



# TACTICAL OIL SPILL MANAGEMENT



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AIRBORNE

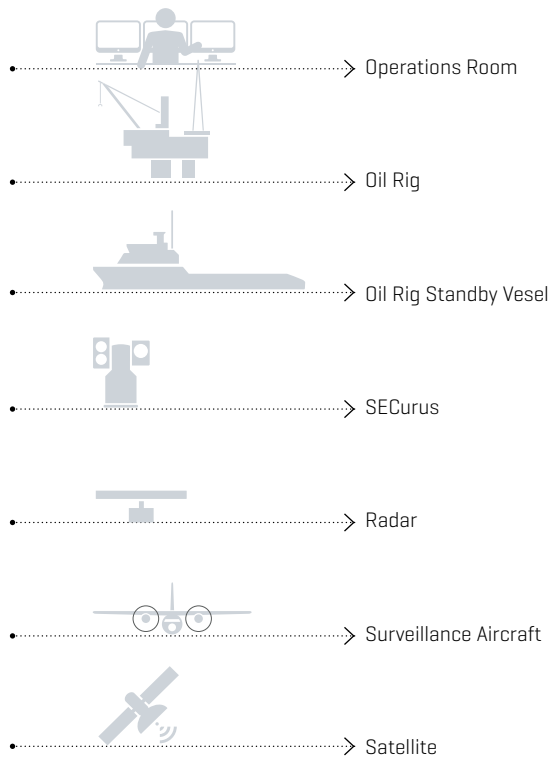
TCMS



OFFSHORE

NEAR SHORE

ONSHORE



# TACTICAL OIL SPILL MANAGEMENT



Tactical Oil Spill Management [TOSM] is the robust and documentable approach to managing oil spills. It has 3 core components; Equipment, Work Processes and Training & Exercises. Combined they enable the most efficient detection and response to an unintended oil spill.

Aptomar is the enabler of Tactical Oil Spill Management with the supply of sensors and networking technology used to create the Common Operating Picture. Aptomar also provides consultancy services to assist with the defining of Work Processes, and the provision of training and exercises.

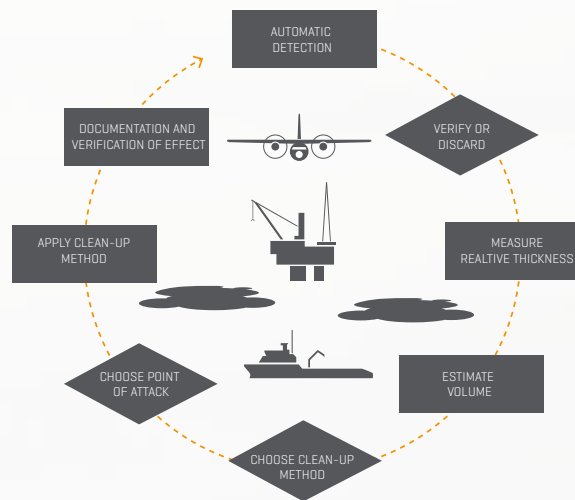
TOSM is the all-encompassing approach to oil spill management. It involves 3 activities;

- Field Monitoring of exploration and production activities to ensure no unintended oil spills are occurring, and documenting Clean To Operate.
- Detection of unintended oil spills as early as possible, and within predetermined time limits.
- Effective and efficient response to be conducted by the provision of the Common Operating Picture (COP).

Tactical Oil Spill Management includes:

- Equipment, including remote sensors and networking technology enable the creation of the COP .
- Work Processes define the roles, how and when to interact and how to use equipment.
- Training and Exercises ensures that everyone involved are familiar with the Equipment and following the Work Processes.

## TACTICAL OIL SPILL COMBAT PROCESS



Exploration and Production operators take measures to reduce the likelihood of unintended oil spills occurring, they also take measures to reduce the consequences should an unintended oil spill occur. Tactical Oil Spill Management will not prevent a spill, but it will significantly reduce the consequences when an incident has happened. The consequences of an unintended spill are related to; damaged ecosystem, corporate reputation, negative stock-prices, loss in values and costs related to response operations and fines.

