

September  
2015**Events 2015/16****9 September 2015**Space Situational  
Awareness workshop,  
ESOC, Darmstadt[http://emits.sso.esa.int/emits-doc/  
ESOC/SSA/SSA-P3-WS-Announcement-  
Final.pdf](http://emits.sso.esa.int/emits-doc/ESOC/SSA/SSA-P3-WS-Announcement-Final.pdf)**11 September 2015**Copernicus User Information  
day, Eumetsat, Darmstadt  
<http://www.eumetsat.int>**21 - 25 September 2015**EUMETSAT Meteorological  
Satellite Conference  
Toulouse, France  
<http://www.eumetsat.int>**13 - 15 October 2015**Meteorological Technology  
World Expo 2015  
Brussels, Belgium  
[http://www.meteorologicaltechnology-  
worldexpo.com/](http://www.meteorologicaltechnology-worldexpo.com/)**10 - 14 January 2016**96<sup>th</sup> AMS Annual Meeting  
New Orleans, Louisiana, USA  
<http://annual.ametsoc.org/2015/>For meeting and appointments  
during the events, e-mail us on  
[marketing@spaceteq.no](mailto:marketing@spaceteq.no)**this issue****ESA IPF CollGS P.1****Tracking antenna to  
Norwegian AIS Satellites P.2****MEOS™ 3.8 m antenna  
to Bratislava P.3****Sentinel-1A to KSAT P.4****ESA's Instrument Processing Facility successfully  
integrated in our Collaborative Ground Segment solution**

MEOS™ NRTSAR is the Kongsberg Spaceteq Near Real Time Synthetic Aperture Radar processor. The MEOS™ NRTSAR processor does processing in parallel with reception, which allows service delivery to start while data is received from the satellite.

In addition Kongsberg Spaceteq recently completed the integration of the Sentinel-1 Instrument Processing Facility (IPF) from the European Space Agency (ESA) in MEOS™ Collaborative Ground Segments (CollGS); our complete ground station solution for the Sentinel satellites.

The ESA IPF is the Sentinel-1 processor in use by the Sentinel-1 Payload Data Ground Segment, and it is made available by ESA for all national collaborative ground stations within the European Union or ESA member states.

More than one ESA IPF may also be integrated into the CollGS system to increase the processing speed.

The Kongsberg Spaceteq MEOS™ CollGS system seamlessly integrates the ESA IPFs and the MEOS™ Sentinel-1 level 0 processor. The same KSPT Sentinel-1 proven receiver and front end processor used by all ESA Sentinel-1 core ground stations, is used to deliver data to the CollGS system.

The full MEOS™ CollGS system is a compact, yet powerful, ground station solution for Sentinel-1, upgradable to include also Sentinel-2 reception and processing capabilities in the near future.

One or more MEOS™ NRTSAR processors can also be included in the CollGS system, giving the user the possibility to provide services from synthetic aperture radar data close to real time.

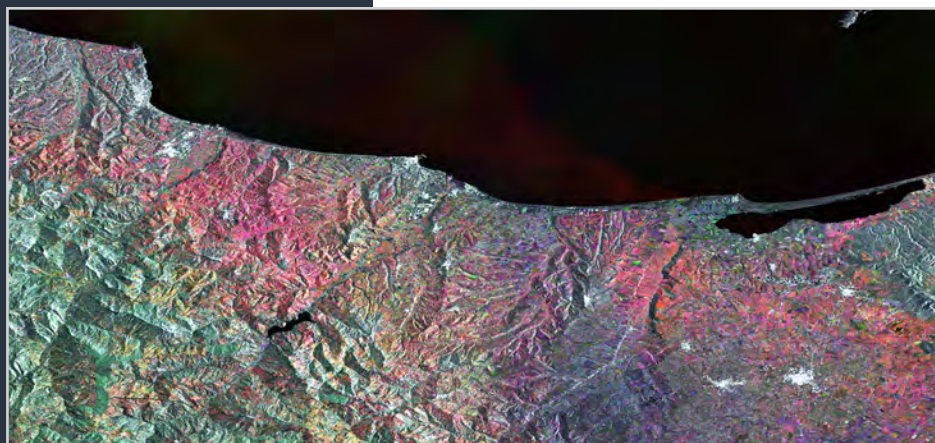
*Information about ESA Sentinel:*

Sentinel Collaborative Ground Segment:

[http://www.esa.int/Our\\_Activities/Observing\\_the\\_Earth/  
Copernicus/Sentinel\\_Collaborative\\_Ground\\_Segment](http://www.esa.int/Our_Activities/Observing_the_Earth/Copernicus/Sentinel_Collaborative_Ground_Segment)

ESA Sentinel-1 Instrument Processing Facility IPF <https://sentinel.esa.int/web/sentinel/sentinel-1-sar-wiki/-/wiki/Sentinel%20One/Algorithm%20Overview>.

