JTC 1

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AMENDMENT 1
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Information technology — Telecommunications and information exchange between systems — Elements of Management Information Related to OSI Transport Layer Standards

AMENDMENT 1: NCMS Management

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Éléments d'information de gestion concernant les normes de la couche Transport OSI

AMENDEMENT 1: Gestion de NCMS

Reference number
ISO/IEC 10737:1994/Amd.1:1994(E)

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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Introduction

ISO/IEC 10737 specifies the elements of management information relating to OSI Transport Layer service and protocol described in ISO/IEC 8072 and ISO/IEC 8073. However the management information relating to Network Connection Management Subprotocol (NCMS) is not included.

This amendment adds to ISO/IEC 10737 the elements of management information relating to NCMS described in annex B of ISO/IEC 8073.

This amendment has a structure which is similar to that of ISO/IEC 10737 in order to facilitate cross reference between the two documents.

Information technology — Telecommunications and information exchange between systems — Elements of Management Information Related to OSI Transport Layer Standards

AMENDMENT 1: NCMS Management

4 Symbols and Abbreviations

Insert the following symbols and abbreviations after MO:

NC	Network Connection
NCC	Network Connection Control
NCMS	Network Connection Management Subprotocol

5 Elements of Transport Layer Management Information

5.1 Managed Object Hierarchy

5.1.1 Summary of Managed Objects

Add the following new items after item g):

h) NCMS Protocol Machine management object (ncmsPM,clause 5.9)
i) NetworkConnection Control managed object (ncc,clause 5.10.1)
j) NetworkConnection Control Initial Value managed object (nccIV,clause 5.10.2).

Replace figure 1 by the following figure:

