SLOVENSKI STANDARD
SIST EN 60244-14:1999

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Methods of measurement for radio transmitters - Part 14: External intermodulation products caused by two or more transmitters using same or adjancent antennas (IEC 60244-14:1997)

Methods of measurement for radio transmitters -- Part 14: External intermodulation products caused by two or more transmitters using the same or adjacent antennas

Meßverfahren für Funksender -- Teil 14: Externe Intermodulationsprodukte, verursacht durch zwei oder mehr Sender, welche gleiche oder benachbarte Antennen benutzen

Méthodes de mesure applicables aux émetteurs radioélectriques -- Partie 14: Produits d'intermodulation à l'extérieur du canal provoqués par deux émetteurs ou plus utilisant la même antenne ou des antennes adjacentes

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Methods of measurement for radio transmitters Part 14: External intermodulation products caused by two or more transmitters using the same or adjacent antennas (IEC 60244-14:1997)

Méthodes de mesure applicables aux émetteurs radioélectriques Partie 14: Produits d'intermodulation à l'extérieur du canal provoqués par deux émetteurs ou plus utilisant la même antenne ou des antennes adjacentes (CEI 60244-14:1997)

Meßverfahren für Funksender Teil 14: Externe Intermodulationsprodukte, verursacht durch zwei oder mehr Sender, welche gleiche oder benachbarte Antennen benutzen (IEC 60244-14:1997)

This European Standard was approved by CENELEC on 1997-07-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 103/2/FDIS, future edition 1 of IEC 60244-14, prepared by SC 12C (transformed into IEC TC 103, Transmitting equipment for radiocommunication), was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60244-14 on 1997-07-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-04-01

Endorsement notice

The text of the International Standard IEC 60244-14:1997 was approved by CENELEC as a European Standard without any modification.

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Méthodes de mesure applicables aux émetteurs radioélectriques –

Partie 14: Produits d'intermodulation à l'extérieur du canal provoqués par deux émetteurs ou plus utilisant la même antenne ou des antennes adjacentes

Methods of measurement for radio transmitters –

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

METHODS OF MEASUREMENT FOR RADIO TRANSMITTERS –

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FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.

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6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60244-14 has been prepared by subcommittee 12C: Transmitting equipment, of IEC technical committee 12: Radiocommunications.

This International Standard supersedes all clauses of IEC 60244-2, dealing with methods for measuring external intermodulation products. It is one of a series of parts of IEC 60244. Several existing parts of IEC 60244 are currently under review and some of the older parts will be revised or withdrawn. When this process is complete, the overall standard will comprise Part 1 which deals with general characteristics including cross-references to International Radio Regulations and relevant ITU-R publications, and a number of parts dedicated to particular types of equipment.

It should be noted that the work undertaken by the ITU-R on problems of compatibility between the broadcasting and aeronautical services, due to the extension of Band II to 108 MHz, has been taken into account in the preparation of this International Standard.

The text of this standard is based on the following documents:

FDIS	Report on voting
103/2/FDIS	103/5/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

Annex A forms an integral part of this standard.

Annexes B and C are given for information only.

INTRODUCTION

Following the decision of the World Administrative Radio Conference held at Geneva in 1979 to extend the VHF/FM broadcast band to 108 MHz, the ITU-R* has recommended more stringent limits on spurious emissions in some circumstances than those called for by the ITU Radio Regulations, in order to avoid interference to the aeronautical services.

Annex C, reproduced from CCIR Recommendation 329-6, summarizes in the form of a graph the requirements given in Provision 304 and Appendix 8 of the Radio Regulations, Geneva 1990 (see also Provisions 138, 139, 146 and 163 of the Radio Regulations, RR1-18/19/20/23, Sec. VI and VII).

* Formerly CCIR.

METHODS OF MEASUREMENT FOR RADIO TRANSMITTERS –

Part 14: External intermodulation products caused by two or more transmitters using the same or adjacent antennas

1 Scope

This part of IEC 60244 details a measurement method for external intermodulation products (intermodulation components) caused by two or more transmitters using the same or adjacent antennas. It describes recommended methods of assessing the performance of radio broadcast transmitters.

The purpose of the measurements described in clauses 4 and 5 of this part is to prove, as far as possible, that the requirements of the Radio Regulations with respect to maximum permissible radiated levels of intermodulation products from LF, MF, HF, VHF, UHF and SHF transmitters will be fulfilled when two or more transmitters use the same or nearby antennas.

The method of measurement given in this part is not appropriate for type tests and IT SHOULD BE NOTED THAT THE MEASUREMENTS ARE TO BE CARRIED OUT ONLY WHEN MUTUALLY AGREED between the purchaser and supplier of the equipment.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60244. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 60244 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ITU-R* Recommendation 329-6: 1994, *Spurious emissions (Fasc. I)*

Radio Regulations and Appendices: Geneva 1990

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* Formerly CCIR.

3 Definitions

For the purpose of this part of IEC 60244, the following definitions apply.

3.1 **external intermodulation products and spurious emission**: Intermodulation products are classified by the Radio Regulations as spurious emissions, i.e., emissions on frequencies outside the necessary bandwidth, the levels of which may be reduced without affecting the corresponding transmission of information. In addition to intermodulation products, spurious emissions include harmonic emissions, parasitic emissions and frequency conversion products, but exclude out-of-band emissions.

External intermodulation products result from intermodulation between the various transmissions when different transmitters make use of antennas located close together, or share the same antenna.

The external intermodulation products (components) may be caused by non-linearity in the output stage of a transmitter if the transmission from another transmitter is superimposed on its own. Such intermodulation may result from coupling between open transmission lines, switching units, nearby antennas (see figure 6) or imperfect separation in the combining network between transmitters sharing the same antenna. External intermodulation products may also be produced if an interfering transmission penetrates the driver stages of a transmitter.

3.2 **out-of-band emission**: Emission on a frequency or frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

3.3 **harmful interference**: Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with the Radio Regulations.

3.4 **necessary bandwidth**: For a given class of emission, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate given and with the quality required under specified conditions.

3.5 **type A-mode interference** (applies to VHF/FM broadcast services only): Type A-mode interference relates to interference radiated from VHF/FM broadcast transmitters at or near the frequency of aeronautical services in the adjacent band from 108 MHz to 137 MHz.

The ITU-R subdivides type A-mode interference into type A1-mode and type A2-mode.

- Type A1-mode interference comprises radiated intermodulation products from broadcast transmitters generated in the aeronautical band from 108 MHz to 137 MHz.

  It is generally a low-level effect but may be of significance at -100 dB, or lower, relative to the transmitter carrier reference level. It is a form of spurious emission and can be regarded as harmful interference as defined in the Radio Regulations.

- Type A2-mode interference relates to out-of-band emissions from broadcast transmitters on frequencies just below 108 MHz to aeronautical services just above 108 MHz.