DEMONSTRATION 7
Fusion of data gathered from different data sources

Speaker:
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CISE-ALERT

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ASI Headquarters
Via del politecnico snc,
00133 Roma (Italia)

Slovenian CISE node & LS

- Cooperation Agreement : **signed in 2022**
- Node owner: **Slovenian Maritime Administration**
- Connected nodes (9): **EMSA, SATCEN, IT (ASI), FR, GR, ES, BG, DE, IT (GC)**
- Planned connections: **HR, EFCA**
- Cise services: **Vessel of Interest List, Area of Interest, Risk profile, Request for Operational Assistance (Assets), Location Document, Document**
- Legacy systems: **VTS Console/Pelagus/VTMIS**

General - Use Case Scenario

- This **use case is principally intended to test the Area of interest (AOI) CISE Operational service** intended for use in the situation where a maritime authority or EU Agency connected to CISE has an interest in a specific maritime geographical area for security, safety or other reasons, and is requesting specific information that other participants may have in their legacy system about the area

Protection of critical maritime infrastructures in the Port of Koper + anchorages (AOI)

- This CISE-ALERT scenario is used for testing the:
  - **sharing of the Area of interest and**
  - **receiving the requested specific information from contributors**

EUMSS & CMI

- One of the strategic objectives within the Action plan of the revised **EU Maritime Security Strategy** is Action point 3.1.3, indicating the use of CISE to exchange maritime surveillance information **to boost resilience and protect the Critical Maritime Infrastructure (CMI)**

- Protecting **CMI is one of key objective of the EUMSS** because these infrastructures are vulnerable to various threats

- **Top political priority** after September 2022 (attacks on the Nord Stream pipelines in the Baltic sea)

Critical Maritime Infrastructure - CMI

- Use case applicability according to the types of CMI:
  - **Shipping** (port, installations, traffic separation schemes, channels, lighthouses…)
  - **Energy** (fixed installations, oil/gas platforms, windfarms, underwater pipelines and electricity cables)
  - **Communications** (fiber optics cables)
  - **Fishing** (ports for fishing, aquaculture farms)
  - **Marine biodiversity**

