SLOVENSKI STANDARD
SIST ETS 300 194 E1:2006

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Satelitske zemeljske postaje in sistemi (SES) – Povezava sistemov satelitskih terminalov z zelo majhno antensko odprtino (VSAT) s paketno komutiranimi javnimi podatkovnimi omrežji (PSPDN)

Satellite Earth Stations and Systems (SES); The interconnection of Very Small Aperture Terminal (VSAT) systems to Packet Switched Public Data Networks (PSPDNs)

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ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 92 94 42 00 - Fax: +33 93 65 47 16

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Satellite Earth Stations and Systems (SES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

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1 Scope

This European Telecommunication Standard (ETS) contains the requirements to be satisfied by Very Small Aperture Terminal (VSAT) systems for their interconnection to Packet Switched Public Data Networks (PSPDNs) implemented according to the CCITT Recommendation X.25 [1].

This ETS applies to the provision of Packet Switched Data Transmission services as defined in section 2 of CCITT Recommendation X.2 [2].

This ETS is applicable to both one-way and two way VSAT networks. In the case of one-way VSAT networks, the provision of the services as defined in section 2 of CCITT Recommendation X.2 [2] implies the implementation of return circuits using facilities of other networks (e.g. terrestrial networks).

This ETS deals with two types of specification:

a) Interface requirements (clause 5):

   Interface requirements are specified in order to ensure that the VSAT network and the PSPDN can be connected.

b) Connection quality recommendations (see clause 6):

   Connection quality recommendations are characteristics that contribute to maintaining a desirable quality of service and a uniform approach with regard to certain interfacing aspects, addressing and facilities.

   The inability to meet the recommendations does not, by itself, prevent the equipment being considered as compliant with this ETS.

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Additional informative elements are provided in annex A.

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2 Normative references

This European Telecommunication Standard (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 applies.

[1] CCITT Recommendation X.25 (1988): "Interface Between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".

[2] CCITT Recommendation X.2 (1988): "International data transmission services and optional user facilities in public data networks and ISDNs".

[3] NET 2 (1988): "Approval requirements for DTEs to connect to PSPDNs using CCITT Recommendation X.25 interface".

[4] CCITT Recommendation X.134 (1988): "Portion boundaries and packet layer reference events: basis for defining packet-switched performance parameters".

[5] CCITT Recommendation X.135 (1988): "Speed of service (delay and throughput) performance values for public data networks when providing international packet-switched services".

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[6] CCITT Recommendation X.136 (1988): "Accuracy and dependability performance values for public data networks when providing international packet-switched services".

[7] CCITT Recommendation X.137 (1988): "Availability performance values for public data networks when providing international packet-switched services".

[8] CEPT Recommendation T/CAC 4 (1989): "Monitoring of network performance aspects of quality of international packet-switched services using externally derived indicators".

3 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

BER	Bit Error Ratio
DM	Disconnected Mode
DTE	Data Terminal Equipment
DCE	Data Circuit-Terminating Equipment
FCS	Frame Check Sequence
LAPB	Link Access Protocol Balanced
OSI	Open System Interconnection
P/F	Poll/Final bit
PSPDN	Packet Switched Public Data Network
PVC	Permanent Virtual Circuit
PvtDN	Private Data Network
RNR	Receive Not Ready
SVC	Switched Virtual Circuit
VSAT	Very Small Aperture Terminal

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4 Interconnection scenarios

A VSAT network may be considered as a particular form of implementation of a Private Data Network (PvtDN). This type of PvtDN is not covered by CCITT Recommendation X.327.

The VSAT Data Terminal Equipment (DTE) connected to the PSPDN appears to the PSPDN as a normal X.25 DTE. The PSPDN makes no allowance and has no knowledge of the VSAT network.

Within the VSAT network two forms of communication are possible: real time direct connection (see subclause 4.1) and store and forward (see subclause 4.2).

4.1 Real time direct connection

In this scenario a real time connection is established between the application served by one of the VSATs and the application served by a DTE connected to the PSPDN. The Switched Virtual Circuit (SVC) or Permanent Virtual Circuit (PVC) over the PSPDN is extended over the VSAT network.

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The following elements are identified in the connection and are shown in figure 1:

A: the applications (APPL) which require communication.

These applications communicate with each other by means of end-to-end protocols which are outside the scope of this ETS.

B: The application running at the remote DTE (B) shall implement a local interface to the remote VSAT (D).

This interface is not a subject of standardization. However the recommendations related to connection quality defined in clause 6 are based on the assumption that this interface satisfies CCITT Recommendation X.25 [1].

C: The remote VSAT provides an appropriate DCE interface (C).

D: The remote VSAT (D) provides the communication over the satellite.

