 AND SUBCLASSES;
    WITH ATTRIBUTE            ePDHTTPId;
    BEHAVIOUR
        e2ATTPSinkR1-e3ATTPSinkR1Behaviour BEHAVIOUR

     DEFINED AS

     "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 59 };


e2ATTPSource-e3ATTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS e2ATTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     e3ATTPSource AND SUBCLASSES;
    WITH ATTRIBUTE            ePDHTTPId;
    BEHAVIOUR
        e2ATTPSource-e3ATTPSourceBehaviour BEHAVIOUR

     DEFINED AS

     "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 20};


e1ATTPSinkR1-e2ATTPSinkR1 NAME BINDING
    SUBORDINATE OBJECT CLASS e1ATTPSinkR1 AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     e2ATTPSinkR1 AND SUBCLASSES;
    WITH ATTRIBUTE            ePDHTTPId;
    BEHAVIOUR
        e1ATTPSinkR1-e2ATTPSinkR1Behaviour BEHAVIOUR

     DEFINED AS

     "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 60 };


e1ATTPSourceR1-e2ATTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS e1ATTPSourceR1 AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     e2ATTPSource;
    WITH ATTRIBUTE            ePDHTTPId;
    BEHAVIOUR
        e1ATTPSourceR1-e2ATTPSourceBehaviour BEHAVIOUR
```

```
    DEFINED AS

    "The subordinate managed object may be automatically instantiated when the superior managed
object is instantiated, according to the make-up and mode of operation of the equipment.";;

REGISTERED AS {en371NameBinding 22};
```

5.3.1   Additional name bindings

```
defaultNMONAlarmSeverityAssignment-managedElement   NAME BINDING
    SUBORDINATE OBJECT CLASS
    "Recommendation M.3100: 1995":alarmSeverityAssignmentProfile  AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS
    "Recommendation M.3100: 1995":managedElement  AND SUBCLASSES;
    WITH ATTRIBUTE
    "Recommendation M.3100: 1995":alarmSeverityAssignmentProfileId;
    BEHAVIOUR
    defaultNMONAlarmSeverityAssignment-managedElementBeh    BEHAVIOUR

DEFINED AS

*One instance of the subordinate class is auto created by the node.

The default values of this object instance shall always map all possible alarms which the node can
generate to the "non-alarmed" severity code.*;;

REGISTERED AS {en371NameBinding 61 };
```

5.4   ASN.1 definitions

```
ASN1DefinedTypesModule1 {ccitt(0) identified-organization(4) etsi(0) ets371(371) informationModel(0)
asn1Module(2) asn1DefinedTypesModule1(1)}
DEFINITIONS IMPLICIT TAGS ::=
BEGIN
-- EXPORTS everything
IMPORTS


NameType FROM  ASN1DefinedTypesModule {ccitt(0) recommendation(0) m(13) m3100(3100)
informationModel(0) asn1Modules(2) asn1DefinedTypesModule(0)};


TrailTrace ::= CHOICE {
    null        NULL,
    pathtrace   [1] GraphicString
}
Activation::=BOOLEAN
AvailableTimeSlots ::= SEQUENCE SIZE (1..31) OF TS
CapThreshold::= INTEGER
CRCOperationMode::=ENUMERATED {disabled(0), forced(1), automatic(2)}
FramedSignalMode::=ENUMERATED {inactive(0), active(1)}
FrameStatus::=  INTEGER
        --0: noIndication
        --1: edcMF
NCSBSRange::=INTEGER(2..10)
    degradeConsecutiveDefault   NCSBSRange::=6
PersistanceTime::=INTEGER(1..300)
    defaultRaisingPersistancy       PersistanceTime::=25
    defaultClearingPersistancy  PersistanceTime::=100
PortMode::=INTEGER
TS ::= BOOLEAN

END -- end of ASN1DefinedTypesModule
```

5.5 Packages

```
crcMonitoringPkg          PACKAGE
    BEHAVIOUR
    crcMonitoringPkgBeh BEHAVIOUR

DEFINED AS

"This packages defines the monitoring capabilities applied to signals with a CRC submultiframe
structure.