The main actions taken as part of TOSM are;

- Monitoring and documentation of ongoing exploration and production activities
- Early detection, quantification and tracking of oil spills independent of light condition and weather
- Choose and apply clean up method with the highest precision and efficiency
- Ensure a Common Operating Picture (COP) through tactical collaboration and information sharing.

## COMMON OPERATING PICTURE — COP

Rapid and correct decisions are key to an efficient response to emergency situations. To enable correct decisions to be made, it is essential that all available information regarding the situation is made available to the decision makers in real time, regardless of their location. Offshore operations are often supported by expertise on shore. Exploration and Production operations will have a number of vessels and aircraft associated with them. To ensure that all involved are aware of the unfolding situation, it is important for everyone to have real time updated situational awareness.

Aptomar TCMS is the networking and display framework that creates the Common Operating Picture.

## TCMS

Common Operating Picture



## FIELD MONITORING

### CLEAN TO OPERATE AND DETECTION OF SPILLS

Field Monitoring involves surveillance of the area immediately surrounding an offshore operation, and the regular documentation of no unintended oil spills, a state known as 'Clean To Operate'. This is done using a network of different sensors. No single sensor is capable of providing a reliable alarm of an unintended oil spill in all weather and light conditions. For this reason Tactical Oil Spill Management calls upon the use of a variety of sensors using different technologies mounted on platforms, vessels, aircraft and satellites.

Tactical Oil Spill Management provides;

- Detection within required timeframe
- Low false alarm rate
- Best Available Technology
- Remote control of sensors



## OIL SPILL RESPONSE

### COMBAT MORE OIL, FASTER, AT A LOWER COST

Once an unintended oil spill has been detected, the same network of sensors, vessels and operations rooms is used to mount a timely and efficient response to it. Tactical Oil Spill Management ensures that Vessels and installations are equipped for a rapid and effective response. This means having the right sensors and equipment to enable;

- Finding the total extent and location of combatable oil
- Choosing and applying the most effective combating method where it has the greatest effect
- Calculating Drift predictions for optimum navigation around the spill
- Showing the effect of the action

A Common Operating Picture is established to enable all parties involved to have a common understanding of the situation, ensuring an efficient and effective response.







## **TRAINING & EXERCISES —**

### **TRAIN HARD, FIGHT EASY**

No system or process involving equipment and personnel can be effective without regular training and exercises. Training ensures all involved are familiar with the use of equipment and follow the required Work Processes. This is important to make sure that actions are taken by the right people at the right time with the knowledge to know what information to share, and when.

Exercises validate the Training and Work Processes to ensure they deliver the desired outcome. Exercises also provide valuable experience for people to practice the skills and processes they learnt in Training

Aptomar is a leader in the field of training for Tactical Oil Spill Management. Aptomar provides Training on equipment and work processes. Additionally Aptomar works with customers to organise and supervise regular exercises.



## NETWORKING

The creation of the Common Operating Picture by combining sensor data from multiple sensors requires an efficient and reliable data networking solution, as well as the clear and precise presentation of the combined data.

## TACTICAL COLLABORATION MANAGEMENT SYSTEM

Aptomar's TCMS [Tactical Collaboration Management System] is a data integration platform that enables different sets of maritime data to be combined, shared and displayed in a map based environment. It is the networking technology that allows for the real-time sharing of sensor data and the creation of the Common Operating Picture.

TCMS is a networking technology based around a central server. Information is displayed on dedicated touch screens running Aptomar software.





## SENSORS

As of today there is no single all-singing-all-dancing sensor that will solve all our decision support challenges. The key to efficient operations is people taking decisions based on facts. Robust and reliable information is created by combining complementary data sources presented in an easy to interpret map based display. Data from any source can be included provided that the data can be geo referenced to be displayed in the map.

