



# SLOVENSKI STANDARD

## SIST TBR 041:1999

01-oktober-1999

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GUHY]hg\_UcgYVbU\_ca i b]\_UWY'g\_Uca fYy'UfG!D7 BŁ!'AcV]bY'nYa Y'g\_Y'dcgHU'Y  
fA9 GŁj\_`f bc'n'fc b]a ]'dfYbcgb]a ]'nYa Y'g\_]a ]'dcgHU'Ua ]'nUgUH'Y]hg\_UcgYVbU  
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a cV]bY'gUH'Y]hg\_Y'g'f]j Y'fA GŁ!'Cgbcj bY'h\ b] bY'nU hYj Y'nUH'fa ]bUY

Satellite Personal Communications Networks (S-PCN); Mobile Earth Stations (MES), including handheld earth stations, for S-PCN in the 1,6/2,4 GHz bands under the Mobile Satellite Service (MSS); Terminal essential requirements

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**ICS:**

33.060.30	Radiorelejni in fiksni satelitski komunikacijski sistemi	Radio relay and fixed satellite communications systems
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Mobile Earth Stations (MESs), including handheld earth stations,  
for S-PCN in the 1,6/2,4 GHz bands under the  
Mobile Satellite Service (MSS);  
Terminal essential requirements**

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## Contents

Foreword .....	7
1 Scope .....	9
2 Normative references .....	10
3 Definitions and abbreviations .....	10
3.1 Definitions .....	10
3.2 Abbreviations .....	11
4 General .....	12
4.1 Presentation of equipment for testing purposes .....	12
4.2 Description of equipment .....	12
4.3 Host-connected equipment .....	13
5 Unwanted emissions outside the band 1 610 to 1 626,5 MHz and the band 1 626,5 to 1 628,5 MHz (carrier-on) .....	13
5.1 Justification .....	13
5.2 Purpose .....	13
5.3 Conformance requirements .....	13
5.4 Method of test .....	14
5.4.1 Peak measurement .....	14
5.4.2 Average measurement .....	15
5.5 Test requirements .....	15
6 Unwanted emissions within the band 1 610 to 1 626,5 MHz and the band 1 626,5 to 1 628,5 MHz (carrier-on) .....	15
6.1 Justification .....	15
6.2 Purpose .....	16
6.3 Conformance requirements .....	16
6.4 Method of test .....	17
6.4.1 Measurement method .....	18
6.5 Test requirements .....	18
7 EIRP density within the operational band .....	18
7.1 Justification .....	18
7.2 Purpose .....	19
7.3 Conformance requirements .....	19
7.4 Method of test .....	19
7.4.1 Peak limit test .....	20
7.4.2 Mean limit test .....	20
7.5 Test requirements .....	20
8 Unwanted emissions in carrier-off state .....	21
8.1 Justification .....	21
8.2 Purpose .....	21
8.3 Conformance requirements .....	21
8.4 Method of test .....	21
8.4.1 Measurement method .....	22
8.5 Test requirements .....	22
9 MES Control and Monitoring Functions (CMF) .....	22
9.1 Special Test Equipment (STE) .....	22
9.2 Self-monitoring functions .....	22
9.2.1 Processor monitoring .....	22
9.2.1.1 Justification .....	22
9.2.1.2 Purpose .....	22

