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**CENELEC/ETSI standardization programme for the
development of Harmonized Standards related to
Electro-Magnetic Compatibility (EMC) in the field of
telecommunications**

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Foreword

This ETSI Technical Report (ETR) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI) and has been adopted for publication by a vote of the ETSI Full Members, and approval by the European Committee for Electrotechnical Standardization (CENELEC) Technical Board.

This ETR has been produced under the Mandate BC-T-319 received from the European Commission (EC), by a Joint Working Party (JWP BCT-319), under the joint responsibility of the European Telecommunications Standards Institute (ETSI) and the European Committee for Electrotechnical Standardization (CENELEC) Electro-Magnetic Compatibility (EMC) co-ordination group.

This ETR contains a first list of the Harmonized EMC Standards for telecommunications equipment to be produced by CENELEC and ETSI, and proposals for the procedures to be followed for the development of these standards.

ETRs are informative documents resulting from ETSI studies that are not appropriate for European Telecommunication Standard (ETS) or Interim European Telecommunication Standard (I-ETS) status. An ETR may be used to publish material that is either of an informative nature, relating to the use or the application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or an I-ETS.

It is the intention that at a later stage, after a mandate from the EC has been received to produce Harmonized EMC Standards, this ETR will be converted into a Technical Committee Reference Technical Report (TCR-TR) (whose requirements are mandatory on all ETSI Members), approved by the ETSI Technical Assembly (ETSI TA). It is also the intention of CENELEC to publish this ETR as a CENELEC Report.

Introduction

General

This ETR is intended to be a reference document for those involved in the production of Harmonized Standards in the framework of the Council Directive 89/336/EEC [1] (EMC Directive) under an EC Mandate.

The JWP felt that additional clarification was necessary to be given regarding the implications of the legislation in relation to the development of Harmonized Standards for telecommunications equipment under the "New Approach", and that, with the present organizational structure and working procedures of the standardization organizations, it is justified to include detailed information in this ETR to assist the reader. This ETR, in accordance with the Mandate BC-T-319, therefore, concentrates on the way forward to produce the Harmonized EMC Standards necessary in the field of telecommunications.

The Directives referred to in the Scope (see clause 1), together with the "Guide to the implementation of Community harmonization directives based on the New Approach [2] and the Global Approach [3]" are considered essential to the reader's understanding of the requirements when producing Harmonized EMC Standards.

The objective of the New Approach

The objective of the New Approach [2] is:

"the removal of barriers to trade between the Member States of the European Union".

This is achieved by the introduction of Council Directives in which the legislative harmonization is restricted to essential requirements to which products intended to be put on the market, and to be used, have to conform to enjoy free movement throughout the European Union.

The principal method identified by the New Approach [2] to achieve the objective of the removal of barriers to trade is the development of Harmonized Standards. These define the technical specifications that elaborate the essential requirements of the Council Directives.

The development of Harmonized EMC Standards, which are needed by manufacturers to design and to market products conforming to the essential requirements established by the Council Directives, is entrusted to the recognised European standardization organizations, CEN, CENELEC and ETSI.

Objectives of ETSI

The objective of the ETSI, according to its statutes is:

"to produce the technical standards which are necessary to achieve a large unified European telecommunications market.

This objective may be achieved by any means. ETSI may carry out any action relating, directly or indirectly, wholly or in part, to its objective or which may develop or facilitate the achievement of its objective".

Objectives of CENELEC

"The objective of CENELEC lies in the scientific, technical and economic fields and consists on the one hand in the harmonization of the national electrotechnical standards published by the national organizations entrusted with such publication, and on the other hand in removing trade barriers which may result directly or indirectly from the measures applied in the member states to indicate or certify conformity to standards of a given product, in particular by means of a mark or of a certificate.

CENELEC may conduct any activities or perform any operations, undertake any steps or initiatives capable of promoting the achievement of its statutory purpose and, in particular, co-operation among its members. It does not intervene in any way in the competitive efforts of industrialists and tradesmen."

Objective of the programme and the procedure

The objective of all the sectorial players contributing to this ETR has been two-fold:

- the development of this standardization programme; and
- the development of a procedure for the production of harmonized standards, as required by the EC Mandate, i.e. "to develop a comprehensive ETSI and CENELEC standardization programme for the development of Harmonized Standards, in the field of electromagnetic compatibility".

The objective is to enable a "one-stop approval" for the free circulation of telecommunications products throughout the European Union.

The sectorial players involved in the production of this ETR were standardization organizations (ETSI and CENELEC), the CEPT administrations (ERC), the European Broadcasting Union (ETSI/EBU JTC), manufacturers (ECTEL), network operators, and regulatory authorities in the field of telecommunications.

This programme addresses the development of Harmonized EMC Standards that specify the relevant electromagnetic phenomena that may degrade the performance of a device, unit of equipment or system, and which specify the necessary performance characteristics of telecommunications and radiocommunications equipment liable to be affected by such disturbance, or the characteristics required to prevent such effects.

These performance characteristics are to be harmonized in order to guarantee the free movement of telecommunications and radiocommunications equipment, without lowering the existing and justified levels of protection in the Member States.

However, the use of radio equipment is subject to national licensing provisions.

In the development of this standardization programme, it has been recognised that for some categories of (transmitting) radio equipment, not all technical specifications deemed necessary as essential requirements can be harmonized. In particular, radio equipment intended to be used on frequencies that are not harmonized across Europe, or intended to operate in a radio service application (for example, the Private Mobile Radio (PMR) service) for which the technical specification differs between several Member States, suffers this problem.

Such different technical specifications may relate to the radio frequency of operation, to the radiated RF output power, and to other technical characteristics of the wanted radio frequency signal.

These technical specifications may be subject to national licensing provisions; they may not necessarily be included in the Harmonized EMC Standards developed under this programme.

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1 Scope

This ETR specifies a standardization programme to be executed by ETSI and CENELEC for the development of draft Harmonized electromagnetic compatibility Standards for telecommunications equipment, telecommunications networks, Satellite Earth Station (SES) equipment and radio communications equipment, and for their installations.

This ETR has been produced in response to, and to satisfy, the Mandate BC-T-319 [4] from the European Commission (EC) to develop a coherent work programme for the establishment of Harmonized Standards laying down technical specifications related to electromagnetic compatibility. These Harmonized EMC Standards will contain all the technical specifications necessary to confer to the equipment presumption of conformance to the essential requirements related to electromagnetic compatibility of Council Directives 89/336/EEC [1], (EMC Directive), 91/263/EEC [5], (TTE Directive) and 93/97/EEC [6], (SES Directive), whichever are relevant for the equipment concerned.

The conformity of an equipment to the applicable Harmonized EMC Standards, the references of which have been published in the Official Journal of the European Communities (OJEC) and published officially in at least one Member State, will confer presumption of conformance with the essential requirements of the relevant Directives.

The standardization programme, as specified in this ETR, applies to all types of telecommunications equipment to which the Council Directives referred to above are relevant insofar as they are within the responsibility of ETSI for the development of ETSs, and CENELEC for the development of ENs, in this field of standardization.

The Harmonized EMC Standards that are to be developed under the terms of this programme will consist of:

- newly developed standards; or
- copies of parts of already existing standards, and where necessary amended to cover all the essential requirements of the Council Directives related to electromagnetic compatibility.

2 References

For the purposes of this ETR the following references apply:

- [1] 89/336/EEC: "Council Directive of 3 May 1989 on the approximation of laws of the Member States relating to Electromagnetic Compatibility (Official Journal L139 of 23/5/89)" including 92/31/CEE.
- [2] "Council Resolution of 7 May 1985 on a new approach to technical harmonization and standards" (Official Journal C 136/1 of 04/06/85).
- [3] "Guide to the implementation of Community harmonization directives based on the new approach and the global approach" (ISBN 92-826-8584-5).
- [4] BC-T-319: "Mandate for the preparation of a work programme forwarded to CEN, CENELEC and ETSI in the field of telecommunications, dated 26 October 1994".
- [5] 91/263/EEC: "Council Directive of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity (Official Journal L128/1, 23/5/1991)".
- [6] 93/97/EEC: "Council Directive of 29 October 1993 supplementing Directive 91/263/EEC in respect of satellite earth station equipment (Official Journal L290, 24/11/93)."

- [7] 83/189/EEC: "Council Directive of 28th March 1983 laying down a procedure for the provision of information in the field of technical standards and regulations" and 94/10/EC: "Council Directive of 23rd March 1994 of the European Parliament and the Council, materially amending for the second time Council Directive 83/189/EC".
- [8] prETS 300 339: "Radio Equipment and Systems (RES); General Electro-Magnetic Compatibility (EMC) for radio equipment".
- [9] EN 55022: "CISPR 22: 1993; Limits and methods of measurement of radio disturbance characteristics of information technology equipment".
- [10] ITU-T Recommendation K.20: "Resistibility of telecommunication switching equipment to overvoltages and overcurrents".
- [11] EN 50081-1: "Electromagnetic compatibility - Generic emission standard; Part 1: Residential, commercial and light industry".
- [12] EN 50082-1: "Electromagnetic compatibility - Generic immunity standard; Part 1: Residential, commercial and light industry".
- [13] EN 50081-2: "Electromagnetic compatibility - Generic emission standard; Part 2: Industrial environment".
- [14] EN 50082-2: Electromagnetic compatibility - Generic immunity standard; Part 2: Industrial environment".
- [15] EN 61000-2-2: "Electromagnetic Compatibility (EMC); Part 2: Environment; Section 2: Compatibility Levels for Low-Frequency Conducted Disturbances and Signalling in Public Low-Voltage Power Supply Systems".
- [16] EN 61000-2-3: "Electromagnetic Compatibility (EMC); Part 2: Environment; Section 3: "Description of the environment Radiated and non-network frequency related Conducted Phenomena".
- [17] 90/683/EEC: "Council Decision of 13th December 1990 concerning the modules for the various phases of the conformity assessment procedures which are intended to be used in the technical harmonization Directives".
- [18] "Council Resolution of 21 December 1989 on a global approach to conformity assessment" (Official Journal C 10/1 16/01/90).
- [19] CENELEC Report R110-001 (March 1993): "Guide on EMC standardization for product committees".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETR the following definitions apply:

technical specification: A specification contained in a document that lays down the characteristics required of a product, such as levels of quality, performance, safety or dimensions, and including the requirements applicable to the product as regards terminology, symbols, testing and test methods packaging, marking or labelling.

standard: A set of technical specifications approved by a recognised standardizing body for repeated or continuous application, with which compliance is not compulsory (voluntary).

telecommunications standard: A standard for a telecommunications equipment or a class of telecommunications equipment.

radiocommunications standard: A telecommunications standard for equipment using radio signals.

European standard: A standard approved by the European Committee for Standardization (CEN) or CENELEC as an EN or Harmonization Document (HD), according to the common rules of CEN or CENELEC respectively, or an ETS approved by ETSI according to its Rules of Procedure.

Harmonized standard: A European standard adopted by CEN/CENELEC or ETSI on the basis of a Mandate from the EC in support of the essential requirements of New Approach Directives.

technical regulation: A technical specification, including the relevant administrative provisions, the observance of which is compulsory, de jure or de facto, in the case of marketing or use in a Member State or a major part thereof, except those laid down by local authorities.

Common Technical Regulation (CTR): A Harmonized Standard that has been transformed into technical regulations with which compliance is mandatory.

Technical Basis for Regulation (TBR): A harmonized standard intended to be part of a CTR, or referred to in a CTR.

National A deviation: A deviation from a Harmonized technical specification, being the elaboration of an essential requirement of the EMC Directive, to reflect a national special measure that has been recognized as being justified and which, in an appropriate notice made by the EC, is referenced in the OJEC, in accordance with Article 6 of the EMC Directive.

manufacturer (supplier): The legal entity responsible under the terms of the Council Directive 89/336/EEC [1] for placing the product on the market in an EU Member State

product: Industrially manufactured product within the meaning of Article 38(1) of the Treaty.

port: A particular interface of the specified equipment (apparatus) with the electromagnetic environment.

immunity: The ability of a device, unit of equipment, or system, to perform as intended without degradation of quality below a specified level in the presence of an electromagnetic disturbance.

horizontal EMC essential requirements: Harmonized technical specifications in the field of electromagnetic compatibility that are the technical elaboration of the essential requirements of the EMC Directive.

vertical EMC essential requirements: Harmonized technical specifications in the field of electromagnetic compatibility that are the technical elaboration of the essential requirements for equipment identified in a specific Directive.

spectrum management parameters: Technical specifications that apply to radio equipment to allow that radio equipment to operate in a particular electromagnetic environment without harmful interference from, and unacceptable disturbance to, other radio equipment.

licensing requirement: Requirements related to a particular subset of spectrum management parameters, which allows radio transmitting equipment to be used at a specific radio frequency, with a determined radiated radio frequency output power at a specified geographical location in a particular radio service and in a particular electromagnetic environment.

ancillary equipment: Equipment used in connection with telecommunications equipment, is considered as an ancillary equipment if:

- the equipment is intended for use in conjunction with a telecommunications equipment to provide additional operational and/or control features to the equipment (for example to extend control to another position or location); and
- the equipment cannot be used on a stand-alone basis to provide user functions independently from a telecommunications equipment; and

- the telecommunications equipment to which it is connected is capable of providing some intended operation such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment's basic functions).

terminal equipment: Equipment intended to be connected to the public communications network, i.e.:

- to be connected directly to the termination of a public telecommunications network; or
- to inter-work with a public telecommunications network being connected directly or indirectly to the termination of a public telecommunications network in order to send, process or receive information.

The system of connection may be by wire, radio, optical or other electromagnetic system.

telecommunications: Any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic means.

technical file: A file of technical documentation held by the manufacturer containing information to demonstrate the conformity of the apparatus to the requirements, and which may include a technical construction file.

technical construction file: A file of documents describing the apparatus and procedures used by the manufacturer to ensure conformity of the apparatus with the essential requirements of the EMC Directive, and which includes a technical report or certificate, obtained from a competent body, which supports the assurance of the conformity of the apparatus.

Satellite Earth Station (SES) equipment: Equipment that is capable of being used either for transmission only, or for transmission and reception (transmit-receive), or for reception only (receive-only), of radio-communication signals by means of satellites or other space-based systems, but excluding purpose-built satellite earth station equipment intended for use as part of the public telecommunications network of a EU Member State.