Information provided includes;

- Detection of oil on water
- Location, Area and Volume of oil spill
- Drift information of oil spill
- Location of combatable part of oil spill
- Vessel traffic information in the area around the spill
- Live visual confirmation of the effectiveness of the chosen response.



Tactical Oil Spill Management makes use of a number of proven and established sensor technologies.

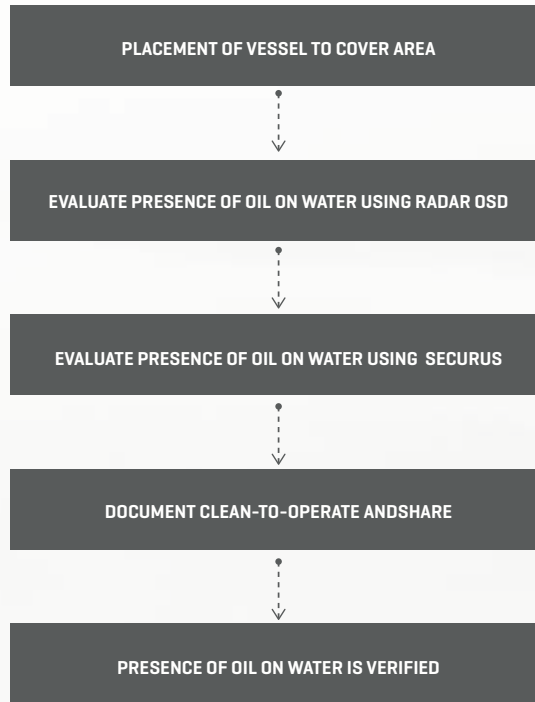
- Oil Spill Detection Radar Processors will detect oil spills automatically. They are able to calculate the drift of an oil slick.
- SECurus System is the only IR sensor platform designed specifically for Oil Spill Detection. It is designed to be mounted on vessels or platforms, and includes an advanced Actively Cooled IR sensor.
- Aerostats are tethered balloon systems that are used to carry Uncooled IR and Daylight cameras. They provide a low level aerial view of the area.
- ROVs are carried by many of today's Offshore Vessels. They are used to provide images of subsea structures for monitoring and servicing.
- Satellite mounted Synthetic Aperture Radar sensors give very wide area coverage, and clearly display oil spills. Satellites provide a snapshot overview of an area at regular timed intervals



No system of personnel and equipment can be effective without a definition of how the equipment is to be used, what information is to be shared, at what time, and with whom. The defining of Work Processes is an essential component of Tactical Oil Spill Management. Work Processes ensure all personnel are using equipment correctly, and actions are carried out in a timely manner to enable the Common Operating Picture.

Regulatory requirements are often function and performance based. While deploying the correct equipment can meet the functionality requirements, only using the equipment in the correct manner, at the correct time, can assure compliance with the performance part of the regulations.

Tactical Oil Spill Management requires that all necessary Work Processes are defined and communicated to relevant personnel.



### Monitoring of Clean to Operate

**Purpose**

Ensure a clear understanding of the workflow, roles and responsibilities while performing the following operations:

- Monitoring and documenting that the requirements for clean-to-operate during drilling operations are met in accordance with license requirements for monitoring and detection of unintended spills.
- Detecting unintended oil spills within 1 hour.
- Reporting and communicating with relevant parties.

**Responsible**

The ORV Officer on duty

**Definitions**

**Area:** The area to be monitored where the oil might appear during the current weather conditions.

**Clean-to-operate (CTO):** No-unintended oil spill, operation can continue.

Process step	Activity
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**1**  
Placement of vessel to cover the area

