5 August 2008

Mr. Fatih Mehmet Yurdal
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Frequency Management and Regulatory Affairs
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Subject: Public Consultation on Draft Amended ECC/DEC/(06)12, "Complementary regulatory provisions for devices using Ultra-Wideband (UWB) technology"

Dear Mr. Yurdal,

This contribution was developed by IEEE Project 802®, the Local and Metropolitan Area Network Standards Committee ("IEEE 802"), an international standards development committee organized under the IEEE and the IEEE Standards Association ("IEEE-SA").

The content herein was prepared by a group of technical experts in IEEE 802 and industry and was approved for submission by the IEEE 802.16™ Working Group on Wireless Metropolitan Area Networks, the IEEE 802.18 Radio Regulatory Technical Advisory Group, and the IEEE 802 Executive Committee, in accordance with the IEEE 802 policies and procedures, and represents the view of IEEE 802.

IEEE 802.16 develops standards for mobile and fixed broadband wireless access systems that operate in various frequency bands, including those below 9 GHz. We have reviewed the proposed amendments to ECC Decision (06)12 and ECC report 120 paying particular attention to the protection that "Detect And Avoid" (DAA) affords to both mobile and fixed BWA terminals in the 3.4-4.2 GHz band.

As previously indicated in the response to the consultation on draft ECC report 120, which in general have not been addressed in the formation of the draft amendment to the decision, we reiterate that we have some concerns that DAA may not be able to practically provide the required level of protection to mobile BWA systems.

The main reasons for our concerns are that in ECC Report 120 it is not considered that:

- Mobile BWA terminals can operate with lower receive power levels than those that appear to have been used. In particular the thresholds in Table 1 of the draft amended decision are derived from sensitivity levels taken from a non-public conformance (not performance) test document that is referenced in the report. While it is not possible for us to review this document to provide an accurate statement, we are concerned that the performance degradation caused by UWB devices with DAA is likely to be more severe than expected unless the thresholds are calculated using typical receive sensitivities of mobile devices.

- Mobile stations (MSs) will support multicast and broadcast services (MBS) and power saving features such as idle and sleep modes. Stations in power saving mode or receiving multicast or broadcast services cannot be presumed to provide a continuous or periodic uplink transmission. The current definition of DAA will not protect devices in these modes or using these services because, based on the parameters in Table 1 of the draft amended decision, after 5.1s the UWB device will assume it can occupy the channel. This will impact the ability of the devices to exit power saving modes and could degrade multicast and broadcast services, particularly for users close to the limit of the coverage of the BWA system. We believe that to provide sufficient protection to such devices and services, DAA needs to include downlink detection mechanisms with appropriate detection thresholds.
- It appears that the figures used in the studies in ECC Report 120 are based on the assumption that BWA devices will always be operating near to full power, as it was assumed that they would always be transmitting on their highest order modulation (64QAM). Whilst this is the case for fixed BWA devices, this will not be the case for mobile BWA devices. Dynamic transmit power provides the opportunity for mobile BWA devices to conserve battery power. In light of this, mobile BWA devices are typically required to support 45dB worth of transmit power control range, whereas fixed BWA devices are typically required to support 3.1dB, as considered in ECC Report 120. Furthermore, a base station (BS) may reduce the effective transmit power delivered to an MS close to the BS in order to boost the power delivered to an MS at the cell edge. It does not appear that the above points were considered when specifying the signal thresholds in Table 1 of the draft amended decision. In light of this we believe that the figures used to calculate these protection zones need to be reassessed in order to provide sufficient protection to these types of mobile devices.

Consequently, it is likely that by adopting the thresholds in Table 1 and only accounting for uplink detection, UWB with DAA will not provide sufficient protection to BWA services. IEEE 802 is willing to assist the ECC in the revision of the DAA protocol, in particular the thresholds and methods for providing protection to MBS and devices utilizing power saving features to ensure the concerns outlined in this response are addressed. IEEE 802 is prepared to provide specific proposals for amendments to the protocol upon request.

In response to other aspects of the draft amended decision, we were pleased to note in ECC Report 120 that DAA is intended to provide protection for more than 99.75% of the time. We suggest that this is reflected in the decision by amending decision 2b as indicated: "**DAA UWB** devices are defined as devices using UWB technology that meet the technical requirements for Detect And Avoid (DAA) mitigation technique given in Annex 2, providing protection to BWA TSs for more than 99.75% of the time;". Alternatively, this requirement could be included into Annex 2.

We are pleased to note consideration i) in the draft amended ECC decision "that technical parameters of DAA will need to be reviewed taking into account future technological development" however this does not seem to be reflected in the decisions made. We request that this is addressed by accommodating for a defined review cycle of at least every 18 months to account for a realistic rate of technology evolution by adding a new decision: "that technical parameters of DAA UWB will be periodically reviewed taking into account future technological development on an 18 monthly basis". This could be addressed either by redrafting the ECC decision or, if more expedient, can be directly input to the appropriate ETSI harmonized standard.

As requested in our response to the consultation on draft ECC Report 120, we would appreciate being advised of any future activities in this area, and we repeat this request in this response.

In the interim, we request that the ECC removes or delays changes to the parts of the decision that relate to the 3.4 – 4.2GHz band until an assessment of the above points has been conducted and accounted for through revision of the DAA protocol.

Regards,

/s/

Michael Lynch
Chair, IEEE 802.18 Radio Regulatory Technical Advisory Group

cc: Terry deCourcelle, IEEE-SA
Paul Nikolich, Chair, IEEE 802

Specific text changes to the draft amended ECC decision (06)12:

DECIDES

1. that this ECC Decision defines complementary regulatory provisions for devices using UWB technology;
2. that, for the purpose of the Decision, the following **definitions** apply:
    a. **LDC UWB** devices are defined as devices using UWB technology that meet the technical requirements for Low Duty Cycle (LDC) mitigation technique given in Annex 1;
    b. **DAA UWB** devices are defined as devices using UWB technology that meet the technical requirements for Detect And Avoid (DAA) mitigation technique given in Annex 2, providing protection to BWA TSs for more than 99.75% of the time;
3. that the devices permitted under this ECC Decision are exempt from individual licensing and operate on a non-interference, non-protected basis;
4. that this ECC Decision is not applicable to:
    a. devices and infrastructure used at a fixed outdoor location or connected to a fixed outdoor antenna;
    b. devices installed in flying models, aircraft and other aviation;
5. that for devices permitted under this ECC Decision, the technical requirements detailed in Annex 1 of Decision ECC/DEC/(06)04 apply, and, alternatively:
    a. within the band 3.1 – 4.8 GHz, **LDC UWB** devices are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm measured in 50MHz;
    b. within the bands 3.1 – 4.8 GHz and 8.5 – 9 GHz, **DAA UWB** devices are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm measured in 50MHz; notwithstanding that,
        i. in case of **DAA UWB** devices installed in road and rail vehicles, operation is subject to the implementation of Transmit Power Control (TPC) with a range of 12 dB with respect to the

maximum permitted radiated power. If no TPC is implemented, the maximum mean e.i.r.p. spectral density is -53.3 dBm/MHz;

6. that this Decision enters into force on [1 December 2006];

7. that the preferred date for implementation of this Decision shall be [1 June 2007];

8. that technical parameters of DAA UWB will be periodically reviewed taking into account future technological development on an 18 monthly basis;

9. that CEPT administrations shall communicate the national measures implementing this Decision to the ECC Chairman and the Office when the Decision is nationally implemented.

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