3.2 Abbreviations

For the purposes of this ETR the following abbreviations apply:

CATV	Cable Television
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CEPT	Conference of European Posts and Telecommunications Administrations
CTR	Common Technical Regulation
EBU	European Broadcasting Union
EC	European Commission
ECTEL	Association of European Telecommunications and Professional Electronics Industry
EEA	European Economic Area
EEC	European Economic Community
EFT	Electrical Fast Transients
EMC	ElectroMagnetic Compatibility
EN	European Standard produced by CENELEC
ERC	European Radiocommunications Committee
ESD	ElectroStatic Discharge
ETR	ETSI Technical Report
ETS	European Telecommunication Standard
ETSI	European Telecommunications Standards Institute
EU	European Union
HD	Harmonized Document
ICAO	International Civil Aviation Organization
IEC	International Electrotechnical Commission
IMO	International Maritime Organization
ITU	International Telecommunication Union
JTC	CENELEC/ETSI/EBU Joint Technical Committee
JWP	Joint Working Party BC-T-319

MoU	Memorandum of Understanding
NSO	National Standards Organizations
OJEC	Official Journal of the European Communities
PMR	Private Mobile Radio
RF	Radio Frequency
SES	Satellite Earth Stations
TBR	Technical Basis for Regulation
TTE	Telecommunications Terminal Equipment

4 Executive summary

- 1) The CENELEC/ETSI standardization programme in the field of electromagnetic compatibility, as detailed in this ETR, has been developed by a CENELEC/ETSI Joint Working Party, to satisfy the Mandate BC-T-319 received from the European Commission. Sectorial players in the telecommunications field of standardization, the CENELEC/EBU/ETSI JTC, ECTEL, the ERC and network operators have participated in this work.
- 2) On the basis of the objectives of the New Approach [2], i.e. the removal of barriers to trade between Member States of the European Union through the harmonization of technical specifications, this ETR details in which way, to what extent, and for which products, Harmonized Standards in the field of electromagnetic compatibility should be developed, once a Mandate to do so has been received by the standardization organizations.
- 3) This ETR further details in which way, with what priority and to what extent the EMC Directive, the TTE Directive and the SES Directive are relevant for the development of Harmonized EMC Standards for telecommunications equipment, and how Harmonized EMC Standards should relate to the protection requirements of these Council Directives.
- 4) EMC standardization for telecommunications equipment is carried out in both CENELEC and ETSI. This ETR refers to the co-operation between these organizations as formulated in the CENELEC/ETSI EMC work repartition agreement, to determine the extent (mode) of co-operation and which organization will be leading in the mandated EMC standardization work.
- 5) This ETR further stipulates the necessary co-operation between ETSI and the ERC for the development of harmonized technical specifications in the field of electromagnetic compatibility, which are also relevant to the effective use of the radio frequency spectrum as agreed by the ETSI/ERC Memorandum of Understanding (see annexe G).
- 6) Regarding radiocommunications products to which the TTE or SES Directives do not apply, a detailed procedure to co-operate and to co-ordinate between ETSI and the ERC in the development of Harmonized EMC Standards is included in this ETR.

These Harmonized EMC Standards, according to this procedure, will contain all technical specifications with which the equipment has to comply in order to bring it onto the market, and to freely circulate it. This procedure effectively will allow one-stop approval of the radiocommunications equipment for the European market.

- 7) This ETR has been developed in the light of the present legal framework and interpretations of the relevant European Council Directives.

Proposed amendments to these European Council Directives, as brought to the attention of JWP BC-T-319, have been considered not to be relevant to the development of this ETR.

Future amendments, if any, of any of the three relevant Council Directives, can, due to the structure of this ETR, be easily accommodated with minor or no amendments to the text.

- 8) the JWP has given considerable attention to the procedures imposed by the three relevant Council Directives to assess compliance of telecommunications equipment to the protection requirements of these Council Directives.

The JWP has come to the conclusion that, for radio transmitting equipment to which the TTE or SES Directives do not apply, the provisions of Article 10.5 of the EMC Directive, providing for the EC type examination as the only option, should be complemented with conformance assessment

procedures in accordance with Module H of the Global Approach [18] (i.e. full quality assurance). A recommendation to this effect is included in this ETR.

- 9) This ETR concludes with lists of telecommunications equipment, including radiocommunications equipment, for which Harmonized EMC Standards should be developed, together with the relative priorities for the commencement of such work.
- 10) This ETR is a living document and therefore should be reviewed on a regular basis, with further recommendations made to the EC for extending the lists of products for standardization, when necessary.

5 Procedures for producing Harmonized Standards

5.1 Initiation of the standardization work

5.1.1 General

Harmonized Standards are technical specifications developed and adopted by CEN, CENELEC or ETSI, on the basis of a formal invitation of the EC, pursuant to Council Directive 83/189/EEC [7]. Harmonized Standards, by their definition, are always related to New Approach Directives, and are the technical elaboration of the essential requirements of New Approach Directives.

The formal invitation to the standardization organizations to develop a Harmonized Standard and to present it to the EC may, after consultation with the Standing Committee for Council Directive 83/189/EEC [7], be given to one or more of the three European standardization organizations CEN, CENELEC and ETSI.

The formal invitation may be in the form of a "Mandate". In some cases such an invitation is also referred to "as instructed by the Commission", "upon a remit from the Commission, or, "at the instigation of the Commission".

5.1.2 Commencement of the work

The development of a Harmonized Standard in the field of electromagnetic compatibility for telecommunications or radiocommunications equipment and installations, commences with the acceptance and the formulation of an ETSI or CENELEC work programme item. The receipt of a standardization Mandate from the EC will be the trigger for the establishment of the work item.

Subject to agreement between the EC and either ETSI or CENELEC, or both, the standardization work will be allocated to one or more standardization committees in either ETSI, or CENELEC, in accordance with the ETSI or CENELEC working procedures.

In those cases where it is unclear to the standardization organizations:

- a) what the objectives of the standardization Mandate are, and within which legal framework the Harmonized Standards have to be presented; or
- b) which other EU policy the standardizers have to be aware of in order to successfully perform the standardization activities;

the standardization Mandate shall be further negotiated with the EC, or be clarified by the EC, before the standardization work commences.

5.2 Co-operation between ETSI and CENELEC

ETSI and CENELEC have fully recognized the necessity of close co-operation and co-ordination in the electromagnetic compatibility field of standardization, and have established high level EMC co-ordination meetings on a regular basis. In addition, regular exchanges of information by liaison officers in relevant standardization committees occur, and activities exist under various modes of co-operation.

5.2.1 Repartition of work

A detailed agreement (work repartition) setting out CENELEC's and ETSI's respective competencies for the preparation of EMC standards was made in 1990. This agreement, reproduced in annex F, will be the basis for deciding whether ETSI or CENELEC will perform the actual standardization work or which organization will be leading in the standardization work, requested by the Mandate from the EC.

The agreement on work repartition will also be the basis for the necessary co-ordination and co-operation between the organizations, ranging from exchanging relevant information to full mutual participation in the work of the other organization.

5.3 Co-operation between ETSI and the ERC

In order to ensure the planning of an effective use of the radio frequency spectrum, a Memorandum of Understanding (MoU) (see annex G), has been agreed between ETSI and the European Radiocommunications Committee (ERC), for a co-operation in the development of certain technical specifications for radio equipment.

In the development of Harmonized Standards containing technical specifications pertaining to electromagnetic compatibility, which also has relevance to the effective use of the radio frequency spectrum, including the compatibility between different radio services, the provisions of the ETSI-ERC MoU will be applied, to the extent that the MoU applies to the particular radio equipment.

Examples of technical characteristics of radio equipment that may be subject to the co-operation process with the ERC are shown in tables 3 and 4.

For the development of Harmonized EMC Standards for radiocommunications equipment to which the TTE Directive or the SES Directive does not apply, a specific procedure has been developed and is contained in annex E.

6 Standardization policy

6.1 Introduction

Mandate BC-T-319 [4] calls for the preparation of a work programme for the development of Harmonized Standards laying down all the technical specifications conferring to the equipment presumption of conformance to the essential requirements related to electromagnetic compatibility as specified in the following directives:

- Council Directive 89/336/EEC [1], the EMC Directive;
- Council Directive 91/263/EEC [5], the TTE Directive; and
- Council Directive 93/97/EEC [6], the SES Directive.

This ETR details the policy of ETSI and CENELEC, in which way, and to what extent, these standardization organizations will develop Harmonized EMC Standards. The policy depends upon which type or category of telecommunications equipment is considered, as follows:

- whether the EMC Directive solely applies to the equipment;
- whether the EMC Directive, and the TTE Directive or SES Directive applies; and
- whether a Mandate for standardization from the EC has been given, or is expected to be given, to develop a Harmonized EMC Standard, or a Technical Basis for Regulation (TBR) for equipment to which the TTE Directive or SES Directive applies.

NOTE: The applicability of Council Directives other than the three Directives given above, has not been considered in this ETR, with the exception of the Low Voltage Directive (LVD) which has been investigated in relation to EMC resistibility requirements.

The Harmonized EMC Standards to be developed under this programme shall contain all the technical specifications, which is the elaboration of the essential requirements imposed by the Council Directives. They shall be relevant to the product covered by the standard and relevant to the electromagnetic

environment in which the product is intended to operate. This shall be the case irrespective of whether such technical specifications are specifically identified in this ETR or not.

Case 1

For all telecommunications equipment not covered by the scopes of the TTE or SES Directives, EMC technical specifications shall be elaborated in a Harmonized EMC Standard under the EMC Directive.

In this case the relevant EMC technical specifications shall be prepared under the scenario given in subclause 6.2.

Case 2

When, in addition to the EMC Directive:

- the TTE Directive or the SES Directive also applies to a telecommunications equipment; and
- the EMC technical specifications are not contained in a Harmonized Standard or a CTR related to those Directives as being specific for that equipment;

then all the EMC technical specifications shall be elaborated in a Harmonized EMC Standard under the terms of the EMC Directive.

In this case the relevant EMC technical specifications shall be prepared under the scenario given in subclause 6.2.

NOTE: At the time of the development of the Harmonized EMC Standard, the Harmonized standard or CTR for the particular product related to the TTE or SES Directives may, or may not, exist.

Case 3

When, in addition to the EMC Directive:

- the TTE Directive or the SES Directive also applies to a telecommunications equipment; and
- the EMC technical specifications are contained in a Harmonized Standard or a CTR related to those Directives as being specific for that equipment;

then these specific EMC technical specifications shall not be duplicated in a Harmonized EMC Standard under the terms of the EMC Directive.

All other EMC technical specifications shall be elaborated in a Harmonized EMC Standard under the terms of the EMC Directive.

In this case the relevant EMC technical specifications shall be prepared under the scenario given in subclause 6.3.

6.1.1 Combination of Harmonized and non-harmonized technical specifications

The Harmonized EMC Standard shall include all the technical specifications that are the elaboration of the essential requirements of the EMC Directive, and which are relevant to the product. Under certain conditions (see subclause 6.1.2) a Harmonized Standard may also include provisions based on market needs, such as product specifications not linked to the essential requirements of Council Directives, and conformity assessment procedures.

For radio communications products to which neither the TTE nor the SES Directives applies, the Harmonized EMC Standard may include all the technical specifications relevant to the effective use of the radio frequency spectrum, as agreed by the ERC in an ERC Decision.

In this ETR, the expression "the effective use of the spectrum" covers the protection of the radio frequency spectrum and of the geostationary orbit of satellites from harmful interference.

There are cases where an existing standard is suitable to be copied and/or to be converted into a new Harmonized EMC Standard without amendment.

In other cases, parts of an existing voluntary standard may be the basis for the development of a new Harmonized EMC Standard.

The parts of the Harmonized Standards containing the technical specifications related to essential requirements of Council Directives and those related to the effective use of the spectrum shall be clearly distinguished in the structure of the standard from the parts that relate to the non-harmonized technical specifications related to market demand.

This shall be done in accordance with subclause 6.1.2.

NOTE: The combination of Harmonized technical specifications with those which are not Harmonized in a single standard, based on market needs etc., may give rise to difficulties in the maintenance of the Harmonized EMC Standard.

6.1.2 Reference to essential requirements

In presenting the Harmonized Telecommunications EMC Standard to the EC to have its reference published in the OJEC, the standards containing Harmonized EMC technical specifications shall contain in a normative annex a cross reference table. This table references all the individual EMC technical specifications of the standard, on a clause by clause basis, to the respective essential requirements of the relevant Council Directive(s).

A relevant ERC Decision, if any, referencing radiocommunications equipment standards (ETs) and further referencing on a clause by clause basis the individual technical specifications which are relevant for spectrum management purposes, shall also be included (reproduced) in a Normative annex to the Harmonized EMC Standard.

During the drafting phase of the Harmonized EMC Standard, such normative annexes are a useful tool. They shall, however, be part of the draft Harmonized EMC Standard during the CENELEC/ETSI public consultation phases, i.e. Public Enquiry and Voting.

Examples of the formats of such normative annexes are given in annex A and annex B. The normative annex containing the ERC Decision should be in the form contained in annex E.

6.2 Telecommunications equipment to which the EMC Directive applies

The Harmonized EMC Standards for telecommunications equipment shall contain all technical specifications in a single stand-alone standard, or in a series of related standards. These technical specifications are the elaboration of the essential requirements of the EMC Directive Articles 4(a) and 4(b), to the extent they are relevant for the equipment under consideration and to the extent they are relevant to the electromagnetic environment in which the equipment is intended to be used.

For a product for which no standard containing requirements pertaining to electromagnetic compatibility is published at the time EMC standardization for that product commences, all technical specifications related to electromagnetic compatibility shall be included in a stand-alone Harmonized EMC Standard, or a multi-part Harmonized EMC Standard, having a single reference number, for example ETS 300 XYZ or EN 6

For a product for which a standard also containing requirements pertaining to electromagnetic compatibility is already in existence, it shall be investigated as to whether such a standard fully satisfies the provisions of the EMC Directive, or whether additional standardization needs to be performed by ETSI or CENELEC.

It is preferred that such additional standardization is carried out by amending the original standard before having it harmonized. It is however recognised that:

- for a number of types of equipment standards have been in existence for some time, in particular for radio equipment;

- depending on the extent of foreseeable objections to the amendment of those existing standards, it may be decided by ETSI or CENELEC that any additional and complementary standardization to satisfy the essential requirements of the EMC Directive, may be performed by developing a separate, additional standard for that product.

In this case the two standards together constitute the technical elaboration of the essential requirements related to electromagnetic compatibility as follows:

- they shall both have a normative annex included as referred to in subclause 6.1.2. and shall mutually refer in their scopes to the other standard as being a constituent part of the Harmonized EMC Standard applicable to the product;
- both standards shall be presented to the EC at the same time, to have their references published in the OJEC.

If a Mandate from the EC has been received by ETSI to develop a Harmonized EMC Standard for a radiocommunications equipment, or a family of radiocommunications equipment, to which neither the TTE Directive nor the SES Directive applies, consultation with the ERC under the ETSI/ERC MoU shall take place to investigate the need for an ERC Decision for that radiocommunications product or family of radiocommunications products.

