ETSI WP TM4 work on P-MP/P-P Co-existence

Cover Sheet for Presentation to IEEE 802.16 Broadband Wireless Access Working Group (Rev. 1)

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IEEE 802.16l-00/07r1

Purpose:

The presentation supports a liaison document supplied by ETSI WP TM4. It is considered as being of interest to the work of the 802.16.2 co-existence group. It is the latest draft under work item DETR/TM-04069.

Notice:

Release:

IEEE Patent Policy:

TM4 Work Items

- Items potentially of interest (i.e.BFWA oriented):
  - MWS at 40GHz - early draft
  - Antennas for MWS at 40GHz
  - WI 04069 Co-existence Issues **
  - WI 04087 TDD/FDD Issues
  - Stds at 26/28GHz (EN 301-213 Pts 1-4)

ETSI WP-TM4 Work Item DETR/TM-04069

Rules for coexistence of P-P and P-MP systems using different access methods in the same frequency band.

IEEE 802.16l-00/07r1

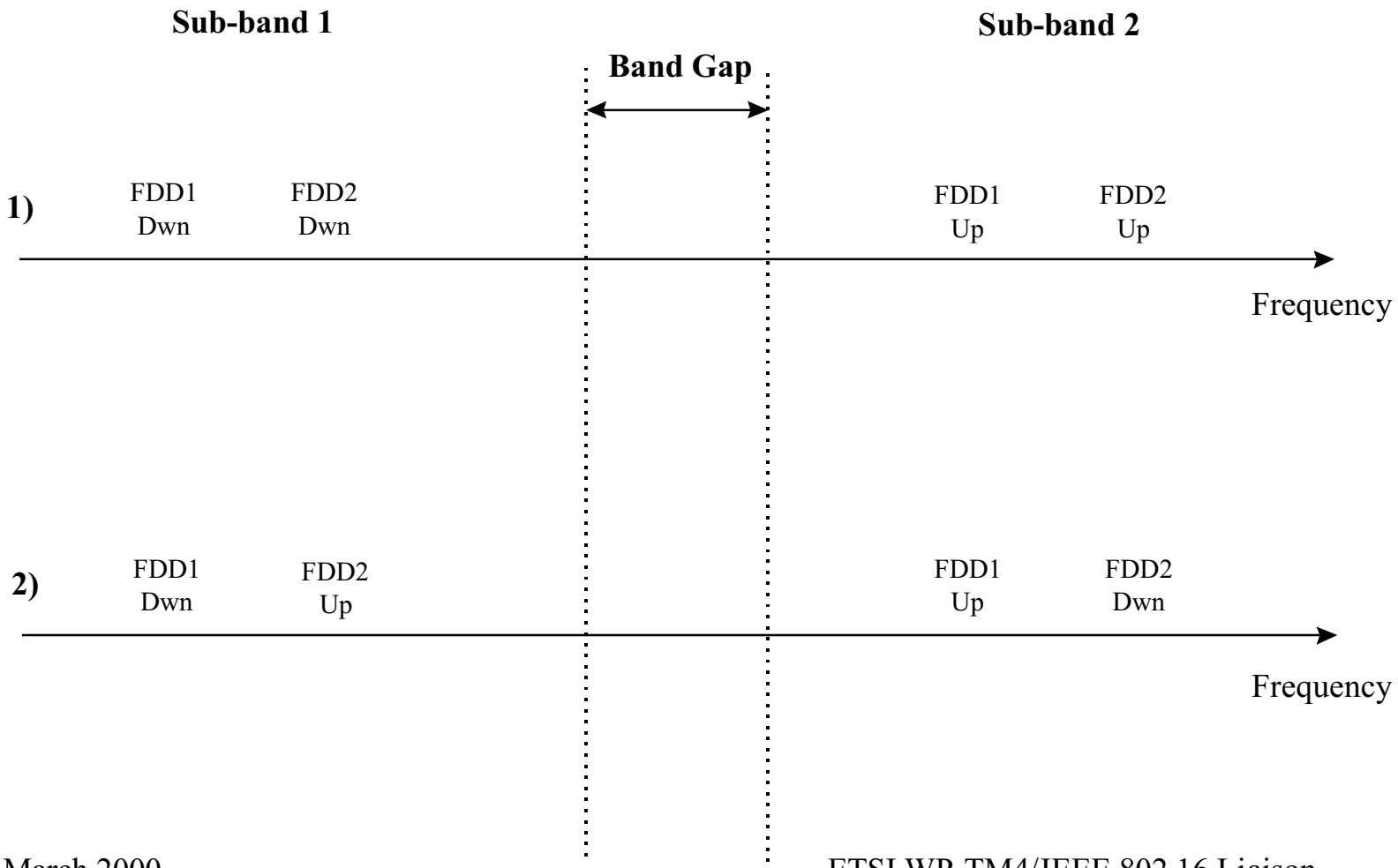
Scope

- Systems intended to operate:
  - in the same frequency band.
  - in the same or near geographical area.
- Methodologies for evaluating interference
- Identifies critical parameters
- Mitigation methods

Deployment Scenario

- P-MP assumptions
  - Number of operators in any given area in any frequency band.
  - Operator plans his own network.
  - Systems may supply differing services.
  - Different access methods might be used.
  - Frequency block assignments.
  - Some deployment constraints could result.

Typical Freq Plan



Interference Classes

With FDD freq. Plan in mind:

- Class A1: *(down/down adjacency)*
  - CS interferer into victim TS
- Class A2: *(up/up adjacency)*
  - TS interferer into victim CS
- Class A3: *(down/up adjacency)*
  - CS interferer into victim CS
- Class A4: *(up/down adjacency)*
  - TS interferer into TS victim

Interference Scenarios

- P-MP FDD/FDD
  - Classes A1 to A4
- P-MP FDD/TDD
  - Specific cases of classes A1 to A4
- P-MP TDD/TDD
  - Specific cases of classes A1 to A4
- P-MP to P-P
  - Classes B1 to B4

Methodology

- Net Filter Discrimination
  - Emitted Spectrum & Rx system filtering
  - Ratio of power transmitted to that “visible” after rx filter.
- Generic Scenario for each class.
- Evaluation parameters
  - separation distances
  - C/I

Considerations (1)

