



**Electromagnetic compatibility and
Radio spectrum Matters (ERM);
Report of the CENELEC/ETSI Joint Working Group
in response to the EC letter
ENTRP/F5/DP/MM/entr.f5.(2013)43164 to the ESOs**

CENELEC

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Contents

Intellectual Property Rights	6
Foreword.....	6
Modal verbs terminology.....	7
Executive summary	7
Introduction	7
1 Scope	9
2 References	9
2.1 Normative references	9
2.2 Informative references.....	9
3 Definitions, symbols and abbreviations	13
3.1 Definitions.....	13
3.2 Symbols.....	13
3.3 Abbreviations	13
4 Descriptions of the new systems operating in the 800 MHz band and expected in the 700 MHz band	15
4.1 LTE Idle Mode	15
4.2 Spectrum emission mask	15
5 Descriptions of the interference mechanisms for the existing services operating in the 800 MHz band and those expected in the 700 MHz band.....	15
5.1 Digital Terrestrial Television Broadcasting	15
5.1.1 Radio issues	15
5.1.2 EMC issues	16
5.1.2.1 RF cabling.....	16
5.1.2.2 Components for private and communal aerial systems antennas	16
5.1.2.3 Aerial amplifiers and splitter amplifiers.....	16
5.2 Impact from the Mobile Broadband Service (LTE) on the SRD in the frequency band 863 MHz - 876 MHz (Short Range Devices)	17
5.2.1 Definition of a Short range Device (SRD).....	17
5.2.2 Spectrum use within 800 MHz	17
5.2.3 LTE and SRDs Co-existence analysis	18
5.2.3.1 ECC Report 207	18
5.2.3.2 Additional simulation analysis from ETSI ERM/MSG TFES	18
5.2.4 Experience of the LTE800 network deployment in France	18
5.2.5 RFID	19
5.2.6 Improvements for SRDs	19
5.2.7 Improvements for LTE UE	19
5.3 Private/Professional Mobile Radio (PMR).....	20
5.3.1 Wireless broadband relevant to PMR systems.....	20
5.3.2 Potential future use of the 700 MHz for PPDR.....	20
5.3.3 PMSE.....	21
5.3.3.1 PMSE Definition.....	21
5.3.3.2 Spectrum Use	21
5.3.4 Assistive Listening Devices (ALDs).....	21
6 Relevant harmonised standards	21
6.1 List of standards	21
6.2 Further information on the update of standards.....	22
6.2.1 Update of ETSI EN 301 908-13.....	22
6.2.2 Definition of Spectrum Emission Mask requirements in ETSI TS 136 101 and ETSI EN 301 908-13	22
6.2.3 RFID standard ETSI EN 302 208	23
6.2.4 Update of PMSE standards	23
6.2.5 Update of PMR standards.....	23
6.3 Need for a new harmonised radio standard	24

7	Remaining issues	24
7.1	Classification system for ready-made cable/connectors	24
7.2	Performance characteristics of TV connectors	24
7.3	Further RFID analysis	24
7.4	Further work on twisted pair wired systems	24
8	Conclusion.....	24
Annex A:	Letter from the Commission	26
Annex B:	LTE signal	29
B.1	LTE signal structure	29
B.2	BS idle signals.....	30
B.3	E-TM2 and E-TM2/"LTE_BS-idle_V2" comparison	31
Annex C:	LTE band 20 devices and SRD coexistence	35
C.1	LTE Out of Band Emissions Specifications	35
C.2	SRD Rx performance specifications	36
Annex D:	Experience of LTE800 networks deployment in France	38
Annex E:	Technical details and proposals: LTE & TV co-existence	39
Annex F:	Impact from the Mobile Broadband Service (LTE) on the SRD in the frequency band 863 MHz - 876 MHz (Short Range Devices) - TRP modelling and simulation results	42
F.1	LTE and SRDs Co-existence analysis in ECC Report 207	42
F.2	Review of Simulation analysis in ECC Report 207	43
F.2.1	Assumptions on the SRD wanted signal distribution (dRSS).....	43
F.2.2	Number of LTE (interfering) UEs in 10 MHz.....	43
F.2.3	Activity Factor of the LTE (interfering) UEs	44
F.3	Additional Simulation Analysis for the Co-existence of LTE and SRDs within the 800 MHz band	45
F.3.1	Simulation Assumptions & Methodology	45
F.3.2	Simulation Results.....	46
F.3.2.1	Results for SRD Rx Cat.2 Metering	46
F.3.2.2	Results for SRD Cat. 2 Audio.....	47
F.4	Conclusions & Summary on the impact from LTE on SRD from the additional simulation.....	48
F.4.1	Summary of Observations on Simulation Assumptions and Methodology	48
F.5	Simulation modelling of LTE UE's TX power distribution in 832 - 862 MHz adjacent to SRDs (863 - 870 MHz).....	48
F.5.1	TRP Measurement.....	48
F.5.2	TRP Distribution Analysis	49
F.5.3	Proposed TRP Distribution	49
F.5.4	Conclusions & Summary on the simulation modelling of LTE UE's TX power distribution in 832 - 862 MHz adjacent to SRDs (863 - 870 MHz).....	50
F.6	Results based on TRP modelling and an improvement of the LTE UE spectrum emission mask by 3 dB	51
F.7	Proposal.....	53
Annex G:	Effect of interference to RFID by OOB emissions from LTE UE	54
G.1	Environment for 863 - 870 MHz Short Range Devices	54
G.2	Investigation into the effects of LTE UE on RFID	54
Annex H:	Wireless broadband relevant to PMR systems.....	57

