WSD Geolocation

The only time the geographic location of a radiocommunication device is unimportant is when it is part of a system that has exclusive use of a frequency, or in cases when radio interference is expected to occur, and when it occurs, it is ignored.

The use of TV bands for WSD does not meet these criteria, so distance and frequency separation are essential for sharing. In conventional interference-free frequency shared bands, this is achieved by an elaborate process requiring human regulatory intervention that involves site and frequency selection, coordination and licensing. This process becomes even more complex when more than one type of radio system shares a band such as proposed in the TV/WSD bands.

In the TV/WSD bands, Television broadcasters have no control of the number or location of broadcast receivers within receiving distance, and no single entity will control unnumbered WSDs. This makes conventional frequency management impractical using the existing FCC processes.

Geolocation in concept, involves the geographic location of a specific WSD with respect to existing broadcast assignments, and assignment of a non-interfering frequency to the WSD from a calculated database of available frequencies in that location. The database can include previously assigned WSD. In theory, this extends conventional frequency management to bands that are otherwise unmanageable, and if put in practice is a revolutionary step to frequency management.

Geolocation

The precise location of WSD is required to not only initially avoid interference, but to correct it if the WSD device is moved to a new location. The WSP community will need to design their systems to provide geolocation, but whatever method will require that the WSD recognizes a change in location, and it is internet-connected to report to the database for a new frequency, if needed. It should not be anonymous, as broadcasters and their clients have a right to know who to contact to resolve interference should it occur, so names, addresses and telephone numbers of WSD users should be available, at least to the FCC who might release specifics to resolve a problem. Those requiring anonymity should use other bands.

The database should also be able to directly interact with the WSD to ensure it is still in operation. Indeed, operation of the WSD might be inhibited in the event of loss of contact with the database. This “active interactivity” might enable WSD operation within a TV service area with few TV receivers, with WSD operation becoming more restricted with time as populations grow.

This scheme of frequency management may seem burdensome, but a high hurdle should be set to guarantee broadcasting spectrum. The WSD manufacturers/providers should provide the infrastructure to achieve this. Achieving it will provide:

A. A market for WSD, and the opportunity to apply the techniques to other bands, to open new markets;
B. optimizing choice of site and frequency to avoid interference situations
C. mitigating interference should the choice of site or frequency still result in interference;
D. re-frequency or re-purpose of band to enable new stations, or applications;
E. provide a source of reliable data to the regulator;
F. fee collection for operation of the management system;
G. an ongoing market database for manufactures/providers