BFWA in the 40GHz band

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Purpose:

The presentation supports a contribution to the co-existence 802.16.2 PAR detailing frequency plans and co-ordination issues for the 40GHz band used for BFWA in Europe. The accompanying contribution proposes text for the Recommended Practice document.

Notice:

Release:

IEEE Patent Policy:

BFWA in the 40GHz Band

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BFWA/MWS

- Some BFWA systems are capable of supplying both traditional telecommunications services and entertainment services.
- Convergence between T/comms and broadcasting.
- Multimedia Wireless Systems.

MWS

- Frequency band 40.5 - 43.5 GHz.
- Prioritised within Europe by an ERC Decision (ERC(99)015).
- Evolution from video distribution systems.
  - Interactivity.
  - Increase in telecomm's traffic.

MWS technologies

- Variety of potential interop. standards.
  - ETSI BRAN (HIPERACCESS)
  - ETSI DVB stds for distribution and I/activity.
  - IEEE 802.16.1
  - ITU-T draft Rec. J.116
- Specific RF band standards
  - IEEE 802.16.2
  - ETSI TM4 MWS Work Item (DEN/TM04097)

Impact on Freq. Man.

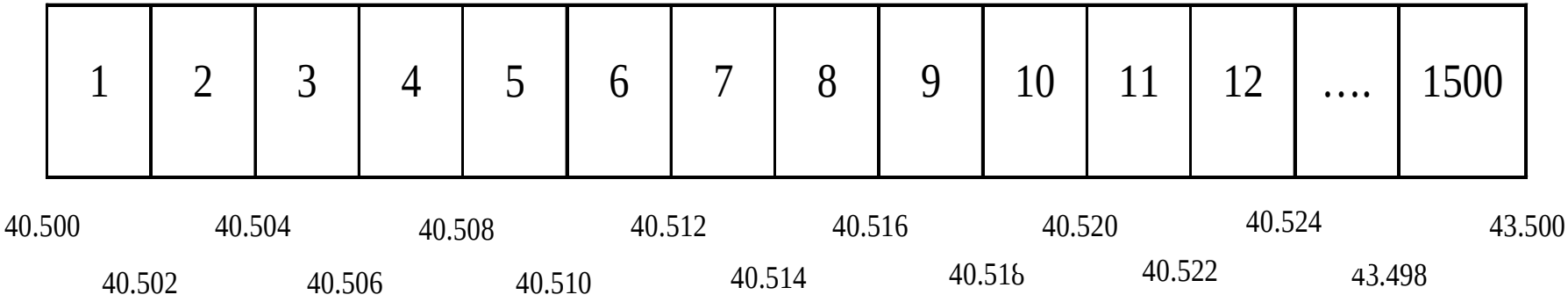
- Paired and unpaired frequency plans
- Asymmetric and symmetric uplink/downlink requirements.
- Variable traffic in either direction.
- Constant traffic and intermittent traffic.

Considerations for assignments

- Competition is a key driver
  - Number of operators in any band.
  - Uncertainty over successful technology
  - Uncertainty over successful services

Solution for 40GHz band

This allocation plan consists of 1500 adjacent 2 MHz slots starting at 40.5 GHz as per Figure 1. Any number of these slots may be aggregated to form a block assignment. Assignments may be paired in a contiguous or non-contiguous manner for FDD operation or unpaired for TDD operation.



Co-existence issues

- Operators co-frequency in neighbouring geographical areas.
  - "Single -entry" PFD limitations and co-ordination zones
- Operators in adjacent frequency blocks in the same geographic area.
  - Guard bands to ensure frequency separation

PFD's for the 40GHz band

- PFD at the neighbouring service area boundary:

  -98.5dBW/MHZ/m^2

- Base station co-ordination zone:

  18km from service area boundary

  – Based upon EIRP of 0.5dBW/MHz

contd……

PFD's for the 40GHz band

- Subscriber station co-ordination zone:

  10km from service area boundary

  – Based upon EIRP of 11.5dBW/MHz
- Co-channel, co-polar subscriber station operation to be avoided within 5km of service area boundary.

Multiple interferers

Modelling results indicate the following:

Interference case	BS downtilt	Interference Threshold Exceedance	Interferers visible (LOS)
BS – BS	No	7dB, 1%. 7dB, 60%	10% 40%
BS – BS	Yes	Zero 3dB, 1%	10% 40%
BS – TS	Yes	1dB, 1% 5dB, 1%	10% 40%
TS – BS or TS	Yes	<0.1%	40%

Interference Threshold I/N = -10dB
Base station downtilt assumed to be 9 degrees.
Subscriber stations employ ATPC.

Guard Bands

- One channel spacing at the edge of each operators frequency block.
  - Less than 0.1% chance of exceeding the interference threshold.
  - In high density (e.g. mesh) there is a 1% chance.
- For the same channel spacing guard band can be one half a channel in each block.

Contributions

- Therefore contributions proposed for the 802.16.2 Recommended Practice for:
  - Section 6, Frequency plan.
  - Section 7, Deployment and Co-ordination.