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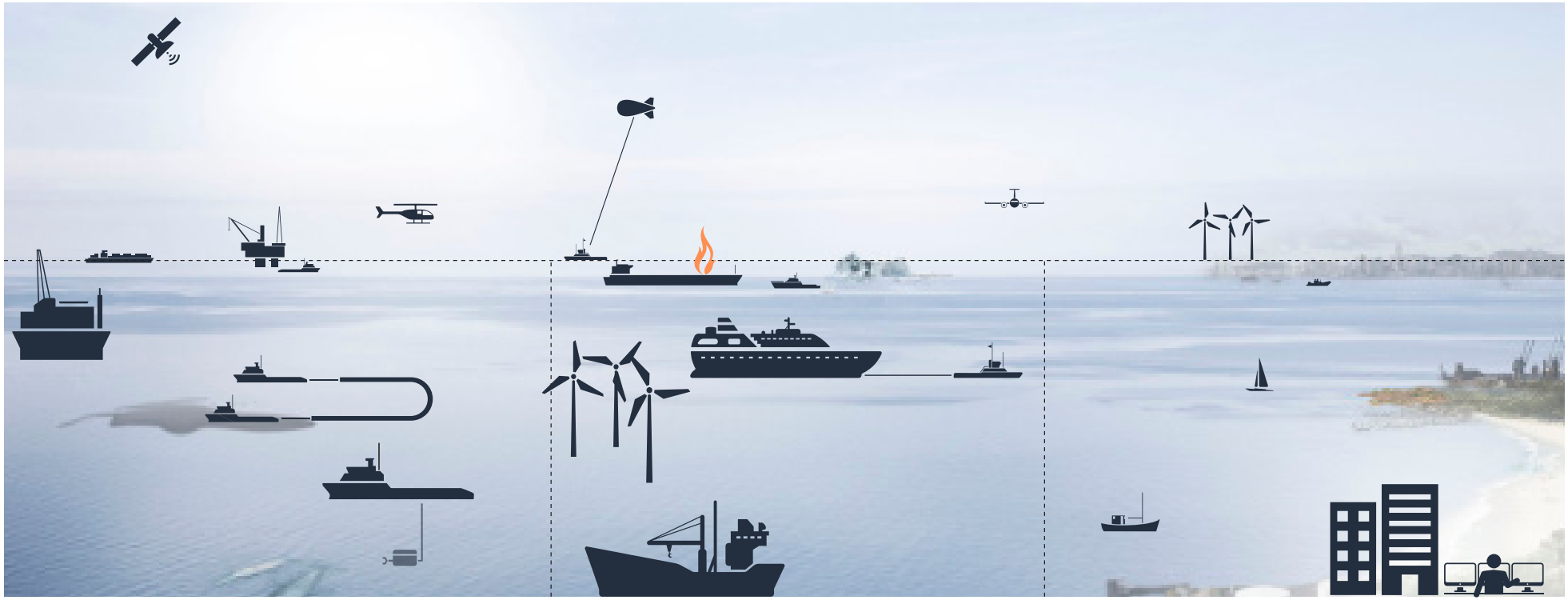
SeaCOP

Enhanced situational awareness and shared operational picture

AIRBORNE



OFFSHORE NEAR SHORE ONSHORE

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

SECurus

Radar

ROV

Aerostat/ Drone

Surveilance Aircraft

Satellites

Surveilance Cameras

Sonars

Situational awareness, at your fingertips

SeaCOP is a multi mission decision support VTMS solution created for Vessel Traffic Management, Port and Terminal Security, Environmental Monitoring and Emergency Response for a large number of maritime operations.

The SeaCOP combines an intuitive user interface, with powerful process and decision support tools, integrating 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, giving the operator an unmatched situational awareness. For the operator this means an **early warning**, the right information to take **approriate decisions** and **initiate efficient counter measures**.

