# Technical Framework Development

## 1800 MHz Spectrum Licence Band

**TLG-Discussion Paper No. 1**

**Design Requirements for the Technical Framework**

**Reference Technologies / Standard Trading Units / Core Conditions**

Document Release Information

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| Version | Date of Release | Remarks |
| 1 | 20/07/2011 | Initial Release |
| 2 | 2/09/2011 | Includes amendment to MCB and non-spurious out-of-band emission limits |
| 3 | 20/11/2011 | Includes amendment to non-spurious out-of-band emission limits by specifying a linear reduction between certain offsets |

## Background

The technical framework of a Spectrum Licence consists of the following 3 interlocking components:

* The Marketing or Conversion Plan including the Draft Licence;
* The Section 145 Determination of Unacceptable Interference; and
* The Section 262 Advisory Guidelines.

The technical framework defines the spectrum licence asset and its relationship to other spectrum users. In doing so the framework provides arrangements to manage interference and provide legal certainty about licensee rights.

The objectives of technical frameworks are to:

* minimise the negotiation necessary between licensees;
* maximise flexibility for the deployment of services; and to
* maximise the efficiency with which the spectrum is used.

The technical framework of the spectrum licence is developed by the ACMA to fulfil its requirements under the *Radiocommunications Act 1992, the Act*. The framework is developed by ACMA in consultation with industry through the Technical Liaison Group (TLG).

The 1800 MHz spectrum licence band consists of the paired frequency bands 1710-1785 MHz / 1805-1880 MHz (the 1800 MHz band). The entire 1800 MHz band is spectrum licensed in major capital city areas, while only the range 1710-1725 MHz / 1805-1820 MHz is available in regional areas. The 1800 MHz band is not designated for spectrum licensing in remote areas.

The original technical framework was optimised for the use of Personal Communications Services (PCS), with GSM deemed to be the most likely technology to be used by operators.

Spectrum licences in the 1800 MHz band were allocated following two auction processes held in 1998 and 2000. The first allocation in the band was the 1710-1755 MHz / 1805-1850 MHz band in 1998 in major capital city and regional areas. The second allocation in the band was the 1755-1875 MHz / 1850-1880 MHz bands in 2000 in major capital city areas only. Fifteen year licences were issued at each of these allocations, resulting in different expiry dates for the two tranches of spectrum, being 2013 and 2015 respectively.

The Australian Communications and Media Authority (the ACMA) considers that the upcoming expiry of these spectrum licences provides an opportunity to review the current technical framework to determine if any changes are required or possible, to ensure suitable and efficient use for a further 15 years. Any amendments to the technical framework should allow the ongoing use of the current technologies in the band as well as support the deployment of future technologies.

## Introduction

This discussion paper looks at the following items;

* the reference technologies;
* the standard trading unit and minimum contiguous bandwidth;
* the out-of-area emission limit; and
* the out-of-band emission limits.

The last two items, together with the frequency and geographic boundaries, make up the core conditions of the spectrum licence as defined in Section 66 of *the Act*. This discussion paper examines each of these four items of the framework, considering the specifications of the reference technologies and the proposed arrangements to support future technologies while being mindful of the need to enable existing services to operate.

This is a discussion paper and the views and suggestions of the members of the technical liaison group are sought as to the relevance and suitability of the proposed values. Table 1 below provides a high level overview of the proposed changes in this paper.

Table 1 – overview of the proposed changes in this discussion paper

| **Item** | **Proposed change** |
| --- | --- |
| Standard Trading Unit (STU) | * Frequency component changed to 1 Hz (essentially removing it from the trading requirements) * Increase resolution of geographical component to 5 minutes Australia wide |
| Minimum Contiguous Bandwidth (MCB) | Currently no MCB defined, by default MCB equals one STU (2.5 MHz). Proposed to define MCB at 5 MHz and make it independent of the STU. Will also become a ‘recommended’ value, the ACMA can grant exemptions on a case by case basis. |
| Core Condition – Out-of-area emission limit | Unchanged |
| Core Condition – Non-spurious emission limit within the 1800 MHz band | Relaxed at frequency offsets between 0.2-1 MHz and greater than 5.8 MHz to account for higher out-of-band emissions from the reference technologies and the practical limitations of additional filtering. |
| Core Condition – Non-spurious emission limit outside the 1800 MHz band | * Relaxed at frequency offsets between 0-0.9 MHz and greater than 5.6 MHz at the 1785, 1805 and 1880 MHz boundaries to account for higher out-of-band emissions from the reference technologies and the practical limitations of additional filtering, as well as considering co-existence with services outside the spectrum licence band. * Unchanged at the 1710 MHz frequency boundary to maintain co-existence with adjacent band Earth station receivers |
| Core Condition – Spurious emission limit | Unchanged |

## Reference Technologies

There are five reference technologies that will be considered in the review of the framework, as shown below in Table 2.

