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SeaCOP

Enhanced situational awareness and shared operational picture

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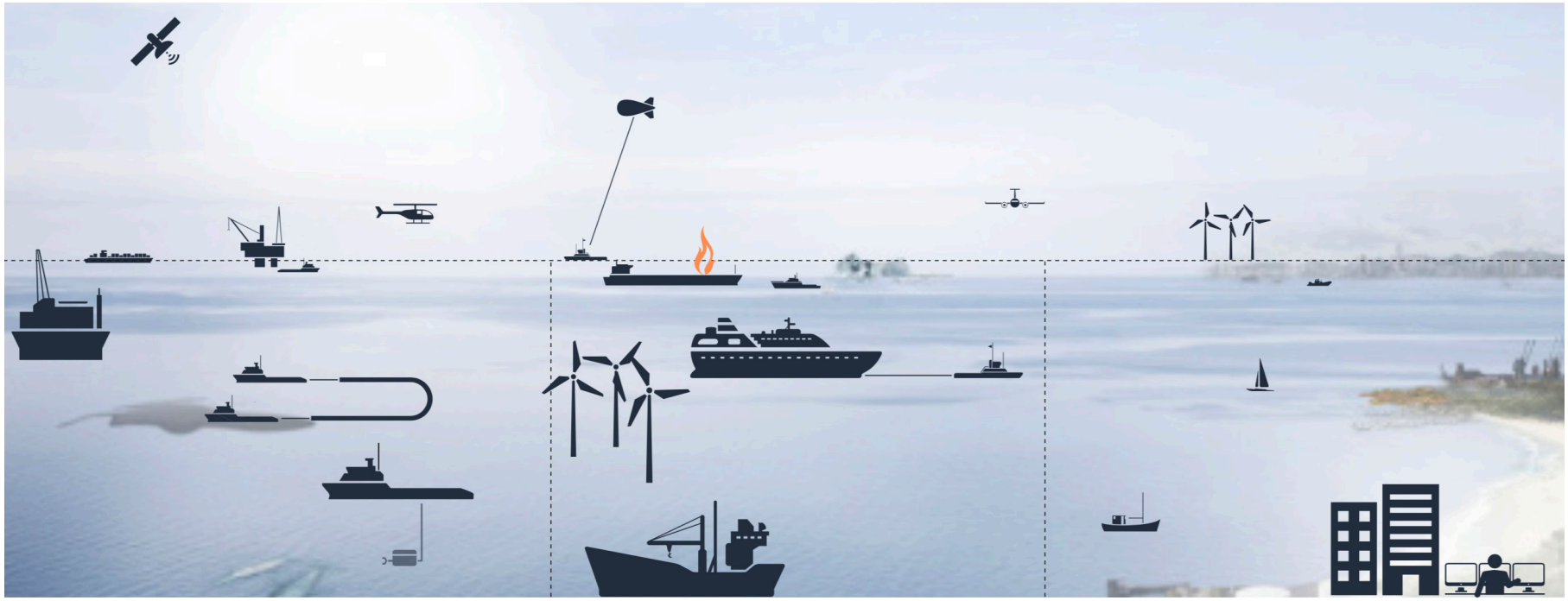
AIRBORNE



OFFSHORE NEAR-SHORE ONSHORE

Unmatched situational awareness in real time, independent of location, available at your fingertips

Situational awareness at your fingertips

SeaCOP is a multi-mission decision support solution designed for Vessel Traffic Management, Port and Terminal Security, Environmental Monitoring and Emergency Response.

The system can be used onboard vessels as well as onshore.

The SeaCOP combines an intuitive user-interface with powerful processing and decision-support tools, sensors and sensor platforms such as AIS, cameras, radars, sonars, drones and satellite data. The sensors and data sources are all integrated, processed and fused together in real-time, providing an unmatched situational awareness solution. For the operator this means an early warning and the right information to take appropriate decisions and initiate efficient. counter-measures.

The distributed SeaCOP systems and sensors are all connected through a secure network structure, enabling remote control and creating a common operational picture for all stakeholders.