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## EXTREME PERFORMANCE FOR EXTREME CONDITIONS

### Near Real-Time Image Viewer

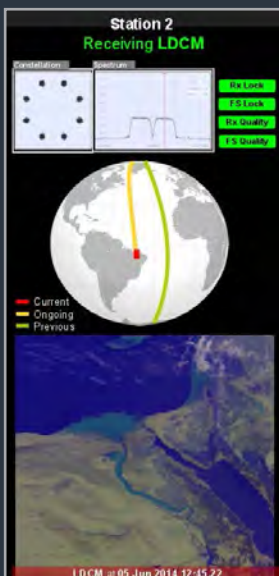
Kongsberg Spacetek has recently signed a contract for implementation of two of the NRT-IV components covered by the ESA EO PDGS Infrastructure Evolution 2011-2016 programme:

- NRT-IV Acquisition System
- NRT Image Data Relay (AS-EXT)
- NRT-IV Remote Station Control Room (NRT-CR)

The purpose of the AS-EXT system is to facilitate the flow of Quick-Look images from acquisition systems (e.g LDCM - Landsat Data Continuity Mission, Sentinels, Proba-V) to user applications. Image data will be processed if required and archived on the AS-EXT. It serves as the central element of the whole NRT-IV system that connects other components together.

The NRT-CR is one of the user applications in the NRT-IV system. Its intended primary users are the ground station operators accessing it from internal ESA networks. Due to this, the NRT-CR will combine the Quick-Look viewing functionality with some additional Monitoring and Control (M&C) features.

Delivery of these systems is scheduled for early 2016.



Example of Visitor GUI layout

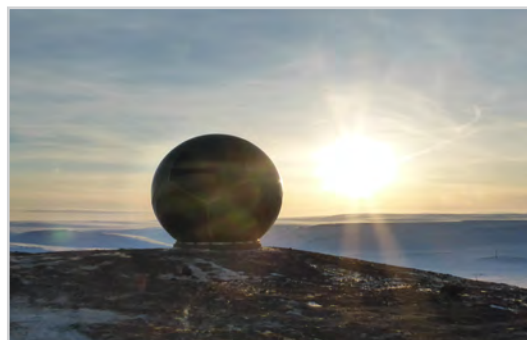
## Tracking antenna for data reception and control for the Norwegian AIS Satellites

Kongsberg Spacetek delivered a 3,7 m S-band TT&C antenna including radome to the Norwegian Coastal Administration. The system will be used for data reception and control of the Norwegian AIS satellites. The system was successfully installed in Vardø, Norway, March 2015.

In addition, we also delivered a 4,5 m radome to cover the uplink antenna.

The Norwegian AIS satellites are operated by Statsat AS for the Norwegian Coastal Administration.

The contract was signed with Space Flight Laboratory Inc. (SFL) of Canada Inc.



## Space Flight Laboratory INC (SFL)

The Space Flight Laboratory (SFL) at the University of Toronto Institute for Aerospace Studies (UTIAS) was founded in 1998 and is Canada's premier microspace organization. SFL builds low-cost microsatellites and nanosatellites that continually push the performance envelope. Missions are typically developed with stringent attitude control and data requirements that are striking relative to the budget available. SFL must be innovative while adopting a highly focused approach to development in order to achieve costs at a small fraction of the price of similar satellites

developed elsewhere. SFL has developed the Generic Nanosatellite Bus (GNB) and the Nanosatellite for Earth Monitoring and Observation (NEMO) bus to provide low cost, high performance missions to international customers. SFL arranges launches through its Nanosatellite Launch Service (NLS) and provides customizable separation systems called "XPODs" for those launches. As part of its complete end-to-end mission capabilities, SFL maintains a mission control center consisting of multiple ground stations. <http://utias-sfl.net/>





## EXTREME PERFORMANCE FOR EXTREME CONDITIONS

# MEOS™ 3.8 m antenna installed at Slovak Hydrometeorological Institute, Bratislava

Kongsberg Spacetec has delivered our MEOS™ Polar and MEOS™ Geo Eumetcast solution to The Slovak Hydrometeorological Institute (SHMÚ) in Bratislava for operational tracking, reception and processing of data from MSG, NOAA, METOP, Terra and Aqua and NPP series of missions.