Table 2 – reference technologies

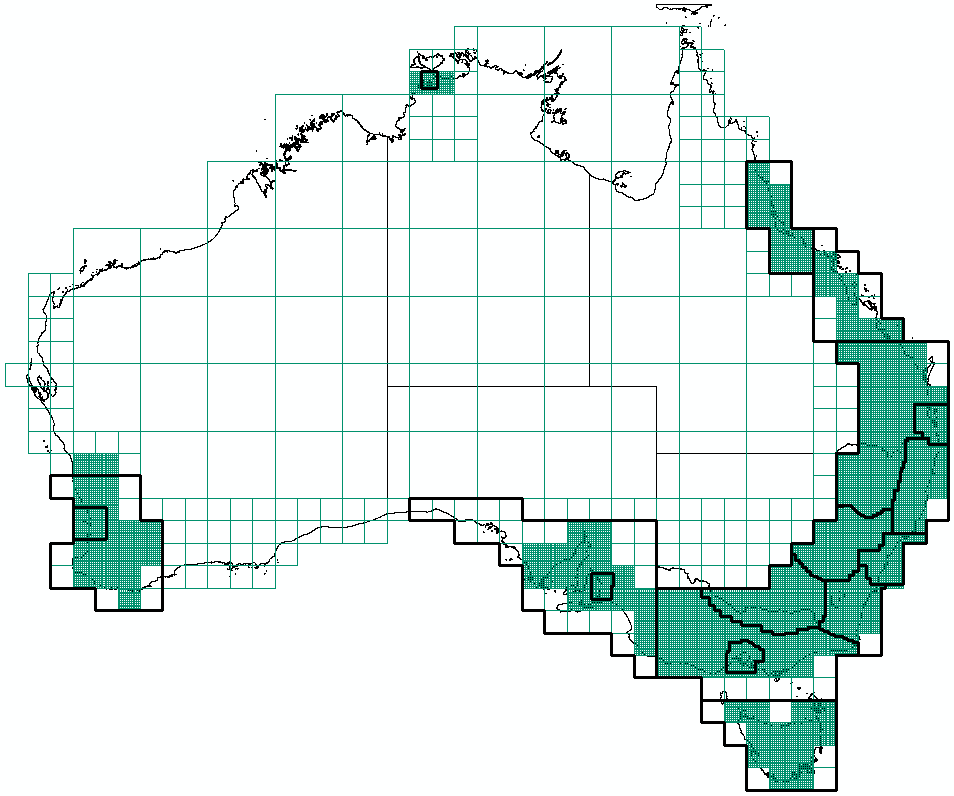
|  |  |
| --- | --- |
| **Reference Technology** | **Applicable standards and reports** |
| UMTS  (UTRA, WCDMA, HSPA, HSPA+) | ITU-R Report M.2039-2, 3GPP TS 25.101, 3GPP TS 25.104, 3GPP TS 24.942, ECC Report 82 |
| LTE  (E-UTRA, LTE-Advanced) | ITU-R Report M.2039-2, 3GPP TS 36.101, 3GPP TS 36.104, 3GPP TS 36.942, CEPT Report 40 |
| GSM  (GPRS, EDGE, GSM-R) | 3GPP TS 45.005, 3GPP TS 51.021, 3GPP TR 03.30 |
| WiMAX  (IEEE 802.16) | ITU-R Report M.2039-2, CEPT Report 40, WMF-T23-005-R015v04 |
| Multi-carrier CDMA  (CDMA2000, EV-DV, EV-DO, HRPD) | ITU-R Report M.2039-2, ITU-R Rec. M.1580, ITU-R Rec. M.1581, TIA-97-C |

This does not exclude other technologies from being used under the framework. Rather, it is proposed that the framework will be reviewed with specific reference to these five technologies.

## Standard Trading Unit and Minimum Contiguous Bandwidth

Current spectrum licence technical frameworks are based on use of a Standard Trading Unit (STU) that defined the minimum unit for the trading of spectrum under spectrum licensing. The size of the STU is defined in terms of both geographic area and frequency bandwidth. The geographic area was defined using the ACMA’s Spectrum Map Grid that was referenced to the Australian Geocentric Datum AGD66. See Figure 1.

Figure 1 – Current geographical STU



The ACMA in its ongoing review of spectrum license technical frameworks[[1]](#footnote-1) has decided to move away from specifying an STU in each band to increase flexibility and better facilitate secondary trading particularly in remote and regional areas. As part of this move ACMA has decided to adopt a uniform 5 minutes of arc map grid and using coordinates specified using the current Australian datum used for mapping and surveying.

Since 2000, all spatial data published by the Commonwealth and state surveying and mapping agencies – excepting unrevised historic data – has used the Geocentric Datum of Australia 1994 (GDA94). GDA94 is an Earth-centred datum compatible with satellite-based navigation systems and other major international geographic systems, such as the World Geodetic System 1984 (WGS84).

The ACMA is currently in the process of updating its systems to make use of the Geocentric Datum of Australia GDA94 across its entire radiocommunications database. This new datum provides better alignment with the coordinates generated by the GPS system among other advantages. The change of datum however leads to a non uniform translation of points along a line so altering the shape and areas within the grid. It has been decided to minimise the impact of this by aligning old and new licence areas at the corners of the grid to minimise changes in licence areas. For more information see the TLG reference paper *Adoption of GDA94 for spectrum licensing*.

