Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Action items from Session #44**
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Re:	Working Group Review of Working Document 802.16h-06/015r1
Abstract	This document contains a resolution of action items assigned during Session #44.
Purpose	
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Action items from Session #44

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Overview

This document addresses a number of action items assigned to the author at Session #44. These action items are related to:

1. Specific comment action items:
   - Comment 1035 – *Define the Base Frequency and additional clarifications on usage.*
   - Comment 1106 – *Define channel switching for DCS.*
   - Comment 1106 – *Specify the reason for DCS.*

2. REP-REQ/REP-RSP MAC messages and associated TLVs:
   - This section consolidates the REP-REQ/REP-RSP message encodings.

3. Correction to figure h1 in sub clause 6.3.15 [1]

4. Improved definitions for extended channel numbering structure.

5. Other matters:
   - There are errors in the definition of both CXZ_DL_IE() and CXZ_UL_IE().

NB These changes should be applied before the implementation of contribution C80216h-06_071 [3].

Specific editorial changes

This section provides a list of changes to the draft document.

Blue text represents specific editorial additions.

~~Red strikethrough~~ text is to be deleted.

Black text is text already in the draft.

Bold italic text is editorial instructions to the editor.

1. Specific action items

Comment 1035 – *Define the Base Frequency and additional clarifications on usage.*

This is covered in section 4 below.

Comment 1106 – *Define channel switching for DCS*

Justification and Specification is presented in contribution C80216h-06_071 [3].

Comment 1106 – *Specify the reason for DCS*

DCS provides an uncoordinated coexistence mechanism. Specification and justification is presented in contribution C80216h-06_071 [3].

2. REP-REQ/REP-RSP MAC messages and associated TLVs

This section consolidates the REP-REQ/REP-RSP message encodings.

Make the following changes to the second table in section 11.11 (REP-REQ management message encoding)

Name	Type	Length	Value
Report type	1.1	1	Bit #0 = 1 Include ~~DFS~~ Basic report
ExChNr	1.10	2	~~Physical~~ Logical E~~e~~xtended C~~c~~hannel N~~n~~umber to be reported on (WirelessMAN-CX and WirelessHUMAN only)

Make the following changes to the second table in section 11.12 (REP-RSP management message encoding)

The report consists of the following parameters (see 8.2.2, 8.3.9, or 8.4.11 for details).

REP-REQ **Report type**	**Name**	**Type**	**Length**	**Value**
Bit #0 = 1	Basic report	1.4	1	Bit #0: WirelessHUMAN detected on the channel Bit #1: Unknown transmissions detected on the channel Bit #2: Specific Spectrum User detected on the channel (type #1) Bit #3: Specific Spectrum User detected on the channel (type #2) Bit #4: Specific Spectrum User detected on the channel (type #3) Bit #5: Specific Spectrum User detected on the channel (type #4) Bit #6: IEEE 802.11 system detected on the channel Bit #7~~3~~: Unmeasured. Channel not measured

3. Correction to figure h1 in 6.3.15 [1]

Replace the new paragraph as the end of 6.3.15.1 with the following:

Figure h1 provides an illustrative flowchart of a generic scheme for operation in bands with SSUs. The flowchart highlights the main operational requirements for coexistence and overviews the description in the remainder of this sub clause.

Figure 1 below provides a replacement figure for Figure h1 in sub clause 6.3.15.1.