The attribute enableCRCMode set to TRUE selects the near/far-end performance processing of the
receive signal based on CRC-4 block errors.

During this mode of operation the degraded signal criteria are in effect dependent on the setting of
the attributes burstyDegradeConsecutive and burstyDegradeThreshold. A communicationsAlarm
notification shall be issued if the account for the detection of the degraded defect is encountered.
The probableCause parameter of the notification shall indicate 'degradedSignal' [3].

The attribute remoteCRCIndication reflects the CRC-4 multiframe generator / detector status at the
far-end NE [8].

The value of burstyDegradeConsecutive attribute represents the number of consecutive seconds that
should be taken into account for the detection or clearing of the degraded defect. The attribute
burstyDegradeThreshold contains the value that should be compared with errored blocks in that second
in order to consider that second as a GOOD one or a BAD one [9].";;

    ATTRIBUTES
    burstyDegradeConsecutive    DEFAULT VALUE
                                        ASN1DefinedTypesModule1.degradeConsecutiveDefault
                                        GET-REPLACE,
    burstyDegradeThreshold      GET-REPLACE,
    enableCRCMode               GET-REPLACE,
    remoteCRCIndication         GET;

REGISTERED AS {en371Package 1 };


crcOperationPkg           PACKAGE
BEHAVIOUR
    crcOperationPkgBeh  BEHAVIOUR

DEFINED AS

"This packages enables to control the operation modes defined for interworking with equipment which
may or may not incorporate CRC procedure";;

    ATTRIBUTES
    crcOperationMode        GET-REPLACE;

REGISTERED AS {en371Package 2 };


iSDNPackage PACKAGE
    BEHAVIOUR iSDNPackageBehaviour BEHAVIOUR

DEFINED AS

*This package permits to blank n (1=<n=<31) time slots on a 2 Mbit/s signal, by setting the
attribute availableTimeSlots. The default value of availableTimeSlots is all TS="FALSE", that is all
time slots are written with 'all ones'.*;;

    ATTRIBUTES
availableTimeSlots      GET-REPLACE;
```

```
REGISTERED AS {en371Package 3};
tpSpecificPersistanceTimePkg    PACKAGE
     BEHAVIOUR                              tpSpecificPersistanceTimePkgBehaviour;
     ATTRIBUTES
     raisingTime    REPLACE-WITH-DEFAULT
                         DEFAULT VALUE   ASN1DefinedTypesModule1.defaultRaisingPersistancy
                         GET-REPLACE,
     clearingTime   REPLACE-WITH-DEFAULT
                         DEFAULT VALUE   ASN1DefinedTypesModule1.defaultClearingPersistancy
                         GET-REPLACE;

REGISTERED AS {en371Package 4 }

;


tpSpecificPersistanceTimePkgBehaviour BEHAVIOUR

DEFINED AS

"This package models the filter (f4) applied for correlated fault causes in order to indicate
failures. The integer values (p) of the contained attributes raisingTime and clearingTime define
intervals of persistance time (Tp). The nominal values Tp are associated to the integer value p by
the equation

Tp=px0.1 sec.
The range and the default intervals of activating and clearing a failure are specified in ETS 300
417-1 [9].";


portModePkg PACKAGE
     BEHAVIOUR
     portModePkgBehaviour    BEHAVIOUR

DEFINED AS

"Any object supporting this package can support the portMode function. It has three states: AUTO,
NMON and MON. The AUTO shall be the default.

In the AUTO state the value of the portMode attribute is AUTO and the containing managed object's
alarmSeverityAssignmentProfilePointer attribute shall  point at the instance of the
AlarmSeverityAssignmentProfile managed object class which has a nameBinding value of
defaultNMONAlarmSeverityAssignmentProfile-managedElement.

In the NMON state the value of the portMode is NMON and the containing managed object's
alarmSeverityProfilePointer attribute shall  point at the same instance as in AUTO  mode, i.e. it
points to the AlarmSeverityAssignmentProfile managed object class which has a nameBinding value of
defaultNMONAlarmSeverityAssignment-managedElement.

