**IEEE P802.15**

**Wireless Specialty Networks**

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| Project | IEEE P802.15 Working Group for Wireless Specialty Networks (WSNs) | |
| Title | IG DEP responses to EC’s comments in DOC 15-21-0138-00-0000 | |
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| Re: | IG DEP responses to EC’s comments | |
| Abstract | Set of responses to EC’s comments on PAR proposal to form Study Group | |
| Purpose | For discussion. | |
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Needs for EDBANs in environments such as multiple piconets and new use cases including:

a)  In cases of colocation of multiple BANs: IEEE Std 802.15.6-2012 may not be sufficiently dependable against contention and interference among collocated BANs. The more BAN uses in dense area, the more contention and inference cause performance degradation.

IG DEP proposes to enhance channel access by using a hybrid scheme like persistent or semi-persistent MAC, which are more robust than contention-based MAC, or time division: contention-free period & contention period of 802.15.6 or 802.15.4.

Regarding interference of collocated BANS, there are contributions of IG DEP posted in Mentor about interference mitigation techniques. Preliminary results show promising mechanisms for interference mitigation of collocated BANs

b)  In case of coexistence with other radios, the ultra wide-band (UWB) physical layer (PHY) of IEEE Std 802.15.6-2012 may not be sufficiently dependable to avoid performance degradation due to interference with coexisting other narrow band and UWB radio networks in an overlapped frequency band.

The intention is to use the channelization plan of 802.15.6 in the high band of UWB, where there are not narrowband services. Also, the intention of the amendment for the UWB PHY is to introduce the mechanisms to mitigate interference from other UWB radios enabling coexistence.

c)   In case of feedback sensing and control loops: the MAC of IEEE Std 802.15.6-2012 is not sufficiently efficient and stable for remote sensing and feedback controlling loops such as remote vital sensing and diagnosis loop and a remote vehicle and factory sensing and actuators and robotics controlling loop.

The EC comment is correct: using wireless links in vehicle’s control is a not advisable for safety and regulations. Either delete or rephrase references to loops and control. For example: mentioning sensing, like RADAR, is fine.

d)  Interoperability and transparency with other radio networks, more flexible network topology,  and ability to coexist with other standards such as European Telecommunications Standards Institute (ETSI) SmartBAN

1. The proposed amendment aims to be interoperable with 802.15.6 and 802.15.4 (New Standard). Hence, the proposed amendment aims to be flexible with other UWB technologies.

2. The envisioned used cases require of a coordinator to guarantee high QoS and dependability.

The proposed amendment will be flexible with peer-to-peer topologies (unicast or multicast).

3. We will provide coexistence studies with SmartBAN.

e)  Capability of ranging and positioning enhanced dependability for mobility of EDBAN in various environment needs ranging and tracking capability and for security of EDBAN needs location information.

The proposed amendment will provide an infrastructure mode for precise localization.

*802.15 WG Chair’s note:*  *The above description does not explicitly address the issue of timeliness of delivery which could be critical for many of the use cases noted above.  In other words, “better late than never” could easily be an erroneous assumption. The 802.15 WG chair has requested the proposed Study Group to work with the IEEE 802.1 WG for methods combining reliability with deterministic behavior.*

Pat’s comment on “timeliness” refers to end-to-end delay must be addressed as it is sensitive and critical for medical applications.