



Oil Spill Management

Are you prepared?



aptomar
safety at your fingertips

CHOOSING THE RIGHT STRATEGY AND THE RIGHT TOOLS



An oil spill clean-up is a war

An oil spill clean-up is a war involving an enemy of floating hydrocarbons in which choosing your weapon and point of attack based on where the enemy is, where it is hiding and how it is moving is the key to minimizing your casualties. When your intelligence shows that the enemy is defeated, you move on to the next target. And so it continues until the war is over; when you go home, regroup, lick your wounds and learn from your achievements and mistakes.

Choose your intelligence wisely

Not even the most experienced captain, oil spill clean-up expert or onshore crisis manager can work with their eyes closed. Good decisions are seldom made that way.

A tactical oil spill management system has one purpose: ensuring that the clean-up resources get the intelligence and tactical information needed to do their job in the shortest time possible and with minimal environmental damage and operational cost, so they go home as heroes.

No matter what the chosen clean-up method (recovery, in situ burning or natural or chemical dispersants), without tactical information you are going to war with your eyes blindfolded.

Are you willing to pay the cost?

As history has shown, oil spill accidents, small or large, have a high cost. Nothing is unaffected: the ocean and its ecosystem, the oil and gas industry, and the civilians living off and near the sea, nothing is impervious. The revenues created through exploration and production

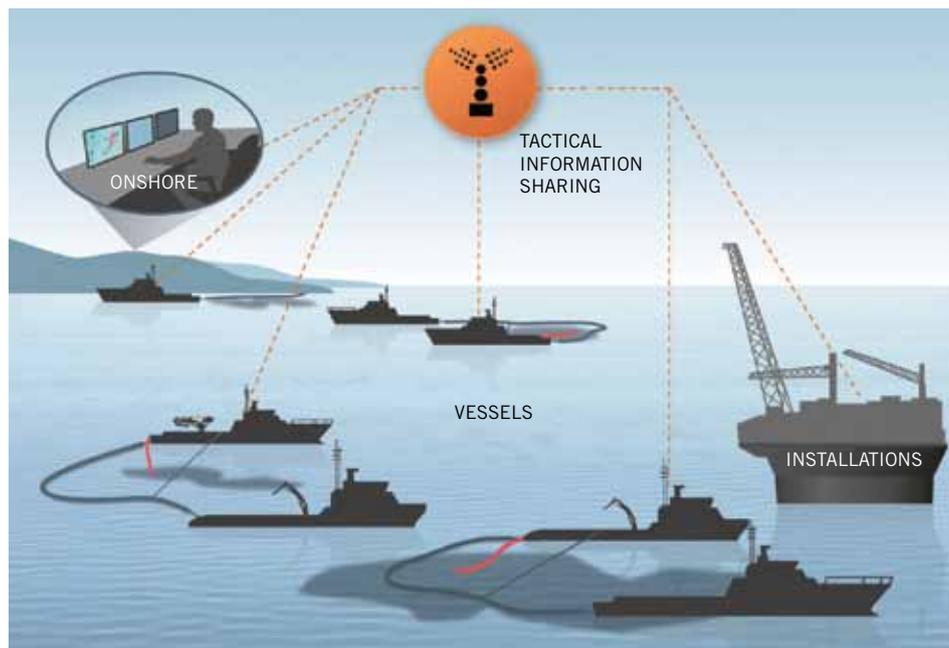
are uncountable, the environmental and personnel risks are unmistakable, and the costs of clean-up, post-operation processes and industry setbacks are unbearable.

Aptomar drives the oil spill clean-up industry to the next level

Oil spill preparedness has, for decades, been an area with a low level of innovation and evolution: all while the world of integrated operations, collaborative methodologies and social networking has developed faster than ever. Aptomar has taken the oil spill clean-up industry into the information age and made a step change by combining years of oil spill clean-up experience, a set of unique sensors and a collaboration toolbox to ensure tactical information, independent of location, in real time.

Are you prepared?

