

## ***ISART Tutorial A: Flexible Spectrum Use Rights***

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**Abstract:** Although "command and control" spectrum management techniques have successfully provided very specific operating rules for many specific services since the early days of radio, such licensing is not easily adapted to permit new technologies and new services. Alternative licensing rules to allow more flexibility of use have been tried, but these have not always been successful in avoiding interference among users-as has occurred in the 800MHz band. This tutorial describes the necessary principles of flexible spectrum use rights, which would allow a wide variety of spectrum uses in a single general-purpose band, while providing a solid basis of responsibility for any interference. Based on the electrospace description of the radio spectrum, these principles allow general aggregation or division of licensed electrospace regions via secondary markets, providing rules for how regulatory limits change under aggregation or division. These flexible-use principles limit transmitter behaviors that create a more difficult operating environment for receivers, and they make receivers responsible for operating as-well-as-necessary in the relatively-benign radio environment created by transmitters. These flexible-use principles could provide a basis for real-world flexible-use frequency bands. However, work is still needed to determine what specific regulatory limits would be the most useful in such frequency bands.