

SPACE OPERATIONS SYMPOSIUM (B6)  
New Operations Concepts, Advanced Systems and Commercial Space Operations (2)

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THE TROLL SATELLITE STATION IN ANTARCTICA – ACHIEVING HIGH RELIABILITY IN  
CHALLENGING CONDITIONS

**Abstract**

The Troll station was established in 2005 by the Norwegian Polar Institute in cooperation with KSAT. Troll is located inland in Antarctica at 72 South and 2 East. It is located on solid rock, surrounded by the 1700m thick Antarctic glacier. The ice has two positive side effects: a) it has allowed the Troll Station to build a 2.5 km runway for airplanes (planes can land all year around), b) it generates a stable high pressure that leads to extremely dry conditions (allowing ideal conditions for Ka-band operations). At the same time Troll is only 230 km of the coast. Big structures like containers with antennas inside and the major part of the supplies are towed by snow cats from the ice edge to the station. Presently the third S/X band 7.3 m full motion antenna is under construction, guaranteeing increased redundancy and spare capacity to our customers. As the antenna systems are identical, spare handling is optimized. KSAT has procured its own Ka-band transponder directed at Troll on the Thor-7 satellite of Telenor that will be launched in 2014. This will increase the communications capacity from Troll to KSAT headquarters in Tromsø, Norway from 155 Mbit/s to 600 Mbit/s and allow a pricing of the communication that is competitive with the most of the last-mile fiber pricing on the mainland in the Southern Hemisphere. Troll has performed extremely well with availability rates of 99.8%. The Troll station is manned around the year. The engineers at Troll are trained to perform trouble shooting, maintenance and to support operations like e.g. Launch and Early Operation Phases and guaranteeing service availability throughout the year. Overall KSAT has managed to make a service from Antarctica as part of its global network available at a competitive price for its customers without compromising performance. The paper will present how the station at Troll is made available through the KSAT network, and the benefits satellite owners get from a station on the Antarctic continent.