EUROPEAN
TELECOMMUNICATION
STANDARD

ETS 300 371

October 1996

Second Edition

Source: ETSI TC-TM

Reference: RE/TM-02223

ICS: 33.020

Key words: PDH, NE, model

Transmission and Multiplexing (TM);
Plesiochronous Digital Hierarchy (PDH) information model
for the Network Element (NE) view

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Contents

Blank page

Foreword

This European Telecommunication Standard (ETS) was produced by the Transmission and Multiplexing (TM) Technical Committee of the European Telecommunications Standards Institute (ETSI).

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

Transposition dates	
Date of adoption of this ETS:	6 September 1996
Date of latest announcement of this ETS (doa):	31 January 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 July 1997
Date of withdrawal of any conflicting National Standard (dow):	31 July 1997

Blank page

1 Scope

This European Telecommunication Standard (ETS) 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).

This ETS defines:

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

This ETS 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 this ETS (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 Normative references

This ETS incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to apply.

[1]   ETS 300 337 (1995): "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 CCITT 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 (1992): "Generic network information model".

[4]   ITU-T Recommendation X.721 (1991): "Information technology - Open Systems Interconnection - Structure of management information: Definition of management information".

[5]   ITU-T Recommendation G.707 (1993): "Synchronous Digital Hierarchy bit rates".

[6]   ITU-T Recommendation G.708 (1993): "Network-Node Interface for the synchronous digital hierarchy".

[7]   ITU-T Recommendation G.709 (1993): " Synchronous Multiplexing Structure".

[8]   ITU-T Recommendation M.3010: "Principles for a telecommunication management network".

[9]   ITU-T Recommendation G.783 (1993): "Characteristics of Synchronous Digital Hierarchy (SDH) equipment functional blocks".

[10]   ITU-T Recommendation G.784 (1993): "Synchronous Digital Hierarchy (SDH) Management".

[11]   ITU-T Recommendation X.722 (1992): "Information technology - Open Systems Interconnection - Structure of Management Information: Guidelines for the definition of managed objects".

[12]   ITU-T Recommendation X.208 (1990): "Specification of Abstract Syntax Notation One (ASN.1)".

[13]   ITU-T Recommendation X.720 (1992): "Information technology - Open Systems Interconnection - Structure of management information: Management information model".

[14]   ITU-T Recommendation G.774 (1992): "SDH Management Information Model for the Network Element View".

[15]   ITU-T Recommendation Q.822 (1993): "Stage 1, stage 2 and stage 3 description for the Q3 interface - Performance management".

[16]   ITU-T Recommendation X.701 (1992): "Information technology - Open Systems Interconnection - Systems management overview".

[17]   ITU-T Recommendation X.710 (1991): "Common management information service definition for CCITT applications".

[18]   ITU-T Recommendation X.711 (1991): "Common management information protocol specification for CCITT applications".

[19]   ITU-T Recommendation X.731 (1992): "Information technology - Open Systems Interconnection - Systems Management: State management function".

[20]   ITU-T Recommendation X.730 (1992): "Information technology - Open Systems Interconnection - Systems Management: Object management function".

[21]   ITU-T Recommendation X.733 (1992): "Information technology - Open Systems Interconnection - Systems Management: Alarm reporting function".

[22]   ITU-T Recommendation X.734 (1992): "Information technology - Open Systems Interconnection - Systems Management: Event report management function".

[23]   ITU-T Recommendation X.735 (1992): "Information technology - Open Systems Interconnection - Systems Management: Log control function".

[24]   ITU-T Recommendations G.803: "Architectures of transport networks based on the synchronous digital hierarchy (SDH)".

[25]   ITU-T Recommendation G.773 (1993): "Protocol suites for Q-interfaces for management of transmission systems".

[26]   ITU-T Recommendation Q.811 (1993): "Lower layer protocol profiles for the Q3 interface".

[27]   ITU-T Recommendation Q.812 (1993): "Upper layer protocol profiles for the Q3 interface".

[28]   ITU-T Recommendation M.60 (1993): "Maintenance terminology and definitions".

[29]   ETS 300 304 (1994): "Transmission and Multiplexing (TM); Synchronous Digital Hierarchy (SDH) information model for the Network Element (NE) view".

[30]   ETS 300 371 Edition 1 (1994): "Transmission and Multiplexing (TM); Plesiochronous Digital Hierarchy (PDH) information model for the Network Element (NE) view".

[31]   ITU-T Recommendation G.831 (1993): "Management capabilities of transport networks based on the synchronous digital hierarchy (SDH)".

3   Abbreviations

For the purposes of this ETS, the following symbols and abbreviations apply.

AIS	Alarm Indication Signal
AP	Access Point
ASN.1	Abstract Syntax Notation No. 1
ATM	Asynchronous Transfer Mode
CMIP	Common Management Information Protocol
CMIS	Common Management Information Service
CP	Connection Point
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
OS	Operation System
OSI	Open System Interconnection
PDH	Plesiochronous Digital Hierarchy
Pkg	Package
PPA	Plesiochronous Physical Adaptation
PPI	Plesiochronous Physical Interface
PPT	Plesiochronous Physical Termination
RAI	Remote Alarm Indication
RDN	Relative Distinguished Name
SDH	Synchronous Digital Hierarchy
Snk	Sink
Src	Source
STM-N	Synchronous Transport Module N
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 ETS 300 371

```
ASN1TypeModule {ccitt(0) identified-organization(4) etsi(0) ets371(371) informationModel(0)
asn1Module(2) asn1TypeModule(0)}
DEFINITIONS IMPLICIT TAGS ::= BEGIN
-- EXPORT Everything
prETS300371 OBJECT IDENTIFIER ::= {ccitt(0) identified-organization(4) etsi(0) ets371(371)
informationModel(0)}
etsObjectClass OBJECT IDENTIFIER ::= {prETS300371 managedObjectClass(3)}
etsPackage OBJECT IDENTIFIER ::= {prETS300371 package(4)}
etsNameBinding OBJECT IDENTIFIER ::= {prETS300371 nameBinding(6)}
etsAttribute OBJECT IDENTIFIER ::= {prETS300371 attribute(7)}
etsAction OBJECT IDENTIFIER ::= {prETS300371 action(9)}
etsNotification OBJECT IDENTIFIER ::= {prETS300371 notification(10)}
END
```

5 PDH fragment

This clause provides managed objects required to model PDH interfaces.