Application Areas

- Environmental Monitoring
- Security
- Vessel and Traffic Management
- Harbor Authorities
- Maritime Law Enforcement
- Coastal Administration
- Offshore Energy Operations
- Oil Spill Preparedness Organizations

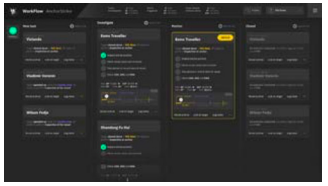
Introduction

With **SeaCOP** you have the tool needed to obtain Situational Awareness and Common Operational Picture for your monitoring, detection and response operations. Be it Vessel Traffic Management (VTMS), waterside security, Oil Spill Detection, law-enforcement, Search & Rescue or asset protection, SeaCOP provides a unified common operational picture and decision-support tool for all stakeholders.

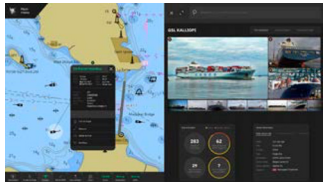
SeaCOP enables maritime professionals to monitor, detect and manage both day-to-day work as well as emergency response operations. Distributed sensors and information sources are integrated, fused, analysed and presented in the multi-mission SeaCOP system.

Automated and customized alarms supported by machine learning and Artificial Intelligence (AI), support tools with augmented reality (AR) and an efficient documentation and reporting module are key components of the SeaCOP system.

Add, analyse and document data and information of all your connected CCTV camera systems.



When a situation has arisen, The SeaCOP Work Flow lets you manage and document the work process directly in the VTMS system.



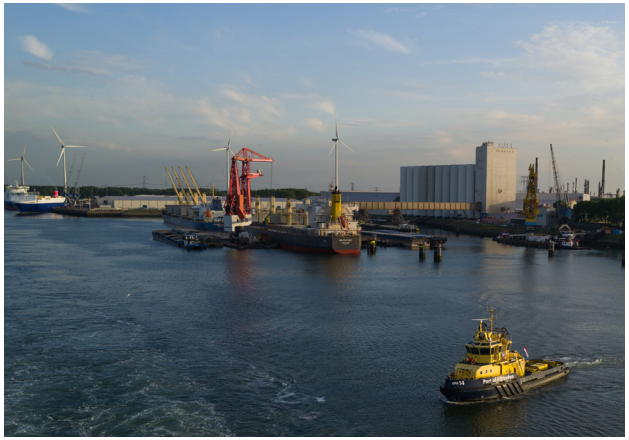
The SeaCOP vessel data card, showing risk profile, history in the area, and all recorded vhf, images and videos of the vessel of interest.

Application Examples

In Oil and gas industry, SeaCOP allows for an early warning vessel management system, and fast and efficient oil spill detection and polluter identification.

In a coast guard setting SeaCOP allows expert decision makers and observers to remain ashore while closely following vessel interdiction or fishery control.

Aircrafts and helicopters use SeaCOP to perform their multi-mission operations, while sharing data and collaborating with offshore and onshore resources.



Small and large harbours use the SeaCOP to manage the day-to-day operations and document every step and actions taken by the vessels.

Distributed sensor arrays like cameras, radars, satellite imagery and AIS are all fused into the SeaCOP, assisting coastal surveillance organizations.

SeaCOP can be used in maritime operations to manage, coordinate and monitor Search & Rescue, firefighting and emergency towing operations.

Common Operational Picture

Common Operational Picture is the shared information from a situation that allows the involved resources to make the correct decisions based on all available information, regardless of their location.

A Common Operational Picture is provided by the identical display of combined data from a number of sensors in a number of different locations. By updating the data in real time, decision-makers can be in any location and yet have the most pertinent information available to assist in their decision making. The Common Operational Picture creates the basis for a group-wide unified situational awareness.