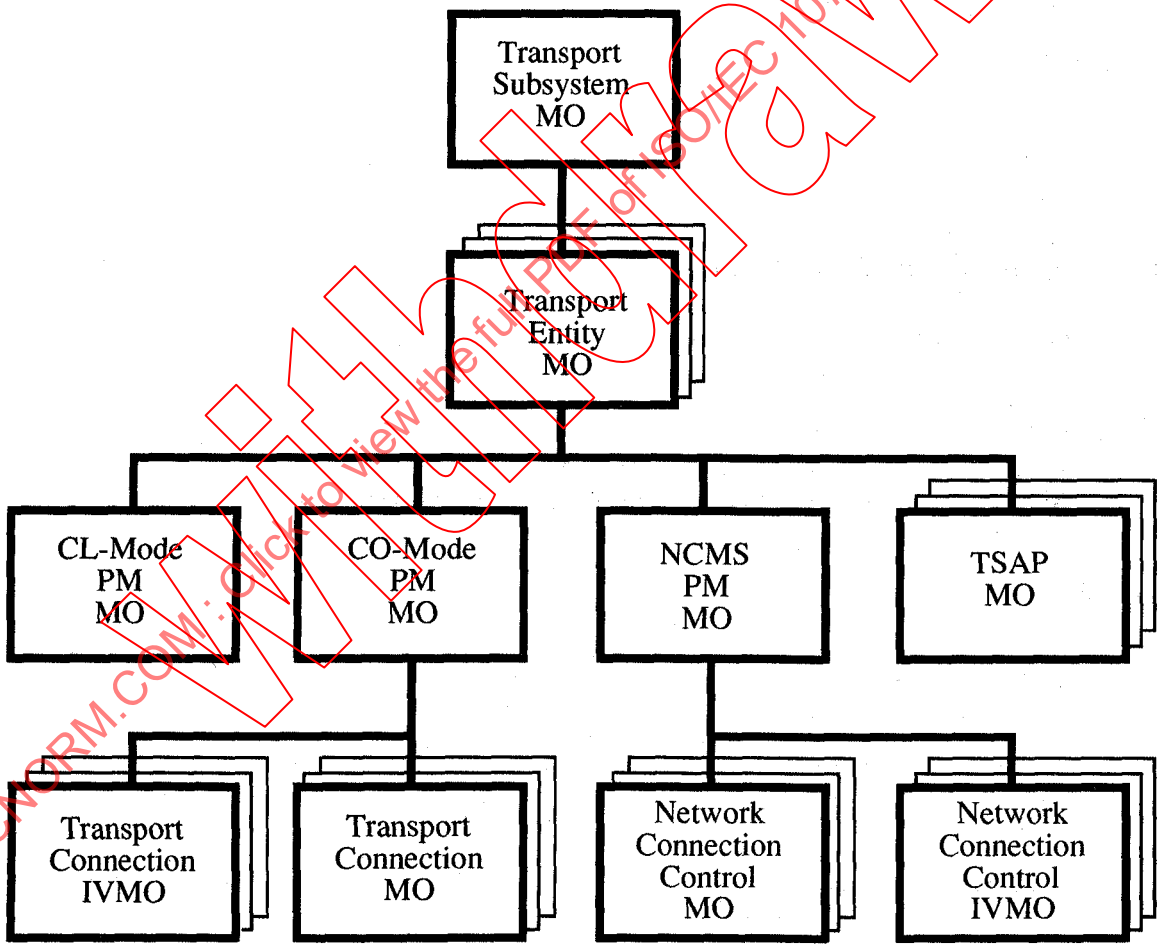

Figure 1-Transport Layer Containment Hierarchy

Add the following new subclause 5.9:

5.9 NCMS Protocol Machine

```
ncmsPM MANAGED OBJECT CLASS
   DERIVED FROM "DMI":top;
   CHARACTERIZED BY ncmsPM-P PACKAGE
      BEHAVIOUR
      commonCreationDeletion-B,
      commonStateChange-B,
     ncmsPMPackageImportedNotificatuions-B,
      ncmsPM-B BEHAVIOR
      DEFINED AS
         !This managed object class represents the part of transport entity that performs the
          NCMS protocol.
          Only one instance of this managed object class may exist within a TEMO instance.!
      ;
   ;

   ATTRIBUTES
      ncmsPMId GET,
      "DMI":administrativeState GET-REPLACE,
      "DMI":operationalState GET;
   ACTIONS
      "GMI":activate,
      "GMI":deactivate;

   NOTIFICATIONS
      "DMI":communicationsAlarm,
         ncmsPMPDUHeader,
         ncmsPMSourceAddress,
      "DMI":objectCreation,
      "DMI":objectDeletion,
      "DMI":stateChange
   ;
;
REGISTERED AS{TLM.moi ncmsPM (8)};
```

--- Behaviours

```
ncmsPMPackageImportedNotifications-B BEHAVIOUR
    DEFINED AS
        !The ncmsPM-P package imports communicationsAlarm from DMI, in order to report
        the failure of NC sharing. The probableCause is set to
        TLM.communicationsProtocolError. The ncmsPMPDUHeader and ncmsPMSourceAddress
        are reported as parameters in the additionalInformation field of the communicationsAlarm.
        The significance subparameter of each item of the additionalInformation shall be set to the
        value 'False' (i.e. not significant) so that a managing system receiving the event will be less
        likely to reject it. The perceivedSeverity shall be set to Minor.
        A subsequent communicationsAlarm with a perceived Severity value of 'Cleared' shall not
        be generated. No other fields or parameters shall be used, with the exception of further parameters
        in the additionalInformation field.!
    ;
```

--- Name Bindings

```
ncmsPM-transportEntity-Management NAME BINDING
   SUBORDINATE OBJECT CLASS ncmsPM AND SUBCLASSES;
   NAMED BY
      SUPERIOR OBJECT CLASS transportEntity AND SUBCLASSES;
      WITH ATTRIBUTE ncmsPMId;
   BEHAVIOUR
      ncmsPM-transportEntity-B BEHAVIOUR
      DEFINED AS
         !The name binding that applies when the ncmsPM managed object is explicitly created
          by management.!
      ;
   ;
   CREATE;
   DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS{TLM.nboi ncmsPM-transportEntity-Management (13)};
```

```
ncmsPM-transportEntity-Automatic NAME BINDING
   SUBORDINATE OBJECT CLASS ncmsPM AND SUBCLASSES;
   NAMED BY
      SUPERIOR OBJECT CLASS transportEntity AND SUBCLASSES;
      WITH ATTRIBUTE ncmsPMId;
   BEHAVIOUR
      ncmsPM-transportEntity-B BEHAVIOUR
      DEFINED AS
         !The name binding that applies when the ncmsPM managed object is created .
         The name binding that applies when the ncmsPM managed object can not be explicitly
         created by management.!
      ;
   ;
REGISTERED AS{TLM.nboi ncmsPM-transportEntity-Automatic (14)};
```