5.1 Object classes definitions

5.1.1 Electrical PDH physical interface

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

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

```
pPITTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM "Recommendation M.3100: 1992":trailTerminationPointBidirectional,
                          pPITTPSink,
                          pPITTPSource;

REGISTERED AS { etsObjectClass 1};

pPITTPSink MANAGED OBJECT CLASS
DERIVED FROM "Recommendation M.3100:1992":trailTerminationPointSink;
CHARACTERIZED BY
    "Recommendation X.721:1991":administrativeStatesPackage,
    "Recommendation M.3100:1992":createDeleteNotificationsPackage,
    "Recommendation M.3100:1992":stateChangeNotificationPackage,
    "Recommendation M.3100:1992":tmnCommunicationsAlarmInformationPackage,
    "Recommendation M.3100:1992":userLabelPackage,

    pPITTPSinkPkg  PACKAGE
        BEHAVIOUR
        pPITTPSinkBehaviourPkg 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 LOS.
        The operational state is disabled if a LOS is detected";;
    ATTRIBUTES
    pPITTPId             GET;;;

REGISTERED AS { etsObjectClass 2 };

pPITTPSource MANAGED OBJECT CLASS
DERIVED FROM "Recommendation M.3100:1992":trailTerminationPointSource;
CHARACTERIZED BY
    "Recommendation M.3100:1992":createDeleteNotificationsPackage,
    "Recommendation M.3100:1992":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 downStream connectivity pointer is NULL
        for an instance of this class.";;
    ATTRIBUTES
    pPITTPId             GET;;;

REGISTERED AS { etsObjectClass 3 };
```

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 monitoring function of a respective Connection Termination Point (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.

Object classes inherited from this class are labelled according to the European PDH hierarchy (exTP, 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 Far End Receive Failure (FERF) and Excessive Bit Error Ratio (EBER) is for further study.

```
ePDHATTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHTTPSink;
CHARACTERIZED BY
ePDHTPSinkPkg  PACKAGE
BEHAVIOUR
ePDHATTPSinkBehaviourPkg BEHAVIOUR
          DEFINED AS
          "This object class includes the AIS 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.
          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 {etsObjectClass 4};


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 {etsObjectClass 5};


ePDHATTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHTTPBidirectional,
    ePDHATTPSink,
    ePDHATTPSource;

REGISTERED AS {etsObjectClass 6};
```

5.1.3 European PDH connection termination point

This subclause describes an object class (sink, source or bidirectional) 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 (exTP, 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).

```
ePDHCTPSink MANAGED OBJECT CLASS
DERIVED FROM "Recommendation M.3100:1992":connectionTerminationPointSink;
CHARACTERIZED BY
"Recommendation M.3100:1992":createDeleteNotificationsPackage,
"Recommendation M.3100:1992":operationalStatePackage,
"Recommendation M.3100:1992":stateChangeNotificationPackage,
```

```
"Recommendation M.3100:1992":tmnCommunicationsAlarmInformationPkg,
ePDHCTPSinkPkg  PACKAGE
        BEHAVIOUR
        ePDHCTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class represents the termination of a PDH hierarchy connection. A
            communicationsAlarm notification shall be issued if an AIS is detected. The
            probableCause parameter of the notification shall indicate AIS. An instance of this
            object class shall be used when, in one layer, flexibility is available or when there
is
            no adaptation to client.";;

    ATTRIBUTES
ePDHCTPId        GET;;;

REGISTERED AS {etsObjectClass 7};


ePDHCTPSource MANAGED OBJECT CLASS
DERIVED FROM "Recommendation M.3100:1992":connectionTerminationPointSource;
CHARACTERIZED BY
"Recommendation M.3100:1992":createDeleteNotificationsPackage,
ePDHCTPSourcePkg PACKAGE
BEHAVIOUR
ePDHCTPSourceBehaviourPkg BEHAVIOUR
DEFINED AS
"This object class originates a PDH hierarchy connection.";;

    ATTRIBUTES
ePDHCTPId        GET;;;

REGISTERED AS {etsObjectClass 8};


ePDHCTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    "Recommendation M.3100:1992":connectionTerminationPointBidirectional,
    ePDHCTPSink,
    ePDHCTPSource;

REGISTERED AS {etsObjectClass 9};
```

5.1.4   European PDH trail termination point

This subclause 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 (exTP, 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).

```
ePDHTTPSink MANAGED OBJECT CLASS
DERIVED FROM     "Recommendation M.3100:1992":trailTerminationPointSink;
CHARACTERIZED BY
    "Recommendation X.721: 1991":administrativeStatePackage,
    "Recommendation M.3100:1992":operationalStatePackage,
    "Recommendation M.3100:1992":createDeleteNotificationsPackage,
    "Recommendation M.3100:1992":stateChangeNotificationPackage,
    "Recommendation M.3100:1992":tmnCommunicationsAlarmInformationPkg,
    ePDHTTPSinkPkg PACKAGE
        BEHAVIOUR
        ePDHTTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class represents the termination of a PDH trail. A communicationsAlarm
            notification shall be issued if a Loss Of Frame (LOF) is detected. The probableCause
            parameter of the notification shall indicate LOF.
            The operationalState is disabled when a LOF is detected.";;

    ATTRIBUTES
    ePDHTTPId   GET;;;

REGISTERED AS {etsObjectClass 10};


ePDHTTPSource MANAGED OBJECT CLASS
DERIVED FROM "Recommendation M.3100:1992":trailTerminationPointSource;
CHARACTERIZED BY
    "Recommendation M.3100:1992":createDeleteNotificationsPackage,
    ePDHTTPSourcePkg PACKAGE
        BEHAVIOUR
        ePDHTTPSourceBehaviourPkg BEHAVIOUR
            DEFINED AS
```

```
                        "This object class originates a PDH hierarchy trail.";;
       ATTRIBUTES
       ePDHTTPId   GET;;;

REGISTERED AS {etsObjectClass 11};


ePDHTTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
     "Recommendation M.3100:1992":trailTerminationPointBidirectional,
     ePDHTTPSink,
     ePDHTTPSource;
CHARACTERIZED BY
     ePDHTTPBidirectionalPkg PACKAGE
         BEHAVIOUR
         ePDHTTPBidirectionalBehaviourPkg BEHAVIOUR
             DEFINED AS
             "A communicationsAlarm notification shall be issued if a Remote Alarm Indication
             (RAI) is detected. The probableCause parameter of the notification shall indicate
RAI.
             Detection of a RAI has no effect on the operationalState.";;;;

REGISTERED AS {etsObjectClass 12};
```

