

Review of Type Approval Technical Standards and Procedures

Part 1 Report – Technical Standards Version 2

Prepared for

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1 Introduction

1.1 General

This document is the draft Part 1 deliverable on project “Review of Type Approval Technical Standards and Procedures” being conducted by LS telcom for the Botswana Telecommunications Regulatory Authority (BOCRA).

2 Review of International Standards

Botswana does not exist in a vacuum and the telecommunications and radio equipment that is imported into, and used in, the country will arrive from other countries. Any technical standards for equipment in Botswana will therefore need to take account of the international arena in which such equipment is manufactured and sold.

The existing Botswana type approval standards largely follow standards used in the European Community (mainly from ETSI). We believe that this is wholly appropriate as:

- The European standards represent international practices as developed in many countries.
- The use of international standards ensures that the Botswana standards follow best international practice
- The use of international standards ensure maximum interoperability and affordability for covered equipment
- Botswana is in ITU Region 1, as is Europe
- The European standards cover different issues such as physical interoperability and physical interoperability in a layered approach where these issues are addressed separately
- The standard documents and related technical reports, are available free of charge (e.g. from the ETIS webpage)

While the European standards cover a wide range of Radio and Telecommunications equipment there are some technologies that might widely be used within Botswana that are not covered by these standards. Therefore international and regional bodies that produce and publish standards for type approval have been considered to identify appropriate standards. Major international standardization organisations include:

- The International Telecommunications Union (ITU)
- The International Standards Organisation (ISO)
- The European Telecommunications Standards Institute (ETSI)
- The International Electrotechnical Commission (IEC)
- The European Committee for Electrotechnical Standardisation (CENELEC)

Aside these international standardisation bodies there are regional bodies that produce regional and national standards that might be of relevance for Botswana. Organisations that have been investigated are:

- The African Organisation for Standardisation (ARSO)
- The Southern African Development Community Cooperation in Standardization (SADCSTAN)
- The Botswana Bureau of Standards (BOBS)

Finally there are specialized organisations that produce detailed technical standards for communication systems like for GSM, WiFi, or WiMax etc. Relevant organisations considered in this respect are:

- The 3G Partnership Project (3GPP)

- Institute of Electrical and Electronics Engineers (IEEE)

The following sections give a short overview on the investigated organisations and the outcome of the research, identified standards to complement the existing Botswana type approval standards are stated per document in section 4.

During the research, we also identified areas where international standards for radio and telecommunications equipment exist, but for which there is no counterpart standard in Botswana. These areas are further described in section 2.2.

2.1 Overview per Standardisation Organisation

2.1.1 International Telecommunications Union (ITU)

The International Telecommunication Union (ITU) is a specialized agency of the United Nations (UN) that is responsible for issues that concern information and communication technologies. Work of the ITU is done in three different sectors: The radiocommunication sector ITU-R, the telecommunication standardization sector ITU-T and the ITU Telecommunication Development Sector ITU-D.

The ITU Radiocommunication Sector (ITU-R) plays a vital role in the global management of the radio-frequency spectrum and satellite orbits. It publishes various ITU-R recommendations on spectrum use, which are adopted and considered in national and international standards.

The ITU-T develops international standards (ITU-T Recommendations) which act as defining elements in the global infrastructure of information and communication technologies (ICTs).

The following table lists exemplary some examples (for information only) of ITU Recommendations in the field of safety for telecommunication equipment:

Document Number	Document Title
ITU-R Rec. BS.1698	Evaluating fields from terrestrial broadcasting transmitting systems operating in any frequency band for assessing exposure to non-ionizing radiation
ITU-T Rec. K.52	Guidance on complying with limits for human exposure to electromagnetic fields
ITU-T Rec. K.61	Guidance to measurement and numerical prediction of electromagnetic fields for compliance with human exposure limits for telecommunication installations

Table 2-1: Examples for ITU-Documents in the field of Safety for Telecommunication Equipment

EMC and safety criteria relevant for the scope of type approval are sufficiently covered by other organisations like the European Standardisation bodies CEN, CENELEC and ETIS. We therefore do not recommend to add specific ITU-R recommendations in this field to the Botswana technical specifications.

However, there is a wide range of ITU-T Recommendations that telecommunication networks. Where relevant for the scope of specific products, relevant standards have been proposed for the corresponding documents (see section 4).

2.1.2 The International Standards Organisation (ISO)

The International Organization for Standardization (ISO) is an independent, non-governmental organization that develops voluntary international standards. ISO works in joint committees with the International Electrotechnical Commission (IEC) to develop standards in the areas of electrical, electronic and related technologies (See section 2.1.3).

There are also some more generic ISO standards that are dealing with conformity assessment and competence of testing and calibration laboratories:

Standard Number	Standard Title
ISO/IEC 17050-1:2004	Conformity assessment -- Supplier's declaration of conformity -- Part 1: General requirements
ISO/IEC 17050-2:2004	Conformity assessment -- Supplier's declaration of conformity -- Part 2: Supporting documentation
ISO/IEC 17025:2005	General requirements for the competence of testing and calibration laboratories

Table 2-2: General ISO/IEC standards on conformity assessment

BOCRA's type approval guidelines already make reference to ISO/IEC 17050 when defining the rules for the supplier's declaration of conformity. However the guidelines does not state whether testing laboratories need to work according to ISO/IEC 17025. Thus the inclusion of this standard to the guidelines could be considered.

2.1.3 The International Electrotechnical Commission (IEC)

The International Electrotechnical Commission (IEC) prepares and publishes International Standards for all electrical, electronic and related technologies. The IEC is one of three global sister organizations (IEC, ISO, ITU) that develop International Standards for the world.

Standards for controlling electromagnetic interference in electrical and electronic devices are produced by IEC's special committee CISPR (Comité International Spécial des Perturbations Radioélectriques / International Special Committee on Radio Interference).

CISPR Standards are divided into the following three categories:

- Basic Standards that give the general and fundamental conditions or rules for the assessment of EMC and related performance of all products, systems or installations, and serve as reference documents for CIS PR Generic and Product Standards.
- Generic Standards are standards related to a particular environment, which specify the minimum set of essential EMC requirements and test procedures, applicable to all the products or systems intended for operation in this environment, provided there do not exist any specific EMC Standards for a particular product family, product, system or installation. Limits are included, and reference is made to the test procedures.

- Product Standards Product Standards define specific EM requirements, test procedures and limits dedicated to particular products, systems or installations for which specific conditions must be considered.

CISPR/IEC Generic EMC Standards are listed in Table 2-3:

Standard Number	Standard Title
IEC 61000-6-1	Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
IEC 61000-6-2	Part 6-2: Generic standards - Immunity for industrial environments
IEC 61000-6-3	Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
IEC 61000-6-4	Part 6-4: Generic standards - Emission standard for industrial environments

Table 2-3: CISPR/IEC Generic EMC Standards

These standards are already included as reference in Document “TS0001 safety and EMC Requirements of Radio and Telecommunications Terminal Equipment” and thus need not to be added. The following table lists available CISPR product standards:

Standard Number	Standard Title
CISPR 11	Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement
CISPR 12	Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of off-board receivers
CISPR 13	Sound and television broadcast receivers and associated equipment - Radio disturbance characteristics - Limits and methods of measurement
CISPR 14-1	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
CISPR 14-2	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard
CISPR 15	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
CISPR 20	Sound and television broadcast receivers and associated equipment - Immunity characteristics - Limits and methods of measurement
CISPR 22	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
CISPR 24	Information technology equipment - Immunity characteristics - Limits and methods of measurement

CISPR 25	Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of on-board receivers
CISPR 32	EMC of multimedia equipment- emission requirements

Table 2-4: CISPR Product Standards

IEC cooperates with other Organisations like ISO or European Standardisation Bodies to ensure that International Standards fit together seamlessly and complement each other. These is for example the case for standards like CISPR 22 and it’s equivalent EN 50022 or the IEC 61000 series and their equivalent EN 61000 series.

Relevant CISPR product standards are in our opinion CISPR 13, CISPR 20, CISPR 22 and CISPR 24. Both CISPR 22 and CISPR 24 and their EN equivalents are already used in Botswana’s existing technical standards. CISPR 13 and CISPR 20 are of relevance for broadcast receivers and should be added to the corresponding product standards. As CISPR 12 and 22 are replaced by 2017 with CISPR 32 therefore it is recommended to add CISPR 32 to the regulations.

2.1.4 European Standardisation Bodies (CEN, CENELEC, ETSI)

There are three major standardisation Bodies that are officially recognised as a European standards body by the European Union:

- CEN, the European Committee for Standardization.
Specific CEN activities cover: Accessibility, air and Space, bio-based products, chemistry, construction, consumer products, energy and utilities, environment, food, health and safety, healthcare, heating, ventilation and air conditioning (HVAC), ICTs, innovation, machinery safety, materials, measurement, nanotechnologies, pressure equipment, security and defence, services, transport and packaging.
- CENELEC the European Committee for Electrotechnical Standardization
CENELEC fulfils within the Electrotechnical sector the same functions as CEN for other areas. Specific CEN activities cover: Accessibility, air and Space, bio-based products, chemistry, construction, consumer products, energy and utilities, environment, food, health and safety, healthcare, heating, ventilation and air conditioning (HVAC), ICTs, innovation, machinery safety, materials, measurement, nanotechnologies, pressure equipment, security and defence, services, transport and packaging.
- ETSI, the European Telecommunications Standards Institute
ETSI develops European and globally-applicable standards in the telecommunications field including fixed, mobile, radio, converged, broadcast and Internet technologies.

These standardization bodies produce harmonized European wide standards that are applicable to the member states of the European Union. With the introduction of the Radio Equipment and Telecommunications Terminal Equipment (R&TTE) Directive in April 2000 the way how type approval in member states of the European Union has been harmonized. With this directive a European Wide Type approval regime has been introduced where for all R&TTE equipment

harmonized European Norms are available. These standards incorporate, where applicable, additional European or international standards.

The research of these Standards resulted in a number of documents that we propose to incorporate into the existing technical documents. The proposed changes are given per technical document in Section 4.1. From the research done on EN standards we also identified a range of new technologies that we believe should be included to Botswana's type approval regime (see Sections 2.2 and 4.2.)

2.1.5 The 3G Partnership Project (3GPP)

The 3rd Generation Partnership Project (3GPP) develops detailed technical standards for cellular telecommunications network technologies, including radio access, the core transport network, and service capabilities. Standardization work currently covers the mobile network standards GSM (for which standardization activities have been transferred from ETSI to 3GPP), UMTS, LTE and LTE advanced.

For this seven standard development organizations (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC) are working together to produce the Reports and Specifications that define 3GPP technologies.

Relevant standards for type approval for GSM, UMTS and LTE systems are covered by the relevant European Harmonized Standards; relevant 3GPP standards are included by reference. Therefore no specific 3GPP standards have been identified that should be additionally be incorporated to the existing technical Standards.

2.1.6 Institute of Electrical and Electronics Engineers (IEEE)

The IEEE is a US based professional association. The IEEE publishes a wide range of technical literature in electrical engineering, computer science and electronics and develops international standards. Published Standards include well known radio systems like WiMax (which is based on standard series IEEE 802.16) and WLAN / WiFi (based on the IEEE 802.11 standard series).

Technical characteristics of these systems are incorporated to the relevant EN harmonized standards used in the current Botswana type approval regime. We therefore do not propose to incorporate IEEE standards directly to Botswana's technical documents.

2.1.7 The ARSO

The African Organization for Standardisation (ARSO) seeks to harmonize national and/or sub-regional standards as African Standards and issue necessary recommendations to member bodies for this purpose. It publishes a catalogue of harmonized African Standards (ARS) for goods and services of particular interest to Africa for application and use in individual African countries and the region as a whole.

From this catalogue two standards have been identified that could be of relevance for the Botswana type approval regime:

- ARS 249:1984(E), Safety requirements for mains operated electronic and related apparatus for house hold and similar general use + Amendment No. 2

This standard applies to the radio, amplifiers, motor-driven apparatus that is to be connected to the supply mains, either directly or indirectly, intended for domestic and similar general indoor use and not subject to dripping or splashing.

ARS 249:1984(E) is equivalent to Standard IEC 60065 ed.5.0 which is a withdrawn standard and has been replaced by IEC 60065:2014 “Audio, video and similar electronic apparatus - Safety requirements”. We therefore believe that ARS 249:1984 should not be included to the type approval requirements.

- ARS 250:1984(E), Recommended methods of measurement on receivers for television broadcast transmissions — Part 1: General considerations — Electrical measurements other than those at audio frequencies

This ARS describes standard conditions and methods of measurement on television receivers that conform to the terrestrial broadcast television standards specified by the ITU-R*. Such receivers may be used for direct off-air reception, reception via cabled networks or as a monitor for pre-recorded video, home movies and games among other applications.

ARS 250:1984(E) is equivalent to Standard IEC 60107-1 ed2.0 which has been withdrawn and was replaced by IEC 60107-1:1997. We therefore believe that ARS 249:1984 should not be included to the type approval requirements.

Aside these standards there are some standards specifying characteristics of electronic components like resistors, capacitors and cables that we believe are too detailed for type approval.

2.1.8 The SADCSTAN

The Southern African Development Community (SADC) is an inter-governmental organization headquartered in Gaborone, Botswana. Within SDC the SADCSTAN (SADC Cooperation in Standardization) promotes the coordination of standardization activities and services in the region, with the purpose of achieving harmonization of standards and technical regulations.

Standards processed by SADCSTAN are only available to SADCSTAN members; therefore the available standards could not be reviewed. However we believe that relevant harmonized SADCSTAN standards would have been adopted and published by the Botswana Bureau of Standards (BOBS) and thus be identified during the review of BOBS' standards.

2.1.9 The Botswana Bureau of Standards (BOBS)

The Botswana Bureau of Standards (BOBS) offers technical services in the areas of standardization, testing of goods, certification of products, industrial & trade metrology, quality management systems, environmental management systems, information and training.

During our research we identified one standard that could be of relevance for the type approval of receivers:

- BOS IEC 60065:2005 applies to receiving apparatus for sound or vision, amplifiers, load and source transducers, motor-driven apparatus (radio-gramophones, tape recorders and sound-film projectors, etc.) which are to be connected to the mains, directly or indirectly, and which are intended for domestic and similar indoor use

The standard is referring to international standard IEC 60065.

Aside this standard we identified some other BOBS standards specifying characteristics of electric cabling and grounding, however we believe that these have no relevance for the purpose of type approval.

2.1.10 ARIB

The Association of Radio Industries and Businesses (ARIB) is a standardization organization in Japan. Its activities include those previously performed by the Research and Development Center for Radio Systems (RCR) and Broadcasting Technology Association. ARIB is a participating standards organization of the Global Standards Collaboration initiative and an organizational partner of the 3rd Generation Partnership Project (3GPP).

