Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: Comment Resolution related to TPC and CID-7127

Date Submitted: August 7, 2015

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Abstract:　　　Comment Resolution

Purpose:　　　Comment Resolution for CID 7024, 7030, 7037 and 7127

CID 7024:

Comment:

Using the TX Power Change has the potential to cause many problems. It is much safer to send the actual received power estimate (in dBm).

Proposed change:

Change TX Power Change (dB) to RX Power Estimate (dBm).

Resolution:

Revised: The commenter is right in that a change in transmit power may not always be desirable, however, received power estimate (in dBm) is not a good measure for link quality since receivers in the network may not all have the same sensitivity. Instead of receive power estimate it may be better to report the available link margin at the receiver. Change TPC to LMC (Link Margin Control) throughout the document. In addition, to avoid problems related to power control the Link Margin should be defined such that ample link margin is assured. Add after the sentence on line 30: "The Link Margin field shall comply with the following equation:" Put Equation: "Link Margin ≤ ED - 20". Exact edits are provided on slides 5 and 6.

CID 7030:

Comment:

If the the TX Power Control IE is sent unsecured, this could lead to network instability issues.

Proposed change:

Provide a mechnism that prevents the TX Power Control IE from easily being used inappropriately to essentially mute all transmissions.

Resolution:

Revised: There is already a security mechanism defined on page 5, line 1 and 2. However to reduce risks of a high priority message being lost, the transmitting device should have an option to ignore the RS-GFSK LMC IE. On line 10, page 4 change the word "shall" into "may". In addition a higher security level in the enhanced ack should be allowed: Change sentence on page 5, line 1 and 2 to: "If the security level, as described in 9.4.1.1, of the incoming Enc-Ack frame containing the RS-GFSK LMC is lower than the security level of the frame being acknowledged then the RS-GFSK LMC IE shall be ignored." Exact edits are provided on slides 5 and 6.

CID 7037:

Comment:

"If the security..." is vague. Do we mean "if the SecurityLevel, macSecurityEnabled, Security Enabled field, or something else?

Proposed change:

Clarify

Resolution:

Revised: The security mentioned on page 5, line 2 should be changed to "security level". In addition, a reference is needed to the sub clause where the security level is described. See also the resolution of CID7030. Exact edits are provided on slides 5 and 6.

Revised text to implement resolutions of CID 7024, 7030 and 7037 (changes highlighted in red):

- **Sub clause 3.2, replace TPC with:**

LMC   Link Margin Control

- **Sub clause 5.1.2.7:**

5.1.2.7 Transmit power control (TPC) in a RS-GFSK PAN

If a device wants to request another device to adjust its transmit power, it may include a RS-GFSK LMC IE within an enhanced acknowledgement frame destined to that device. The RS-GFSK LMC IE shall only be transmitted as part of an enhanced acknowledgement. If a device receives an enhanced acknowledgement containing a RS-GFSK LMC IE and the destination address matches that of the receiving device then it may adjust its Transmit Power within its power control range in all in following GTS transmissions directed to the originating device. In non GTS transmissions the RS-GFSK TPC IE shall be ignored. The transmit power control shall ignore the RS-GFSK LM IE when transmitting non-GTS frames. The RS-GFSK LMC IE is described in 5.2.4.38. If an acknowledgement for a transmission to a particular device is not received, the transmit power for transmission to that device may be increased for the next transmission attempt. The decision to transmit the RS-GFSK LMC IE is taken at a higher layer. The LMC algorithm is outside the scope of this standard.

Revised text to implement resolutions of CID 7024, 7030 and 7037 (changes highlighted in red):

- **Sub clause 5.2.4.38:**

5.2.4.38 RS-GFSK Link Margin Control IE

The RS-GFSK Link Margin Control IE is optional and shall only be used in enhanced acknowledgment frames that use the RS-GFSK PHY. The IE Content field of the RS-GFSK Link Margin Control IE shall be formatted as illustrated in Figure (Allan add table number please, it was missing in the draft).

In table 48nag change TX Power *change to* Link Margin.

The Link Margin field shall be set to the requested change in link margin, represented as a two's-complement number, defining the Link Margin in dB with a range from -31 dB to 32 dB, in steps of 1dB. The Link Margin field shall comply with the following equation:

$$\text{Link Margin} \leq ED - 20$$

In the equation above ED is the Energy Detect value of the received frame preceding the transmission of the RS-GFSK Link Margin Control IE. ED is described in 10.2.5.

If the security level, as described in 9.4.1.1, of the incoming Enc-Ack frame containing the RS-GFSK LMC IE ~~does not match~~ is lower than the security level of the frame being acknowledged then the RS-GFSK LMC IE shall be ignored.

CID 7127:

Comment:

On page 34 on line 16. Whitening of the PHR breaks the compatibility with MR-FSK PHY.

Proposed change:

On page 34, line 16, change sentence to: "When FEC is not used, data whitening shall be applied over the PSDU, as described in 23.2.9. When FEC is used, data whitening shall be applied over the PHR and the PSDU". Also change Figure 176: Remove PHR at the input of the data whitening block. Add a "PHR generation" block. Add a switch and connect the input of the switch to the output of the "PHR generation" block and control the switch by PhyFskFecEnabled. When FEC is disabled the switch will rout the PHR to the Concatenator block to concatenate the PHR with the SHR. Add a second Concatenator block with an input connected to the output of the PSDU generation. When FEC is enabled the added switch will route the PHR to a second input of the added Concatenator. The ouput of the added Concatenator will be connected to the input of the Data Whitening block.

CID 7127:

Resolution:

Revised: Text changes are accepted. Figure 176 needs to be updated. See updated figure below: