S&T Airborne Systems

Your solution provider in Airborne Maritime Surveillance

Bonn Agreement seminar Middelburg, April 14, 2015

Olov Fäst
S&T Airborne Systems

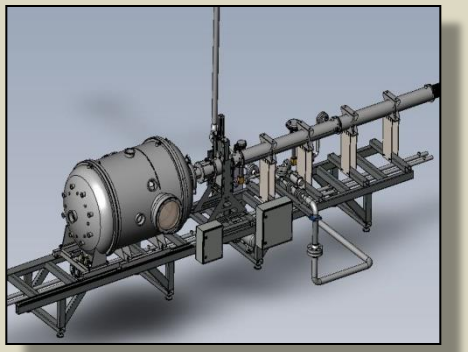
Sjöland&Thyselius (S&T)

- **Swedish Consultancy Company established 1989**
- **From turn-key assignments to expert consultancy**
  - System Development
  - System Integration
  - Communication
  - Simulation and Modeling
- **Customers in Europe, Asia, North and South America**
- **160 employees**

S&T Airborne Systems
Experts in airborne maritime surveillance
Member of the Sjöland&Thyselius Group

Sjöland&Thyselius

Provides innovative customer specific solutions



Sjöland&Thyselius
Experts in Advanced Technology

Institutes | Universities | HW/COTS

S&T Airborne Systems
Experts in airborne maritime surveillance
Member of the Sjöland&Thyselius Group

> 35 years of experience

S&T Airborne Systems











- > 35 years experience
- > 80 systems delivered worldwide
- Multiple platforms
- Multi-mission systems (Integrated & user friendly!)
- Real time reporting

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SSC Airborne Systems -> S&T Airborne Systems

Airborne Maritime Surveillance Systems in use in >20 countries for:

- **Environmental Protection/ Oil pollution**
- **EEZ Protection/Border control**
- **Law enforcement**
- **Fishery patrol**
- **Search and rescue**
- **Ship traffic management**
- **Ice patrol**

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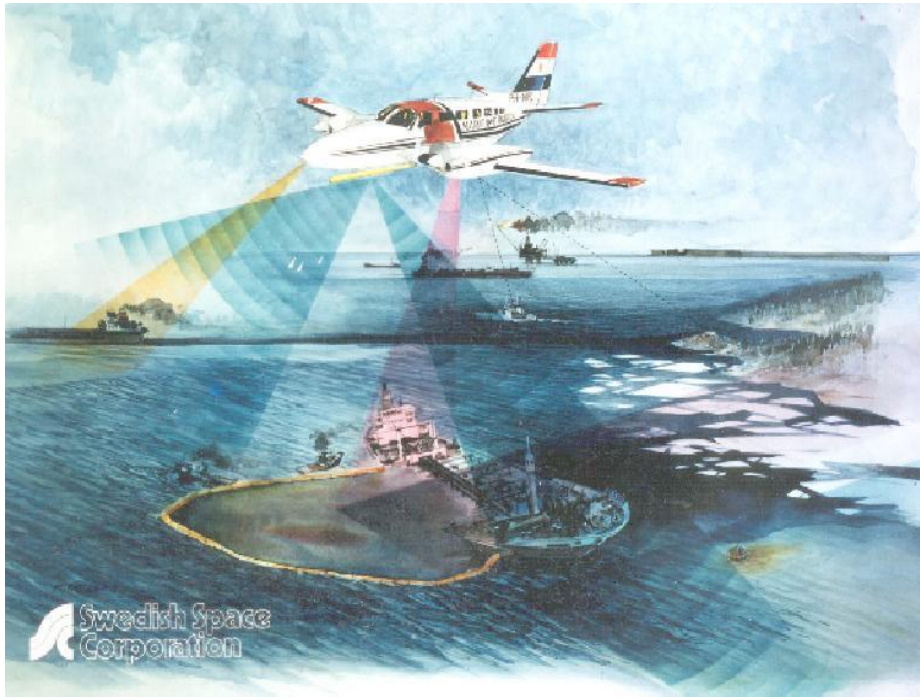
1982 first installation for Rijkswaterstaat

- SLAR (Side Looking Airborne Radar) for large area patrol, optimised for detection of oil spills and small targets
- IR/UV scanner for wake inspection and oil pollution mapping
- Photographic and video camera system for documentation and courtroom evidence



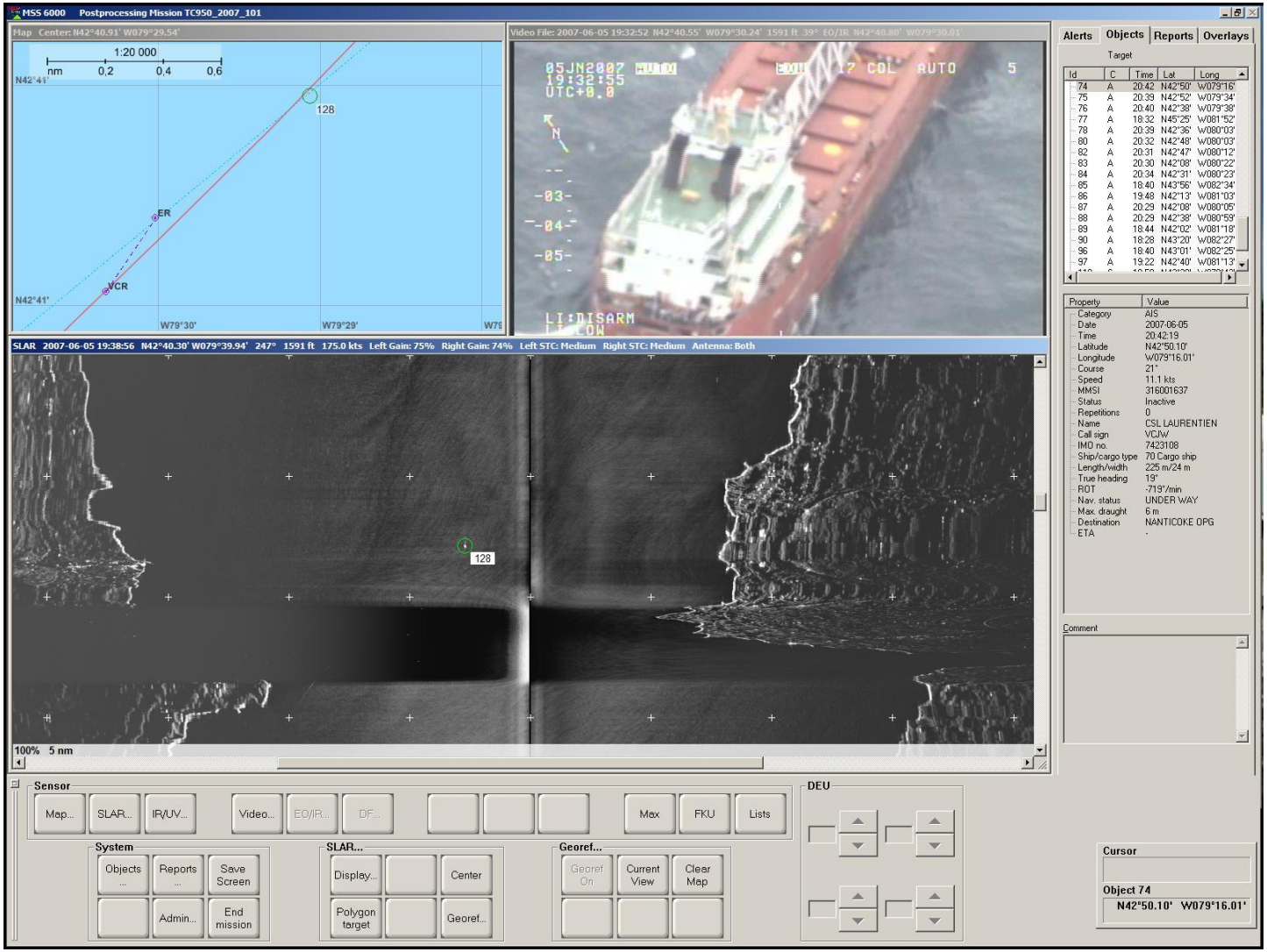
MSS 6000 in operation with Transport Canada since 2006

