OX2 Security Concept
- Real Test Conducted

Turning a Problem into an Opportunity!

Lilla Båtskären

South of the Åland Islands

OX2 in Brief

25,526 MW
Project development portfolio

496
Employees

5,580 MW
Asset management portfolio

1,032 MW
Construction portfolio

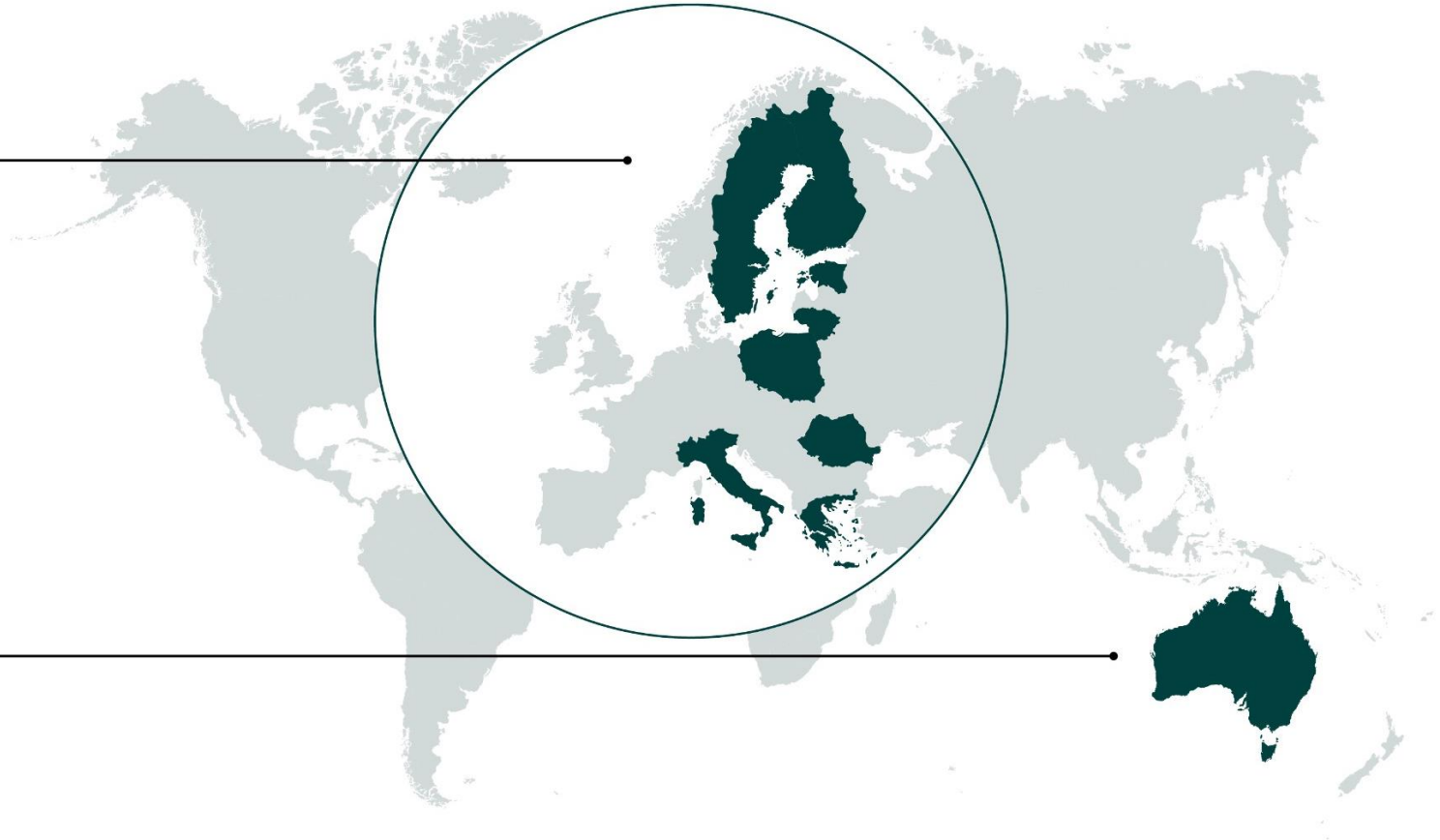
Where we operate

Europe

Sweden
Finland
Poland
Italy
Romania
Åland
Greece
Estonia
Lithuania

Oceania

Australia



The open sea – a perceived natural barrier

Critical infrastructure on land is built with protection

Wind farms are historically being built without protection

Purpose with the OX2 Security Concept

Why an OX2 Security Concept?

1. Situational awareness for offshore asset owners
    - + 10 Billion € projects.

2. Opportunities for authorities for extended situational awareness in remote areas above and below water.

Reason for conducting a test in autumn 2024:

- Present the OX2 Security Concept (Theory)
- Demonstrate test and outcome based on data gathered from all scenarios (Practice)
- Utilize best of breed technology, leading partners, civilian classified and commercially available today.