If the ERC decides that there is a need for such an ERC Decision, the procedure for the development of the Harmonized EMC Standard, or series of such standards, as detailed in annex E, shall be followed.

NOTE: This procedure requires the existence of, or the production of, a product standard including the functional characteristics of the radio equipment, with all the technical specifications relevant to the effective use of the radio spectrum. The ERC Decision if any, will be based on this product standard in accordance with the ETSI TA/ERC MoU.

6.3 Telecommunications equipment to which the EMC Directive and the TTE Directive and/or the SES Directive applies.

The Harmonized EMC Standards for telecommunications equipment shall contain in a single stand-alone standard, or in a series of related standards, all technical specifications in their main body and in any normative annexes. These technical specifications shall be the elaboration of the essential requirements of the EMC Directive Articles 4(a) and 4(b), to the extent they are relevant for the equipment under consideration and to the extent they are relevant for the electromagnetic environment in which the equipment is intended to be used, except for the following:

- technical specifications which are the elaboration of the essential requirements of the TTE Directive, Article 4(c), electromagnetic compatibility requirements, insofar as they are specific to terminal equipment, shall be included in Harmonized Standards (also referred to as Technical Base for Regulation (TBRs)) which apply under the terms of the TTE Directive or the SES Directive;
- technical specifications pertaining to electromagnetic compatibility which are the elaboration of the essential requirements of the TTE Directive Article 4(e), effective use of the radio frequency spectrum, shall be included in Harmonized Standards that apply under the terms of the TTE Directive or the SES Directive.

With respect to the requirements of Article 4(c) of the TTE Directive, no electromagnetic compatibility requirements have been identified to date by either ETSI or CENELEC for any telecommunications equipment that are specific to telecommunications terminal equipment. However this may not necessarily be the case for equipment to which the SES Directive applies.

For radio telecommunications equipment for which it is unknown to ETSI or CENELEC whether a Harmonized Standard, or a TBR, under the terms of the TTE Directive the SES Directive (or any other specific Directive) will be developed, the procedure in the standardization work shall follow the scenario as detailed in subclause 6.2.

At a later stage, if a Harmonized Standard or a TBR is developed for such radio telecommunication equipment, those technical specifications in the Harmonized EMC Standard that are similar, or which have the same objective, in specifying an essential requirement as a technical specification in the Harmonized Standard or TBR under the terms of the TTE Directive, or SES Directive, or other specific Directive, shall

be deleted by formal amendment from the Harmonized EMC Standard in accordance with Article 2.2 of the EMC Directive.

6.4 Specific product families not identified under the previous subclauses

Radar is not generally standardized within CENELEC or ETSI, although there have been some exceptions relating to marine radar. The requirements for marine radar and aircraft radar are dependent upon global International Maritime Organization (IMO) and International Civil Aviation Organization (ICAO) recommendations respectively. Aircraft radar requirements are subject to further discussion in the CEN/CENELEC/ETSI ITAEG-Air.

High power broadcast transmitters are another category of equipment that is not yet standardized in ETSI or CENELEC.

NOTE: ETSI has prepared a standard for VHF FM sound broadcast transmitters only.

Large terrestrial Satellite Earth Stations (SESs) are not standardized and are specifically excluded from the SES Directive.

As regards radar installations, high power broadcast transmitting stations and large terrestrial SESs, it appears that such installations, when placed on the market or put into service, are likely to be certifiable only as an installation on the basis of a technical construction file, in accordance with Article 10.2 and Article 10.5 of the EMC Directive.

Such installations will also be subject to national requirements of licensing or of other regulatory nature, which will take into account the local (on-site) conditions.

It therefore appears that no particular action is necessary to draw up Harmonized EMC Standards for these installations.

However, there is a separate market for "off-the-shelf" radar equipment, which could benefit from specific product standardization. Some manufacturers are known to prefer the possibility of using such Harmonized product EMC Standards rather than relying on the General EMC standard for radio equipment (ETS 300 339 [8]). It has not been decided yet whether any standardization and harmonization in this field should be carried out by CENELEC or ETSI.

7 Categories of standards

In the development of draft Harmonized EMC Standards a number of different categories of standards can be observed. Standards may be qualified as basic EMC standards, Harmonized generic EMC standards, Harmonized product family EMC standards, and Harmonized product EMC standards.

7.1 Basic EMC standards

Basic standards for testing and measurements in the field of EMC are internationally available standards which address individual electromagnetic phenomena. For immunity they specify methods of assessing an equipment for its functional properties under application of the electromagnetic phenomenon defined in the particular basic standard or for the assessment of the emissions from the equipment they specify the test methods.

Basic standards are not related to any specific product. For immunity they specify in general a number of test severity levels that may be used to assess equipment under test. These test severity levels have normally been derived from actual electromagnetic environmental conditions and take into consideration the state-of-the-art in measurement techniques.

Basic EMC standards are phenomenon and test method oriented rather than product or environment oriented and do not contain product specific technical specifications and limits.

Basic standards do not refer to New Approach Directives and therefore will not be transferred into Harmonized EMC Standards and their reference will not be proposed for publication in the OJEC.

Hence, a declaration of conformity of products with basic EMC standards has no significance with regard to the EMC Directive.

It is the objective that for the methods of measurement Harmonized generic, Harmonized product family (general) and Harmonized product EMC Standards should make normative reference to basic EMC standards, without repeating the detailed contents.

Other types of EMC standards and publications (for example ITU Recommendations) may be identified and classified as basic EMC standards. These standards and publications may contain:

- specialised terminology;
- a description and classification of electromagnetic environments, which may include ranges of environmental and/or compatibility levels that constitute an important basis for establishing limits for electromagnetic disturbance and immunity test severity levels.

EN 55022 [9] is an example of a product family EMC standard. However, this standard also contains measurement methods that allow it to be referenced as a basic EMC standard.

ITU-T Recommendation K.20 [10] is an example of an ITU Recommendation that may be referenced as a basic EMC standard.

7.2 Harmonized generic EMC Standards

Harmonized generic EMC Standards are standards that are electromagnetic environment oriented. They elaborate the technical specifications that are relevant for all electrical and electronic equipment in a specific electromagnetic environment. They contain all the elaborated technical specifications conferring presumption of conformity to the equipment with the essential requirements of Council Directive 89/336/EEC [1], Articles 4(a) electromagnetic disturbance and 4(b) intrinsic immunity.

The Harmonized generic EMC Standards apply to all electric and electronic equipment and installations in a specific electromagnetic environment. The performance criteria relevant for the assessment of the equipment can, for that reason, only be specified in rather general terms and refers fundamentally to the intended use of the equipment and the performance of the equipment that may be expected by the user of the equipment, based on information derived from the product documentation accompanying the equipment.

Since the Harmonized generic EMC Standards are electromagnetic environment oriented. They identify and specify the environment in terms of the most relevant electromagnetic phenomena and their magnitudes that might effect electrical and electronic equipment. As such they form the EMC template for the development of Harmonized product family and Harmonized product EMC Standards for the same electromagnetic environment as encompassed by the relevant Harmonized generic EMC Standard.

Harmonized generic EMC Standards may be used to confer presumption of conformance with the essential requirements of Council Directive 89/336/EEC [1] of any electrical and electronic equipment for intended use in the electromagnetic environment encompassed by the Harmonized generic EMC standard, provided that no Harmonized product family or Harmonized product EMC standard relevant to the product concerned exists, or is deemed necessary, and that the product is not excluded from the Harmonized generic EMC Standard.

Examples of Harmonized generic EMC Standards are:

- EN 50081-1 [11] for the generic emission requirements, and EN 50082-1 [12] for the generic immunity requirements, in the residential, commercial and light industrial electromagnetic environment; and
- EN 50081-2 [13] for the generic emission requirements, and EN 50082-2 [14] for the generic immunity requirements, in the industrial electromagnetic environment.

7.3 Harmonized product family and Harmonized product EMC Standards

Harmonized product family and Harmonized product EMC Standards are equipment oriented rather than electromagnetic environment oriented.

For Harmonized product family or Harmonized product EMC Standards the same criteria for the contents and the structure of the standard as defined for Harmonized generic EMC Standards apply except that technical specifications are tailored to the individual type of product family or product.

For product families and products, the actual performance or degradation of performance in a specified electromagnetic environment can be specified in much more detail than would be possible in the Harmonized generic EMC Standards.

Harmonized product family or Harmonized product EMC Standards elaborate the technical specifications and performance criteria specific for the product family of equipment, or for the specific product, in relation to the intended use in one or more defined electromagnetic environments.

The test severity levels and limits in Harmonized product family or Harmonized product EMC Standards shall be based upon Harmonized generic Standards. Where deviations are necessary, they shall be fully justified and the rationale shall be indicated in the Harmonized product family or Harmonized product EMC Standard concerned. Deviations may concern the phenomena considered, additional tests, or differences in test severity levels.

In the framework of this ETR, and under a Mandate from the EC, ETSI will develop Harmonized EMC Standards for telecommunications equipment including radiocommunications in the category of Harmonized product EMC Standards and Harmonized product family EMC Standards.

An example of a Harmonized product family EMC Standard will be ETS 300 339 [8]. It is intended that this Harmonized general EMC Standard will be used as a Harmonized EMC Standard for all radiocommunications products for which no specific Harmonized product EMC Standard exists.

8 Harmonized EMC Standards

8.1 Applicability and priority

For the assessment of products, in order to confer presumption of conformance with the essential requirements in the field of EMC of the Council Directives, the priority in applicability of Harmonized EMC Standards is as follows:

- a Harmonized product EMC Standard takes precedence over a Harmonized product family, or Harmonized generic EMC Standards;
- a Harmonized product family EMC Standard takes precedence over a Harmonized generic EMC Standards;
- a Harmonized generic EMC Standard may be used in the absence of a dedicated Harmonized product or product family EMC Standard, provided that the product is not excluded from the scope of the Harmonized generic EMC Standard.

This priority applies in every respect of the technical specifications of a Harmonized EMC Standard.

Additionally there may be published in the OJEC references to other Harmonized EMC Standards that apply to the product in their own right, for example, EN 61000-2-2 [15] and EN 61000-2-3 [16] (power frequency harmonics and voltage fluctuations). A Harmonized EMC Standard may refer to these other Harmonized Standards, when considered relevant.

8.2 Environmental classification

Harmonized EMC Standards may identify more than one electromagnetic environment for each phenomena included in the Harmonized EMC Standard.

The manufacturer may select the electromagnetic environments from the Harmonized EMC Standard appropriate to his apparatus and its declared intended use.

The declaration of conformity to the technical specifications of the applicable Harmonized EMC Standard, for particular electromagnetic environments, allows the manufacturer to place the apparatus on the European market.

The electromagnetic environment(s), for example domestic, industrial or other electromagnetic environments, referred to in the instructions or documentation, accompanying the equipment, shall correspond to those declared by the manufacturer for conformity to the Harmonized EMC Standard.

8.3 Contents of Harmonized product or product family standards for EMC

8.3.1 General

The Harmonized product or product family EMC Standards shall contain all technical specifications concerning electromagnetic compatibility which are relevant for each of the electromagnetic environments in which the equipment is intended to be used and which are relevant for the equipment for normal intended use. Particular attention is drawn to subclause 9.2.1 with respect to resistibility requirements.

Where the equipment is intended to be used in different (more than one) electromagnetic environments, the Harmonized product or Harmonized product family EMC Standard or series of related Standards shall also include all technical specifications relevant for the equipment in those different electromagnetic environments, or may refer to another Harmonized EMC Standard or series of related Standards relevant for other different electromagnetic environments.

The elaboration of the technical specifications in the Harmonized EMC Standard shall be to such detail that they are unambiguous and that measurements and other forms of assessment of the performance of the product will be reproducible irrespective of the manufacturer or competent body using the Harmonized EMC Standard.

The provisions of the EMC Directive apply to telecommunications apparatus together with equipment and installations containing electrical and/or electronic components, (89/336/EEC [1], Article 1.1). In the elaboration of the technical specifications in Harmonized EMC Standards, consideration should therefore be given in ensuring that the specifications and/or test methods encompass the critical aspects in retaining the EMC performance when the equipment is correctly installed as part of an installation. In particular, the screening effectiveness of cables and connectors, or the lack of it, in actual installations, shall be considered in this context.

Where, in the Harmonized EMC Standard, reference needs to be made to other internationally available standards that are not Harmonized Standards, the reference shall be normative and restricted to methods of measurement and test configurations.

The actual technical specification and limits which are constituent parts of the technical elaboration of the essential requirements of the Council Directives related to EMC, shall be included in the Harmonized EMC Standard or series of related Harmonized EMC Standards, on a normative basis.

Some electromagnetic phenomena related to electromagnetic disturbance (emissions) or to the intrinsic immunity of particular telecommunications equipment, may, based on the physical properties of that particular equipment in relation to the electromagnetic environment in which it is intended to be used, be of less or no significance for that particular equipment.

In such cases, there is no need to include in the Harmonized EMC Standard technical specifications related to those electromagnetic phenomena, provided that the essential requirements of the EMC Directive are still met.

The rationale for not elaborating or including such technical specifications, which are of relevance for the majority of electrical and electronic equipment intended to be used in the same electromagnetic environment, shall be included in the Harmonized EMC Standard.

8.3.2 The scopes of Harmonized EMC Standards for telecommunications equipment

The scope(s) of Harmonized EMC Standard(s) or series of related Standards shall contain a clause informing the reader of the standard(s) that the standard(s) concerned is a Harmonized EMC Standard that may be used to confer to the equipment presumption of compliance with the essential requirements concerning electromagnetic compatibility with Council Directive(s).

As an example, the first paragraph of the scope of the Harmonized EMC Standard, adjusted to the correct equipment type and referenced Directive(s), could read:

"1 Scope

This European Telecommunication Standard (ETS) or European Standard (EN) covers the assessment of (type of radio communications equipment) (type of telecommunications equipment) (type of satellite earth station) and ancillary equipment in respect of electromagnetic compatibility, and may be used to confer presumption of compliance with the essential requirements of the Council Directive 89/336/EEC, (EMC Directive). The technical specifications of this ETS relevant to Council Directive 89/336/EEC are listed in annex A."

If more than one Harmonized EMC Standard in a series of related Harmonized EMC Standards contains complementary technical specifications to satisfy the essential requirements of the EMC Directive, the first paragraph of the scope of each of the Harmonized EMC Standards should read:

"1 Scope

This European Telecommunication Standard (ETS) or European Standard (EN) together with ETS 300 XYZ or EN 550 XYZ covers the assessment of (type of radio communications equipment) (type of telecommunications equipment) (type of satellite earth station) and ancillary equipment in respect of electromagnetic compatibility, and may be used to confer presumption of compliance with the essential requirements of the Council Directive 89/336/EEC, (EMC Directive). The technical specifications of this ETS relevant to Council Directive 89/336/EEC are listed in annex A."