	9.2.1.3	Conformance requirements .....	22
	9.2.1.4	Method of test .....	23
	9.2.2	Transmit frequency generation sub-system monitoring.....	23
	9.2.2.1	Justification .....	23
	9.2.2.2	Purpose .....	23
	9.2.2.3	Conformance requirements .....	23
	9.2.2.4	Method of test .....	23
9.3	Network control authorization and reception .....		23
	9.3.1	Network control authorization .....	23
	9.3.1.1	Justification .....	23
	9.3.1.2	Purpose .....	23
	9.3.1.3	Conformance requirements .....	24
	9.3.1.4	Method of test .....	24
	9.3.1.5	Test procedure .....	24
	9.3.1.6	Test requirement.....	24
	9.3.2	Network control reception .....	25
	9.3.2.1	Transmission disable/enable .....	25
	9.3.2.1.1	Justification .....	25
	9.3.2.1.2	Purpose .....	25
	9.3.2.1.3	Conformance requirements .....	25
	9.3.2.1.4	Method of test .....	25
	9.3.2.1.5	Test procedure .....	25
	9.3.2.1.6	Test requirement.....	26
	9.3.2.2	Transmit frequency control .....	26
	9.3.2.2.1	Justification .....	26
	9.3.2.2.2	Purpose .....	26
	9.3.2.2.3	Conformance requirements .....	26
	9.3.2.2.4	Method of test .....	26
	9.3.2.2.5	Test procedure.....	26
	9.3.2.2.6	Test requirement.....	27
9.4	Fellow radio stations in a dual-mode or multi-mode terminal.....		27
	9.4.1	Justification .....	27
	9.4.2	Purpose .....	27
	9.4.3	Conformance requirements .....	27
	9.4.4	Method of test .....	27
	9.4.5	Test procedure.....	27
	9.4.6	Test requirements.....	27
10	Equipment identity .....		27
	10.1	Justification.....	27
	10.2	Purpose .....	27
	10.3	Conformance requirements .....	28
	10.4	Method of test.....	28
	10.5	Test procedure .....	28
	10.6	Test requirements .....	28
11	Protection of the radio astronomy service operation in the band 1 610,6 to 1 613,8 MHz .....		28
	11.1	Justification.....	28
	11.2	Purpose .....	28
	11.3	Conformance requirements .....	28
	11.4	Method of test.....	28
	11.5	Test procedure .....	29
	11.6	Test requirement.....	29
Annex A (normative):	General test requirements .....		30
A.1	MES test modes .....		30
A.2	Special Test Equipment (STE) .....		30
	A.2.1	STE description.....	30
	A.2.2	Use of STE for control and monitoring functions tests.....	30
	A.2.3	Test modulating signal .....	31

A.3	Laboratory Test Equipment (LTE).....	31
A.4	Methods of test for MES RF emissions.....	32
A.5	Interpretation of the measurement results .....	32
A.6	Test report.....	32
Annex B (normative): Environmental conditions and host connected equipment.....		33
B.1	General.....	33
B.2	Environmental requirements .....	33
B.2.1	Temperature .....	33
B.2.2	Voltage.....	33
B.2.3	Vibration.....	33
B.3	Environmental test conditions .....	33
B.3.1	Specification of the environmental test conditions.....	33
B.3.2	Tests under extreme voltage conditions .....	34
B.4	Testing of host-connected equipment and plug-in modules .....	34
B.4.1	Alternative A: combined equipment .....	34
B.4.2	Alternative B: use of a test jig .....	34
Annex C (normative): Procedures for measurement of radiated emissions .....		35
C.1	General.....	35
C.1.1	Test site .....	35
C.1.2	Test set up for radiated emissions of the MES.....	35
C.1.3	Reference position of the MES .....	36
C.2	Measurement procedure for radiated emissions (peak) .....	36
C.2.1	Measurement procedure for peak radiated emissions of the MES.....	36
C.2.2	Measurement procedure for peak radiated emissions of the cabinet.....	38
C.3	Measurement procedure for radiated emissions (average) .....	38
C.3.1	Measurement procedure for average radiated emissions of the MES .....	38
C.3.2	Measurement procedure for average radiated emissions of the cabinet.....	39
Annex D (normative): Procedures for measurement of conducted emissions.....		40
D.1	General.....	40
D.1.1	Test site .....	40
D.1.2	Test set-up.....	40
D.2	Measurement procedure for conducted emissions (peak).....	40
D.3	Measurement procedure for conducted emissions (average).....	41

Annex E (informative):	Explanation of nominated bandwidth .....	42
E.1	Introduction .....	42
E.2	Interpretation of Parameters $[B_n, f_c, a, b]$ .....	42
E.3	Choice of nominated bandwidth .....	42
E.4	Maximum value for nominated bandwidth .....	44
Annex F (normative):	The TBR Requirements Table (TBR-RT) .....	46
Annex G (informative):	Bibliography .....	47
History .....		48

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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).