### 4.1 Frequency STU and MCB

The frequency STU is the smallest unit of spectrum that can be traded, and currently any trade must also consist of whole multiples of this unit. The current STU in the 1800 MHz band is set at 2.5 MHz. While the frequency STU has been important in the derivation of technical framework conditions, it has been assessed that this requirement places unnecessary restrictions on secondary trading of spectrum while not providing any ongoing technical benefit. It is therefore proposed that the frequency STU be changed to 1 Hz, essentially removing it from the 1800 MHz band technical framework.

This change while increasing spectrum trading flexibility could also lead to fragmentation in the band. Specifying a recommended Minimum Contiguous Bandwidth (MCB) in the 1800 MHz band will help prevent fragmentation through ensuring the minimum amount of contiguous spectrum per licence is maintained as a result of a trade. No MCB is currently defined for the 1800 MHz band.

As there is no defined MCB under the current framework, by default it is set to equal one STU, i.e. 2.5 MHz, which is also the minimum bandwidth of current spectrum allocations in the band. As it is proposed to change the STU value to 1 Hz, it is therefore proposed to defined the MCB independent of the STU.

Typically the MCB under a spectrum licence has been chosen based on both system technical requirements and marketing goals. From a technical perspective, the MCB should be the minimum bandwidth required to support a service. For example, sufficient aggregated bandwidth needs to be provided to give a licensee enough channels to support a practical or viable system.

In consideration of the reference technologies it is proposed to increase the MCB size from 2.5 MHz to 5 MHz. Although some of the reference technologies allow for channel bandwidths of less than 5 MHz, 5 MHz is recognised as the minimum required bandwidth to provide a viable service. It is also consistent with minimum block sizes in bands where IMT technologies are used internationally.

To further enhance trading flexibility the amended *Radiocommunications (Trading Rules for Spectrum Licences) Determination 1998* will define the MCB as a ‘recommended’ value. Any spectrum trades where the resultant licences have a contiguous bandwidth of less than the recommended MCB will not be allowed unless approved by the ACMA.

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| It is proposed to:   * Define an MCB of 5 MHz for the technical framework of the 1800 MHz spectrum licence band; however it will be re-defined as a ‘recommended’ MCB. Approval from the ACMA is required for any spectrum trades that result in licences with contiguous bandwidths of less than 5 MHz. * Change the frequency component of the STU to 1 Hz, essentially removing this item from the trading requirements. * Increase the resolution of the geographical STU to a 5x5 minute cell size Australia-wide. |

## Out-of-area Emission Limit (a licence core condition)

Emissions that fall outside the geographic area of a spectrum licence are limited by a core condition of the licence. The form of this condition (found in the draft licence in the marketing plan) places a limit on the horizontally radiated true mean power anywhere in the area of the licence and thus towards adjacent licences.

Expressing the limit this way helps to control the maximum level of radiated signal from stations within the licence area. The limit directly affects the risk of receiver overload and the levels of site generated intermodulation products that may cause interference to receivers in close proximity. However this gross value is typically unsuitable for coordination between co-frequency adjacent areas.

The out-of-area emission limit in the licence is generally chosen to encompass transmitter powers likely to be implemented while allowing for likely technology developments. This provides continuing flexibility of the technical framework by enabling technologies and system configurations not foreseen in the development of the framework to be deployed.

### 5.1 Current arrangements

The current out-of-area emission limit in the 1800 MHz band is an EIRP of 54.5 dBm/30kHz. This level was agreed during the TLG process for the first 1800 MHz band spectrum licences based on a high powered regional GSM base station. In comparison, wideband IMT technologies typically operate using a lower power spectral density than narrow band GSM services.

### 5.2 Proposed Out-of-Area Emission Limit

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| It is proposed to maintain the current out-of-area emission limit of a horizontally radiated maximum true mean power of 54.5 dBm/30 kHz EIRP for licences in the 1800 MHz band. |

Typical IMT technologies have a lower power spectral density than the proposed out-of-area limit. Maintaining the current level will allow the continued use of GSM as well as providing a buffer to cover future technological development over the period of the licence.

This limit is slightly less than that found in the 2 GHz (55 dBm/30kHz EIRP) and slightly greater than that in the 3.4 GHz (52 dBm/30 kHz EIRP) spectrum licence.

**6** Out-of-band Emission Limits (a licence core condition)

The out-of-band emission limits are a core condition of the licence. These limits control emissions affecting licensees in adjacent geographic holdings across the frequency boundaries of the licence. These limits also include requirements for both non-spurious unwanted emissions and spurious emissions.

Non-spurious unwanted emissions are modulation-generated noise or intermodulation products caused by the transmission of information, or broadband noise generated by the transmitter. Spurious emissions are emissions including intermodulation products, harmonics and frequency conversion products not associated with the transmission of information by the transmitter.