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

Application Areas

Ports and harbors
Offshore energy
Law enforcement
Coast guard
Coastal administrations

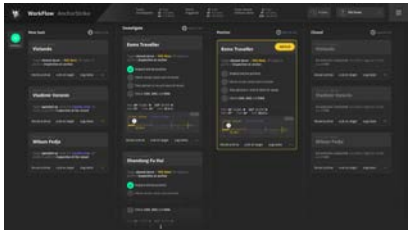
INTRODUCTION

With **SeaCOP** you have the tool needed to obtain Situational Awareness and Common Operating Picture for your monitoring, detection and response operations. Be it Vessel Traffic Management (VTS), waterside security, oil spill detection, law-enforcement, search & rescue or asset protection, SeaCOP ensures for all stakeholders, a unified common operating picture and decision support tool.

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

Automated and customized alarms supported by machine learning and AI, remote control of sensors, powerful decision support tools 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 WorkFlow 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, imges 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 harbors 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 worldwide

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

COMMON OPERATING PICTURE

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

A Common Operating 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 Operating Picture enables a group wide **unified situational awareness**.

SeaCOP enables **access**, **viewing** and **control** of live data from distributed sensors, onshore, offshore or aerial. Bringing the captain's view right into the onshore operation room, or automatically detection of potential threats from passing traffic by correlating sensor data from different sources and process this through advanced algorithms, is an integrated part of the SeaCOP system.

Independent of location

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

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

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

Add drone integration to any onshore or marine operation, with payloads consisting of infrared and daylight cameras, or sniffers for sulfur or radioactive material.

SCALABILITY MEETS FLEXIBILITY

SeaCOP is scalable from a **single location**, 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 deliver virtualized systems utilizing existing hardware at customer location.

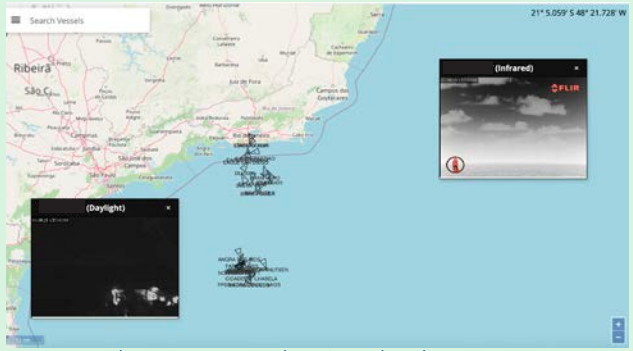
SeaCOP software is installed on touch-screen based control room workstations, movable laptops or tablet computers that just needs a network connection to be operational. This enables operators in the field to have access to all available data as well as the capability to input data to the network.

Professionals and key decision makers can always have a SeaCOP Workstation or the WebAccess with them to be prepared for any situation. Shore survey and clean-up teams, vessel inspectors and port security can access or enter data on scene, that becomes instantly viewable on all SeaCOP nodes in the network.

SeaCOP WebAccess

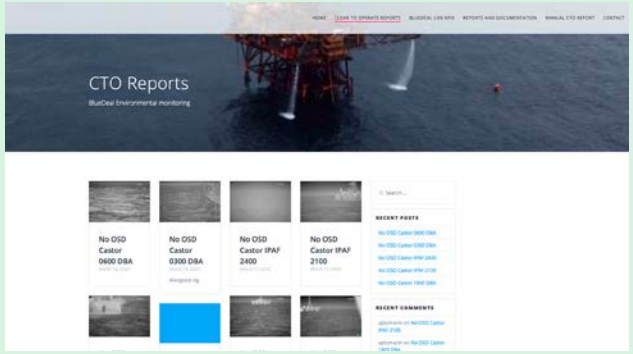
All the data in the SeaCOP network is available via a secure web server. SeaCOP WebAccess is a view-only display of SeaCOP data, including live streaming of video from coastal radars, vessels, handheld cameras, drones or ROVs.

- 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 evalute historical events
- Access SeaCOP video matrix, including remote control of cameras
- Monitor or work directly in the SeaCOP workflow
- 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 interagency/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 BASE 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 the BASE module as starting point, you can add functionality from a rich set of add-on modules with more advanced functionality for **VESSEL TRAFFIC MANAGEMENT, WATERSIDE SECURITY, ENVIRONMENTAL MONITORING AND RESPONSE**. This ensures a system that can be tailored and optimized for the actual operation in question.