Leading Partners

Tue Lippert

- Royal Danish Navy – Frigates and Navy Special Forces (14 years of sailing and ops)
- Danish Met office (DMI) – Head of Maritime Commercial Dept.
- Ørsted – Construction Project Manager Westermost Rough OWF
- K2 Management – Deputy Technical Director Deutsche Bucht OWF
- K2 Management – Director Offshore Installation
- Worley – Director of Offshore Wind Engineering
- Ørsted – External Consultant & Senior Project Manager Defence project
- Vestas – Programme Manager Burbo Bank and Walney End of Warranty process
- OX2 – Defence consultant and offshore wind expansion projects

- Royal Danish Navy Reserve - Joint Arctic Command Greenland
  Liaison Officer to United Kingdom and United States

Tobhias Wikström, LtCol (ret)

- Swedish Air Force– Wing Commander Flying F 21 Luleå (25 years of flying)
- Swedish Air Force– Head of fighter program development, strategic planning
- Swedish/Finnish Air Force– Head of Swe AF Ops FiSe
- Swedish/Finnish Armed Forces – Joint Targeting

- Started Parachute Consulting 2021 – a bridge between industry and defence
- OX2 – Defence consultant since 2023

- Swedish Air Force– Officer in the reserve AF HQ

TERMA

TELEDYNE MARINE

AP SENSING advanced photonic

MacArtney UNDERWATER TECHNOLOGY

OX2 Security Concept

Identified solutions to coexistence

The OX2 Security Concept is a concept providing:

Enhanced Recognized Air Picture

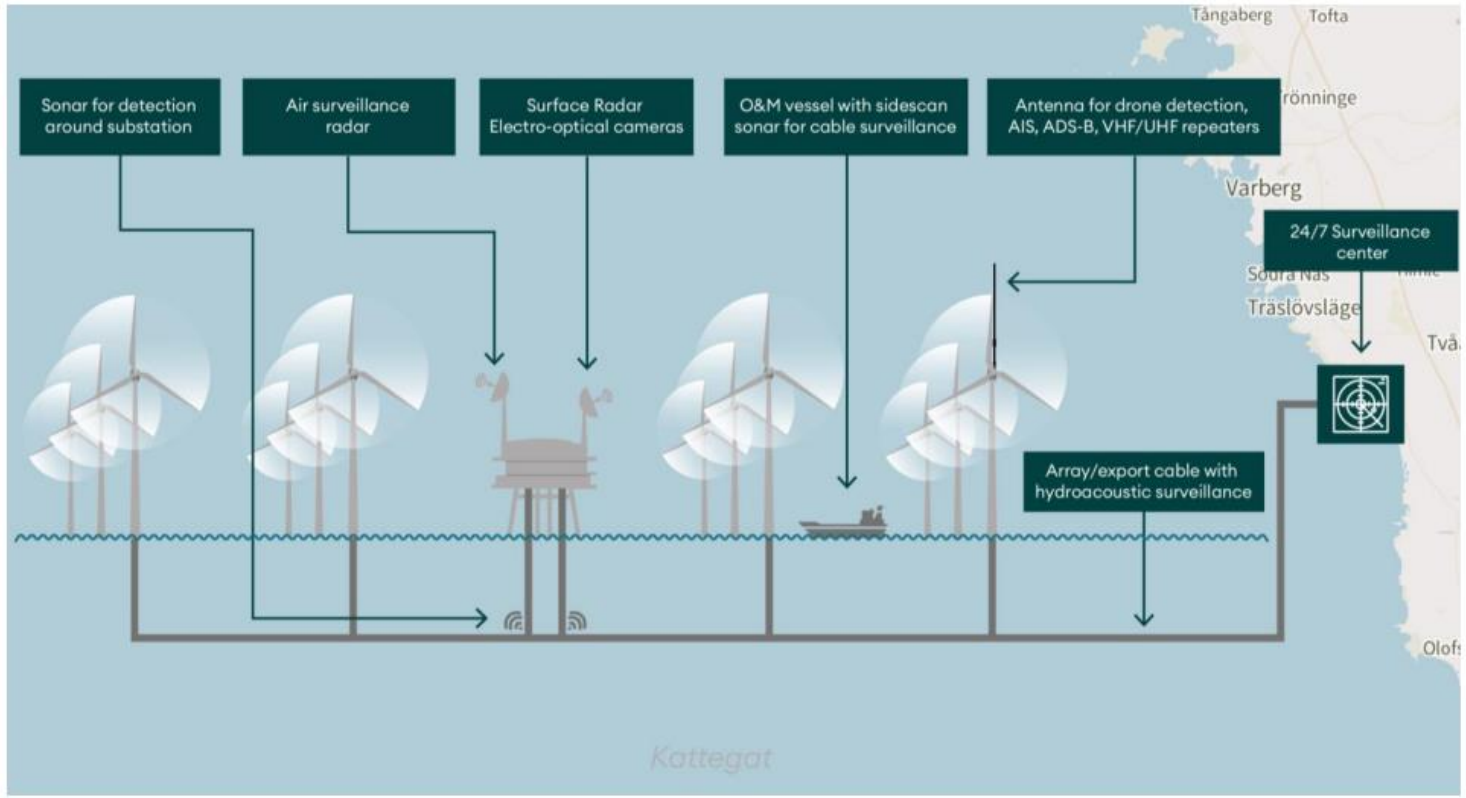
Enhanced Recognized Maritime Picture

Enhanced subsurface awareness

Offshore wind changes the environment and the battlespace.