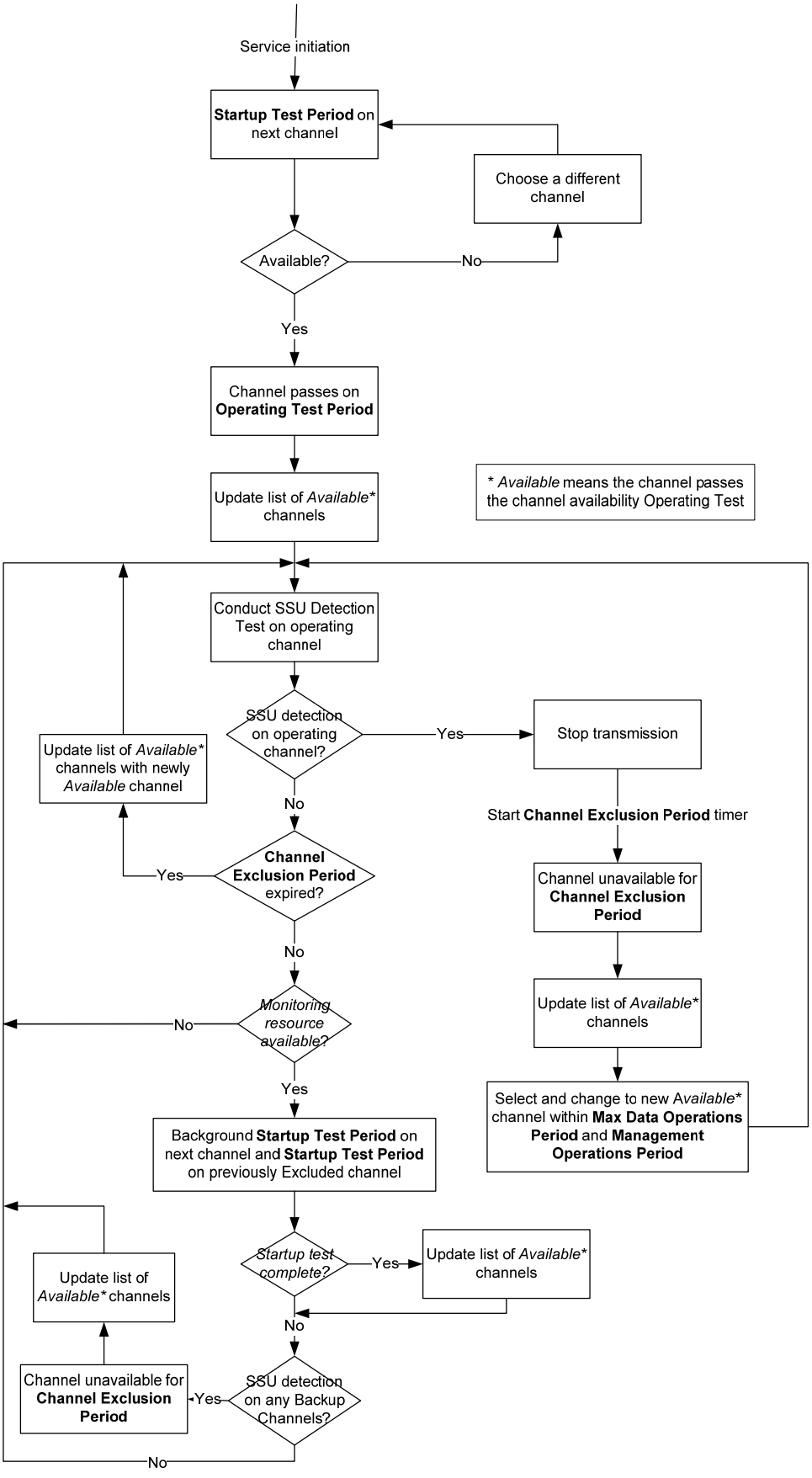
Service initiation
Startup Test Period on next channel
Choose a different channel
Available?
No
Yes
Channel passes on Operating Test Period
Update list of Available* channels
* Available means the channel passes the channel availability Operating Test
Conduct SSU Detection Test on operating channel
SSU detection on operating channel?
Yes
Stop transmission
Update list of Available* channels with newly Available channel
No
Start Channel Exclusion Period timer
Channel Exclusion Period expired?
Yes
Channel unavailable for Channel Exclusion Period
No
Update list of Available* channels
Monitoring resource available?
No
Yes
Select and change to new Available* channel within Max Data Operations Period and Management Operations Period
Background Startup Test Period on next channel and Startup Test Period on previously Excluded channel
Startup test complete?
Yes
Update list of Available* channels
Update list of Available* channels
No
Channel unavailable for Channel Exclusion Period
Yes
SSU detection on any Backup Channels?
No

Figure 1 *Flowchart showing generic operation in bands with specific spectrum users.*

Add the following sentence at the end of section 6.3.15.3

The detection of a specific spectrum user will mean the channel is unusable for **Channel Exclusion Period**. The channel is marked as an Excluded Channel for a period defined by regulation.

4. Improved definitions for extended channel numbering

Replace 6.4.1.2 with the following

6.4.1.2 Extended channel numbering

Extended channel numbering provides an enhancement to the definition for *channel center frequency* given in section 8.5.1. This extension provides channel references beyond the limitations of 5-6GHz as defined in that section. The channel references are described according to the following terms.

- Extended Channel Number (*ExChNr*) – A 2 byte specific channel number reference in MHz. *ExChNr* is a logical channel number within a given band and enables the absolute frequency to be calculated with the use of a 2 byte reference.
- Base Channel Reference (*BaseChRef*) – A 1 byte base reference to frequency range or deployment band in MHz. *BaseChRef* is an index into a list of known operational bands, termed *BaseCenterFrequency*(). For a given value of *BaseChRef* then *BaseCenterFrequency*() provides the lowest, or base, center frequency for a particular band of operation.
- Channel spacing (*ChSp*) – A 2 byte channel spacing value in 10kHz increments. The channel spacing is referenced from center frequency to center frequency.

