A Generalized Method for Evaluating Interference is Spectrum Sharing Applications

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This abstract describes a method that was developed to identify all potential forms of interference that could occur with a proposed collocation of Federal Services in a common frequency band. The primary objective is that the quality of the mission critical communications for each service is maintained. A detailed electromagnetic compatibility analysis is necessary to identify both the highest potential interference scenarios and those scenarios that have little or no effect. Two primary interference mitigation techniques can be implemented to achieve electromagnetic compatibility: frequency offset and separation distance. Based on the frequency dependent rejection between the interference source and the receiver, the frequency offset and separation distance necessary for a desired level of interference rejection can be calculated. For all potential interference interactions, the frequency offset and separation distance can be adjusted to arrive at a solution for operation on a non-interference basis.

Federal agencies have been instructed to examine the potential of spectrally relocating their communication services and sharing spectrum bands with services of other agencies. The Institute for Telecommunication Sciences (ITS) , the Laboratory of the National Telecommunications and Information Administration (NTIA), was asked to conduct such an evaluation. This presentation details the method developed to evaluate the feasibility of coexistence of Federal communication services.

This work was performed under the direction of the Department of Homeland Security lead task group charged with examining an exit strategy for equipment assigned to operate in the 1755 to 1850 MHz band. It was proposed to relocate the frequency assignments of their services, which include a video surveillance system to the 1675 to 1695 MHz band, which is currently occupied by satellite and radiosonde communication services that are central to the mission of the National Oceanographic and Atmospheric Administration.

The generalized method described in this presentation can be used to evaluate interference when other Federal services may be required to locate to already occupied bands.