A strengthened protection for critical infrastructure is needed.

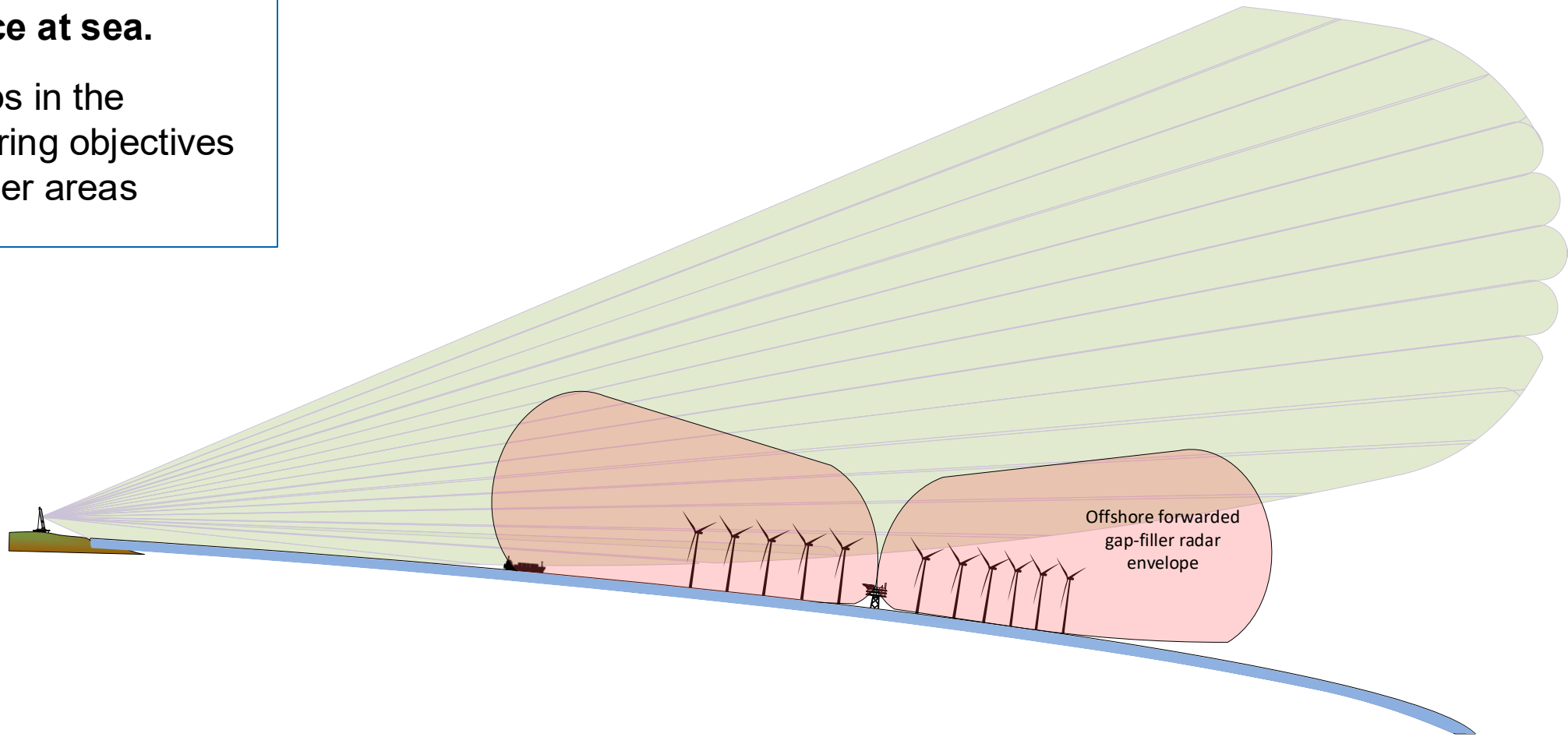
OX2 developed the OX2 Security Concept using only Commercial Off The Shelf (COTS) sensors and equipment to a mature Concept.



Offshore wind farms can increase situational awareness

Benefits of Reinforced surveillance at sea.

- Fill gaps in the monitoring objectives for larger areas



Chosen site for IRL Test:

Lilla Båtskär, South of the Åland Islands

Demonstrating the capabilities of the technologies

Bringing the OX2 Security Concept alive

What

- A demonstration combining civilian sensors from **all domains** in one demonstration
- Creating **local situational awareness** around an **offshore windfarm and infrastructure**

How

- Combining **surveillance of air, surface and subsurface** into one overview
- Simulating **realistic threats scenarios** testing the ability to **detect and identify**

Why

- Demonstrating civilian technologies for **countering and deterring hybrid events** are available for **offshore infrastructure today**