The scope of the Harmonized EMC Standard(s) shall further contain clauses to specify:

- 1) the type of equipment in sufficient detail, for example:

"This ETS/EN specifies the applicable EMC tests, the methods of measurement, the limits and the minimum performance criteria for (type of equipment) operating in the frequency range (X - Y MHz), and the associated ancillary equipment.";

- 2) the electromagnetic environment that is considered in this ETS/EN, for example:

"The electromagnetic environments encompassed by this ETS/EN refer to the electromagnetic classification for:

- the domestic, commercial and light industrial environment used in the Generic EMC Standards EN 50081-1 and EN 50082-1;
- industrial environment used in the Generic EMC Standards EN 50081-2 and EN 50082-2;
- telecommunications centre environment defined in ETS 300 386-1;
- other electromagnetic environments relevant in the light of this ETS/EN."

- 3) the limitations in the applicability of the individual EMC standard for example:

"The EMC requirements have been selected to ensure an adequate level of compatibility for apparatus at residential, commercial, light industrial and vehicular environments. The specified limits or levels do not cover extreme cases which may occur in any location but have a low probability of occurrence.

This ETS/EN may not cover those cases where a potential source of interference that is producing individually repeated transient phenomena or where a continuous phenomenon is permanently present, for example a radar or broadcast site in the near vicinity. In such a case it may be necessary to use special mitigation measures applied to either the source of interference or the interfered part, or both.

Compliance of (radio) equipment to the requirements of this ETS/EN does not signify compliance to any requirements related to the use of the equipment (for example licensing requirements).

Compliance to this ETS/EN does not signify compliance to any safety requirements. However, it is the responsibility of the assessor of the equipment to record in the report any observations

regarding apparatus becoming dangerous or unsafe as a result of the application of the tests of this ETS."

8.3.3 The structure of Harmonized EMC Standards

To date a number of Harmonized EMC Standards (produced by CENELEC) and a number of voluntary product EMC standards (produced by ETSI) have been published.

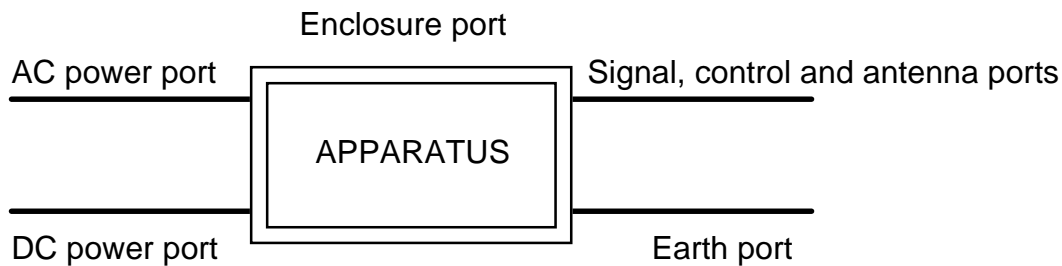
It has been identified by the users of the standards (i.e. manufacturers, competent bodies, test houses and others) that the preferred method in elaborating the technical specifications in Harmonized EMC Standards is by the so called "port by port approach".

The port by port approach means that all relevant technical specifications for a port of the equipment are grouped together in the Harmonized EMC Standard. This structure allows the technical specifications relevant to the antenna port of radiocommunications equipment to be in a separate part of the Harmonized EMC Standard, whilst maintaining the port by port approach of the complete Harmonized EMC Standard.

NOTE: For apparatus with an integral antenna, which cannot be removed, the distinction between the effects on the antenna port and on the enclosure port, may be determined on a case by case basis by partitioning of the testing frequency spectrum.

A typical example of a Harmonized EMC Standard with such a structure is EN 50082-1 [12].

Examples of ports are given in figure 1.



NOTE: Due to the fact that the enclosures are never perfect barriers to the electromagnetic environment, the enclosure is regarded as a port.

Figure 1: Examples of ports

8.4 Use of normative and informative annexes

8.4.1 Normative annexes

Harmonized generic, product family (general), and product EMC Standards state the applicable technical specifications as follows:

- the parameters to be measured;
- the electromagnetic phenomena to be applied;
- the relevant limits and test levels; and
- the minimum performance of the equipment.

These technical specifications are, as a rule, included in the main body of a in Harmonized EMC Standards.

Product family Harmonized EMC Standards, and even Harmonized product EMC Standards may however be applicable to more than one type of equipment.

These types of equipment may have similar user functions, or to some extent identical user functions, but may also have different characteristics, for example, at the telecommunications port (network interface) for connection to the analogue PSTN or to ISDN networks.

Other equipment may have functions to support speech communication and optionally functions to support data communications.

In such cases it may be advantageous to use a modular structure for the Harmonized EMC Standard. The main body of the standard shall, in this case, contain all technical specifications that are of common applicability to the different variants of the equipment, whereas the technical specifications related to the specific properties of those variants may be elaborated in one or more normative annexes to the Harmonized EMC Standard.

Since the technical specifications in such annexes constitute a subset of the technical specifications elaborating the essential requirements of the relevant Council Directives, these annexes shall be normative.

The test methods and test configurations relevant to the individual technical specifications are normally specified in basic EMC standards, or other standards that are used as basic EMC standards. The detailed contents of basic standards are not intended to be repeated in Harmonized generic, Harmonized product family, or Harmonized product EMC Standards. These basic standards however, should be referenced on a normative basis for measurement methods.

In cases where basic standards are not yet in existence, i.e. published, the definition of an electromagnetic phenomenon and related test methods may be elaborated in normative annexes to Harmonized generic, Harmonized product family or Harmonized product EMC Standard(s). However, it is preferable that such definitions and test methods are formulated as stable reference documents in the form of I-ETTs or ENVs.

Alternatively such normative annexes may also consist of copies of the technical contents of a draft basic standard that is under development, or revision, by one of the international standardization organizations, and which is considered sufficiently stable for the purpose of the Harmonized EMC Standard, but which is not yet published. However, the use of parts of draft basic standards as a normative annex to Harmonized EMC Standards could lead to different test methods compared with other products, and should be avoided.

Basic standards may in some cases be of insufficient detail to be applied, without modification, for the assessment of the product relate to the Harmonized EMC Standard. The necessary (minor) amendments of the test methods or configurations of the basic standard should be elaborated in the relevant technical specification of the Harmonized EMC Standard itself (main body) rather than in normative annexes to that standard. Major amendments are best presented in a normative annex.

8.4.2 Informative annexes

Informative annexes shall not contain technical specifications or other information that may affect measurement results, except those relating to National A deviations in accordance with Article 6 of the EMC Directive.

9 Disturbance and immunity technical specifications for Harmonized EMC Standards

In the EMC Directive, distinction is made between the capability of equipment to cause disturbances and the capability of the equipment to be disturbed.

The provisions related to disturbances set the electromagnetic environmental conditions that should be taken into consideration for other telecommunications equipment, including radiocommunications equipment and other equipment to operate as intended.

In this context, a radio transmitting equipment is an example of an equipment that sets, to some extent, the environment in which other electronic and electrical equipment should operate as intended.

9.1 Disturbance

Electromagnetic disturbances generated by electrical and electronic equipment may affect the performance and functioning of other (victim) equipment in the same electromagnetic environment. Unwanted disturbances have to be limited to a level allowing other equipment, which may be unknown, in the same electromagnetic environment to function as intended.

The technical specifications for these emitted unwanted disturbances will be limits specified in absolute terms relevant for the environment in which the equipment is intended to operate. These limits shall be expressed in terms of maximum output voltage, current, or power at the equipment's ports (emissions), or in terms of maximum field strength at a specified distance, or in terms of maximum levels of radiated power.

9.2 Immunity

In the development of technical specifications for immunity, the common denominator is the electromagnetic environment in which the different types of equipment are intended to operate.

In the development of immunity technical specifications, the variable aspect is the intended operational functionality of the equipment when submitted to a hostile electromagnetic environment.

The technical specifications for the immunity of the equipment shall be expressed in terms of minimum operational performance of the equipment when subjected to a specific EMC phenomenon with a specified test level.

The minimum performance criteria may be expressed in terms ranging from:

- relative to the normal performance, in particular in generic and product family standards; to
- absolute minimum performance criteria, in particular in product standards.

9.2.1 Protection, over-voltage and resistibility requirements

A particular subset of immunity requirements to electromagnetic phenomena comprises resistibility and protection from overvoltage for networks and equipment. These EMC protection requirements elaborate the technical specifications for immunity to lightning effects, and surges induced from power or traction lines. Immunity tests for these phenomena do not normally call for the continuation of the intended operation during the application of the test signals, but require the normal intended operation to be resumed after cessation of the test. For some of these phenomena, or test levels, limited damage to the equipment may be allowed, provided that no hazardous conditions develop.

9.3 Concept of immunity specifications

The following concept of specifying the immunity requirements for equipment under electromagnetic stress has been developed to be applied for all Harmonized EMC Standards.

This concept of requirements applies when the equipment is tested (assessed) for its immunity with each of the individual electromagnetic phenomena at the time.

A differentiation in the immunity requirements is made dependent on the nature of the electromagnetic phenomena, either being a phenomenon of a constant nature, of a transient nature or a power supply interruption exceeding a quantified limit in time.

9.3.1 Immunity specifications in Generic EMC standards

Generic EMC standards are electromagnetic environment oriented and may apply to all electric and electronic equipment in that environment, and therefore the intrinsic immunity requirements cannot be specific for particular products.

The actual minimum operational performance criteria to be used for assessing the equipment are declared by the manufacturer, but they shall be aligned with the performance criteria specified within the Harmonized EMC Standard referred to.

If not declared by the manufacturer they should be derived from the manufacturers' documentation accompanying the equipment, from product descriptions, and from what the user may reasonably expect from the equipment if used as intended. In any case the performance criteria shall be based on, but not inferior to, the general performance criteria as outlined in the following subclause.

9.3.1.1 General performance criteria

The equipment shall meet the minimum performance criteria, for which the structure is specified in table 1 including the associated notes 1 and 2.

The actual performance criteria to be used for the assessment of the equipment under consideration, shall be further determined by the electromagnetic environment in which the equipment is intended to be used and also by the telecommunications service for which the equipment is intended to be used (see subclause 9.3.2.1).

Table 1: General performance criteria

Criteria	During test	After test
A	Operates as intended Degradation of performance (note 1) No loss of function	Operates as intended No degradation of performance (note 2) No loss of function
B	Loss of function (one or more)	Operates as intended No degradation of performance (note 2) Functions self-recoverable
C	Loss of function (one or more)	Operates as intended No degradation of performance (note 2) Functions recoverable by the user
<p>NOTE 1: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. The specified minimum performance level may be replaced by a specified permissible degradation of performance.</p> <p>If the minimum performance level, or the permissible performance degradation, is not specified by the manufacturer, then either of these may be derived from the product description and documentation (including leaflets), and what the user may reasonably expect from the apparatus if used as intended.</p> <p>NOTE 2: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. The specified minimum performance level may be replaced by a specified permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed.</p> <p>If the minimum performance level, or the permissible performance degradation, is not specified by the manufacturer, then either of these may be derived from the product description and documentation (including leaflets), and what the user may reasonably expect from the apparatus if used as intended.</p>		

The performance criteria A, B and C as indicated in table 1 shall be used in the following manner:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain period of time.

For immunity tests that relate to resistibility requirements given in subclause 9.2.1, performance criteria B apply.

In relation to the performance criteria B in table 1, the application of phenomena of a transient nature, is indicated that "one or more functions of the equipment under test may be lost" during the application of the actual test signal.

It is further indicated that after the application of the immunity test signal the equipment shall "operate as intended, that there shall not be a degradation in performance and that functions shall recover automatically".

This formulation has been chosen to avoid assessment of the actual performance of the equipment during the application of, for example, a single electrostatic discharge or of a fast transient burst. In many cases this would be impossible to assess, or would be prohibitively expensive. The equipment performance, when phenomena of a transient nature are applied, should therefore preferably be specified as the result of a total test cycle. For telecommunications terminal equipment, used by a single user, this means that the performance of the equipment could be specified in terms of:

- "there shall be no user-noticeable loss of telecommunications link" etc.;

whereas for more complex systems the performance could be specified in terms of:

- "the bit error ratio shall not degrade to less than....."; or
- "the additional transmission delay shall be not more than.....".

9.3.2 Immunity specifications in Harmonized product family and Harmonized product EMC Standards

The scope of Harmonized product family or Harmonized product EMC Standards indicates the particular product family or product to which the standard applies. This may be a broad scope to cover a range of similar products, or a narrow scope to cover a specific product.

The performance criteria for immunity testing and assessment may differ in detail, dependent on the scope of the standard.

Product Harmonized EMC Standards shall include all immunity tests, assessment specifications and performance criteria that are of particular relevance for the equipment covered by that standard only.

The immunity specifications in Harmonized product EMC Standards will be more specific than those in Harmonized product family EMC Standards. These shall be relevant for the electromagnetic environment, shall have relevance for the product, and be of a common nature for most equipment in the same electromagnetic environment (for example ElectroStatic Discharge (ESD), Electrical fast Transients (EFT), RF immunity, etc.).

A particular category of product specific immunity requirements is that which applies to the antenna port of radiocommunications equipment.

9.3.2.1 Levels of immunity

In the development of technical specifications for telecommunications equipment related to intrinsic immunity, consideration shall be given to the telecommunications services for which the equipment is intended to be used.

In developing a tolerable degradation of performance criteria under electromagnetic stress, the priority of service shall be considered. It shall be necessary to consider whether the equipment is part of a link in an extensive telecommunication network, what type of service is affected and how many users may suffer problems, or whether it is part of a chain in a non-public telecommunication link between two (skilled) individuals.

For a number of equipment types for which EMC standards have to be developed, for example microwave radio fixed link equipment, the minimum performance criteria shall take into consideration the relevant ITU recommendations. For some Private Mobile Radio (PMR) equipment the degradation in performance may be to a minimum intelligibility level for skilled users.

Some telecommunications services support safety related communications, for example fire services, medical services, police services, etc. These safety related aspects shall be taken into consideration when developing the technical specifications for telecommunications equipment supporting these services.

In the development of the technical specifications related to intrinsic immunity for telecommunications equipment, at least the following functional requirements shall be considered (if applicable to the equipment):

- the ability to establish a call;
- the ability to receive a call;
- the ability to maintain a call;
- the ability to clear a call in a controlled manner;
- the correct operation of call charging;
- the correct operation of primary and supplementary services.