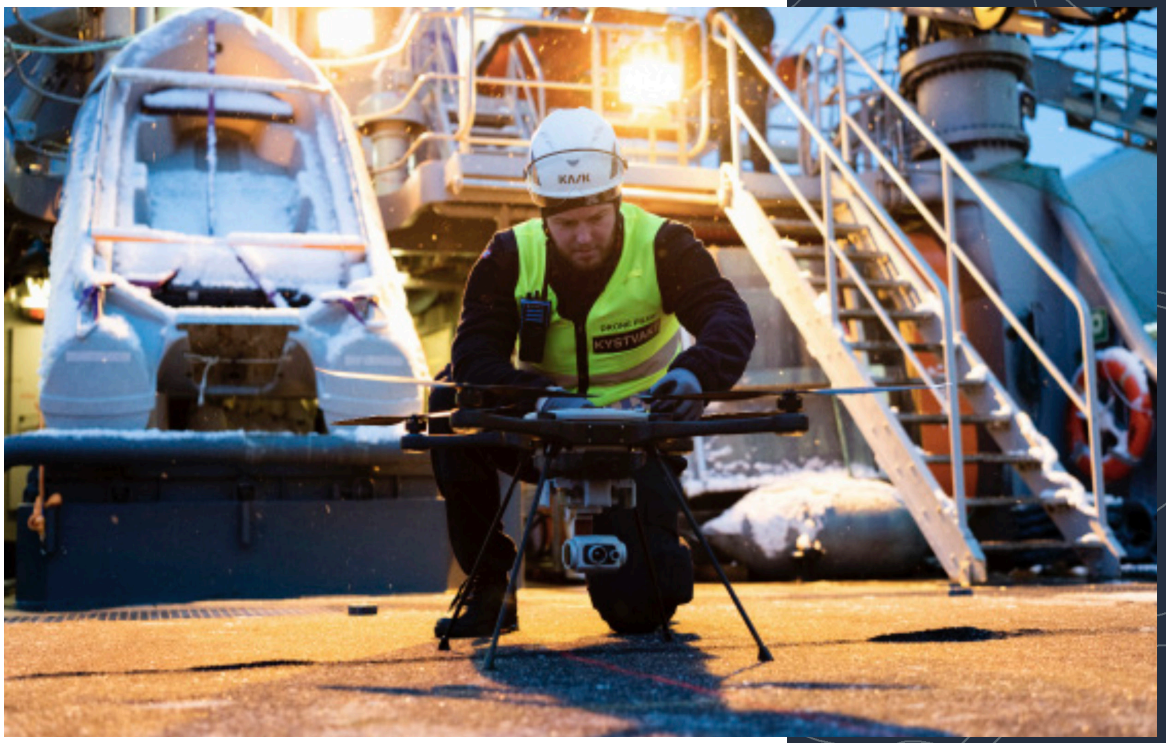
SeaCOP enables access, viewing and control of live data from distributed sensors onshore, subsea or aerial. It brings the captain's view right into the onshore operation room, and provides automatic detection of potential threats from passing traffic, by correlating sensor data from different sources and process this through advanced algorithms.

Independent of location

By making information available independent of location, key decision makers make decisions using the best available information during both everyday operations and emergency response situations.

Furthermore, as an operation or incident develops, it may be necessary to collaborate with resources or agencies outside of one's own organization. By making the information available independent of location, additional resources can easily be given access to the Common Operating Picture.

SeaCOP uses a standard internet-based data-sharing network protocol. This means that any vessel, onshore operations room or aircraft can be SeaCOP-enabled. Additionally, remote personnel, external organizations and agencies can be included in the Common Operational Picture quickly and easily via SeaCOP WebAccess. SeaCOP is perfect for enabling efficient cross-agency collaboration.



Scalability Meets Flexibility

SeaCOP is scalable from a **single location** or single workstation to a **multi-location**, multi-workstation environment. The workstations are installed at chosen vessels, maritime control centers or at any location requiring access to the SeaCOP functionality. NORBIT Aptomar can provide a complete solution from supplying computer hardware and display equipment to delivering virtualized systems utilizing existing hardware at customer location.

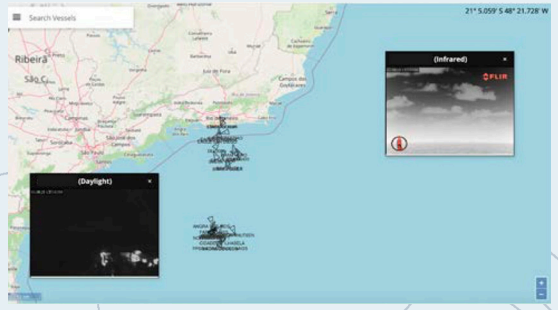
SeaCOP software is installed on installed on control room workstations, movable laptops or tablet computers that just need a network connection to be operational. This enables operators in the field to have access to all available data as well as the capability to input data to the network.