ARIB standardizes the Integrated Services Digital Broadcasting (ISDB) which is also in use in Botswana. Relevant ARIB standards are:

Standard Number	Standard Title
ARIB STD – B21	Receiver for Digital Broadcasting
ARIB STD - B31	Transmission system for digital terrestrial television broadcasting

Table 2-5: ARIB standard documents for ISDB

2.2 Identified technologies

During the review of standards we identified areas where international standards for telecommunications equipment exist, but for which there is no counterpart type approval standard in Botswana. The following gives an overview on technologies that have been identified and could be of interest for Botswana. The relevant standards addressing these technologies are given in section 4.2:

- Medical Applications
- Ultra-Wide Band (UWB) applications
- Broadband wireless technologies
- On-site paging systems
- Long Term Evolution (LTE)
- Mobile WiMax
- Specific SRD Applications
- Meterological Aids
- Wireline Telecommunications Equipment
- New Broadcast Systems and standards are further discussed in Section 3.

In addition to this we also identified several systems / technologies for which we believe that these might not be relevant for Botswana. These are:

- Aviation systems and systems aboard aircraft as these are typically managed by the aviation authority (CAAB)
- Any maritime system due to the geographic Situation of Botswana
- BroadBand Disaster Relief applications (BBDR) (5 GHz)

-
- Base Stations (BS) and User Equipment (UE) for IMT-2000 / UWC 136 cellular network
 - Short Range Devices (SRD)-Automatic Vehicle Identification (AVI) for railways (2,45 GHz)
 - Short Range Devices (SRD)-Radio equipment for Eurobalise railway systems
 - Short Range Devices (SRD)-Radio equipment for Euroloop railway systems
 - Short Range Devices-Global Navigation Satellite Systems (GNSS) Repeaters
 - Satellite Earth Stations and Systems (SES)-tracking Earth Stations on Trains (ESTs) operating in the 14/12 GHz
 - White Space Devices (WSD)- Wireless Access Systems operating in the 470 MHz to 790 MHz
 - Intelligent Transport Systems (ITS) (5 855 MHz to 5 925 MHz, 63 GHz to 64 GHz)

3 Development of Broadcast Standards

3.1 Overview of broadcasting platforms

In many countries the terrestrial broadcasting platform is the primary means of delivering broadcasting services. It also has an important role in fulfilling the obligation of universal coverage.

Even in countries where cable, satellite or broadband hold a significant market share, terrestrial broadcasting is usually regarded, alongside these other platforms, as an essential, flexible and reliable way of delivering broadcasting content to a mass audience.

Terrestrial networks are optimized for the delivery of content such as radio, TV and supplementary data services, to very large audiences. Such networks are typically designed to achieve a specific coverage for the pre-defined quality of service and reception mode (e.g. roof-top fixed, mobile, portable indoor, handheld).

Terrestrial networks enable free-to-air reception or conditional access to services depending on the preference of the broadcasters. Service quality and delivery costs are independent of the actual number of simultaneous viewers or listeners.

Digital terrestrial television (DTT) in Botswana is based on the ISDB-T standard. Frequency arrangements and international agreements are harmonized while the networks themselves are implemented according to national specifications.

DTT networks facilitate the introduction of new and innovative services on the terrestrial platform (e.g. HDTV, mobile TV, data services) as well as offering the flexibility to meet specific coverage and service requirements (e.g. regional and local programming).

Whilst terrestrial radio is still largely based on analogue FM networks, digital radio services could become increasingly available based on say, the DAB family of standards. Other digital systems such as DRM/DRM+ are also candidates for delivering digital radio services.

Digital terrestrial reception is cost efficient for the public because many households are equipped with suitable receiving antennas. This reception infrastructure was built for analogue services but a portion of it can also be used for digital services. This facilitates the digital switch-over at a reasonable cost for the public whilst the costs of digital transmissions are lower compared to those of analogue for the broadcasters.

The terrestrial broadcasting platform represents a unique combination of characteristics such as technical excellence and efficiency, favourable coverage and support of services, flexibility, market success and wide acceptance by industry as well as by the public. Furthermore it provides intrinsic added value and stimulates a constant search for new opportunities. As a result the terrestrial broadcasting platform generates significant social and economic benefits.

The terrestrial platform is important for the broadcasting industry even in those markets that are dominated by other delivery platforms. It stimulates competition amongst the delivery

platforms but can also be complementary to other platforms. It is therefore in the interest of both the broadcasting industry and society as a whole that the terrestrial broadcasting platform remains attractive for viewers and listeners and a viable alternative to other delivery platforms.

The terrestrial broadcasting platform is widely supported by manufacturers, network operators, broadcasters, regulators and the public. For this support to continue, regulatory clarity and certainty are required as they enable broadcasters and the associated industry, not forgetting the public, to make the right investments into future technology and services.

Terrestrial broadcasting networks are optimized for the delivery of linear media services to large audiences and they will continue to be important in delivering these services in the future.

There is a potential for synergies between the terrestrial and other delivery platforms, and in particular broadband networks, since their combined use enables personalized on-demand and interactive media services that neither platform can realise individually. It is the combination of broadcasting and broadband networks that will enable broadcasters to offer the richest range of services

The standards recommended for broadcasting services are those agreed to with BOCRA in principle and will be the output of this task.

The following broadcast transmission standards were then investigated as agreed:

- FM Broadcasting & Ancillary Services (RDS)
- DAB Plus
- DRM
- ISDBT
- Radio HF/MF(AM)
- DVB-S2 Transmission
- DVB-S2 Receiver
- DVB-T2 Transmission
- DVB-T2 Receiver
- Analogue Television PAL(I)

The broadcast standards are generally based on ETSI documents and where these were not available for certain older technologies ETS, CCIR and UTI-R references were applied .

This principle of renumbering of ETSI and other standards locally in each country has become a norm especially in African countries.

4 Recommendations on Technical Standards

This section gives our recommendations on changes to existing BOCRA type approval documents and our proposals for new type approval standards in areas where international standards for telecommunications equipment exist, but for which there is no counterpart type approval standard in Botswana.

This section also lists the recommendations for the new broadcasting standards as per the technologies agreed to by BOCRA.

The subsections are organized as following:

- Section 4.1 gives information on proposed changes on existing standard documents. Proposed changes cover both the addition of new references to international standards as well as the deletion of cited standards that have been withdrawn or superseded by more recent standards. The tables included to Section 4.1 however do not list changes where we only propose to update or add a version number to references that have already been included in the existing documents.
- Section 4.2 lists technologies that we propose to include into new standard documents. The Sections gives in addition the international standards that should be incorporated to these documents.
- Section 4.3 lists the recommended broadcasting standards to be considered for adoption by BOCRA.

4.1 Modification of Existing Equipment Standard

4.1.1 TS0001 safety and EMC Requirements of Radio and Telecommunications Terminal Equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 62479 or IEC 62479	Assessment of the compliance of low power electronic and electrical apparatus equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz - 300 GHz)
ETSI EN 301 489-1 V1.9.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
EN 55013 or CISPR 13 (until 5.03.2017)	Sound and television broadcast receivers and associated equipment - Radio disturbance characteristics - Limits and methods of measurement
EN 55032 or CISPR 32 (after 5.03.2017)	EMC of multimedia equipment- emission requirements
EN 55020 or CISPR 20	Sound and television broadcast receivers and associated equipment - Immunity characteristics - Limits and methods of measurement
EN 50385	Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields
EN 62311 or IEC 62311	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

Table 4-1: Standards to add to document TS0001

The following standards are outdated; therefore we propose to delete them from the document:

Standard Number	Standard Title
EN 50371	Generic standard to demonstrate the compliance of low power electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (10 MHz - 300 GHz) - General public

Table 4-2: Standards to delete from document TS0001

4.1.2 TS0002 GSM HANDSETS, TERMINALS AND ANCILLARY EQUIPMENT

Aside updates of version numbers for included standards no further changes are proposed for this standard document

4.1.3 TS0003 GSM Base Station and ancillary equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 300 609-4-V10.2.1	Global System for Mobile communications (GSM); Part 4: Harmonized EN for GSM Repeaters covering the essential requirements of article 3.2 of the R&TTE Directive
EN 301 489-50-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 50: Specific conditions for Cellular Communication Base Station (BS), repeater and ancillary equipment
EN 301 908-18-V7.1.2	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 18: E-UTRA, UTRA and GSM/EDGE Multi- Standard Radio (MSR) Base Station (BS)

Table 4-3: Standards to add to document TS0003

The following standards are outdated; therefore we propose to delete them from the document:

Standard Number	Standard Title
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ETSI EN 300 342	Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC)Global System for European digital cellular telecommunications systemMobile communications (GSM 900 MHz and DCS 1 800 MHz); Part 2: Base station radio and ancillary equipment
ETS 300 342-3	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) for European cellular telecommunications system (GSM 900 MHz and DCS 1 800 MHz); Part 3: Base station radio and ancillary equipment and repeaters meeting Phase 2 GSM requirements

Table 4-4: Standards to delete from document TS0003

4.1.4 TS0004 Analogue PMR Handsets and ancillary equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 300 296-1-V1.4.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech; Part 1: Technical characteristics and methods of measurement
EN 300 296-2-V1.4.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 301 166-1-V1.3.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment for analogue and/or digital communication (speech and/or data) and operating on narrow band channels and having an antenna connector; Part 1: Technical characteristics and methods of measurement
EN 301 166-2-V1.2.3	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment for analogue and/or digital communication (speech and/or data) and operating on narrow band channels and having an antenna connector; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
EN 302 561-V1.3.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment using constant or non-constant envelope modulation operating in a channel bandwidth of 25 kHz, 50 kHz, 100 kHz or 150 kHz; Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
EN 303 039-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Multichannel transmitter specification for the PMR Service; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

Table 4-5: Standards to add to document TS0004

The content of the following documents is covered by the above listed documents; therefore we propose to delete them from the document:

Standard Number	Standard Title
ETS 300 296	Radio Equipment and Systems (RES); Land mobile service Technical characteristics and test conditions for radio equipment using integral antennas intended primarily for analogue speech
ETS 300 339	Electromagnetic compatibility and Radio spectrum Matters (ERM); General Electromagnetic Compatibility (EMC) for radio communications equipment

Table 4-6: Standards to delete from document TS0004

4.1.5 TS0005 Analogue PMR Base Stations and ancillary equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 301 489-16-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 16: Specific conditions for analogue cellular radio communications equipment, mobile and portable

Table 4-7: Standards to add to document TS0005

The following standards are outdated; therefore we propose to delete them from the document:

Standard Number	Standard Title
ETS 300 339	Electromagnetic compatibility and Radio spectrum Matters (ERM); General Electromagnetic Compatibility (EMC) for radio communications equipment

Table 4-8: Standards to delete from document TS0005

4.1.6 TS0006 TETRA Handsets and ancillary equipment

Aside updates of version numbers for included standards no further changes are proposed for this standard document

4.1.7 TS0007 TETRA Base Stations and ancillary equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 301 489-50-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 50: Specific conditions for Cellular Communication Base Station (BS), repeater and ancillary equipment

Table 4-9: Standards to add to document TS0007

4.1.8 TS0008 Citizens' Band Radio and ancillary equipment

Aside updates of version numbers for included standards no further changes are proposed for this standard document

4.1.9 TS0009 Amateur Radio and ancillary equipment

Aside updates of version numbers for included standards no further changes are proposed for this standard document

4.1.10 TS0010 V-SAT and ancillary equipment

Aside updates of version numbers for included standards no further changes are proposed for this standard document

4.1.11 TS0011 Mobile Earth Stations (MES), Satellite News Gathering (SNG) and ancillary equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 301 426-V1.2.1	Satellite Earth Stations and Systems (SES); Harmonized EN for Low data rate Land Mobile satellite Earth Stations (LMES) and Maritime Mobile satellite Earth Stations (MMES) not intended for distress and safety communications operating in the 1,5/1,6 GHz frequency bands covering essential requirements under article 3.2 of the R&TTE Directive
EN 301 427-V1.2.1	Satellite Earth Stations and Systems (SES); Harmonized EN for Low data rate Mobile satellite Earth Stations (MESs) except aeronautical mobile satellite earth stations, operating in the 11/12/14 GHz frequency bands covering essential requirements under article 3.2 of the R&TTE directive
EN 301 441-V1.1.1	Satellite Earth Stations and Systems (SES); Harmonized EN for Mobile Earth Stations (MESs), including handheld earth stations, for Satellite Personal Communications Networks (S-PCN) in the 1,6/2,4 GHz bands under the Mobile Satellite Service (MSS) covering essential requirements under Article 3.2 of the R&TTE directive
EN 301 442-V1.2.1	Satellite Earth Stations and Systems (SES); Harmonized EN for Mobile Earth Stations (MESs), including handheld earth stations, for Satellite Personal Communications Networks (S-PCN) in the 2,0 GHz bands under the Mobile Satellite Service (MSS) covering essential requirements under article 3.2 of the R&TTE directive
EN 301 444-V1.2.2	Satellite Earth Stations and Systems (SES); Harmonized EN for Land Mobile Earth Stations (LMES) operating in the 1,5 GHz and 1,6 GHz bands providing voice and/or data communications covering essential requirements of article 3.2 of the R&TTE directive
EN 301 489-19-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communication
EN 301 681-V1.4.1	Satellite Earth Stations and Systems (SES); Harmonized EN for Mobile Earth Stations (MESs) of Geostationary mobile satellite

	systems, including handheld earth stations, for Satellite Personal Communications Networks (S-PCN) in the 1,5/1,6 GHz bands under the Mobile Satellite Service (MSS) covering the essential requirements of article 3.2 of the R&TTE Directive
EN 301 721-V1.2.1	Satellite Earth Stations and Systems (SES); Harmonized EN for Mobile Earth Stations (MES) providing Low Bit Rate Data Communications (LBRDC) using Low Earth Orbiting (LEO) satellites operating below 1 GHz covering essential requirements under Article 3.2 of the R&TTE Directive
EN 302 574-1-V1.1.1	Satellite Earth Stations and Systems (SES); Harmonized Standard for satellite earth stations for MSS operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands; Part 1: Complementary Ground Component (CGC) for wideband systems: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 574-2-V1.1.1	Satellite Earth Stations and Systems (SES); Harmonized Standard for satellite earth stations for MSS operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands; Part 2: User Equipment (UE) for wideband systems: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 574-3-V1.1.1	Satellite Earth Stations and Systems (SES); Harmonized Standard for satellite earth stations for MSS operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands; Part 3: User Equipment (UE) for narrowband systems: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 977-V1.1.2	Satellite Earth Stations and Systems (SES); Harmonized EN for Vehicle-Mounted Earth Stations (VMES) operating in the 14/12 GHz frequency bands covering the essential requirements of article 3.2 of the R&TTE directive
EN 303 978-V1.1.2	Satellite Earth Stations and Systems (SES); Harmonized EN for Earth Stations on Mobile Platforms (ESOMP) transmitting towards satellites in geostationary orbit in the 27,5 GHz to 30,0 GHz frequency bands covering the essential requirements of article 3.2 of the R&TTE Directive

Table 4-10: Standards to add to document TS0011

4.1.12 TS0012 Fixed Earth Stations and ancillary equipment

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.13 TS0013 Radio MF (AM) Broadcast and ancillary equipment

We propose to replace this standard by a new standard TS 0100.

