

Project	<b>IEEE 802.16 Broadband Wireless Access Working Group</b> < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >	
Title	<b>Action items from Session #43 and new introductory material for the Working Draft (802.16h-06/015)</b>	
Date Submitted	<b>2006-07-19</b>	
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Re:	Recirculation of Working Group Review of Working Document 80216h-06 015	
Abstract	This document contains 1) Suggested remedies to action items from session #43 from Working Group Review 2) New material pertaining to the introductory sections of the Working Draft.	
Purpose		
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## Action items from Session #43 and new introductory material for the Working Draft (802.16h-06/015)

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### Overview

This document considers:

- 1) Suggested remedies to action items from session #43's Working Group Review, namely  
Comment 26 of [2] – Correction of document figures.

*This is covered in section 1 'Figure Corrections' below.*

- 2) New material pertaining to the introductory sections of the Working Draft. Addressing action items:

Comment 4 of [2] – Areas of applicability for LE operation. *It is important to provide a statement that details the application area and market where 802.16-only co-existence will be of benefit. There is no high-level discussion of candidate frequency bands and the applicability of techniques defined within this amendment. A high-level premise for this work is needed to firmly define the document's direction.*

Comment 102 of [2] – Applicability of primary user detection. *There is little information on coexistence with primary users. This has not been developed in the draft but is explicitly mentioned in the PAR.*

*This is covered in section 2 'Refinement of Introductory Sections' below.*

### 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 Figure Corrections

Figure 1 provides the replacement figure for the flowchart algorithm for specific spectrum users. This is Figure h1 in section 6.3.15 of [1].