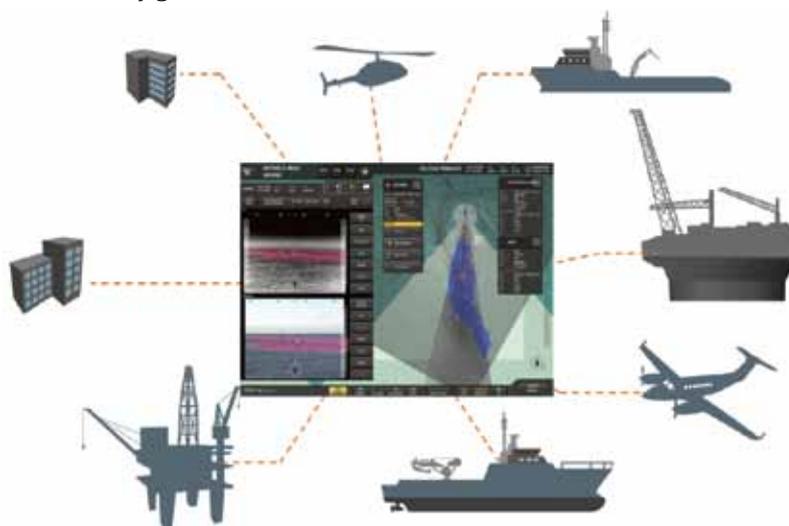
APTOMAR TACTICAL OIL SPILL MANAGEMENT



TACTICAL INFORMATION, INDEPENDENT OF LOCATION, IN REAL TIME

During an oil spill clean-up operation, the challenge is to quickly acquire a tactical situation overview and then retain it throughout the stages of the operation. This overview needs to be independent of your location, whether it is on a vessel or a platform, or in a helicopter or the onshore operations room. Decisions must be made and resources must be managed, all to ensure a safe and efficient operation, and to minimize the strain on the environment.

With this in mind, Aptomar has introduced the tactical user interface, which brings all tactical information together in one operational overview, independent of what or where the resources are, and ensures they get it when it matters.



Integration

Based on open standards, the tactical user interface integrates all the information available.

Distribution

Wherever you place the tactical user interface, the people at that location will gain access to all the information and features.

Presentation

All the information is presented on an intuitive and user-friendly touch screen.

Why tactical information?

Without tactical information you are operationally blind, deaf, and mute. Choosing a clean-up method, applying countermeasures where they have the greatest effect, evaluating that effect and planning the next steps are impossible without tactical information.

Why independent of location?

The combating resources, know-how and management resources required are seldom in the same location at the same time. They do not have the same roles and responsibilities, but they do need access to the same tactical information.

Why real time?

Oil spill disasters need immediate and constant attention, and access to real-time information is vital to getting a best possible overview and taking the right decisions.



Why Aptomar?

Aptomar has made a step change in oil spill management by combining years of oil spill experience with the latest technology and the principles used every day in integrated operations and wide-area networks with a focus on user friendliness.

Why relative thickness?

Determining the relative thickness of an oil slick is necessary because 90% of the volume of an oil slick is located in 10% of the visible oil spill area. Without this information, choosing and then applying booms, dispersants or in situ burning are undertaken with your eyes blindfolded.

Why automatic oil spill detection?

Detecting and tracking oil slicks are tasks best done by an automatic system. A manual approach requires 100% attention and takes away the focus on using the available tactical information.

Why oil-slick drift predictions?

Planning a clean-up operation requires information on oil-slick drift speed and direction; in addition, an optimized vessel speed increases the efficiency of the resources involved.



Why SECurus sensor?

