Ad Hoc Committee on Licensed-Exempt Coexistence

-Activity Report-

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Purpose:

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Marianna Goldhammer
Ah-Hoc Chair
E-mail process

- Following 802.16 members request, the correspondence was open to all 802.16 e-mail group
- E-mail active people:
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  - Marianna Goldhammer [marianna.goldhammer@alvarion.com]
Output document

• C802.16-04/07r1
• Includes
  – System parameters for 2.4GHz and 5.8GHz
  – Base Station to Base Station interference study
    • Shows the existence of the problem
  – Possible solutions
• Was not possible to accomplish more
  – Parallel efforts in 802.16REVd and 802.16e Ballots
Studied problem

- Deployment scenario: Co-located or separated Base Stations

- Problem: Tx to Rx interference, co-channel and adjacent channel
System / Deployment Parameters

- **BST:**
  - Tx power:
    - 2.4GHz: 25dBm
    - 5.8GHz: 20dBm
  - Antenna gain: omni: 10dBi; directional: $AGsa = 17\text{dBi}; AGsb = 23\text{dBi}$
  - Cable loss: 1dB

- **SS:**
  - Tx power: $Pts = 20\text{dBm}$
  - Antenna gain: omni: 10dBi; directional: $AGsa = 17\text{dBi}; AGsb = 23\text{dBi}$
  - Cable loss: 1dB

- **Antenna isolation for co-located outdoor antennae:**
  - $AI = 75\text{dB}$ for directional-to-directional
  - $AI = 30\text{dB}$ for omni-to-directional or omni-to-omni

- **Signal BW for evaluation:** 10MHz

- **RSL:** -83dBm
- **Fade Margin:** FM=10dB
- **ACI:** -12dB
Interference Calculation

- LOS deployment model

- Co-channel criteria:
  - 1dB degradation of RSL

- Adjacent channel criteria
  - 1dB degradation of RSL
  - ACI translation to working channel
Results: interference level for co-located BSs

<table>
<thead>
<tr>
<th>Antennae</th>
<th>2.4GHz</th>
<th>5.8GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adj. channel</td>
<td>Adj. channel</td>
<td></td>
</tr>
<tr>
<td>Directional-to-Directional</td>
<td>-62dBm</td>
<td>-67dBm</td>
</tr>
<tr>
<td>Directional-to-Omni</td>
<td>-17dBm</td>
<td>-22dBm</td>
</tr>
<tr>
<td>Omni-to-Omni</td>
<td>-17dBm</td>
<td>-22dBm</td>
</tr>
</tbody>
</table>
Results: minimum BS separation distance

<table>
<thead>
<tr>
<th>Antennae</th>
<th>2.4GHz Co-channel</th>
<th>2.4GHz Adj. channel</th>
<th>5.8GHz Co-channel</th>
<th>5.8GHz Adj. channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directional-to-</td>
<td>15.8km (Note 1)</td>
<td>130km</td>
<td>3.7km</td>
<td></td>
</tr>
<tr>
<td>Directional</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directional-to-Omni</td>
<td>&gt;120km (Note 1)</td>
<td>3.2km (Note 1)</td>
<td>63km</td>
<td>1.64km</td>
</tr>
<tr>
<td>Omni-to-Omni</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Note 1: 5dB higher power, 7dB lower propagation loss, compared with 5.8GHz
Conclusion

Obviously there is a problem!
Proposals for solutions

• Proposals for solutions
  – Zion Hadad
  – Phil Barber
  – Marianna Goldhammer

• Replay comments
  – Duncan McClure
Tuesday evening session - Agenda

- Discuss the Ad-hoc output document
  - Discuss the proposed solutions
- Look at more interference scenarios
  - BS-to-SS and SS-to-BS, etc.
- Discuss criteria for performance evaluation, like:
  - ARQ+low C/I PHY mode
  - Dynamic Channel Selection (threshold?)
  - Time separation
- Make a recommendation regarding the advisability of initiating standardization in this area
  - Continue the study for more scenarios and performance evaluation?
  - If a standard will be needed, what is the right timing?