The terms above are used to calculate the physical *channel center frequency*, termed *ChannelCenterFrequency*, and is defined accordingly:

ChannelCentreFrequency [MHz] = *BaseFrequency*(*BaseChRef*) [MHz] + (*ExChNr* *(*ChSp**0.01)) [MHz] [xxx]

This is shown graphically in figure h2.

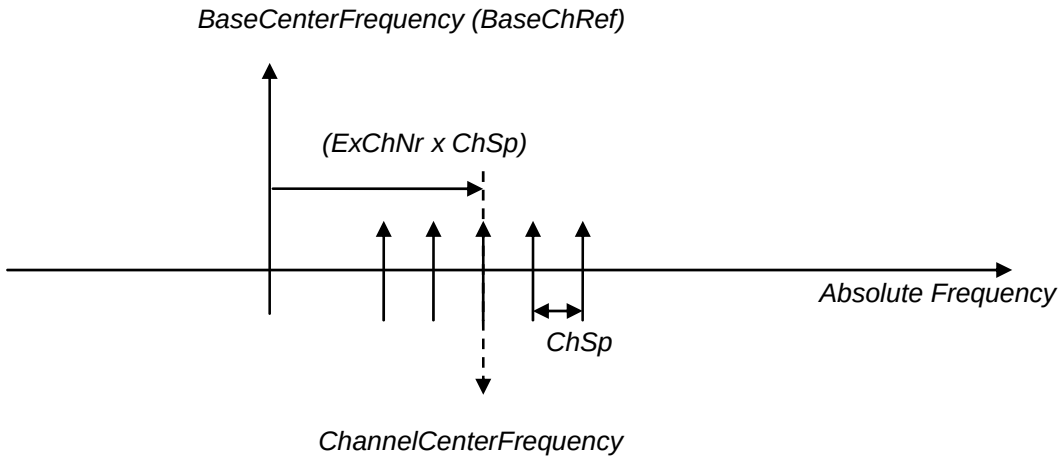

Figure h2 – Representation of *ChannelCentreFrequency* calculation.

ExChNr is used in REP-REQ/REP-RSP (6.3.2.3.33) messages while *BaseChRef*, and *ChSp* are communicated at a session setup or reconfiguration (see 11.7.8 for SS capabilities encoding).

5. Other matters

There are errors in the definition of both CXZ_DL_IE() and CXZ_UL_IE(). Specifically these are:

- Length is wrong.
- Padding bits have not been included.
- Other copy and paste errors in CXZ_UL_IE from CXZ_DL_IE.

Make the following changes to 8.4.5.3.28 Co-existence (CXZ) downlink IE format

Table 286aa—CXZ downlink IE

Syntax	Size	Notes
CXZ_DL_IE() {		
Extended DIUC	4 bits	CXZ = 0x09
Length	4 bits	Length = 0x0~~1~~4
OFDMA symbol offset	8 bits	Denotes the start of the zone (counting from the frame preamble and starting

		from 0).
CXZ duration	10 bits	Denotes the duration of the zone
New CXZ start	12 bits	The time interval, in symbols, until the start of the next downlink CXZ.
Padding	2 bits	Shall be set to zero.
}		

Make the following changes to 8.4.5.3.29 Co-existence (CXZ) uplink IE format

Table 302w—CXZ uplink IE

Syntax	Size	Notes
CXZ_DL_IE() {		
Extended ~~D~~UIUC	4 bits	CXZ = 0x0~~9~~B
Length	4 bits	Length = 0x0~~1~~4
OFDMA symbol offset	8 bits	Denotes the start of the zone (counting from the frame preamble and starting from 0).
CXZ duration	10 bits	Denotes the duration of the zone
New CXZ start	12 bits	The time interval, in symbols, until the start of the next downlink CXZ.
Padding	2 bits	Shall be set to zero.
}		

References

[1] IEEE 802.16h-06/015r1: *Air Interface for Fixed Broadband Wireless Access Systems: Amendment for Improved Coexistence Mechanisms for License-Exempt Operation*, Working Document.

[2] IEEE 802.16h-06/012r1: *Comments received in Working Group Review of Working Document IEEE 802.16h-06/010.*

[3] IEEE C802.16h-06/071: *P802.16h Working Document structure clarification*, Paul Piggin.