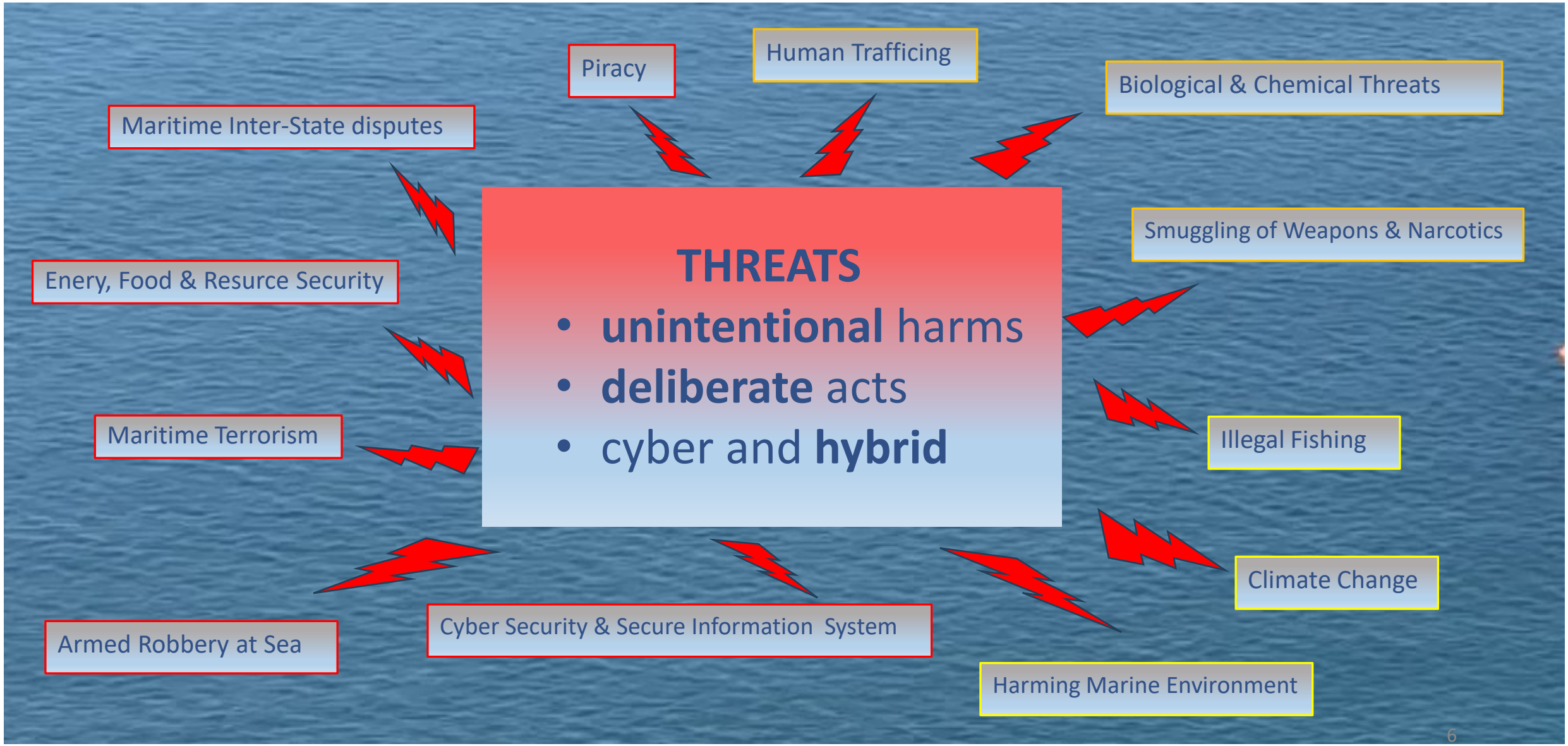
Maritime domain Awareness (MDA)

understanding of anything that could impact security, safety, the economy or the marine environment

- routing and position data, AIS
- radars and CCTV
- patrols, satellites, unmanned vehicles
- identification of suspicious behavior and patterns

- Challenges:
  - **surveillance of small boats**
  - **surveillance under the sea surface**
  - **underwater vehicles and drones**

Threats


Piracy
Human Trafficing
Biological & Chemical Threats
Maritime Inter-State disputes
Smuggling of Weapons & Narcotics
Enery, Food & Resurce Security
THREATS
• unintentional harms
• deliberate acts
• cyber and hybrid
Maritime Terrorism
Illegal Fishing
Climate Change
Cyber Security & Secure Information System
Armed Robbery at Sea
Harming Marine Environment

Reference Use Case

Initiator CISE-ALERT partner: Slovenian Maritime Administration (MzI)

Applicable Use Cases (WP2): Use Case - **Protection of critical infrastructures**

Storyboard: The Slovenian Maritime Administration (initiator) is interested to **perform the necessary checks using the specific data available through CISE** exchange mechanism about the activities/situations detected in the AOI which may raise suspicion such as:

- **presence of VOI in the AOI**
- **abnormal behaviors** of a vessel as sudden change of heading, sudden change of destination port, anomalous route, rendezvous with (small) vessels, loss of AIS while sailing …
- **unreliable information** (e.g. AIS spoofing, AIS jamming, discrepancies between declared voyage and track of the ship…) of any vessel located in the AOI

Validity period of AOI is updated every 6 months. In case of availability of data or suspicious activities/situations detected MzI receive the information by the contributors.

Involved CISE participant: HMOD, ASI, EMSA, SATCEN

Involved CISE-ALERT operational services: **AOI Service**

Area of interest - anchorages & TSS

Script

1) The Initiator (MzI) **share an area of interest (AOI)** to CISE participants by defining a polygon, which serves to provide a geographical location of AOI.

2) First step is the **generation of AOI service** on sides of initiator and participant, then the push of AOI and the push response with available data notification is possible.