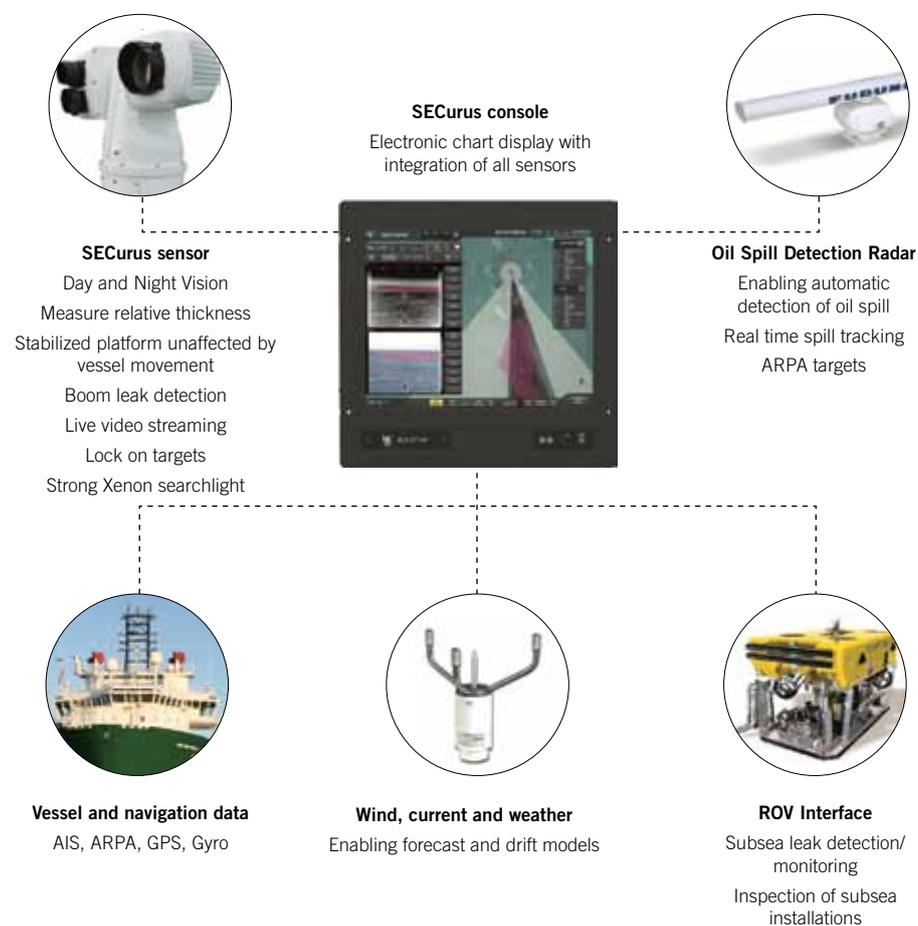
Today, the only proven method for determining the relative thickness of an oil slick is an actively cooled infrared sensor. The SECurus sensor is stabilized in three degrees of freedom to give the operator the best-available technology for detecting, measuring and combating an oil spill 24 hours a day in any weather conditions.

THE BASICS THAT MAKE IT ALL POSSIBLE

There is an abundance of sensors, equipment and services that have been tested, verified and used on a daily basis for detecting, tracking, measuring and planning throughout the different stages of an oil spill operation. Each sensor and each source has its unique set of features and limitations.

To create a complete tactical overview and ensure that the correct decisions are made, all the information from the different sensors and sources is integrated into a combined picture that gives the operators and the decision makers clear and complete understanding of the situation.

All the data acquired and collected at one location can be made available to all the other locations through the tactical user interface.



OIL SPILL OPERATIONS IN REAL LIFE AND REAL TIME

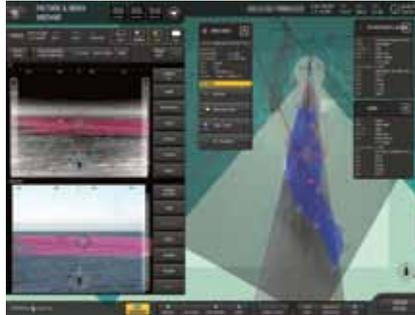
Through the tactical user interface, the users submit, share and access the same data and the same information in real time. Aptomar has developed the functional and intuitive user interface, with its special focus on oil spill response preparedness, in cooperation with some of the world's leading oil companies. The driver was a common vision: a higher volume of oil dealt with in a shorter time, at a lower cost.

Automatically detect oil spills



Oil spill detection radar continuously monitors for oil spills and generates alarms. With the SECurus system, oil spills are verified and false targets are discarded. The screen grab shows an area with a significant volume of oil in accordance with the 90:10 rule.

Estimate oil-slick thickness and volume



Using a high-sensitivity infrared sensor, the oil slick's thickness and volume are estimated. Focusing your efforts on the thickest part of an oil slick is paramount for success.

Operate day and night



The system is independent of weather conditions and light levels. It enables the operator to evaluate the right clean-up strategy and direct efforts to where they give the best results, 24 hours a day.

Predict the oil-slick drift



The system has functions for manually predicting the oil slick's drift as well as using information from automatic identification system (AIS) buoys and weather and current data. Predictions can be made in 15, 30, 45, 60 and 90 minutes time slots to optimize planning and placement.