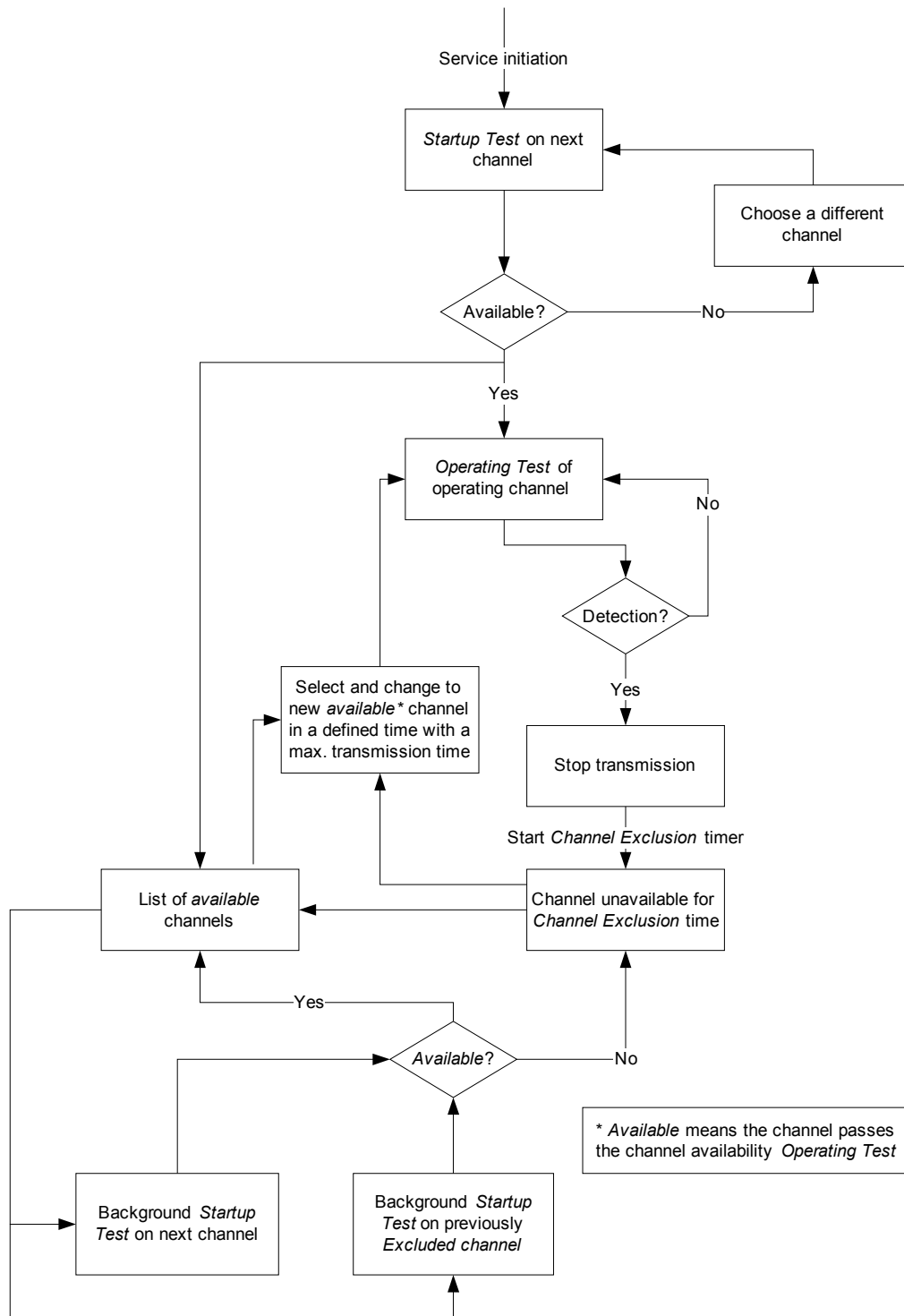
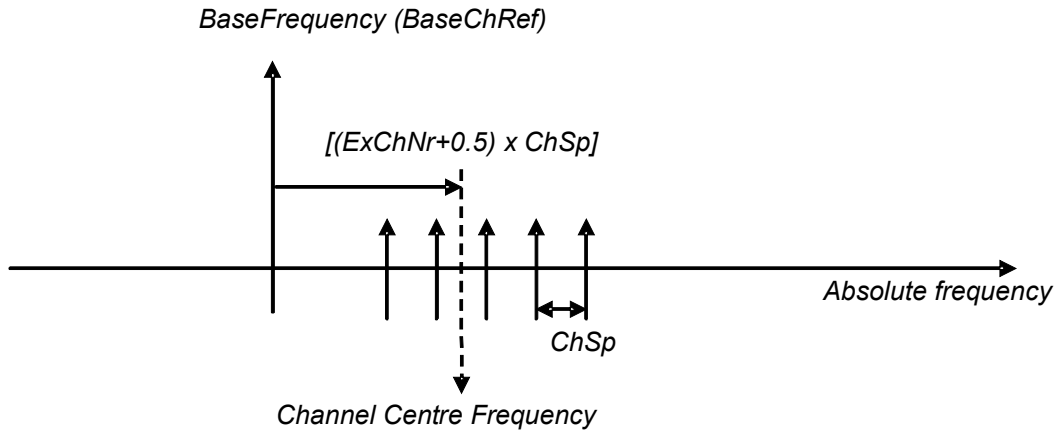


Figure 1 Flowchart algorithm for specific spectrum users.

Figure 2 provides a replacement figure for the extended channel numbering structure. This is figure h2 in section 6.4.1.2 of [1].