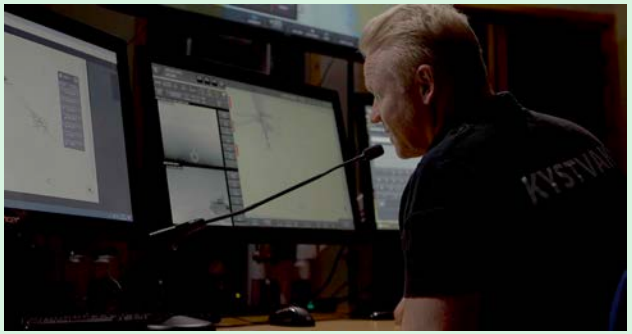
Secure Network

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

At the heart of every SeaCOP network is the dedicated SeaCOP server software. The SeaCOP Server communicates with all the nodes, merging and analyzing the available data. All network connections are via a secure connection, and all connections are inbound to the SeaCOP Server. For operations withouth 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 high level of network 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 carriers. 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 bandwith as possible.

The SeaCOP Modules

Customize SeaCOP to suit your operational needs

SeaCOP Base System

The base system icludes all basic functions of the SeaCOP system. It offers a set of core features for marine monitoring, surveillance and respons 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, boarder 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, handheld 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

WorkFlow - Event workprocess 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 size and drift
- Historical analysis and playback
- Sattelite 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 threashold values for temperature, humidity, noise, CO2, formaldehyd, dust and VOCs.

Features and functions in support of Emergency Response are incorperated 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 forcasting for accurate planning of resources
- Cross-agency and cross-organization collaboration, one operationa, operating picture

Search and rescue (SAR)

- Search and retrieval of personell 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 threath assessment
- Transfer data on incoming threath 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

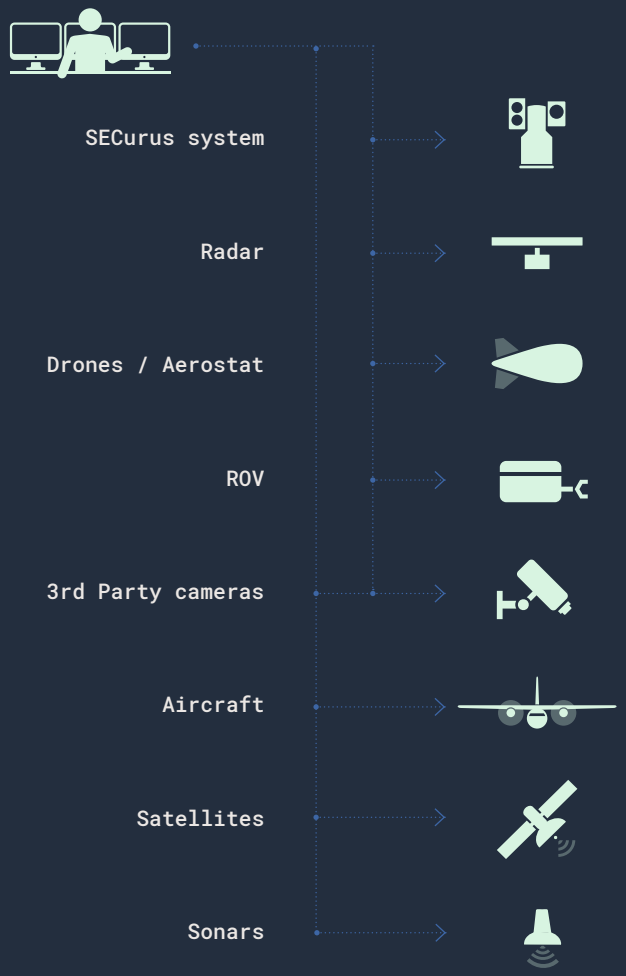
NORBIT APTOMAR TECHNOLOGY

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 modueles are designed and improved over the last decade based on thousands of small and large operations, incidents and day-to-day events. Our customers uses 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




OBJECT ARCHIVE
FLIR
KYSTVAKT

Main Office Norway
Stiklestadveien 1
N-7041 Trondheim, Norway

Tel: (+47) 40 00 34 03
E-mail: sales.aptomar@norbit.com

Web: www.aptomar.com

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