

All drawings appearing in this Recommendation have been done in Autocad.

## **Recommendation Q.513**

### **EXCHANGE INTERFACES FOR OPERATIONS, ADMINISTRATION AND MAINTENANCE**

## **1 General**

This Recommendation applies to digital local, combined, transit and international exchanges for telephony in Integrated Digital Networks (IDN) and mixed (analogue/digital) networks, and also to local, combined, transit and international exchanges in an Integrated Services Digital Network (ISDN).

The field of application of this Recommendation is more fully defined in Recommendation Q.500.

This Recommendation is not intended to define any systems or equipment in or connected to, a digital exchange via these interfaces. Therefore only the interfaces characteristics are described.

In the text of this Recommendation, references are made to operation, administration and maintenance (OAM) equipment which comprises either or both of the following:

- a) operations systems (OS) which support personnel responsible for exchange OAM.  
Note that the word exchange includes both signalling and switching equipment;
- b) human-machine terminals which provide access to exchanges or operations systems.

## **2 General characteristics of these interfaces to OAM equipment**

2.1 Interfaces are provided for the transfer of information between exchanges and locations where OAM functions are performed. Items a) and b) below illustrate examples of information that may cross the interface and which may need to be catered for. (The choice of information that crosses the interface is a matter for each Administration/RPOA.)

- a) The information transferred from the exchange to OAM equipment may include customer usage and charging data, exchange system status indication, system resource utilization data, system performance measurements, alarms and messages alerting operating personnel to the current state of the exchange and other data.
- b) The information transferred to the exchange from the OAM equipment may include commands for system initializations and configuration control, data to effect changes in system operation, commands to initiate, terminate, or otherwise modify the services provided to customers, requests for status information and other commands.

2.2 An exchange may have access to one or more OAM equipment.

2.3 Access may be provided using separate data links, multiplexed data links, or one or more data networks to each OAM equipment.

2.4 The exchange shall not become unavailable due to the failure or malfunction of OAM equipment, or the failure of links between the exchange and OAM equipment.

2.5 The choice between single and multiple physical links at the exchange, and the configuration of the OAM equipment is a national matter, not subject to CCITT Recommendations.

### **3 Functional characteristics of the interface to OAM equipment**

3.1 The exchange should not depend for its basic operation on the correct functioning of the OAM equipment.

3.2 The interface should provide basic initialization, error detection and automatic recovery procedures for the data link.

3.3 The interface should support data transport mechanisms that may be employed by the exchange and the OAM equipment to assure the reliable transfer of particular information (e.g., charging data).

3.4 The interface should support the setting of priorities by the exchange or OAM equipment for the use of the transmission medium (data links).

3.5 The interface should support priority transfer of urgent messages.

### **4 Exchange OAM interfaces**

Exchange OAM interfaces are shown in Figure 1/Q.513.

There are two general classes of OAM interfaces:

- a) human-machine interfaces;
- b) interfaces to OAM OSs and workstations.

The interfaces for local and remote human-machine functions should conform to the MML Z.300-Series of Recommendations.

It is planned to provide Recommendations which specify interfaces between exchanges and operations systems and between exchanges and workstations. Such specifications will be based on the concept of the Telecommunications Management Network (TMN). The principles and architecture of the TMN are defined in Recommendation M.30.

#### **4.1 *TMN interfaces***

##### **4.1.1 *Q3 interface***

Interface Q3 connects exchanges to OSs via the Data Communication Network (DCN).

The interface shall be capable of supporting the following two broad categories of information to be communicated:

- a) transactions: low data volumes to be transported, e.g., exchange alarm messages;
- b) bulk data transfers: large data volumes to be transported, e.g., billing data.

The characterization of these information types is for further study.

The protocols used across the Q3 interface will be based on the OSI model and will use OSI protocols specified by CCITT where possible. To allow for alternative DCNs, alternative lower layer protocol sets may be used, depending on the specific situation. Several protocol sets for layers 1, 2 and 3 have been used for similar data communications networks. Examples include:

- a) X.25
- b) Signalling System No. 7 MTP/SCCP
- c) Q.921/Q.931.

Their use in TMN applications is for further study.

It is recommended that each set of TMN application functions with similar protocol needs be supported with unique protocol selections for layers 4 through 7 as defined by the OSI Reference Model (Recommendation X.200). The nulling of service options of individual layers above layer 3 and even entire layers above layer 3 may be necessary where justifiable.

#### 4.1.2 *xe ""§Q2 interface*

Interface Q2 may be used to connect exchanges to Mediation Devices (MDs) or to Network Elements (NEs) which contain a mediation function.

The need for the Q2 interface on an exchange is for further study.

#### 4.1.3 *xe ""§Q1 interface*

Interface Q1 may be used to connect exchanges to NEs which support only the Network Element Function and no mediation function.

The need for the Q1 interface on an exchange is for further study.

#### 4.1.4 *xe ""§F interface*

Interface F connects exchanges to workstations. The definition of functions and protocols is for further study.

#### 4.1.5 *xe ""\$G interface*

Interface G is the human-machine interface for OAM functions, providing output displays and text (e.g., CRT, printer, light panel) and input capabilities (e.g., keyboard).

This interface is specified in the Z.300-Series of Recommendations which may be enhanced in the future.

### 4.2 *Other OAM interfaces*

These interfaces are intended to represent existing OAM interfaces during the period of transition to TMN. They are not subject to CCITT Recommendations.

#### 4.2.1 *xe ""\$Q0 interface*

Interface Q0 connects exchanges to OSs, MDs and NEs using protocols and functions other than those defined in TMN Recommendations.

#### 4.2.2 *xe ""\$F0 interface*

Interface F0 connects exchanges to workstations, using function and protocols not specified in TMN Recommendations.

#### 4.2.3 *xe ""\$G0 interface*

Interface G0 is a human-machine interface not subject to CCITT Recommendations.

### 4.3 *ISDN access interfaces*

The exchange requirements for interworking between the exchange ISDN access sub-system including the V interfaces and the exchange TMN sub-system are for further study.

### 4.4 *Signalling System No. 7 network interface*

The exchange requirements for interworking between the exchange Signalling System No. 7 sub-systems and the exchange TMN sub-system are for further study.