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Fiksni radijski sistemi ï Veļ toļ kovna oprema in antene ï 3. del: Harmonizirani EN, ki zajema bistvene zahteve ļ lena 3.2 direktive R&TTE za veļ toļ kovne radijske antene

Fixed Radio Systems; Multipoint Equipment and Antennas; Part 3: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for Multipoint Radio Antennas

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Fixed Radio Systems; Multipoint Equipment and Antennas; Part 3: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for Multipoint Radio Antennas

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Foreword

This Candidate Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Transmission and Multiplexing (TM).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC (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 Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity ("the R&TTE Directive" [1]).

Technical specifications relevant to Directive 1999/5/EC [1] are given in annex A.

This multi-part deliverable covers characteristics and requirements for fixed multipoint radio equipment and antennas, using a variety of access and duplex methods and operating at a variety of bit rates in frequency bands as specified in the present document.

The present document is part 3 of a multi-part deliverable covering the Fixed Radio Systems; Multipoint Equipment and Antennas, as identified below:

Part 1: "Overview and Requirements for Digital Multipoint Radio Systems";

Part 2: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for Digital Multipoint Radio Equipment";

Part 3: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for Multipoint Radio Antennas".

EN 302 326-2 [7] and the present document are Harmonized ENs and essential requirements are those requirements which are essential under article 3.2 of the R&TTE Directive [1].

In the above, "equipment" includes equipment with integral antennas, and "antennas" include requirements for antennas whether they are integral or non-integral.

The present document with EN 302 326-2 [7] will replace and supersede the harmonized EN 301 753 (see bibliography) for all Multipoint equipment and antennas under its scope.

The date of cessation of presumption of conformity to R&TTE Directive [1] with reference to EN 301 753 (see bibliography, latest version published) is proposed to be two years after the date of publication in the OJ EC of the present document.

National transposition dates	
Date of adoption of this EN:	16 December 2005
Date of latest announcement of this EN (doa):	31 March 2006
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 September 2006
Date of withdrawal of any conflicting National Standard (dow):	30 September 2007

0 Introduction

0.1 General

For the general background, rationale and structure of the present document see also the clause "Introduction" in EN 302 326-1 [6].

0.2 Applicability to the R&TTE directive

The present document is part of a set of standards designed to fit in a modular structure to cover all radio and telecommunications terminal equipment under the R&TTE Directive [1]. Each standard is a module in the structure. The modular structure is shown in figure 1.