3) Focusing on needs related to the of Protection of critical infrastructure **MZI request a specific type of information** from the participants that it would like to be notified of, such as (list not exhaustive):

   - **presence of vessels of interest** (VOI) in the AOI
   - **report on event** (i.e. detection of any illegal activities, anomalous vessel behavior such as change of speed) in the AOI
   - **sensors data** (i.e. satellite images, video streaming by aerial assets) in the AOI and/or their derived products (vessel detection in satellite imagery, activity detection, etc.)

Script

4) All the CISE participants that have available information about the AOI shared by the Initiator provide relevant data, such as:
   - **Satellite imagery (optical & radar data)**
   - **Satellite imagery analyses**
   - **Report on anomalies**
   - **Information about presence of Vessels of interest (VOI)**

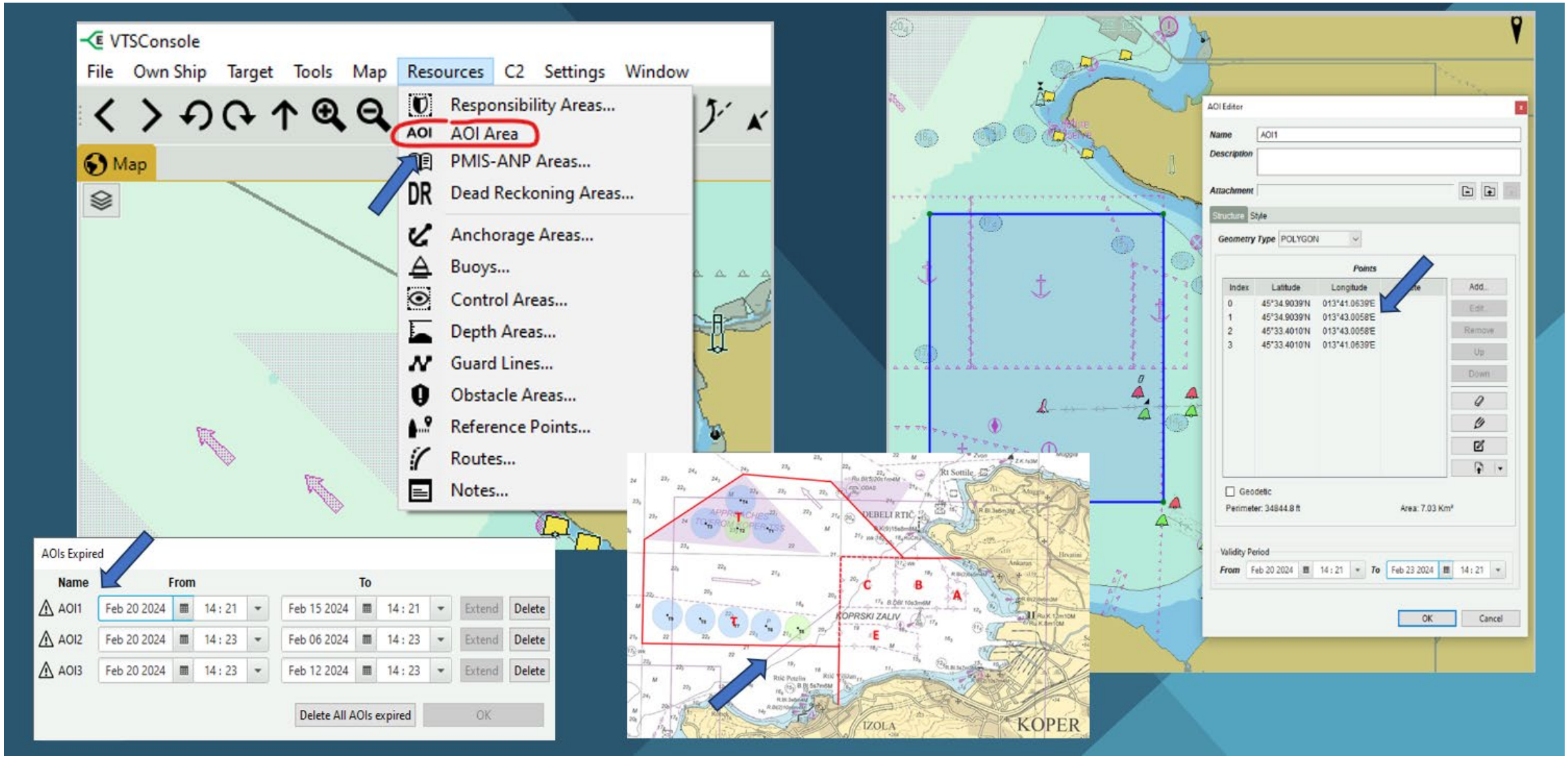
5) The Initiator (MzI) processes the information shared by CISE participants and performs the risk analysis based on data that enrich the actual national situational picture