9.3.2.2 Primary and secondary functions, and their performance criteria

Telecommunications equipment may contain user functions that are of a primary relevance from the point of view of conveying information or to configure the equipment to allow the exchange of information.

In addition, other user functions may be included in the equipment that do not have a functional relationship with the primary functions.

From the perspective of developing intrinsic immunity specifications (minimum performance criteria) the example below illustrates what are considered as primary and secondary functions.

EXAMPLE:

A paging receiver also contains an alarm clock:

- the reception of a call, the call alert and the storage of a call, if provided, are examples of the primary functions of the equipment; and
- the functions related to the alarm clock are the secondary functions.

The Harmonized EMC Standard developed to satisfy the essential requirements of the EMC Directive shall contain detailed criteria for the primary functions of the equipment, and performance criteria preferably expressed in general terms for the secondary functions (see subclause 9.3.1.1).

10 Relevance of technical specifications

10.1 General

The Mandate BC-T-319 [4] stipulates that the CENELEC/ETSI work programme, as detailed in annexes C and D of this ETR, should be complete in the sense that it should cover all types of telecommunications equipment.

It also stipulates that existing standards and activities should be scrutinised and additional activities identified as being relevant for the three Council Directives as noted in BC-T-319 [4].

In particular:

- adopted standards shall be reviewed for changes needed to cover the requirements of the EMC Directive;
- account shall be taken of existing uncompleted work items (drafts, pre-drafts, etc.) in the ETSI and CENELEC work programme;
- additional standardization activities shall be identified.

The scrutinising and possible review of draft and existing EMC standards shall be carried out with the objective of identifying and laying down the essential requirements of the three Council Directives 89/336/EEC [1], 91/263/EEC [5] and 93/97/EEC [6] in the field of electromagnetic compatibility.

It shall be clearly distinguished between "horizontal essential requirements" imposed by the EMC Directive, and "specific electromagnetic compatibility aspects (vertical essential requirements)" in so far as these are recognised as relevant, and result from requirements imposed by the Telecommunications Directives.

NOTE: Reference is made to subclause 6.3 where it is indicated that in relation to Article 4 (c) of the TTE Directive, "no electromagnetic compatibility requirements have been identified by either ETSI or CENELEC that are specific for any telecommunications equipment to which the TTE Directive applies." However this may not necessarily be relevant for equipment to which the SES Directive applies.

In this context it is noted that (radio) telecommunications equipment "vertical" specific electromagnetic compatibility specifications for certain equipment only exist by virtue of the classification of that (radio) telecommunications equipment as terminal equipment or Satellite Earth Station equipment as defined in the TTE Directive or the SES Directive respectively.

Certain electromagnetic compatibility specifications classified as "horizontal" specifications for non-terminal equipment may also be classified as "vertical" specifications for certain equipment to which the TTE Directive or SES Directive applies (article 2.2 EMC Directive), even if this equipment is technically identical to non-terminal equipment.

Further, in this context, it is noted that for radio transmitting equipment the classification of such equipment as terminal equipment will change the performance assessment procedures as imposed by either the EMC Directive in Article 10.5 or the TTE Directive in Article 9 and annex I to annex IV. This happens regardless of whether the terminal equipment is technically identical to non-terminal equipment, and regardless of whether the total set of technical specifications related to electromagnetic compatibility is identical for the terminal equipment version and the non-terminal equipment version of the equipment concerned.

In consequence, a transmitting radio equipment intended for use as a terminal equipment, or as a non-terminal equipment (see definitions for terminal equipment), as required by the user (purchaser), and marketed as such, would be subject to two different conformance assessment procedures.

Recommendation:

To resolve this inconsistency, it is recommended that the provisions of Article 10.5 of the EMC Directive, related to the conformance assessment procedures for radio transmitters, are amended such that, in addition to the current provisions, new provisions are included to allow conformance assessment procedures in accordance with Module H [17] of the Global Approach [19] (i.e. full quality assurance).

10.2 Radio and EMC phenomena and their relevance to Council Directives

As a tool to identify (radio) telecommunication technical specifications and phenomena related to electromagnetic compatibility, how they relate to the provisions of the EMC Directive, the TTE Directive and SES Directive, where appropriate, overview tables are included in this subclause.

The overview of technical specifications and phenomena related to electromagnetic compatibility, as given in tables 2 to 5, although not exhaustive, represents the majority that can be elaborated in Harmonized (radio) telecommunications Standards as appropriate.

The tables show the relationship of those individual phenomena with the emission and immunity essential protection requirements of the EMC Directive, the TTE Directive and SES Directive where appropriate.

The phenomena and technical specifications that are shown in these tables and which may be elaborated in the Harmonized EMC Standards as being relevant essential requirements to the (radio) telecommunications product concerned shall be referred to in the normative annex as detailed in annex A and B.

Electromagnetic phenomena that are relevant for the product as essential requirements for the electromagnetic environment where it is intended to be used, and which relate to Council Directives, shall be specified in the Harmonized EMC Standards. This shall be done irrespective whether such phenomena are identified in the tables 2, 3, 4, and 5.

To identify in the normative annex, as detailed in annex A and B, the relationship between the technical specifications and the essential protection requirements of the Council Directives, the guidance in the following subclauses applies. The guidance differs depending upon the categories and types of telecommunications equipment under consideration.

10.2.1 Non-radio, non-terminal telecommunications equipment

Table 2, columns 1 and 2, show the relationship of typical (horizontal) EMC phenomena to the essential protection requirements as meant in the EMC Directive, Articles 4 (a) and 4 (b) respectively.

10.2.2 Non-radio terminal telecommunications equipment

There are no specific electromagnetic compatibility requirements, as meant by the TTE Directive Article 4 (c), for terminal telecommunications equipment. Therefore, Article 4 (c) of the TTE Directive does not have any relevance to this type of equipment.

Table 2, columns 1 and 2 show the relationship of typical (horizontal) EMC phenomena to the essential protection requirements of the EMC Directive, Articles 4 (a) and 4 (b) respectively.

10.2.3 Radio, non-terminal, non-SES equipment

Table 2, columns 1 and 2 show for those technical specifications that are common for radio and other telecommunications equipment how they relate to the essential protection requirements of the EMC Directive, Articles 4 (a) and 4 (b) respectively.

The tables 3 and 4 represent additionally a non-exhaustive list of radio parameters and phenomena that may be relevant in its full extent for some radio equipment. For other radio equipment, depending on its use, only a subset of these parameters and phenomena, or other additional parameters, may be relevant and, therefore, need to be elaborated in standards.

The purpose of these tables and table 2 is to provide guidance for the development of the normative annexes referred to in subclause 6.1.2.

For radio equipment, not being TTE or SES equipment, tables 3 and 4 apply additionally to table 2 in the following manner:

- table 3 is relevant for radio transmitting equipment in this category of equipment and shows in columns 1 and/or 2 for typical radio technical specifications for transmitting equipment, how they relate to the essential requirements of the EMC Directive, Articles 4 (a) and 4 (b) respectively;
- table 4 is relevant for radio receivers in this category of equipment and shows in columns 1 and/or 2 for typical radio technical specifications for receiving equipment, how they relate to the essential protection requirements of the EMC Directive, Articles 4 (a) and 4 (b) respectively.

10.2.4 Radio terminal equipment

There are no specific electromagnetic compatibility requirements as meant by the TTE Directive Article 4 (c) for terminal telecommunications equipment. Therefore, Article 4 (c) of the TTE Directive does not have any relevance to this type of equipment.

Table 2, columns 1 and 2 show for those technical specifications that are common for radio and other telecommunications equipment how they relate to the essential requirements of the EMC Directive, Articles 4 (a) and 4 (b) respectively.

The tables 3 and 4 represent additionally a non-exhaustive list of radio parameters and phenomena that may be relevant in its full extent for some radio equipment. For other radio equipment, depending on its use, only a subset of these parameters and phenomena, or other additional parameters, may be relevant and, therefore, need to be elaborated in Harmonized EMC Standards.

The purpose of these tables and table 2 is to provide guidance for the development of the normative annexes as referred to in subclause 6.1.2.

For radio equipment, being TTE equipment, tables 3 and 4 apply additionally to table 2 in the following manner:

- table 3 is relevant for radio transmitting equipment in this category of equipment and shows in columns 1 and/or 2 for typical radio technical specifications for transmitting equipment, how they relate to the essential protection requirements of the EMC Directive, Articles 4 (a) and 4 (b) respectively;
 - for radio transmitting equipment in the category of this subclause, the references as identified by entries in columns 1 and/or 2 shall be used to develop the normative annex referred to in subclause 6.1.2 for inclusion in Harmonized EMC Standards subject to the EMC Directive, provided that there are no relevant entries in columns 3 and/or 4;
 - entries in columns 3 and/or 4 show typical radio technical specifications for this type of equipment and how they relate to the specific essential requirements of the TTE Directive articles 4 (c) and 4 (d) respectively;
 - for radio transmitting equipment relevant to this subclause, the reference as identified by entries in columns 3 and/or 4 shall be used to develop the normative annexes as referred to in subclause 6.1.2 for inclusion in Harmonized Standards subject to the TTE Directive;
- table 4 is relevant for radio receivers in this category of equipment and shows in columns 1 and/or 2 for typical radio technical specifications for receiving equipment how they relate to the essential protection requirements of the EMC Directive, Articles 4 (a) and 4 (b) respectively;
 - for radio receivers in the category of this subclause, the references as identified by entries in columns 1 and/or 2 shall be used to develop the normative annex referred to in subclause 6.1.2 for inclusion in Harmonized EMC Standards subject to the EMC Directive, provided that there are no relevant entries in columns 3 and/or 4;
 - entries in columns 3 and/or 4 show for typical radio technical specifications for this type of equipment how they relate to the specific essential requirements of the Terminal Directive articles 4 (c) and 4 (e) respectively;
 - for radio receivers relevant to this subclause, the reference, as identified by entries in columns 3 and/or 4, shall be used to develop the normative annexes as referred to in subclause 6.1.2, for inclusion in Harmonized Standards subject to the TTE Directive.

10.2.5 SES equipment

Table 2, columns 1 and 2 show for those technical specifications that are common for radio, telecommunications and SES equipment, how they relate to the essential requirements of the EMC Directive, Articles 4 (a) and 4 (b) respectively.

The table 5 represents a non-exhaustive list of radio parameters and phenomena that may be relevant in its full extent for some SES equipment. For other SES equipment, depending on its use, only a subset of these parameters and phenomena or other additional parameters may be relevant and, therefore, need to be elaborated in Harmonized EMC Standards.

The purpose of this table is to provide guidance for the development of the normative annex as referred to in subclause 6.1.2.

For SES equipment, table 5 applies additionally to table 2 in the following manner:

- table 5 is relevant for SES transmitting and/or receiving equipment and shows in columns 1 and/or 2 for typical radio technical specifications for transmitters and/or receivers, how they relate to the essential protection requirements of the EMC Directive, Articles 4 (a) and 4 (b) respectively;
 - for SES equipment the references as identified by entries in columns 1 and/or 2 shall be used to develop the normative annex referred to in subclause 6.1.2, for inclusion in Harmonized EMC Standards subject to the EMC Directive, provided that there are no relevant entries in columns 3 and/or 4;
 - entries in columns 3 and/or 4 show for typical SES technical specifications for this type of equipment, how they relate to the specific essential requirements of the SES Directive articles 4 (c) and 4 (e) respectively;
 - for SES equipment relevant to this subclause, the reference as identified by entries in columns 3 and/or 4 shall be used to develop the normative annex as referred to in subclause 6.1.2 for inclusion in Harmonized Standards subject to the SES Directive.

10.3 Tables of electromagnetic phenomena and their relationship to Council Directives

10.3.1 Typical electromagnetic phenomena and their relationship with the EMC Directive

Table 2: Telecommunications and radiocommunications equipment

EMC 89/336/EEC Article 4(a) electromagnetic disturbance - 1 EMC 89/336/EEC Article 4(b) intrinsic immunity - 2		
Phenomena	1	2
Disturbance		
Radiated emission (enclosure, cables)	X	
Conducted emission, AC power port	X	
Conducted emission, DC power port	X	
Conducted emission, signal line port	X	
Conducted emission, control line port	X	
Immunity		
		X
Radiated field, continuous		X
Electrical fast transients		X
ElectroStatic Discharge		X
Radio frequency, common mode		X
Power frequency, common mode		X
Power frequency, differential mode		X
Voltage fluctuation		X
Surges, common mode		X
Surges, differential mode		X
Voltage dips		X
Voltage interruptions		X
Mains power frequency, magnetic fields		X
Mains power frequency, harmonics and inter-harmonics		
NOTE:	As mentioned in subclause 10.2 this list shows the majority of technical specifications, but not necessarily exhaustive, that should be considered for elaboration in a Harmonized EMC Standard. Some of them may be less relevant, or not relevant, for the equipment concerned in relation to the environment in which the equipment is intended to be used and may not be included in Harmonized EMC Standards, when properly justified (see subclause 8.3.1).	

10.3.2 Typical electromagnetic phenomena and their relationship with the EMC Directive and with the TTE Directive

Table 3: Radio transmitting equipment

EMC 89/336/EEC Article 4 (a) electromagnetic disturbance 1) EMC 89/336/EEC Article 4 (b) intrinsic immunity 2) TTE 91/263/EEC Article 4 (c) specific EMC for TE 3) TTE 91/263/EEC- 4 (e) effective use RF spectrum 4)				
Phenomena	1	2	3	4
Frequency (bands) wanted RF emission				X
Transmitter frequency tolerance				X
Class of emission				X
Necessary bandwidth				X
RF channel separation				X
Spectral power density				X
RF radiated output power, wanted emission				X
RF conducted output power, antenna port, wanted emission				
Antenna gain				X
Antenna polarization				X
RF spurious emissions, antenna port	X			X
RF enclosure radiation	X			
RF out of band emissions				X
RF adjacent channel power				X
Intermodulation, within assigned frequency band				
Inter-transmitter intermodulation				X
NOTE 1: The definitions of spurious emissions, unwanted emissions and out of band emissions are those given in the ITU Radio Regulations				
NOTE 2: The development in standards of the specific aspects of the phenomena indicated in the table, and their relevance for certain radiocommunications equipment, is subject to the provisions of the ETSI/ERC MoU, irrespective of any entry in the columns 1 to 4 (see subclause 5.3).				