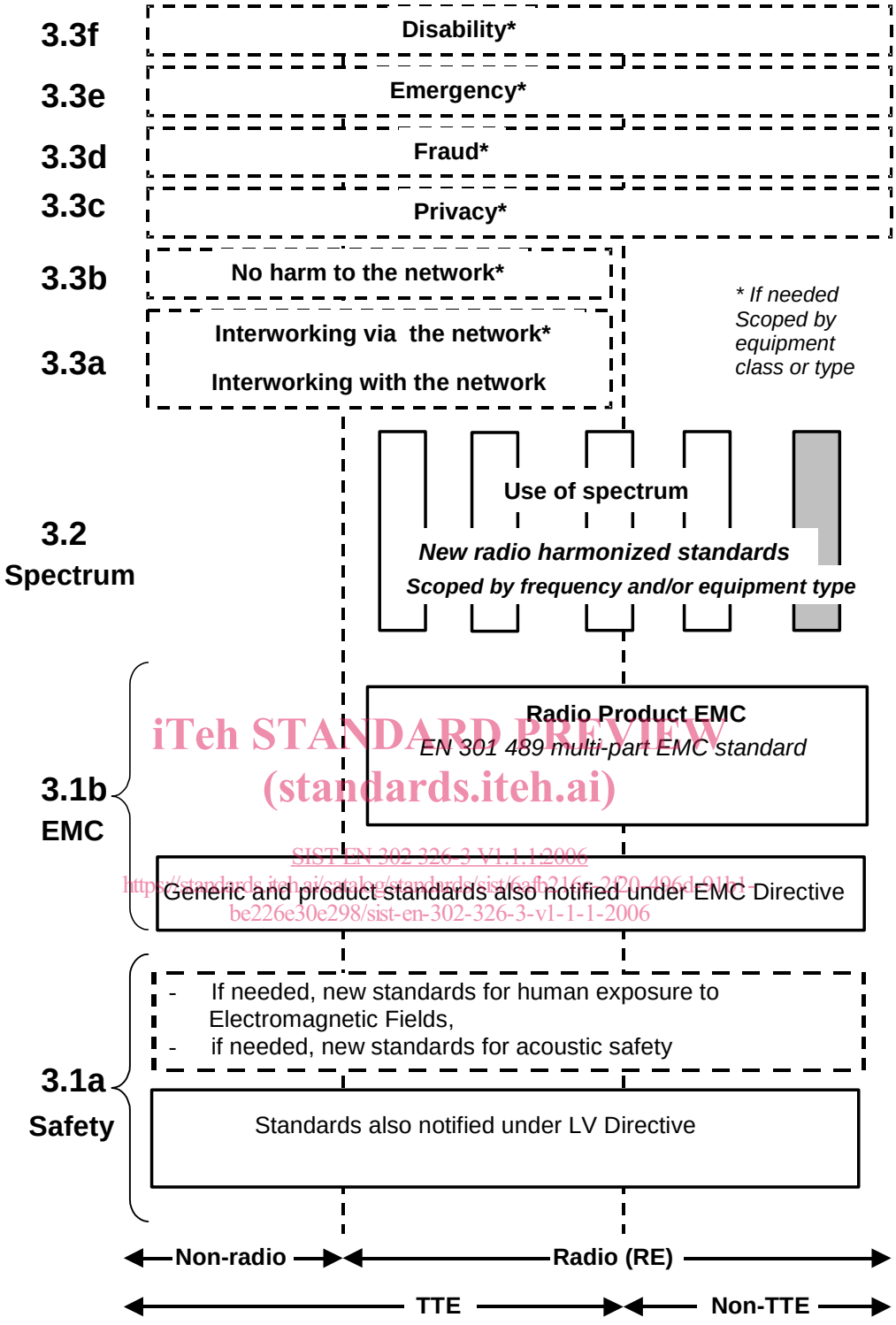

Figure 1: Modular structure for the various standards used under the R&TTE Directive [1]

The left hand edge of figure 1 shows the different clauses of article 3 of the R&TTE Directive [1].

For article 3.3 various horizontal boxes are shown. Dotted lines indicate that at the time of publication of the present document essential requirements in these areas have to be adopted by the Commission. If such essential requirements are adopted, and as far and as long as they are applicable, they will justify individual standards whose scope is likely to be specified by function or interface type.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum by radio equipment. The scopes of these standards are specified either by frequency (normally in the case where frequency bands are harmonized) or by radio equipment type.

For article 3.1b the diagram shows EN 301 489 (see bibliography), the multi-part product EMC standard for radio used under the EMC Directive 89/336/EEC (see bibliography).

NOTE: For Fixed Radio Systems, EN 301 489-1 and EN 301 489-4 (see bibliography) are relevant.

For article 3.1a the diagram shows the existing safety standards currently used under the LV Directive 73/23/EEC (see bibliography) and new standards covering human exposure to electromagnetic fields. New standards covering acoustic safety may also be required.

The bottom of the figure shows the relationship of the standards to radio equipment and telecommunications terminal equipment. A particular equipment may be radio equipment, telecommunications terminal equipment or both. A radio spectrum standard will apply if it is radio equipment. An article 3.3 standard will apply as well only if the relevant essential requirement under the R&TTE Directive [1] is adopted by the Commission and if the equipment in question is covered by the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the R&TTE Directive [1] may be covered in a set of standards.

The modularity principle has been taken because:

- it minimizes the number of standards needed. Because equipment may, in fact, have multiple interfaces and functions it is not practicable to produce a single standard for each possible combination of functions that may occur in an equipment;
- it provides scope for standards to be added:
  - under article 3.2 when new frequency bands are agreed; or
  - under article 3.3 should the Commission take the necessary decisions

  without requiring alteration of standards that are already published;
- it clarifies, simplifies and promotes the usage of Harmonized Standards as the relevant means of conformity assessment.