- SLAR
- IR/UV
- AIS
- EO/IR (FLIR)
- Still camera
- Video camera
- Direction Finder
- SATCOM

Photo Paul Minnaar, Transport Canada


BARCO
MPRD 126 HB
BARCO
MAPD 3548

Correlated observation and documentation



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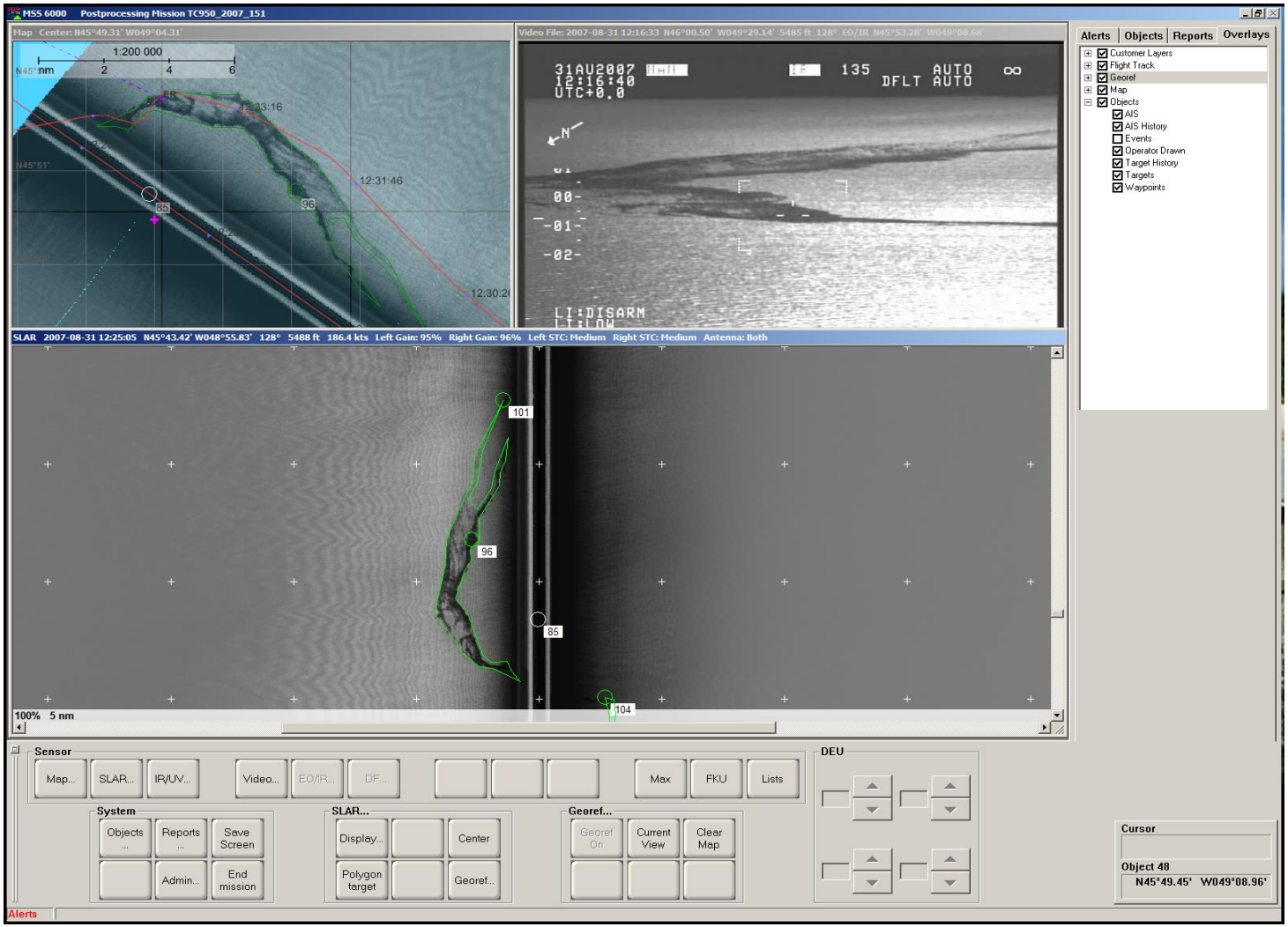
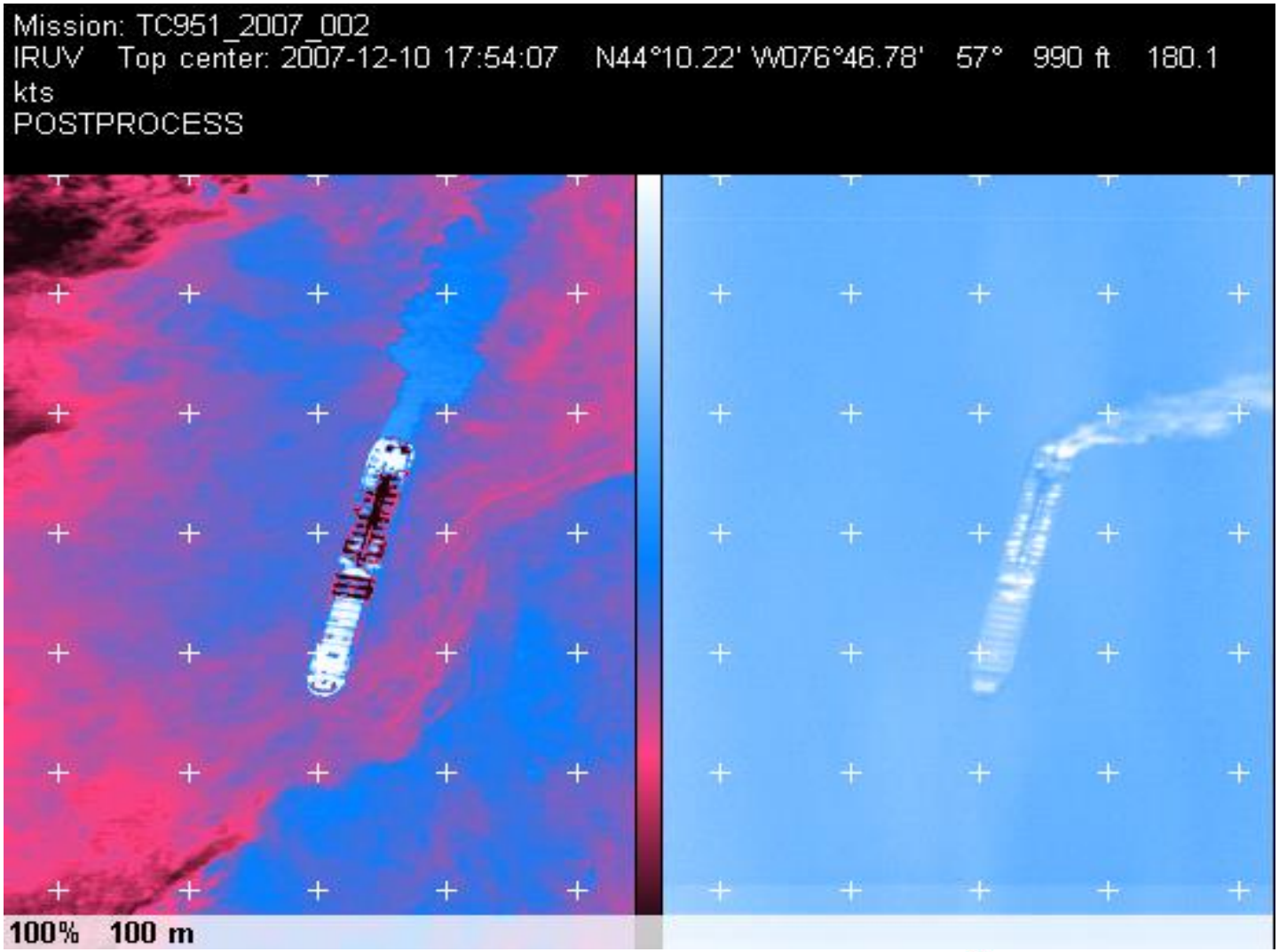
Correlated observation and documentation