The delivered system is based on the 3.8 meter X- and L-band MEOS™ Antenna for satellite tracking and data reception working as front end for MEOS™ Polar data acquisition and processing system.

This delivery is being carried out as a part of the “Construction of a Flood Warning and Forecasting System” Project co-financed by the European Regional Development Fund under the Environment Programme.

The delivered system also includes reception of data from the EUMETSAT - EUMETCast DVB-S2 Service using a 1.8 m geostationary antenna working as front end for the MEOS™ Geo data acquisition and processing system.



## SENTINEL Collaborative Ground Segment reception and processing system

Kongsberg Spacetec delivers satellite data reception and processing systems for the Sentinels.

We have developed the demodulator, front end processor and archive (Sentinel DFEP) systems currently deployed at the ESA ground network.

For Sentinel-1 we are now offering a highly configurable Collaborative Ground Segment (CollGS) solution that may include everything from the antenna to value added services, or just the pieces you need for integration in your current infrastructure.

Our MEOS™ Antenna has been tested and proven to receive Sentinel-1 data of excellent quality. Sizes from 3.8 m up to 5 m.

## Slovak Hydrometeorological Institute (SHMÚ)

The Slovak Hydrometeorological Institute (SHMÚ) is a specialized organization providing hydrological and meteorological services at the national and international level. The SHMÚ was established by the former Ministry of Forestry and Water Management on 1 January 1969. The SHMÚ is the successor of institutions that were providing hydrological and meteorological services in Slovakia from the mid-19th century. It is state-subsidised organisation operating under the Slovak Ministry of Environment.

The SHMÚ’s activities include the following: monitoring of quantitative and qualitative parameters of the air and water in Slovak territory; collecting, verifying, interpreting and archiving data and information on the condition and regime of air and water; describing developments in the atmosphere and hydrosphere; and issuing forecasts, warnings and other information regarding the atmosphere and hydrosphere. All the aforementioned data, information and other research are made available to the public. <http://www.shmu.sk>



MEOS™ 5 m Antenna



## New contracts

Kongsberg SpaceteC has signed a contract with the Korean company InSpace Co., Ltd. to provide our MEOS™ Polar system to K-water (The Korea Water Resources Corporation). **JUL 2015**

Kongsberg SpaceteC has signed a contract with Kongsberg Satellite Services (KSAT) for delivery of three MEOS antennas for tracking of polar orbiting satellites. The antennas are delivered with 5m reflector and radomes. They will be installed in Alaska, South America and Antarctica 4Q 2015 and 1Q 2016. **JUN 2015**

Kongsberg SpaceteC has signed a contract with Tianjin Sanwei Electric Co. Ltd, PRC China, for delivery of one MEOS antenna and data capture system for reception of data from orbiting satellites. The antenna is delivered with 5 m reflector and radome. It will be installed in 2Q 2016. **JUN 2015**

Kongsberg SpaceteC has delivered our MEOS™ solution to The Slovak Hydrometeorological Institute (SHMÚ) in Bratislava for operational tracking, reception and processing of data from NOAA, METOP, Terra and Aqua and NPP series of missions. **MAY 2015**

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## MEOS™ Polar v. 4.0 release

During autumn 2015 we will release MEOS™ POLAR version 4 and you can read more about the new features in the February 2016 edition.