1 Scope

1.1 General

The present document is intended to cover the provisions of the R&TTE Directive [1] regarding article 3.2, which states that "….. radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

The present document is applicable to the essential requirements of antennas (including equipment with integral antennas) used in fixed multipoint radio systems

The present document together with EN 302 326-2 [7], is intended to replace and supersede, after a suitable transition period, the harmonized EN 301 753 (see bibliography). for all multipoint equipment and antennas under its scope.

The present document and EN 302 326-2 [7] introduce rationalization among systems conforming to previous EN 301 753 (see bibliography) referencing a number of ENs which, being developed at different times, may have specified slightly different antenna parameters. Nevertheless, care has been taken so that such variations will not affect any frequency planning assumption for already deployed networks. Therefore, unless specifically mentioned, these new requirements, whenever different from those single ENs, are considered completely "equivalent". Therefore mixed use of antennas conforming to the present document and to those previous ones will not change, in practice, any frequency planning rule in any network.

Therefore, from a strictly technical point of view, in most cases it is expected that equipment already conforming to the previous versions of Harmonized EN 301 753 (see bibliography), would not need re-assessment of essential requirements according to the present document. The legal implications of the declaration of conformity and equipment labelling are, however, outside the scope of this whole multi-part deliverable. Cases, where additional conformance assessment is required, will be specifically mentioned in EN 302 326-2 [7] and in the present document.

A formal change in the requirements, introduced by the present document, is that the antenna manufacturer shall declare the nominal gain and tolerance of the antenna against which the conformity assessment is done.

In addition to the present document, other ENs specify technical requirements in respect of essential requirements under other parts of article 3 of the R&TTE Directive [1] and which will apply to antennas within the scope of the present document.

NOTE: A list of such ENs is included on the web site: http://www.newapproach.org.

In order to (technically) cover different market and network requirements, with an appropriate balance of performance to cost and effective and appropriate use of the radio spectrum, the present document, together with EN 302 326-2 [7], offers a number of system types and antennas alternatives, for selection by administrations, operators and manufacturers dependent on the desired use of the radio spectrum and network/market requirements; those options include:

- channel separation alternatives (as provided by the relevant CEPT Recommendation);
- spectral efficiency class alternatives (different modulation formats provided in radio equipment standards);
- antenna sectorization alternatives and directivity classes for CS;
- antenna directivity class alternatives for TS and/or RS;
- antenna basic polarization (linear or circular).

For Digital Fixed Radio Systems (DFRS), antennas are considered "relevant components" of "radio equipment" according the definition in article 2(c) of the R&TTE Directive [1]. In particular, it has to be noted that TCAM, while recognizing the "essentiality" of antenna directional requirements for some applications, including the Fixed Service, has deliberated that there should be no obligation for separate declaration of conformity for stand alone antennas and that the conformity to the relevant essential requirements should be the responsibility of the final system integrator.

However, it has also been recognized that the assessment of article 3.2 requirements on the radio-sites is technically impractical. Therefore, it should not be forbidden to a supplier of DFRS antennas, who decides, under his responsibility, to declare compliance to the relevant harmonized standard (or part thereof, in this case), to affix the CE label to a stand-alone Fixed Radio antenna product, fulfilling all other obligations foreseen by the R&TTE Directive [1] and in particular, providing information for the user on the intended use of the apparatus. The final system integrator might benefit from such a declaration of conformity for any final radio-site assessment obligations.

In the case where the antenna manufacturer does not wish to fulfil all the applicable obligations of the R&TTE Directive [1] it is recommended to keep the specific radio test suite (relevant to the antenna essential requirements) and offer them on request to the radio system vendor or to the final system integrator in order to fulfil his obligation to the R&TTE Directive [1].

More information and background on the R&TTE Directive [1] possible applicability and requirements for stand alone DFRS antennas is found in EG 201 399 (see bibliography) and in TR 101 506 (see bibliography).

Technical specifications relevant to the R&TTE Directive [1] are summarized in annex A. For Fixed Systems, antennas are considered "relevant components" of "radio equipment" according the definition in article 2(c) of the R&TTE Directive [1].