4.1.14 TS0014 Radio VHF (FM) Broadcast and Ancillary Equipment documents

We propose to replace this standard by a new Sstandard TS 0101.

4.1.15 TS0015 Radio Fixed Links

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 302 217-1-V2.1.1	Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 1: Overview and system-independent common characteristics
EN 302 217-2-2-V2.2.1	Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2-2: Digital systems operating in frequency bands where frequency coordination is applied; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 217-3-V2.2.1	Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 3: Equipment operating in frequency bands where both frequency coordinated or uncoordinated deployment might be applied; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 217-4-2-V1.5.1	Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 4-2: Antennas; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 326-1-V1.2.2	Fixed Radio Systems; Multipoint Equipment and Antennas; Part 1:

	Overview and Requirements for Digital Multipoint Radio Systems
EN 302 326-2-V1.2.2	Fixed Radio Systems; Multipoint Equipment and Antennas; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for Digital Multipoint Radio Equipment
EN 302 326-3-V1.3.1	Fixed Radio Systems; Multipoint Equipment and Antennas; Part 3: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for Multipoint Radio Antennas

Table 4-11: Standards to add to document TS0015

The following standards are outdated; therefore we propose to delete them from the document:

Standard Number	Standard Title
EN 301 751	Fixed Radio Systems; Point-to-Point equipment and antennas; Generic harmonized standard for Point-to-Point digital fixed radio systems and antennas covering the essential requirements under article 3.2 of the 1999/5/EC Directive
EN 301 753	Fixed Radio Systems; Multipoint equipment and antennas; Generic harmonized standard for multipoint digital fixed radio systems and antennas covering the essential requirements under article 3.2 of the Directive 1999/5/EC

Table 4-12: Standards to delete from document TS0015

4.1.16 TS0016 DECT Cordless Telephone Handsets and ancillary equipment

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.17 TS0017 DECT Base Stations and ancillary equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 301 908-10-V4.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 10: Harmonized EN for IMT-2000, FDMA/TDMA (DECT) covering essential requirements of article 3.2 of the R&TTE Directive

Table 4-13: Standards to add to document TS0017

4.1.18 TS0018 Radio Microphones/In-Ear Monitoring and ancillary equipment

The following standards are outdated; therefore we propose to delete them from the document:

Standard Number	Standard Title
EN 301 840-2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Digital radio microphones operating in the CEPT Harmonized band 1 785 MHz to 1 800 MHz; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive

Table 4-14: Standards to delete from document TS0018

4.1.19 TS0019 WiFi/RLAN/Bluetooth 2.4 GHz and ancillary equipment

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.20 TS0020 HIPERLAN 5.2 – 5.8 GHz and ancillary equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 302 502-V1.2.1	Broadband Radio Access Networks (BRAN); 5,8 GHz fixed broadband data transmitting systems; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

Table 4-15: Standards to add to document TS0020

4.1.21 TS0021 Ground and Airborne Model Control Equipment

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.22 TS0022 UMTS Base Stations and related equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 301 489-50-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 50: Specific conditions for Cellular Communication Base Station (BS), repeater and ancillary equipment
EN 301 908-18-V7.1.2	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 18: E-UTRA, UTRA and GSM/EDGE Multi- Standard Radio (MSR) Base Station (BS)
EN 301 908-1-V6.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Introduction and common requirements

Table 4-16: Standards to add to document TS0022

4.1.23 TS0023 UMTS Handsets and related equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 301 908-1-V6.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Introduction and common requirements

Table 4-17: Standards to add to document TS0023

4.1.24 TS0024 Equipment Connecting to the Analogue PSTN

We propose to add the following standards to the document:

Standard Number	Standard Title
ETSI TBR 038 ed.1 (1998-05)	Public Switched Telephone Network (PSTN); Attachment requirements for a terminal equipment incorporating an analogue handset function capable of supporting the justified case service when connected to the analogue interface of the PSTN in Europe
ETSI ES 201 235-3 V1.3.1 (2006-03)	Access and Terminals (AT); Specification of Dual-Tone Multi-Frequency (DTMF) Transmitters and Receivers; Part 3: Receivers
ETSI ES 201 912 V1.2.1 (2004-08)	Access and Terminals (AT); Short Message Service (SMS) for PSTN/ISDN; Short Message Communication between a fixed network Short Message Terminal Equipment and a Short Message Service Centre
ETSI TS 103 912 V1.3.1 (2003-12)	Access and Terminals (AT); Short Message Service (SMS) for PSTN/ISDN; Short Message Communication between a fixed network Short Message Terminal Equipment and a Short Message Service Centre (Corrections to ES 201 912 V1.1.1)
ETSI EN 300 659-2 V1.3.1 (2001-01)	Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 2: Off-hook data transmission
ETSI ES 200 778-2 V1.2.2 (2002-11)	Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Protocol over the local loop for display and related services; Terminal equipment requirements; Part 2: Off-hook data transmission

Table 4-18: Standards to add to document TS0024

4.1.25 TS0025 Equipment Connecting to ADSL Services

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.26 TS0026 Equipment Connecting to ADSL Services

We propose to extend to a unique standard covering all types of DSL services (xDSL). Therefore we propose merge this document with TS0034 and rename the document to “Equipment Connecting to xDSL Services”.

For this we propose to add the following standards to the document:

Standard Number	Standard Title
ETSI TS 101 135 V1.5.3 (2000-09)	Transmission and Multiplexing (TM); High bit-rate Digital Subscriber Line (HDSL) transmission systems on metallic local lines; HDSL core specification and applications for combined ISDN-BA and 2 048 kbit/s transmission
ETR 152 ed.3	Transmission and Multiplexing (TM); High bit rate Digital Subscriber Line (HDSL) transmission system on metallic local lines; HDSL core specification and applications for 2 048 kbit/s based access digital section

Table 4-19: Standards to add to document TS0026

4.1.27 TS0027 Equipment Connecting to 2.048 Mb/s Digital Leased Line Services

We propose to add the following standards to the document:

Standard Number	Standard Title
ETSI EN 300 420 V1.2.1 (2001-07)	Access and Terminals (AT); 2 048 kbit/s digital structured leased lines (D2048S); Terminal equipment interface

Table 4-20: Standards to add to document TS0027

4.1.28 TS0028 Equipment Connecting to 34 Mb/s Digital Leased Line Services

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.29 TS0029 Equipment Connecting to Co-directional G.703 Digital Leased Line Services

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.30 TS0030 Equipment Connecting to X.25 Packet Switched Networks

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.31 TS0031 Equipment Connecting to High Speed Serial Interfaces (HSSI)

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.32 TS0032 Equipment Connecting to 64Kbit/s Services

We propose to add the following standards to the document:

Standard Number	Standard Title
ITU-T REC. H.244	H.244 : Synchronized aggregation of multiple 64 or 56 kbit/s channels
ITU-T REC H.323	H.323 : Packet-based multimedia communications systems

Table 4-21: Standards to add to document TS0032

4.1.33 TS0033 Equipment Connecting to X.21 Services

We propose to add the following standards to the document:

Standard Number	Standard Title
ETSI ETS 300 103 ed.1 (1990-12)	Integrated Services Digital Network (ISDN); Support of CCITT Recommendation X.21, X.21 bis and X.20 bis based Data Terminal Equipment (DTEs) by an ISDN Synchronous and asynchronous terminal adaptation functions

Table 4-22: Standards to add to document TS0033

4.1.34 TS0034 Equipment Connecting to HDSL Services

We propose to merge this standard with TS0026 and delete document TS0034.

4.1.35 TS0035 Equipment Connecting to X.25 Packet Switched Networks

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.36 TS0036 Equipment Connecting to X.25 Packet Switched Networks

Aside updates of version numbers for included standards no further changes are proposed for this standard document.

4.1.37 TS0037 Equipment Connecting to Primary Rate ISDN Services

We propose to add the following standards to the document:

Standard Number	Standard Title
ETSI ETR 080 ed.2 (1996-11)	Transmission and Multiplexing (TM); Integrated Services Digital Network (ISDN) basic rate access; Digital transmission system on metallic local lines

Table 4-23: Standards to add to document TS0037

4.1.38 TS0038 Short Range Radio and related equipment

We propose to delete the following standards from the document:

Standard Number	Standard Title
ETS 300 296	Radio Equipment and Systems (RES); Land mobile service Technical characteristics and test conditions for radio equipment using integral antennas intended primarily for analogue speech

Table 4-24: Standards to delete from document TS0038

4.1.39 TS0039 Cordless Telephone (Analogue) Handsets and related equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
ETSI EN 300 220-2 V2.4.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW; Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
ETSI EN 300 220-3 V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW; Part 3: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

Table 4-25: Standards to delete from document TS0039

4.1.40 TS0040 Cordless Telephone (Analogue) Base Stations and related equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
ETSI EN 300 220-2 V2.4.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW; Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
ETSI EN 300 220-3 V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW; Part 3: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

Table 4-26: Standards to add to document TS0040

4.1.41 TS0041 Radio Detection of Movement Applications and related equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
ETSI EN 300 440-2 V1.4.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

Table 4-27: Standards to add to document TS0041

4.1.42 TS0042 Road Transport Telematics and related equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 302 264-1-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Short Range Radar equipment operating in the 77 GHz to 81 GHz band; Part 1: Technical requirements and methods of measurement
EN 302 264-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Short Range Radar equipment operating in the 77 GHz to 81 GHz band; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 288-1-V1.6.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Short range radar equipment operating in the 24 GHz range; Part 1: Technical requirements and methods of measurement
EN 302 288-2-V1.6.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Short range radar equipment operating in the 24 GHz range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 858-1-V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Automotive radar equipment operating in the 24,05 GHz up to 24,25 GHz or 24,50 GHz frequency range; Part 1: Technical characteristics and test methods
EN 302 858-2-V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Short range radar equipment operating in the 24,05 GHz up to 24,25 or 24,50 GHz frequency range for automotive application; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

Table 4-28: Standards to add to document TS0042

4.1.43 TS0043 Inductive Applications and related equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 302 291-1-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Close Range Inductive Data Communication equipment operating at 13,56 MHz; Part 1: Technical characteristics and test methods
EN 302 291-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Close Range Inductive Data Communication equipment operating at 13,56 MHz; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive

Table 4-29: Standards to add to document TS0043

4.1.44 TS0044 Non-Specific Short Range Devices and related equipment

We propose to add the following standards to the document:

Standard Number	Standard Title
EN 302 536-1-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 315 kHz to 600 kHz; Part 1: Technical characteristics and test methods
EN 302 536-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 315 kHz to 600 kHz; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
EN 305 550-1-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 40 GHz to 246 GHz frequency range; Part 1: Technical characteristics and test methods
EN 305 550-2-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 40 GHz to 246 GHz frequency range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

Table 4-30: Standards to add to document TS0044

4.2 New Equipment Standards

4.2.1 TS0048 Medical Applications

We propose to add a new TS document TS0048 dealing with the radio spectrum matters for the following Medical Application Equipment:

- Low Power Active Medical Implants (LP-AMI) (2 483,5 MHz to 2 500 MHz)
- Medical Body Area Network Systems (MBANSs) (2 483,5 MHz to 2 500 MHz)
- Medical Data Service Devices (MEDS) (401 MHz to 402 MHz and 405 MHz)
- Radiosondes with power levels ranging up to 200 mW (400,15 MHz to 406 MHz)
- Radiosondes (1 668,4 MHz to 1 690 MHz)
- Ultra-Low Power Active Medical Implants (ULP- AMI) and accessories (9 kHz to 315 kHz)
- Ultra-Low Power Active Medical Implants (ULP-AMI) and related peripheral devices (ULP-AMI-P) (9 kHz to 315 kHz)
- Ultra-Low Power Active Medical Implants (ULP-AMI) and Peripherals (ULP-AMI-P) (402 MHz to 405 MHz)
- Ultra-Low Power Active Medical Membrane Implants and Accessories (30 MHz to 37,5 MHz)
- Ultra-Low Power Medical Data Service Systems (401 MHz to 402 MHz and 405 MHz to 406 MHz)

The following standards should be added to this TS:

Standard Number	Standard Title
EN 301 489-27-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 27: Specific conditions for Ultra Low Power Active Medical Implants (ULP-AMI) and related peripheral devices (ULP-AMI-P)
EN 301 489-29-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 29: Specific conditions for Medical Data Service Devices (MEDS) operating in the 401 MHz to 402 MHz and 405 MHz to 406 MHz bands
EN 301 489-31-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 31: Specific conditions for equipment in the 9 kHz to 315 kHz band for Ultra Low Power Active Medical Implants (ULP-AMI) and related peripheral devices (ULP-AMI-P)

EN 301 489-35-V1.1.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 35: Specific requirements for Low Power Active Medical Implants (LP-AMI) operating in the 2 483,5 MHz to 2 500 MHz bands
EN 301 559-1-V1.1.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Low Power Active Medical Implants (LP-AMI) operating in the frequency range 2 483,5 MHz to 2 500 MHz; Part 1: Technical characteristics and test methods
EN 301 559-2-V1.1.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Low Power Active Medical Implants (LP-AMI) operating in the frequency range 2 483,5 MHz to 2 500 MHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 301 839-1-V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ultra Low Power Active Medical Implants (ULP-AMI) and Peripherals (ULP-AMI-P) operating in the frequency range 402 MHz to 405 MHz; Part 1: Technical characteristics and test methods
EN 301 839-2-V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ultra Low Power Active Medical Implants (ULP-AMI) and Peripherals (ULP-AMI-P) operating in the frequency range 402 MHz to 405 MHz; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
EN 302 195-1-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 9 kHz to 315 kHz for Ultra Low Power Active Medical Implants (ULP-AMI) and accessories; Part 1: Technical characteristics and test methods
EN 302 195-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 9 kHz to 315 kHz for Ultra Low Power Active Medical Implants (ULP-AMI) and accessories; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
EN 302 510-1-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 30 MHz to 37,5 MHz for Ultra Low Power Active Medical Membrane Implants and Accessories; Part 1: Technical characteristics and test methods

EN 302 510-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 30 MHz to 37,5 MHz for Ultra Low Power Active Medical Membrane Implants and Accessories; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directiv
EN 302 537-1-V1.1.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ultra Low Power Medical Data Service Systems operating in the frequency range 401 MHz to 402 MHz and 405 MHz to 406 MHz; Part 1: Technical characteristics and test methods
EN 302 537-2-V1.1.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ultra Low Power Medical Data Service Systems operating in the frequency range 401 MHz to 402 MHz and 405 MHz to 406 MHz; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
EN 303 203-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Medical Body Area Network Systems (MBANSs) operating in the 2 483,5 MHz to 2 500 MHz range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

Table 4-31: Standards to add to Medical Applications Equipment

4.2.2 TS0051 Ultra-Wide Band (UWB) applications

We propose to add type approval standards covering the following UWB applications:

- Non-specific SRD using Ultra Wide Band technology (UWB)
- UWB location tracking
- UWB devices for road and rail vehicles
- UWB for communications purposes
- Building Material Analysis and Classification equipment applications (2,2 GHz to 8,5 GHz)
- Object Discrimination and Characterization Applications for power tool devices (2,2 GHz to 8,5 GHz)

