SLOVENSKI STANDARD
SIST TBR 043 E1:2004

01-oktober-2004

Satelitske zemeljske postaje in sistemi (SES) - Satelitske zemeljske postaje s terminali z zelo majhno antensko odprtino (VSAT) samo za oddajanje, za oddajanje in sprejemanje ali samo za sprejemanje, ki delujejo v frekvenļ nih pasovih 4 GHz in 6 GHz

Satellite Earth Stations and Systems (SES); Very Small Aperture Terminal (VSAT) transmit-only, transmit-and-receive, receive-only satellite earth stations operating in the 4 GHz and 6 GHz frequency bands

Ta slovenski standard je istoveten z: **TBR 043 Edition 1**

ICS:

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

SIST TBR 043 E1:2004 **en**

TECHNICAL BASIS for REGULATION

TBR 43

May 1998

Source: SES

Reference: DTBR/SES-00021

ICS: 33.020

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

Satellite Earth Stations and Systems (SES); Very Small Aperture Terminal (VSAT) transmit-only, transmit-and-receive, receive-only satellite earth stations operating in the 4 GHz and 6 GHz frequency bands

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
Internet: secretariat@etsi.fr - http://www.etsi.fr - http://www.etsi.org

Tel.: +33 4 92 94 42 00 - Fax: +33 4 93 65 47 16

Contents

Blank page

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).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 83/189/EEC (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Council Directive 93/97/EEC of 29 October 1993 supplementing Directive 91/263/EEC in respect of satellite earth station equipment (the "SES Directive").

A common technical regulation may be established by the European Commission in accordance with the Directive.

Introduction

The Satellite Earth Station (SES) Directive [1] which supplements the Telecommunications Terminal Equipment (TTE) Directive [2] concerns the harmonisation of conditions for the placing on the market of such equipment.

Two classes of standard are applicable to SES equipment. European Telecommunication Standards (ETS) give the full technical specifications for this equipment, whereas Technical Bases for Regulation (TBR) 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 300 332, ETS 300 333, ETS 300 160 and ETS 300 456 (see annex C, Bibliography).

Blank page

1 Scope

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

The VSAT has the following characteristics:

- the VSAT is operating in the following bands allocated to the Fixed Satellite Service (FSS), shared with other services, e.g. the Fixed Service (FS) and the Mobile Service (MS):
  - 5,85 GHz to 6,65 GHz (earth-to-space);
  - 3,40 GHz to 4,20 GHz (space-to-earth);
- the VSAT uses linear or circular polarization;
- the VSAT operates 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 7,3 m, or equivalent effective area;
- the VSAT is either:
  - transmit-only VSAT: designed for transmission-only of radio-communications signals in the frequency band specified above; or
  - transmit-and-receive VSAT: designed for transmission-and-reception of radio-communications signals in the frequency band specified above; or
  - receive-only VSAT: designed for reception-only of radio-communications signals in the frequency band specified above;
- the VSAT is designed usually for unattended operation;
- the VSAT is 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 transmit-only and transmit-and-receive VSAT is 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 (including its ancillary equipment and its various terrestrial ports) 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] SES Directive: "Council Directive 93/97/EEC (1993) supplementing Directive 91/263/EEC in respect of satellite earth station equipment".

[2] TTE Directive: "Council Directive 91/263/EEC (1991) on the approximation of the laws of Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity".

[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 N 16-1 (1993): "Specification for radio interference measuring apparatus and measurements 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 the VSAT is considered 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 (XPD): 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 (CC): 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 (RC): 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.

internal Control Channel (CC): 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 of the VSAT system.

internal Response Channel (RC): 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 of the VSAT system.

manufacturer: The legal entity responsible under the terms of the Council Directive 93/97/EEC [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 in-band 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;

c) the up-converter and the power amplifier which convert from the intermediate frequency to RF and amplify the low level RF signals for transmission through the antenna subsystem.

NOTE 3: The installation equipment (means of attachment) is outside the scope of this TBR. However, the antenna structures and other components directly mounted on the antenna and forming an integral part of it, are subject to the specifications of this TBR.