

## **Shared Spectrum Company Memo**

From:David G JonesDate:May 7, 2020Subject:Project Description for Experimental License File Number 0405-EX-CN-2020

Project Title: Dynamic Spectrum Access (DSA) Rule Development and Validation

## 1. Background:

On January 29, 2015, the Federal Communications Commission completed an auction of Advanced Wireless Service licenses in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands (collectively, the "AWS-3" bands). With the reallocation of the 1695-1710 MHz and 1755-1780 MHz bands, a limited number of federal systems will indefinitely remain in the bands and will face sharing spectrum with non-federal users.

Spectrum sharing means that multiple users may potentially be in contention for the same frequency, and care must be taken to avoid interference that would result in degradation of primary user system performance. This may be mitigated at fixed sites by keeping the users separated geographically but the users must still be able to respond dynamically (for instance by adjusting antenna directionality) due to changes in propagation conditions that vary with weather, time of day, or seasons. The problem becomes much more complex with mobile users. Dynamic Spectrum Access (DSA) is a class of solutions where users can change frequency and/or other parameters in response to conditions, to maintain their own communications and avoid interfering with others.

As a result of the AWS-3 auction, the Spectrum Access R&D Program (SAR&DP) was initiated via partnership between ASD(R&E), Department of Defense (DoD) CIO, and Joint Staff J6 to develop and implement innovative spectrum technologies. The goal is to reduce operational risks to military communications stemming from the AWS-3 auctions and to define a clear transition path for sustained coexistence that can be realized within 2-5 years.

## 2. Scope:

The purpose of this SAR&DP Dynamic Spectrum Access (DSA) Rule Development and Validation effort, hereinafter referred to as "Project", is to develop and validate specific rules to govern coexistence and sharing between DSA Systems, DoD legacy systems, and commercial systems. There are two objectives of this Project: 1) Develop sensing, geo-location, and combined sensing/geo-location technology to be used as the empirical and scientific basis for concurrently developed DSA rules enabling spectrum sharing; and 2) Validate DSA rules and technology through lab and field testing.

It is important to understand the difference between DSA rules and DSA policies. As defined by IEEE 1900.5-2011 Standard for Policy Language Requirements and System Architectures for DSA Systems, a rule is a formula that has the form of an implication, while a policy is a set of rules governing the behavior of a system.



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The Project inherently includes up-front identification of assumptions and constraints for all affected systems stemming from coexistence within the bands of interest allocated by the AWS-3 auction. The designed solution shall demonstrate mitigation of interference risks associated with the AWS-3 auction and resulting transition out of the band or into shared spectrum operation. The DSA rules will include the use of data gathered through sensing, geo-location data, and a combination of both.

Provisions for the development of a lab simulation test bed, for the purpose of DSA rule validation, falls within the scope defined herein. The test bed will also be used for field validation, as well as for validation of future rules that may not be specifically evaluated during this period of performance.