IR/UV

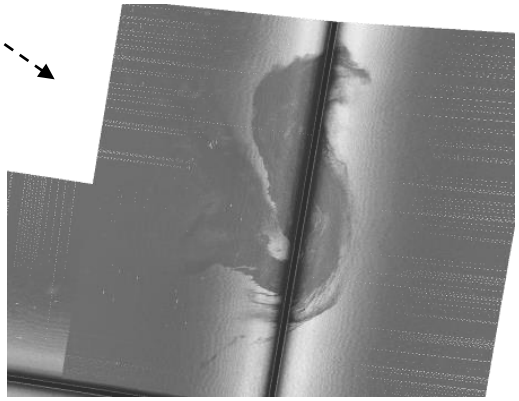


Cameras for documentation and information

Real time data transfer

- Satellite data transmission system (high-speed INMARSAT)
- Map overlay images, photos, video, reports to command centre in flight

Command centre



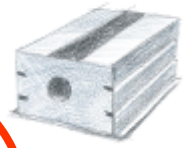
SLAR radar image with geographic references (GeoTIFF)

Finnish Border Guard MSS 6000

Communication & reporting

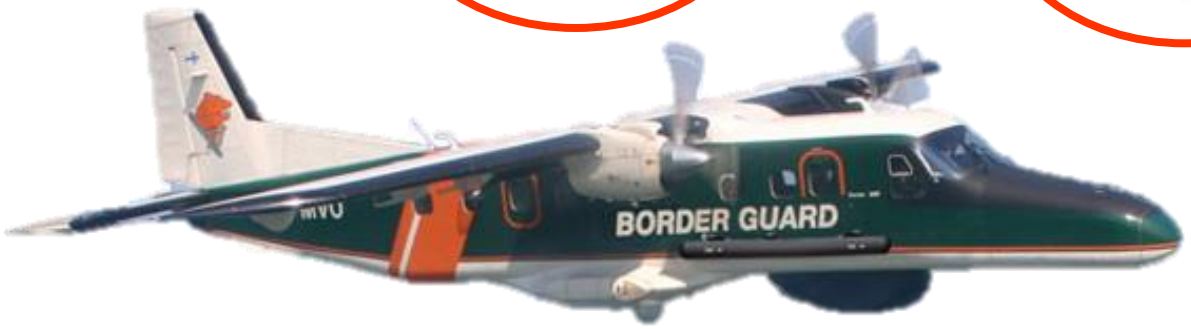
Dual Operator consoles

AIS

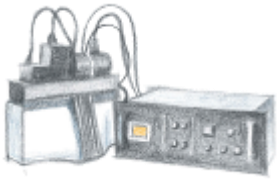


Search Radar

Cameras



DF



IR/UV Scanner

EO/IR

SLAR

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Two identical workstations, with integrated control of:

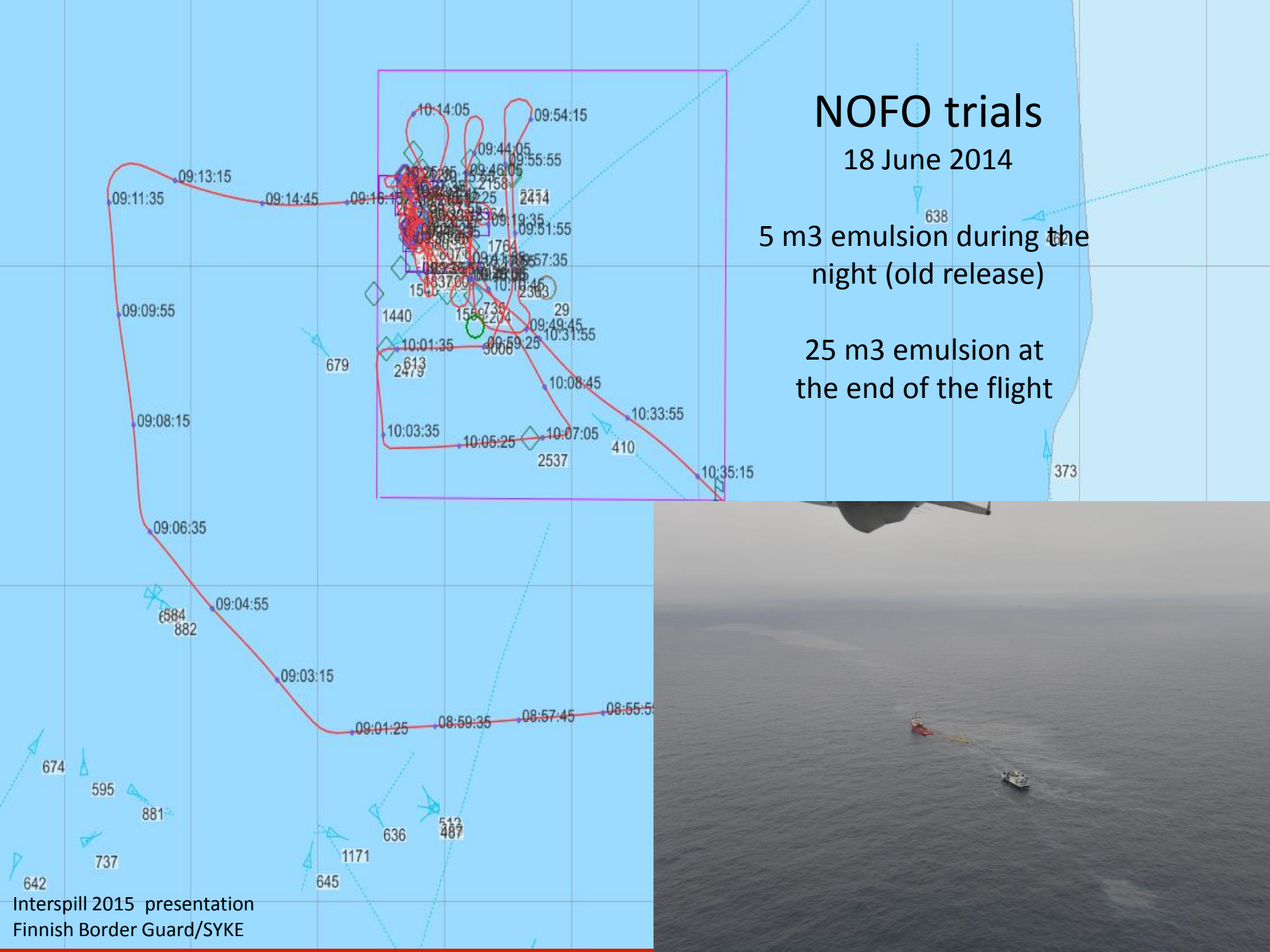
Search radar, SLAR, IR/UV, AIS, Cameras, Satcom, FLIR, DF