--- Attribute

```
ncmsPMId ATTRIBUTE
   WITH ATTRIBUTE SYNTAX ASN1DefinedTypesModule.NameSyntax;
   MATCHES FOR EQUALITY;
   BEHAVIOUR
      ncmsPMId-B BEHAVIOUR
      DEFINED AS
         !The attribute that is used in naming instances of the ncms Protocol Machine
         managed object class.!
      ;
   ;
REGISTERED AS{TLM.aoi ncmsPMId (67)};
```

--- **Parameters**

```
ncmsPMPHeader PARAMETER
    CONTEXT EVENT-INFO;
    WITH SYNTAX TLM.PDUHeaderSyntax;
    BEHAVIOUR ncmsPMPDUHeader-B BEHAVIOUR
          DEFINED AS
             !Header of the PDU that causes the failure of NC sharing.
             Returned in the problemData field of a communicationsAlarm notification.
          ;
    ;
REGISTERED AS {TLM.proi ncmsPMPDUHeader (8)};


ncmsPMSourceAddress PARAMETER
    CONTEXT EVENT-INFO;
    WITH SYNTAX TLM.SourceAddressSyntax;
    BEHAVIOUR ncmsPMSourceAddress-B BEHAVIOUR
          DEFINED AS
             !Source N-Address.
             Returned in the problemData field of a communicationsAlarm notification.
          ;
    ;
REGISTERED AS{TLM.proi ncmsPMSourceAddress (9)};
```

Add the following new subclause 5.10:

5.10 Network Connection Control MO and IVMO

5.10.1 Network Connection Control Managed Object

```
nccMANAGED OBJECT CLASS
   DERIVED FROM "DMI":top;
   CHARACTERIZED BY ncc-P PACKAGE
      BEHAVIOUR
         nccInitialValues-B,
         ncc-B BEHAVIOUR
          DEFINED AS
               !This managed object class represents the management aspect of the information needed
                to control the network connections by NCMS.
                Multiple instances of this managed object class may exist within a NCMSPM MO instance.
               This MO is created and deleted as a result of NCMS operation.!
         ;
      ;
      ATTRIBUTES
         nccId GET,
         nc-COL GET,
         nc-REC GET,
         nc-REF GET,
         nc-PREF GET,
         nc-Right GET,
         ncRecoveries GET,
         ttrNCTime GET,
         tpdNCTime GET,
         tfrNCTime GET,
         sourceOfAllocation GET,
         "GMI":underlyingConnectionNames GET;

      NOTIFICATIONS
         "DMI":objectCreation,
         "DMI":objectDeletion;
   ;
;
REGISTERED AS {TLM.moi ncc (9)};
```

5.10.2 Network Connection Control Initial Value Managed Object

```
nccIVMO MANAGED OBJECT CLASS
   DERIVED FROM "DMI":top;
   CHARACTERIZED BY nccIVMO-P PACKAGE
      BEHAVIOUR
         use-of-nccInitialValues-B,
        nccIVMO-B BEHAVIOUR
         DEFINED AS
               !This managed object class represents the set of initial values for NCC MO instances.
               Multiple instances of this managed object class may exist within a NCMSPM MO instance.
               The relationship between instances of NCC MO and NCCIV MO is not specified
               in this standard.!
         ;
      ;
      ATTRIBUTES
         nccIVMOId  GET,
         nc-COL  REPLACE-WITH-DEFAULT GET-REPLACE,
         nc-REC  REPLACE-WITH-DEFAULT GET-REPLACE,
         nc-PREF  REPLACE-WITH-DEFAULT GET-REPLACE,
         nc-Right  REPLACE-WITH-DEFAULT GET-REPLACE,
         ttrNCTime  REPLACE-WITH-DEFAULT GET-REPLACE,
         tpdNCTime  REPLACE-WITH-DEFAULT GET-REPLACE,
         tfrNCTime  REPLACE-WITH-DEFAULT GET-REPLACE;
   ;
;
REGISTERED AS{TLM.moi nccIVMO(10)};

--- NCC INITIAL VALUES BEHAVIOUR

nccInitialValues-B BEHAVIOUR
   DEFINED AS
      !When an instance of the NCC MO is created using the ncc-ncmsPM name binding,the initial values
      for some of the attributes of the NCC MO may be supplied by an instance of the NCC IVMO. The
      means by which an instance(if any) of the NCC IVMO are identified are a local matter.!
   ;

--- USE OF NCC INITIAL VALUES BEHAVIOUR

use-of-nccInitialValues-B BEHAVIOUR
   DEFINED AS
      !The creation of an instance of the NCC MO using the ncc-ncmsPM name binding may reference an instance
      of NCC IVMO. When this occurs,some of the initial values of the attributes of the instance of NCC MO
      may be supplied by the values of the attributes in the specified instance of the NCC IVMO.
      However any such value may be overridden by a value supplied by local means(for example across an internal
      interface). Where values are supplied by the IVMO,the initial values of an attribute of NCC MO shall be the
      value of the corresponding attribute in the NCC IVMO(that is,which has the same attribute template label).!
   ;
```