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**.

```
ePDHIntTTPSink  MANAGED OBJECT CLASS
  DERIVED FROM          ePDHATTPSink;
   CHARACTERIZED BY
    ePDHIntTTPSinkPkg  PACKAGE
         BEHAVIOUR
         ePDHIntTTPSinkBehaviourPkg 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.";;

          ATTRIBUTES
             trTrailTraceExpected              GET-REPLACE,
             trTrailTraceReceived              GET;;;

   REGISTERED AS { etsObjectClass 13 };


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 { etsObjectClass 14 };


ePDHIntTTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM ePDHATTPBidirectional,
     ePDHIntTTPSink,
     ePDHIntTTPSource;

REGISTERED AS  { etsObjectClass 15};
```

5.1.6   140 Mbit/s object classes

```
e4ATTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHATTPSink;
CHARACTERIZED BY
     e4ATTPSinkPkg  PACKAGE
         BEHAVIOUR
         e4ATTPSinkBehaviourPkg BEHAVIOUR
             DEFINED AS
             "This object class terminates a CCITT Recommendation G.702 [2] 140 Mbit/s
             trail.";;;;
```

```
REGISTERED AS {etsObjectClass 16};
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 {etsObjectClass 17};


e4ATTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHATTPBidirectional,
    e4ATTPSink,
    e4ATTPSource;

REGISTERED AS {etsObjectClass 18};


e4CTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHCTPSink;
CHARACTERIZED BY
    e4CTPSinkPkg  PACKAGE
        BEHAVIOUR
        e4CTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class terminates a CCITT Recommendation G.702 [2] 140 Mbit/s
            connection.";;;;

REGISTERED AS {etsObjectClass 19};


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 {etsObjectClass 20};


e4CTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHCTPBidirectional,
    e4CTPSink,
    e4CTPSource;

REGISTERED AS {etsObjectClass 21};
e4TTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHTTPSink;
CHARACTERIZED BY
    e4TTPSinkPkg PACKAGE
        BEHAVIOUR
        e4TTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class terminates a CCITT Recommendation G.702 [2] 140 Mbit/s
            trail.";;;;

REGISTERED AS {etsObjectClass 22};


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 {etsObjectClass 23};


e4TTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHTTPBidirectional,
    e4TTPSink,
```

```
       e4TTPSource;

REGISTERED AS {etsObjectClass 24};


e4IntTTPSink  MANAGED OBJECT CLASS
  DERIVED FROM          ePDHIntTTPSink;
   CHARACTERIZED BY
    e4IntTTPSinkPkg  PACKAGE
         BEHAVIOUR
         e4IntTTPSinkBehaviourPkg BEHAVIOUR
             DEFINED AS
             "This object class terminates a ETS 300 337 [1] 140 Mbit/s trail transporting ATM
             cells or SDH elements.";;;;

   REGISTERED AS { etsObjectClass 25};


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 { etsObjectClass 26};

e4IntTTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHIntTTPBidirectional,
    e4IntTTPSink,
    e4IntTTPSource;

REGISTERED AS  { etsObjectClass 27};
```

5.1.7   34 Mbit/s object classes

```
e3ATTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHATTPSink;
CHARACTERIZED BY
    e3ATTPSinkPkg  PACKAGE
         BEHAVIOUR
         e3ATTPSinkBehaviourPkg BEHAVIOUR
             DEFINED AS
             "This object class terminates a CCITT Recommendation G.702 [2] 34 Mbit/s trail.";;;;

REGISTERED AS {etsObjectClass 28};


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 {etsObjectClass 29};


e3ATTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHATTPBidirectional,
    e3ATTPSink,
    e3ATTPSource;

REGISTERED AS {etsObjectClass 30};


e3CTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHCTPSink;
CHARACTERIZED BY
    e3CTPSinkPkg  PACKAGE
         BEHAVIOUR
         e3CTPSinkBehaviourPkg BEHAVIOUR
             DEFINED AS
             "This object class terminates a CCITT Recommendation G.702 [2] 34 Mbit/s
             connection.";;;;

REGISTERED AS {etsObjectClass 31};
```

```
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 {etsObjectClass 32};


e3CTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHCTPBidirectional,
    e3CTPSink,
    e3CTPSource;

REGISTERED AS {etsObjectClass 33};


e3TTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHTTPSink;
CHARACTERIZED BY
    e3TTPSinkPkg PACKAGE
        BEHAVIOUR
        e3TTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class terminates a CCITT Recommendation G.702 [2] 34 Mbit/s trail.";;;;

REGISTERED AS {etsObjectClass 34};


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 {etsObjectClass 35};

e3TTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHTTPBidirectional,
    e3TTPSink,
    e3TTPSource;

REGISTERED AS {etsObjectClass 36};
e3IntTTPSink  MANAGED OBJECT CLASS
  DERIVED FROM          ePDHIntTTPSink;
  CHARACTERIZED BY
    e3IntTTPSinkPkg  PACKAGE
        BEHAVIOUR
        e3IntTTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class terminates a ETS 300 337 [1] 34 Mbit/s trail transporting ATM
            cells or SDH elements.";;;;

  REGISTERED AS { etsObjectClass 37};
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 { etsObjectClass 38};

e3IntTTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHIntTTPBidirectional,
    e3IntTTPSink,
    e3IntTTPSource;

REGISTERED AS  { etsObjectClass 39};
```

5.1.8   8 Mbit/s object classes

```
e2ATTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHATTPSink;
CHARACTERIZED BY
    e2ATTPSinkPkg  PACKAGE
        BEHAVIOUR
        e2ATTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class terminates a CCITT Recommendation G.702 [2] 8 Mbit/s trail.";;;;

REGISTERED AS {etsObjectClass 40};


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 {etsObjectClass 41};
e2ATTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHATTPBidirectional,
    e2ATTPSink,
    e2ATTPSource;

REGISTERED AS {etsObjectClass 42};


e2CTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHCTPSink;
CHARACTERIZED BY
    e2CTPSinkPkg  PACKAGE
        BEHAVIOUR
        e2CTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class terminates a CCITT Recommendation G.702 [2] 8 Mbit/s
            connection.";;;;

REGISTERED AS {etsObjectClass 43};


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 {etsObjectClass 44};


e2CTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHCTPBidirectional,
    e2CTPSink,
    e2CTPSource;

REGISTERED AS {etsObjectClass 45};


e2TTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHTTPSink;
CHARACTERIZED BY
    e2TTPSinkPkg PACKAGE
        BEHAVIOUR
        e2TTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class terminates a CCITT Recommendation G.702 [2] 8 Mbit/s trail.";;;;

REGISTERED AS {etsObjectClass 46};
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 {etsObjectClass 47};


e2TTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHTTPBidirectional,
    e2TTPSink,
    e2TTPSource;

REGISTERED AS {etsObjectClass 48};
```