In the MON state the value of the portMode is MON and the containing managed object's
alarmSeverityAssignmentProfilePointer attribute shall has a value indicating some other
AlarmSeverityAssignmentProfile instance than the one used in NMON/AUTO state or it should be NULL.
When portMode changes from AUTO or NMON to MON the alarmSeverityAssignmentProfilePointer shall
revert to the value as stated above.

The MON, NMON or AUTO state is entered via M-Set of the portMode attribute by a managing system. In
addition, the containing object leaves the AUTO state when a valid signal is detected (i.e. LOS is
cleared) by the containing object, and in this case an attributeValueChange notification is emitted.
An attempt from management system to change the portMode attribute from either MON or NMON to AUTO
is rejected, when there is a valid signal.

When the portMode attribute changes, the alarmSeverityAssignmentProfilePointer attribute of the
containing object changes automatically by NE according to the behaviour specified in this package.
In NMON or AUTO state the alarmSeverityAssignmentProfilePointer should always point to the
alarmSeverityAssignmentProfile instance with nameBinding defaultNMONAlarmSeverityAssignmentProfile-
managedElement."

     ;;

     ATTRIBUTES
     portMode               GET-REPLACE;
     NOTIFICATIONS
     "Recommendation X.721 [4]: 1992":attributeValueChange;

REGISTERED AS  {en371Package 5 };
```

5.6 Behaviour definitions

```
alarmReportingControlBehaviour        BEHAVIOUR

DEFINED AS

"If the attribute alarmSeverityProfilePointer points to an instance of the MOC
alarmSeverityAssignmentProfile then the perceivedSeverity associated with the probableCause in the
communicationsAlarm is determined by the assignment given in the attribute
alarmSeverityAssignmentList of that instance. The value 'non-alarmed' of the severity assigned to a
problem inhibits the emission of the potential communicationsAlarm notification of that problem.
This behaviour meets the ability to configure the defect correlation filter not to report selected
fault causes (i.e. problems) and hence no associated failures will be alerted by communicationsAlarm
notifications.

The alarmSeverityProfilePointer may point to an instance of alarmSeverityAssignmentProfile which is
auto-created by the NE according the name-binding label 'defaultNMONAlarmSeverityAssignment-
managedElement'. This relationship of the termination point reflects the NMON state during which no
communicationsAlarm is reported at all.

When the severity changes to a value 'non-alarmed' for a problem which has been notified by an
instance of this class then a communicationsAlarm notification with the perceivedSeverity 'cleared'
is issued and the corresponding entry in the attributes currentProblemList and alarmStatus is
removed. When the severity changes from 'non-alarmed' to a value other than 'non-alarmed' then a
pending, persistent defect will be notified.
If the alarm severity cannot be assigned by the way of an alarmSeverityAssignmentProfile object
(e.g. the attribute alarmSeverityProfilePointer has the value NULL or no assignment is given in the
attribute alarmSeverityAssignmentList) then one of the two choices applies when reporting alarms:

a)  agent assigns the severity,
b)  the value 'indeterminate' is used.";


pathTerminationMonitoringBehavior    BEHAVIOUR

DEFINED AS

"A communicationsAlarm notification shall be issued if a Server Signal Fail (SSF) is detected. The
probableCause parameter of the notification shall indicate serverSignalFailure.

A communicationsAlarm notification shall be issued if a Far End Receiver Failure is detected. The
probableCause parameter of the notification shall indicate farEndReceiverFailure (fERF) [3].
Detection of a fERF has no effect on the operationalState.

