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SATELLITE DCS USE CONCEPT VALIDATION PROJECT - GOOD RF SPECTRUM STEWARDSHIP

Abstract

The 401-402 MHz band is under pressure from smallsat constellations to use for their satellite systems. The challenge being addressed is that in this same band, meteorological aids uplink data to geosynchronous Data Collection System (DCS) receivers and the small satellites downlink, using small omni-directional antennas that also transmit harmful energy towards these DCS receivers. As more and more of these satellite operations take place, an aggregate effect of interfering with the DCS receiver is expected and thus denying critical data from being received by the DCS receivers. NOAA continues to work and negotiate with the smallsat companies and also with the spectrum regulatory authorities to find effective, long-term solutions. However, these solutions continue to remain elusive. Identifying an opportunity for satellite use of the DCS system is expected to alleviate some of these risks and further strengthen the value of maintaining this system capability. The Satellite DCS Use Concept Validation project is designed to validate that LEO satellites are able to interface with the GOES hosted, and possibly other satellite, DCS receivers and thereby enable a low rate data (300 to 1600 bps) service to satellite users; primarily to assist in launch, early orbit, and anomaly (LEOA) operations. Satellite DCS users are good candidates for using available international DCS channels. There's sufficient room in random access DCS channels to allow a large number of satellite users to access the DCS through use of the international DCS band (IDCS) on GOES, METEOSAT, and HIMAWARI. It is expected that using DCS will assist in decreasing some of the risk of interference in the 400 MHz band. While risk reduction to RFI in the 400 MHz band is the primary benefit, additional benefits have also been identified, such as:

1) Low cost enablement of scientific, educational, and development satellite low data rate communications to respective mission centers. 2) Ability to enable LEOA communications during clustered deployments. 3) Projected demand for enabling the two-way communications capabilities of the DCS via GOES. 4) Good spectrum stewardship and responsible sharing of spectrum resources.

Validation of this satellite DCS use concept is planned for early 2020. Since no change is required for the DCS receiver system, once this use is validated, it can also be used by the other DCS systems in the international community, expanding the availability of DCS satellite use while further decreasing the pressure on the DCS utilized spectrum band.