--- Name Binding

```
ncc-ncmsPM NAME BINDING
   SUBORDINATE OBJECT CLASS ncc AND SUBCLASSES;
   NAMED BY
      SUPERIOR OBJECT CLASS ncmsPM AND SUBCLASSES;
     WITH ATTRIBUTE nccId;
   BEHAVIOUR
     ncc-ncmsPM-B BEHAVIOUR
      DEFINED AS
           !The name binding that applies when the ncc managed object is created and deleted.!
      ;
   ;
   CREATE WITH-REFERENCE-OBJECT;
   DELETE;
REGISTERED AS{TLM.nboi ncc-ncmsPM (15)};


nccIVMO-ncmsPM NAME BINDING
   SUBORDINATE OBJECT CLASS nccIV AND SUBCLASSES;
   NAMED BY
      SUPERIOR OBJECT CLASS ncmsPM AND SUBCLASSES;
     WITH ATTRIBUTE nccIVMOId;
   BEHAVIOUR
     nccIVMO-ncmsPM-B BEHAVIOUR
      DEFINED AS
           !The name binding that applies when the nccIV managed object is created and deleted.!
      ;
   ;
   CREATE WITH-REFERENCE-OBJECT;
   DELETE;
REGISTERED AS{TLM.nboi nccIV-ncmsPM(16)};
```

