

SPACE OPERATIONS SYMPOSIUM (B6)
Ground Operations - Systems and Solutions (1)

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MANAGING FREQUENCY CONJUNCTION FROM POLAR ORBITING SATELLITES

Abstract

As the use of X-band for transmitting large amounts of data from satellite to ground has been the preferred choice, and more polar orbiting satellites find their way into space (fueled by the SmallSat/NewSpace revolution), possible frequency conjunction at ground stations has become an issue. As well as having the potential of influencing downlink data quality, regulatory issues also makes it challenging for SmallSat/NewSpace missions to compete with existing government entities for X-band frequency/downlink coordination. The latter often results in new missions implementing a quite conservative downlink policy to account for possible frequency conjunction impacts.

Kongsberg Satellite Services (KSAT), having extensive experience in operating polar ground stations (Svalbard for the last 20 years and Antarctica for the last 10 years), is aware that frequency conjunction occurs. To minimize impacts to our customers due to this, KSAT has developed tools to coordinate operations. In addition, as the number of satellites using these stations continue to grow, we are constantly developing new techniques and services to accommodate the higher load.

Svalbard, the busiest ground station in the world and able to receive all polar orbits, together with the Antarctica ground station currently handles close to 20 000 contacts per month, spanning more than 100 missions. Based on this, the paper will discuss the statistical background as experienced by KSAT as well as the tools and related services available to manage frequency conjunction and to ease customer's mission planning.