

## Proactive protection of cables - and timely responses to potential threats



Subsea transmission cables are increasingly becoming critical infrastructure. Subsea telecommunication cables constitute a backbone of the global communications network, and subsea power transmission cables play a key role in current and planned transnational infrastructures which gradually will integrate EU power markets and supplies.

Despite regulation of traffic and activities in protection zones around cable infrastructures and clear markings on navigational charts, damages caused by vessels occur – e.g. inflicted by bottom trawling or anchors which pose substantial threats to the integrity and expected or residual life time of the cables. The economical and societal consequences can be significant.

ghMaritime Offshore Cables constitutes a proactive and automated solution which effectively reduces the risk of damages to the offshore transmission cable infrastructures. It increases awareness in and around the offshore cable surveillance zones, and it provides the intelligence required to optimize preventive measures at sea level and focus inspection and maintenance efforts at the sea bed.

### Benefits

#### Minimize the risk of damage to cables

Event detection algorithms developed by GateHouse Maritime enable zone-specific detection of sea level events with probability of interference on the structural integrity of the subsea power and telecommunication cable infrastructures. Vessels approaching and entering the protection zones are automatically notified and warned, by message on display or by SMS/email, in case they show evidence of

contingency or potentially violating behaviour. These timely warnings are a valuable tool for prevention of damages.

#### Identify and document perpetrators

All activity in the defined surveillance zones is logged which provides the best possible evidence for correlating the occurrence of damages with identifiable vessels.

#### Preventive inspection, maintenance and security

Advanced statistical analysis of traffic patterns in and around the cables enable continuous risk assessment and better marking of the cables. Traffic pattern analysis, traffic density plots, event type frequencies and locations provide

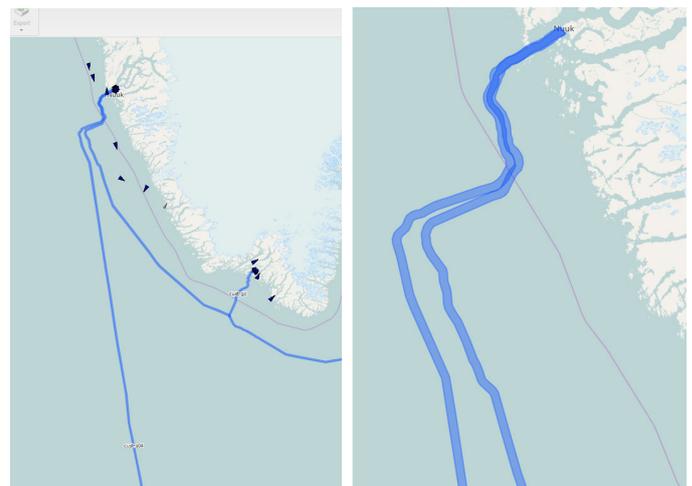


Figure 1. The blue lines signifies the surveillance areas around each cable. Surveillance zones can be user defined, e.g. to trigger automatic alarms when a vessel shows abnormal behaviour.

direct decision support for preventive measures at sea level, such as virtual AtoNs and – at seabed level – optimizing marking in areas where traffic is particularly dense and/or the sections of the cable(s), where abnormal events have been detected.

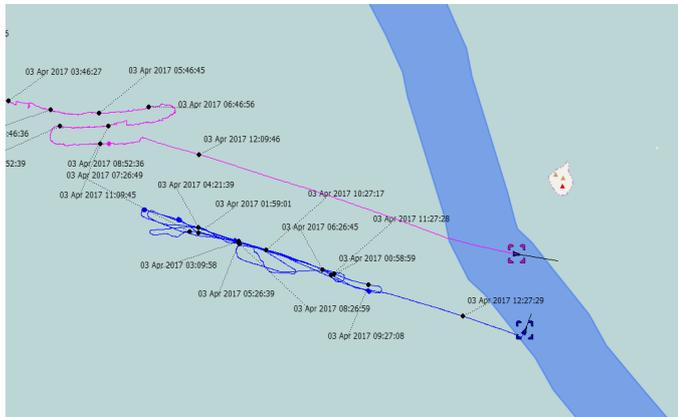


Figure 2. Display of a subset of registered AIS messages: position, time stamp, speed over ground for a vessel operating in and around a surveillance zone.

### Low operational costs

A high degree of system automation reduces the need for manual operator intervention to an absolute minimum, thereby ensuring low operational costs.

## Features

### WatchDogs

The GateHouse Maritime developed event detection algorithms enable zone-specific, rule-based detection of sea level events with particular probability of interference and effect on the structural integrity of subsea power and telecommunication cable infrastructures. Surveillance zones are defined using cable way-points and width of the individual zone, each with event triggers. The event triggers, also called WatchDogs, accurately detect abnormal events and derivatives in the configured surveillance zone. Obvious events are anchoring, fishing, drifting/ vessel in distress, and passage time. It is highly configurable and flexible, and can be set up to fit the precise surveillance requirements in any section of the cable structure.

### Ship information

When the user clicks on a target (e.g. an AIS equipped ship, base station, virtual area, etc.) on the map, information about the target is displayed in the information window. All ship information can be displayed as labels on the map,

attached to each ship. Historical tracks and projected heading can also be displayed for selected ships.

### Automated and real-time surveillance

If regulations are violated, operators and watchstanding officers at the violating vessel are automatically notified in real-time. Intelligent filtering minimizes false positive alarms, e.g. alarms caused by vessels with legitimate presence in the surveillance zone. Manual operator intervention is only required if a vessel continues to show abnormal behavior or the probability of violation is high.

### Statistics and reports

Based on logged tracks and events, the system automatically and on schedule, e.g. on a weekly or a monthly basis, generates advanced statistical reports. Changes in traffic patterns, traffic density plots, event type frequencies and locations in the surveillance zone(s) etc. are reported and visualized for optimal usability of the data.

## Technical description

The ghMaritime Offshore Cables solution is based on our widely used and field proven AIS software - implemented by coast guards and maritime administrations worldwide. The solution includes a web-based display for operators and an event notification server hosted by GateHouse Maritime.

### Technology independence

The key enabling technology is, as mentioned, AIS (Automatic Identification System), i.e. the availability of AIS data from vessels deriving from the operators own receivers and/or streamed from national maritime authorities. The system is, however, in no way limited or restricted to AIS, but can be extended to comprise radar detection of smaller vessels without AIS, CCTV identification of radar targets, VHF, and sensors. The solution is inherently technology independent and designed to embrace current and future technological opportunities and needs.

### Training

We provide an online two-day training session where operators and administrators receive hands-on training in operating the solution for optimal utilization. The training session is included in the price of the solution.

### Support & Maintenance

GateHouse Maritime offers 24/7 support and maintenance, which can be purchased in addition to the solution.

### Request for price or more information

Please, contact us at [maritime@gatehouse.dk](mailto:maritime@gatehouse.dk) for further information.