Professionals and key decision-makers can always have a SeaCOP workstation or the WebAccess with them to be prepared for any situation. Shore surveys and clean-up teams, vessel inspectors and port security can access or enter data on-scene.

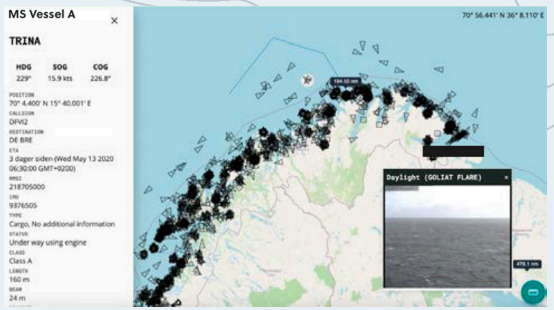
SeaCOP Web Access

All the data in the SeaCOP network is available via a secure web server. SeaCOP webAccess is a view-only display of SeaCOP data, including live streaming of video from coastal radars, vessels, hand-held cameras, drones or ROVs.

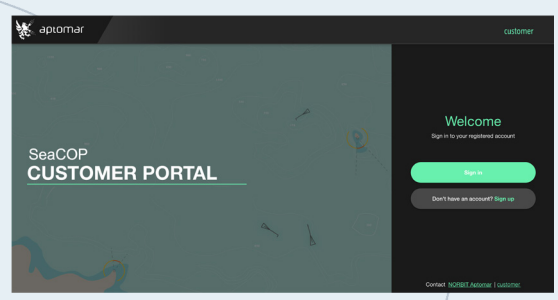
- Web-based interface to the SeaCOP database, including electronic charts, Radar, AIS objects and streaming of live IR, DV and ROV video.
- Live and historical vessel data cards to evaluate risk, plan arrival or evaluate historical events.
- Access SeaCOP Video Matrix, including remote control of cameras.
- Monitor or work directly in the SeaCOP Work Flow.
- Created to give access to decision data, or a general overview, for personnel not situated in SeaCOP-equipped locations.
- Accessible through standard internet browser on personal computers, tablet pc's and smart phones.
- Ideal for temporary inter-agency/inter-organisational sharing and collaboration.



Access real time maps with AIS and Video.



Live and historical vessel data cards.



Generate, deliver and manage live reports in one portal.

Modularity and Network

SeaCOP is a modular and scalable solution where functionality and sensors can be added at any time, based on the changing needs and requirements of the client.

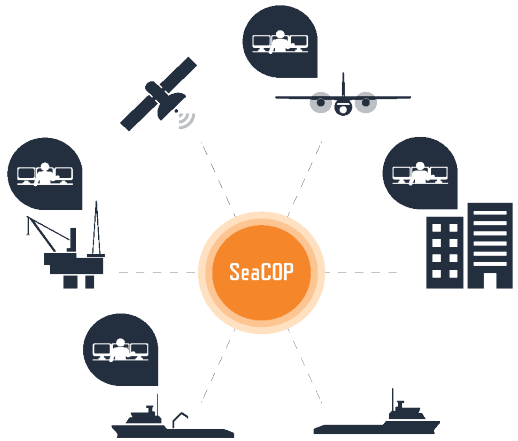
The SeaCOP System includes the most used functions and sensor integrations for conducting basic monitoring, detection and emergency response operations. This includes vessel and object detection and tracking using input from ARPA radar and AIS, customized alarm zones, camera integration, and recording functionality.

With With a basic module as starting point, you can add and extend operational functionality from a rich set of add-on modules with more advanced functionality for **VESSEL TRAFFIC MANAGEMENT, WATERSIDE SECURITY, ENVIRONMENTAL MONITORING AND EMERGENCY RESPONSE.** This ensures a system that can be tailored and optimized for the actual operation in question.

