

## Unique Ground Network

At KSAT we have made it our mission to ensure rapid access to data and delivery of services through a set of well equipped, modern ground stations.

Through this unique ground network and established relationships with the world's major satellite operators, the company has "pole position" when it comes to the ability to access, download and distribute multi mission information in near realtime.

KSAT's unique network of ground stations puts us in the best position to receive the highest possible volume and variety of satellite data from polar orbiting satellites with a minimum latency, anywhere on earth.



Kongsberg Satellite Services



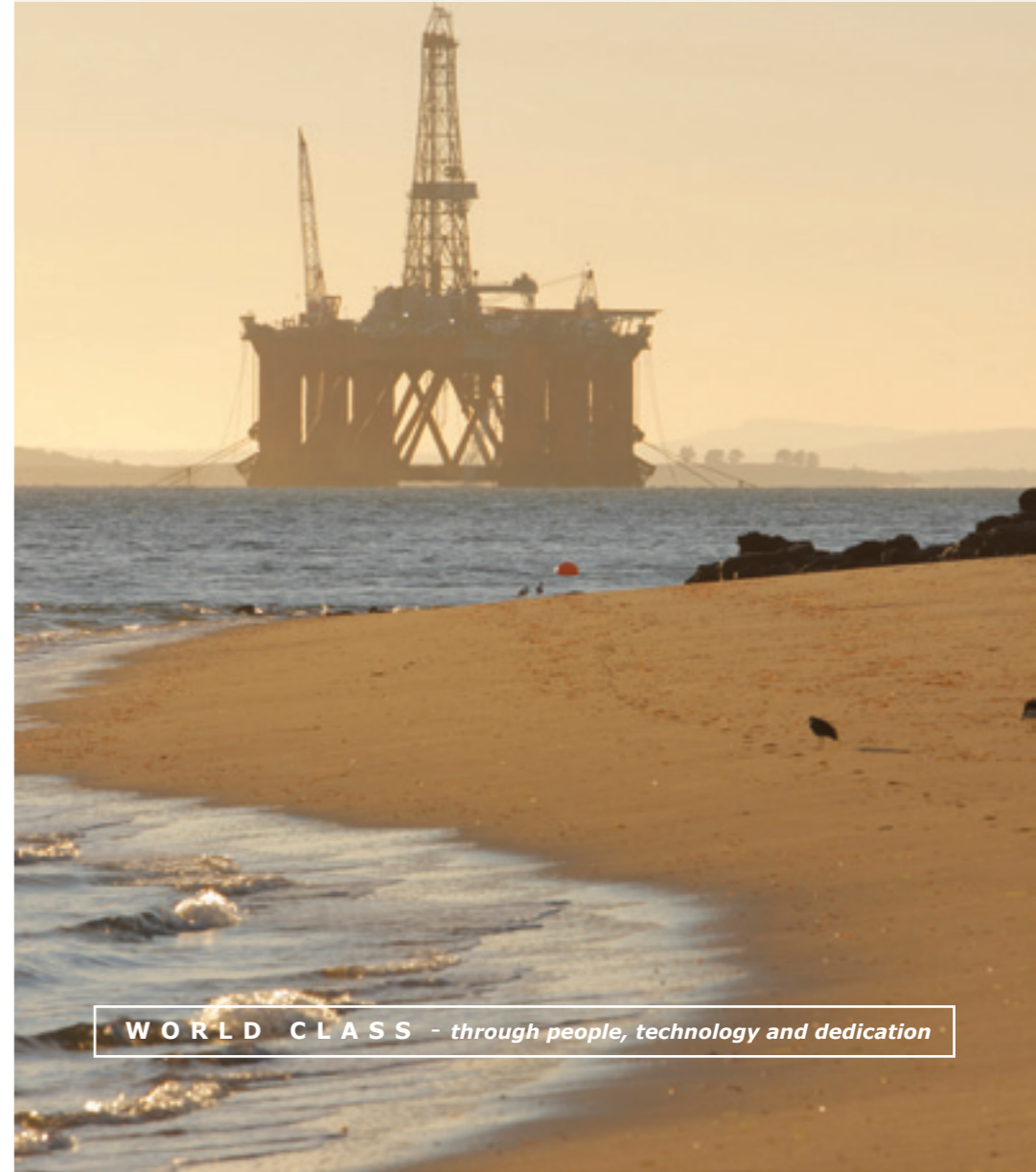
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## Maritime Monitoring KSAT - Oil spill detection service