5.1.9   2 Mbit/s object classes

```
e1ATTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHATTPSink;
CHARACTERIZED BY
    e1ATTPSinkPkg  PACKAGE
        BEHAVIOUR
        e1ATTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class terminates a CCITT Recommendation G.702 [2] 2 Mbit/s trail.";;;;

REGISTERED AS {etsObjectClass 49};


e1ATTPSource MANAGED OBJECT CLASS
DERIVED FROM ePDHATTPSource;
CHARACTERIZED BY
    e1ATTPSourcePkg PACKAGE
        BEHAVIOUR
        e1ATTPSourceBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class originates a CCITT Recommendation G.702 [2] 2 Mbit/s trail.";;;;

REGISTERED AS {etsObjectClass 50};

e1ATTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHATTPBidirectional,
    e1ATTPSink,
    e1ATTPSource;

REGISTERED AS {etsObjectClass 51};
e1CTPSink MANAGED OBJECT CLASS
    DERIVED FROM      ePDHCTPSink;
    CHARACTERIZED BY
        e1CTPSinkPkg  PACKAGE
            BEHAVIOUR
                        e1CTPSinkBehaviourPkg BEHAVIOUR
DEFINED AS
"This object class terminates a CCITT Recommendation G.702 2 Mbit/s connection. There are
communication alarms for byte synchronous mapping only. A communicationsAlarm notification shall
be issued if a Loss Of Frame (LOF) is detected. The probableCause parameter of the notification
shall indicate LOF (Loss Of Frame).The operational state is disabled when a LOF alarm is
reportable on an instance.";;;;
REGISTERED AS {etsObjectClass 52};


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 {etsObjectClass 53};


e1CTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHCTPBidirectional,
    e1CTPSink,
    e1CTPSource;
REGISTERED AS {etsObjectClass 54};


e1TTPSink MANAGED OBJECT CLASS
DERIVED FROM ePDHTTPSink;
```

```
CHARACTERIZED BY
    e1TTPSinkPkg  PACKAGE
        BEHAVIOUR
        e1TTPSinkBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class terminates a CCITT Recommendation G.702 [2] 2 Mbit/s trail.";;;;

REGISTERED AS {etsObjectClass 55};


e1TTPSource MANAGED OBJECT CLASS
DERIVED FROM ePDHTTPSource;
CHARACTERIZED BY
    e1TTPSourcePkg PACKAGE
        BEHAVIOUR
        e1TTPSourceBehaviourPkg BEHAVIOUR
            DEFINED AS
            "This object class originates a CCITT Recommendation G.702 [2] 2 Mbit/s trail.";;;;
REGISTERED AS {etsObjectClass 56};
e1TTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    ePDHTTPBidirectional,
    e1TTPSink,
    e1TTPSource;

REGISTERED AS {etsObjectClass 57};
```

5.1.10 64 kbit/s object classes

```
e0CTPSink MANAGED OBJECT CLASS
DERIVED FROM "Recommendation M.3100:1992":connectionTerminationPointSink;
CHARACTERIZED BY
"Recommendation M.3100:1992":createDeleteNotificationsPackage,
"Recommendation M.3100:1992":operationalStatePackage,
"Recommendation M.3100:1992":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 {etsObjectClass 58};
e0CTPSource MANAGED OBJECT CLASS
DERIVED FROM "Recommendation M.3100:1992":connectionTerminationPointSource;
CHARACTERIZED BY
    "Recommendation M.3100:1992":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 {etsObjectClass 59};


e0CTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
    "Recommendation M.3100:1992":connectionTerminationPointBidirectional,
    e0CTPSink,
    e0CTPSource;

REGISTERED AS {etsObjectClass 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 {etsAttribute 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 {etsAttribute 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 {etsAttribute 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 {etsAttribute 4};


trTrailTraceReceive 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 {etsAttribute 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 {etsAttribute 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 {etsAttribute 7};
```

5.3   Name bindings definitions

```
pPITTPSink-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS pPITTPSink AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "Recommendation M.3100:1992":managedElement AND SUBCLASSES;
    WITH ATTRIBUTE pPITTPId;
    CREATE
            WITH-REFERENCE-OBJECT,
            WITH-AUTOMATIC-INSTANCE-NAMING;
        DELETE
            DELETES-CONTAINED-OBJECTS;
REGISTERED AS { etsNameBinding 1 };

pPITTPSource-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS pPITTPSource AND SUBCLASSES;
```

```
    NAMED BY SUPERIOR OBJECT CLASS "Recommendation M.3100:1992":managedElement AND SUBCLASSES;
    WITH ATTRIBUTE pPITTPId;
    CREATE
            WITH-REFERENCE-OBJECT,
            WITH-AUTOMATIC-INSTANCE-NAMING;
      DELETE
              DELETES-CONTAINED-OBJECTS;
REGISTERED AS { etsNameBinding 2 };


ePDHTTPSink-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHTTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS "Recommendation M.3100:1992":managedElement AND SUBCLASSES;
    WITH ATTRIBUTE          ePDHTTPId;
       BEHAVIOUR ePDHTTPSink-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 {etsNameBinding 3};
ePDHTTPSource-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHTTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS "Recommendation M.3100:1992":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 {etsNameBinding 4};


ePDHCTPSink-pPITTPSink NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHCTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     pPITTPSink AND SUBCLASSES;
    WITH ATTRIBUTE            ePDHCTPId;
    BEHAVIOUR
       ePDHCTPSink-pPITTPSinkBehaviour 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 {etsNameBinding 5};

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 {etsNameBinding 6};

e0CTPSink-pPITTPSink NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     pPITTPSink AND SUBCLASSES;
    WITH ATTRIBUTE            e0CTPId;
    BEHAVIOUR
       e0CTPSink-pPITTPSinkBehaviour 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 {etsNameBinding 7};

e0CTPSource-pPITTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     pPPITTPSource 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 {etsNameBinding 8};
```

```
ePDHCTPSink-ePDHTTPSink NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHCTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    ePDHTTPSink AND SUBCLASSES;
    WITH ATTRIBUTE           ePDHCTPId;
    BEHAVIOUR
       ePDHCTPSink-ePDHTTPSinkBehaviour 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 {etsNameBinding 9};

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 {etsNameBinding 10};

e0CTPSink-e1TTPSink NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    e1TTPSink AND SUBCLASSES;
    WITH ATTRIBUTE           e0CTPId;
    BEHAVIOUR
       e0CTPSink-e1TTPSinkBehaviour 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 {etsNameBinding 11};
e0CTPSource-e1TTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    e1TTPSource AND SUBCLASSES;
    WITH ATTRIBUTE           e0CTPId;
    BEHAVIOUR
       e0CTPSource-e1TTPSourceBehaviour 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 {etsNameBinding 12};


ePDHATTPSink-pPITTPSink NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHATTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    pPITTPSink AND SUBCLASSES;
    WITH ATTRIBUTE           ePDHTTPId;
    BEHAVIOUR
       ePDHATTPSink-pPITTPSinkBehaviour 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 {etsNameBinding 13};

ePDHATTPSource-pPITTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS ePDHATTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    pPITTPSource AND SUBCLASSES;
    WITH ATTRIBUTE           ePDHTTPId;
    BEHAVIOUR
       ePDHATTPSink-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 {etsNameBinding 14};


e0CTPSink-e1ATTPSink NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS    e1ATTPSink AND SUBCLASSES;
    WITH ATTRIBUTE           e0CTPId;
```

```
      BEHAVIOUR
        e0CTPSink-e1ATTPSinkBehaviour 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 {etsNameBinding 15};
e0CTPSource-e1ATTPSource NAME BINDING
    SUBORDINATE OBJECT CLASS e0CTPSource AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     e1ATTPSource AND SUBCLASSES;
    WITH ATTRIBUTE            e0CTPId;
    BEHAVIOUR
        e0CTPSource-e1ATTPSourceBehaviour 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 {etsNameBinding 16};

e3ATTPSink-e4ATTPSink NAME BINDING
    SUBORDINATE OBJECT CLASS e3ATTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     e4ATTPSink AND SUBCLASSES;
    WITH ATTRIBUTE            ePDHTTPId;
    BEHAVIOUR
        e3ATTPSink-e4ATTPSinkBehaviour 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 {etsNameBinding 17};

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 {etsNameBinding 18};


e2ATTPSink-e3ATTPSink NAME BINDING
    SUBORDINATE OBJECT CLASS e2ATTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     e3ATTPSink AND SUBCLASSES;
    WITH ATTRIBUTE            ePDHTTPId;
    BEHAVIOUR
        e2ATTPSink-e3ATTPSinkBehaviour 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 {etsNameBinding 19};
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 {etsNameBinding 20};

e1ATTPSink-e2ATTPSink NAME BINDING
    SUBORDINATE OBJECT CLASS e1ATTPSink AND SUBCLASSES;
    NAMED BY
    SUPERIOR OBJECT CLASS     e2ATTPSink AND SUBCLASSES;
    WITH ATTRIBUTE            ePDHTTPId;
    BEHAVIOUR
        e1ATTPSink-e2ATTPSinkBehaviour 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 {etsNameBinding 21};
```

```
e1ATTPSource-e2ATTPSource NAME BINDING
   SUBORDINATE OBJECT CLASS e1ATTPSource AND SUBCLASSES;
   NAMED BY
   SUPERIOR OBJECT CLASS    e2ATTPSource;
   WITH ATTRIBUTE           ePDHTTPId;
   BEHAVIOUR
      e1ATTPSource-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 {etsNameBinding 22};
```