Båtskären, South Åland

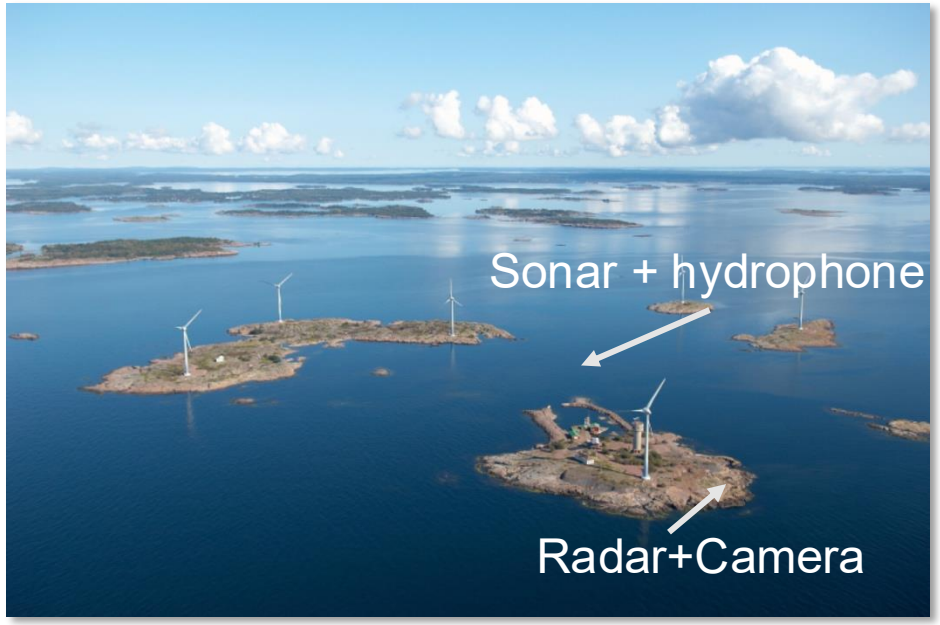
Test in existing Windfarm in a demilitarized zone.

Mobile radar
- 40 KM range
- Sea and air monitoring
- Bird detection

Mobile Camera
- Long Range
- Short Range
- Night Vision (IR)

Underwater Grid monitoring
- DAS system (fiberoptics)
- Hydrophones
- Sonar

Together with leading global providers, latest civilian technology, combined situational awareness for critical infrastructure.




HDMI 2

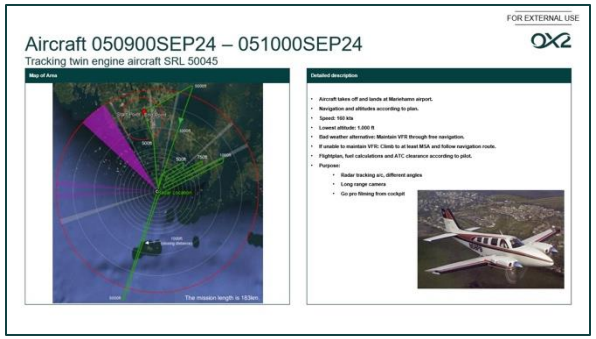
WELCOME TO THE

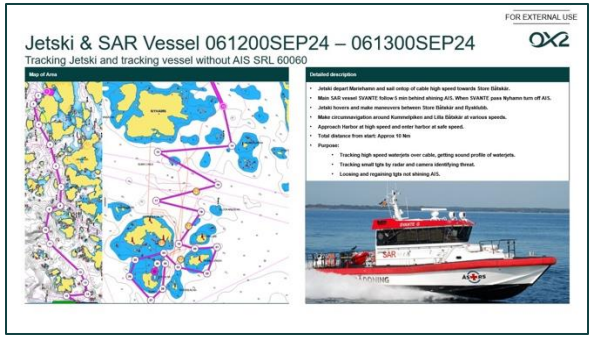
OX2

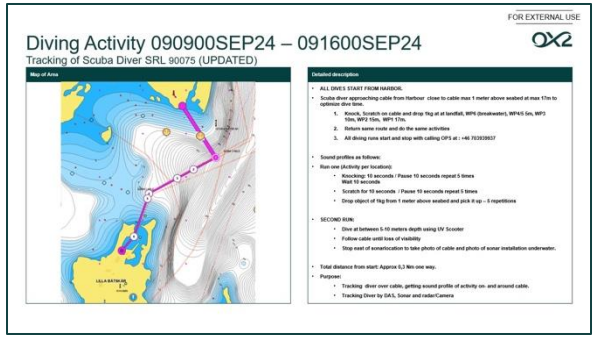
SECURITY CONCEPT

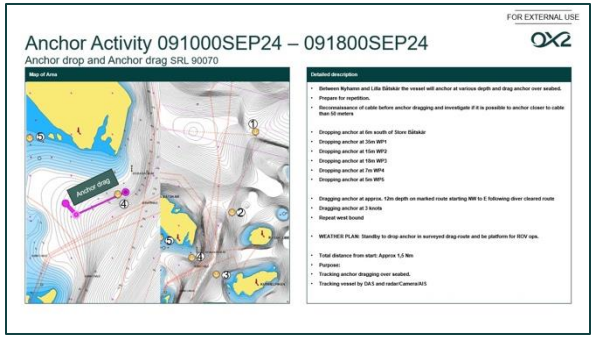
Demonstration scenarios

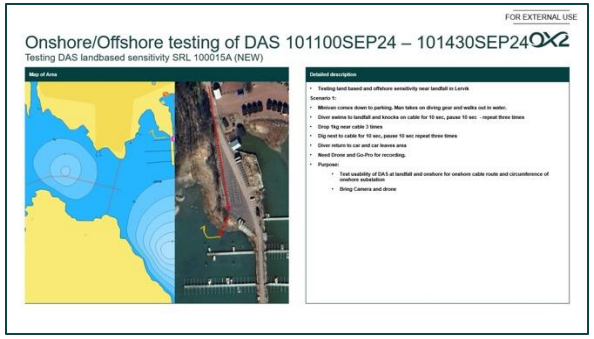
Each scenario designed to simulate an event or threat in hybrid warfare