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.

Technical specifications relevant to the SES Directive are given in annex F.

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## 1 Scope

This Technical Basis for Regulation (TBR) specifies those technical requirements under Article 4 of Council Directive 93/97/EEC (SES Directive), supplementing Council Directive 91/263/EEC (TTE Directive), in respect of satellite earth station equipment that apply to Mobile Earth Station (MES) equipment with both transmit and receive capabilities for operation in a Satellite-Personal Communications Network (S-PCN), in one or more of the Mobile Satellite Service (MSS) frequency bands given in table 1.

**Table 1: Mobile Satellite Service (MSS) frequency bands**

	<b>MSS frequency bands</b>
MESs transmit	1 610 - 1 626,5 MHz
MESs receive	1 613,8 - 1 626,5 MHz 2 483,5 - 2 500 MHz

An S-PCN MES may be a handheld, portable, vehicle-mounted, host connected, semi-fixed or fixed equipment, or may be an element in a multi-mode terminal. It may consist of a number of modules with associated connections and user interface, or may be a self contained single unit.

If the MES is an element in a multi-mode terminal, unless otherwise stated in this TBR, its requirements apply only to the S-PCN MES element of the terminal operating in one or more of the MSS frequency bands given in table 1.

The technical requirements in this TBR are applied under Articles 4.1 and 4.3 of the SES Directive referencing Article 4(e) of the TTE Directive, concerning effective use of the radio frequency spectrum, including the effective use of orbital resources and the avoidance of harmful interference between space-based and terrestrial communications systems and other technical systems. These requirements are in two major categories:

**emissions limits:** to protect other radio services from harmful interference generated by the MES in normal use; <https://standards.iteh.ai/catalog/standards/sist/cb5de935-d8fc-45f8-8fb7-487652f862d7/sist-tbr-041-1999>

**MES Control and Monitoring Functions (CMF):** to protect other radio services from unwanted transmissions from the MES. The CMF in each MES is capable of answering to commands from the Network Control Facilities (NCF) for its S-PCN.

NOTE: The requirements for Network Control Facilities (NCF) for S-PCN are contained in ETS 300 735 (see annex G).

There are no technical requirements in this TBR under:

- Articles 4.1 and 4.4 of the SES Directive, referencing Article 4(c) of the TTE Directive as there are no EMC requirements specific to the S-PCN MESs, nor under:
  - Article 4.1 of the SES Directive, referencing Article 4(d) of the TTE Directive;
  - Articles 4.1 and 4.5 of the SES Directive, referencing Article 4(f) of the TTE Directive;
  - Articles 4.1 and 4.6 of the SES Directive, referencing Article 4(g) of the TTE Directive;

as, for the purposes of the SES Directive and the TTE Directive, the radio interface between the MES and the S-PCN network is not regarded as a network termination point of a public telecommunications network.

An MES may be subject to additional or alternative requirements in other TBRs depending on its functionality, in particular if it supports a service which is considered a justified case for regulation of terminal equipment interworking via the public telecommunications network.

## 2 Normative references

This TBR 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 TBR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] CCITT Recommendation O.153 (1988): "Characteristics of distortion and error-rate measuring apparatus for data transmission".

## 3 Definitions and abbreviations

### 3.1 Definitions

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

**applicant:** A party seeking an approval, or to place an S-PCN MES on the European market, i.e. the manufacturer of the equipment, or his authorized representative, or an equipment supplier to the European market.

**carrier-on state (allocated a channel):** An MES is in this state when it is transmitting a signal in a continuous or non-continuous mode.

**carrier-off state (idle mode):** An MES is in this state when it is powered-on but not transmitting a signal, i.e. not in the carrier-on state.

**conducted measurement:** A measurement of emissions from an antenna port of the MES made by direct wired connection to the port.