### 6.1 Current Limits

The current framework specifies both spurious and non-spurious out-of-band emission limits. Different non-spurious limits are specified for emissions inside the 1800 MHz band (applicable to frequency offsets from the licence band edges) and those outside the band (applicable to frequency offsets from the designated spectrum licensed band). A stricter non-spurious limit is specified for frequencies offset from 1710 MHz to protect adjacent band meteorological satellite Earth station receivers.

The current out-of-band non-spurious emission limits are based on GSM technology. A comparison with emission limits from the reference technologies indicate that the current limits will be restrictive for new technologies. This is particularly so at offsets of less than approximately 1 MHz where effective filtering of out-of-band emissions may be difficult. This comparison is shown in Figures 2 and 3. The technology emission levels are sourced from the documents identified in Table 3 below and assume an antenna gain of 15 dBi including losses.[[2]](#footnote-2)

Table 3 – reference technology standards

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| **Technology** | **Standard document** |
| LTE | 3GPP TS 36.104 |
| WCDMA | 3GPP TS 25.104 |
| Multi carrier GSM base station | 3GPP TS 45.005 & TS 51.021 |
| Multi Standard Radio[[3]](#footnote-3) | 3GPP TS 37.104 |
| CDMA-MC | ITU-R Rec. M.1580 |
| WiMAX | WMF-T23-005-R015v04 |

The multicarrier GSM non-spurious emission mask assumes:

* four GSM carriers with a carrier spacing of 600 kHz;
* each carrier has a transmitter power of 43 dBm/200 kHz;
* the top carrier is 400 kHz from the licence edge; and
* a class 2 transmitter with no 3rd order intermodulation products falling at offsets greater than 5.8 MHz from the licence edge.

For comparison with the current non-spurious emission limits within the 1800 MHz band, the Multi Standard Radio non-spurious emission mask assumes:

* two sub blocks separated by a 10 MHz sub block gap; and
* a GSM carrier adjacent to the upper and lower edges of the sub blocks.

Figure 2 – comparison of base station emissions with the current non-supurious limit within the 1800 MHz band (offset from the licence band edge)

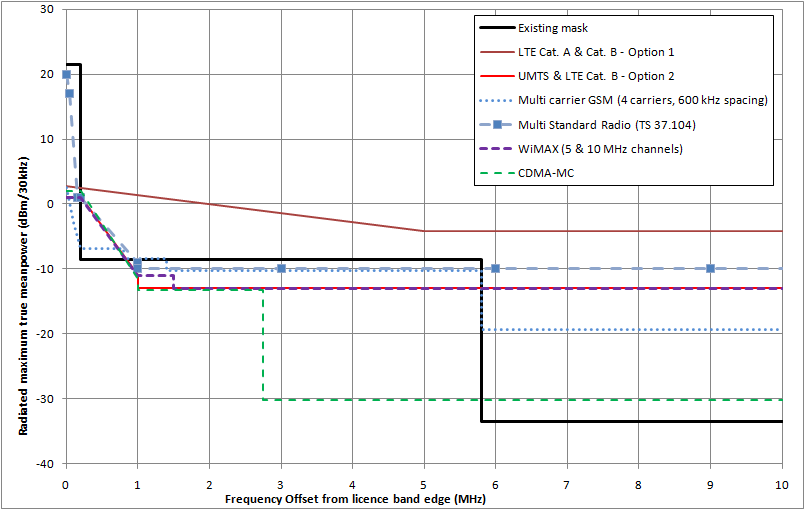
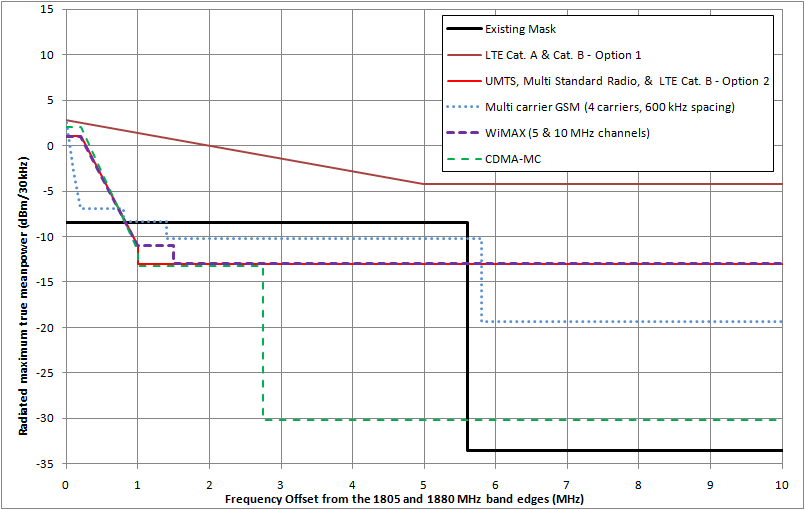


Figure 3 – comparison of base station emission with the current non-spurious limit offset from 1805 MHz and 1880 MHz



### 6.2 Proposed out-of-band non-spurious emission limits

The current framework specifies non-spurious out-of-band emission limits both within the 1800 MHz band and at frequency offsets outside of the band. Comparison of the current limits with emission levels of IMT technologies indicates that the current limits are restrictive at small frequency offsets from the licence band edge and may not allow efficient deployment of these technologies. The proposed changes to the non-spurious emission limits in this section aim to decrease deployment restrictions for future technologies while protecting current technologies and adjacent band services.

