SLOVENSKI STANDARD
SIST EN 300 721 V1.2.2:2004

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Satelitske zemeljske postaje in sistemi (SES) - Mobilne zemeljske postaje (MES), ki zagotavljajo podatkovne komunikacije z nizkimi bitnimi hitrostmi (LBRDC), uporabljajo satelite na nizki zemeljski orbiti in obratujejo pod 1 GHz

Satellite Earth Stations and Systems (SES); Mobile Earth Stations (MES) providing Low Bit Rate Data Communications (LBRDC) using Low Earth Orbiting (LEO) satellites operating below 1 GHz

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Candidate Harmonized European Standard (Telecommunications series)

Satellite Earth Stations and Systems (SES); Mobile Earth Stations (MES) providing Low Bit Rate Data Communications (LBRDC) using Low Earth Orbiting (LEO) satellites operating below 1 GHz

Reference
REN/SES-00039 (6oc00ipc.PDF)

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Satellite Earth Stations and Systems (SES).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [2] (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 [3] supplementing Directive 98/13/EC [1] in respect of satellite earth station equipment ("the SES Directive").

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

National transposition dates	
Date of adoption of this EN:	23 July 1999
Date of latest announcement of this EN (doa):	31 October 1999
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2000
Date of withdrawal of any conflicting National Standard (dow):	30 April 2000

1 Scope

The present document specifies those technical requirements that apply to Mobile Earth Stations (MESs) for compliance with article 17 of Council Directive 98/13/EC [1].

There are no essential requirements under article 17.6 of Directive 98/13/EC [1] for terminals approved against the present document, and there is no guarantee of correct interworking between satellite earth station equipment.

The MESs will operate in frequency range below 1 GHz, in one or more of the Mobile Satellite Service (MSS)/Land Mobile-Satellite Service (LMSS) frequency bands given in table 1.

Table 1: Frequency Ranges

MES Transmit frequencies and Service allocations (MHz)		MES Receive frequencies and Service allocations (MHz)	
148 to 149,9	MSS	137 to 137,025	MSS
149,9 to 150,05	LMSS	137,025 to 137,175	MSS
235 to 322	MSS	137,175 to 137,825	MSS
335,4 to 399,9	MSS	137,825 to 138	MSS
399,9 to 400,05	LMSS	235 to 322	MSS
		335,4 to 399,9	MSS
		400,15 to 401	MSS

- The MESs could be a Based MES (BMES), a Vehicle mounted MES (VMES), or a Portable MES (PME S).
- The MESs operate through satellites in Low Earth Orbit (LEO) as part of a network providing Low Bit Rate Data Communications (LBRDC).
- The MESs are controlled and monitored by a Network Control Facility (NCF). The NCF is outside the scope of the present document.

The requirements of the present document shall be selected to ensure an adequate level of compatibility with other radio services.

The present document does not contain any requirement, recommendation, or information about the installation of the MESs.

Compliance of MESs to the requirements of the present document does not imply that the MESs may be used. In conformity with article 15.2 of Directive 98/13/EC [1] the use of such equipment may be subject to licensing terms in conformity with Community law.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] Directive 98/13/EC of the European Parliament and of the Council of 12 February 1998 relating to telecommunications terminal equipment and satellite earth station equipment, including the mutual recognition of their conformity.

[2] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.

[3] Directive 93/97/EEC of the European Parliament and of the Council concerning satellite earth station equipment, including the mutual recognition of their conformity: COM(95) 612 fin.

[4] IEC 60068-2-1: "Environmental testing - Part 2: Tests. Tests A: Cold".

[5] IEC 60068-2-2: "Environmental testing - Part 2: Tests. Tests B: Dry heat".

[6] IEC 60068-2-36: "Environmental testing - Part 2: Tests. Tests Fdb: Random vibration wide band - Reproducibility medium".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

applicant: party seeking an approval, or to place a S-PCS < 1 GHz MES on the market, i.e. the manufacturer of the equipment, or his authorized representative, or an equipment supplier to the market

BMES: MES intended to be installed in a fixed location, and which is powered either by DC or AC supply

carrier-off state: MES is in this state when it is not transmitting a signal, i.e. not in the carrier-on state

carrier-on state: MES is in this state when it is transmitting a signal in a continuous or non-continuous mode

control channel: control channel may be either a command to a particular MES or a signal from the satellite containing control information to appropriately enable or disable transmissions from a MES

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

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

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): 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 modules(s) as Internally Mounted Equipment (IME)

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

MSS band: continuous range of frequencies allocated by the ITU to the MSS (Mobile Satellite Service)

narrow-band system: 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: channel by which an MES receives general control information from the NCF