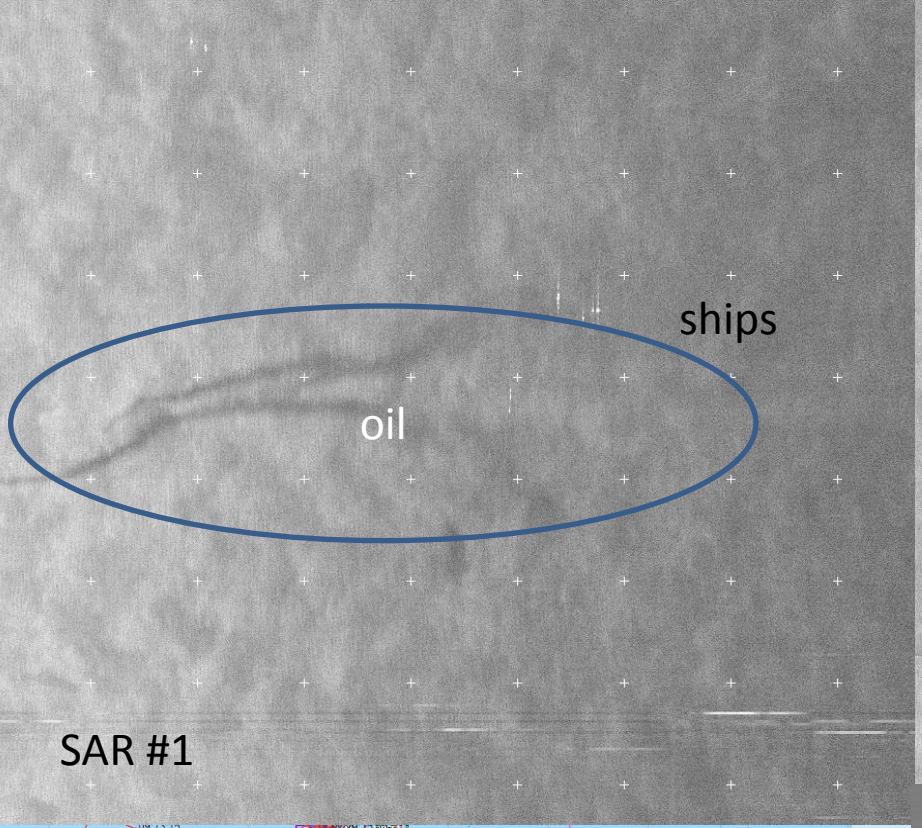
NOFO trials

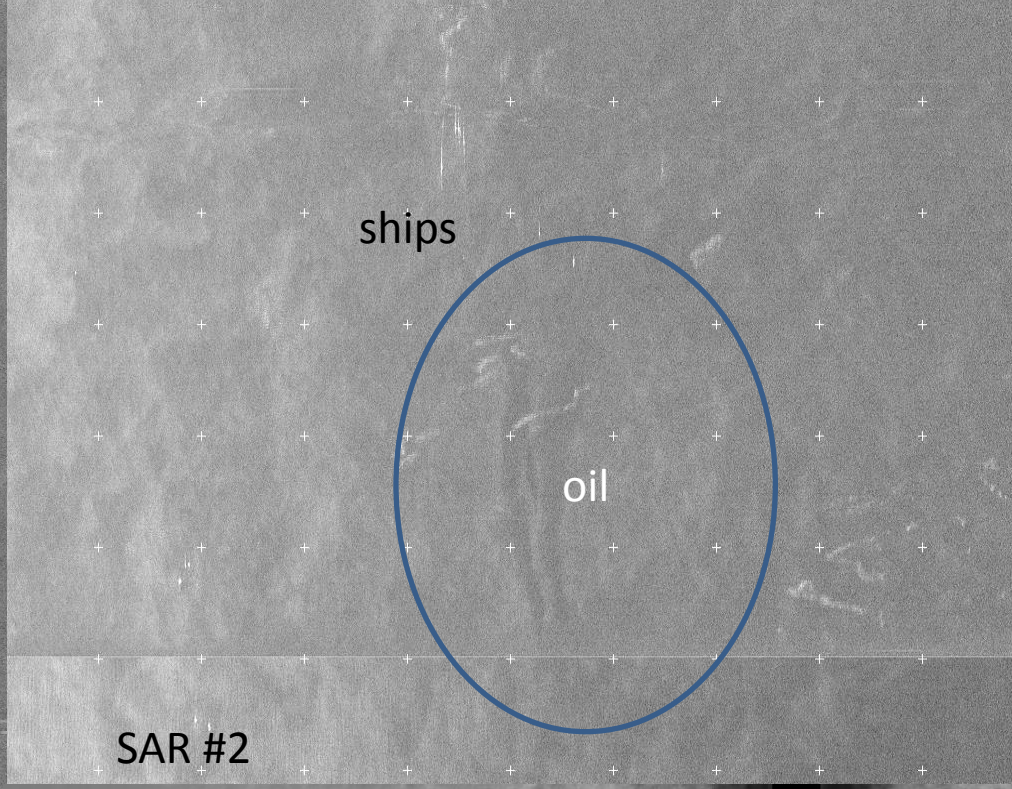
18 June 2014

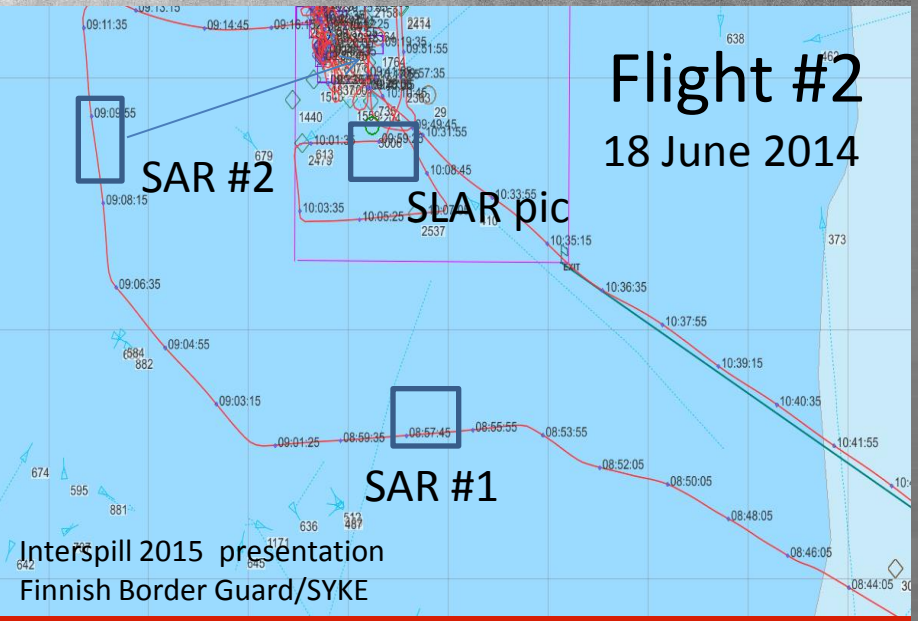
5 m3 emulsion during the night (old release)