6) The data received in AOI response are saved in the legacy system

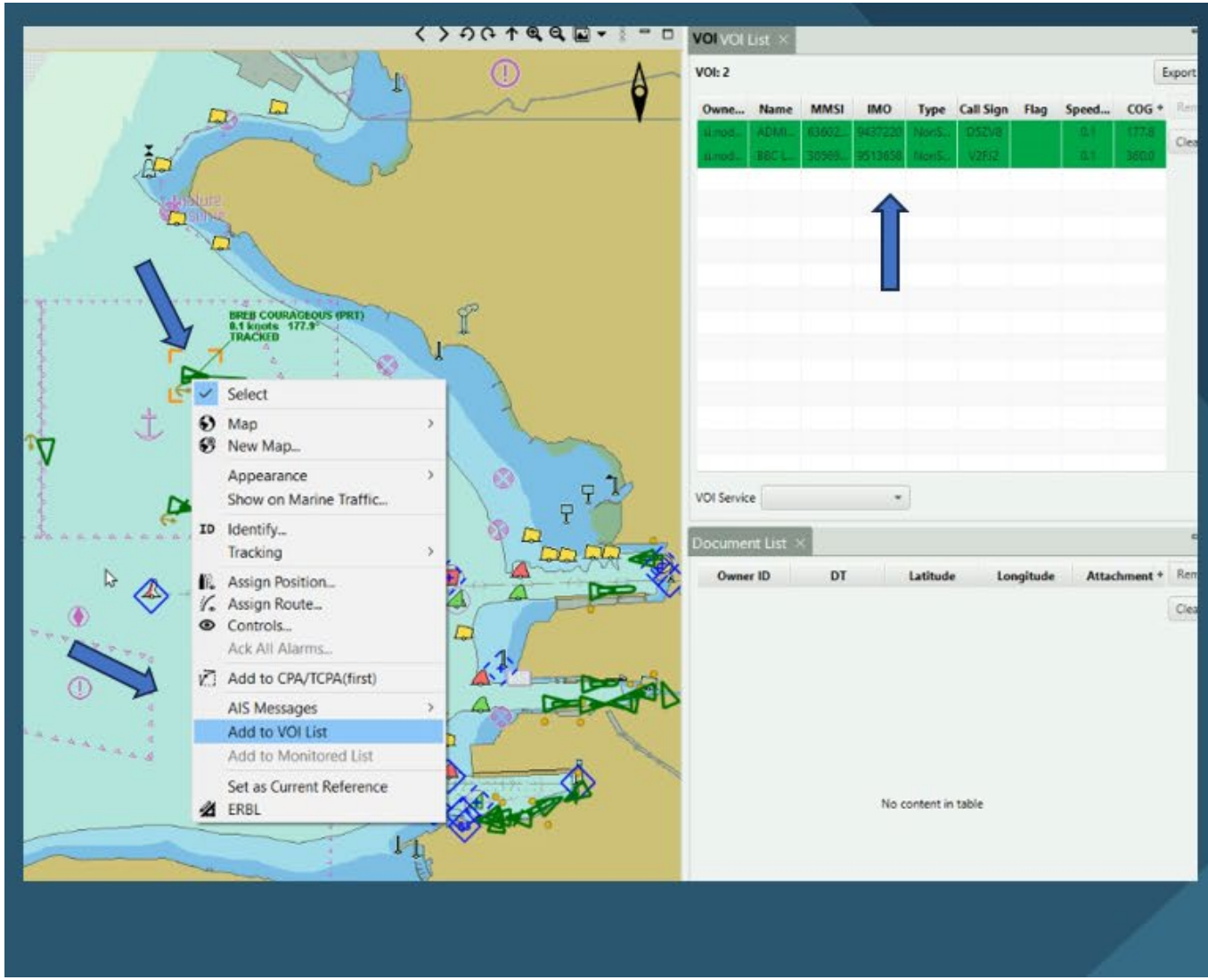
List of participants

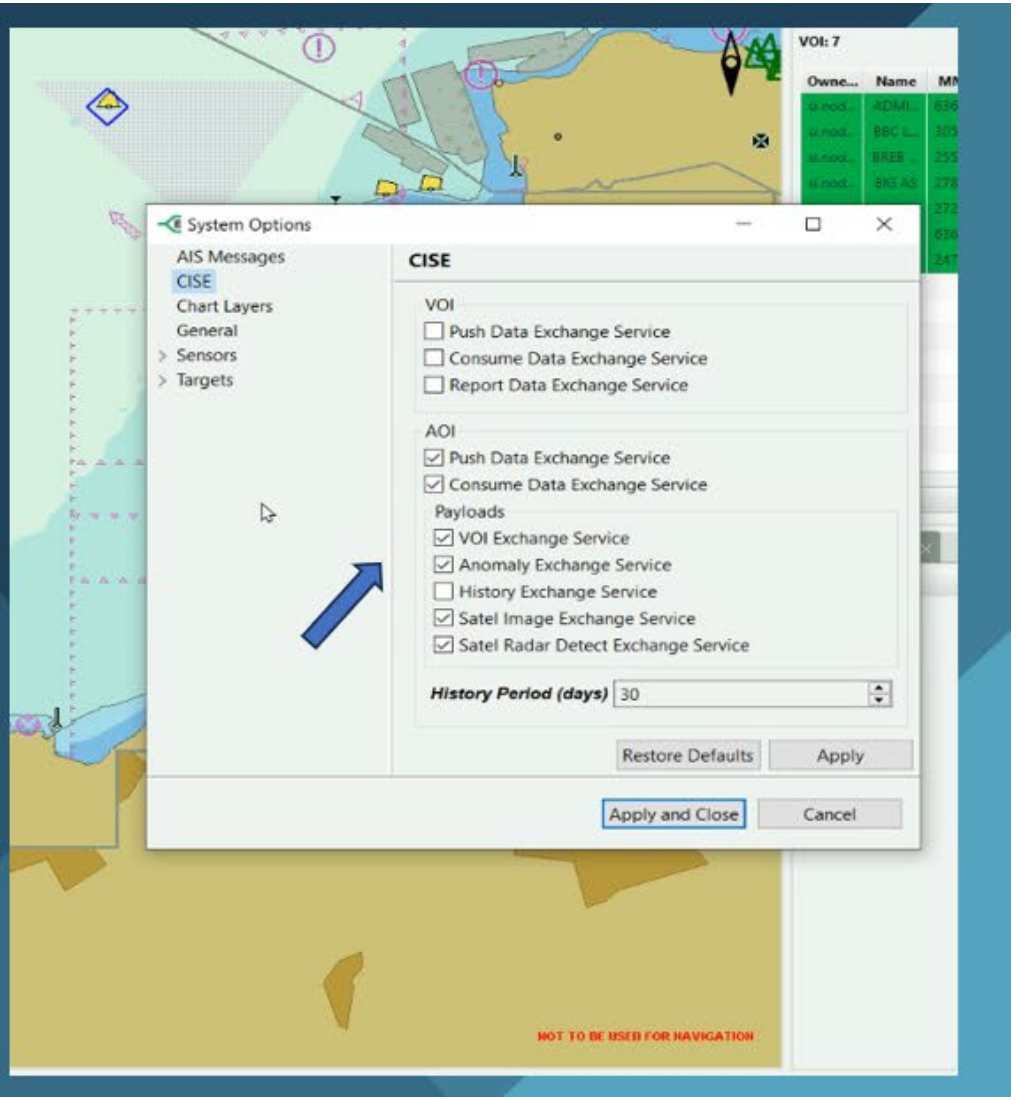
CISE-ALERT partner	Role	Available CISE services	Dataset	Examples (i.e. request/response xml message)
MzI	Initiator	si.nodesi.VTMadaptor.action.push.provider.aoi si.nodesi.VTMadaptor.action.subscribe.provider.aoi si.nodesi.VTMadaptor.action.push.consumer.aoi si.nodesi.VTMadaptor.action.subscribe.consumer.aoi si.nodesi.wmsadapclient.location.document.pull.consumer	AOI_REQ_VOI AOI_REQ_ANOMALY AOI_REQ_SATELIMAGES AOI_REQ_SATELRADARDETECTION	(link to the CISE-ALERT Teams folder where xml examples are stored)
EMSA	Contributor	eu.emsa.emsawmsprovider.locationdocument.pull.provider	AOI_RESP_SATELIMAGES AOI_RESP_SATELRADARDETECTION Location Document service	(link to the CISE-ALERT Teams folder where xml examples are stored)
Satcen	Contributor	eu.satcen.sim-satcen.action.subscribe.consumer eu.satcen.sim-satcen.action.push.provider	Document	(link to the CISE-ALERT Teams folder where xml examples are stored)
HMOD	Contributor	gr.nodegr.nss-adaptor.subscribe.consumer gr.nodegr.nss-adaptor.push.provider	AOI_RESP_VOI AOI_RESP_ANOMALY	(link to the CISE-ALERT Teams folder where xml examples are stored)
ASI	Contributor	it.nodeit.sim1.action.subscribe.consumer it.nodeit.sim1.action.push.provider	AOI_RESP_SATELRADARDETECTION	(link to the CISE-ALERT Teams folder where xml examples are stored)