NCF control message: 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: bandwidth of the MES radio frequency transmission is nominated by the applicant. The nominated bandwidth is wide enough to encompass all spectral elements of the transmission which have a level greater than the specified unwanted emissions limits. The nominated bandwidth is wide enough to take account of the transmit carrier frequency stability. The nominated bandwidth is within the MSS transmit frequency band within which the MES operates

PMES: MES intended to be portable, and which is powered by a stand alone battery, and generally intended to be self-contained and free standing. A PMES would normally consist of a single module, but may consist of several interconnected modules. In some cases different specifications apply to PMES and this is noted in the relevant text

radiated measurement: 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 the present document can be performed

test laboratory: laboratory authorized by an accreditation body, which performs conformance testing in accordance with the Directive 98/13/EC [1]

test load: 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

VMES: MES intended to be installed on a vehicle

wide-band system: 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

NOTE: For FDMA/DCAA systems the Nominated Bandwidth does not exceed 25 kHz.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AC	Alternating Current
ASD	Acceleration Spectral Density
BMES	Base MES
CMF	Control and Monitoring Function
dBpW	decibels relative to 1 picaWatt
DC	Direct Current
DCAA	Dynamic Channel Activity Assignment
DS-SSMA	Direct Sequence Spread Spectrum Multiple Access
EIRP	Equivalent Isotropically Radiated Power
EMC	Electro-Magnetic Compatibility
EME	Externally Mounted Equipment
FDMA	Frequency Division Multiple Access
IE	Installable Equipment
IEC	International Electrotechnical Commission/Committee
IME	Internally Mounted Equipment
ITU	International Telecommunications Union
LBRDC	Low Bit Rate Data Communications
LMSS	Land Mobile Satellite Service
LTE	Laboratory Test Equipment
MES	Mobile Earth Station
MIC	MES Identification Code
MSS	Mobile Satellite Service

NCF	Network Control Facility
PMES	Portable MES
ppm	parts per million
RAS	Radio Astronomy Service
RF	Radio Frequency
S-PCS	Satellite Personal Communication System/Service
STE	Special Test Equipment
VMES	Vehicle Mounted MES

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 the present document.

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 present document 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:

- self contained or host-connected;
- 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 subclause 6.1.2.

- the fault conditions which cause transmission shut-down;
- the nominal, the minimum and maximum electrical operation voltages;
- if the conducted emission measurements are to be performed:
  - the maximum antenna gain or the antenna gain at the frequency of the measured spurious emission, according to the choice of the applicant.

- In an information leaflet:

  1) the name of the network;

  2) the maximum value of nominated bandwidth for that network, as defined by the network operator;

  3) the maximum value of nominated bandwidth for the MES, as defined by the applicant;

  4) the operating frequency range(s) of the MES;

  5) the maximum gross data rate at which the MES is designed to operate;

  6) the manufacturers declaration of full environmental conformity with subclause 5.8.2;

  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 subclause 6.2 shall be used.

5 Requirements

5.1 Unwanted emission outside the bands 148 MHz to 150,05 MHz, 235 MHz to 322 MHz, 335,4 MHz to 399,9 MHz and 399,9 MHz to 400,05 MHz

5.1.1 Justification and purpose

This requirement is justified under Directive 98/13/EC [1] article 17 in order to protect other terrestrial services, space radiocommunications services and the radio astronomy services from emissions caused by MESs outside the bands 148 MHz to 150,05 MHz, 235 to 322 MHz, 335,4 to 399,9 MHz and 399,9 to 400,05 MHz.

5.1.2 Conformance requirements

The unwanted emissions from the MES outside the uplink bands 148 MHz to 150,05 MHz, 235 MHz to 322 MHz, 335,4 MHz to 399,9 MHz and 399,9 MHz to 400,05 MHz, within which the MES is designed to operate, shall not exceed the limits shown in the following tables.

Table 2: Unwanted emissions for FDMA MESs outside the operational band 148 MHz to 150,05 MHz, 235 MHz to 322 MHz, 335,4 MHz to 399,9 MHz and 399,9 MHz to 400,05 MHz

Frequency (MHz)	Maximum EIRP density (dBpW) FDMA	Measurement bandwidth
0,1 to 148	54	100 kHz
150,05 to 235	54	100 kHz
322 to 335,4	54	100 kHz
400,05 to 1 000	54	100 kHz
1 000 to 1 559	60	1 MHz
1 559 to 1 626,5	50	1 MHz
1 626,5 to 12 750	60	1 MHz