Instances of the subclasses of this class may be used at the different PDH path layers to provide
with performance data monitoring capabilities based on Frame Alignment Signal Errors (FASE) [8].";
```
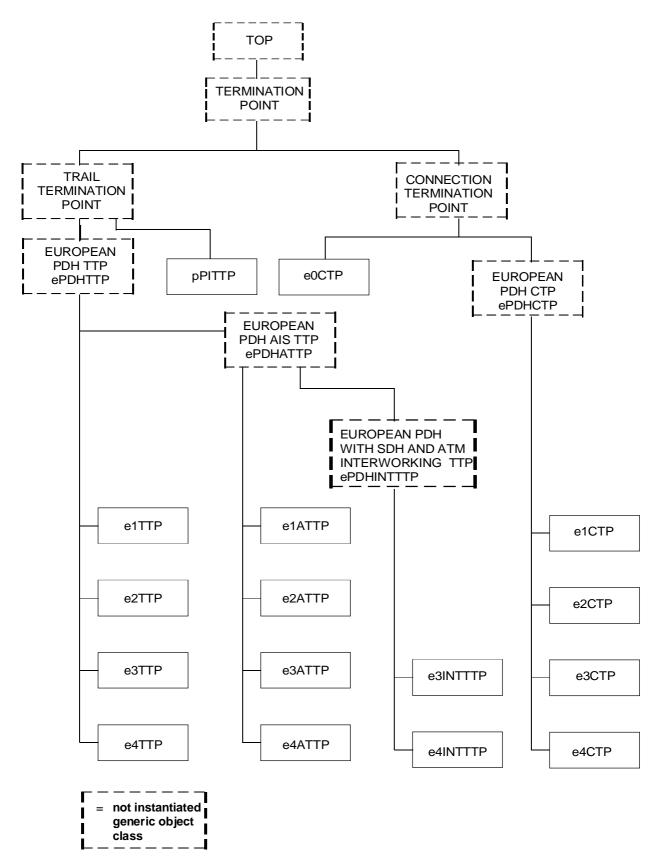
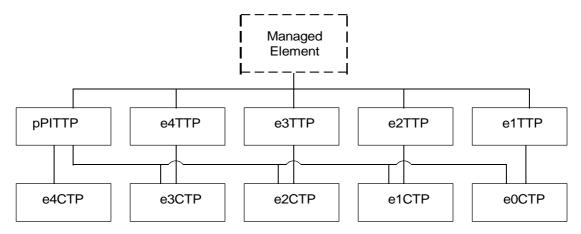**Figure 1: PDH transport object inheritance (all PDH objects may be source, sink or bidirectional)**

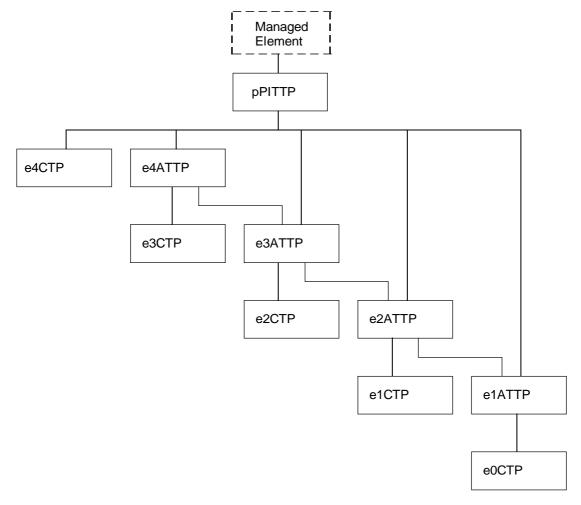**Figure 2: PDH object naming when PDH cross connectivity is available**

Figure 3: PDH object naming when no PDH cross connectivity is available
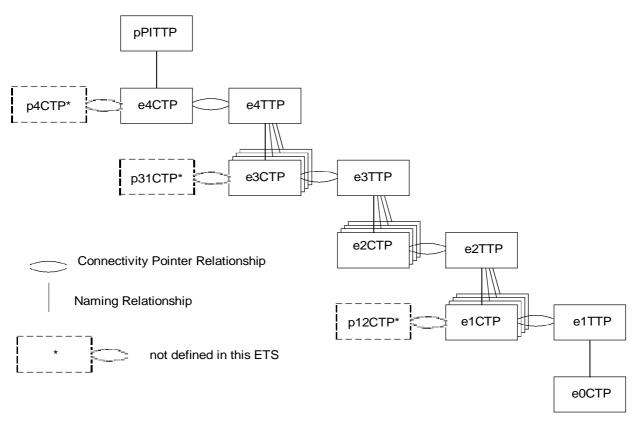
ETSI

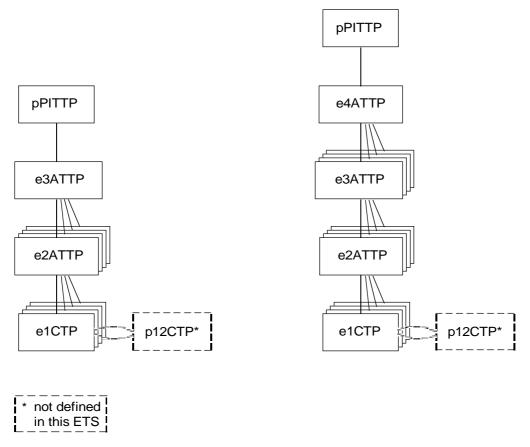**Figure 4: Naming and pointer relationships for PDH and relationship with SDH object classes**

**Figure 5: Naming and pointer relationships examples
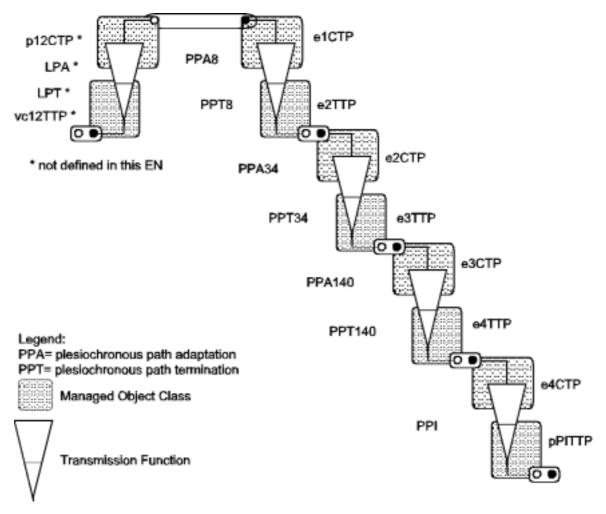for short version 34/vc12 and 140/vc12 transmultiplexer**

p12CTP *

LPA *

LPT *

vc12TTP *

PPA8

e1CTP

PPT8

e2TTP

* not defined in this EN

PPA34