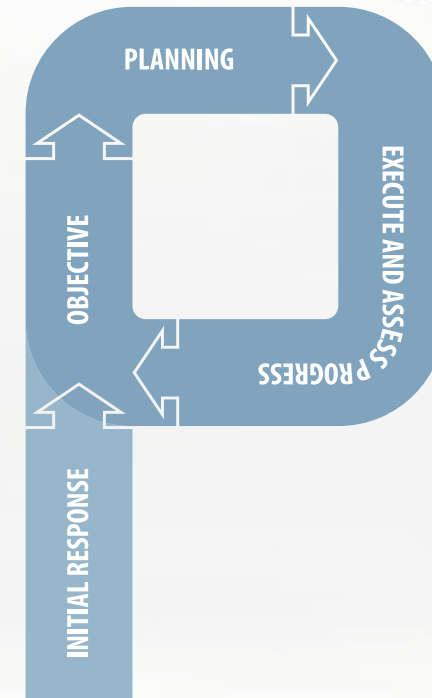
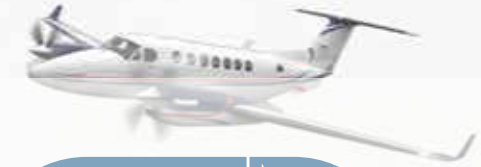
Place the vessel in a position to minimize monitoring dead zones, while covering the Area where the oil would appear in accordance with current and wind conditions.

Ref Vessel monitoring and report manual, chapter 3.



Aptomar provides consultancy and support for defining all Work Processes associated with Tactical Oil Spill Management. Aptomar's in house oil spill experts can provide valuable insight to the operation of sensor equipment in real world oil spill events. Aptomar can also provide guidance on the correct use of sensor equipment to comply with regulatory requirements, as well as advise the best practice use of equipment to provide a swift and meaningful Common Operating Picture.

- Supply of ready-made work processes for Field Monitoring and Oil Spill Detection and Response.
- Consultancy to work with organisations to integrate TOSM work processes with existing processes.
- Work Processes for vessel crew.
- Work Processes for aircraft crew.
- Work Processes for Operations or Emergency Response Room Staff.



## TRAIN HARD, FIGHT EASY

With the correct sensors deployed, data networks established and work processes defined, it is necessary to train all personnel involved to use the Equipment in accordance with the Work Processes. Once trained, personnel should take part in regular exercises to maintain the level of preparedness in the event of an unintended oil spill. Training and Exercises are the third component of Tactical Oil Spill Management.

Training is important to ensure that equipment is used properly, and that communication plans and reporting regimes are adhered to for the formation of the Common Operating Picture.

Aptomar provides training for vessel crew and operations and emergency room staff. Training can take place at customer locations, or at Aptomar's dedicated training facilities in Norway, Brazil and the US.

Training focuses on the operation of SECurus System and TCMS Workstations. Aptomar also provides tailored training in the Work Practices to be employed by the operator.

In addition to training on the use of equipment functionality, Aptomar training also includes correct use of the systems during an oil spill.

- Detecting and documenting unintended spills
- Quantification and measurement of spills
- Choosing and effectuating combat strategy
- Documenting all stages of the clean-up operation
- Tactical collaboration between sea, land and air, creating the COP





## EXERCISES

Exercises are used to verify the effectiveness of the selected Work Processes and Training. Exercises are also used to allow personnel to gain experience in using equipment and working to the Work Processes. Aptomar arranges and operates oil spill exercises for, and in conjunction with, customers. The exercises are conducted using built in functionality of TCMS and SECurus. This enables a familiarisation of using sensors and communication equipment in a simulated environment.

Aptomar can also supply in house oil spill expertise to assist customers in creating and conducting realistic oil spill exercise as possible