H.1	Description of LTE Signals	57
H.2	PMR Immunity Measurements	64
H.2.1	Definition of immunity test signals	64
H.2.2	Categorization of Radio Frequency immunity of current equipment	64
H.2.2.1	Test Method	64
H.2.2.2	Results of the measurements	64
H.2.2.3	Implications of the measurements	66
Annex I:	Detailed information on PMSE and ALDs	67
Annex J:	Change History	69
History		70

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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been produced by the CENELEC- ETSI Joint Working Group (JWG) in response to the letter from the European Commission dated the 13th February 2013 (see annex A). The letter requested CENELEC and ETSI to undertake the following standardisation activities:

- a) Revise or develop harmonised standards conferring presumption of conformity with the EMC Directive and/or R&TTE Directive [i.26], and/or European standards covering the following aspects:
 - 1) Improved immunity of all broadcast receivers operating in the whole frequency bands 174 - 230 MHz and 470 - 862 MHz including in particular digital terrestrial TV and satellite TV receivers. This implies a new revision of CENELEC EN 55020 [i.2] including reconsideration of the scope of the so-called "exclusion band" in the context of new uses of spectrum, and should cover in particular immunity against signals with discontinuous transmission such as the «idle mode» of LTE equipment operating in the 800 MHz band (see below under b)). A European modification of the future CENELEC EN 55035 [i.36] improving immunity at enclosure and antenna ports is also to be considered.

Selectivity of TV receivers has been covered by existing test suites already developed in Europe (e.g. DTG D-Book 7, Nordig, E-book), and these could be used as the basis for improved antenna port immunity requirements in both CENELEC EN 55020 [i.2] and the future CENELEC EN 55035 [i.36].

 - 2) Improved immunity and related specifications of other equipment relevant in the reception of digital terrestrial TV services, i.e. amplifiers, passive equipment and filters, especially the immunity of equipment operating below 790 MHz to LTE signals in the 800 MHz band.
 - 3) To investigate improved robustness of SRD and suitable mitigation techniques in order to enhance the sharing environment between LTE and short-range devices operating in the 800 MHz and adjacent bands.
- b) Revise or develop harmonised standards conferring presumption of conformity with the R&TTE Directive [i.26] and/or European standards covering the following aspects:
 - Improved characterization, revision of requirements and appropriate reduction of out of band emissions of LTE equipment. In particular, a comprehensive definition of the idle mode emissions mentioned in item a) above 1 is required.

These standardisation activities should take place, where appropriate, under available standardisation mandates issued in support of the EMC Directive [i.43] and R&TTE Directive [i.26]. In all cases, close co-operation with ECC is to be considered as essential.

Such standardisation efforts are critical for a timely and comprehensive exploitation of the potential of wireless broadband in the 800 MHz band for citizens, business and public services. Taking into account that novel standards proposed to manufacturers generally need at least 18 months before they can reach the market it is urgent that the relevant standards are updated as soon as possible.

Modal verbs terminology

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Executive summary

The present document is developed jointly by CENELEC and ETSI in response to the EC letter ENTRP/F5/DP/MM/entr.f5.(2013)43164 to the ESOs. The text of the letter is given in annex A of the present document.

The interference situation between the mobile service and the existing services in the 800 MHz band was considered and is addressed in the present document.

NOTE: More detailed information on the interference assessment is provided in several annexes of the present document.

Initial assumptions were made for the future situation in the 700 MHz band, even though the new services in this band are not standardised yet.

Some issues for further investigation and also a need for a new standard for terrestrial TV mast head amplifiers were identified.

The resulting activities, which were also asked by the EC letter, are:

- ETSI EN 301 908-13 [i.14] will be updated with a SEM reduction of 3 dB.
 - ETSI EN 300 220 [i.35] will be updated deleting the Cat 3 for the 863 - 870 MHz band. Cat. 2 will therefore become the minimum performance and investigation on the possible introduction of a new Category 1,5 are ongoing.
 - New Harmonised Standards will be created for satellite and terrestrial broadcasting TV receivers.
 - Cable networks were addressed under the work of JWG DD [i.1].
-

Introduction

The present document has been produced jointly between CENELEC and ETSI addressing the objectives as given in the scope.