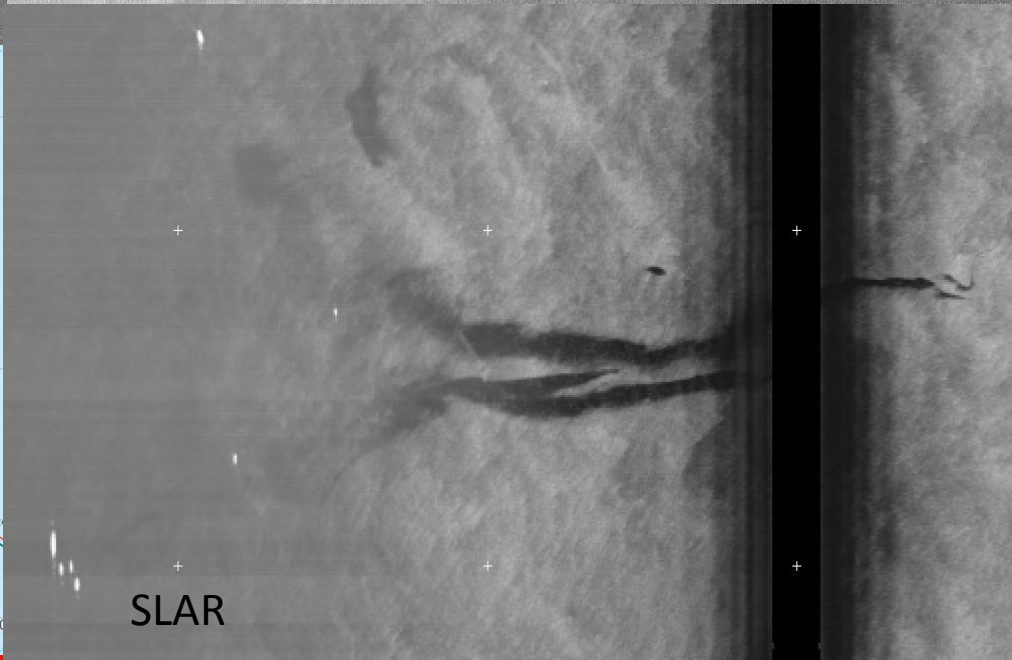
25 m3 emulsion at the end of the flight









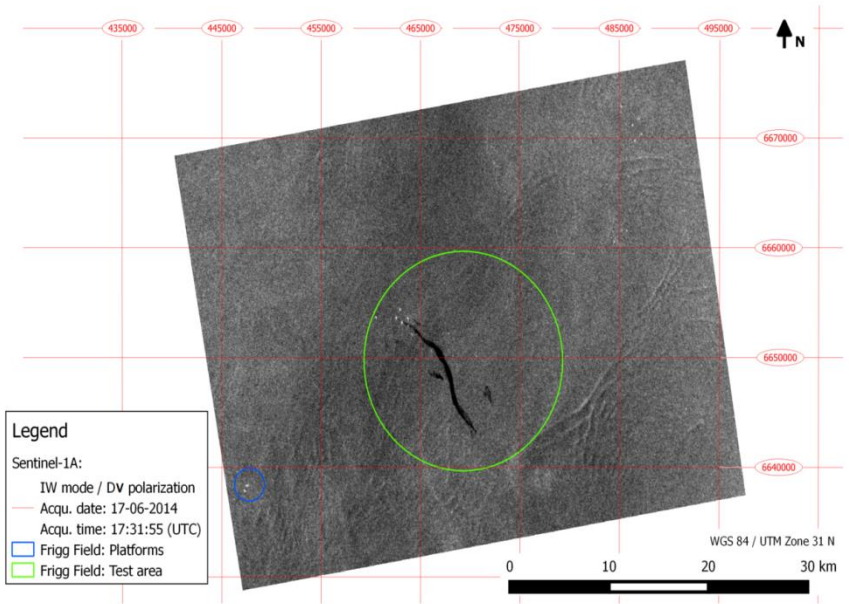


Interspill 2015 presentation
Finnish Border Guard/SYKE

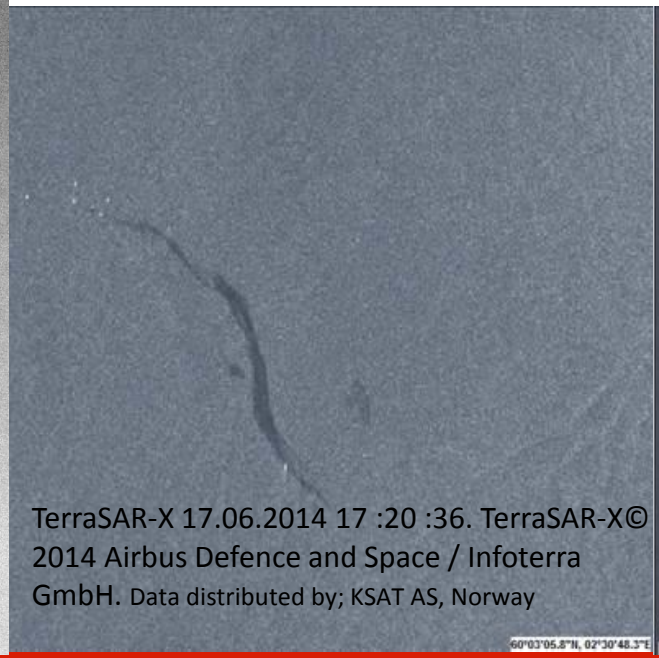
Airborne SAR vs. Satellite SAR

Interspill 2015 presentation
Finnish Border Guard/SYKE

Airborne SAR, Finnish Border Guard/SYKE

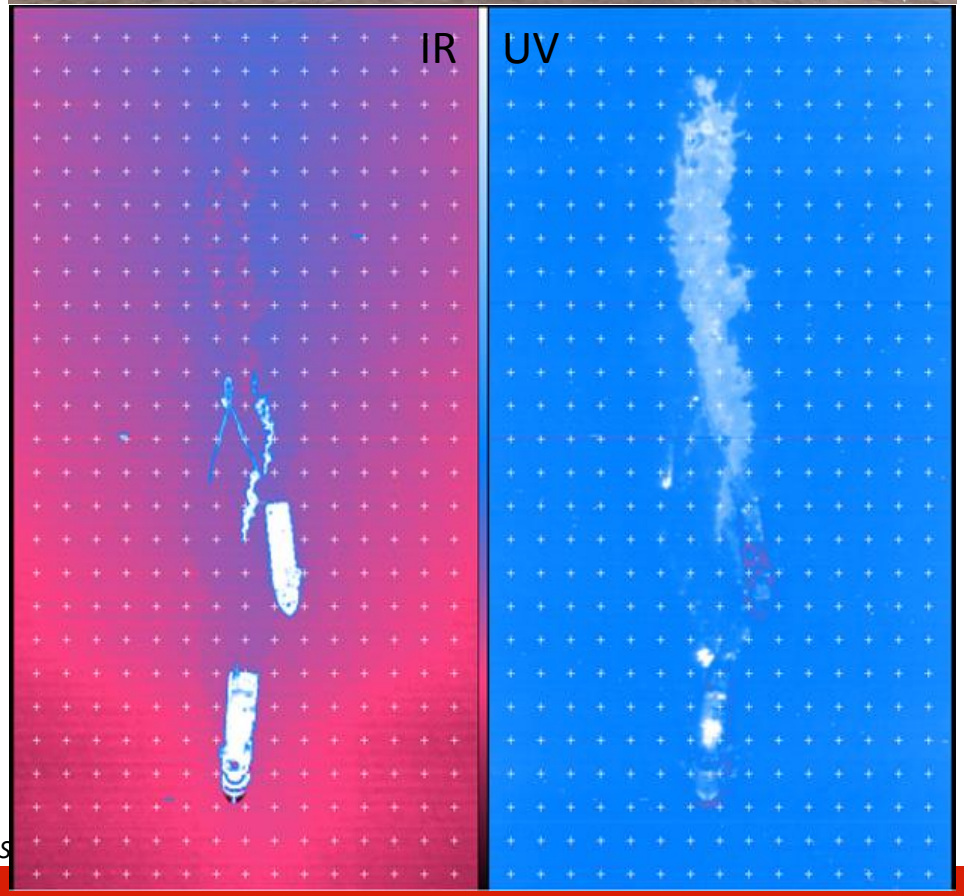


Sentinel-1 17.06.2014 17:31© European Space Agency 2014



TerraSAR-X 17.06.2014 17 :20 :36. TerraSAR-X© 2014 Airbus Defence and Space / Infoterra GmbH. Data distributed by; KSAT AS, Norway

Cosmo Skymed 17.06.2014 18:08:12. ©ASI (2014) processed under license from ASI – Agenzia Spaziale Italiana., Data distributed by; KSAT AS, Norway.



IR/UV

Interspill 2015 presentation
Finnish Border Guard/SYKE

- The thickest parts of the oil spill shown in IR image
  - Guiding the oil response vessels!
- Total extent of oil on the water visible in UV

Future of airborne surveillance

- More background information is available
  - AIS, Satellite AIS
  - Satellite images
  - Databases and trajectory forecasts
- We are used to geographic information at our fingertips
- We are used to real time updates
- The task of the surveillance aircraft is still:
  - To demonstrate a presence, show that we are watching
  - To monitor and document activities on the surface
  - To give a real time situational overview
  - To help direct surface assets

Few oil spills in the Baltic today

- Daily patrol of the ship lanes
  - supported by satellite images
- Zero tolerance
  - Even very small spills are reported
- Well working reception facilities in the ports

- ….more important than winning court cases
- Difficult to build a case if you do not catch the polluter in the act

NEXT GENERATION SYSTEM

S&T MSS 7000

- Ease of operation
- Comprehensive situation overview
- Real time reporting

- Configurable:
  - one or more operators
  - small or large suite of sensors
  - small or large aircraft

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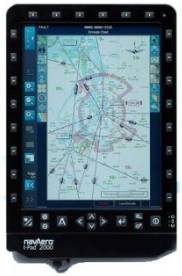
Improved system integration

S&T MSS 7000 – a new concept built on a proven solution

SatCom
High Speed dual channel

Lightweight
Operator console (-s)