The following standards could be either included to a separate TS dealing with UWB or merged with short range devices to a generic short range device document:

Standard Number	Standard Title
EN 301 489-33-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 33: Specific conditions for Ultra Wide Band (UWB) communications devices
EN 302 065-1-V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Requirements for Generic UWB applications
EN 302 065-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 2: Requirements for UWB location tracking
EN 302 065-3-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 3: Requirements for UWB devices for road and rail vehicles

EN 302 065-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band technology (UWB) for communications purposes; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 435-1-V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Technical characteristics for SRD equipment using Ultra WideBand technology (UWB); Building Material Analysis and Classification equipment applications operating in the frequency band from 2,2 GHz to 8,5 GHz; Part 1: Technical characteristics and test methods
EN 302 435-2-V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Technical characteristics for SRD equipment using Ultra WideBand technology (UWB); Building Material Analysis and Classification equipment applications operating in the frequency band from 2,2 GHz to 8,5 GHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 498-1-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Technical characteristics for SRD equipment using Ultra WideBand technology (UWB); Object Discrimination and Characterization Applications for power tool devices operating in the frequency band from 2,2 GHz to 8,5 GHz; Part 1: Technical characteristics and test methods
EN 302 498-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Technical characteristics for SRD equipment using Ultra WideBand technology (UWB); Object Discrimination and Characterization Applications for power tool devices operating in the frequency band from 2,2 GHz to 8,5 GHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 500-1-V2.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra WideBand (UWB) technology; Location Tracking equipment operating in the frequency range from 6 GHz to 9 GHz; Part 1: Technical characteristics and methods of measurement
EN 302 500-2-V2.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra WideBand (UWB) technology; Location Tracking equipment operating in the frequency range from 6 GHz to 9 GHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE

	Directive
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Table 4-32: Standards to add to UWB Application

4.2.3 Broadband wireless technologies (TS0045, TS0052, TS0055)

We propose to define TS to cover the following broadband wireless applications:

- Broadband wireless Access Systems (3 400 MHz to 3 800 MHz)
- Fixed broadband Radio Access Networks (BRAN) (5,8 GHz)
- Multiple-Gigabit WAS/RLAN Systems (60 GHz)
- Wireless Video Links (WVL) (1,3 GHz to 50 GHz); Wideband audio links

4.2.3.1 TS0045 BWA, BRAN and WAS/RLAN systems

We propose to add the following standards to a new document covering BWA, BRAN and WAS/RLAN systems:

Standard Number	Standard Title
EN 302 623-V1.1.1	Broadband Wireless Access Systems (BWA) in the 3 400 MHz to 3 800 MHz frequency band; Mobile Terminal Stations; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 774-V1.2.1	Broadband Wireless Access Systems (BWA) in the 3 400 MHz to 3 800 MHz frequency band; Base Stations; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 502-V1.2.1	Broadband Radio Access Networks (BRAN); 5,8 GHz fixed broadband data transmitting systems; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 567-V1.2.1	Broadband Radio Access Networks (BRAN); 60 GHz Multiple-Gigabit WAS/RLAN Systems; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

Table 4-33: Standards to add to BRAN

4.2.3.2 TS0055 Wireless Video Link:

We propose to add the following standards to a new TS covering wireless video links:

Standard Number	Standard Title
EN 301 489-28-V1.1.1	Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment

	and services; Part 28: Specific conditions for wireless digital video links
EN 302 064-1-V1.1.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless Video Links (WVL) operating in the 1,3 GHz to 50 GHz frequency band; Part 1: Technical characteristics and methods of measurement
EN 302 064-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless Video Links (WVL) operating in the 1,3 GHz to 50 GHz frequency band; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive

Table 4-34: Standards to add to Wireless Video Link

4.2.3.3 *TS0052 Wideband audio*

We propose to add the following standards to a new TS covering Wideband Audio:

Standard Number	Standard Title
EN 300 454-1-V1.1.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband audio links; Part 1: Technical characteristics and test methods
EN 300 454-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wide band audio links; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive

Table 4-35: Standards to add to Wideband Audio

4.2.4 TS0050 On Site paging systems

We propose to prepare a new TS for onsite paging systems covering the following standards:

Standard Number	Standard Title
EN 300 224-1-V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); On-site paging service; Part 1: Technical and functional characteristics, including test methods
EN 300 224-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); On-site paging service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive
EN 301 489-2-V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 2: Specific conditions for radio paging equipment

Table 4-36: Standards to add to Site Paging

4.2.5 TS0046/47 Long Term Evolution (LTE)

We propose to prepare two new TS for LTE; one covering LTE base stations, one covering LTE user equipment.

We propose to add the following standards to the LTE base station document:

Standard Number	Standard Title
EN 301 489-1-V1.9.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
EN 301 489-23-V1.5.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 23: Specific conditions for IMT-2000 CDMA, Direct Spread (UTRA and E-UTRA) Base Station (BS) radio, repeater and ancillary equipment
EN 301 489-50-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 50: Specific conditions for Cellular Communication Base Station (BS), repeater and ancillary equipment

EN 301 908-14-V6.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 14: Evolved Universal Terrestrial Radio Access (E-UTRA) Base Stations (BS)
EN 301 908-15-V5.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 15: Evolved Universal Terrestrial Radio Access (E-UTRA FDD) (Repeaters)
EN 301 908-18-V7.1.2	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 18: E-UTRA, UTRA and GSM/EDGE Multi- Standard Radio (MSR) Base Station (BS)
EN 301 908-1-V6.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Introduction and common requirements

Table 4-37: Standards to add to LTE Base Station

We propose to add the following standards to the document for LTE user equipment:

Standard Number	Standard Title
EN 301 489-1-V1.9.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
EN 301 489-24-V1.5.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 24: Specific conditions for IMT-2000 CDMA Direct Spread (UTRA and E-UTRA) for Mobile and portable (UE) radio and ancillary equipment
EN 301 908-13-V6.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)
EN 301 908-1-V6.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Introduction and common requirements

Table 4-38: Standards to add to LTE User Equipment

4.2.6 TS0053/54 Mobile WiMax

We propose to prepare two new TS for mobile WiMax; one covering WiMax base stations, one covering WiMax user equipment.

We propose to add the following standards to the WiMax base station document:

Standard Number	Standard Title
EN 301 908-20-V6.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 20: OFDMA TDD WMAN (Mobile WiMAX) TDD Base Stations (BS)
EN 301 908-22-V5.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 22: OFDMA TDD WMAN (Mobile WiMAX) FDD Base Stations (BS)

Table 4-39: Standards to add to WiMax Base Station

We propose to add the following standards to the document for WiMax user Equipment:

Standard Number	Standard Title
EN 301 908-19-V6.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 19: OFDMA TDD WMAN (Mobile WiMAX) TDD User Equipment (UE)
EN 301 908-21-V5.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 21: OFDMA TDD WMAN (Mobile WiMAX) FDD User Equipment (UE)

Table 4-40: Standards to add to WiMax User Equipment

4.2.7 TS0056 Specific SRD Applications

We propose to add standards for the following specific SRD applications:

- Ground- and Wall- Probing Radar applications (GPR/WPR) imaging systems
- Radio Frequency Identification Equipment (865 MHz to 868 MHz)
- Tanks Level Probing Radar (TLPR) (5,8 GHz, 10 GHz, 25 GHz, 61 GHz and 77 GHz)
- Level Probing Radar (LPR) equipment (6 GHz to 8,5 GHz, 24,05 GHz to 26,5 GHz, 57 GHz to 64 GHz, 75 GHz to 85 GHz)

The following standards could be either included to a separate TS dealing with specific SRD Applications or merged with the existing short range devices document to a generic short range device document:

Standard Number	Standard Title
EN 301 489-32-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 32: Specific conditions for Ground and Wall Probing Radar applications
EN 302 066-1-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Ground- and Wall- Probing Radar applications (GPR/WPR) imaging systems; Part 1: Technical characteristics and test methods
EN 302 066-2-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Ground- and Wall- Probing Radar applications (GPR/WPR) imaging systems; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
EN 302 208-2-V1.4.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 208-2-V2.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W; Part 1: Technical requirements and methods of measurement
EN 302 372-1-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Equipment for Detection and

	Movement; Tanks Level Probing Radar (TLPR) operating in the frequency bands 5,8 GHz, 10 GHz, 25 GHz, 61 GHz and 77 GHz; Part 1: Technical characteristics and test methods
EN 302 372-2-V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Equipment for Detection and Movement; Tanks Level Probing Radar (TLPR) operating in the frequency bands 5,8 GHz, 10 GHz, 25 GHz, 61 GHz and 77 GHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 302 729-1-V1.1.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Level Probing Radar (LPR) equipment operating in the frequency ranges 6 GHz to 8,5 GHz, 24,05 GHz to 26,5 GHz, 57 GHz to 64 GHz, 75 GHz to 85 GHz; Part 1: Technical characteristics and test methods
EN 302 729-2-V1.1.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Level Probing Radar (LPR) equipment operating in the frequency ranges 6 GHz to 8,5 GHz, 24,05 GHz to 26,5 GHz, 57 GHz to 64 GHz, 75 GHz to 85 GHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
EN 303 204-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Network Based Short Range Devices (SRD); Radio equipment to be used in the 870 MHz to 876 MHz frequency range with power levels ranging up to 500 mW; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

Table 4-41: Standards to add to Specific SRD Application

4.2.8 TS0049 Meteorological Aids

We propose to prepare a new TS covering the following Meteorological Aids:

- Radiosondes with power levels ranging up to 200 mW (400,15 MHz to 406 MHz)
- Radiosondes (1 668,4 MHz to 1 690 MHz)

These standards should be included to the document:

Standard Number	Standard Title
EN 302 054-1-V1.1.1	Electromagnetic Compatibility and Radio spectrum Matters (ERM); Meteorological Aids (Met Aids); Radiosondes to be used in the 400,15 MHz to 406 MHz frequency range with power levels ranging up to 200 mW; Part 1: Technical characteristics and test methods
EN 302 054-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Meteorological Aids (Met Aids); Radiosondes to be used in the 400,15 MHz to 406 MHz frequency range with power levels ranging up to 200 mW; Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
EN 302 454-1-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Meteorological Aids (Met Aids); Radiosondes to be used in the 1 668,4 MHz to 1 690 MHz frequency range; Part 1: Technical characteristics and test methods
EN 302 454-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Meteorological Aids (Met Aids); Radiosondes to be used in the 1 668,4 MHz to 1 690 MHz frequency range; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive

Table 4-45: Standards to add to Meteorological Aids

4.2.9 TS0058 Wireline Telecommunications Equipment

4.2.9.1 *Equipment directly connecting to SDH*

We propose to add the following standards to a TS covering equipment directly connecting to SDH:

Standard Number	Standard Title
ETSI ETS 300 232/A1 ed.1 (1996-03)	Transmission and Multiplexing (TM); Optical interfaces for equipment and systems relating to the Synchronous Digital Hierarchy (SDH) [ITU-T Recommendation G.957 (1995), modified]
ETSI ETS 300 300 ed.2 (1997-04)	Broadband Integrated Services Digital Network (B-ISDN); Synchronous Digital Hierarchy (SDH) based user network access; Physical layer User Network Interfaces (UNI) for 155 520 kbit/s and 622 080 kbit/s Asynchronous Transfer Mode (ATM) B-ISDN applications
ETSI ETS 300 814 ed.1 (1998-03)	Digital Video Broadcasting (DVB); DVB interfaces to Synchronous Digital Hierarchy (SDH) networks

Table 4-46: Standards to add to Equipment directly connecting to SDH

4.2.10 TS0057 Equipment Connecting to 140 Mbps Services

We propose to add the following standards to a TS covering equipment connecting to 140 Mbps services:

Standard Number	Standard Title
ETSI TBR 025 ed.1 (1997-07)	Business TeleCommunications (BTC); 140 Mbit/s digital unstructured and structured leased lines (D140U and D140S); Attachment requirements for terminal equipment interface
ETSI EN 300 690 V1.2.1 (2001-07)	Access and Terminals (AT); 140 Mbit/s digital leased lines (D140U and D140S); Terminal equipment interface

Table 4-42: Standards to add to Equipment Connecting to 140 Mbps Services

4.3 Broadcast Systems

In this section we propose an extensive range of standards for the different broadcast technologies listed in section 3 of this document. It should be noted that many of the standards included herein are under constant and various stages of revision and therefore the references listed might not be representative of the latest available in certain cases.

4.3.1 FM Broadcasting & Ancillary Services (RDS)

Standard Number	Standard Title
ETS 300 384	<p>Radio broadcasting systems; Very High Frequency (VHF), frequency modulated, sound broadcasting transmitters</p> <p>This European Telecommunication Standard (ETS) covers those performance requirements for Very High Frequency (VHF) Frequency Modulation (FM) sound broadcasting transmitters operating in the frequency band 87,5 MHz to 108 MHz, and modulated in accordance with CCIR Recommendation 450-1 [1], which has some bearing on the Radio Frequency (RF) spectrum. Monophonic signals are transmitted in accordance with section 1, and stereophonic signals in accordance with section 2.2 (pilot tone system) of CCIR Recommendation 450-1 [1]. This ETS also covers the transmission of supplementary signals as described in CCIR Recommendation 450-1 [1] and/or EN 50067 [2].</p> <p>This ETS considers only those technical characteristics that relate to the radiated signal and hence directly affect the efficient use of RF spectrum.</p> <p>The use of CCIR Recommendation 412-5 [3] for planning sound broadcasting services is assumed.</p> <p>Spurious and out-of-band emission limits specified in figures 1 and 3 respectively are incorporated to protect both aeronautical navigation and communication services operating in the frequency band 108 MHz to 137 MHz and rebroadcast reception in the frequency band 87,5 MHz to 108 MHz.</p> <p>In those areas where reliance on a transmitter specification alone cannot guarantee protection of the RF spectrum (e.g. reverse intermodulation), recommendations appropriate to installed systems are described in ETSI Technical Report (ETR) 132 [8].</p> <p>Electro Magnetic Compatibility (EMC) aspects for equipment covered by this ETS are given in ETS 300 447 (see annex E, bibliography).</p>

<p>EN 50067</p>	<p>Specification for radio data system (RDS) for VHF sound broadcasting in the frequency range from 87,5 to 108,0 MHz</p> <p>This European Telecommunication Standard (ETS) covers those performance requirements for Very High Frequency (VHF) Frequency Modulation (FM) sound broadcasting transmitters operating in the frequency band 87,5 MHz to 108 MHz, and modulated in accordance with CCIR Recommendation 450-1 [1], which has some bearing on the Radio Frequency (RF) spectrum. Monophonic signals are transmitted in accordance with section 1, and stereophonic signals in accordance with section 2.2 (pilot tone system) of CCIR Recommendation 450-1 [1]. This ETS also covers the transmission of supplementary signals as described in CCIR Recommendation 450-1 [1] and/or EN 50067 [2].</p> <p>This ETS considers only those technical characteristics that relate to the radiated signal and hence directly affect the efficient use of RF spectrum.</p> <p>The use of CCIR Recommendation 412-5 [3] for planning sound broadcasting services is assumed.</p> <p>Spurious and out-of-band emission limits specified in figures 1 and 3 respectively are incorporated to protect both aeronautical navigation and communication services operating in the frequency band 108 MHz to 137 MHz and rebroadcast reception in the frequency band 87,5 MHz to 108 MHz.</p> <p>In those areas where reliance on a transmitter specification alone cannot guarantee protection of the RF spectrum (e.g. reverse intermodulation), recommendations appropriate to installed systems are described in ETSI Technical Report (ETR) 132 [8].</p> <p>Electro Magnetic Compatibility (EMC) aspects for equipment covered by this ETS are given in ETS 300447 (see annex E, bibliography).</p>
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Table 4-48: Broadcasting standards: FM Broadcasting & Ancillary Services (RDS)

