SLOVENSKI STANDARD
PSIST TBR 028:1999

01-oktober-1999

Satelitske zemeljske postaje in sistemi (SES) - Satelitski terminal z manjġo anteno (VSAT) - Zemeljske satelitske postaje samo za oddajanje, za oddajanje in sprejemanje ali samo za sprejemanje, ki delujejo v frekvenį nih pasovih 11/12/14 GHz

Satellite Earth Stations and Systems (SES); Very Small Aperture Terminal (VSAT); Transmit-only, transmit/receive or receive-only satellite earth stations operating in the 11/12/14 GHz frequency bands

Ta slovenski standard je istoveten z: **TBR 028 Edition 1**

ICS:

33.060.30	Radiorelejni in fiksni satelitski komunikacijski sistemi	Radio relay and fixed satellite communications systems

PSIST TBR 028:1999 **en**

TECHNICAL BASIS for REGULATION

TBR 28

December 1997

Source: ETSI TC-SES

Reference: DTBR/SES-00006

ICS: 33.020

Key words: Satellite, earth station, VSAT, FSS, type approval

Satellite Earth Stations and Systems (SES); Very Small Aperture Terminal (VSAT); Transmit-only, transmit/receive or receive-only satellite earth stations operating in the 11/12/14 GHz frequency bands

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Foreword

This Technical Basis for Regulation (TBR) has been produced by the Satellite Earth Stations and Systems (SES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Introduction

The SES Directive [1] which supplements the TTE Directive [2] concerns the harmonization of conditions for the placing on the market of such equipment.

Two classes of standards are applicable to satellite earth station equipment. European Telecommunication Standards (ETSs) give the full technical specifications for this equipment, whereas Technical Bases for Regulation (TBRs) give the essential requirements under the SES Directive [1] and the TTE Directive [2] for placing such equipment on the market. Receive-only equipment, not intended for terrestrial connection to the public telecommunications network, may be put into use. Nothing in this TBR is construed to prevent the use of Community internal production control procedures as set out in the annexes to the two Directives for such receive-only equipment. This TBR is based on ETS 300 157, ETS 300 159, ETS 300 160 and ETS 300 456 (see annex C, Bibliography).

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1 Scope

This Technical Basis for Regulation (TBR) specifies the technical requirements that apply to Very Small Aperture Terminals (VSAT) for compliance with Articles 4.1 and 4.3 of the SES Directive [1].

These VSAT have the following characteristics:

- The VSAT are operating in one or more frequency ranges in the exclusive part of the following bands allocated to the Fixed Satellite Services (FSS):

  - 14,00 GHz to 14,25 GHz (earth-to-space);
  - 12,50 GHz to 12,75 GHz (space-to-earth);

  or in the shared parts of the following bands, allocated to the FSS and Fixed Services (FS):

  - 14,25 GHz to 14,50 GHz (earth-to-space);
  - 10,70 GHz to 11,70 GHz (space-to-earth).

- The VSAT use linear polarization.

- The VSAT operate through a geostationary satellite at least 3° away from any other geostationary satellite operating in the same frequency band and covering the same area.

- The VSAT antenna diameter does not exceed 3,8 m, or equivalent corresponding aperture.

- The VSAT are either:

  - transmit only VSAT: designed for transmission only of radio-communications signals in any of the frequency bands (earth-space) specified above; or

  - transmit and receive VSAT: designed for transmission and reception of radio-communications signals in any of the frequency bands specified above; or

  - receive only VSAT: designed for reception only of radio-communications signals in any of the frequency bands (space-earth) specified above.

- The VSAT are designed usually for unattended operation.

- The VSAT are operating as part of a satellite network (e.g. star, mesh or point-to-point) used for the distribution and/or exchange of information between users.

- The VSAT are controlled and monitored by a Centralized Control and Monitoring Function (CCMF). The CCMF is outside the scope of this TBR.

This TBR applies to the VSAT with its ancillary equipment and its various terrestrial ports, and operated under the conditions which are within the ranges of humidity, temperature and supply voltage declared by the manufacturer.

The requirements have been selected to ensure an adequate level of compatibility with other radio services. The levels, however, do not cover extreme cases which may occur in any location but with a low probability of occurrence.

This TBR may not cover those cases where a potential source of interference which is producing individually repeated transient phenomena or a continuous phenomenon is present, e.g. a radar or broadcast site in the near vicinity. In such a case it may be necessary to use special protection applied to either the source of interference, or the interfered part or both.

This TBR does not contain any requirement, recommendation or information about the installation of the VSAT.

Compliance of a VSAT to the requirements of this TBR does not imply compliance to any requirement related to the use of the VSAT (e.g. licensing requirements).