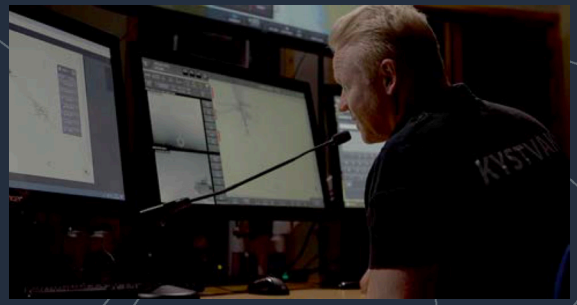
Tactical Collaboration Management System (TCMS)

The SeaCOP system is made up of one or several local or distributed nodes. Each node is either a sensor, or a group of sensors, on a vessel, offshore installation, aircraft or marine control centre all integrated into a SeaCOP workstation. All networked workstations will then allow display of information from all sensors integrated into a SeaCOP TCMS network, independent of location, in real-time.

At the heart of every SeaCOP network is the dedicated SeaCOP server that communicates with all the connected nodes, merging and analysing the available data. All network connections are secured and inbound to the SeaCOP server. For operations without a classic client-server architecture, the SeaCOP server is integrated into the SeaCOP workstation. This server controls the sharing network and the access to it. The system ensures a high level of cyber security and data control.



All notes in the SeaCOP network are connected through secure and encrypted connections.



Crew conducting high-risk operations streaming live video back to the main vessel and the onshore personnel following the operation remotely.

Network Nodes

The nodes are connected using any IP-based network carrier. This includes wired LAN, microwave links, standard ship satellite data systems, 3G/4G/5G, Maritime Broadband Radio (MBR) or similar.

The SeaCOP implements sophisticated compression and time-synchronisation algorithms that will ensure that the highest possible quality is transferred using as little bandwidth as possible.

Network Nodes

Customize SeaCOP to suit your operational needs

SeaCOP System

The SeaCOP system includes all the basic core features for marine monitoring, surveillance and response operations:

- Electronic Navigation Charts (ENC) with 2D/3D view
- Integration of AIS / VDES, ARPA Radar Targets, CCTV/marine cameras
- CPA / TCPA
- Guard zones and automatic alarms
- Recording, replay and documentation
- System health monitoring

Based on the SeaCOP base system, add-on modules within **Vessel Traffic Management, Security, Environmental Monitoring** and **Communication**.

Situational Awareness Module

The Situational Awareness module enables advanced functionality for vessel traffic management, port security, coastal surveillance, border control and critical infrastructure security and protection, such as offshore installations, wind energy parks and nuclear power plants.

Sensor network support

- Advanced AIS / VDES Base station network management
- Advanced RADAR processing-, fusion-, control- and presentation
- Long-range, high-sensitivity daylight and infrared (IR) cameras
- Sonars for underwater intrusion-detection and waterside security

Voice communication VHF

- VHF receiver and transceiver
- Remote VHF calls using VHF-over-IP
- Recording and playback

Maritime Broadband Radio - MBR

- Integration and distribution of video-sources through MBR; drones, helmet cameras, hand-held devices and vessel-mounted electro-optical systems
- Sharing of operational data over MBR; AIS, Radar targets, GIS data, user-created chart-objects
- File-sharing; Documents, images, videos
- MBR network manager

Integrated vessel database - Vessel data card

- Integration of international vessel database
- Vessel particulars, photo, voyage information
- Detailed vessel-tracking statistics
- Blacklisted or sanctioned vessel
- Integration with external databases

Work Flow - Event work process management

- Situations, events or alarms trigger an alert and creates a work task
- Operators to respond in accordance with created work process
- Full history and documentation of what, who and when

Environmental Monitoring Module

Oil Spill Detection & Polluter-identification

- Oil Spill Detection using maritime navigation radars and EO/IR cameras
- Polluter-identification and documentation
- Estimation and forecasting of spill size and drift
- Historical analysis and playback
- Satellite images

Monitoring of marine life

- Monitoring and detection of birds and mammals
- Document species, location and numbers

Air pollution

- Sniffer sensors carried by UAVs ref. MARPOL (SOx and NOx) and EU-directive 2005/33/EC (SO2)
- Sensors and infrastructure for monitoring and notification of threshold values for temperature, humidity, noise, CO2, formaldehyde, dust and VOCs.