4.3.2 Radio MF/HF(AM)

Standard Number	Standard Title
<p>Rule of Procedure related to Annex 2 to the GE75 Agreement, as amended by decision of the RRB in December 2002 for the Radio MF/HF (AM) broadcast standards for Botswana.</p>	<p>Background</p> <p>In ITU Regions 1 and 3, the GE75 LF/MF Final Acts provide a plan for the assignment of frequencies to broadcasting stations, a modification procedure (Article 4) and the technical details to be used for the preparation of the plan. This Agreement is based on analogue Amplitude Modulated Double-Side Band (AM DSB) transmissions.</p> <p>AM double sideband broadcasting in the LF, MF bands has been in operation for some 85 years. Broadcasters rely heavily upon the use of these bands because of the ease of providing wide-area coverage with very stable and predictable propagation conditions.</p>

	<p>The technology is simple to implement for transmitters and receivers and, for at least half of that period of operation, has delivered good quality to listeners. However, growing demand for additional coverage and rising expectations for audio quality means that the services offered in the LF/MF bands have become increasingly unsatisfactory.</p> <p>The first attempts, from the early 1950s, to counter interference and spectrum congestion involved the transfer or duplication of many service requirements into VHF Band II using FM. Another major factor at the time was to overcome impulsive interference from car spark ignition systems and other man-made noise sources. Although better suppression techniques eventually overcame those problems, broadcasting at LF/MF now faces new challenges from radiated noise caused by PLT (Power Line Technology) systems, together with switched mode power supplies in lighting and electronic equipment, and the large numbers of electronic devices like PCs. Nonetheless, AM broadcasting in the LF/MF bands has retained many advantages in terms of predictable coverage and simple receiver design.</p>
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Table 4-49: Broadcasting standards: Radio MF/HF (AM)

4.3.3 Analogue Television PAL (I)

Standard Number	Standard Title
RECOMMENDATION ITU-R BT.470-6*	<p>The ITU Radiocommunication Assembly, <i>considering</i></p> <ul style="list-style-type: none"> a) that many countries have established satisfactory monochrome television broadcasting services based on either 525-line or 625-line systems; b) that a number of countries have established (or are in the process of establishing) satisfactory colour television broadcasting services based on the NTSC, PAL or SECAM systems; c) that the use of video component signals, signals consisting of the luminance and two colour difference signals, with time compression and time division multiplexing, may offer picture quality benefits, using new types of television receivers; d) that it would add further complications to the interchange

	<p>of programmes to have a greater multiplicity of systems, <i>recommends</i></p> <p>1 that, for a country wishing to initiate a conventional monochrome television service, a system using 525- or 625-lines as defined in Annex 1 is to be preferred;</p> <p>2 that, for conventional monochrome 625-line systems, the video-frequency characteristic described in Recommendation ITU-R BT.472 is to be preferred;</p> <p>3 that, for a country wishing to initiate a conventional colour television service, one of the systems defined in Annex 1 is to be preferred.</p> <p>NOTE 1 – Pre-1986 editions of the ex-CCIR Volumes, and in particular that of 1982, contain a complete description of system E used in France until 1984, and system A used in the United Kingdom until 1985.</p> <p>NOTE 2 – Pre-1997 editions of Recommendation ITU-R BT.470 contain a complete description of the SECAM IV colour television system.</p>
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Table 4-50: Broadcasting standards: Analogue Television PAL (I)

4.3.4 Digital Radio Mondiale DRM

We propose to add the following standards and recommendations to the document:

Standard/Recommendation Reference Number	Standard/Recommendation Title
EN 302 245-1-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the Digital Radio Mondiale (DRM) broadcasting service; Part 1: Technical characteristics and test methods
EN 302 245-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the Digital Radio Mondiale (DRM) broadcasting service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive
ETSI ES 201 980 V3.2.1 (2012-06)	Digital Radio Mondiale (DRM) System Specification

http://www.drm.org/wp-content/uploads/2013/09/DRM-guide-artwork-9-2013-1.pdf	DRM Introduction and Implementation Guide. Digital Radio Consortium.
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Table 4-51: Standards to add to DRM

4.3.5 T-DAB

We propose to add the following standards and recommendations to the document:

Standard/Recommendation Reference Number	Standard/Recommendation Title
EN 302 077-1-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the Terrestrial - Digital Audio Broadcasting (T-DAB) service; Part 1: Technical characteristics and test methods
EN 302 077-2-V1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the Terrestrial - Digital Audio Broadcasting (T-DAB) service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive
TS 103 17-V1.1.1 (2013-08)	Digital Audio Broadcasting (DAB); Filecasting; User application specification This document specifies the Filecasting user application which permits the non-linear delivery of multimedia content using DAB. Whilst the main focus of the present document is the delivery of

	<p>audio files over a broadcast network, it is also applicable to other media formats too, such as video files and documents which may contain a mixture of formatted text and graphics, for example in pdf format</p>
<p>TS 103 176 V1.1.2 (2013-07)</p>	<p>Digital Audio Broadcasting (DAB); Rules of implementation; Service information features</p> <p>This document defines rules of implementation for certain service information features. These rules have been developed to provide a reliable and consistent experience for digital radio listeners; they provide implementation details for how the FIC signalling is used and how receivers will interpret and behave in response to receiving the FIC signalling. The rules defined in the present document supersede the informative guidance given in TR 101 496 [i.1] for the FIGs contained herein. In addition, some clarifications are provided for EN 300 401 [1] where a number interpretations may appear equally valid: in each case this is mentioned specifically. Future versions of EN 300 401 [1] will be modified to include these clarifications</p>
<p>TS 102 979 v1.1.1 (2008-06)</p>	<p>Digital Audio Broadcasting (DAB); Journaline; User application specification</p> <p>This document is to describe and define the XML based low profile information service "Journaline®"</p>
<p>TS 102 978 v1.1.1 (2008-07)</p>	<p>Digital Audio Broadcasting (DAB); Encapsulation of DAB Interfaces (EDI)</p> <p>This document provides a mechanism for the encapsulation of STI-D (see EN 300 797 [4]) and ETI (see ETS 300 799 [5]) compliant data streams for distribution over IP networks. EDI is based on the existing Distribution and Communications Protocol (DCP - TS 102 821 [2]), and therefore a layered approach relevant to unique IP network designs can be implemented. An EDI Packet represents a single STI-D or ETI 24 ms logical frame. In order to maximize efficiency across the IP network, unnecessary LI data (i.e. data formatted according to the STI-D or ETI "logical interface"), which can be reliably reproduced at the receiver is removed. The TAG Items are grouped to form a single EDI Packet, and passed onto DCP for Application Framing (AF)</p>

<p>TS 102 818 v1.4.1 (2008-06)</p>	<p>Digital Audio Broadcasting (DAB); Digital Radio Mondiale (DRM); XML Specification for DAB Electronic Programme Guide (EPG)</p> <p>This paper defines the XML Document Type Definitions (DTDs) for an Electronic Programme Guide (EPG) for Digital Audio Broadcasting (DAB)</p>
<p>TS 102 693 v1.1.2 (2009-11)</p>	<p>Digital Audio Broadcasting (DAB); Encapsulation of DAB Interfaces (EDI)</p> <p>This document provides a mechanism for the encapsulation of STI-D (see EN 300 797 [4]) and ETI (see ETS 300 799 [5]) compliant data streams for distribution over IP networks. EDI is based on the existing Distribution and Communications Protocol (DCP - TS 102 821 [2]), and therefore a layered approach relevant to unique IP network designs can be implemented. An EDI Packet represents a single STI-D or ETI 24 ms logical frame. In order to maximize efficiency across the IP network, unnecessary LI data (i.e. data formatted according to the STI-D or ETI "logical interface"), which can be reliably reproduced at the receiver is removed. The TAG Items are grouped to form a single EDI Packet, and passed onto DCP for Application Framing (AF)</p>
<p>TS 102 652 v1.1.1 (2007-10)</p>	<p>Digital Audio Broadcasting (DAB); Intellitext; Application specification</p> <p>This document describes the Intellitext DL extension, including structure and formatting of data and receiver and broadcast requirements. It also covers backwards compatibility with earlier versions of Intellitext</p>
<p>TS 102 635-2 v1.1.1 (2009-08)</p>	<p>Digital Audio Broadcasting (DAB); Middleware; Part 2: DAB</p> <p>This document specifies the additional definitions to apply MATE middleware to Eureka-147 Digital Audio Broadcasting (DAB) (EN 300 401 [9]). Within the present document the term "DAB" is used to refer to the Eureka-147 Digital Audio Broadcasting standard</p>
<p>TS 102 635-1 v1.1.1 (2009-08)</p>	<p>Digital Audio Broadcasting (DAB); Middleware; Part 1: System aspects</p> <p>This document establishes a standard for a platform-independent</p>

			<p>environment, where executable applications can be signalled and transferred to a receiver via a broadcasting network and executed on the receiver. It does not suppose the exclusive use of a specific broadcast network but defines the commonly-required specifications among diverse broadcast networks. It includes the definitions of basic data formats, protocols to deliver data, to signal downloadable applications and to download them, ways to denote resources on broadcast networks, and detailed interfaces among receiver platform, broadcast and communication networks, and the applications</p>
TS 102 v1.1.1 (2008-11)	632		<p>Digital Audio Broadcasting (DAB); Voice Applications</p> <p>This document describes Voice Applications specification. To begin with, the VoiceXML profile is explained with details about the modularization of VoiceXML 2.0, the dialog constructs, the user input, the system output, the control flow and scripting and the environment and resources. Then, the synchronization management mechanism is explained, followed by the specification of the extended interfaces. Finally, the transport and signalling of Voice Applications are detailed</p>
TS 102 v.1.2.1 (2010-05)	563		<p>Digital Audio Broadcasting (DAB); Transport of Advanced Audio Coding (AAC) audio</p> <p>The present document defines the method to code and transmit audio services using the HE AAC v2 [2] audio coder for Eureka-147 Digital Audio Broadcasting (DAB) (EN 300 401 [1]) and details the necessary mandatory requirements for decoders. The permitted audio modes and the data protection and encapsulation are detailed. This audio coding scheme permits the full use of the PAD channel for carrying dynamic labels and user applications</p>
TS 102 v1.2.1. (2009-04)	428		<p>Digital Audio Broadcasting (DAB); DMB video service; User Application Specification</p> <p>The present document specifies the user application for video services carried via DAB. It also includes profile definitions for the application</p>
TS 102 1.1.1 (2005-07)	427		<p>Digital Audio Broadcasting (DAB); Data Broadcasting - MPEG-2 TS streaming</p>

			<p>The present document specifies how MPEG 2 Transport Stream can be encapsulated within a DAB sub-channel including additional error protection mechanisms.</p>
TS	102	371	<p>Digital Audio Broadcasting (DAB); Digital Radio Mondiale (DRM); Transportation and Binary Encoding Specification for Service and Programme Information (SPI)</p> <p>The present document defines how the XML schema data model for Service and Programme Information (SPI) (ETSI TS 102 818 [1]) should be compressed, profiled and broadcast. Within the present document the term "DAB" is used to refer to the Digital Audio Broadcasting standard (ETSI EN 300 401 [3]) and "DRM" is used to refer to the Digital Radio Mondiale standard (ETSI ES 201 980 [6]). In respect to previous versions of the present document, hybrid radio provisions have been added to allow a seamless experience for users when consuming radio services delivered by digital radio broadcasting systems (DAB, DRM) or IP or a combination of both. The use of the present document allows content to be created once by the service provider for delivery by both mechanisms and allows manufacturers to implement devices with many common elements</p>
TS	102	368	<p>Digital Audio Broadcasting (DAB); DAB-TMC (Traffic Message Channel)</p> <p>The present document specifies how to transport RDS-TMC messages using the DAB Fast Information Data channel (FIDC).</p>
TS	102	367	<p>Digital Audio Broadcasting (DAB); Conditional access</p> <p>The present document specifies how to use Conditional Access within the Digital Audio Broadcasting (DAB) system</p>
EN 301 234	V2.1.1 (2006-06)		<p>Digital Audio Broadcasting (DAB); Multimedia Object Transfer (MOT) protocol</p> <p>Specification of the DAB Multimedia Object Transfer (MOT) protocol.</p>

<p>EN 301 700 V1.1.1 (2000-03)</p>	<p>Digital Audio Broadcasting (DAB); VHF/FM Broadcasting: cross-referencing to simulcast DAB services by RDS-ODA 147</p> <p>To produce an EN for the definition and use of a Radio Data System Open Data Application (RDS-ODA) for the cross referencing of audio services from FM-RDS to DAB. Supporters: Eureka 147 project member companies</p>
<p>ES 201 735 V1.1.1 (2000-09)</p>	<p>Digital Audio Broadcasting (DAB); Internet Protocol (IP) datagram tunnelling</p> <p>To describe how to transport Internet Protocol (IP) datagrams in a Digital Audio Broadcasting (DAB) packet mode service component, a technique further on referred to as IP tunnelling. TS also to be published while the ES is in the Members' Vote procedure.</p>
<p>ES 201736 V1.1.1 (2000-09)</p>	<p>Digital Audio Broadcasting (DAB); Network Independent Protocols for Interactive Services</p> <p>This specifies the protocol stacks to be used for the different types of services that are defined, as local interactive, one-way interactive and two-way interactive service. It also defines a protocol PSSC (Personal DAB Service Session Control) which allows the setup of personal DAB service sessions and functionalities like handover between DAB cells, etc. It also defines the message format to be used and allows for further future extensions</p>
<p>EN 300 797-V1.2.1 (2005-05)</p>	<p>Digital Audio Broadcasting (DAB); Distribution interfaces; Service Transport Interface (STI)</p> <p>This document specifies an interface which allows broadcasters, who are producing a DAB programme or data service component, to transmit this DAB component to the multiplex operator responsible for building the full signal.</p>
<p>EN 300 798 1.1.1 (1998-03)</p>	<p>Digital Audio Broadcasting (DAB); Distribution interfaces; Digital baseband In-phase and Quadrature (DIQ) interface</p> <p>Specifies an interface which allows digital processing equipment for DAB to be connected to RF modulation equipment at DAB transmitter sites</p>