2 Normative references

This TBR incorporates by dated or undated reference, provisions from other publications. These 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 TBR only when incorporated into it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] Council Directive 93/97/EEC of 29 October 1993 supplementing Directive 91/263/EEC in respect of satellite earth station equipment. Called the "SES Directive" in the present document the.

[2] Council Directive 91/263/EEC of 29 April 1991 on the approximation of the laws of Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity. Called the "TTE Directive" in the present document the.

[3] ETS 300 673 (1996): "Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC) standard for 4/6 GHz and 11/12/14 GHz Very Small Aperture Terminal (VSAT) equipment and 11/12/13/14 GHz Satellite News Gathering (SNG) Transportable Earth Station (TES) equipment".

[4] CISPR 16-1 (1993): "Specification for radio interference measuring apparatus and measurement methods; Part 1: Radio disturbance and immunity measuring apparatus" (annex G: Validation of the open area test site for the frequency range of 30 MHz to 1 000 MHz).

NOTE: This TBR also contains a number of informative references which have been included to indicate the sources from which various material has been derived, hence they do not have an associated normative reference number. Details of these publications are given in annex C, bibliography.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this TBR, the following definitions apply:

ancillary equipment: Equipment used in connection with a VSAT is considered as ancillary if the three following conditions are met:

a) the equipment is intended for use in conjunction with the VSAT to provide additional operational and/or control features (e.g. to extend control to another position or location); and

b) the equipment cannot be used on a stand alone basis, to provide user functions independently of the VSAT; and

c) the absence of the equipment does not inhibit the operation of the VSAT.

carrier-off state: A VSAT is in this state when it is authorized by the Centralized Control and Monitoring Functions (CCMF) to transmit, but when it does not transmit any signal.

NOTE 1: The existence of a carrier-off state depends on the system of transmission used. For VSAT designed for continuous transmission mode there may be no carrier-off state.

carrier-on state: A VSAT is in this state when it is authorized by the CCMF to transmit and when it transmits a signal.

Centralized Control and Monitoring Functions (CCMF): A set of functional entities that, at system level, monitor and control the correct operation of all transmit VSAT in a network.

Control Channel (CC): A channel or channels by which VSAT receive control information from the CCMF.

cross-polarization discrimination: The ratio of the on-axis co-polar gain to the cross-polar gain in a given direction, at a transmit or receive frequency.

external control channel: A control channel which is either (i) carried by the VSAT network via the same or another satellite, but not within the internal protocol of the VSAT system, or (ii) carried by the PSTN or some other means.

external response channel: A response channel which is either (i) carried by the VSAT network via the same or another satellite, but not within the internal protocol of the VSAT system, or (ii) carried by the PSTN or some other means.

indoor unit: Is composed of that part of the VSAT which is not part of the outdoor unit. It is generally installed inside a building and is connected to the outdoor unit. The connection cable between the outdoor and indoor unit is considered part of the indoor unit.

integral antenna: An antenna which may not be removed during the tests according to the manufacturer's statement.

internal control channel: A control channel which is carried by the VSAT network via the same satellite as used for transmission of user data and within the internal protocol structure of the VSAT system.

internal response channel: A response channel which is carried by the VSAT network via the same satellite as used for transmission of user data and within the internal protocol structure of the VSAT system.

manufacturer: The legal entity responsible under the terms of the Council Directive 93/97/EEC (SES Directive) [1] for placing the product on the market in a member state.

network: In this TBR a network is any network configuration including star, mesh and point-to-point configurations.

nominated bandwidth: The bandwidth of the VSAT radio frequency transmission is nominated by the manufacturer. The nominated bandwidth is centred on the transmit frequency and does not exceed 5 times the occupied bandwidth.

NOTE 2: The nominated bandwidth is wide enough to encompass all spectral elements of the transmission which have a level greater than the specified spurious radiation limits. The nominated bandwidth is wide enough to take account of the transmit carrier frequency stability. This definition is chosen to allow flexibility regarding adjacent channel interference levels which will be taken into account by operational procedures depending on the exact transponder carrier assignment situation.

occupied Bandwidth (Bo): For a digital modulation scheme - the width of the signal spectrum 10 dB below the maximum inband density. For an analogue modulation scheme - the width of a frequency band such that, below the lower and above the upper frequency limits, the mean power emitted is equal to 0,5 % of the total mean power of the emission.

outdoor unit: The part of the VSAT intended to be installed outdoor, as declared by the manufacturer, or as indicated in the user documentation.

The outdoor unit usually comprises three main parts:

a) the antenna sub-system which converts the incident radiation field into a guided wave and vice versa;

b) the Low Noise Block (LNB) down converter, which is a device that amplifies, with very low internal noise, the received signals in the Radio Frequency (RF) band and converts them to intermediate frequencies;