--- Attribute

```
nccId ATTRIBUTE
   WITH ATTRIBUTE SYNTAX ASN1DefinedTypesModule.NameType;
   MATCHES FOR EQUALITY;
   BEHAVIOUR
     nccId-B BEHAVIOUR
      DEFINED AS
           !The attribute that is used in naming instances of the network connection control
         managed object class.!
      ;
   ;
REGISTERED AS{TLM.aoi nccId (68)};
```

```
nccIVMOId ATTRIBUTE
  WITH ATTRIBUTE SYNTAX ASN1DefinedTypesModule.NameType;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
    nccIVMOId-B BEHAVIOUR
      DEFINED AS
        !The attribute that is used in naming instances of the network connection control
        initial value managed object class.!
      ;
  ;
REGISTERED AS{TLM.aoi nccIVMOId (69)};


nc-COL ATTRIBUTE
  WITH ATTRIBUTE SYNTAX TLM.NC-COLSyntax;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
    nc-COL-B BEHAVIOUR
      DEFINED AS
        !The attribute that indicates the collision algorithm as defined in ANNEX B of ISO/IEC 8073.
        In NCCIV managed object, indicates the collision algorithm to be used. In NCC managed object,
        indicates the collision algorithm in use.!
      ;
  ;
REGISTERED AS{TLM.aoi nc-COL (70)};


nc-PREF ATTRIBUTE
  WITH ATTRIBUTE SYNTAX TLM.NC-PREFSyntax;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
    nc-PREF-B BEHAVIOUR
      DEFINED AS
        !The attribute that indicates the preference the initiator has to keep the network connection
        as defined in ANNEX B of ISO/IEC 8073.
        In NCCIV managed object, indicates the preference to be used.
        In NCC managed object, indicates the preference in use.!
      ;
  ;
REGISTERED AS{TLM.aoi nc-PREF (71)};


nc-REC ATTRIBUTE
  WITH ATTRIBUTE SYNTAX TLM.NC-RECSyntax;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
    nc-REC-B BEHAVIOUR
      DEFINED AS
        !The attribute that indicates the recovery optimization option as defined in ANNEX B of ISO/IEC 8073.
        In NCCIV managed object, indicates the recovery optimization option to be used.
        In NCC managed object, indicates the recovery optimization option in use.!
      ;
  ;
REGISTERED AS{TLM.aoi nc-REC (72)};
```

```
nc-REF ATTRIBUTE
   WITH ATTRIBUTE SYNTAX TLM.NC-REFSyntax;
   MATCHES FOR EQUALITY;
   BEHAVIOUR
      nc-REF-B BEHAVIOUR
       DEFINED AS
         !The attribute that indicates the nc-reference as defined in ANNEX B of ISO/IEC 8073.!
       ;
   ;
REGISTERED AS{TLM.aoi nc-REF (73)};


ncRecoveries ATTRIBUTE
   DERIVED FROM "GMI":nonwrapping64BitCounter;
   BEHAVIOUR
      ncRecoveries-B BEHAVIOUR
       DEFINED AS
         !The attribute that indicates the total number of network connection successful recoveries.!
       ;
   ;
REGISTERED AS{TLM.aoi ncRecoveries (74)};


nc-Right ATTRIBUTE
   WITH ATTRIBUTE SYNTAX TLM.NC-RightSyntax;
   MATCHES FOR EQUALITY;
   BEHAVIOUR
      nc-Right-B BEHAVIOUR
       DEFINED AS
         !The attribute that indicates the type of right of use as defined in ANNEX B of ISO/IEC 8073.
         In NCCIV managed object, indicates the type of right of use to be used. Namely, the value "my-side"
         means "SA", "remote-side" means "RA" and "both-sides" means "RR".
          In NCC managed object, indicates the type of right of use in use.!
       ;
   ;
REGISTERED AS{TLM.aoi networkConnectionRight (75)};


sourceOfAllocation ATTRIBUTE
   WITH ATTRIBUTE SYNTAX TLM.SourceOfAllocationSyntax;
   MATCHES FOR EQUALITY;
   BEHAVIOUR
      sourceOfAllocation-B BEHAVIOUR
       DEFINED AS
         !The attribute that indicates the transport entity that established the network connection at the first time
         during the life time of an NC reference.!
       ;
   ;
REGISTERED AS{TLM.aoi sourceOfAllocation (76)};
```

```
tfrNCTime ATTRIBUTE
   DERIVED FROM "GMI":timer;
   BEHAVIOUR
      tfrNCTime-B BEHAVIOUR
       DEFINED AS
         !Value of the TFR-NC timer as defined in ANNEX B of ISO/IEC 8073.!
       ;
   ;
REGISTERED AS{TLM.aoi tfrNCTime (77)};


tpdNCTime ATTRIBUTE
   DERIVED FROM "GMI":timer;
   BEHAVIOUR
      tpdNCTime-B BEHAVIOUR
       DEFINED AS
         !Value of the TPD-NC timer as defined in ANNEX B of ISO/IEC 8073.!
       ;
   ;
REGISTERED AS{TLM.aoi tpdNCTime (78)};


ttrNCTime ATTRIBUTE
   DERIVED FROM "GMI":timer;
   BEHAVIOUR
      ttrNCTime-B BEHAVIOUR
       DEFINED AS
         !Value of the TTR-NC timer as defined in ANNEX B of ISO/IEC 8073.!
       ;
   ;
REGISTERED AS{TLM.aoi ttrNCTime (79)};
```

6 ASN.1 Module

6.2 Other Definitions

Add the following definitions:

```
NC-COLSyntax::=ENUMERATED{nc-COL0(0)}

NC-PREFSyntax::=ENUMERATED{highest(0),
                           medium(1),
                           lowest(3)}

NC-RECSyntax::=ENUMERATED{pleaseDoNotRecover(0),
                          pleaseRecover(1)}

NC-REFSyntax::=INTEGER

NC-RightSyntax::=ENUMERATED{my-side(1),
                            remote-side(2),
                            both-sides(3)}

SourceOfAllocationSyntax:=ENUMERATED{local(0),
                                     remote(1)}
```

Annex A
(normative)