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
}

END -- end of ASN1DefinedTypesModule
```
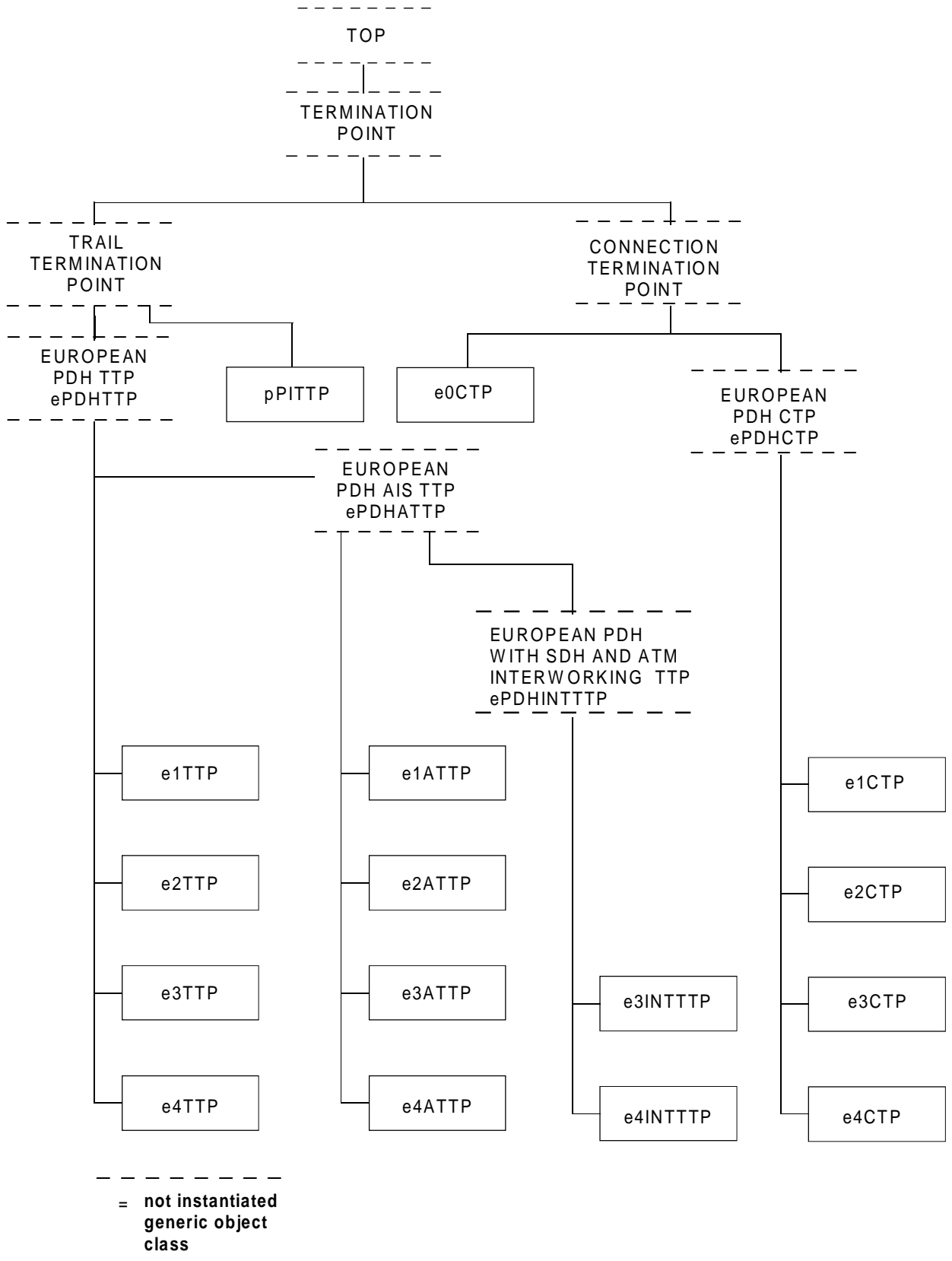
Figure 1: PDH transport object inheritance (all PDH objects may be source, sink or bidirectional)
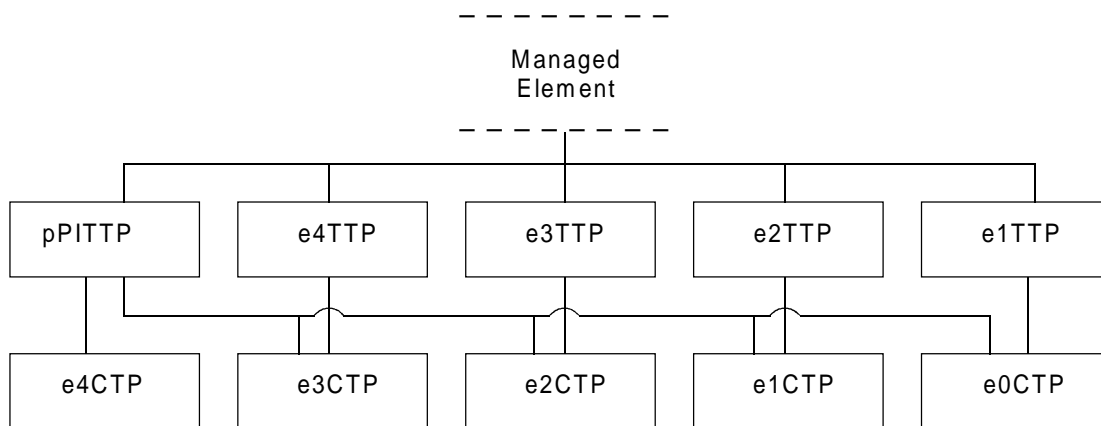
```
 _ _ _ _ _ _ _
     Managed
     Element
 _ _ _ _ _ _ _
```

pPITTP	e4TTP	e3TTP	e2TTP	e1TTP

e4CTP	e3CTP	e2CTP	e1CTP	e0CTP

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