**Figure 2** Representation of extended channel numbering structure.

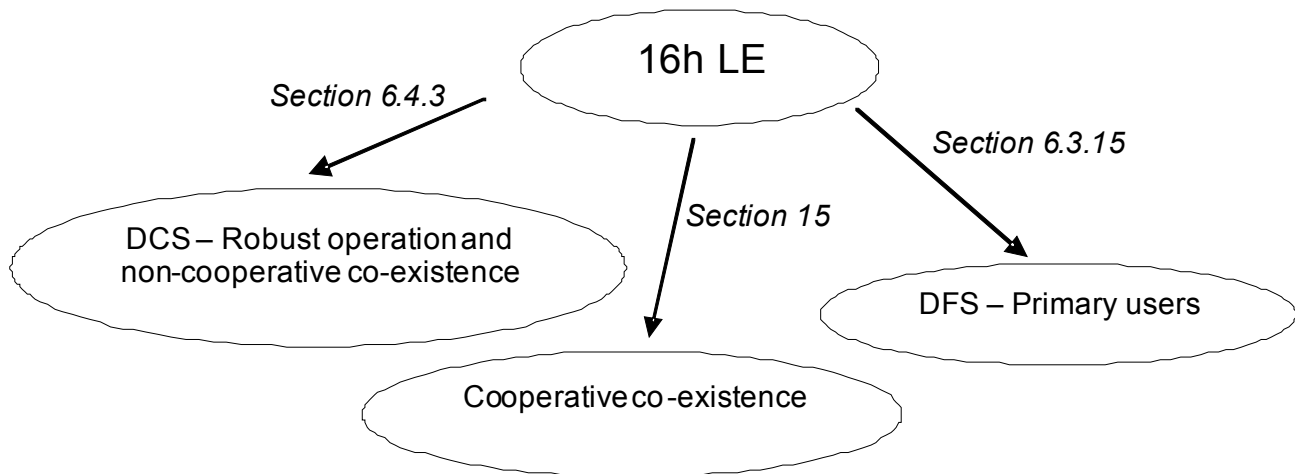
## 2 Refinement of introductory sections

This section details amendments to the working document [1] addressing unresolved comments in [2]. The specific areas to be considered are given below:

Statement on the areas of applicability for LE operation.

Statement on the detection of primary users.

Statement on how robust operation in LE bands can compliment that given in section 15 of the working document.



**Figure 3** Representation of co-existence schemes addressed by Task Group h.

**Make the following modifications to the paragraphs in section 1.3.3.**

[Editorial note: The three paragraphs below are shown in black text, although these paragraphs are new text and present in the working document [1]. The reason for the black text is so the further modifications to this new material can be easily seen by the editor.]

### 1.3.3 License-exempt and uncoordinated systems below 11 GHz

The physical environment for the license-exempt bands and uncoordinated systems below 11 GHz is similar to that of the licensed bands in the same frequency range, as described in 1.3.2. However, the license-exempt nature introduces additional interference and co-existence issues, whereas regulatory constraints limit the allowed radiated power. In addition to the features described in 1.3.2, the PHY and MAC introduce mechanisms such as dynamic frequency selection (DFS) to detect and avoid interference to specific spectrum users. This is specified in section 6.3.15 concerning shared frequency band usage.

Further enhancements to facilitate co-existence for license-exempt and uncoordinated systems in utilizing improved co-existence mechanisms is embodied in policies, MAC enhancements, and recommended practice specified in 6.3.15.6.4. This section provides a definition for the WirelessMAN-CX designation. WirelessMAN-CX operation is intended to cover a number of license-exempt and uncoordinated band operation scenarios. Section 6.4 describes support functions for WirelessMAN-CX operation for non-collaborative operation. These procedures provide robust co-existence operation in the presence of non-cooperative and unknown wireless technologies, together with application to interference avoidance of adjacent licensed and license-exempt bands.

Based on the WirelessMAN-CX designated section 15 This mode of operation provides enhancements to the MAC protocol to facilitate communication between infrastructure and subscriber devices for interference measurement, reporting and management; together with negotiation for spectrum sharing to allow different WirelessMAN-CX systems to coexist in the band of operation without interference from the presence of other

~~wireless technologies, and is designated WirelessMAN-CX. Additional needs of systems operating in license-exempt bands are addressed in 8.5 and 15.~~

~~License-exempt or uncoordinated bands may adopt RF profiling in terms of selecting a known set of RF parameters, such as a band plan. If such a convention is adopted the design, management and inter-working of uncoordinated systems is eased significantly. If no baseline assumptions about other systems sharing the band can be made then complexity is added to both system design and algorithms implemented.~~

*Make the following editorial changes to section 6.4.1.*

### 6.4.1 General concepts

This section describes WirelessMAN-CX operation specific to the MAC and support of the ~~PHY~~ MAC from the PHY ~~MAC~~.