Trial execution – defining AOI

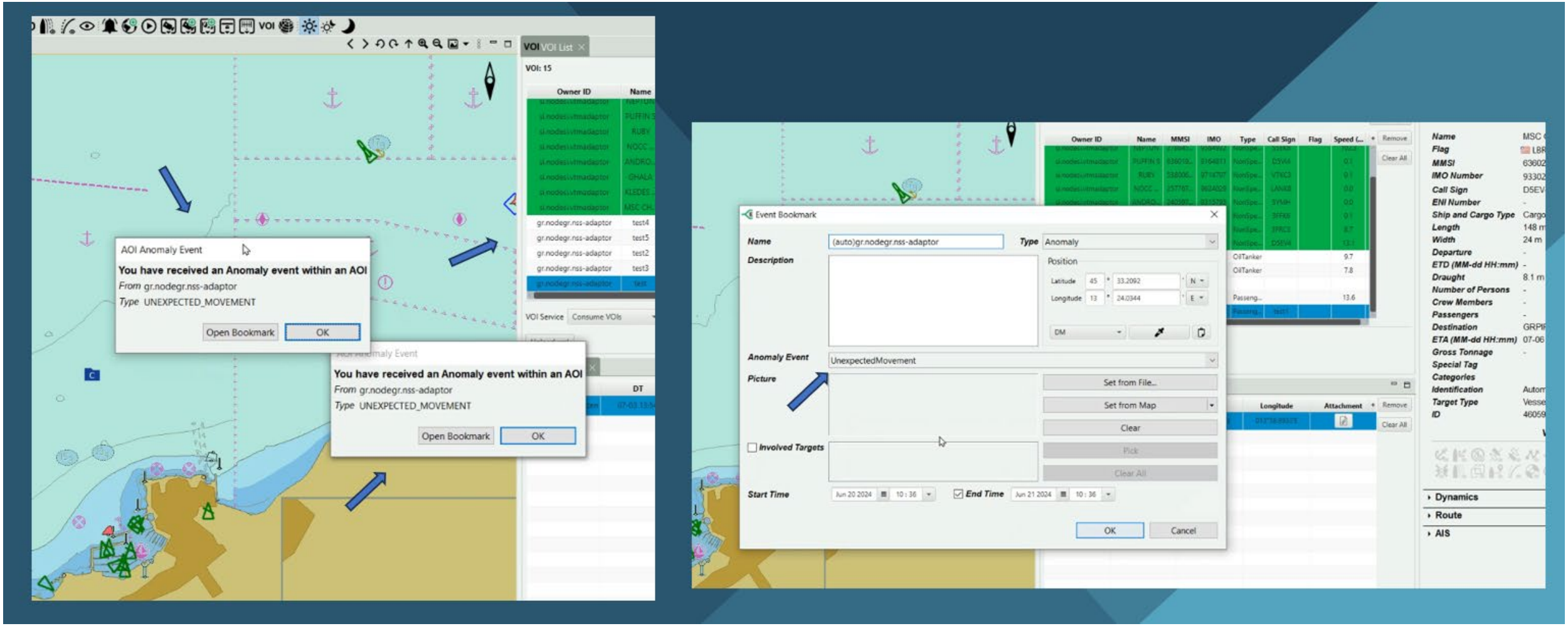


Trials execution – requesting type of info

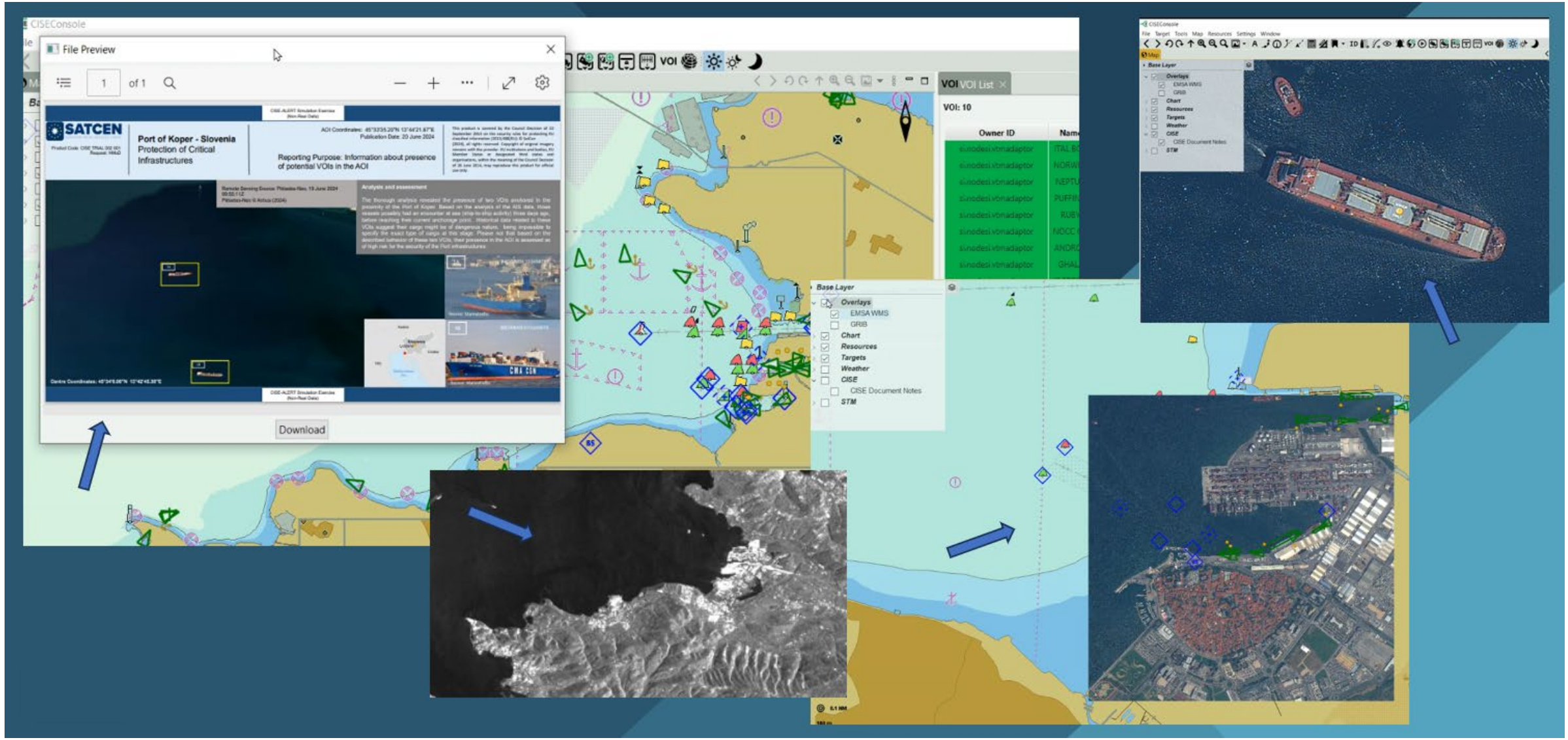




Trial execution – report on anomalys received



Trial execution – satimagery & analyses received



Fusion of data

- **Different data sources in the context of involving, integrating and combining information:**

Automatic Identification Systems (AIS)

Radars

Port & Coastal information

Satellite imagery's information

Weather data

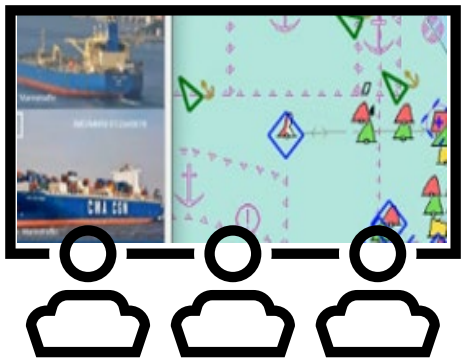
Vessel Traffic Management Systems (VTMS)

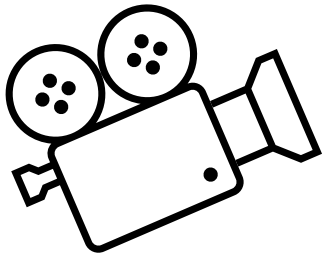
Drones

Benefits of merging data

- **Improved Situational Awareness:** By combining data from multiple sources CISE enables a more comprehensive view of a situation, having a unified picture enhances understanding and response capabilities.