```
 _ _ _ _ _ _ _
     Managed
     Element
 _ _ _ _ _ _ _
```

pPITTP

e4CTP	e4ATTP

e3CTP	e3ATTP

e2CTP	e2ATTP

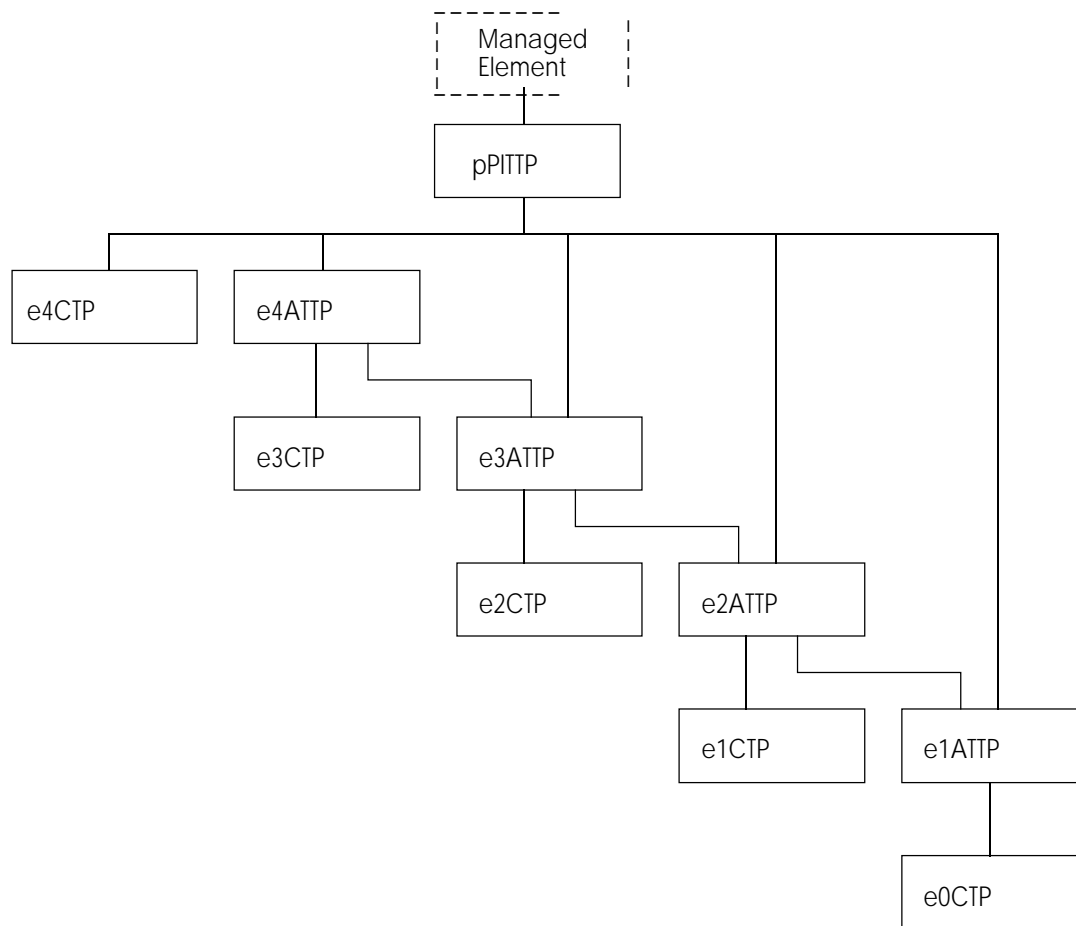| e1CTP	e1ATTP

e0CTP

Figure 3: PDH object naming when no PDH cross connectivity is available
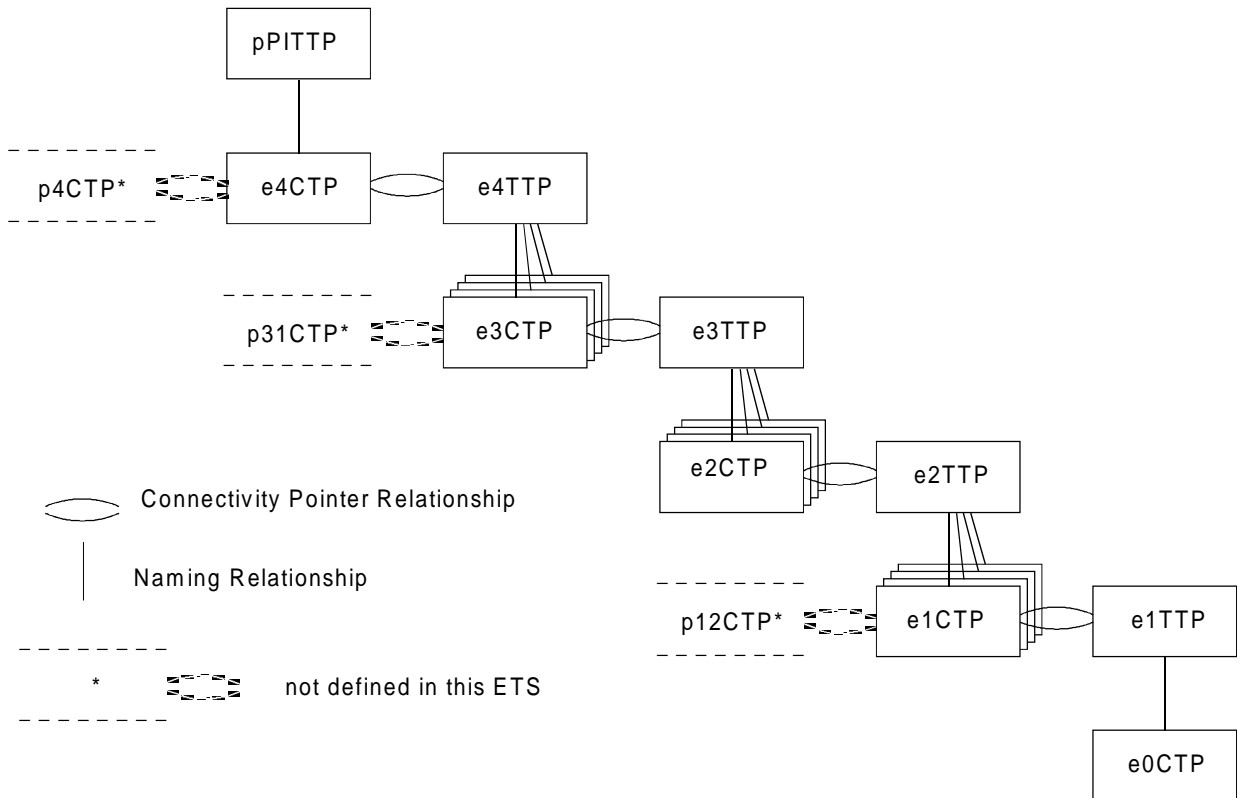
Figure 4: Naming and pointer relationships for PDH and relationship with SDH object classes
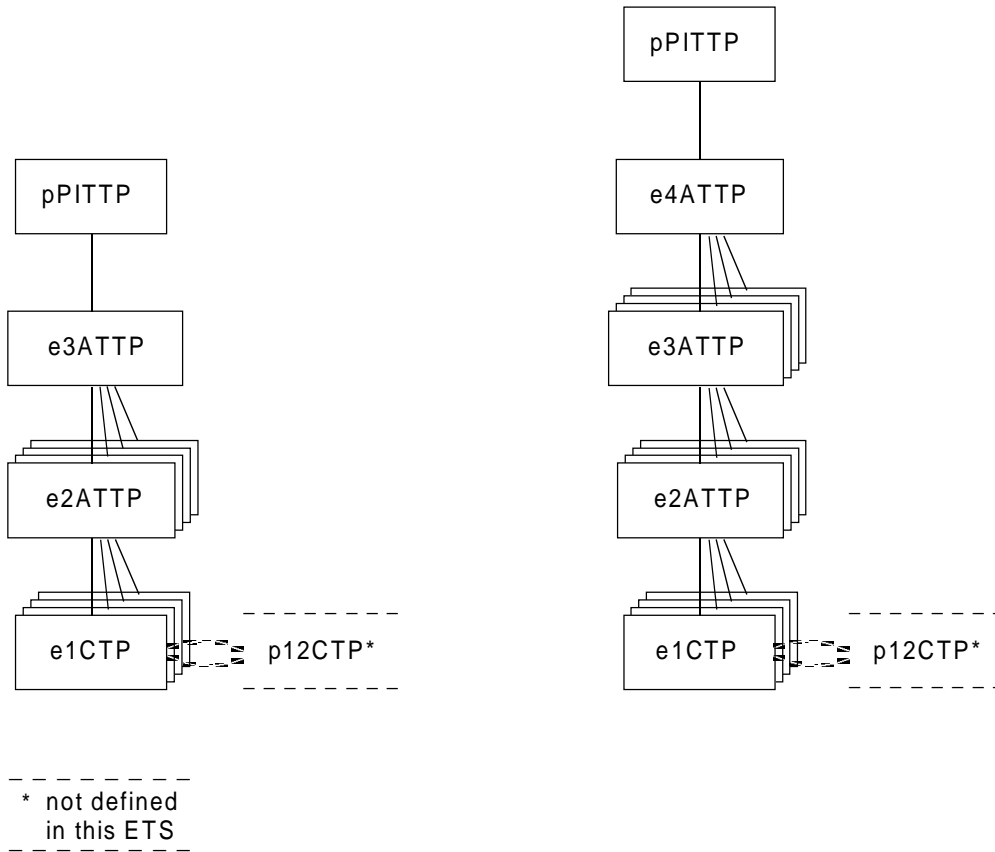
pPITTP

pPITTP

e4ATTP

e3ATTP