*Make the following editorial change to the title of section 6.4.1.*

### 6.4.2 OFDMA PHY support for WirelessMAN-CX ~~support for OFDMA PHY~~

*Add a new section 6.4.3*

### 6.4.3 Dynamic Channel Selection (DCS)

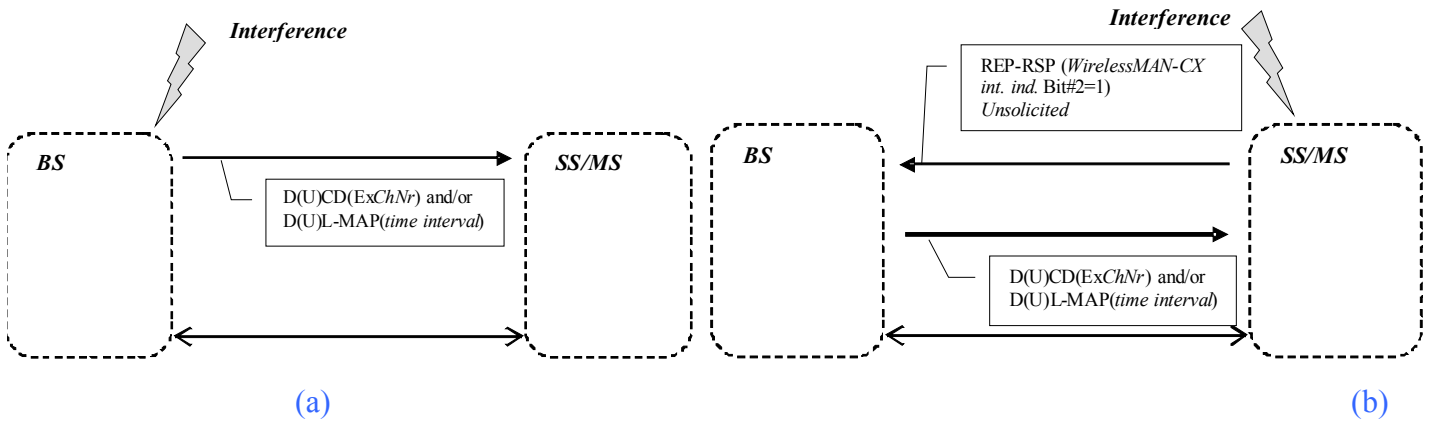
#### 6.4.3.1 Introduction

Dynamic Channel Selection (DCS) provides the ability of a system to switch to different logical channel based on channel measurements thus avoiding interference in license-exempt and uncoordinated bands of operation. Logical channels can be constructed from: frequency band, portion of a frequency band, time, or a combination of these.

The main distinction for DCS from avoidance of specific spectrum users (6.3.15) is that there are no regulatory demands placed on the DCS solution. However both mechanisms are supported with the REP-REQ/ REP-RSP (6.3.2.3.33) MAC messages. DCS provides a solution for bands in which there is no inter-system collaboration possible. DCS supports the solutions described in section 15.

A general example of a DCS solution is provided in figure xyz in which interference detection provides agility in frequency and time to reduce the affects of the incident interference. Figure h1 (section 6.3.15.1), although for specific spectrum users, provides a further example of how DCS can be used to provide resource

[management.](#)



**Figure xyz** Link level representation of DCS operation: (a) interference and remedial action at the BS, (b) interference and remedial action at the MS/SS.

*Add the following definition to section 3: Definitions*

**3.22 Dynamic Channel Selection (DCS):** The ability of a system to switch to a different *logical channel* based on channel measurements avoiding interference in license-exempt and uncoordinated bands of operation. *Logical channels* can be constructed from: frequency band, portion of a frequency band, time, or a combination of these elements.

*Add the following definition to section 4: Abbreviations and Acronyms*

DCS      Dynamic Channel Selection

**References**

[1] IEEE 802.16h-06/015: *Part 16: Air Interface for Fixed Broadband Wireless Access Systems Amendment for Improved Coexistence Mechanisms for License-Exempt Operation*, Working document.  
 [2] 80216h-06\_012r1: *Working Group Review Commentary file from session #43.*