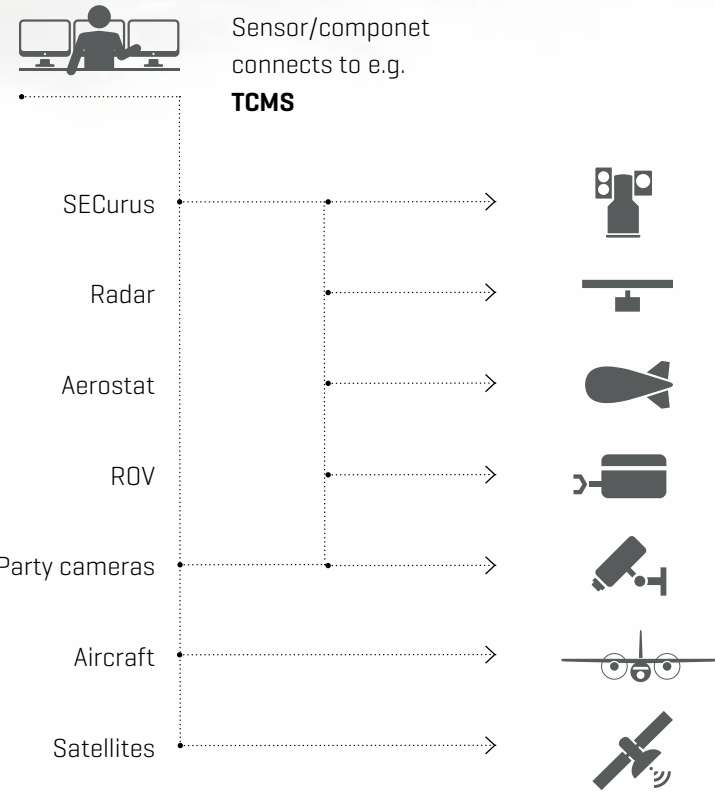
- Simulation scenarios using built in SECurus and TCMS functionality
- Realistic exercises
- Exercises include emergency response team, vessel crew and on shore staff.



Aptomar's sensors and networking technology create one the most comprehensive and accessible maritime domain awareness systems available. SECurus and TCMS are designed around work processes to create the ultimate tools for oil spill detection and spill response management. They are also widely deployed to provide situational awareness and decision support tools for Search & Rescue, Emergency Towing and Fire Fighting. In addition they are ideal for Maritime Surveillance missions such as Fishing Area Enforcement, Boarder Patrol, Smuggling Interdiction and Anti Piracy.

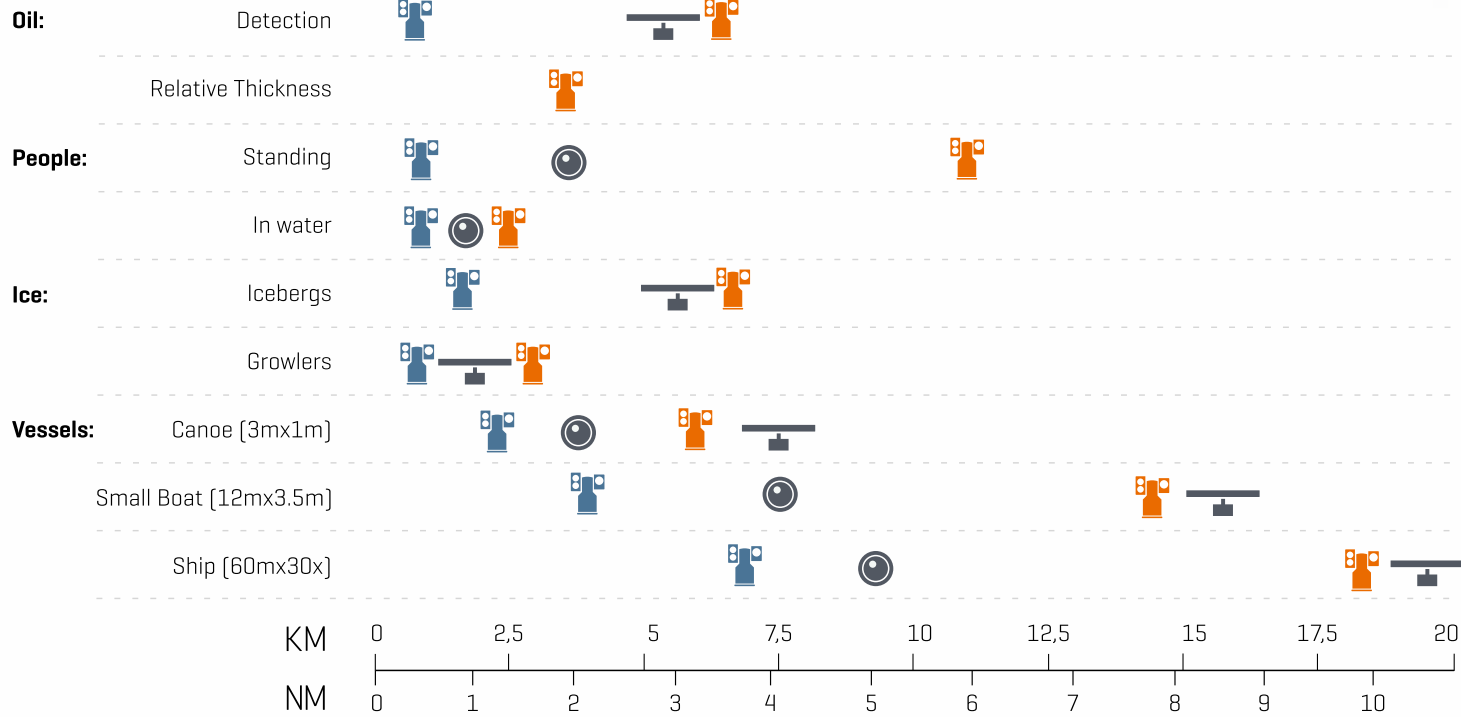
Tactical Oil Spill Management is a documented and robust approach to reduce the consequence of unintended oil spills. Tactical Oil Spill Management is made up of three components; Equipment, Work Processes and Training & Exercises.