The proposed out-of-band emission limits have been derived from the emission masks from:

* 3GPP documents TS 45.005, TS 51.021, TS 25.104, TS 36.104, TS 37.104,
* ITU-R Recommendation M.1580,
* ECC Report 82, and
* CEPT Report 40.

The changes proposed in non-spurious out-of-band emission limits is considered to be minor and it is not believed the change will have a significant impact to adjacent band services.

**Non-spurious emissions within the 1800 MHz band**

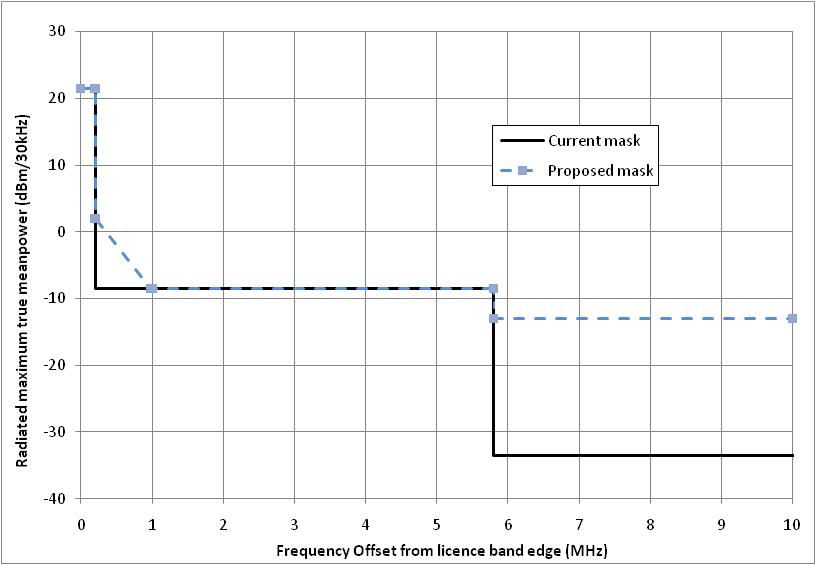
The proposed limits are relaxed based on the emission levels of the reference technologies for offsets between 200 kHz and 1 MHz and at offsets greater than 5.8 MHz. The changes are intended to include the emissions of the reference technologies without any additional attenuation, with the exception of the LTE Category A & B – Option 1, and the Multi Standard Radio masks. Emission limits at offsets greater than 1 MHz but less than 5.8 MHz will remain unchanged.

It is expected that the increase in unwanted emissions will have a minimal impact to frequency adjacent spectrum licensed services. The proposed emission limits are closely aligned with those used in European studies ECC Report 82 and CEPT Report 40. These studies conclude that adjacent band GSM, WCDMA, LTE and WiMAX services can satisfactory co-exist in the same geographical area provided a 200 kHz guard band is employed. The proposed emission limit has a linear reduction between 200 kHz and 1 MHz which aligns with the emission levels of IMT technologies in Figure 2, and reduces the need for a guard band greater than 200 kHz between GSM and IMT technologies.

As the proposed limits are radiated they also include an antenna gain of 15 dBi (including losses).[[4]](#footnote-4)

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| ***The proposed limits of non-spurious out-of-band emissions within the 1800 MHz band from a transmitter operated under a 1800 MHz band spectrum licence for the core conditions of the licence are:***  For a radio emission that is:   1. not a spurious emission; and 2. caused by a transmitter operated under a spectrum licence issued for the 1800 MHz band; and 3. at frequencies outside the frequency band of the licence; and 4. offset from the upper or lower limits of the frequency band of the licence;   the emission limits outside the band are for frequency bands containing frequencies that have offsets:   1. within the range 0 MHz to 0.2 MHz – a radiated maximum true mean power of 21.5 dBm EIRP per 30 kHz; and 2. within the range 0.2 MHz to 1 MHz – a radiated maximum true mean power of x dBm EIRP per 30 kHz, where   x = 2 – 13.63 \* (f\_offset – 0.215) dBm,  0.215 MHz ≤ f\_offset ≤ 0.985 MHz,  where f\_offset is the offset frequency in megahertz from the band edge of the licensed frequency band to the centre frequency of the measuring filter; and,   1. within the range 1 MHz to 5.8 MHz – a radiated maximum true mean power of -8.5 dBm EIRP per 30 kHz; and 2. greater than 5.8 MHz – a radiated maximum true mean power of -13 dBm EIRP per 30 kHz; and 3. within the range 0.2 MHz to 0.5 MHz – a radiated peak power of 10 dBm EIRP measured within a 300 kHz rectangular bandwidth. |

Figure 4 – Out-of-band non-spurious emission limits within the 1800 MHz band (offset from the licence band edge)



**Non-spurious emissions outside the 1800 MHz band**

Additional limits are specified to assist with the coexistence of adjacent band services outside of the 1800 MHz band. These limits are specified at frequency offsets from the 1710 MHz, 1785 MHz, 1805 MHz and 1880 MHz band edges.