The way in which this is done and the internal protocols of the VSAT network are outside the scope of this ETS.

E: The Hub station.

In the case of a star network this is the central station with which all the remote VSATs communicate.

F: The interface between the VSAT network and the PSPDN.

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This is a DTE on the VSAT network side and may be implemented at either the HUB or at any of the remote VSAT stations. Under these circumstances two types of connection over the VSAT network can be distinguished:

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- single hop connections which apply in meshed networks i.e. those that allow the direct communication between remote VSATs, and in star networks, in which the interface to the PSPDN is implemented exclusively at the HUB;

- double hop connections which apply in star VSAT networks which implement the DTE interface to the PSPDN at any of the remote VSATs. In these cases all communications are routed via the HUB and, therefore, require two satellite hops.

G: The PSPDN Data Circuit Equipment (DCE).

These are customer connection points which offer an X.25 interface to the PSPDN. These occur at the interface to the VSAT network and also at the interface to the customer.

H: This is a generic PSPDN which may be made up of a number of national and possibly international portions. These portions are defined in CCITT Recommendation X.134 [4] and their requirements for quality are defined in CCITT Recommendations X.135 [5], X.136 [6] and X.137 [7].

I: The remote DTE of the customer connected to the PSPDN where the corresponding application runs.

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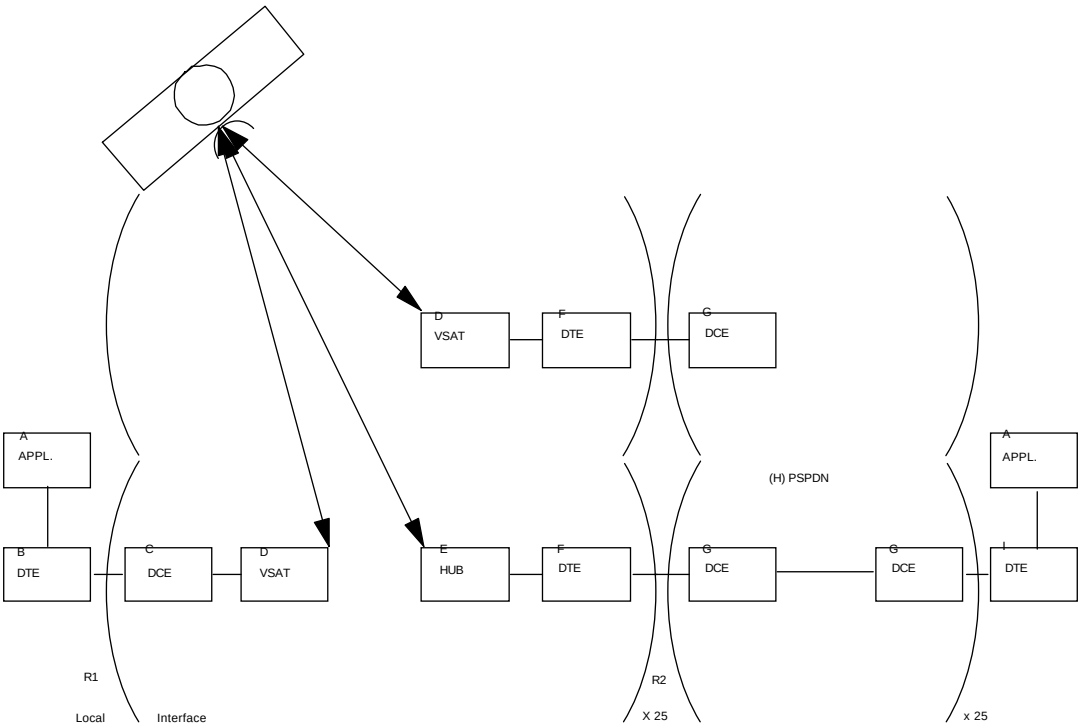

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R1 = Bit rate at DTE(B) - DCE(C) interface
R2 = Bit rate at DTE(F) - DCE(G) interface

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Figure 1: Real time direct connection scenario

The use of the VSAT network to interconnect two PSPDNs is outside the scope of this ETS.

4.2 Store and forward

This scenario is depicted in figure 2.

In this scenario the delivery to or from the remote DTE (B) is performed over the VSAT system to a store-and-forward gateway (J) connected to the PSPDN via a DTE (F). The delivery to or from the remote DTE (I) takes place from the gateway over the PSPDN. The transmission of information between the DTE (B) and the DTE(I) is performed therefore in two separate transactions. This means there is no real time interaction between the remote DTE (B) and the remote DTE (I).

NOTE: The HUB (E) may or may not be present depending on the VSAT network architecture.