**Equivalent Isotropically Radiated Power (EIRP):** The product of transmitter power and maximum antenna gain, equivalent to an isotropic source radiating uniformly in all directions.

**handheld:** Indicates a PE MES which is self-contained and is small enough and light enough to be carried and used during a call with one hand.

**host-connected:** Indicates an MES for which connection to or integration with host equipment is necessary to offer functionality.

**host equipment:** Is any equipment which has a complete user functionality when not connected to the MES, and to which the MES provides additional functionality, and to which connection is necessary for the MES to offer functionality.

**Installable Equipment (IE), Internally Mounted Equipment (IME) And Externally Mounted Equipment (EME):** An Installable Equipment (IE) is an equipment which is intended to be installed in a vehicle. An IE may consist of one or several interconnected modules. The IE is composed of modules intended to be externally mounted as declared by the applicant, and defined as Externally Mounted Equipment (EME) and the remaining module(s) as Internally Mounted Equipment (IME).

**Laboratory Test Equipment (LTE):** A logical grouping that contains the standard test equipment provided by a test laboratory.

**MSS band:** A continuous range of frequencies allocated by the ITU to the MSS.

**multi-mode:** Indicates equipment that accommodates radio stations of different radio networks.

**narrow-band system:** A narrow-band system is one in which the nominal carrier frequency spacing for MESs in the earth-to-space direction is less than 300 kHz.

**network control channel:** A channel by which an MES receives general control information from the NCF of its S-PCN.

**NCF control message:** A message, normally originating from a network, to a specified terminal or set of terminals of the network which indicates to the terminal or set of terminals that it/they should carry out some specific action or should enter or maintain some specific state. For test purposes NCF control messages may originate from Special Test Equipment (STE).

**nominated bandwidth ( $B_n$ ):** The  $B_n$  of the Mobile Earth Station (MES) radio frequency transmission is wide enough to encompass all spectral elements of the transmission which have a level greater than the specified levels of unwanted emissions. The  $B_n$  is defined relative to the MES actual carrier frequency  $f_c$ .

$B_n$  is the width of the frequency interval ( $f_c - a$ ,  $f_c + b$ ), where  $a$  and  $b$ , which shall be specified by the applicant, may vary with  $f_c$ .

The frequency interval ( $f_c - a$ ,  $f_c + b$ ) shall not encompass more than either:

- i) when  $a = b$ , 4 nominal carrier frequencies for narrow-band systems
- ii) when  $a \neq b$ , 1 nominal carrier frequency for narrow-band systems, or
- iii) 1 nominal carrier frequency for wide-band systems.

The frequency interval ( $f_c - a$ ,  $f_c + b$ ) shall be within the operational band of the MES.

**operational band:** The sub-portion of the 1 610 to 1 626,5 MHz band which has been assigned in the earth-to-space direction to the MSS network within which the MES is operating.

**Portable Equipment (PE):** A Portable Equipment (PE) is generally intended to be self-contained, free standing and portable. A PE would normally consist of a single module, but may consist of several interconnected modules.

**radiated measurement:** A measurement of an actual radiated field.

**Special Test Equipment (STE):** Equipment which allows a test laboratory to control the MES so that the tests required by this TBR can be performed.

**test laboratory:** A laboratory authorized by an accreditation body, which performs conformance testing in accordance with the SES and TTE directives.

**test load:** The test load is a substantially non-reactive, non-radiating power attenuator which is capable of safely dissipating the power from the transmitter(s).

**unwanted emissions:** Unwanted emissions are those falling outside the nominated bandwidth in the carrier-on state, and those generated in the carrier-off state.

**wide-band system:** A wide-band system is one in which the nominal carrier frequency spacing for MESs in the Earth-to-Space direction is equal to or greater than 300 kHz.