To facilitate efficient access for future technologies the proposed emission masks offset from 1785, 1805 and 1880 MHz have been relaxed at offsets less than 0.9 MHz and greater than 5.6 MHz, in consideration of the emission levels of the reference technologies. Emissions limits at offsets greater than 0.9 MHz but less than 5.6 MHz will remain unchanged.

It is proposed to increase the emission limit at offsets greater than 5.6 MHz from -33.5 dBm/30kHz to -18.5 dBm/30kHz. This emission limit increase is intended to ease the deployment restrictions for technologies with higher emission levels at these offsets while still allowing co-existence with services operating outside of the 1800 MHz spectrum licence band. Advice from industry indicates that IMT equipment will be able to meet the proposed limit even though it is more restrictive than the reference technology emission masks.

The limits offset from 1710 MHz remain unchanged to maintain coexistence with adjacent band Earth station receivers.

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| ***The proposed limits of non-spurious out-of-band emissions offset from 1785 MHz, 1805 MHz and 1880 MHz, from a transmitter operated under a 1800 MHz band spectrum licence for the core conditions of the licence are:***  For a radio emission that is:   1. not a spurious emission; and 2. caused by a transmitter operated under a spectrum licence issued for the 1800 MHz band; and 3. at frequencies outside the frequency band 1710 MHz to 1785 MHz and 1805 MHz to 1880 MHz; and 4. offset from 1785 MHz, 1805 MHz and 1880 MHz;   the emission limits outside the band are for frequency bands containing frequencies that have offsets:   1. within the range 0 MHz to 0.2 MHz – a radiated maximum true mean power of 2 dBm EIRP per 30 kHz; and 2. within the range 0.2 MHz to 0.9 MHz – a radiated maximum true mean power of x dBm EIRP per 30 kHz, where   x = 2 – 15.67 \* (f\_offset – 0.215) dBm,  0.215 MHz ≤ f\_offset ≤ 0.885 MHz,  where f\_offset is the offset frequency in megahertz from the 1785 MHz, 1805 MHz or 1880 MHz band edge to the centre frequency of the measuring filter; and   1. within the range 0.9 MHz to 5.6 MHz – a radiated maximum true mean power of -8.5 dBm EIRP per 30 kHz; and 2. greater than 5.6 MHz – a radiated maximum true mean power of -18.5 dBm EIRP per 30 kHz; and 3. within the range 0 MHz to 0.3 MHz – a radiated peak power of 10 dBm EIRP measured within a 300 kHz rectangular bandwidth. |

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| ***The proposed limits of non-spurious out-of-band emissions offset from 1710 MHz, from a transmitter operated under a 1800 MHz band spectrum licence for the core conditions of the licence are:***  For a radio emission that is:   1. not a spurious emission; and 2. caused by a transmitter operated under a spectrum licence issued for the 1800 MHz band; and 3. at frequencies outside the frequency band 1710 MHz to 1785 MHz; and 4. offset from 1710 MHz;   the emission limits outside the band are for frequency bands containing frequencies that have offsets:   1. within the range 0 MHz to 0.5 MHz – a radiated maximum true mean power of -8.5 dBm EIRP per 30 kHz; and 2. greater than 0.5 MHz – a radiated maximum true mean power of -33.5 dBm EIRP per 30 kHz; and 3. within the range 0 MHz to 0.3 MHz – a radiated peak power of 10 dBm EIRP measured within a 300 kHz rectangular bandwidth. |

Figure 5 – Out-of-band non-spurious emission limits outside the 1800 MHz band offset from the 1785 MHz, 1805 MHz and 1880 MHz frequency band edges