10.3.3 Typical electromagnetic phenomena and their relationship with the EMC Directive and with the TTE Directive

Table 4: Radio receiving equipment

EMC 89/336/EEC Article 4 (a) electromagnetic disturbance 1) EMC 89/336/EEC Article 4 (b) intrinsic immunity 2) TTE 91/263/EEC Article 4 (c) specific EMC for TE 3) TTE 91/263/EEC- 4 (e) effective use RF spectrum 4)				
Phenomena	1	2	3	4
RF frequency/tuning range				
RF frequency tolerance and stabilization				
RF channel separation				X
RF/IF bandwidth				
RF selectivity				
RF sensitivity				
RF co-channel rejection				
Demodulation method				
RF blocking/desensitization (see note 2)		X		
RF spurious responses (see note 2)		X		
Intermodulation				
RF spurious emissions, antenna port	X			X
RF enclosure radiation	X			
NOTE 1:	The development in standards of the specific aspects of the phenomena indicated in the table and their relevance for certain radiocommunications equipment is subject to the provisions of the ETSI/ERC MoU, irrespective of any entry in the columns 1 to 4 (see subclause 5.3).			
NOTE 2:	The definition of these parameters is as defined in the relevant product radiocommunications (I)-ETS.			

10.3.4 Typical electromagnetic phenomena and their relationship with the EMC Directive and with the SES Directive

Table 5: SES transmitting and receiving equipment

EMC 89/336/EEC Article 4 (a) electromagnetic disturbance 1) EMC 89/336/EEC Article 4 (b) intrinsic immunity 2) SES 93/97/EEC/TTE 91/263/EEC Article 4 (c) specific EMC for SES 3) SES 93/97/EEC/TE 91/263/EEC- 4 (e) effective use RF spectrum (see note) 4)				
Phenomena	1	2	3	4
SES transmitting equipment				
Spurious radiation below 960 MHz	X			
Spurious radiation above 960 MHz			X	X
On axis spurious radiation			X	X
Tx carrier centre frequency stability				X
Off axis EIRP emission density				X
Tx polarization discrimination				X
Carrier on-off				X
Electromagnetic immunity below 960 MHz		X		
Electromagnetic immunity above 960 MHz			X	X
Antenna pointing stability				X
Processor monitoring				X
Transmit subsystem monitoring				X
Network control authorization				X
Network control channel reception				X
SES transmission validation				X
Suppression of transmission				X
Initial burst rate transmission				X
SES receiving equipment				
Spurious radiation below 960 MHz	X			
Spurious radiation above 960 MHz			X	X
Electromagnetic immunity below 960 MHz		X		
Electromagnetic immunity above 960 MHz			X	X
Antenna pointing stability				X
NOTE:	This includes "Effective use of orbital resources and the avoidance of harmful interference between space-based and terrestrial communications systems and other technical systems."			

11 Procedures for conversion of non-harmonized EMC standards into Harmonized EMC Standards

This clause describes the ETSI and CENELEC procedures for the conversion of existing published, and draft, non-harmonized standards into new Harmonized EMC Standards for the purposes of the EMC Directive.

11.1 Procedures for conversion

The following subclauses outline the procedures to be followed when converting existing published and draft standards into new Harmonized EMC Standards. With regard to standards (ETs) to which ERC Decisions relate, the procedures in annex E apply.

11.1.1 Existing published standards

Existing published standards in ETSI consist of ETs for EMC. In CENELEC no non-harmonized standard exists for EMC. The procedure for the conversion of the published standards in ETSI into Harmonized EMC Standards is given in the following subclause.

11.1.1.1 ETSs for EMC

A published product standard, that relates to EMC but to which product at that time no ERC Decision relates, will be reviewed to ensure that the requirements in the standard comply with the essential requirements of the EMC Directive and with the provisions of this ETR. The following actions will also be taken:

- the foreword is to be amended to indicate that the standard is to be a Harmonized EMC Standard;
- the scope is to be amended to indicate that the standard may be used to give presumption of conformity with the EMC Directive;
- a normative annex is to be added giving the cross references for clauses and subclauses in the standard to the essential requirements of the EMC Directive (see annex A).

These changes may be submitted to Public Enquiry and Vote, as an amendment, using the ETSI Unified Approval Procedure (UAP).

11.1.2 Existing draft standards

For existing draft product EMC standards, but to which product at that time no ERC Decision relates, the requirements for amendment are given in the previous subclauses with the following changes:

- for standards being drafted prior to TC approval, the amendments will be incorporated before submission for STC or TC approval;
- for standards in the Public Enquiry, or TC resolution phase, the amendments will be incorporated into the standard before the voting procedure;
- for standards that have been adopted, but not yet published, the standard will be amended and sent on the ETSI Voting procedure for a second time.

12 Approval procedures

12.1 First edition of Harmonized EMC Standards

The first edition of a Harmonized EMC Standards follow the same approval procedures as any other ETSI or CENELEC standard.

The normal ETSI or CENELEC procedure in accordance with the respective organization's rules for public consultation and approval by National Standards Organizations (NSOs) applies.

In the process of public consultation (Public Enquiry) and approval (Vote) it shall be made known that the draft standard is intended to become a Harmonized EMC Standard, the reference and title of which is intended for publication in the OJEC referencing the EMC Directive.

The normal ETSI and CENELEC rules for transposition apply to the Harmonized EMC Standards.

12.2 Second and subsequent editions of Harmonized EMC Standards

Any subsequent editions of Harmonized EMC Standards follow the same approval procedure as any other ETSI or CENELEC standard and shall state the date for withdrawal of the previous edition.

In order to allow manufacturers and other users of the Harmonized Standards to adapt to the revised Harmonized Standard, a transition period will be introduced in the revised version. During such a transition period, compliance with the essential requirements of the EMC Directive may be presumed when the equipment is compliant with either the old or new version of the Harmonized Standard.

The responsible drafting committee shall specify within the standard the transition period during which both the old and the new versions apply, prior to sending the Harmonized EMC Standard to the Public Enquiry and to the Voting phase of the approval procedure.

The transition period shall be stated in the Foreword of the Harmonized EMC Standard.

13 Presentation of adopted Harmonized EMC Standards to the European Commission

13.1 Before adoption

Before a Harmonized EMC Standard is submitted to the Voting procedure, (see clause 12), the Standard shall be finally examined to ascertain that the conditions imposed by the relevant EC Council Directive, the conditions of the standardization Mandate, and the conditions stemming from this ETR, are satisfied.

For Harmonized EMC Standards produced by CENELEC, this final examination of the Harmonized EMC Standard will be carried out by the Chairman of TC 110 assisted by the chairman's advisory group in accordance with the "Guide on EMC standardization for product committees" [19].

For Harmonized EMC Standards produced by ETSI this final examination of the Harmonized EMC Standard will be carried out by an advisory group composed of experts in the field of EMC, European regulatory issues, and ETSI procedures (see note).

NOTE: ETSI should establish an ETSI officials' group who will advise the ETSI Director whether the conditions of a relevant standardization Mandate, the conditions of EC guidance related to harmonized standards, and the conditions stemming from this ETR are satisfied, before the Harmonized EMC Standard is presented to the EC.

13.2 After adoption

After a Harmonized EMC Standard, or series of related Harmonized EMC Standards have successfully been adopted, the Harmonized EMC Standard, with reference to the Mandate under which it has been prepared, shall be presented to the EC to have its reference published in the OJEC as a Harmonized Standard which may be used to confer presumption of conformity with the essential requirements of the Council Directive 89/336/EEC [1]. Together with the Harmonized EMC Standards, translations of the titles in the languages of the EU Member States shall be sent to the EC.

Annex A: Model of a normative annex to be used for Harmonized EMC Standards

This annex gives the format of the normative annex to be placed in each Harmonized EMC Standard as described in subclause 6.1.2, in a general form, and as an example.

"Annex A (normative): ETS 300 ???/EN 550???, (Title of standard)

Table A.1: Subclauses of this ETS/EN relevant for compliance with the essential requirements of EC Council Directives

Clause/subclause number, or annex reference	Corresponding article of Council Directive 89/336/EEC	Qualifying remarks
Disturbance		
8.2 Enclosure radiation	4 (a)	
8.3 DC power input/output port	4 (a)	
8.4 AC mains power input/output port	4 (a)	
8.5 RF spurious emissions	4 (a)	
Immunity		
9.2 RF electromagnetic field (80 to 1 000 MHz)	4 (b)	
9.3 ElectroStatic discharge	4 (b)	
9.4 Fast transients common mode	4 (b)	
9.5 RF common mode, 0,15 to 80 MHz	4 (b)	
9.6 Transients and surges, vehicular environment	4 (b)	
9.7 Voltage dips and interruptions	4 (b)	
9.8 Surges, common and differential mode	4 (b)	
9.9 RF blocking and desensitization	4 (b)	
9.10 RF spurious responses	4 (b)	

Annex B: Example of an actual normative annex to telecommunications equipment Harmonized EMC Standard

"Annex A (normative): ETS 300 386-1: "Equipment Engineering (EE); Public telecommunication network equipment, electromagnetic compatibility (EMC) requirements"; Normal priority of service

Table A.1: Subclauses of this ETS/EN relevant for compliance with the essential requirements of EC Council Directives

Clause/subclause number, or annex reference	Corresponding article of Council Directive 89/336/EEC	Qualifying remarks
Immunity		
6.2 ElectroStatic discharge	4(b)	
6.3 Electrical fast transients/burst, AC Power	4(b)	
6.3 Electrical fast transients/burst, DC Power	4(b)	
6.3 Electrical fast transients/burst, Signal line	4(b)	
6.4.1 Surges, Outdoor signal line ports	4(b)	
6.4.2 Surges, Indoor signal line ports	4(b)	
6.4.3 Surges, AC power line ports	4(b)	
6.5.1.1 Continuous conducted, Low frequency, AC power supply port	4(b)	
6.5.1.2 Continuous conducted, Low frequency, DC power supply interface port	4(b)	
6.5.1.3 Continuous conducted, Low frequency, Signal line port	4(b)	
6.5.2.1 Continuous conducted, Radio frequency, AC power supply port	4(b)	
6.5.2.2 Continuous conducted, Radio frequency, DC power supply interface port	4(b)	
6.5.2.3 Continuous conducted, Radio frequency, Signal line port	4(b)	
6.6 Radiated electromagnetic fields	4(b)	
Emission		
7.2.1 Conducted emission, Signal line ports	4(a)	
7.2.2 Conducted emission, Mains power interface ports	4(a)	
7.2.3 Conducted emission, DC power interface ports	4(a)	
7.3 Radiated emission	4(a)	

Annex C: ETSI standards for EMC in the telecommunications field

C.1 Introduction

In this annex overviews are given of Harmonized EMC Standards to be prepared under a Mandate from the EC by ETSI (see annex D for CENELEC).

Further distinction is made in tables C.1, C.2 and C.3 as follows:

- table C.1:
 - lists EMC standards which have already been published as voluntary EMC standards. They have not been prepared under a Mandate from the EC and therefore need conversion into Harmonized EMC Standards by formal amendment after ETSI has received a Mandate to produce relevant Harmonized EMC Standards;
- table C.2:
 - lists EMC standards, which are product family EMC standards and which are in an advanced state of development, although not prepared under a Mandate from the EC. They need conversion into Harmonized EMC Standards by formal amendment prior to publication after ETSI has received a Mandate to produce relevant Harmonized EMC Standards;
- table C.3:
 - lists product EMC standards for which, on a voluntary basis, work may be in progress.

C.2 Priority

In each of the tables the relative priority of the Harmonized standardization work has been identified ranging from 1 for the highest priority, to 3 for the lowest priority.

Priority 1 means that Harmonized EMC Standards may be available for publication, and presentation to the EC to have its reference published in the OJEC, approximately 2 years after the receipt of the standardization Mandate. Where a Harmonized EMC Standard is based upon an already published voluntary standard this period may be reduced to 1,5 years.

Priority 2 means that the standardization work may commence 6 months later than that with priority 1, with a time period similar to priority 1.

Priority 3 is similar to the above but commencing 1 year after priority 1.

The time scales identified above are based upon the typical development of standards by ETSI Technical Sub-Committees (STC), meeting 3 to 4 times a year. The output from the STC is then approved for the ETSI standards approval procedure by the Technical Committee meeting 3 times a year. These time scales may be substantially reduced by the utilisation of an ETSI Project Team specifically set up for the purpose of drafting the Harmonized EMC Standards, following the guidance of this standardization programme.

C.3 Published standards for conversion to Harmonized EMC Standards

Table C.1

ETSI Work item	ETS number	Title	Status	Priority
DE/EE-04002	ETS 300 127	Radiated emission testing of physically large telecommunication systems	Published	3
DE/EE-04003-1	ETS 300 386-1	Public telecommunications network equipment; EMC requirements; Part 1: product family overview, compliance criteria and test levels	Published	2
DE/RES-09004-1	ETS 300 342-1	EMC standard for GSM mobile radio and ancillary equipment	Published	1
DE/RES-09005	ETS 300 340	EMC standard for ERMES paging receivers	Published	1
DE/RES-09010	ETS 300 329	EMC standard for DECT equipment	Published	1

C.4 Standards in development for evaluation and conversion to Harmonized EMC Standards

Table C.2

ETSI Work item	ETS number	Title	Status	Priority
DE/EE-04003-2-x	ETS 300 386-2-x 5 parts	EMC requirements for equipment installed and used in the public telecommunications network	Draft	1
DE/RES-09003	ETS 300 339	General EMC standard for radio communication equipment	Draft	1

C.5 Standards to be prepared for harmonization

NOTE: "In preparation" relates to work on a draft ETS. These draft ETSs will be converted to Harmonized Standards on receipt of the Mandate from the EC in accordance with this ETR.

Table C.3

ETSI Work item	ETS number	Title	Status	Priority
DE/EE-04006		EMC requirements standard for radio and network telecommunications equipment	In preparation	1
		EMC standard for private paging equipment	In preparation	2
		EMC standard for short-range devices (includes alarm systems, telecontrol)	In preparation	1
		EMC standard for wide-area paging	In preparation	2

continued

Table C.3 (concluded)

ETSI Work item	ETS number	Title	Status	Priority
		EMC standard for Digital Short Range Radio (DSRR)		3
		EMC standard for Wideband Data transmission Systems (WDS) operating in the 2,45 GHz ISM band	In preparation	1
		EMC standard for Amateur Radio equipment	In preparation	2
		EMC standard for Digital Private Mobile Radio		3
		EMC standard for Trans-European Trunked Radio (TETRA)		2
		EMC standard for Maritime Mobile Radio Equipment	In preparation	2
		EMC standard for GSM/DCS 1800 base station radio and ancillary equipment		1
		EMC standard for Private Mobile Radio (PMR) trunked and ancillary equipment	In preparation	1
		EMC standard for digital fixed radio links and ancillary equipment	In preparation	2
		EMC standard for VHF-FM broadcast transmitters	In preparation	2
		EMC standard for Cordless Telephone CT2	In preparation	2
		EMC standard for Wireless Microphones	In preparation	2
		EMC standard for Audio Links	In preparation	2
		EMC standard for analogue cellular mobile radio	In preparation	2
		EMC standard for analogue cordless telephones		2
		EMC standard for Ku band VSATs	In preparation	1
		EMC standard for Ku band TVROs		1
		EMC standard for Ku band transportable SESs		2
		EMC standard for L band LMESs		2
		EMC standard for Ku band LMESs		2
		EMC standard for Satellite News Gathering	In preparation	2
		EMC standard for Citizen Band FM	In preparation	2
		EMC standard for Citizen Band AM/SSB	In preparation	3
		EMC standard for TFTS mobile station		2
		EMC standard for TFTS base station		2
		EMC standard for HIPERLAN		2
		EMC standard for DCS 1800		2
		EMC standard for UIC		3
		EMC standard for Satellite Personal Communications Networks		3
		EMC standard for UMTS		3

Annex D: CENELEC standards for EMC in the telecommunications field

In this annex overviews are given of Harmonized EMC Standards in preparation by CENELEC under an existing Mandate from the EC.