- Class A1 (Int. from CS to victim TS)
  - Site sharing improves co-existence
  - Possibly without guard bands
  - Near siting helps also.
  - With no site sharing, at least one channel guard required.(Overlapping cell problem).
  - Small interfered area exists
  - Co-existence etiquette required.

Considerations (2)

- Class A2 (Int. from TS to victim CS)
  - Same as Class A1.
- Class A3 (Int. from CS to adjacent victim CS)
  - Site sharing not possible / minimum separation required.
  - Guard band required to minimise separation distance.

Considerations (3)

- Class A4 (Int. from TS to adjacent victim TS)
  - guard band required
  - exacerbated by large numbers of TS

Useful Rules

- Best possible NFD reduces guard bands.
  - Rx “masks” not defined in standards though.
- Similar EIRP’s at CS reduces Class A1 interference.
- Use of RTPC reduces guard band requirements.
- Equal channelisation and similar receiver performance reduces guard bands.

Frequency planning

- Defined uplink and downlink sub-bands for FDD systems limits scenarios to Classes A1 and A2.
- Introduction of TDD requires Class A3 to be considered requiring guard bands.

Examples

- 3.5GHz band
  - Generally suggests 3.5MHz (1 channel) guard satisfactory if “actual” characteristics used.
- TDMA systems in 26GHz Band
  - Generally suggests that site (or near) sharing possible with no guard band for identical systems.
  - Better NFD’s could cover non identical systems
  - 1 channel guard for non co-ordinated use.

Another Example

- FDMA and TDMA system in 26GHz Band
  - Differing parameter characteristics require one (largest) channel guard band even if site sharing possible.
  - 2 channel guard required for non co-ordinated deployment.

Status of Work

- Approval anticipated at next TM4 plenary (June 2000).
- All previous examples were FDD
- Further FDD/TDD issues being tackled in work item DETR/TM-04087 (TDD in P-MP FWA systems).

Proposal

- Willing to provide input for Section 5 in Recommended Practice (TM4 approved)
  - Work of other standardisation bodies
  - Outline scope of this work
  - Detail interference scenarios addressed
  - Outline methodologies proposed
  - Highlight the main conclusions/recommendations.
- Feedback to TM4 from 802.16