e3ATTP

e2ATTP

e2ATTP

e1CTP   p12CTP*

e1CTP   p12CTP*

* not defined
in this ETS

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

p12CTP *

LPA *

LPT *
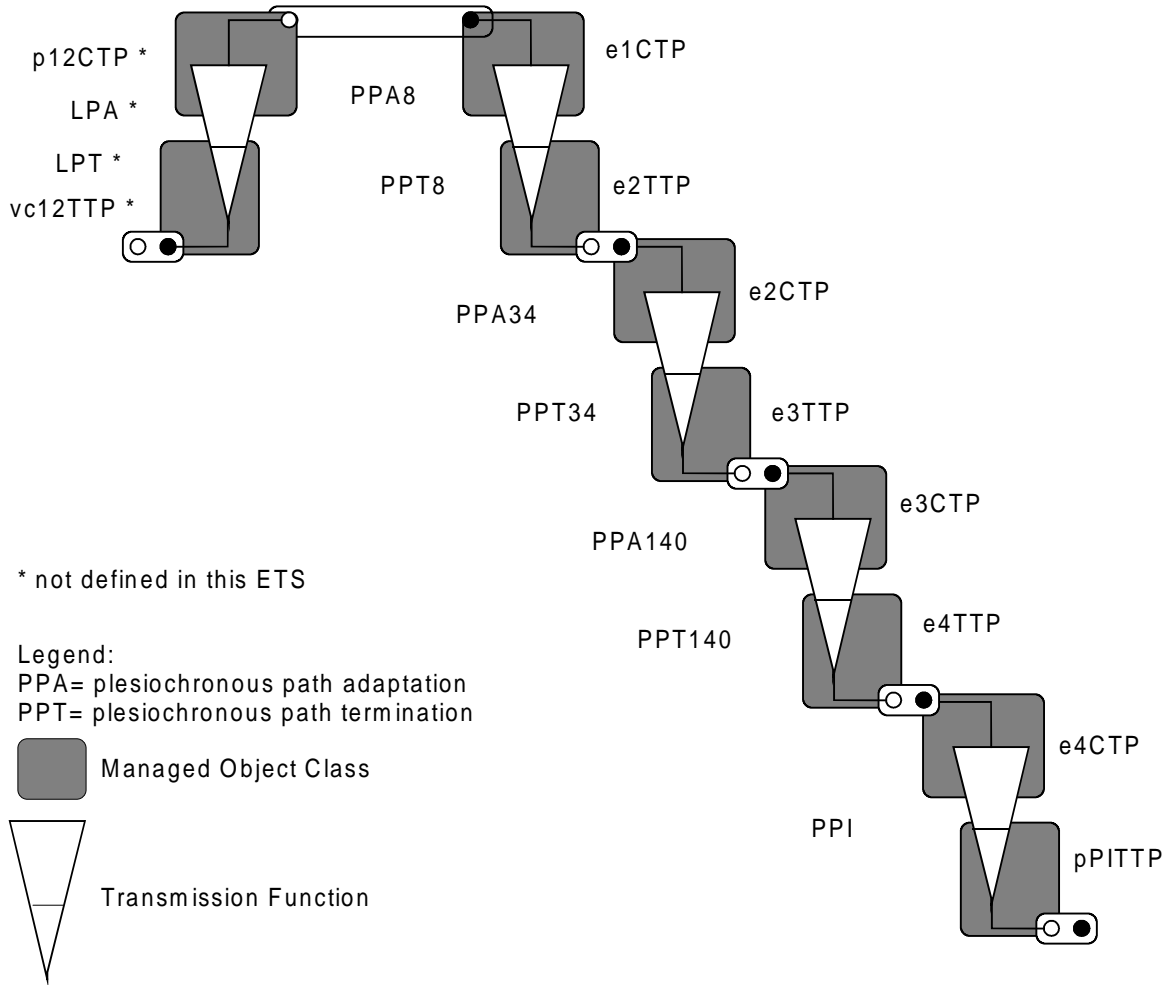
vc12TTP *

PPA8

e1CTP

PPT8

e2TTP

PPA34

e2CTP

PPT34

e3TTP

PPA140

e3CTP

PPT140

e4TTP

e4CTP

PPI

pPITTP

* not defined in this ETS

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

Managed Object Class

Transmission Function