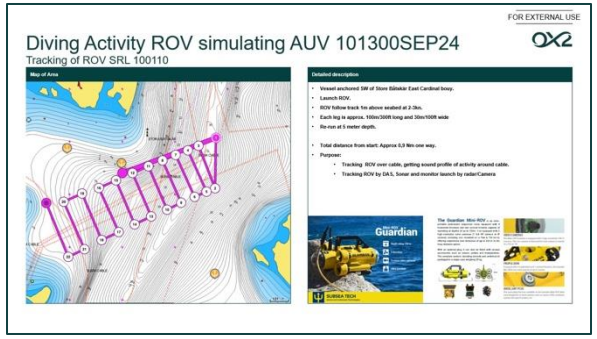


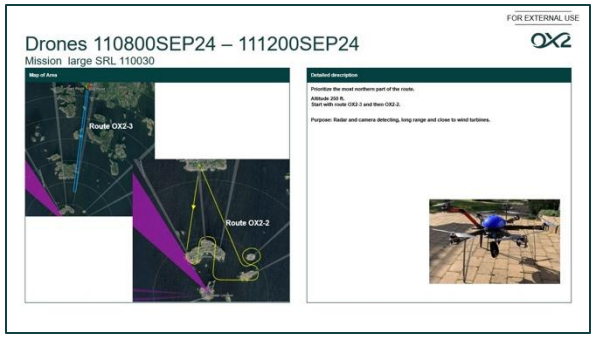


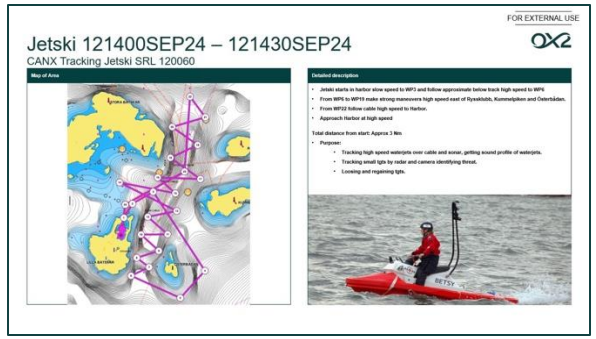


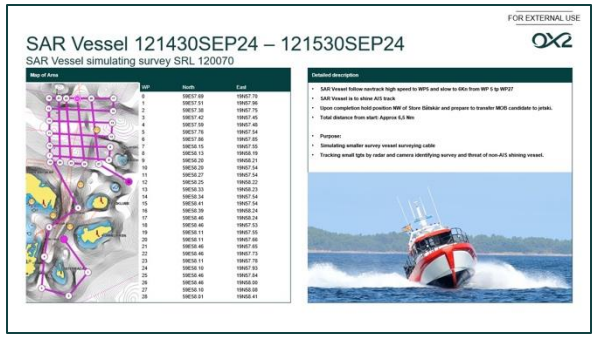