D.1 Published standards for conversion to Harmonized EMC Standards

Table D.1

CENELEC Work item	EN number	Title	Status	Priority
	55022	Emission requirements for IT equipment	Revision	1

D.2 Standards in development for evaluation and conversion to Harmonized EMC Standards

Table D.2

CENELEC Work item	EN number	Title	Status	Priority
	55024	Immunity requirements for IT equipment	Draft	1
	55105	Immunity requirements for telecommunications terminal equipment	Draft	1

Annex E: Procedure for the development of Harmonized Standards for radiocommunications equipment in co-operation with the CEPT ERC

E.1 Introduction

The procedure for the development of Harmonized EMC Standards described in this annex applies to radiocommunications equipment not subject to the provisions of the TTE or SES Directives.

E.1.1 Background

The free movement of radiocommunications goods and the provision of Europe-wide services for radiocommunications are only achievable if there exist common regulations throughout Europe regarding availability of frequency bands, type approval requirements and border crossing procedures. A basic requirement, to fulfil these objectives, is the Europe-wide implementation of regulations based on ETSs.

In this process, both the ERC and ETSI are involved.

It is important to understand that radiocommunications products within the scope of this annex, are subject to two regimes to enable the user to use them as intended:

- compliance with the EMC Directive and the application of a CE mark;
- compliance with national type approval requirements as part of licensing regimes for radiocommunications systems.

There has been considerable debate between ETSI and the ERC concerning the identification of parameters that should be included in Harmonized EMC Standards to meet the essential requirements of the EMC Directive. This debate is closely associated with the perceived need to simplify the existing legal and regulatory provisions that need to be satisfied to place radiocommunications equipment on the European market and to bring it into use.

E.1.2 ERC opinion

The ERC has taken part in the discussions that have led to this ETR, and support the production of harmonized standards for horizontal EMC parameters and the principle of one-stop approval for licensing of radio products, but considers that the latter cannot be achieved by harmonizing under the EMC Directive those parts of radio product standards that contain spectrum management parameters, as this Directive does not concern the licensing systems of the EU Member States.

To achieve the same objective, the ERC proposes the development of ERC Decisions by which CEPT Administrations would commit themselves to adopt national type approval requirements for licensing based on ETSI standards, and an ERC Decision "on the mutual recognition of type approvals for radio products". A proposal has also been made to extend the scope of the TTE Directive, which contains appropriate regulatory procedures, or to develop a Radio Directive.

E.1.3 ETSI/ERC Memorandum of Understanding (ETSI/ERC MoU)

In December 1993 the ERC and the ETSI TA agreed a Memorandum of Understanding.:

- a) to implement the principles of co-operation and a procedure (described in an annex to the MoU) insofar as it does not conflict with European Community law;
- b) that this co-operation procedure is open to review at the request of either party.

The procedure for the development of Harmonized EMC Standards described in this annex implements the MoU to its full extent laying down in detail the process and activities to be carried out in both organizations individually and those which are to be carried out mutually to obtain one stop approval and free circulation of radiocommunications equipment.

This annex therefore proposes a solution that can be accommodated within the existing standardization framework and should achieve the objectives given in clause E.2.

E.2 Objectives

- 1) To develop and publish a single ETS containing:
 - those technical specifications which confer presumption of conformity to the essential requirements of the EMC Directive and thus removing barriers to trade;
 - those technical specifications that need to be satisfied to meet the type approval requirements for licensing purposes.
- 2) To develop a straight forward procedure to achieve "one-stop" European approval, to the maximum extent possible, for placing products on the market of the EU and for type approval for licensing purposes, bearing in mind that the licensing requirements for the use of radiocommunications equipment are the responsibility of national authorities.
- 3) To reach a mutually acceptable way of overcoming the differences of opinion between the ERC and ETSI on the content of Harmonized EMC Standards.

E.3 Procedure

E.3.1 Initiation of the procedure

The procedure for the initiation of the harmonization process shall be carried out using the ETSI TA/ERC MoU to inform each party of the requirements of the mandates received from the EC by ETSI. The MoU should be used to ensure that the processes for the production of an ERC Decision and the Harmonized EMC Standards required commences in parallel.

E.3.2 Development of new mandated standardization work

Throughout the development of an ERC Decision and a Harmonized EMC Standard for a particular radio equipment the procedure shall follow the interactive process as described in the flow diagram given in figure E.1.

E.3.3 Conversion of voluntary standards to Harmonized EMC Standards

ETSI will develop the horizontal EMC technical specifications in accordance with the mandates from the EC and will develop the functional radio product standard, in accordance with the MoU.

The ERC will develop an ERC Decision to adopt the functional radio product standard, as developed by ETSI, as the type approval requirements within the licensing regimes of the CEPT Member States.

The result of this process is to have completed for the production of a Harmonized EMC Standard:

- a (draft) standard containing the horizontal EMC technical specifications;
- a radio product standard;
- an ERC Decision referencing all relevant technical specifications within the radio product standard that have to be satisfied as a requirement for type approval as part of the licensing for the use of the radiocommunications equipment within the CEPT countries.

The final act in the harmonization process is now to bring the relevant parts of these documents together to produce the Harmonized EMC Standard.

The Harmonized EMC Standard will contain the horizontal EMC technical specifications and the functional radio technical specifications via the addition of:

- a normative annex referencing only those subclauses within the Harmonized EMC Standard that are relevant to the EMC Directive and that can be used to give presumption of compliance with the EMC Directive; and

- a normative annex containing the ERC Decision, completed with references to those subclauses within the Harmonized EMC Standard that have been copied from the radio product standard.

The Harmonized Standard containing the two normative annexes will then be offered to the EC for its reference to be published in the OJEC.

The result of this process will provide:

- full participation of all concerned parties in the standardization and harmonization process;
- a standard containing all necessary technical specifications required for one-stop type approval for licensing within the EU and EFTA;
- rapid development of Harmonized Standards to meet the needs of the market;

However, although all technical specifications that apply to the radiocommunications product on a "mandatory" basis to have it placed on the market and brought into use are included in one Harmonized Standard, not all technical specifications have a similar status:

- compliance with the technical specifications, as referenced to the EMC Directive, allow the affixation of the CE mark and the free circulation of the radiocommunications product;
- the technical specifications referenced in the ERC Decision are for type approval purposes as part of the licensing provisions for bringing the equipment into use.

This latter subset of the technical specifications, although contained in the standard, is not harmonized under the terms of the EMC Directive, with the exception of those specifically referenced to the EMC Directive.

E.3.5 Typical annex relating to ERC Decisions

"Annex B (normative): "ERC Decision of 1995 on the adoption of national type approval regulations for equipment to be used in the Land Mobile Service using angle modulation based on the European Telecommunications Standard (ETS) 300 086 [2]".

This annex contains the ERC Decision (), dated (), which references the technical specifications in ETS 300 086 [2] for inclusion in national type approval regulations.

ERC Decision

of () (1995)

**on the adoption of national type approval regulations
for equipment to be used in the Land Mobile Service using angle modulation
based upon the European Telecommunications Standard (ETS) 300 086 [2]**

The European Conference of Postal and Telecommunications Administrations,

considering:

- a) that CEPT has a long term objective to harmonize the use of frequencies and the related regulatory regimes;
- b) that such harmonization will benefit administrations, manufacturers, operators and users;
- c) that ETSI has published ETS 300 086 [2] for equipment to be used in the Land Mobile Service operating on radio frequencies between 30 MHz and 1 000 MHz with channel separations of 12,5 kHz, 20 kHz, and 25 kHz and intended primarily for analogue speech;
- d) that, for the foreseeable future, many official, public and private networks will continue to use land mobile equipment having the technical characteristics described in c) above;
- e) that, in accordance with the Memorandum of Understanding (MoU) between ERC and ETSI, the ERC shall adopt ERC Decisions on the introduction of ETSI standards into national type approval regimes;
- f) that the use of radio equipment is subject to national licensing and frequency planning requirements, in particular for frequency of operation, limit of maximum duration of transmission (e.g. use of time-out/timers) and effective radiated power (e.r.p.);
- g) that, in accordance with the requirements of the EMC Directive 89/336/EEC [1], further EMC product standards are in preparation which should include appropriate measurements below 30 MHz;
- h) that suitable transitional arrangements are given in CEPT Recommendation T/R 01-05.

Decides:

- 1) to adopt, by the 1st July 1995, national type approval regulations for equipment to be used in the Land Mobile Service using angle modulation, based on the limit values and measurement methods for spectrum management parameters (see note 1) contained in ETS 300 086 [2], with the exception of those which are subject to national licensing requirements (see note 2);
- 2) to withdraw any conflicting national regulation(s).

NOTE 1: Annex B.1 contains parameters from ETS 300 086 [2] to be included into national type approval regulation.

NOTE 2: Annex B.2 is provided for information to show which options have been adopted by each Administration in those cases where ETS 300 086 [2] offers an optional choice.

Table B.1: Parameters in ETS 300 086 [2] to be included in national type approval regulations

ETS 300 086 [2]	Clause	ERC spectrum management parameters(note 1)	Comments
Transmitter parameter limits:	4.1		
Frequency error	4.1.1	Transmitter frequency accuracy	
Carrier power variation (conducted)	4.1.2		
Effective radiated power	4.1.3	Part of spectrum mask	Subject to national licensing conditions
Frequency deviation	4.1.4	Part of spectrum mask	Options for 12,5 kHz, 20 and 25 kHz (note 2)
Adjacent channel power	4.1.5	Part of spectrum mask	Options for 12,5 kHz, 20 and 25 kHz (note 2)
Spurious emissions	4.1.6	Part of spectrum mask	
Intermodulation attenuation	4.1.7		Site engineering conditions in special cases
Transient frequency behaviour of a transmitter	4.1.8		
Receiver parameters	4.2		
Maximum usable sensitivity	4.2.1		
Maximum usable sensitivity (field strength)	4.2.2		Split into frequency bands
Amplitude characteristic	4.2.3		
Co-channel rejection	4.2.4		Options for 12,5 kHz, 20 and 25 kHz (note 2)
Adjacent channel selectivity	4.2.5	Receiver selectivity	Options for 12,5 kHz, 20 and 25 kHz (note 2)
Spurious response rejection	4.2.6	Receiver spurious response	
Intermodulation response rejection	4.2.7	Receiver intermodulation	
Blocking or desensitization	4.2.8	Receiver blocking/desensitization	
Spurious radiation	4.2.9	Receiver spurious radiation	
Duplex operation - receiver limits	4.3		
Receiver desensitization and maximum usable sensitivity	4.3.1		
Receiver spurious response rejection	4.3.2	Receiver spurious responses	
NOTE 1: ERC parameters necessary for spectrum management as agreed at the 11th ERC meeting in Brussels, June 1994.			
NOTE 2: See annex B.2 for details of the national implementation of channel spacing and temperature range options.			

Annex B.2

Table B.2: Adoption of ETS 300 086 [2]: National variations for channel spacing and temperature

Administration	Adoption of channel spacing options	Adoption of temperature range options
Albania		
Austria		
Belgium		
Bosnia and Herzegovina		
Bulgaria		
Croatia		
Cyprus		
Czech Republic		
Denmark		
Estonia		
Finland		
France		
Germany		
Greece		
Hungary		
Iceland		
Ireland		
Italy		
Latvia		
Liechtenstein		
Lithuania		
Luxembourg		
Malta		
Moldova		
Monaco		
Netherlands		
Norway		
Poland		
Portugal		
Romania		
Russian Federation		
San Marino		
Slovak Republic		
Slovenia		
Spain		
Sweden		
Switzerland		
Turkey		
United Kingdom		
Vatican City		
Key: Channel spacing options:		Temperature range options:
U = UHF; 1 = 12,5 kHz;		1 = - 25 to + 55 °C;
V = VHF. 2 = 20 kHz;		2 = - 15 to + 55 °C;
3 = 25 kHz.		3 = - 10 to + 55 °C.

Annex F: Repartition agreement between ETSI and CENELEC

Work repartition and co-operation for standardization concerning EMC between CENELEC and ETSI (formulated in a joint ETSI-CENELEC meeting on 21/6/90), (with additions made in subsequent meeting on equipment engineering)

F.1 Introduction

This paper formulates the work repartition between CENELEC and ETSI concerning standardization related to EMC, which has been negotiated between CENELEC and ETSI in an ad hoc WG.

Relevant procedures and modes of co-operation in accordance with the basic tripartite co-operation agreement are included in this document.

F.2 Basic principles

With the exception of radio communications (dealt with in F.3.1), the following are the basic principles:

- for the creation of European generic EMC standards CENELEC will be responsible. ETSI will co-operate in this work (mode 4);
- for EMC product standards (including equipment) the generic EMC standards will be taken as the reference by both organizations.

In the exceptional cases where a full reference to the generic EMC standards would not be possible, the relevant product standard should mention this situation with full technical justification. This justification will have to be approved for CENELEC by the Chairman of TC110 who has been designated by BT as the co-ordinator of all EMC product standardization.

F.3 Particular work repartition

F.3.1 EMC in the field of radio communications

EMC standards for equipment used for all radio communications as defined by ITU in the frequency range 9 kHz - 3 000 GHz (except broadcasting), i.e. equipment using radio waves, whether for public or for private services.

Examples of radio communications (not exhaustive):

- mobile radio;
- fixed radio;
- mobile-satellite radio;
- fixed-satellite radio;
- broadcasting.

Examples of relevant equipment (non-exhaustive):

- radiotelephone equipment;
- paging equipment;
- citizens' band equipment;
- amateur radio equipment;
- remote control equipment (for example for opening doors, for toys, etc.);
- VSAT equipment;
- microwave link equipment.

