



# Sharing with Federal Government: Industry View

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# Unlicensed Access



## Facilitates broad market deployment

- Cost of spectrum is low
- Requires devices that can be compatible with licensed operations in the band

## Methods to gain access need to be well defined and stable in order to avoid market disruption

- Early definition of the Radar signals to be used in the design of sharing algorithms is key
  - Studies arrived at appropriate level to be sensed by devices
  - Field testing demonstrated proof-of-concept
  - Type approval ensured devices performed vs. testing requirements

# Success of DFS



## What is Dynamic Frequency Selection (DFS)?

- Algorithm embedded in device that allows a master device to detect radar energy and avoid interference
- Permits low power unlicensed devices to utilize radar spectrum that would otherwise lie fallow

## DFS is a policy and business success

- Successful coexistence with DoD and others
- Empowers new generation of broadband devices
- Well-suited for rural broadband deployment
- Utilized by multiple sectors including education, healthcare, government, and business

# Business and Policy Interest in 5 GHz and DFS



5 GHz DFS has been embraced by manufacturing industry

- Significant support from leading U.S. technology vendors

5 GHz is a key band for WISP community

- Driving broadband service to rural America

Sharing 5 GHz is critical to FCC's broadband goals and spectrum policy

- Industry is a key part of current and future shared spectrum opportunities

# Licensed Access



## Two models used that impact sharing with Government operations

### ➤ License-Lite Models

- Model used in 3650-3700 MHz and implements 80 km zone around 3 radiolocation sites where no operation is permitted.

### ➤ Licensed Model

- Radiolocation operations in bands above Global 2500-2690 MHz raises compatibility issues with radiolocation operation in adjacent band
- Example
  - Coexistence of S Band Radar Systems and Adjacent Future Services  
([http://www.ofcom.org.uk/radiocomms/spectrumawards/awardspending/award\\_2010/](http://www.ofcom.org.uk/radiocomms/spectrumawards/awardspending/award_2010/))

# Adjacent Channel Issues



## Implications of poor radar selectivity for 2.6 GHz use



- To protect unmitigated radars, around 43% of UK landmass could be temporarily excluded from 2.6 GHz base station use
  - including most urban areas
- This is based on assumptions on protecting civil and military ATC radars (air defence and maritime radars excluded at this stage)
- Watchman type radars make the greatest contribution (due to relative selectivity and number)
- Need for coordinated radar mitigation programme identified and agreed with Government and CAA to facilitate use of 2.6GHz in UK
- Potential implications also noted to ITU (though radar types and deployments differ significantly elsewhere)

# Summary



## Sharing is Hard

- First pass through in the U-NII bands took years
- Willingness of all parties to work towards solution was key to progress

## Spectrum Access In the Future Will Require Innovation

- All user of the spectrum are experiencing explosive growth
- Smart Radios, Sensing Radios, Cognitive Radios, Location Awareness, Database Techniques

Looking forward to continued Federal Government and Industry Partnership