### 3.2 Abbreviations

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

AC	Alternating Current
$B_n$	nominated Bandwidth
CCITT	Comité Consultatif International Télégraphique et Téléphonique (now ITU-T)
CDMA	Code Division Multiple Access
CMF	Control and Monitoring Functions
dBW	decibel relative to 1 Watt
EIRP	Equivalent Isotropically Radiated Power
EMC	Electro-Magnetic Compatibility
EME	Externally Mounted Equipment
IE	Installable Equipment
IEC	International Electrotechnical Commission/Committee
IME	Internally Mounted Equipment
ITU	International Telecommunications Union
LTE	Laboratory Test Equipment

MES	Mobile Earth Station
MSS	Mobile Satellite Service
MIC	MES unique Identification Code (within its S-PCN)
NCF	Network Control Facility
PE	Portable Equipment
RF	Radio Frequency
SES	Satellite Earth Stations and Systems or, in the case of the SES Directive, Satellite Earth Station
S-PCN	Satellite Personal Communications Network
STE	Special Test Equipment
TDMA	Time Division Multiple Access
TTE	Telecommunications Terminal Equipment

## 4 General

### 4.1 Presentation of equipment for testing purposes

The applicant may provide to a test laboratory one or more preliminary or production models of the MES equipment, as appropriate, for testing for conformance against the technical requirements of this TBR.

If the MES is intended for use with an active antenna, this shall be provided as part of the MES.

If a statement of conformance with the TBR is given by the test laboratory on the basis of tests on a preliminary model, then the statement of conformance shall apply to corresponding production models only if they are identical in all technical respects with the preliminary model tested.

### 4.2 Description of equipment

The applicant shall provide to the test laboratory a statement which contains all of the information related to the MES and its testing environment which will enable the test laboratory to run an appropriate test suite against the MES.

This shall include:

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- Self contained or host-connected;
- Single-mode or multi-mode;
- Antenna:
  - active or;
  - passive, with an antenna port available or;
  - passive, no antenna port available.

NOTE 1: If the MES has an active antenna, the antenna is regarded as an integral part of the MES.

NOTE 2: If the MES is intended for use with a passive antenna, the maximum gain of any antenna intended to be used with the equipment is to be stated.

- The method by which the equipment can be switched into its test modes.

NOTE 3: If Special Test Equipment (STE) is required see annex A, clause A.2.

- The fault conditions which cause transmission shut-down;
- The nominal, the lower extreme and the higher extreme operational voltages;
- In the case of a multi-mode MES, the other modes of operation;
- If the conducted emission measurements are to be performed:
  - the gain at the frequency of the measured spurious emission, according to the choice of the applicant.

- In an information leaflet, for each S-PCN for which the MES is designed to operate:
  - 1) the name of the S-PCN;
  - 2) the maximum value of nominated bandwidth for that S-PCN, as defined by the network operator;
  - 3) the a and b values of the nominated bandwidth for each nominal carrier frequency of the MES;
  - 4) the operating frequency range(s) of the MES;
  - 5) The frequency sub-bands and operating conditions for which the different EIRP density limits apply;
  - 6) the maximum gross data rate at which the MES is designed to operate;
  - 7) the agreement of the network operator to the above information.

#### 4.3 Host-connected equipment

For testing of equipment for which connection to, or integration with, host equipment is required to offer functionality, the applicant shall supply a statement indicating which of the test configurations detailed in clause B 4 shall be used.

## 5 Unwanted emissions outside the band 1 610 to 1 626,5 MHz and the band 1 626,5 to 1 628,5 MHz (carrier-on)

### 5.1 Justification

This requirement is justified under SES Directive Articles 4.1 and 4.3.

### 5.2 Purpose

Protection of other radio services operating outside the band 1 610 to 1 628,5 MHz from emissions caused by S-PCN MESs operating within the band 1 610 to 1 626,5 MHz.

### 5.3 Conformance requirements

The maximum EIRP density of the unwanted emissions from the MES outside the band 1 610,0 to 1 626,5 MHz and the band 1 626,5 to 1 628,5 MHz shall not exceed the limits in table 2.

In table 2, whenever a change of limit between adjacent frequency bands occurs, the lower of the two limits shall apply at the transition frequency.