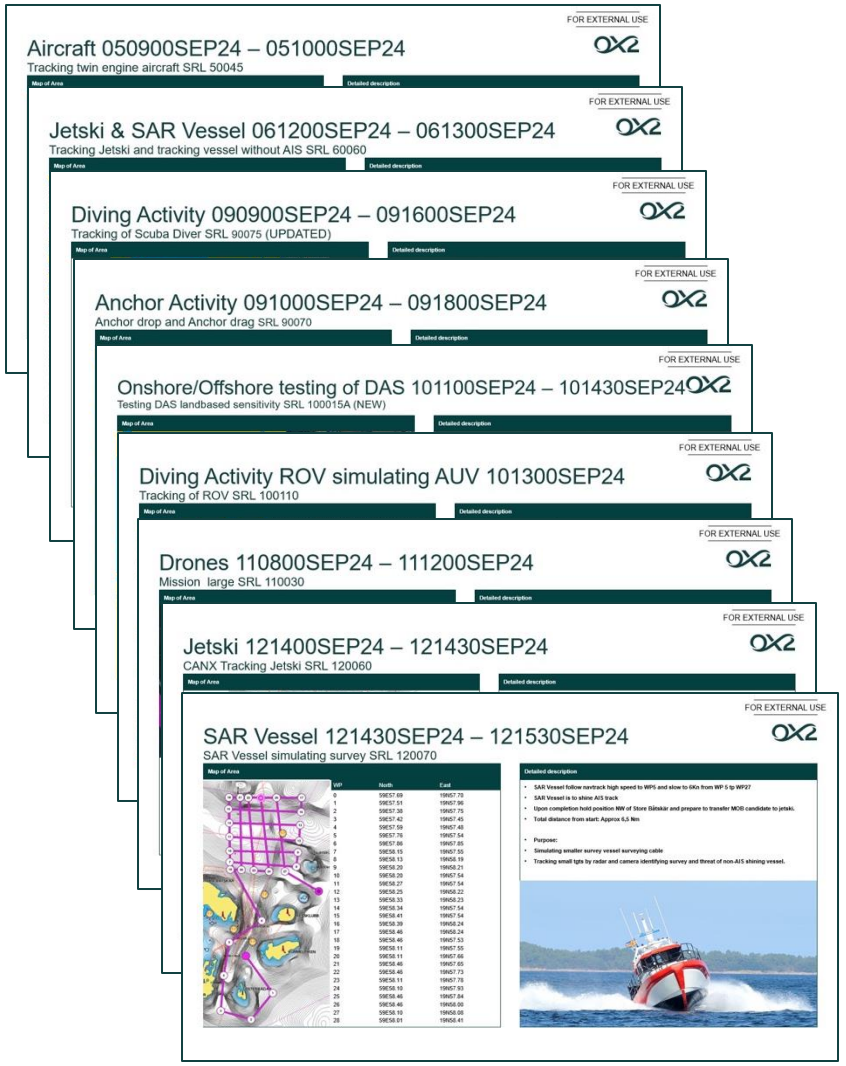




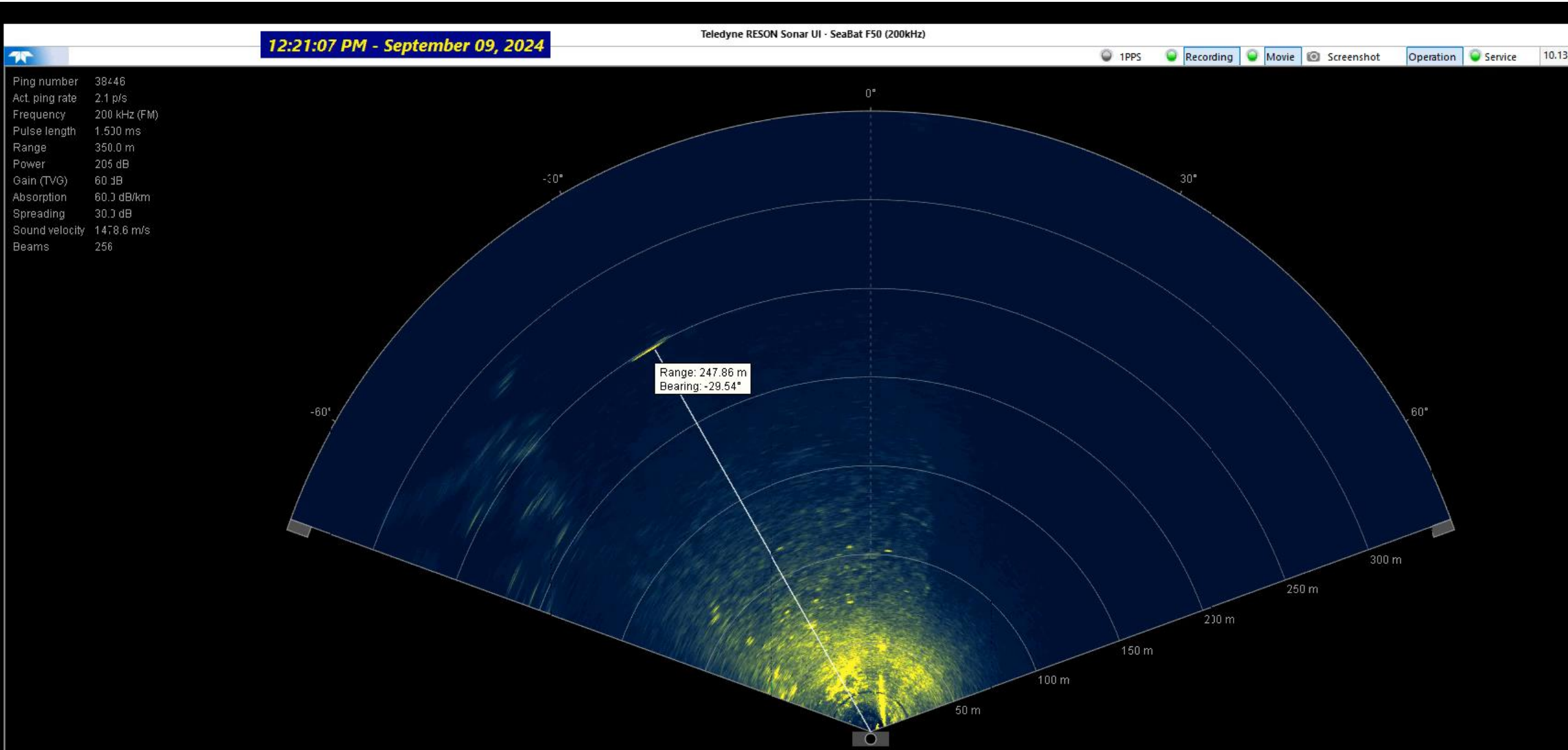
Demonstrating the capabilities of the technologies

