



CASE STUDY

ASCAT Advanced Scatterometer

The ASCAT Advanced Scatterometer will be an important instrument on the MetOp satellites. The ASCAT's primary purpose is to measure the radar backscatter from the ocean surface, which enables estimation of the ocean surface roughness and wind velocity for meteorological purposes. In order to derive accurate information from ASCAT data, it is necessary to perform regular in-flight calibration of the instrument. This will be done (in part) using dedicated ground transponders that provide radar returns with very accurately known amplitudes.

SEA is providing the ground-based ASCAT Calibration Transponders. In a related activity, SEA completed a study for EUMETSAT investigating and prototyping the algorithms required to derive the in-flight antenna patterns from the observed transponder measurements. This activity helped to ensure the accuracy of the ASCAT information being provided to the meteorological community.



The ASCAT ground calibration transponders have now completed external calibration. The calibration performance of the ground calibration transponders exceeded the requirements in all cases and the transponders were formally handed over to the customer at a delivery review in December 2004. The transponders were stored in the UK prior to their operational deployment in Turkey.

Radar calibration systems sited in Turkey

SEA is installing and commissioning its precision radar calibration systems in three specialised ground stations at sites across Turkey.



The equipment will be operated by Eumetsat to support the operational meteorological satellite programme MetOp 1. The systems will be used to calibrate the Advanced Scatterometer instrument while in orbit; the benefits of the data from the Advanced Scatterometer include improved estimates and predictions of wind speeds. The systems have been designed to provide a highly stable echo of the received signal and to operate over a period of 15 years.

The significant elements of the system include the C-Band antenna and RF up/down conversion, two-axes steerable mount and digital electronics for capturing, processing and echoing the signal emitted from the spaceborne instrument. Additional equipment has been provided to enable all of the calibration systems to be remotely monitored and controlled, with routine operations performed autonomously.

SEA is the prime contractor with a major subcontract placed with QinetiQ.