Portable
Display Unit

Observer workstation

Cameras

Sea VHF
and
A/C intercom

AIS

Direction
Finder

IR/UV-
scanner

SLAR

EO/IR

AESA 360º
Search Radar

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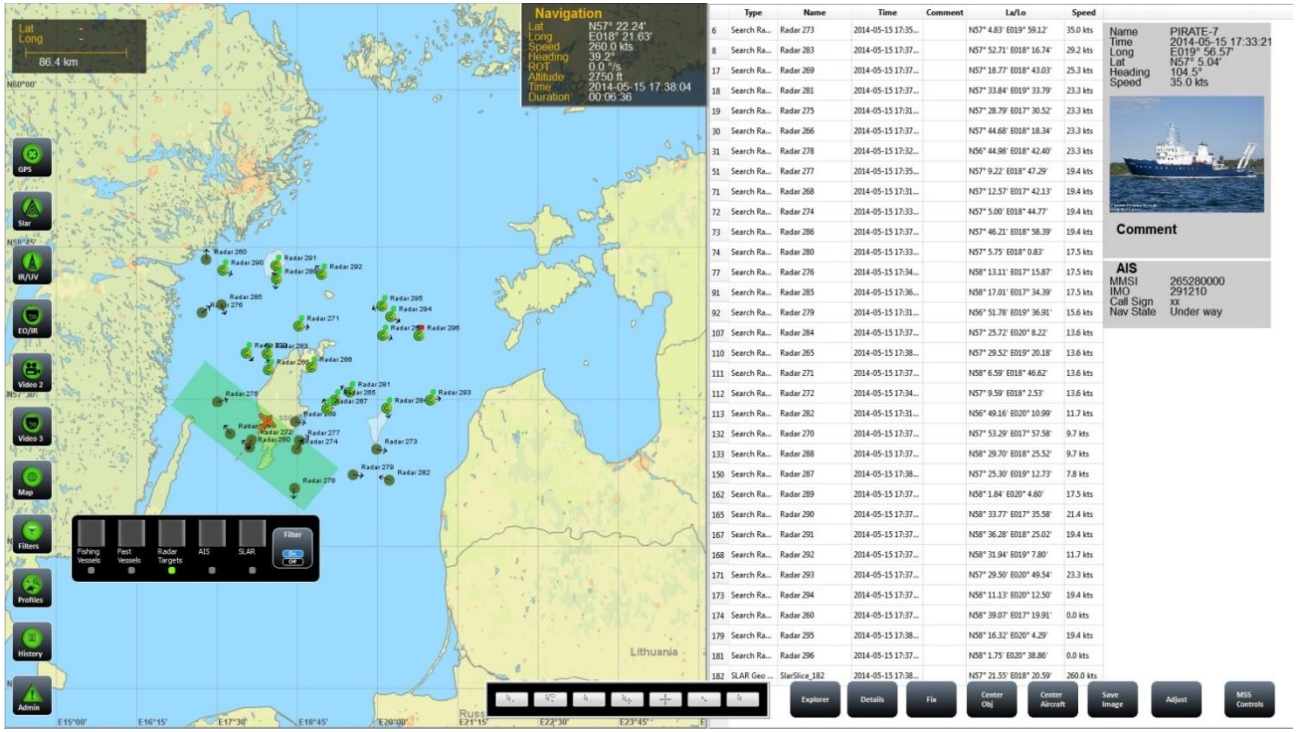
New User Interface

Target correlation and filtering

s&T MSS 7000 – a new concept built on a proven solution



- Filtering out **objects of interest**
- **Correlation of targets and target tracks**

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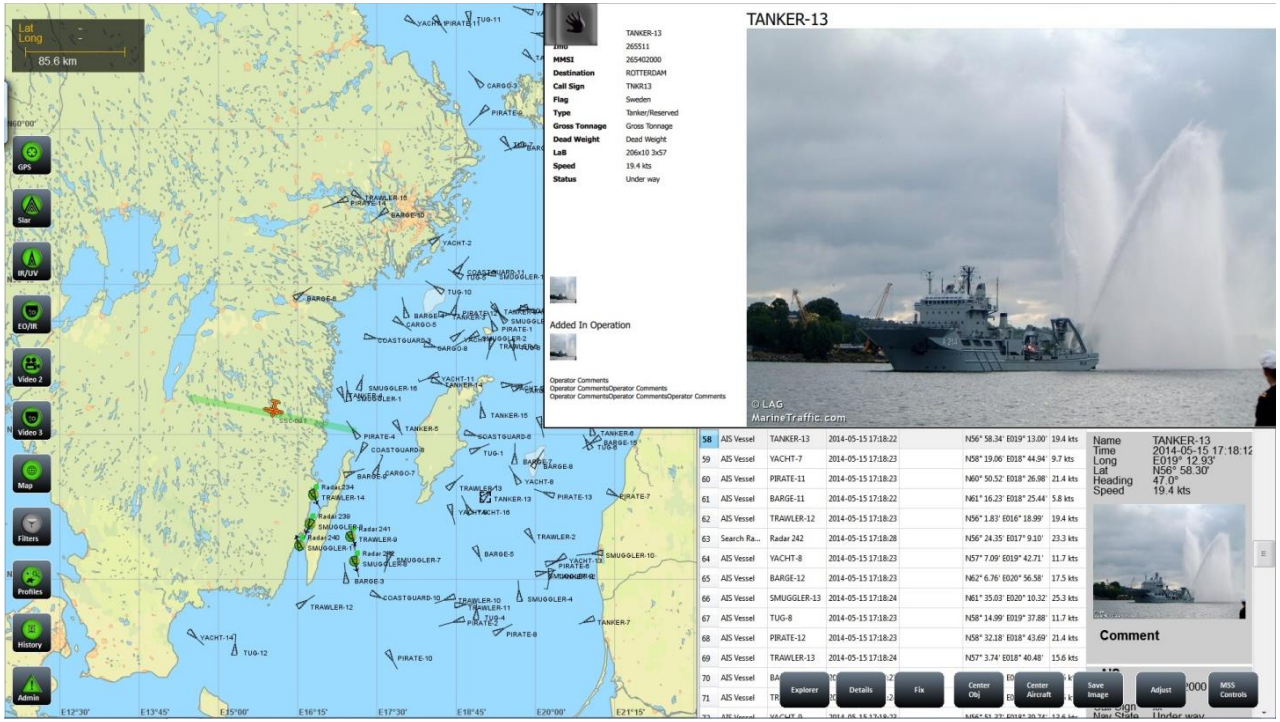
On-board ship image database