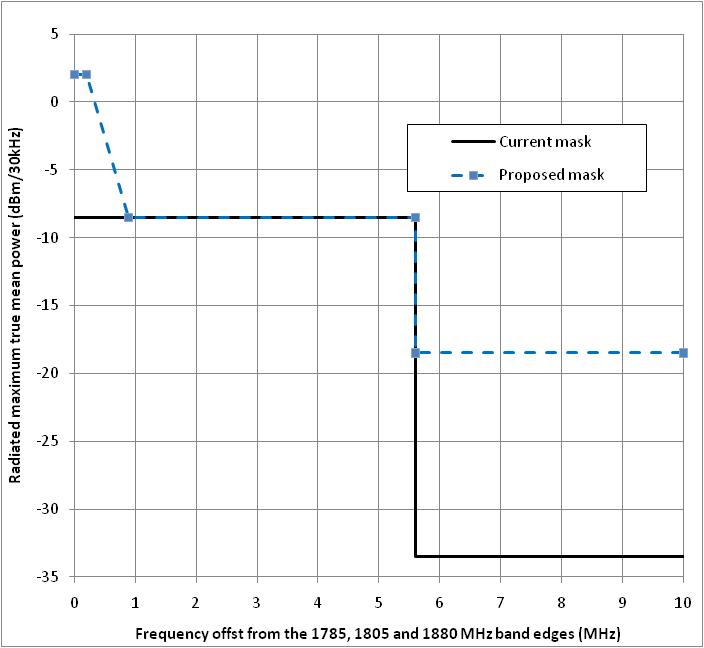
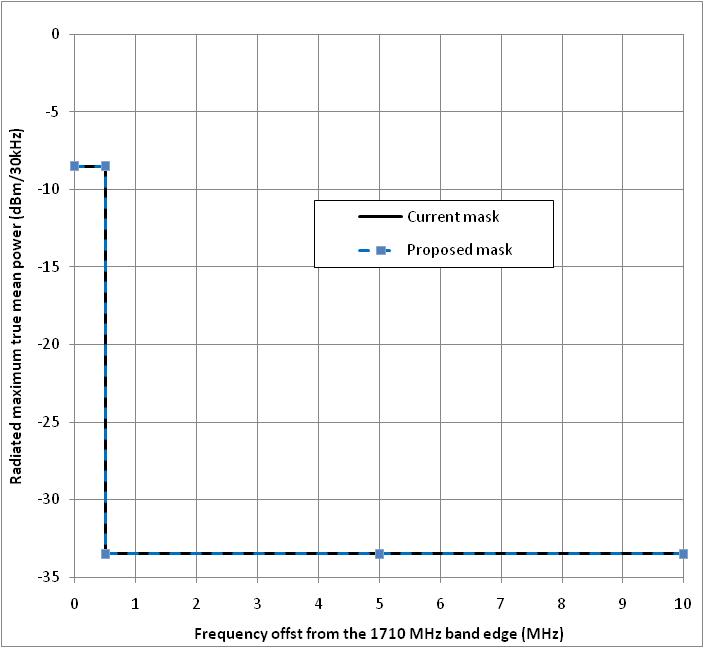


Figure 6 – Out-of-band non-spurious emission limits outside the 1800 MHz band offset from the 1710 MHz frequency band edge



### 6.3 Proposed Out-of-Band Spurious emission limits

Spurious emissions limits from both transmitters and receivers are included as part of the out-of-band core conditions of the licence. A comparison of the current limits with the spurious levels of the reference technologies was undertaken to evaluate if amendments are necessary for the deployment of the reference technologies. This comparison is shown in Figures 7 and 8.

As the current limits are specified as a radiated level, the notional antenna gain of 15 dBi[[5]](#footnote-5) is included to the reference technology limits in the frequency range 1-3.5 GHz, and 0 dBi gain is assumed outside this range. This approach is consistent with the ranges used in the development of the current spurious emission limits in the technical framework (i.e. full antenna gain in the range 1-3.5 GHz and 0 dBi gain outside this range).

Figure 7 – transmitter spurious emission comparison

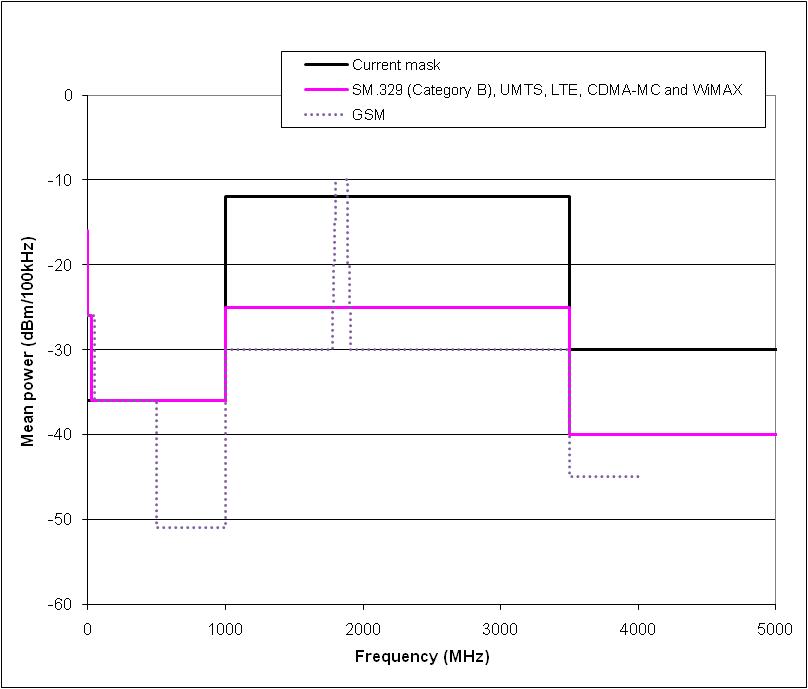
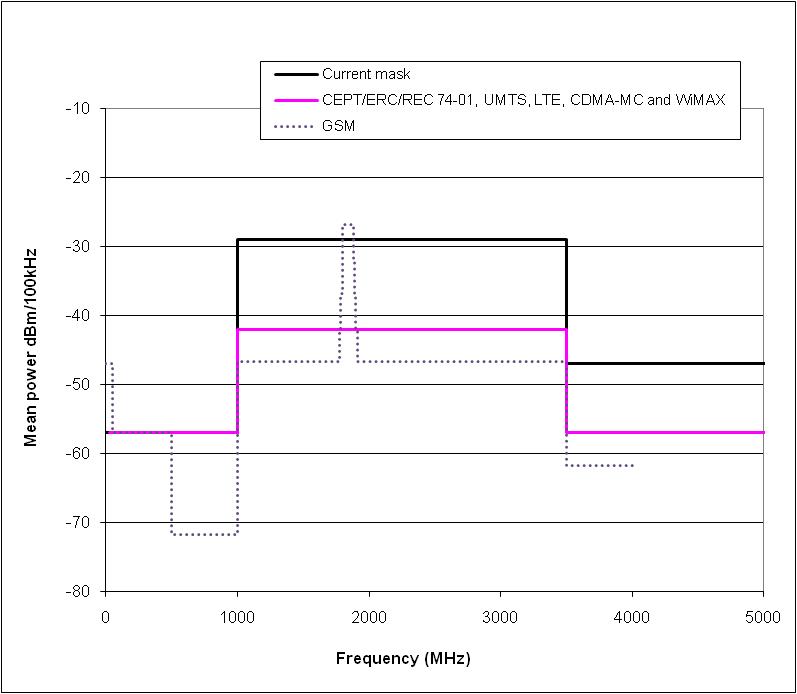


