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DIGITAL SYSTEMS AND NETWORKS

Digital terminal equipments – Operations, administration  
and maintenance features of transmission equipment

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## **Synchronous Digital Hierarchy (SDH) configuration of linear multiplex section protection for the network element view**

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“Synchronous Digital Hierarchy (SDH) configuration of linear multiplex section protection for the network element view”

## Summary

This Recommendation provides an information model for the Synchronous Digital Hierarchy (SDH) Network. This model describes the managed object classes and their properties for the configuration of the protection switching function, as defined in Recommendations G.805 and G.774.3 and as related to SDH transmission resources. These objects are useful to describe information exchanged across interfaces defined in M.3010 Telecommunications Management Network (TMN) architecture for the configuration of the protection function. The protection switching scheme of an SDH network element is usually set up autonomously by the network element according to its make-up and mode of operation. When this is not possible, the information model defined by this Recommendation will be used. Post-configuration management of the protection function is described in Recommendation G.774.3.

## 1. Scope

Recommendation G.774.3 defines an information model for management of fixed linear Multiplex Section Protection (MSP) groups. This Recommendation defines the object model that allows to configure flexible linear MSP groups in accordance with the requirements described in Recommendation G.784. This model can be used to establish, modify and remove MSP groups for Network Elements that require external provisioning to configure their protection switching schemes. The protection switching scheme of an SDH network element is usually set up autonomously by the network element according to its make-up and mode of operation. When this is not possible, the information model defined by this Recommendation will be used. Post-configuration control of the protection function is carried out by means of the object model defined in Recommendation G.774.3.

## Structure of this Recommendation

Subclause 5.1 provides an overview of the SDH protection configuration information model. Clauses 6-15 describe the information model using the notation mechanisms defined in Recommendation X.722 Guidelines for the Definition of Managed Objects. Clause 15 contains the syntax definitions of the information carried in the protocol using Abstract Syntax Notation One (ASN.1) defined in Recommendation X.680-683. Naming and Inheritance are illustrated in Appendix I. Clauses 5-15 are normative; all other text is informative.

## 2. References

The following Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision: all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- ITU-T Recommendation G.707 (2000), *Network-node interface for the synchronous digital hierarchy*.
- ITU-T Recommendation G.773 (1993), *Q-Interface protocols*
- ITU-T Recommendation G.774 (2000), *SDH management information model for the network element view*.
- ITU-T Recommendation G.783 (1998), *Characteristics of Synchronous Digital Hierarchy (SDH) equipment functional blocks*.
- ITU-T Recommendation G.784 (1999), *Synchronous Digital Hierarchy (SDH) management*.
- ITU-T Recommendation G.803 (1997), *Architectures of transport networks based on the synchronous digital hierarchy (SDH)*.
- ITU-T Recommendation G.831 (1996), *Management capabilities of transport networks based on the synchronous digital hierarchy (SDH)*.
- ITU-T Recommendation G.958 (1994), *Digital line systems based on SDH for use on optical fibre cables*.
- ITU-T Recommendation M.60 (1993), *Maintenance terminology and definitions*.
- ITU-T Recommendation M.2120 (1997), *Digital path, section and transmission system fault detection and localisation procedures*.
- ITU-T Recommendation M.3010 (2000), *Principles for a telecommunication management network*.
- ITU-T Recommendation M.3013 (2000), *Considerations for a Telecommunications Management Network*.
- ITU-T Recommendation M.3100 (1995), *Generic network information model*.
- ITU-T Recommendation Q.811 (1990), *Q3-Lower layers protocols*.
- ITU-T Recommendation Q.812 (1990), *Q3-Higher layers protocols*.
- ITU-T Recommendation Q.822 (1993), *Stage 1, Stage 2 and Stage 3 description for the Q3-interface: performance management*.
- ITU-T Recommendation X.680 - X.683 (1997), *Specification of Abstract Syntax Notation One (ASN.1)*.
- ITU-T Recommendation X.701(1997), *Systems management overview*.
- ITU-T Recommendation X.710 (1997), *Common management information service*.
- ITU-T Recommendation X.711(1997), *Common management information protocol*.
- ITU-T Recommendation X.720 (1992) and Amd.1 (95) and Corr.1 (94), *Information technology – OSI – Structure of Management Information: Management information model*.
- ITU-T Recommendation X.721 (1993) and Corr. 1, 2, 3, and 4, *Definition of management information*.
- ITU-T Recommendation X.722 (1992) and Amd.1 (95), Amd.2 (97), Amd.2 (97) and Corr.1 (96), *Information technology – OSI – Structure of management information: Guidelines for the definition of managed objects*.
- ITU-T Recommendation X.731 (1992) and Amd.1 (95), Corr.1 (95) and Corr1Amd1 (96), *State management function*.
- ITU-T Recommendation X.730 (1992) and Amd.1 (95) and Corr1Amd1 (96), *Object management function*.

- ITU-T Recommendation X.733 (1992) and Corr.1 (94), Amd1 (95), Corr1Amd1 (96) and Corr.2 (99), *Alarm reporting function*.
- ITU-T Recommendation X.734 (1992) and Corr.1 (94), Amd1 (95), Corr1Amd1 (96) and Corr.2 (99), *Event report management function*.
- ITU-T Recommendation X.735 (1992) and Amd.1 (95) and Corr1Amd1 (96), *Log control function*.

### 3. Terms and Definitions

This Recommendation uses the terms and definitions defined in Recommendations G.784, G.774 and M.3100.

### 4. Abbreviations

For the purpose of this Recommendation, the following abbreviations are used:

|       |                                                |
|-------|------------------------------------------------|
| APDU  | Application Protocol Data Unit                 |
| APS   | Automatic Protection Switching                 |
| CMIP  | Common Management Information Protocol         |
| CMIS  | Common Management Information Service          |
| CTP   | Connection Termination Point                   |
| ISO   | International Organization for Standardization |
| ITU   | International Telecommunication Union          |
| LOS   | Loss of Signal                                 |
| MS    | Multiplex Section                              |
| MSP   | Multiplex Section Protection                   |
| NE    | Network Element                                |
| OS    | Operations System                              |
| OSI   | Open Systems Interconnection                   |
| Pkg   | Package                                        |
| RDN   | Relative Distinguished Name                    |
| SDH   | Synchronous Digital Hierarchy                  |
| SF    | Signal Fail                                    |
| STM-N | Synchronous Transport Module N                 |
| TMN   | Telecommunications Management Network          |
| TP    | Termination Point                              |
| TTP   | Trail Termination Point                        |
| WTR   | Wait-to-Restore                                |

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