- **Enhanced Decision-Making:** Decision-makers can rely on more accurate and timely information to assess risks, allocate resources effectively, and respond swiftly to emerging situations.
- **Reduced Duplication of Effort:** Integrated systems reduce the time and effort required to gather and interpret data from multiple sources.
- **Interoperability, Collaboration and Coordination:** Data fusion in CISE facilitates interoperability among different systems and stakeholders, what is crucial for coordination among agencies, nations and other entities involved in complex operations or responses.
- **Early Detection and Response:** By integrating diverse data sources, CISE can enable early detection of potential threats or incidents, proactivelly preventing escalation or minimizing impact.
- **Enhanced Maritime Security:** By merging data from intelligence sources, surveillance systems, and maritime traffic databases, CISE helps authorities detect anomalies and respond proactively to emerging threats.

Demo video



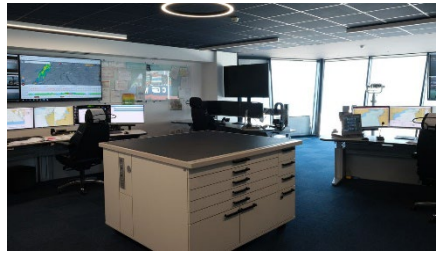


Let‘s see the video now!

Looking forward

- Adriatic Sea SARex 2024 – Search & Rescue exercise 2024
- North Adriatic Sea Basin focus
- MSPTN (Maritime Safety Permanent Transnational Network) eNAV Thematic WG
- CSG and other CISE Expert Groups

CISE-ALERT
CISE's operationalization launch through A Long Endurance and Real live Test



Thank you for your attention!

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