<p>ES 201 737 V1.1.1 (2000-01)</p>	<p>Digital Audio Broadcasting (DAB); Interaction channel through Global System for Mobile communications (GSM) the Public switched Telecommunications System (PSTN); Integrated Services Digital Network (ISDN) and Digital Enhanced Cordless Telecommunications</p> <p>This specifies the DAB Interaction Channel through GSM/PSTN/ISDN/DECT and handles low level network questions. It is basically a document with references to relevant telecommunications standards where you will find how to implement the low level interaction part. Supporting ETSI member Organisations; Eureka 147 Project i.e., BBC, Bosch, IRT, Teracom.</p>
<p>TS 101 993 1.1.1 (2002-03)</p>	<p>Digital Audio Broadcasting (DAB); A Virtual Machine for DAB: DAB Java Specification</p> <p>Specification of a Java Virtual Machine for DAB</p>
<p>TS 101 860 1.1.1 (2001-12)</p>	<p>Digital Audio Broadcasting (DAB); Distribution Interfaces; Service Transport Interface (STI); STI levels</p> <p>The document establishes guidance in implementation and usage of the functionality described in the STI standard EN 300 797. Subsets of the STI standard are defined in order to make interoperable solutions possible for different suppliers of STI devices. The subsets are called STI Levels. Interoperability is ensured if the STI Logical Interface (LI) and STI Physical Interfaces (STI-PI,X) are the same for entities transporting DAB Service Components, Service Information and control messages in a DAB collection network. The present document only particularises the Logical Interface (LI) layer of the STI, i.e. the syntax for STI-D frames and STI-C messages, to provide interoperability. The document defines a functional hierarchy of levels. Higher levels comprise lower levels. Three levels are specified where the highest STI Level does not comprise all STI functionality that could be implemented using EN 300 797. Some of the functionality is not included due to the fact that it is not assumed to be widely used. This functionality may optionally be added to any of the defined STI Levels. The document defines the minimum functionality an upstream or downstream entity shall provide on each level to be considered compliant with that level</p>

<p>TS 101 759 1.2.1 (2005-01)</p>	<p>Digital Audio Broadcasting (DAB); Data Broadcasting - Transparent Data Channel (TDC)</p> <p>Specification covering transparent data channel in packet mode, stream mode and Programme Associated Data</p>
<p>TS 101 758 v2.1.1 (2000-11)</p>	<p>Digital Audio Broadcasting (DAB); Signal strengths and receiver parameters; Targets for typical operation</p> <p>Gives guidance about the required field strength and receiver sensitivity required for satisfactory DAB operation</p>
<p>TS 101 757 1.1.1 (2000-06)</p>	<p>Digital Audio Broadcasting (DAB); Registered Tables</p> <p>The present document contains a number of tables for use in the implementation of the Digital Audio Broadcasting (DAB), system [1] and the related Multimedia Object Transfer (MOT) standard [4]. The tables in the present document are maintained by the WorldDAB Information and Registration Centre (WorldDAB IRC). The WorldDAB IRC apply an easy procedure for registering new values, to ensure that they may be used without the need to change the so-called "main DAB standard" EN 300 401 [1]</p>
<p>TS 101 756 V1.7.1 (2015-09)</p>	<p>Digital Audio Broadcasting (DAB); Conformance testing for DAB Audio</p> <p>Conformance testing specification, to test the DAB extensions to the MPEG audio specification.</p>
<p>TS 101 499 v3.1.1 (2015-01)</p>	<p>Hybrid Digital Radio Slide-Show</p> <p>The present document describes an application that provides a visual accompaniment to a radio service. In respect to previous versions of the present document, hybrid radio provisions have been added to allow a seamless experience for users when consuming radio services delivered by digital radio broadcasting systems (DAB, DRM) or IP or a combination of both. The use of the present document allows content to be created once by the service provider for delivery by both mechanisms and allows manufacturers to implement devices with many common elements. The application can be delivered using broadcast or IP, or a combination of the two</p>

<p>TS 101 498-3 v2.1.1 (2005-10)</p>	<p>Digital Audio Broadcasting (DAB); Broadcast website; Part 3: TopNews basic profile specification</p> <p>This document specifies how to create a broadcast carousel of objects for an audio information service. TopNews allows a service provider to deliver compressed audio, for instance MP3, via digital radio. Receivers may then extract information directly from this carousel and store it in the receiver in order to present the service.</p>
<p>TS 101 498-2 1.1.1 (2000-09)</p>	<p>Digital Audio Broadcasting (DAB); Broadcast website; Part 2: Basic profile specification</p> <p>The DAB Broadcast website application describes the protocol required to create a broadcast carousel of files for a 'website'. Receivers may then extract information directly from this carousel in order to present the service. The DAB Broadcast website application applies the DAB-MOT protocol and allows a service provider to deliver HTML content via DAB without the need for a return channel. Supporting ETSI member organisations: Eureka 147 Project i.e. BBC Bosh IRT Teracom</p>
<p>TS 101 498-1 2.1.1 (2006-01)</p>	<p>Digital Audio Broadcasting (DAB); Broadcast website; Part 1: User application specification</p> <p>The DAB Broadcast website application describes the protocol required to create a broadcast carousel of files for a 'website'. Receivers may then extract information directly from this carousel in order to present the service. The DAB Broadcast website application applies the DAB-MOT protocol and allows a service provider to deliver HTML content via DAB without the need for a return channel. Supporting ETSI member organisations: Eureka 147 Project i.e. BBC Bosh IRT Teracom</p>
<p>TR 101 496-3 1.1.2 (2001-05)</p>	<p>Digital Audio Broadcasting (DAB); Guidelines and rules for implementation and operation; Part 3: Broadcast network</p> <p>This TR is based on a EUREKA document and is written as a supplement of the ETS 300 401. Details and explanations are given that help to implement DAB equipment</p>
<p>TR 101 496-2 1.1.2 (2001-05)</p>	<p>Digital Audio Broadcasting (DAB); Guidelines and rules for implementation and operation; Part 2: System features</p>

	<p>This TR is based on a EUREKA document and is written as a supplement of the ETS 300 401. Details and explanations are given that help to implement DAB equipment.</p>
<p>TR 101 496-1 1.1.1 (2000-11)</p>	<p>Digital Audio Broadcasting (DAB); Guidelines and rules for implementation and operation; Part 1: System outline</p> <p>This TR is based on a EUREKA document and is written as a supplement of the ETS 300 401. Details and explanations are given that help to implement DAB equipment</p>
<p>TR 101 495- V1.4.1 (2012-03)</p>	<p>Digital Audio Broadcasting (DAB); Guide to DAB standards; Guidelines and Bibliography</p> <p>This paper explains the different standards for Digital Audio Broadcasting (DAB) that exist, what they cover and how they are inter-related. The main DAB standard ETS 300 401 is explained first of all and the remaining documents are grouped into standards/documents related to the DAB receivers, DAB networks along with transmitters and data transmission via DAB. Sources where one can obtain these documents and a brief overview of general literature about DAB is also given</p>
<p>EN300 401 –V1.4.1 (2006-01)</p>	<p>Radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers</p> <p>This document establishes a broadcasting standard for the Digital Audio Broadcasting (DAB) system designed for delivery of high-quality digital audio programme and data services for mobile, portable and fixed reception from terrestrial or satellite transmitters in the Very High Frequency (VHF)/Ultra High Frequency (UHF) frequency bands.</p>

Table 4-52: Standards to add to T-DAB

4.3.6 Digital Terrestrial Broadcasting ISDB

We propose to prepare two new TS for ISDB; one covering ISDB transmitter, one covering ISDB receiver.

We propose to add the following standards to the ISDB transmitter document:

Standard Number	Standard Title
ARIB STD - B31	Transmission system for digital terrestrial television broadcasting
ITU - R Recommendation BT.1206-2	Spectrum limit masks for digital terrestrial television broadcasting

Table 4-53 Standard ISDB-T

The following standards should be included to the ISDB receiver document:

Standard Number	Standard Title
ARIB STD - B21	Receiver for Digital Broadcasting

Table 4-54 Standard ISDB-T

4.3.7 DVB-S2 Transmission Standards

In order to provide a complete standards document for DVB-S2 implementation we propose the following standards to be included for different technical areas of DVB-S2. Please note that we include in addition to the standard normative and informative references which are marked accordingly.

4.3.7.1 *Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications*

Standard Number	Standard Title
ETSI EN 302 307 Standard Document for DVB-S2	<p>Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications</p> <p>DVB-S (EN 300 421 [2]) was introduced as a standard in 1994 and DVB-DSNG (EN 301 210 [3]) in 1997. The DVB-S standard specifies QPSK modulation and concatenated convolutional and Reed-Solomon channel coding, and is now used by most satellite operators worldwide for television and data broadcasting services. DVB-DSNG specifies, in addition to DVB-S format, the use of 8PSK and 16QAM</p>

modulation for satellite news gathering and contribution services. Since 1997, digital satellite transmission technology has evolved somewhat:

- New channel coding schemes, combined with higher order modulation, promise more powerful alternatives to the DVB-S/DVB-DSNG coding and modulation schemes. The result is a capacity gain in the order of 30 % at a given transponder bandwidth and transmitted EIRP, depending on the modulation type and code rate.
- Variable Coding and Modulation (VCM) may be applied to provide different levels of error protection to different service components (e.g. SDTV and HDTV, audio, multimedia).
- In the case of interactive and point-to-point applications, the VCM functionality may be combined with the use of return channels, to achieve Adaptive Coding and Modulation (ACM). This technique provides more exact channel protection and dynamic link adaptation to propagation conditions, targeting each individual receiving terminal. ACM systems promise satellite capacity gains of up to 100 % - 200 %. In addition, service availability may be extended compared to a constant protection system (CCM) such as DVB-S or DVB-DSNG. Such gains are achieved by informing the satellite up-link station of the channel condition (e.g. C/N+I) of each receiving terminal via the satellite or terrestrial return channels.
- DVB-S and DVB-DSNG are strictly focused on a unique data format, the MPEG Transport Stream (ISO/IEC 13818-1 [1] or a reference to it). Extended flexibility to cope with other input data formats (such as multiple Transport Streams, or generic data formats) is now possible without significant complexity increase. The present document defines a "second generation" modulation and channel coding system (denoted the "System" or "DVB-S2" for the purposes of the present document) to make use of the improvements listed above. DVB-S2 is a single, very flexible standard, covering a variety of applications by satellite, as described below. It is characterized by:

- a flexible input stream adapter, suitable for operation with single and multiple input streams of various formats (packetized or continuous);
- a powerful FEC system based on LDPC (Low-Density Parity Check) codes concatenated with BCH codes, allowing Quasi-Error-Free operation at about 0,7 dB to 1 dB from the Shannon limit, depending on the transmission mode (AWGN channel, modulation constrained Shannon limit);
- a wide range of code rates (from 1/4 up to 9/10);
- 4 constellations, ranging in spectrum efficiency from 2 bit/s/Hz to 5 bit/s/Hz, optimized for operation over non-linear transponders;
- a set of three

spectrum shapes with roll-off factors 0,35, 0,25 and 0,20; • Adaptive Coding and Modulation (ACM) functionality, optimizing channel coding and modulation on a frame-by-frame basis. The System has been optimized for the following broadband satellite applications: Broadcast Services (BS) Digital multi-programme Television (TV)/High Definition Television (HDTV) Broadcasting services to be used for primary and secondary distribution in the Fixed Satellite Service (FSS) and the Broadcast Satellite Service (BSS) bands. ETSI 7 ETSI EN 302 307 V1.2.1 (2009-08) DVB-S2 is intended to provide Direct-To-Home (DTH) services for consumer Integrated Receiver Decoder (IRD), as well as collective antenna systems (Satellite Master Antenna Television - SMATV) and cable television head-end stations (possibly with remodulation, see EN 300 429 [5]). DVB-S2 may be considered a successor to the current DVB-S standard EN 300 421 [2], and may be introduced for new services and allow for a long-term migration. BS services are transported in MPEG Transport Stream format. VCM may be applied on multiple transport stream to achieve a differentiated error protection for different services (TV, HDTV, audio, multimedia). Two modes are available: • NBC-BS (Non Backwards Compatible Broadcast Services) is not backwards-compatible with EN 300 421 [2]. • BC-BS (Backwards-Compatible Broadcast Services) is backwards-compatible to EN 300 421 [2] (see annex F). In fact, with a large number of DVB-S receivers already installed, backwards compatibility may be required for a period of time, where old receivers continue to receive the same capacity as before, while the new DVB-S2 receivers could receive additional capacity broadcasts. When the complete receiver population has migrated to DVB-S2, the transmitted signal can be modified to a non-backward compatible mode, thus exploiting the full potential of DVB-S2. To facilitate the reception of DVB-S services by DVB-S2 receivers, implementation of DVB-S in DVB-S2 chips is highly recommended. Interactive Services (IS) Interactive data services including Internet access DVB-S2 is intended to provide interactive services to consumer IRDs and to personal computers, where DVB-S2's forward path supersedes the current DVB-S standard EN 300 421 [2] for interactive systems. The return path can be implemented using various DVB interactive systems, such as DVB-RCS (EN 301 790 [6]), DVB-RCP (ETS 300 801 [7]), DVB-RCG (EN 301 195 [8]), DVB-RCC (ES 200 800 [9]). Data services are transported in (single or multiple) Transport Stream

format according to EN 301 192 [4] (e.g. using Multiprotocol Encapsulation), or in (single or multiple) generic stream format. DVB-S2 can provide Constant Coding and Modulation (CCM), or Adaptive Coding and Modulation (ACM), where each individual satellite receiving station controls the protection mode of the traffic addressed to it. Input Stream Adaptation for ACM is specified in annex D. Digital TV Contribution and Satellite News Gathering (DTVC/DSNG) Digital television contribution applications by satellite consist of point-to-point or point-to-multipoint transmissions, connecting fixed or transportable uplink and receiving stations. They are not intended for reception by the general public. According to ITU-R Recommendation SNG.770-1 [10], SNG is defined as "Temporary and occasional transmission with short notice of television or sound for broadcasting purposes, using highly portable or transportable uplink earth stations ...". Services are transported in single (or multiple) MPEG Transport Stream format. DVB-S2 can provide Constant Coding and Modulation (CCM), or Adaptive Coding and Modulation (ACM). In this latter case, a single satellite receiving station typically controls the protection mode of the full multiplex. Input Stream Adaptation for ACM is specified in annex D. Data content distribution/trunking and other professional applications (PS) These services are mainly point-to-point or point-to-multipoint, including interactive services to professional head-ends, which re-distribute services over other media. Services may be transported in (single or multiple) generic stream format. The system can provide Constant Coding and Modulation (CCM), Variable Coding and Modulation (VCM) or Adaptive Coding and Modulation (ACM). In this latter case, a single satellite receiving station typically controls the protection mode of the full TDM multiplex, or multiple receiving stations control the protection mode of the traffic addressed to each one. In either case, interactive or non-interactive, the present document is only concerned with the forward broadband channel. DVB-S2 is suitable for use on different satellite transponder bandwidths and frequency bands. The symbol rate is matched to given transponder characteristics, and, in the case of multiple carriers per transponder (FDM), to the frequency plan adopted. Examples of possible DVB-S2 use are given in clause H.1. Digital transmissions via satellite are affected by power and bandwidth limitations. Therefore DVB-S2 provides for many transmission modes (FEC coding and modulations), giving different trade-offs between power and