Features and functions in support of emergency response are incorporated in the various modules

Oil spill response and recovery

- Establish and maintain a common operating picture throughout the operation; offshore, onshore, and aerial
- Oil spill drift forecasting for accurate planning of resources
- Cross-agency and cross-organization collaboration, one operational picture

Search and rescue (SAR)

- Search and retrieval of personnel or objects lost at sea
- Current- and weather-adapted search patterns

Anti-piracy and anti-smuggling

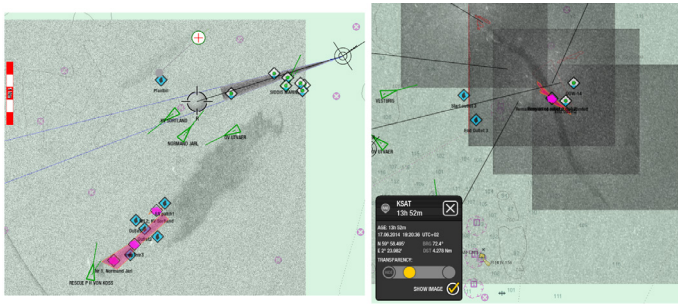
- Pre-inspections of object of interest before deploying boarding party
- Long-range inspections and threat assessment
- Transfer data on incoming threat in real time to chosen locations

Fishery control

- Vessel inspections
- Algorithms for automatic detection of abnormal and suspicious vessel movements

SECurus system on Norwegian Coast Guard vessel.

Drone integration in SeaCOP using MBR.



SeaCOP satellite integration for oil spill detection and clean-up operations

NORBIT APTOMAR Technology

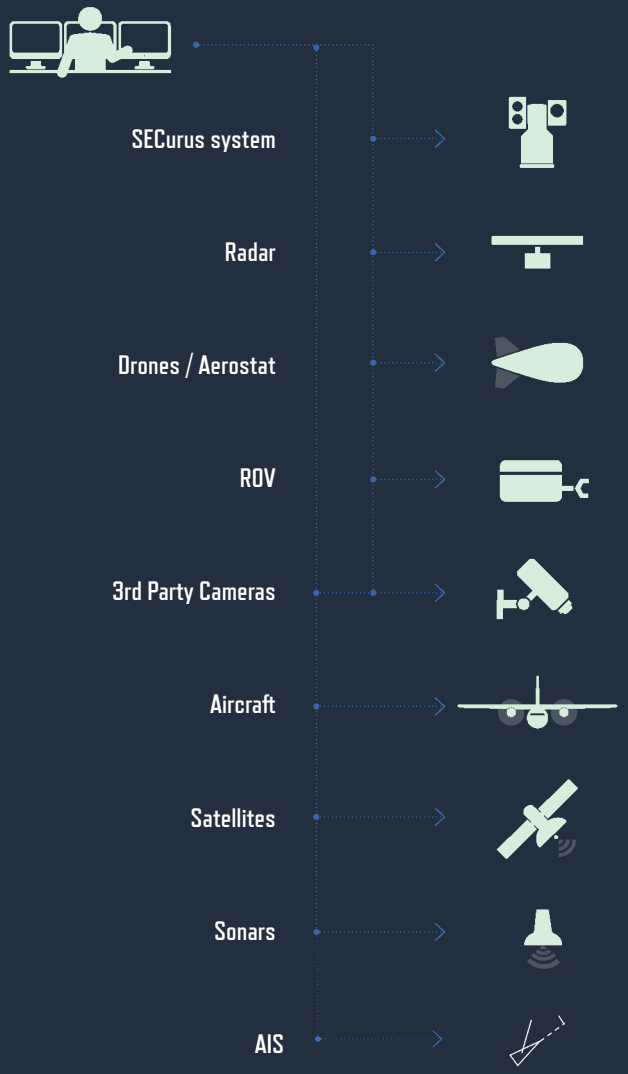
NORBIT Aptomar's software, sensors and networking technology create one of the most comprehensive and accessible maritime domain awareness systems available today. As the challenges and operations of our clients change, the SeaCOP system is under continuous development.

The SeaCOP and all its available add-on modules are designed and improved over the last decade based on thousands of small and large operations, incidents and day-to-day events. Our customers use the SeaCOP system for maritime surveillance missions, vessel traffic management, fishing-area enforcement, boarder patrol, offshore energy, asset protection and environmental monitoring and detection.

Together we will ensure the safety and integrity of people, the environment and assets.

Sensor/components that connects to

SeaCOP



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