Visualize clean-up operations



Visualizations help to ensure optimal usage and placement of booms or dispersant arms, and monitor the in situ burning operations.

Monitor mechanical recovery



Mechanical recovery can be monitored day and night. Leakages and equipment problems can be detected early.

Monitor traffic and objects



AIS and automatic radar plotting aid (ARPA) targets are plotted on the same chart, which makes it possible to monitor all the traffic surrounding the operations.

Monitor subsea



Integration with remotely operated vehicle (ROV) systems makes subsea inspections and monitoring possible.

Store the evidence



All videos, pictures, chart snapshots and objects can be stored in the database. This is a key feature for documenting, sharing and reviewing oil spill situations.

Why combine radar and SECurus?

Radar and SECurus are operationally complementary sensors; both are needed in different stages of a clean-up operation. In addition, the radar's erroneous detections are discarded by the SECurus system.

How to choose a clean-up method

Should you use mechanical recovery or dispersants? Should you burn the oil or wait until it disperses naturally? Using the right clean-up strategy is essential for prioritizing resources and getting the best results. Tools for detecting, measuring and predicting oil spills are key to enable operators at sea and on land to take the right decisions.

Why estimate volume?

Estimation of volume is undertaken to

- compare the volume of oil slicks, and, on the basis of that information, choose where to use resources first
- create an estimate for the amount of oil in the water.

Where can the system be deployed?

The SECurus system should be deployed on vessels, production units, installations or onshore locations that are taking an active role in oil spill detection and clean-up.

COMMON OPERATIONAL PICTURE (COP)

The tactical oil spill management system from Aptomar enables sharing of all the tactical information from all the vessels, platforms, terminals and airborne support involved in an oil spill situation. This means operators and experts can verify the situation, obtain the correct status, undertake the correct analyses, prioritize, make decisions and see the results of their actions.



Aptomar's tactical collaboration and management system (TCMS) is a communication platform that brings all the information together in a COP.



A TAILOR-MADE TACTICAL OIL SPILL MANAGEMENT SYSTEM

Build and configure your own tactical oil spill management system based on your operational requirements, available resources and need for future flexibility. The oil spill management system is based on the concept of nodes in a private network and can be configured and expanded at any time. Tactical information is made available in real time at all locations in the network.



The Aptomar TCMS

Tactical collaboration and management system

The TCMS brings the tactical information from all the vessels, platforms, terminals and airborne support into the onshore or offshore operations room.

In the field, the resources have a focus on their own operations, but you will have a tactical overview of all the resources involved and can take decisions based on the complete overview.

The SECurus system

Safety at your fingertips

The SECurus system is a building block in the Aptomar tactical oil spill management system

The unique sensors ensure that the clean-up crew has access to the information crucial for an efficient oil spill clean-up: automatic detection and relative thickness, drift and volume estimates.

And, do not forget, you can manage your oil spill operations 24 hours a day, 365 days a year, independently of light levels and weather conditions.



Aptomar ROV streaming

Subsea inspections

Subsea inspection using ROVs is an important activity for ensuring the safety and integrity of subsea installations and equipment.

With the Aptomar ROV streaming solution, the video and ROV navigation information is transferred in real time, at high quality, to any location with a tactical user interface, a SECurus system or a TCMS.

Standalone tactical user interface

Scaleable information sharing

By deploying a standalone tactical user interface, the location will have access to all the information created by and shared between the SECurus systems, the TCMS operation rooms or other standalone tactical user interfaces.

By installing a tactical user interface on a vessel or platform or in an onshore operations room, the location can aid and participate in the work using the tactical information and instructions issued by the main oil clean-up vessel or onshore TCMS operations room.

With the user interface in place, you are prepared for future expansions, as, at any time, you can add additional sensors and information sources such as a SECurus system, a standalone radar oil spill detector, ROV streaming and weather information.

Actively versus passively cooled infrared sensors

The passively cooled infrared cameras normally used in handheld devices and low-cost marine solutions have too low a sensitivity to be able to measure the relative thickness of an oil slick. An actively cooled camera is typically 10 times more sensitive than a passive camera.

Can X-band radar measure relative oil-slick thickness?

X-band radar cannot determine the relative or absolute thickness of an oil slick. It goes against the laws of physics, and is backed up by empirical test data from oil spill authorities. The same goes for vertical, horizontal and dual polarized antennas.



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