Figure 8 – receiver spurious emission comparison



The plots in Figures 7 and 8 shows that GSM technologies may exceed the current limits at frequencies below 50 MHz and between 1803 and 1882 MHz. However, given that GSM technologies are already operating in this band it is assumed that licensees deploying or intending to employ GSM service will be able to meet the current limits without difficulty.

The comparison in Figures 7 and 8 also show that the remainder of the reference technologies are expected to comply with the current limits except for transmitter emissions below 30 MHz. Given the frequency separation from the operating band, it is assumed that these levels can be easily filtered out.

Based on this analysis it is proposed that the current transmitter and receiver spurious emission limits remain unchanged in the new technical framework.

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| ***The proposed limits of spurious out-of-band emissions from a transmitter operated under a 1800 MHz band spectrum licence for the core condition of the licence are:***  For a radio emission that is:   1. a spurious emission; and 2. caused by transmitters operated under spectrum licences issued for the 1800 MHz band; and 3. at frequencies outside the frequency band of the licence;   the emission limit at the input to the antenna is a mean power of:   1. -36 dBm EIRP measured within a 100 kHz rectangular bandwidth that is within the band 9 kHz to 1 GHz; and 2. -12 dBm EIRP measured within a 100 kHz rectangular bandwidth that is within the band 1 GHz to 3.5 GHz; and 3. -30 dBm EIRP measured within a 100 kHz rectangular bandwidth that is within the band 3.5 GHz to 12.75 GHz. |

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| ***The proposed limits of spurious out-of-band emissions from a receiver operated under a 1800 MHz band spectrum licence for the core condition of the licence are:***  For a radio emission that is:   1. a spurious emission; and 2. caused by receivers operated under spectrum licences issued for the 1800 MHz band; and 3. at frequencies outside the frequency band of the licence;   the emission limit at the input to the antenna is a mean power of:   1. -57 dBm EIRP measured within a 100 kHz rectangular bandwidth that is within the band 9 kHz to 1 GHz; and 2. -29 dBm EIRP measured within a 100 kHz rectangular bandwidth that is within the band 1 GHz to 3.5 GHz; and 3. -47 dBm EIRP measured within a 100 kHz rectangular bandwidth that is within the band 3.5 GHz to 12.75 GHz. |

### 6.4 Other Emission Limits Outside the Bands

The maximum level of emissions outside the band of the licence for a particular transmitter registered under the spectrum licence could be constrained to levels below the proposed limits by the need to coordinate with existing services operating in adjacent spectrum.

For example, when coordinating a proposed transmitter at a site near radio astronomy facilities, fixed point-to-point services, Meteorological satellite (space to Earth) services. Coordination requirements are outlined in the Radiocommunications Advisory Guidelines for the 1800 MHz band, another part of the technical framework to be discussed in a latter TLG discussion paper.

**7 Comment Period**

The comment period for the third release of the discussion paper closes 28th October 2011.

Comment and proposals for changes to this discussion paper should be made on the 1800 MHz Spectrum Licence TLG SharePoint site.

1. Spectrum Licensing review paper reference. [↑](#footnote-ref-1)
2. Based on a 17 dBi antenna gain (from ITU-R Report M.2039), with assumed 2 dB of losses [↑](#footnote-ref-2)
3. The Multi Standard Radio specification is included here as the emission mask may vary from the individual technologies depending on the carrier placement of the different technologies. [↑](#footnote-ref-3)
4. Based on a 17 dBi antenna gain (from ITU-R Report M.2039), with assumed 2 dB of losses. [↑](#footnote-ref-4)
5. Based on a 17 dBi antenna gain (from ITU-R Report M.2039), with assumed 2 dB of losses [↑](#footnote-ref-5)