Allocation of Object Identifiers

Add the following objectclass Identifiers :

ncmsPM (8)
ncc (9)
nccIVMO (10)

Add the following parameter Identifiers:

ncmsPMPDUHeader (8)
ncmsPMSourceAddress(9)

Add the following namebinding Identifiers:

ncmsPM-transportEntity-Automatic (14)
ncc-ncmsPM (15)
nccIVMO-ncmsPM (16)

Add the following attribute Identifiers:

ncmsPMId (67)
nccId (68)
nccIVMOId (69)
nc-COL (70)
nc-PREF (71)
nc-REC (72)
nc-REF(73)
ncRecoveries (74)
networkConnectionRight (75)
sourceOfAllocation (76)
tfrNCTime (77)
tpdNCTime (78)
ttrNCTime (79)

Annex B
(informative)

Shorthand Description of Managed Objects

Replace figure B.1 by the following figure:

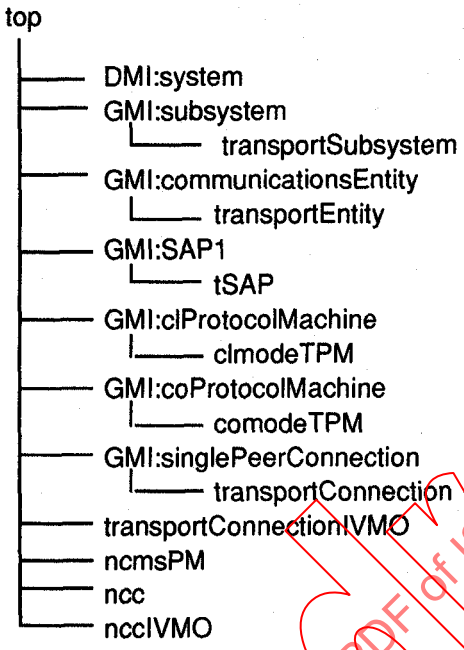

Figure B.1

Add the short hand description of NCMS PM MO, NCC MO and NCCIV MO:

```
MANAGED OBJECT CLASS ncmsPM DERIVED FROM (DMI:top)
CONTAINED IN (transportEntity)
   ncmsPMId ATTRIBUTE (G)
   DMI:administrativeState ATTRIBUTE (G,R)
   DMI:operationalState ATTRIBUTE (G)
   GMI:activate ACTION
   GMI:deactivate ACTION
   DMI:communicationsAlarm NOTIFICATION
   DMI:objectCreation NOTIFICATION
   DMI:objectDeletion NOTIFICATION
   DMI:stateChange NOTIFICATION
END MANAGED OBJECT CLASS ncmsPM
```

```
MANAGED OBJECT CLASS ncc DERIVED FROM (DMI:top)
CONTAINED IN (ncmsPM)
    nccId ATTRIBUTE (G)
    nc-COL ATTRIBUTE (G)
    nc-REC ATTRIBUTE (G)
    nc-REF ATTRIBUTE (G)
    nc-PREF ATTRIBUTE (G)
    nc-Right ATTRIBUTE (G)
    ncRecoveries ATTRIBUTE (G)
    ttrNCTime ATTRIBUTE (G)
    tpdNCTime ATTRIBUTE (G)
    tfrNCTime ATTRIBUTE (G)
    sourceOfAllocation ATTRIBUTE (G)
    GMI:underlyingConnectionName ATTRIBUTE (G)
    DMI:objectCreation NOTIFICATION
    DMI:objectDeletion NOTIFICATION
END MANAGED OBJECT CLASS ncc

MANAGED OBJECT CLASS nccIVMO DERIVED FROM (DMI:top)
CONTAINED IN (ncmsPM)
    nccIVMOId ATTRIBUTE (G)
    nc-COL ATTRIBUTE (G,R,RWD)
    nc-REC ATTRIBUTE (G,R,RWD)
    nc-REF ATTRIBUTE (G,R,RWD)
    nc-PREF ATTRIBUTE (G,R,RWD)
    nc-Right ATTRIBUTE (G,R,RWD)
    ttrNCTime ATTRIBUTE (G,R,RWD)
    tpdNCTime ATTRIBUTE (G,R,RWD)
    tfrNCTime ATTRIBUTE (G,R,RWD)
END MANAGED OBJECT CLASS nccIVMO
```