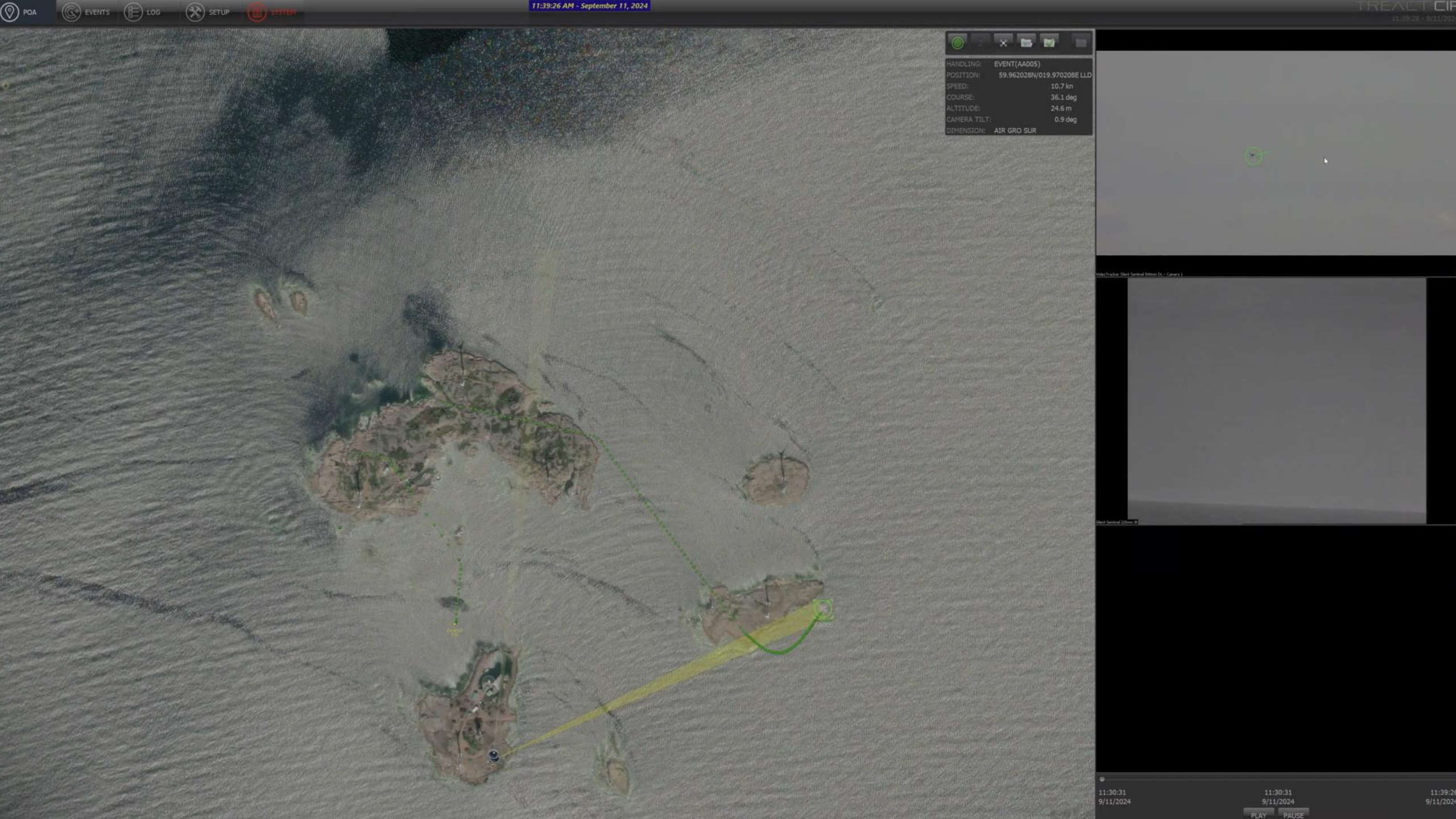
Scenarios planned and executed

Element	Planned events	Actual events
Total surface	120	112
Total underwater	56	46
Total air	29	25
Total overall	**205**	**183**