	<p>spectrum efficiency (see clause H.1). For some specific applications (e.g. broadcasting) modes such as QPSK and 8PSK, with their quasi-constant envelope, are appropriate for operation with saturated satellite power amplifiers (in single carrier per transponder configuration). When higher power margins are available, spectrum efficiency can be further increased to reduce bit delivery cost. In these cases also 16APSK and 32APSK can operate in single carrier mode close to the satellite HPA saturation by pre-distortion techniques. All the modes are appropriate for operation in quasi-linear satellite channels, in multi-carrier Frequency Division Multiplex (FDM) type applications. ETSI 8 ETSI EN 302 307 V1.2.1 (2009-08) DVB-S2 is compatible with Moving Pictures Experts Group (MPEG-2 and MPEG-4) coded TV services (see ISO/IEC 13818-1 [1]), with a Transport Stream packet multiplex. Multiplex flexibility allows the use of the transmission capacity for a variety of TV service configurations, including sound and data services. All service components are Time Division Multiplexed (TDM) on a single digital carrier. The present document:</p> <ul style="list-style-type: none"> • gives a general description of the DVB-S2 system; • specifies the digitally modulated signal in order to allow compatibility between pieces of equipment developed by different manufacturers. This is achieved by describing in detail the signal processing principles at the modulator side, while the processing at the receive side is left open to different implementation solutions. However, it is necessary in the present document to refer to certain aspects of reception; • identifies the global performance requirements and features of the System, in order to meet the service quality targets.
<p>ETSI EN 301 192 Normative Reference</p>	<p>Digital Video Broadcasting (DVB); DVB specification for data broadcasting"</p> <p>The present document is designed to be used in conjunction with EN 300 468 [2] and TR 101 211 [4]. The DVB System provides a means of delivering MPEG-2 Transport Streams (TS) via a variety of transmission media. These TSs have traditionally been oriented to containing MPEG-2 Video and Audio. Data broadcasting is seen as an important extension of the MPEG-2 based DVB transmission standards. Examples for data broadcasting are the download of software over satellite, cable or terrestrial links, the delivery of Internet services over broadcast channels (IP tunnelling), interactive TV etc. Four different application areas with different requirements for the data transport have been identified. For each application area a data broadcasting</p>

	<p>profile is specified in the present document. The following is a short description of the application areas and the profiles.</p>
<p>ETSI EN 301 210 Normative Reference</p>	<p>Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for Digital Satellite News Gathering (DSNG) and other contribution applications by satellite".</p> <p>The present document describes the modulation and channel coding system (denoted the "System" for the purposes of the present document) for Digital Satellite News Gathering (DSNG) and other contribution applications by satellite. According to ITU-R Recommendation SNG.770-1 [12], SNG is defined as "Temporary and occasional transmission with short notice of television or sound for broadcasting purposes, using highly portable or transportable uplink earth stations...". The equipment should be capable of uplinking the video programme (or programmes) with its associated sound or sound programme signals. Optionally it should be capable of providing two-way co-ordination (communication) circuits and data transmission according to EN 301 222 [6]. The equipment should be capable of being set up and operated by a crew of no more than two people within a reasonably short time. Limited receiving capability should be available in the uplink terminal to assist in pointing the antenna and to monitor the transmitted signal, where possible. Digital television contribution applications by satellite consist of point-to-point or point-to-multipoint transmissions, connecting fixed or transportable uplink and receiving stations, not intended to be received by the general public. Although these applications often transmit a single TV service, the Transport Stream multiplex flexibility also allows multi-programme TV services with associated sound, including commentary sound channels and data services; in this case multiple service components are Time Division Multiplexed (TDM) on a single digital carrier. Maximum commonality with EN 300 421 [3] is maintained, such as Transport Stream multiplexing [1], scrambling for energy dispersal, concatenated error protection strategy based on Reed-Solomon coding, convolutional interleaving and inner convolutional coding. The baseline System compatibly includes (as a subset) all the transmission formats specified by EN 300 421 [3], based on Quaternary Phase Shift Keying (QPSK) modulation and is suitable for DSNG services as well as for other contribution applications by satellite. Nevertheless, other optional (annex C explains the meaning of "optional" within the present document) transmission modes are added, using Eight</p>

	Phase Shift Keying (8PSK) modulation and Sixteen Quadrature Amplitude Modulation (16QAM), in order to fulfil specific application requirements. These optional modes can be very efficient in certain contribution applications by satellite.
ETSI EN 300 429 Normative Reference	<p>"Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for cable systems"</p> <p>The present document only adds 128 and 256 QAM to the specification. The present document describes the framing structure, channel coding and modulation (denoted "the System" for the purposes of the present document) for a digital multi-programme television distribution by cable. The aim of the present document is to present a harmonized transmission standard for cable and satellite, based on the MPEG-2 System Layer ISO/IEC 13818-1 [1], with the addition of appropriate Forward Error Correction (FEC) technique. This System can be used transparently with the modulation/channel coding system used for digital multi-programme television by satellite (see EN 300 421 [3]). The System is based on Quadrature Amplitude Modulation (QAM). It allows for 16, 32, 64, 128 or 256-QAM constellations. The System FEC is designed to improve Bit Error Ratio (BER) from 10⁻⁴ to a range, 10⁻¹⁰ to 10⁻¹¹, ensuring "Quasi Error Free" (QEF) operation with approximately one uncorrected error event per transmission hour</p>

Table 4-55 Standard DVB-S2

4.3.7.2 Video & Audio Coding

Standard Number	Standard Title
ISO/IEC 13818-1 Informative Reference Document	<p>"Information technology – Generic coding of moving pictures and associated audio information: Systems"</p> <p>The systems part of this Recommendation International Standard addresses the combining of one or more elementary streams of video and audio, as well as other data, into single or multiple streams which are suitable for storage or transmission. Systems coding follows the syntactical and semantic rules imposed by this Specification</p>

		and provides information to enable synchronized decoding of decoder buffers over a wide range of retrieval or receipt conditions.
ISO/IEC 14496	Informative Reference Document	<p>Coding of audio-visual objects (MPEG-4)</p> <p>MPEG-4 is a method of defining <u>compression</u> of audio and visual (AV) digital data. It was introduced in late 1998 and designated a <u>standard</u> for a group of <u>audio</u> and <u>video coding</u> formats and related technology agreed upon by the <u>ISO/IEC Moving Picture Experts Group</u> (MPEG) (<u>ISO/IEC JTC1/SC29/WG11</u>) under the formal standard ISO/IEC 14496 – <i>Coding of audio-visual objects</i>. Uses of MPEG-4 include compression of AV data for web (<u>streaming media</u>) and <u>CD</u> distribution, voice (<u>telephone, videophone</u>) and <u>broadcast television</u> applications.</p>

Table 4-56 Standard DVB-S2

4.3.7.3 Service information

Standard Number		Standard Title
ETSI EN 300 468	Normative Reference Document	<p>“Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems”</p> <p>The present document specify the Service Information(SI) data which forms part of DVB bitstreams, in order that the user can be provided with information to assist in the selection of service and/or event within the bitstream, and so that the Integrated Receiver Decoder (IRD) can automatically configure itself for the selected service. SI data for automatic configuration is mostly specified within ISO/IEC 13818-1.</p>

Table 4-57 Standard DVB-S2

4.3.7.4 Generic Stream Encapsulation

Standard Number		Standard Title
ETSI TS 102 606	Informative Reference Document	<p>“Digital Video Broadcasting (DVB); Generic Stream Encapsulation (GSE) Protocol”</p> <p>The present document includes the definition of the Generic Stream Encapsulation (GSE) protocol, which allows for efficient encapsulation of IP and other network layer packets</p>

	<p>over a “generic” physical layer. Such a “generic” physical layer is intended as a transport mode that carries a sequence of data bits or data packets, possibly organized in frames, but with no specific timing constraints. The first generation of DVB standards only supported data transport using the MPEG format (see ISO/IEC 13818-1 [2]), with a Transport Stream packet multiplex (MPEG-TS). Multi-Protocol Encapsulation (EN 301 192 [3]) is the DVB standard for encapsulation of audio/video and other content on MPEG-TS packets. The second generation of DVB standards features backwards compatibility modes for carrying MPEG-TS as well as generic modes for carrying arbitrary packets of variable length. These are referred to as Generic Streams (GS). The GSE protocol has been devised as an adaptation layer to provide network layer packet encapsulation and fragmentation functions over Generic Stream. GSE provides efficient encapsulation of IP datagrams over variable length Layer 2 packets, which are then directly scheduled on the physical layer into Base Band frames.</p>
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Table 4-58 Standard DVB-S2

4.3.7.5 **Digital Video Broadcasting (DVB); Interaction channel**

Standard Number	Standard Title
<p>ETSI EN 301 790 Normative Reference Document</p>	<p>Digital Video Broadcasting (DVB); Interaction channel for satellite distribution systems".</p> <p>The present document defines the GEM platform. GEM is applicable for specifications and standards based on the GEM APIs, content formats, and semantic guarantees. The present document is firstly intended to be used by entities writing terminal specifications and/or standards based on GEM. Secondly it is intended for developers of applications that use the GEM functionality and APIs. The GEM specification aims to ensure interoperability between GEM applications and different implementations of platforms supporting GEM applications. This includes interoperability across different middleware specifications, e.g. MHP [1], Blu-ray [8], OCAP [5], ACAP [i.2], ARIB [i.1], and the Open IPTV Procedural Application Gateway [i.3]. Implementers should consult the publisher of specifications which reference GEM regarding conformance.</p>

<p>ETSI ETS 300 801</p> <p>Normative Reference Document</p>	<p>Digital Video Broadcasting (DVB); Interaction channel through Public Switched Telecommunications Network (PSTN)/ Integrated Services Digital Networks (ISDN)"</p> <p>This European Telecommunication Standard (ETS) is the baseline specification for the provision of Return Channel (RC) based on PSTN and ISDN to Digital Video Broadcasting (DVB) systems. It is not intended to specify a RC solution associated to each broadcast system because the inter-operability of different delivery media to transport the RC is desirable. Therefore the PSTN/ISDN solutions for the RC apply to satellite, cable, SMATV, terrestrial, MMDS or any future DVB system. The solutions here provided for RC through PSTN/ISDN are a part of a wider set of alternatives to implement interactive services for DVB systems.</p>
<p>ETSI EN 301 195</p> <p>Normative Reference Document</p>	<p>Digital Video Broadcasting (DVB); Interaction channel through the Global System for Mobile communications (GSM)"</p> <p>The present document is the baseline specification for the provision of an interaction channel based on Global System for Mobile communications (GSM) to Digital Video Broadcasting (DVB) systems. The DVB project does not intend to specify an interaction channel solution associated to each broadcast system because the interoperability of different delivery media to transport the interaction channel is desirable. Therefore the GSM solution for the interaction channel apply to satellite, cable, MATV, SMATV, terrestrial, microwave or any future DVB broadcasting or distribution system. The solutions provided in the present document for an interaction channel through GSM are a part of a wider set of alternatives to implement interactive services for DVB systems.</p>
<p>ETSI ES 200 800</p> <p>Normative Reference Document</p>	<p>"Digital Video Broadcasting (DVB); DVB interaction channel for Cable TV distribution systems (CATV)"</p> <p>The present document is the baseline specification for the provision of the interaction channel for CATV networks. It is not intended to specify a return channel solution associated to each broadcast system because the inter-operability of different delivery media to transport the return channel is desirable. The solutions provided in the present document for interaction channel for CATV networks are a part of a wider set of alternatives to implement interactive services for Digital Video Broadcasting (DVB) systems.</p>

Table 4-59: Standards DVB-T2

4.3.7.6 *Interactive Services*

Standard Number	Standard Title
<p>ETSI ETS 300 802</p> <p>Normative Reference Document</p>	<p>"Digital Video Broadcasting (DVB); Network-independent protocols for DVB interactive services"</p> <p>This ETS covers the core Digital Video Broadcasting (DVB) requirements to enable interactive services supporting broadcasting to the home with narrowband return channels (see annex A: Bibliography - "DVB commercial requirements"). The system defined in this ETS provides a generic solution for a variety of future interactive services, through the adoption of DSM-CC User-to-User, Download and Object Carousel protocols, as specified in TR 101 194 [2]. The interactive services are provided on systems consisting of a high bitrate downstream channel (up to the maximum bitrate of the Broadcast channel) from the Service Providers to Service consumers and low bitrate interaction channels (up to 150 kbit/s). The Broadcast Service Provider and the Interactive Service Provider need not operate from the same location.</p>
<p>ETSI TS 101 545-1</p> <p>Normative Reference Document</p>	<p>"Digital Video Broadcasting (DVB);Second Generation DVB Interactive Satellite System (DVB-RCS2); Part 1: Overview and System Level specification"</p> <p>The present document establishes the system specifications for the 2nd Generation Interactive DVB Satellite System (DVB-RCS2) and represents the first part of the multi-part specification of that system. It also gives links to the adequate sections into the detailed specification documents and explains how the features must be combined together to make a terminal compliant with different subsets of specifications mentioned here as profiles. General terms and definitions are given in the present document which can be found also in the other parts of the DVBRCS2 multi-part specification.</p>

Table 4-60: Standards DVB-T2

4.3.7.7 SNG

Standard Number	Standard Title
Recommendation ITU-R SNG.770-1	Uniform operational procedures for satellite news gathering (SNG)"
Normative Reference Document	The main features of SNG systems are essentially defined by the uplink characteristics. Operations with the SNG uplink terminal assumes that the receiving side is appropriately dimensioned. To ensure system compatibility and efficient operation, it is necessary to standardize equipment characteristics and operating procedures. The functions of the SNG system are to: ñ transmit with a minimum of impairments, a vision and associated sound or sound programme signal; ñ provide limited receiving capability to assist in pointing the antenna and to monitor the transmitted signals, where possible; ñ provide two-way communication channels for operation.

