IEEE 802.19.1a
Wireless Coexistence

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| Text proposal on Section 7 |
| Date: 2016-05-17 |
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Abstract

This document provides text proposal on section 7.

=======(Text start)

1. Coexistence mechanisms and algorithms
	1. Coexistence mechanisms
		1. Introduction

A coexistence system contains two basic mechanisms to address coexistence of either WSOs in TV white spaces or GCOs: coexistence management and neighbor discovery. Coexistence management is the mechanism with which CMs of a coexistence system determine how potentially interfering WSO/GCOs can effectively share a set of radio resources. Coexistence discovery is the mechanism with which CMs find out potentially interfering WSO/GCOs. Additionally the CMs get from the neighbor discovery any information related to neighbors required for the CMs to communicate with each other.

* + 1. Coexistence management

Coexistence management is the mechanism with which a CM serves WSO/GCO s so that they can operate efficiently in available channels of the TVWS band. The CM determines how to share radio resources among a set of WSO/GCOs that are potentially interfering each other. For WSOs this is visible as a set of coexistence services that are available for it.

Each CM shall provide the following types of service for WSO/GCOs:

* Information service, and
* Management service.

Additionally, as parts of the management service each CM shall provide the following modes of the management service:

* TV channel mode, and
* Operating frequency mode.

For the WSO/GCOs that are subscribed to the information service the CM provides information about other users of the available radio resources. For those WSO/GCOs the CM does not determine operating parameters but all the decisions are made by the WSO/GCO.

For the WSOs that are subscribed to the management service the CM provides either one or more TV channels to operate within or an operating frequency to operate with. One or more TV channels are given to the WSOs that are subscribed to the TV channel mode of the management service. An operating frequency is given to the WSO/GCOs that are subscribed to the operating frequency mode of the management service.

* + 1. Coexistence decisions

Each CM shall implement the following three guidelines in the making coexistence decisions regardless of the algorithm in use:

* First, a non-overlapping WSO/GCO operating channel is selected for each WSO/GCO to avoid co-channel interference.
* If that is not possible, group similar WSO/GCOs together in frequency domain.
* If even that is not possible, start splitting the WSO/GCO operating channels of the WSO/GCOs for example in the time domain, the code domain, or the frequency domain.

Before a CM makes coexistence decisions it helps ensure that it has up-to-date information about available ~~TV~~ channels, coexistence sets, and the radio environment related to the WSO/GCOs to which the decisions apply. The CM shall use the relevant procedures specified in 5.2 to obtain all the up-to-date information.

* + - 1. Decision-making topologies

The decision-making topologies specified for the IEEE 802.19.1/802.19.1a coexistence system are as follows:

* Autonomous
* Distributed
* Centralized

When autonomous decision making is applied, a CM shall make decisions on coexistence independently from other CMs.

When distributed decision making is applied, a CM shall negotiate with other CMs that serve the neighboring WSO/GCOs about decisions.

When centralized decision making is applied, one CM shall control decision making of one or more other CMs. The CM that controls the decision making is called a *master CM*. The CM that is controlled by a master CM is called a *slave CM*.

With all three decision-making topologies a CM shall obtain information about neighboring WSO/GCOs to make the decisions.

CMs may change the decision-making topology at any time.

* + - 1. Information service

When a WSO/GCO is subscribed to the information service, it receives neighbor and radio environment information from the CM. The WSO/GCO determines its operating parameters. The WSO/GCO shall indicate the operating parameters to the CM.

* + - 1. Management service

A CM shall issue reconfiguration commands to those WSO/GCOs that are subscribed to the management service. A CM may also issue measurement requests for those WSO/GCOs.

* + - * 1. Operating frequency mode of the management service

When a WSO/GCO is subscribed to the operating frequency mode of the management service, it receives from the CM an operating frequency for use. The WSO/GCO shall operate as per the given operating frequency.

* 1. Coexistence algorithms
		1. Coexistence decision algorithms
			1. Algorithm based on load balancing
				1. Introduction

*Instruct editor to revise all the “WSO” as “GCO”.*

* + - * 1. Algorithm description

*Instruct editor to revise all the “WSO” as “GCO”.*

* + - 1. Algorithm based on output power level control
				1. Introduction

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* + - * 1. Interference-victim reference point

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* + - * 1. Reference point on a potential interfering node

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* + - * 1. Algorithm description

Flexible margin based calculation

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Calculation method of maximized output power level of GCO

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* + - 1. Algorithm based on co-channel sharing via GCO network geometry classification
				1. Introduction

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* + - * 1. Network geometry classification

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* + - * 1. Algorithm description

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