This brochure is about Tactical Oil Spill Management. Please see [www.aptomar.com](http://www.aptomar.com) to find out about other components in the network, and to contact Aptomar for more information.







# RANGE CHART

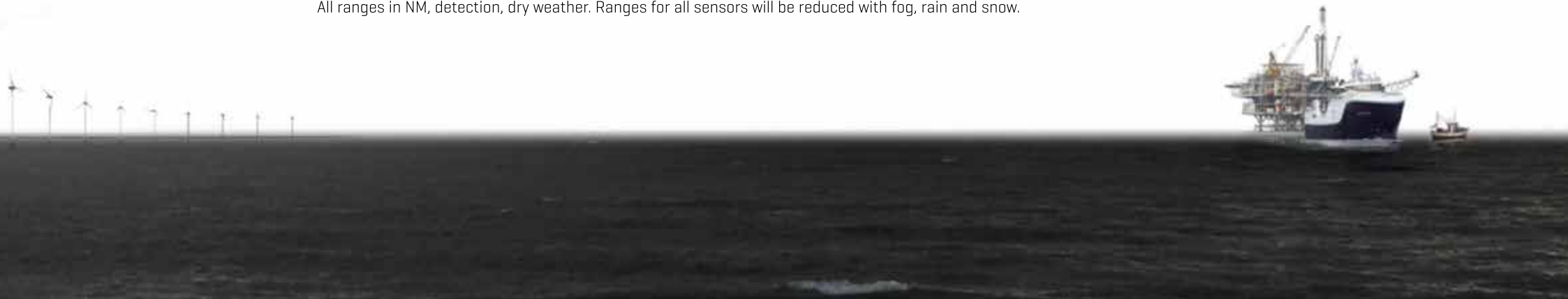
## SUBJECT



## KEY

-  HD Daylight Camera
-  Passive IR
-  Active IR
-  Radar

All ranges in NM, detection, dry weather. Ranges for all sensors will be reduced with fog, rain and snow.



**TOSM**  
**APTOMAR.COM**

**MAIN OFFICE NORWAY**

Stiklestadveien 3  
N-7041 Trondheim, Norway  
Tel: +47 40 00 34 03  
E-mail: [sales@aptomar.com](mailto:sales@aptomar.com)

**USA OFFICE / HOUSTON**

E-mail: [usa@aptomar.com](mailto:usa@aptomar.com)

**APTOMAR DO BRASIL**

E-mail: [brasil@aptomar.com](mailto:brasil@aptomar.com)



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