Table 4-61: Standards DVB-T2

4.3.8 DVB-S2 Receiver Standards

The following Standards need to be considered in the design of the DVB-S2 receiver

Standard Number	Standard Title
ETSI EN 302 307	Digital Video Broadcasting (DVB); Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications (DVB-S2)
ETR 211	<i>Digital broadcasting systems for television, sound and data services; Guidelines on the implementation and usage of DVB service information (SI)</i>
ETSI ES 202 184	<i>MHEG-5 Broadcast Profile</i>
ETSI ETS 300 743	<i>5 DVB System Software Update (SSU)</i>
IEC 60169-2	<i>Radio-frequency connectors – Part 2: Coaxial unmatched connectors</i>
IEC 60728-5	<i>Cable networks for television signals, sound signals and interactive services – Part 5</i>

ETSI TS 101 154 v1.10.1 (2011-06)	Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream
IEC 60065 (Feb 2011)	Audio, video and similar electronic apparatus – Safety requirements
IEC CISPR 13 (Jun 2009)	Sound and television broadcast receivers and associated equipment – Radio disturbance characteristics – Limits and methods of measurement
IEC CISPR 22 (Sept 2008)	Information Technology equipment – Radio disturbance characteristics – Limits and methods of measurement

6 ITU-T Rec. H.222.0 / ISO/IEC 13818-1 (2012)	Information technology – Generic coding of moving pictures and associated audio information: Systems
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7 ITU-T Rec. H.262 / ISO/IEC 13818-2 (2012)	Information technology – Generic coding of moving pictures and associated audio information: Video
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8 ITU-T Rec. H.264 / ISO/IEC 14496-10 (01/2012)	Infrastructure of audio-visual services – Coding of moving video: Advanced video coding for generic audio-visual services
ISO/IEC 13818-3 (Apr 1998)	Information technology — Generic coding of moving pictures and associated audio information- Part 3: Audio
ISO/IEC 14496-3 (Sep 2009)	Information technology — Coding of audio-visual objects — Part 3: Audio
ETSI EN 300 744 v1.6.1 (2009-01)	Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for digital terrestrial television
ETSI EN 302 755 v1.3.1 (2012-04)	Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)
ETSI TR 101 211 v1.9.1 (2009-06)	Digital Video Broadcasting (DVB) Guidelines on implementation and usage of Service Information (SI)
ETSI EN 300 468 v1.13.1 (2012-04)	Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems
ISO/IEC 3166-1	Countries and Subdivisions Codes (2006)
ISO/IEC 8859 Information technology	8-bit single-byte coded graphic character sets (1998)
ETSI EN 300 743 v1.4.1 (2011-10)	Digital Video Broadcasting (DVB); Subtitling systems
ETSI EN 300 472 v1.3.1 (2003-05)	Digital Video Broadcasting (DVB); Specification for Conveying ITU-R System B Teletext in DVB bit-streams
ETSI EN 300 706 v1.2.1 (2003-04)	Digital Video Broadcasting (DVB); Enhanced Teletext Specification
IEC 60169-2 (1995)	Radio-frequency connectors, Part 2: Coaxial unmatched connectors
ITU-R Rec. BT.653-3 (02/1998)	Teletext systems
ETSI TS 102 006 v1.3.2 (2008-07)	Digital Video Broadcasting (DVB); Specification for System Software Update in DVB Systems
ETSI TS 102 366 v1.2.1 (2008-8)	Digital Audio Compression (AC3, Enhanced AC3) Standard

Table 4-62 Receiver Standard DVB-S2

8.1.1 DVB-T2 Transmission Standards

In order to provide a complete standards document for DVB-T2 implementation we propose the following standards to be included for different technical areas of DVB-T2. Please note that we include in addition to the standard normative and informative references which are marked accordingly.

8.1.1.1 *Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)*

Standard Number	Standard Title
ETSI EN 302 755 Standard Document	<p>Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)</p> <p>The present document describes a second generation baseline transmission system for digital terrestrial television broadcasting. It specifies the channel coding/modulation system intended for digital television services and generic data streams. The scope is as follows: • it gives a general description of the Baseline System for digital terrestrial TV; • it specifies the digitally modulated signal in order to allow compatibility between pieces of equipment developed by different manufacturers. This is achieved by describing in detail the signal processing at the modulator side, while the processing at the receiver side is left open to different implementation solutions. However, it is necessary in this text to refer to certain aspects of reception. Versions 1.1.1 and 1.2.1 of the present document [i.7] and [i.8] defined a single profile which incorporates time-slicing but not time-frequency-slicing (TFS). Features which would allow a possible future implementation of TFS (for receivers with two tuners/front-ends) can be found in annex E. It is not intended that a receiver with a single tuner should support TFS. Version 1.3.1 of the present document [i.9] added a T2-Lite profile. This profile is intended to allow simpler receiver implementations for very low capacity applications such as mobile broadcasting, although it may also be received by conventional stationary receivers. The details of this T2-Lite profile are described in annex I. Version 1.3.1 of the present document [i.9] also introduces a name, which is 'T2-base</p>

	<p>profile', for the previous single profile. Version 1.4.1 (the present document) made a number of changes, but all of these are clarifications of particular points, changes in non-normative recommendations, and corrections to the wording; no new technical features have been added and no changes have been made to existing features.</p>
<p>ETSI TS 101 162 Normative Reference</p>	<p>Digital Video Broadcasting (DVB); Allocation of identifiers and codes for Digital Video Broadcasting (DVB) systems</p> <p>The present document defines codes, and identifiers (also referred to as code points) used in DVB systems. These codes are allocated by the DVB Project Office at the request of potential service providers and once allocated, become part of EN 300 468 [i.1] by reference. Further details can be obtained by contacting DVB Services Sàrl.</p> <p>DVB Services Sàrl c/o EBU L'Ancienne Route 17a CH-1218 Grand-Saconnex Switzerland</p> <p>Tel: +41 22 717 27 19</p> <p>Email: info@dvbservices.com</p> <p>Web: http://www.dvbservices.com</p>
<p>ETSI TS 102 992 Normative Reference</p>	<p>Digital Video Broadcasting (DVB); Structure and modulation of optional transmitter signatures (T2-TX-SIG) for use with the DVB-T2 second generation digital terrestrial television broadcasting system</p> <p>The present document describes an optional extension to the DVB-T2 second-generation transmission system for digital terrestrial television broadcasting, as specified in [1]. This extension takes the form of the addition of transmitter signature information, and is primarily intended for use in single-frequency networks (SFNs). The extension is made in ways which are fully compatible with the original specification by exploiting some of its explicit provisions for future expansion. The primary purpose of the addition of transmitter-signature information described herein is to assist network operators with the setting-up, maintenance, monitoring and fault-finding of their networks, by making it possible to identify the individual contributions of different transmitters within a single-frequency network. However, once it is present the transmitter-signature information could also be used for other purposes, e.g. applications requiring location information. The present document specifies the details of the additional signals, and must be read in conjunction with the DVB-T2 specification [1] for full</p>

	understanding. In order to accommodate different purposes, and different scales of networks, various options are provided; network operators can select from them to suit their requirements.
ETSI EN 300 429 Informative Reference Document	Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for cable systems

Table 4-63: Standards DVB-T2

8.1.1.2 Video & Audio Coding

Standard Number	Standard Title
ISO/IEC 13818-1 Normative Reference Document	"Information technology - Generic coding of moving pictures and associated audio information: Systems" The systems part of this Recommendation International Standard addresses the combining of one or more elementary streams of video and audio, as well as other data, into single or multiple streams which are suitable for storage or transmission. Systems coding follows the syntactical and semantic rules imposed by this Specification and provides information to enable synchronized decoding of decoder buffers over a wide range of retrieval or receipt conditions.
ISO/IEC 14496 Informative Reference Document	Coding of audio-visual objects (MPEG-4) MPEG-4 is a method of defining <u>compression</u> of audio and visual (AV) digital data. It was introduced in late 1998 and designated a <u>standard</u> for a group of <u>audio</u> and <u>video coding</u> formats and related technology agreed upon by the <u>ISO/IEC Moving Picture Experts Group (MPEG) (ISO/IEC JTC1/SC29/WG11)</u> under the formal standard ISO/IEC 14496 – <u>Coding of audio-visual objects</u> . Uses of MPEG-4 include compression of AV data for web (<u>streaming media</u>) and <u>CD</u> distribution, voice (<u>telephone, videophone</u>) and <u>broadcast television</u> applications.

Table 4-64: Standards DVB-T2

8.1.1.3 Service information

Standard Number	Standard Title
ETSI EN 300 468 Normative Reference Document	"Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems" The present document specify the Service Information(SI) data which forms part of DVB bitstreams, in order that the user can be provided with information to assist in the selection of service and/or event within the bitstream, and so that the Integrated Receiver Decoder (IRD) can automatically configure itself for the selected service. SI data for automatic configuration is mostly specified within ISO/IEC 13818-1.

Table 4-65: Standards DVB-T2

8.1.1.4 Modulator Interface (T2-MI) for a second generation digital terrestrial television broadcasting system (DVB-T2)

Standard Number	Standard Title
ETSI TS 102 773 V1.3.1 published in January 2012. Informative Reference Document	DVB-T2 modulator interface The present document defines the interface to a modulator for a second generation terrestrial television system (DVB-T2). The present document also describes a mechanism to allow the operation of over the air regenerative repeaters in SFN or non-SFN networks.

Table 4-66 Standard DVB-S2

8.1.1.5 Generic Stream Encapsulation

Standard Number	Standard Title
ETSI TS 102 606 Normative Reference Document	"Digital Video Broadcasting (DVB); Generic Stream Encapsulation (GSE) Protocol" The present document includes the definition of the Generic Stream Encapsulation (GSE) protocol, which allows for efficient encapsulation of IP and other network layer packets

	<p>over a “generic” physical layer. Such a “generic” physical layer is intended as a transport mode that carries a sequence of data bits or data packets, possibly organized in frames, but with no specific timing constraints. The first generation of DVB standards only supported data transport using the MPEG format (see ISO/IEC 13818-1 [2]), with a Transport Stream packet multiplex (MPEG-TS). Multi Protocol Encapsulation (EN 301 192 [3]) is the DVB standard for encapsulation of audio/video and other content on MPEG-TS packets. The second generation of DVB standards features backwards compatibility modes for carrying MPEG-TS as well as generic modes for carrying arbitrary packets of variable length. These are referred to as Generic Streams (GS). The GSE protocol has been devised as an adaptation layer to provide network layer packet encapsulation and fragmentation functions over Generic Stream. GSE provides efficient encapsulation of IP datagrams over variable length Layer 2 packets, which are then directly scheduled on the physical layer into Base Band frames.</p> <p>Also refer to ETSI TS 102 606-1 V1.1.1 & ETSI TS 102 606-2 V1.1.1 & ETSI TS 102 606-3 V1.1.1</p>
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Table 4-67 Standard DVB-S2

8.1.1.6 Implementation guidelines for a second generation digital terrestrial television broadcasting system (DVB-T2)”

Standard Number	Standard Title
ETSI TS 102 831 Normative Reference Document	<p>"Digital Video Broadcasting (DVB); Implementation guidelines for a second generation digital terrestrial television broadcasting system (DVB-T2)"</p> <p>The present document gives guidelines for the implementation of all aspects of the DVB-T2 end-to-end chain. This includes: • the parts of the system defined by the physical layer system specification [i.1]; • aspects of the input pre-processing, which is outside the scope of [i.1]; • the modulator interface (or T2-MI) specification; • future developments including a possible Transmitter Identification (TxID) standard. The scope includes guidance relevant to implementers of T2-gateways, modulators, transmitters, receivers and tuners; network planners or operators; and broadcasters.</p>

Table 4-68 Standard DVB-T2

Standard Number	Standard Title
<p>ETSI EN 300 744 & later versions.</p> <p>Normative Reference Document</p>	<p>Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for digital terrestrial television</p> <p>The present document describes a baseline transmission system for digital terrestrial TeleVision (TV) broadcasting. It specifies the channel coding/modulation system intended for digital multi-programme LDTV/SDTV/EDTV/HDTV terrestrial services. The scope is as follows: - it gives a general description of the Baseline System for digital terrestrial TV; - it identifies the global performance requirements and features of the Baseline System, in order to meet the service quality targets; - it specifies the digitally modulated signal in order to allow compatibility between pieces of equipment developed by different manufacturers. This is achieved by describing in detail the signal processing at the modulator side, while the processing at the receiver side is left open to different implementation solutions. However, it is necessary in this text to refer to certain aspects of reception. In order to address Handheld terminals (DVB-H) in annexes are provided: - an additional 4K Mode offering supplementary options for network planning (annex F); - an optional in-depth inner interleaver, to mitigate the effects of the high level of man-made noise affecting the reception of DVB-H services (annex F); - an extension of the Transmission Parameter Signalling (TPS) information for signalling DVB-H Services (annex F); - the transmission parameters to operate the transmission system in 5 MHz channel bandwidth, even outside of the traditional broadcasting bands (annex G)</p>

Table 4-69 Standard DVB-T2

8.1.2 DVB-T2 Receiver Standards

The following Standards need to be considered in the design of the DVB-T2 receiver

Standard Number	Standard Title
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ETSI 302 755	Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)
ETR 211	Digital broadcasting systems for television, sound and data services; Guidelines on the implementation and usage of DVB service information (SI)
ETSI ES 202 184	MHEG-5 Broadcast Profile
ETSI ETS 300 743	9 DVB System Software Update (SSU)
IEC 60169-2	Radio-frequency connectors – Part 2: Coaxial unmatched connectors
IEC 60728-5	Cable networks for television signals, sound signals and interactive services – Part 5
ETSI TS 101 154 v1.10.1 (2011-06)	Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream
IEC 60065 (Feb 2011)	Audio, video and similar electronic apparatus – Safety requirements
IEC CISPR 13 (Jun 2009)	Sound and television broadcast receivers and associated equipment – Radio disturbance characteristics – Limits and methods of measurement
IEC CISPR 22 (Sept 2008)	Information Technology equipment – Radio disturbance characteristics – Limits and methods of measurement

10 ITU-T Rec. H.222.0 / ISO/IEC 13818-1 (2012)	Information technology – Generic coding of moving pictures and associated audio information: Systems
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11 ITU-T Rec. H.262 / ISO/IEC 13818-2 (2012)	Information technology – Generic coding of moving pictures and associated audio information: Video
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12 ITU-T Rec. H.264 / ISO/IEC 14496-10 (01/2012)	Infrastructure of audio-visual services – Coding of moving video: Advanced video coding for generic audio-visual services
ISO/IEC 13818-3 (Apr 1998)	Information technology — Generic coding of moving pictures and associated audio information- Part 3: Audio
ISO/IEC 14496-3 (Sep 2009)	Information technology — Coding of audio-visual objects — Part 3: Audio
ETSI EN 300 744 v1.6.1 (2009-01)	Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for digital terrestrial television
ETSI EN 302 755 v1.3.1 (2012-04)	Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)
ETSI TR 101 211 v1.9.1 (2009-06)	Digital Video Broadcasting (DVB) Guidelines on implementation and usage of Service Information (SI)
ETSI EN 300 468 v1.13.1 (2012-04)	Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems
ISO/IEC 3166-1	Countries and Subdivisions Codes (2006)
ISO/IEC 8859 Information technology	8-bit single-byte coded graphic character sets (1998)
ETSI EN 300 743 v1.4.1 (2011-10)	Digital Video Broadcasting (DVB); Subtitling systems
ETSI EN 300 472 v1.3.1 (2003-05)	Digital Video Broadcasting (DVB); Specification for Conveying ITU-R System B Teletext in DVB bit-streams
ETSI EN 300 706 v1.2.1 (2003-04)	Digital Video Broadcasting (DVB); Enhanced Teletext Specification
IEC 60169-2 (1995)	Radio-frequency connectors, Part 2: Coaxial unmatched connectors
ITU-R Rec. BT.653-3 (02/1998)	Teletext systems
ETSI TS 102 006 v1.3.2 (2008-07)	Digital Video Broadcasting (DVB); Specification for System Software Update in DVB Systems
ETSI TS 102 366 v1.2.1 (2008-8)	Digital Audio Compression (AC3, Enhanced AC3) Standard

Table 4-70: Standards DVB-T2 Receiver