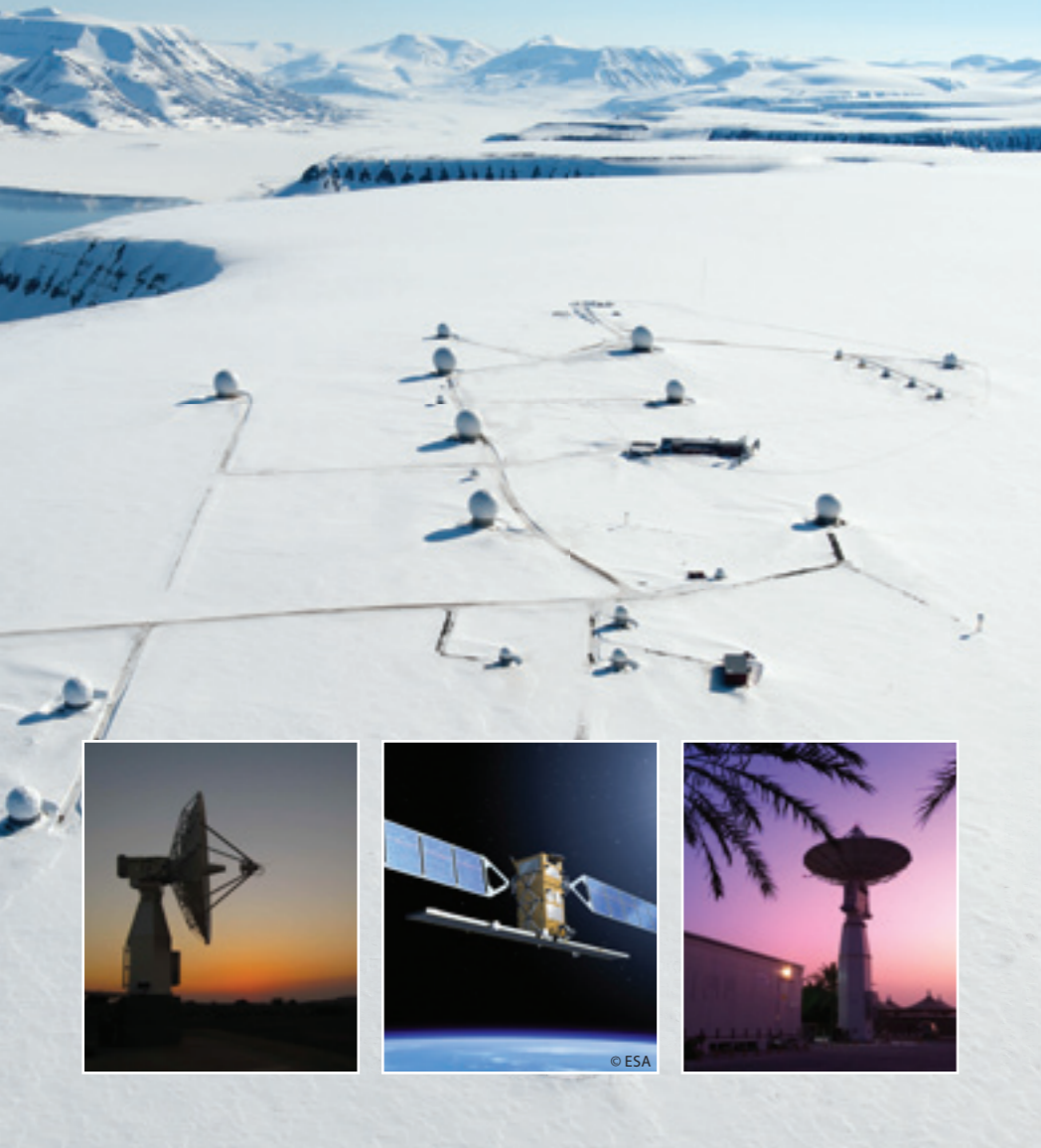
**Kongsberg Satellite Services (KSAT)** is a commercial Norwegian company which has provided satellite ground station and earth observation services since 1967. With over 60 antennas distributed between interconnected ground stations at each pole and a growing global network, KSAT's unique infrastructure provides unprecedented access to polar orbiting satellites and enables our world-class operations.

KSAT is owned 50 % by KONGSBERG Group and 50 % by Norwegian Space Agency Properties, and the head office is located in Tromsø.

For more information: [www.ksat.no](http://www.ksat.no)



WORLD CLASS - *through people, technology and dedication*



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# The KSAT Advantage

KSAT pioneered operational oil spill detection and has since established itself as the global leader in every aspect of service provision – acquisition, analysis, and delivery.