e2CTP

PPT34

e3TTP

Legend:
PPA= plesiochronous path adaptation
PPT= plesiochronous path termination

Managed Object Class

Transmission Function

PPA140

e3CTP

PPT140

e4TTP

e4CTP

PPI

pPITTP

Figure 6: Example for relationship between object classes and transmission functions

p12CTP *

LPA *

e1CTP

PPA8

LPT *

PPT8

vc12TTP *

e2ATTP

PPA34

* not defined in this EN

PPT34

e3ATTP

PPA140

Legend:
PPA= plesiochronous path adaptation
PPT= plesiochronous path termination

PPT140

e4ATTP

Managed Object Class
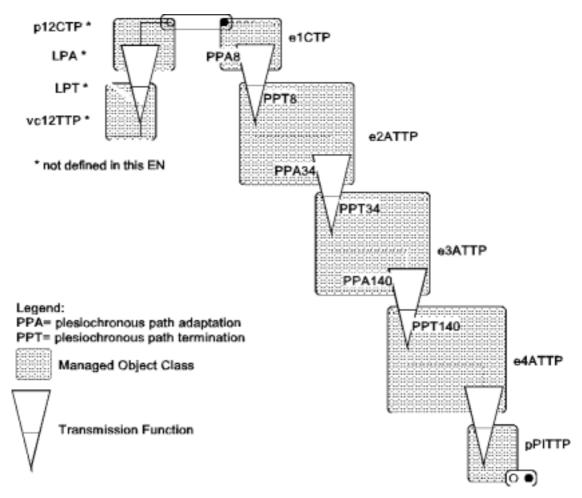
pPITTP

Transmission Function

**Figure 7: Example for relationship between object classes
and transmission functions short version without PDH cross connectivity**

History

Document history		
Edition 1	November 1994	Publication as ETS 300 371
Edition 2	October 1996	Publication as ETS 300 371
V1.3.1	March 1999	Publication
V1.3.2	October 2000	One-step Approval Procedure OAP 20010223: 2000-10-25 to 2001-02-23
V1.3.2	February 2001	Publication