ETSI will be responsible for the preparation of all EMC standards in this area. CENELEC will participate in this work under Mode 4 Approach, in all the relevant ETSI technical bodies with a view to bringing to ETSI's attention, CENELEC generic EMC standards approach.

F.3.2 Other telecommunications

EMC product standards for equipment used for telecommunications other than radio and for the interface connecting a piece of radio equipment to a non-radio telecommunications network (for example galvanic, opto-couplers, fibre optic, etc.).

Examples (not exhaustive):

- signalling and communication systems via the mains network;
- telecommunications terminal equipment, like:
 - modem;
 - ISDN equipment;
 - PABX equipment.

CENELEC will be responsible for these EMC product standards. ETSI will contribute where appropriate to the "acceptable" degradation of performance with relation to EMC immunity requirements. Specific EMC product standards for telecommunications network equipment, for example switching and transmission equipment and telecommunications terminal equipment, which are not intended to be installed in subscribers' premises, for example public paying telephones, will be under the responsibility of ETSI. CENELEC will be invited to participate (Mode 4).

NOTE: A list of the specific products mentioned above will be worked out by specialists of the two parties.

F.3.3 Broadcasting equipment

EMC product standards for broadcast receivers for consumers.

Examples (not exhaustive):

- MAC D2, HDTV receivers;
- Radio data systems (for example car radio in the VHF band 2).

CENELEC will be responsible for the preparation of EMC products standards in this area. ETSI will participate under application of Mode 4. However, ETSI will be responsible for the EMC product standards for broadcasting transmitters.

NOTE: Necessary co-ordination with EBU will be organised.

F.3.4 CATV cable systems

EMC product standards for CATV cable systems will be dealt with in CENELEC. For the present, narrow band (CATV) networks with participation of ETSI (Mode 4). A revision of this item will however be necessary as soon as hybrid and broad-band networks will be promoted.

F.4 Additional work on EMC

ETSI will in particular contribute to the development in CENELEC of codes of practice and the classification of specific environments, with respect to EMC and related to telecommunications and radio communication equipment.

F.5 Future developments

As it is impossible to prepare a complete list of existing and future items related to EMC which may be of interest to both organizations, the establishment of a joint ad hoc working party may be required to prepare further decisions, wherever conflicts of interest may arise.

F.6 Practical organization

Organization of co-operation, procedures, information flow, invitations to meetings, documentation, etc. will be established between the responsible managers of the CENELEC Central Secretariat and ETSI Secretariat. These administrative and related procedures will be established as soon as possible and will be applicable to all similar detailed agreements with a minimum of deviations for each of the relevant fields.

F.7 Addendum (points added by work repartition concerning accessories for telecommunications equipment and equipment practice)

(2.2) Specific network-related EMC requirements on the interfaces of radiocommunications apparatus with networks:

ETSI STCs/EE4 and RES9 lead, with mode 4 co-operation with CENELEC TC110.

(2.6) Code of practice related to EMC measurements for non-radio telecommunications equipment:

CENELEC TC110 lead; code will be prepared with mode 4 co-operation with ETSI STC/EE4.

ETSI Secretariat, 15 October 1992.

Annex G: ETSI/ERC Memorandum of Understanding

Memorandum of Understanding
between
European Radiocommunications Committee (ERC)
and the
European Telecommunications Standards Institute (ETSI)
Technical Assembly

The ERC of the Conference of European Postal and Telecommunications administrations (CEPT) and the ETSI Technical Assembly

Considering:

- a the transition agreement between ETSI and CEPT signed on 19 December 1989;
- b the respective responsibilities of the two organisations;
- c the need for full co-operation between the two organisations to ensure:
 - the efficient and effective use of the spectrum by radio equipment and systems based on European Telecommunications Standards (ETSSs);
 - the timely availability of spectrum for radio equipment and systems based on ETSSs;
 - the timely availability of ETSSs;
 - the implementation on a Europe-wide basis of ETSSs for radio equipment and systems;
- d that a close liaison and an iterative process of consultation between the two organisations is essential;
- e that consequently there is a need for mutual representation of the organisations in each others' meetings;

Noting:

- f that the Commission of the European Communities (CEC) has recognised ETSI as a European Standardisation Organisation in accordance with the provisions of Directive 83/189/EEC and its amendments;
- g the Council Resolution of 19 November 1992 on the implementation in the Community of ERC Decisions (92/C318/01);

- h that ETSI and the Technical Regulations Application Committee (TRAC) co-operate in the elaboration of Technical Bases for Regulations (TBRs) for Common Technical Regulations (CTRs) for telecommunication terminal equipment;

Agree:

- 1 to implement the principles of co-operation and the procedure as described in the Annex in so far as it does not conflict with European Community law¹
- 2 that this co-operation procedure is open to review at the request of either party.

Signed:

for ERC

for ETSI

Chairman ERC

**Chairman ETSI
Technical Assembly**

Director ETSI

Dated: 16 December 1993

Annex

¹ The CEC will provide advice in this regard.

1 Introduction

The free movement of radiocommunication goods and the provision of Europe-wide services for radiocommunications are only achievable if there exist common regulations throughout Europe regarding availability of frequency bands, type approval requirements and border crossing procedures. A basic requirement to fulfil these objectives is the Europe-wide implementation of national regulations based on ETSs.

In this process, both the European Radiocommunications Committee (ERC) and the European Telecommunications Standards Institute (ETSI) are involved.

ERC is responsible for the effective use and harmonisation of the radio frequency spectrum and, therefore, provides for decisions regarding the allocation of frequencies for radiocommunication systems and equipment within the CEPT countries, as well as for regulatory requirements relevant to the use of these systems or equipment. The ERC is composed of representatives of the national radio regulatory authorities of the CEPT member states. National Governments are not bound to implement ERC Recommendations, but may commit themselves to implement ERC Decisions.

ETSI is responsible for the development of standards for radiocommunication systems and equipment. Radio standards contain by their nature several requirements which relate to the efficient use of the spectrum and many radio standards developed by ETSI specify requirements which are intended to be used for type approval purposes. The ETSI membership is composed of relevant regulatory authorities, network operators, manufacturers, service providers, research institutes and users.

The application of standards as developed by ETSI is voluntary. The National Standardisation Organisations are, however, obliged to transpose ETSI standards into national standards, and to withdraw any conflicting national standards. Together with CEN and CENELEC, ETSI is one of the three European standardisation institutes, recognised by the Commission of the European Communities (CEC), in the light of Directive 83/189/EEC..

ERC is well placed to assist with the direct implementation of ETSI standards by:

- adopting Decisions on the allocation of spectrum for the standards concerned;
- or by adopting Decisions to implement ETSI standards or parts of them in the national regulations for type approval purposes;
- or both.

This annex describes the principles for co-operation between the two organisations as well as the mechanism to execute a co-operation procedure.

2 Principles of Co-operation

There is an interaction between the technical parameters defined in the standards and the effect on the efficient use of the spectrum. It is essential that the national administrations, collectively represented by the ERC, take due account of the views of ETSI when considering their responsibility regarding the allocation of spectrum or assignment of frequencies and associated regulatory requirements.

In the same way, ETSI has to take account of the views of the ERC when developing its standards, and in particular when considering which influence the efficient use of the spectrum.

ERC and ETSI conclusions should be mutually acceptable and neither party should feel that its views have been disregarded. Both parties should build on the principle of co-operation in their tasks, not on a demarcation of responsibilities.

Considering that any CEPT Member administration may be a member of ETSI, and that all ETSI members may participate in the project teams of the ERC Working Group Spectrum Engineering, the following principles should apply:

- there should be a dialogue, respecting each body's responsibilities;
- there should be full consultation;
- an iterative process should precede conclusions.

The general approach should be:

- for the ERC to provide sufficient frequency spectrum for new services, according to market demand and taking account of the requirements of existing services and of different categories of users;
- for ETSI to develop appropriate equipment and system standards which provide for, inter alia, the effective use of the radio frequency spectrum. ETSI, however, has also to consider economic, market related and system efficiency requirements and there should be, in principle, a proper balance between these and the spectrum management requirements.

The results of the co-operation procedure described below should be that ETSI will develop standards embracing all aspects of radio equipment and systems. The development of these standards for radio equipment and systems would take full account of the requirements for the efficient use of the radio frequency spectrum, economic and other factors and would result in ETSI standards which should be implemented by CEPT/ERC Members into regulations via a direct reference, without additions, modifications or deletions, except in justified cases to meet essential requirements.

It should result in regulations for type approval which are harmonised on a Europe-wide basis, for radio equipment both within and without the scope of Directive 91/263/EEC².

3 Co-operation Procedure

3.1 General

There is a need to establish two related procedures: one for radio equipment which falls within the scope of Directive 91/263/EEC, and a second for other radio equipment and systems.

In the first case, ETSI will develop Technical Bases for Regulations (TBRs)³ to be included in Common Technical Regulations (CTRs), based upon the essential requirements as given in Article 4 of this Directive. ERC will designate the frequency bands to be specified in the standard. In addition, ERC may advise the CEC on the requirements for the effective use of the radio frequency spectrum, and related regulatory provisions in conformity with this Directive.

In the second case, ETSI will also develop standards reflecting these requirements, as co-ordinated and agreed with the ERC.

² Including any amending Directives.

³ Also known as "ETS-CTR candidates".

In both cases, the ERC and ETSI have the shared obligation to identify and make known those requirements which affect the efficient use of the radio frequency spectrum.

3.2 Initial co-ordination

Once the requirement for a new or modified standard has been identified by one of the parties concerned, one of the first issues to be addressed by the initiating party will be whether there is a need for the other party to start the preparation of a relevant deliverable:

- ERC should indicate to ETSI its wish to develop or review a Decision and that there is a need to develop or modify a standard;
- ETSI should indicate to ERC its wish to develop or review a standard and that there is a need to develop or review Decisions regarding the availability of spectrum or regarding the implementation of the standard into national regulations, if appropriate;
- Both parties should exchange the working assumptions for the new deliverable;
- Both parties should exchange information on the time plan for their activities.

The addressed party will respond to the initiating party, taking due account of the indicated time plan, with a liaison statement indicating an initial response to the given working assumptions and time plan.

If there is any disagreement on the working assumptions, further consultation shall be taken up as soon as possible.

The working assumptions should, as far as possible, contain information about intended use, potential market conditions and an outline of the technical solution. Such information is necessary both for the ERC to find suitable spectrum, and for ETSI to develop the work programme.

3.3 ERC activities

For the ERC it will be necessary, as an immediate following activity, to identify and/or to confirm the availability of spectrum. The ERC will also have to develop guidance on regulatory aspects and on the technical conditions for the proposed allocation. This will be summarised eventually in a detailed ERC-Liaison Statement, which will also form the basis for ERC regulatory outputs (such as ERC Decisions or Recommendations). This ERC-Liaison Statement will be drafted in close co-operation and co-ordination with the appropriate ETSI Committee(s).

In most cases it will not be possible to have an exclusive allocation for a new application, and sharing with other radio users will be necessary. Services and systems in adjacent bands will also need to be protected. This will require the ERC to specify a number of requirements, associated with the proposed allocation, designed to avoid interference. These need to be based on a number of assumptions on the choice of technology, and the present and/or future use of adjacent bands.

The guidelines will therefore probably require revision during the course of development of the standard. This again should be done through close co-operation between ETSI and the ERC. In practice this is likely to be achieved through a dialogue between the relevant ETSI Sub Technical Committee (STC) and the relevant ERC Working Group or its project team.

3.4 ETSI activities

ETSI will start its activities to develop a standard in accordance with its internal rules of procedure.

For equipment within the scope of Directive 91/263/EEC, ETSI will develop TBRs. The essential requirements of the Directive 91/263/EEC will be included. These requirements, as well as further regulatory provisions which need inclusion, will be adopted in accordance with Article 6 of Directive 91/263/EEC.

For equipment not within the scope of Directive 91/263/EEC, ETSI will develop an ETS in two separate parts (A and B) within the same document⁴. Part A will incorporate the requirements which are intended to be used for type approval purposes. If relevant, Part B will incorporate further technical specifications considered by ETSI as appertaining to a voluntary standard.

3.5 Subsequent co-ordination

In parallel with the development of a standard within ETSI, ERC will prepare a draft ERC Decision based on its Liaison Statement and comments received from ETSI. This will be sent to ETSI as soon as possible, but at least before ETSI starts its Public Enquiry procedure, to enable ETSI to express its views on the draft.

ETSI shall inform the ERC if, during the development of the standard, it comes to the conclusion that, in order to fulfil the objectives of the standard, it has to reconsider the working assumptions resulting from the initial co-ordination. Both parties shall in this case reconsider whether a renewed agreement can be obtained.

3.6 Final co-ordination

Once a draft standard or draft TBR comes into the ETSI "Public Enquiry" phase, ETSI will invite the ERC:

- either to consider whether it is willing to reconfirm its earlier conclusions regarding the adoption of a Decision, and therefore to adopt a Decision referencing the Part A of the standard concerned;
- or to comment on the draft TBR;

both cases being in accordance with ERC's responsibility.

Any such comments by the ERC will be considered by ETSI.

The relevant ETSI Technical Committee will decide via a "Resolution meeting" and a TC decision on the final contents of the standard, before bringing it to the formal ETSI voting procedure. In some cases, it might be necessary for ETSI to invite ERC as a separate entity to its resolution or TC meeting to resolve any difficulties.

For radio standards not within the scope of the Directive 91/263/EEC, the relevant ERC Decision will make reference to the ETS Part A, its application domain, any additional regulatory requirements, and a date for its introduction into national type approval regimes.

For radio terminal equipment standards within the scope of the Directive 91/263/EEC, once a standard has been adopted as a CTR, the ERC shall encourage the implementation of the standard in those CEPT countries that are not members of the EEA.

⁴ Alternatively in two or more separate ETSs, the first of which would correspond to Part A.

3.7 Other co-ordination mechanisms

Apart from the fact that all ERC members are also members of ETSI, the participation of an ETSI representative in the ERC and in the ERC Working Groups, especially the Working Group Spectrum Engineering (WGSE), when dealing with relevant matters, as well as direct participation of ETSI members in the work of the project teams of WGSE, should ensure that mutually acceptable solutions are found regarding the essential requirements.

Additionally, co-ordination should be achieved by nominating liaison representatives, which participate in the Working Groups of the ERC, and in ETSI.

4 Existing standards

ETSI may request ERC to adopt appropriate Decisions relating to standards adopted before the date of signing of this MoU and which are not within the scope of Directive 91/263/EEC.

5 Exchange of documents

The ETSI Secretariat shall circulate its Public Enquiry documents to the ERC's European Radiocommunication Office (ERO).

The ERC shall send its output documents, its publications and documentation for public consultation, to the ETSI Secretariat.

This exchange of documents shall be free of charge.

History

Document history	
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