## Acquisition

KSAT has specialized personnel and a sophisticated custom planning tool to quickly investigate coverage options and task satellites anywhere in the world. We can provide data from the majority of commercial satellites in orbit today and routinely assist clients with everything from complex long-term planning across multiple missions to initial education and communication of options. KSAT owns and operates a unique network of satellite antennas positioned to ensure frequency and redundancy.

*More satellites supported and more passes received means KSAT has access to the most extensive and most current imagery possible.*

## Analysis

KSAT pioneered the interpretation of satellite imagery for oil spill detection purposes – a process refined over fifteen years. SAR image analysis is a skill; it cannot be reliably automated. Our expert analysts have reviewed thousands of images and this track record is a critical element of our success.

*KSAT spill reports are the most accurate in the industry.*

## Delivery

Oil spills can happen at any time and response efforts must begin immediately. KSAT's entire organizational value chain, from the infrastructure and information technologies we utilize to the personnel we staff twenty-four hours per day seven days per week, is designed to minimize the time between satellite imaging and the communication of analysis results.

*KSAT delivers actionable information in a matter of minutes, anywhere in the world.*



KSAT has specialized personnel at work 24/7 all year.

“KSAT’s maritime monitoring services have been provided to oil companies, pollution-control authorities and coastguards for more than 15 years”

Day or night, fair weather or foul, satellite imagery makes it possible to monitor large ocean areas anywhere in the world, and the use of Synthetic Aperture Radar (SAR) from satellites has proven to be an excellent tool for detecting oil slicks at sea. Information derived from analyzing SAR images provides early detection of pollution incidents introduced by offshore oil activities as well as accidental or illegal discharges from vessel traffic. KSAT established the world’s first operational oil spill detection service using SAR and the service is currently provided worldwide, assisting national authorities in detecting oil discharges and alerting oil companies of possible pollution.

KSAT’s maritime services are utilized by a wide range of customers world wide - including governmental regulators, coastal authorities and fisheries agencies, the petroleum and shipping industries, and defense / intelligence communities.

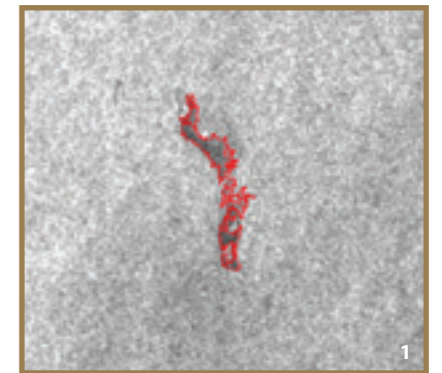


KSAT was instrumental in the establishment of the European Maritime Safety Agency’s CleanSeaNet Service in 2007 which monitors 24 European coastal states. The CleanSeaNet service provides the EU Member States with coordinated monitoring and detection of illegal discharges and accidental oil spill at sea.

The Norwegian Clean Seas Association for Operating Companies (NOFO) maintains the operating companies’ oil spill preparedness associated with exploration for and production of oil and gas. KSAT provides early detection service to all oil companies operating on the Norwegian continental shelf through NOFO.

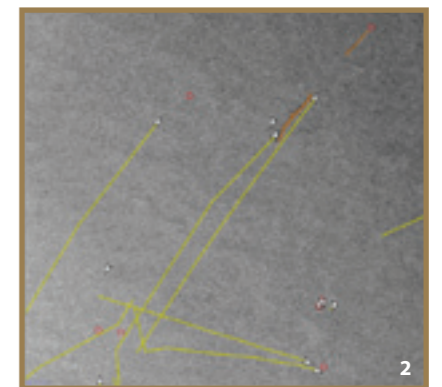
## Synthetic Aperture Radar (SAR)

SAR has proven to be an excellent tool for detection of oil slicks, vessels and installations at sea. This advanced sensor can detect oil slicks due to the change in behavior of the sea surface and vessels, oilrigs and other installations are reflected as bright dots. Image analysts are able to distinguish features and objects on the surface independent of day light and atmospheric complications such as clouds and fog.



## Source Identification

Vessel movements tracked using Automatic Identification System (AIS) data are integrated into the analysis process, creating a powerful tool for identifying likely sources. Source identification further benefits from overlaying maps with positions of rigs and drilling-ships, pipelines and subsea installations.



1. KSAT believes in continuous improvement. This example is from an exercise in 2012 where oil was intentionally introduced and a variety of innovative new techniques were evaluated. COSMO-SkyMed©ASI 2012. Data distributed by; KSAT, Norway.

2. Live AIS feeds are integrated into the analysis process. RADARSAT-2 Data and Products © MacDonald, Dettwiler and Associates Ltd. 2012. – All Rights Reserved. RADARSAT is an official mark of the Canadian Space Agency.