Anchor dragging



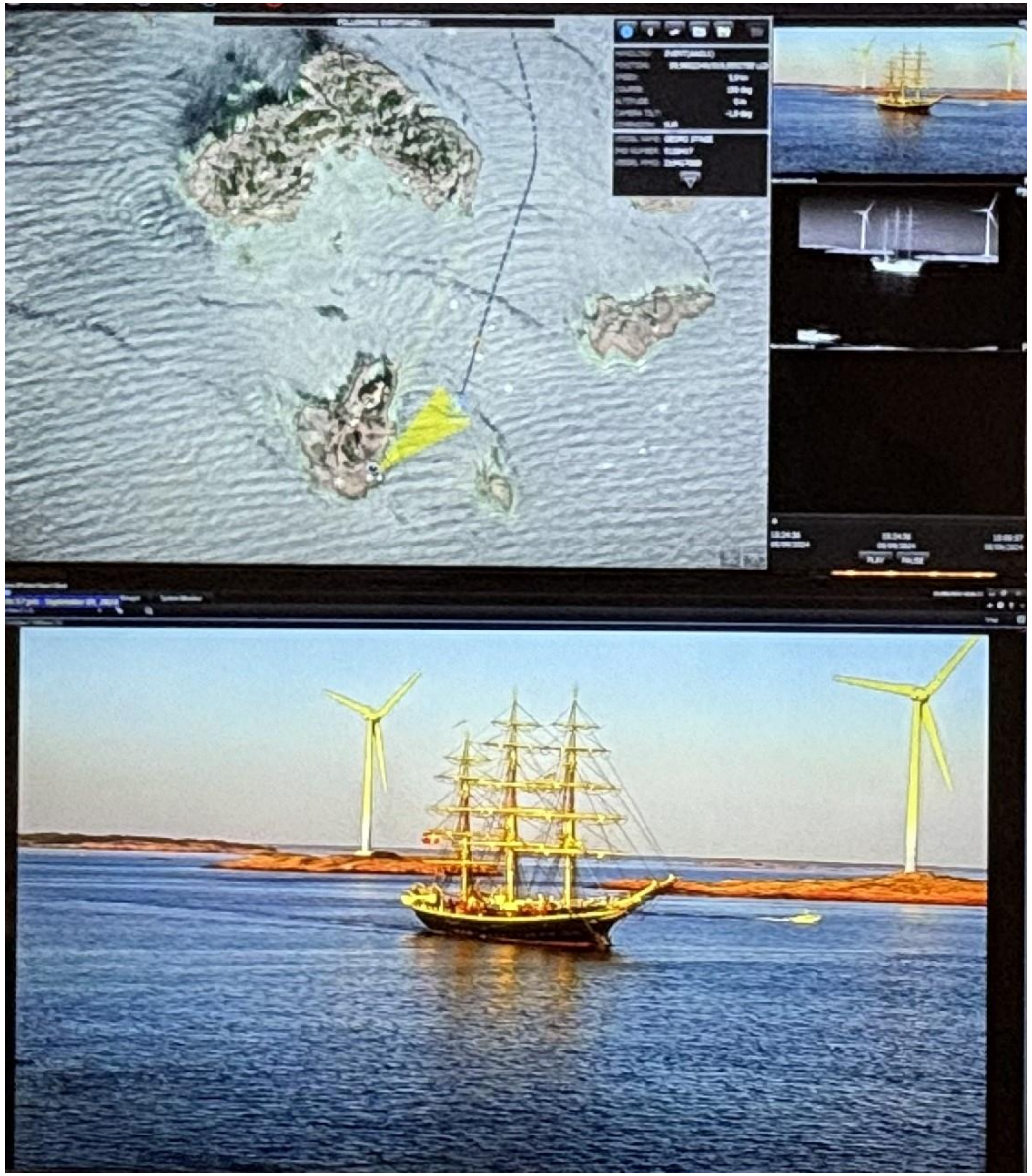

POA
EVENTS
LOG
SETUP
11:39:26 AM - September 11, 2024
HANDLING: EVENT(AA005)
POSITION: 59.962028N/019.970208E LLD
SPEED: 10.7 kn
COURSE: 36.1 deg
ALTITUDE: 24.6 m
CAMERA TILT: 0.9 deg
DIMENSION: AIR GRO SUR
11:30:31
9/11/2024
11:30:31
9/11/2024
PLAY
PAUSE

3 Demo Days:
- over 240 people participating in total from 10 different countries.

Key findings from demonstration

Assessment of ability to detect, track and identify

- ✓ Detect if someone is tampering with our onshore and offshore cables
- ✓ Detect and track sound from ROVs, UV scooters and divers
- ✓ Detect anchors drops and dragging
- ✓ Detect, track and identify surface activity
- ✓ Detect, track and identify aircraft and drones



FOI

Möjligheter till samexistens mellan Försvarsmaktens verksamhet och utbyggd vindkraft

ANDERS ODELL, ANDERS BERNLAND, GUNNAR ERIKSSON,
PER GRAHN, TOMAS MÅRTENSSON, LARS NORIN,
MARI OLSÉN, BEATRICE REICHEL

Rapportförfattarna bedömer att det finns goda möjligheter till att öka samexistensen. Det kommer dock kräva ansträngningar, både från Försvarsmakten och från andra aktörer. En nyckellösning bedöms vara att inrätta en nationell arbetsgrupp för samexistens mellan vindkraft och Försvarsmaktens intressen. Andra föreslagna lösningar består i att studera exempel på åtgärder och lösningar i andra länder, fortsatt utreda möjligheten att inkludera villkor i tillstånd samt vidare utreda tekniska lösningar. Dessa ansträngningar kan kräva ökade resurser och eventuellt tydligare styrning eller uppdrag från regeringen.

VALTIONEUVOSTO
STATSRÅDET

OX2

Det är möjligt att effektivisera vindkraftsbyggandet i östra Finland. Försvarsmakten och vindkraftsoperatörerna är redo att samarbeta för att hitta lösningar, men för att uppnå dem krävs noggrannare politisk styrning, samarbetsarrangemang, en tydlig långsiktig strategi och en översyn av lagstiftningen", funderar Räty.

– Ett mer balanserat elsystem innebär också att förnybar energi byggs ut mer rättvist regionalt. Arto Rädys utredning visar att det är möjligt att samordna den regionala övervakningen och vindkraften i östra Finland, men det kräver ett tätare samarbete mellan myndigheterna och projektaktörerna, säger näringsminister **Mika Lintilä**.

Next steps?

- Integration into upcoming offshore wind farm development by OX2.
- Explain and show-case security concept, mature understanding from authorities.
- A new concept test?
  - Data transfer focus
  - Cooperation public - private

Questions?