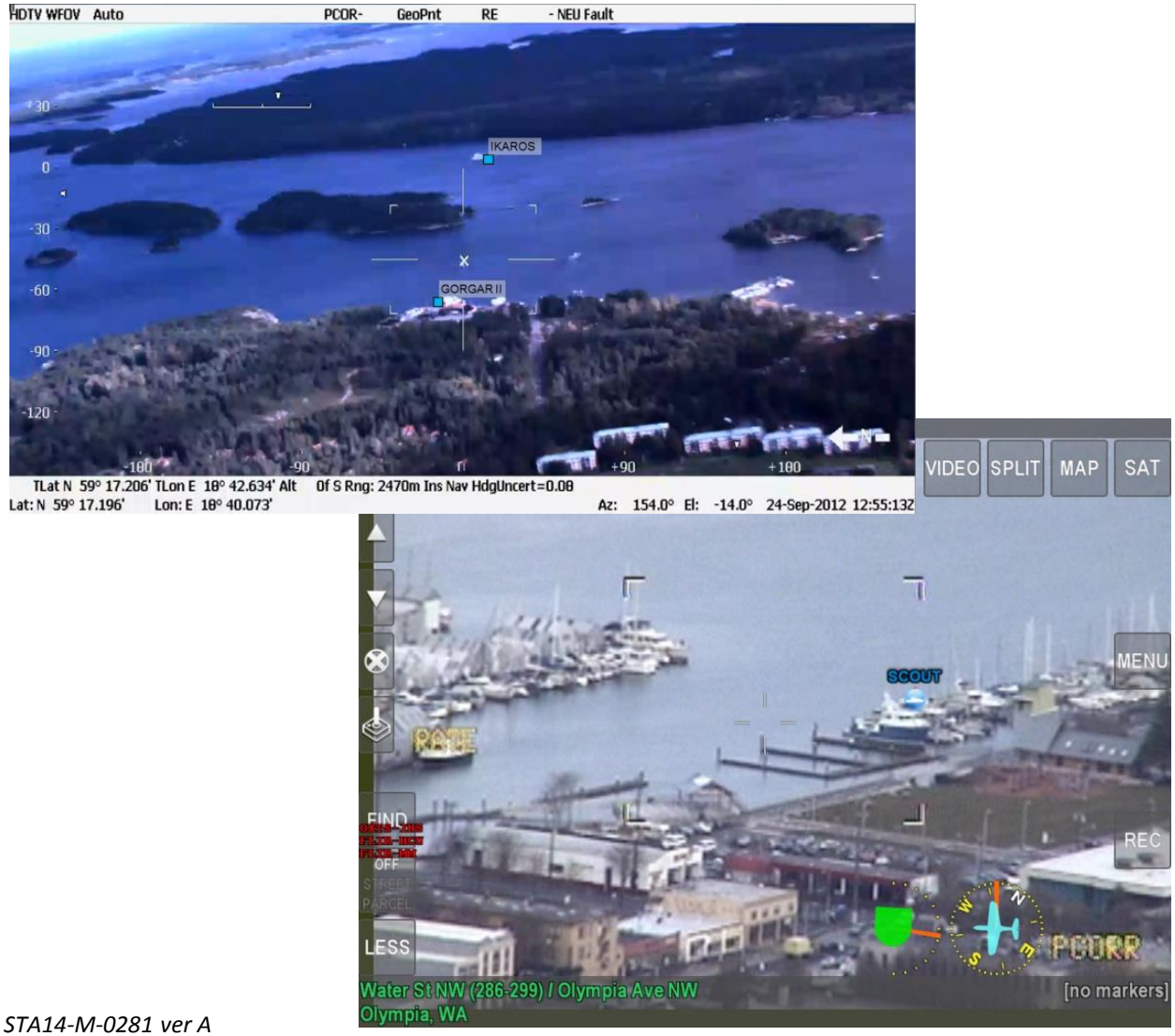
S&T MSS 7000 – a new concept built on a proven solution



- **Tag and add** images
- **Build up your own** image database over time

Target data overlay on EO/IR video

S&T MSS 7000 – a new concept built on a proven solution



- For improved situational awareness
- Known target identity dynamically added to live or recorded video

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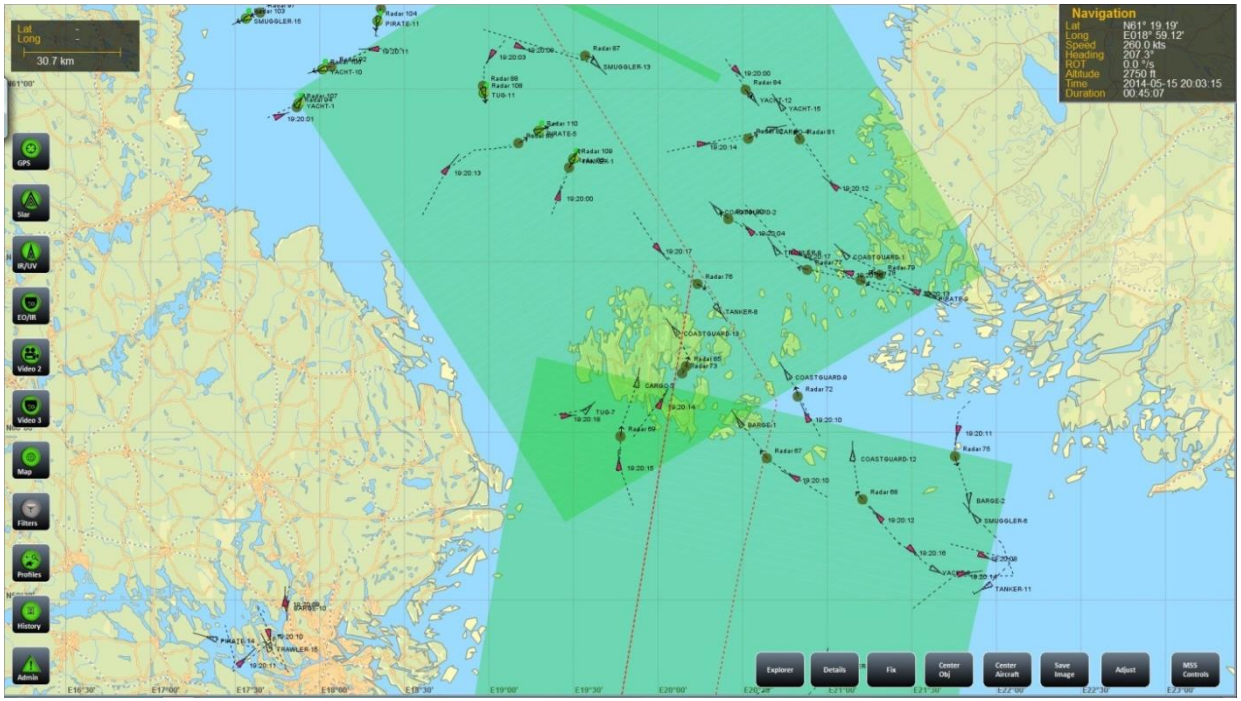
View mission history

S&T MSS 7000 – a new concept built on a proven solution



- **Analyze relative motion** of targets and other objects
- **Synchronized replay of all collected target data, sensor data and video**
- **Display of current and accumulated sensor coverage for each sensor**

Real time reporting

S&T MSS 7000 – a new concept built on a proven solution

- **Real time streaming video as standard**
- **New report tools for improved in-flight reporting**
  - Sharing the situation overview with the Mission Command Center
  - Guiding cooperating units
- **Data in standard GIS formats – easier to exchange [geographical] information with cooperating authorities**
  - Easy to compare Aircraft and Satellite generated data
  - Improved planning and coordination of airborne patrols

ENABLING YOU TO CONTROL AND PROTECT YOUR WATERS!

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