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

p12CTP *

e1CTP

LPA *

PPA8

LPT *

PPT8

vc12TTP *

e2ATTP

* not defined in this ETS

PPA34

PPT34

e3ATTP

PPA140

PPT140

e4ATTP

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

Managed Object Class
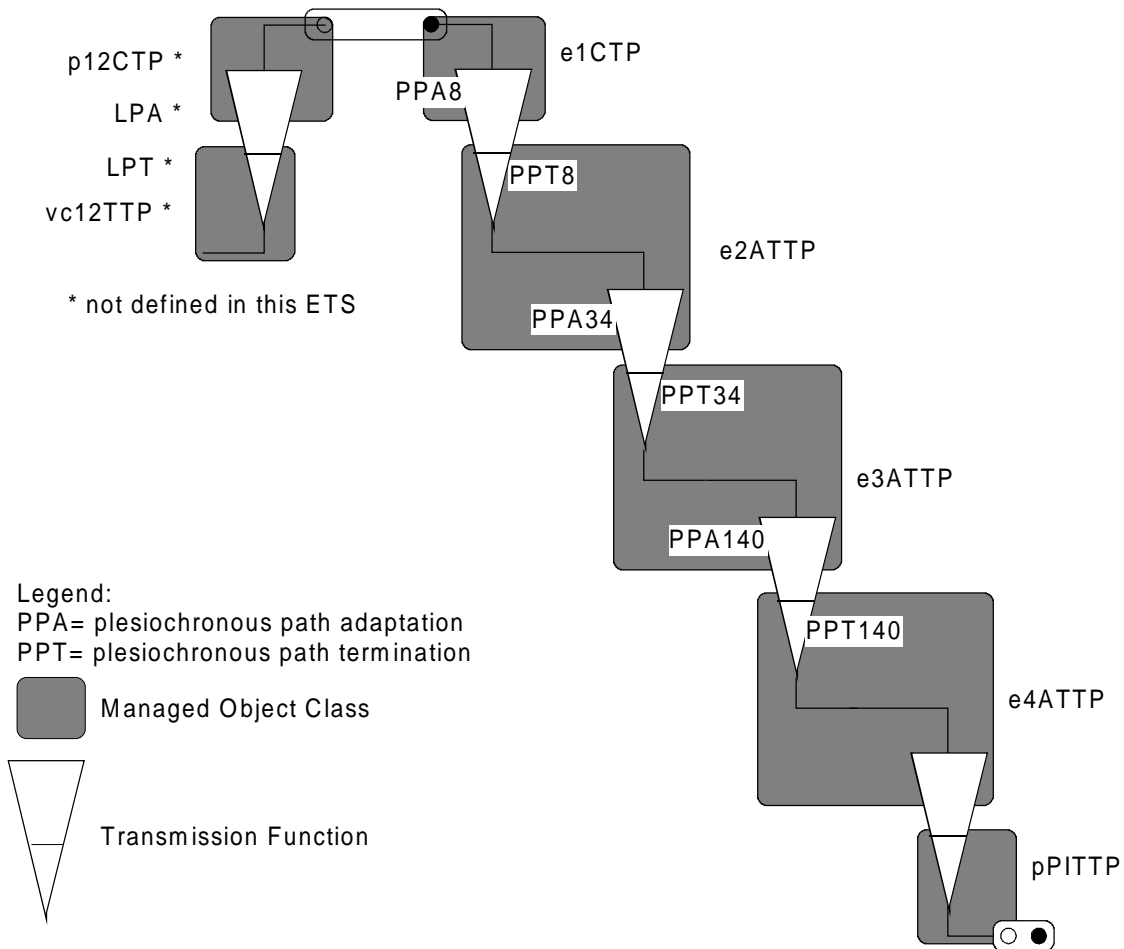
Transmission Function

pPITTP

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

History

Document history	
November 1994	First Edition
October 1996	Second Edition