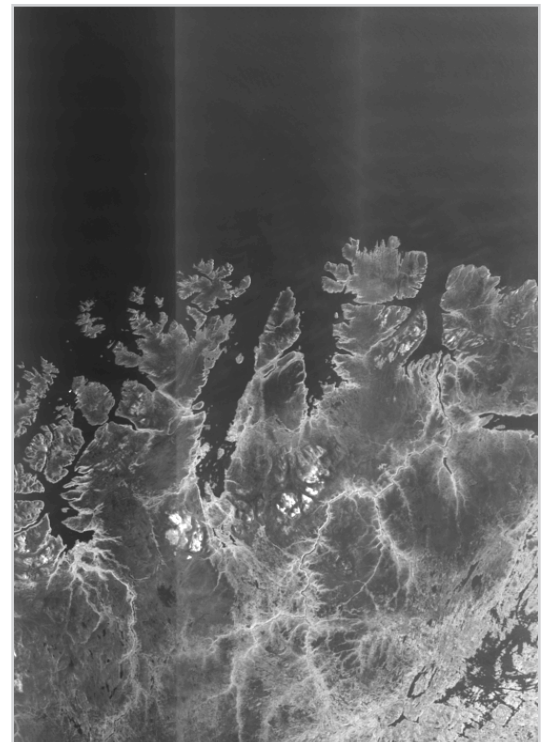


## Sentinel-1A CollGS system delivered to KSAT

Kongsberg SpaceteC completed the On-Site Acceptance Testing and delivery of the Sentinel-1 CollGS system on 10th July 2015, as a part of the contract between Kongsberg SpaceteC and Kongsberg Satellite Services (KSAT) to deliver the national Norwegian integrated Sentinel-1 Collaborative Ground Segment (CollGS) reception and processing system.

The Sentinel-1 CollGS system has been used during a one month national Norwegian campaign starting on 20th July 2015, to deliver Sentinel-1 products to Norwegian test users.

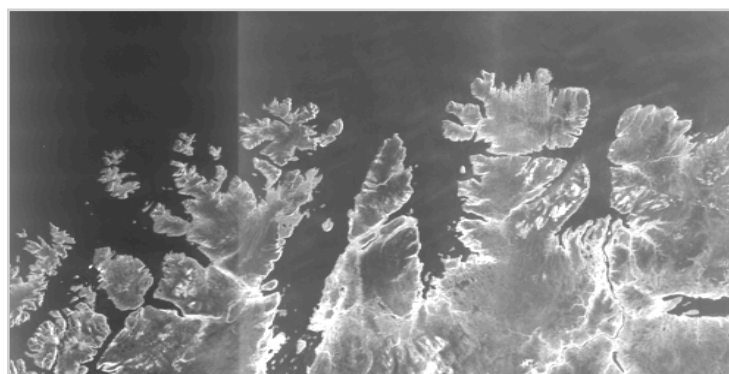
Kongsberg SpaceteC is currently working to upgrade the Sentinel-1 CollGS system to deliver level 1 Dual Polarization products and level 2 (TBC) IPF products.



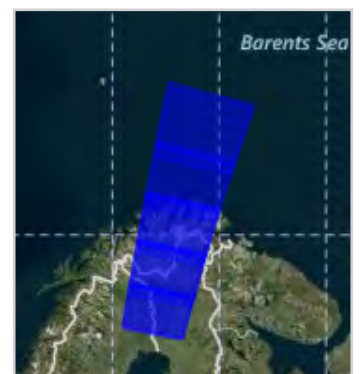
A 90 seconds contrast enhanced Sentinel-1A Interferometric Wide (IW) swath (3 swaths: 12/11/10) Ground Range Detected (GRD) image from VH polarization (channel 1), covering the coast of Finnmark (Norway) on May 6<sup>th</sup> 2015

*Both the 90 and 30 seconds images are processed using the national Norwegian Collaborative Ground Segment (CollGS) system developed and delivered by Kongsberg SpaceteC, using data received in Tromsø by KSAT on May 6<sup>th</sup> 2015. These two images are the first images processed by the national Norwegian CollGS system from Sentinel-1 data received in Tromsø.*

*The images are processed using the level 0 processor developed by Kongsberg SpaceteC and the IPF processor delivered by ESA, both integrated into the national Norwegian CollGS system.*



A 30 seconds contrast enhanced Sentinel-1A Interferometric Wide (IW) swath (3 swaths: 12/11/10) Ground Range Detected (GRD) image from VH polarization (channel 1), covering the coast of Finnmark (Norway) on May 6<sup>th</sup> 2015



Sentinel-1A image May 6<sup>th</sup> 2015