1.2 Frequency ranges

The present document is applicable to antennas (whether integral or non-integral) used in multipoint radio systems operating in bands allocated to Fixed Service and assigned by national regulations to MP applications within the following frequency ranges:

- 1 GHz to 3 GHz;
- 3 GHz to 5,9 GHz;
- 5,9 GHz to 8,5 GHz;
- 8,5 GHz to 11 GHz;
- 24,25 GHz to 30 GHz;
- 30 GHz to 40,5 GHz.

NOTE 1: Attention is drawn to the fact that the specific operating bands are subject of CEPT or national licensing rules. Currently applicable Fixed Service bands and channel plans are described in EN 302 326-1 [6], although the applicability of these Fixed Service bands is at the discretion of the national administrations. Therefore, this EN applies only to those bands which are allocated to the Fixed Service and/or assigned by national regulations to MP applications on the date on which the EN was published.

NOTE 2: Antenna characteristics are not specified at frequencies below 1 GHz and therefore the present document and Harmonized EN 302 326-2 [7] can not be used for Declaration of conformity, according article 3.2 of the R&TTE Directive [1] for non integral antennas or for equipment with integral antennas below this limit. In this case, additional test suites for relevant antenna directional phenomena shall be produced in accordance with a Notified Body.

NOTE 3: MWS antenna systems in the band 40,5 GHz to 43,5 GHz are not within the scope of the present document. For these systems see EN 301 997-2 (see bibliography).

1.3 Profiles

1.3.1 General

This whole multi-part deliverable allows many distinct types of equipment, several different antenna types and several ways in which they might be interconnected to form a network. However, the applicability is limited to certain combinations of attributes and these combinations of attributes are called "profiles". The following clauses address:

- Equipment profiles.
- Antenna profiles.
- System profiles.

1.3.2 Equipment profiles

This whole multi-part deliverable allows alternative consistent sets of recommendations and requirements, each for identified equipment profiles, which are defined in terms of their Equipment Classification (EqC), which classify equipments in terms of key characteristics. The profiles (or indeed any specific equipment) within the scope of this whole multi-part deliverable may be classified as discussed in normative annex A of EN 302 326-1 [6]. Clause 6.1 of EN 302 326-1 [6] defines the permitted equipment profiles in terms of the various fields of EqC.

1.3.3 Antenna profiles

According to their characteristics, multipoint systems use different types of antennas. Table 1 outlines the multipoint antenna types described in the present document.

Table 1: Antenna Types

Frequency Range	Types	Polarization	Notes
1 GHz to 3 GHz	Directional Sectored single beam Omnidirectional	Linear	The sectored and omnidirectional antennas may have a symmetric or asymmetric radiation pattern in the elevation plane.
3 GHz to 11 GHz	Directional Sectored single beam Sectored multi beam (up to 5,9 GHz only) Omnidirectional	Linear	The sectored single and omnidirectional antennas may have a symmetric or asymmetric radiation pattern in the elevation plane. The sectored multi beam antennas have a symmetric radiation pattern only.
1 GHz to 11 GHz	Directional Sectored single beam Omnidirectional	Circular	The sectored and omnidirectional antennas may have a symmetric or asymmetric radiation pattern in the elevation plane.
24,25 GHz to 30 GHz	Directional Sectored single beam	Linear	
30 GHz to 40,5 GHz	Directional Sectored single beam Omnidirectional	Linear	The omnidirectional antennas may have a symmetric or asymmetric radiation pattern in the elevation plane.

The present document is applicable to multipoint radio system antennas of both linear (single or dual) polarization and circular (single or dual) polarization. Linear polarization antennas may support either or both of two mutually perpendicular planes of polarization. These planes are frequently, though not always, horizontal and vertical. Circular polarization antennas may support either right hand or left hand polarization or, for dual polarization, both.

The RPE directional characteristics and polarization characteristics (co-polar and cross-polar and for either linear or circular polarized antennas) impact on the interference to be considered in network planning. A number of antenna options are defined in the present document to allow a trade-off between highly demanding RPE directivity and the cost/size/weight of the antennas. The antenna choice should take into account present and future networks requirements and constraints.

Annex B discusses Antenna Profiles for multipoint systems.