The present document presents in clause 4 a description of the new systems operating in the 800 MHz band and those expected in the 700 MHz band.

Clause 5 is a description of interference mechanisms for the different services operating in the 800 MHz band and those expected in the 700 MHz covering in its subclauses the mobile, digital terrestrial television broadcasting, as well as the impact on short range devices in the band 863 - 876 MHz band and the private/professional mobile radio (PMR).

Clause 6 presents the relevant harmonised standards recognized needing to be updated and recommendations for development of any new standardisation work.

Clause 7 presents information on a list of issues identified that are not covered by the present document but are recommended to be addressed.

Clause 8 presents a conclusion with the key points arising from the present document with an Executive Summary included at the beginning of the present document produced as a summary also for the European Commission.

Detailed supporting information for each of the main clauses above are provided in corresponding annexes to the present document.

Background information on the JWG DD, that also worked on the 800 MHz band:

The updating of the relevant standards for cable network systems had already been fulfilled by the work of CENELEC TC 210 and TC 209 as was identified by the JWG on Digital Dividend (DD) [i.1].

With regards to Cable Systems JWG DD identified that LTE800 (790 - 862 MHz) disturbed consumer services where LTE800 is operated in coexisting and adjacent channels. ETSI or CENELEC has not itself verified level of disturbance to consumer services caused by LTE800 however this has been demonstrated by third party laboratory testing and some field testing. Furthermore the details are documented from the reports produced during the JWG DD. Recommendations arising from the output of JWG DD resulted in changes to the relevant standards with the assessment completed and the harmonised standards CENELEC EN 55020 [i.2] and CENELEC EN 50083-2 [i.3] adapted to the new requirements. There is no requirement for any further standardisation work. Any changes in existing radio environment from new mobile use cases would need further investigation.

The experiences from the studies given below in the present document on the 800 MHz band may support the potential implications to the 700 MHz, for example:

- The EC decision [i.4] on 800 MHz had an impact on cable networks, however this is manageable for existing equipment for examples as in Austria and Netherlands where the Authorities encouraged the mobile LTE operators to manage the disturbance to cable consumer services in cooperation with the Cable Operators. Furthermore in Austria the criteria used is the relevant CENELEC Standards for Cable.
- In the first draft JWG report [i.1], the Mobile Operator stated that the very high transmit power described in the CEPT report 30 [i.5] is not usable in many networks. Due to planning reasons and coexistence with the adjacent signals from the other mobile operators the output transmission power has to be reduced which are operational requirements.
- The recommendations [i.6] for updating CENELEC standards resulted in new values within CENELEC EN 55020 Amendment 11 [i.2] and the new version of the CENELEC EN 50083-2 [i.3]. In the work of this standardisation projects all relevant stakeholders were involved and accepted the new requirements.
- Due to the fact that the band plan for 700 MHz is not agreed yet and the services in this band are not known or standardised yet it is hard to assess the impact on cable networks. Without a clear assessment on the different technologies no predictions can be made at this point of time.
- The changes done to CENELEC EN 55020 [i.2] and the CENELEC EN 50083-2 [i.3] may also be sufficient to have the cable services coexisting with new services in the 700 MHz band if the technical decisions for mobile services in 700 MHz band are such that they aim to maintain the same level of performance as today for mobile in 800 MHz band. This consideration is based on the improved propagation characteristics in frequencies below 790 MHz band such that a reduction in the BS and UE transmit power levels is feasible.

1 Scope

The present document:

- investigates and documents anticipated and/or planned changes in frequency use in the band 470 MHz - 862 MHz including the relevant characteristics of the expected radio technologies to be deployed in these and neighbouring bands, in particular the 863 - 870 MHz band used by Short-Range Devices (SRD);
- develops a description of the emerging electromagnetic environment in the above bands and evaluate how these changes will affect the co-existence services, systems and equipment;
- makes recommendations to the CENELEC and ETSI committees to revise affected Harmonised Standards and other European Standards as necessary to improve to co-existence of relevant services and equipment.

The present document is developed jointly by CENELEC and ETSI in response to the EC letter ENTRP/F5/DP/MM/entr.f5.(2013)43164 to the ESOs. The text of the letter is given in annex A of the present document.

The letter of the European Commission mentions the band 174 - 230 MHz with regard to the broadcast receivers. This does not imply any intention to modify the 174 - 230 MHz band. The band does not fall under the scope of the present document.

2 References

2.1 Normative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] Report on CENELEC/ETSI Joint Working Group on the Digital Dividend.

NOTE: Available at <http://ec.europa.eu/DocsRoom/documents/10530/attachments/1/translations/en/renditions/native>.

[i.2] CENELEC EN 55020:2007/A.1:2011: "Sound and television broadcast receivers and associated equipment - Immunity characteristics - Limits and methods of measurement".

[i.3] CENELEC EN 50083-2: "Cable networks for television signals, sound signals and interactive services - Part 2: Electromagnetic compatibility for equipment".