

# **The Threat of Damage to Submarine Cables by the Anchors of Ships Underway**

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## **Introduction**

Faults to submarine cables have been closely monitored by the International Cable Protection Committee (ICPC) <sup>(1)</sup> since it's formation in 1958. The submarine cable industry had generally believed the main cause of faults to be fishing. However the increasing use of the new Automatic Identification System (AIS) technology has changed this view and revealed the extent of threat of damage from anchors.

Preventing cable faults and reducing risks is integral to the core purpose of the ICPC. It is also an important business consideration for its members. It is estimated that on average there are about 150 cable faults per year to international cable systems with an average repair cost of between US\$1 million to US\$3 million plus per fault. This is in addition to the disruption these faults can cause to international communications continuity.

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1. ICPC – International Cable Protection Committee - the premier international submarine cable authority providing leadership and guidance on issues related to submarine cable planning, installation, operation, maintenance protection and retirement.

## **Background**

BT <sup>(2)</sup> commenced use of the Automatic Identification System (AIS) <sup>(3)</sup> in 2006 to monitor ship movements in the UK in the vicinity of submarine cables. The AIS data combined with a vessel management software package has provided the ability to accurately identify ships that present a threat to submarine cables. An example of AIS representation of ships and association with submarine cables is provided at Appendix 1. However the use of AIS has also proved invaluable in accurately determining the cause of some submarine cable faults. There have been 53 faults around the UK since 2007 of which 19 were caused by anchor and as can be seen below has significantly changed the causal distribution.

<b>Cause</b>	<b>Pre 2007</b>	<b>2007 - 2010</b>
Fishing	67%	39%
Anchors	8%	36%
Dredging	2%	0%
Other	23%	25%

The submarine cable industry has always been aware of the threat of ships anchoring near to submarine cables and dragging their anchor across the cable due to bad weather and AIS is being increasingly used to provide pro-active protection against this threat. However the use of AIS has revealed a more critical threat which is from ships that are underway and unaware that their anchor is deployed. There have been 13 cases of anchor damage due to ships dragging anchor whilst underway just around the UK since 2007.

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2. BT – British Telecom PLC – is one of the leading communication services companies, serving the needs of customers in the UK and in more than 170 countries.

3. AIS is an automated tracking system used on ships and by Vessel Traffic Services (VTS) for identifying and locating vessels by electronically exchanging data with other nearby ships and VTS stations. Information provided by AIS equipment includes unique identification, position, course, and speed. AIS is intended to assist a vessel's watch keeping officers and allow maritime authorities to track and monitor vessel movements.

This type of event is more critical than a ship dragging at anchor because it can result in the failure of multiple cables within a short period of time where cables land are in close proximity. The most significant event occurred off Sicily in 2008 when a ship dragged its anchor for 300km and damaged 6 cables in water depths down to 180m. The ship on this occasion was a large oil tanker of 244m length with a gross tonnage of 58,000 tons.

A selection of the ships that have damaged submarine cables around the UK is provided at Appendix 2 and summary of their attributes is also provided at Appendix 3. The majority of these ships were relatively small, primarily engaged in coastal trade, had a very low freeboard when laden and the stowed anchors were at or close to the water-line. However large ocean going vessels can also cause multiple cable faults <sup>(4)</sup>.

### **Anchor Securing Equipment**

All ships are provided with mechanisms to secure anchors to technical standards defined by Classification Societies. These Societies are non-governmental organisations that establish and maintain technical standards for the construction and operation of ships and offshore structures. They also certify that construction of a new vessel meets these standards and carry out regular surveys in service to ensure continued compliance.

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4. The Chilean flag container ship Aconcagua cut three of the then 4 cables linking the United States to Europe in 2002 while sailing from Philadelphia to New York City. The Captain erroneously attributed the reduction in the ship's speed during a gale to the wind when in fact it was the ship's anchor dragging. Investigation revealed that the anchor windlass had only been secured with the brake and the chain stopper had not been used.

Typical anchor securing equipment for all ships can be seen in the photographs below.



Picture 1 showing Riding Pawl  
Courtesy TE Subcom



Picture 2 showing Securing Wires  
Courtesy TE Subcom

However the use of this equipment is subject to the discretion of each Master and Officers on the ship. From the securing arrangements identified above and other mechanical chain stopper devices it would seem inconceivable that the anchor would be able to run out at sea, regardless of the weather incurred by the ship during a passage, if applied prior to commencing passage. However this has happened on many occasions and either the securing devices are failing or were not fully implemented prior to passage.

The ICPC has pro-actively highlighted the increasing trend of damage to submarine cables by ships' anchors to vessels' Protection & Indemnity Clubs (P&I Clubs) <sup>(5)</sup>. This was accomplished by the production and distribution of a loss prevention, safety and awareness document <sup>(6)</sup> which also advises on what can be done to prevent anchors from being deployed whilst underway.

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5. Protection and indemnity insurance, commonly known as P&I, is a form of marine insurance provided by a P&I Club. A P&I Club is a mutual (i.e. co-operative) insurance association that provides cover for its members, who will typically be ship-owners, ship-operators or demise charterers. P&I Clubs provide liability cover (protection and indemnity) for approximately 90% of the world's ocean-going tonnage.

6. Loss Prevention, Safety & Awareness document – ICPC produced document promulgating the issue of anchor damage to submarine cables. See Appendix 4.

P&I Clubs can be an effective way to communicate with vessel owners who are likely to pay attention to warnings and recommendations from their insurers. But with many clubs and constant turnover of club members, coverage reliability is limited.

### **Proposed Solution**

The incidence of ships travelling underway with anchor deployed and consequential damage to submarine cables needs to be brought to the attention of the International Maritime Organisation <sup>(7)</sup> (IMO).

It is recommended that the IMO be invited to consider:

a) whether the securing of anchors prior to passage should be of a minimum standard methodology and a mandatory requirement

b) the introduction of interlock on anchors when secured for sea passage with an alarm on bridge

c) securing of the anchor for sea with the interlock or a reason why the interlock is not used should be a required entry in the vessel log book and subject to Port State inspection

d) greater promulgation of the problem via ‘M’ notices (Marine Coastguard Agency) and appropriate notices worldwide

e) wider port inspections by the state following future submarine cable failures due to anchors

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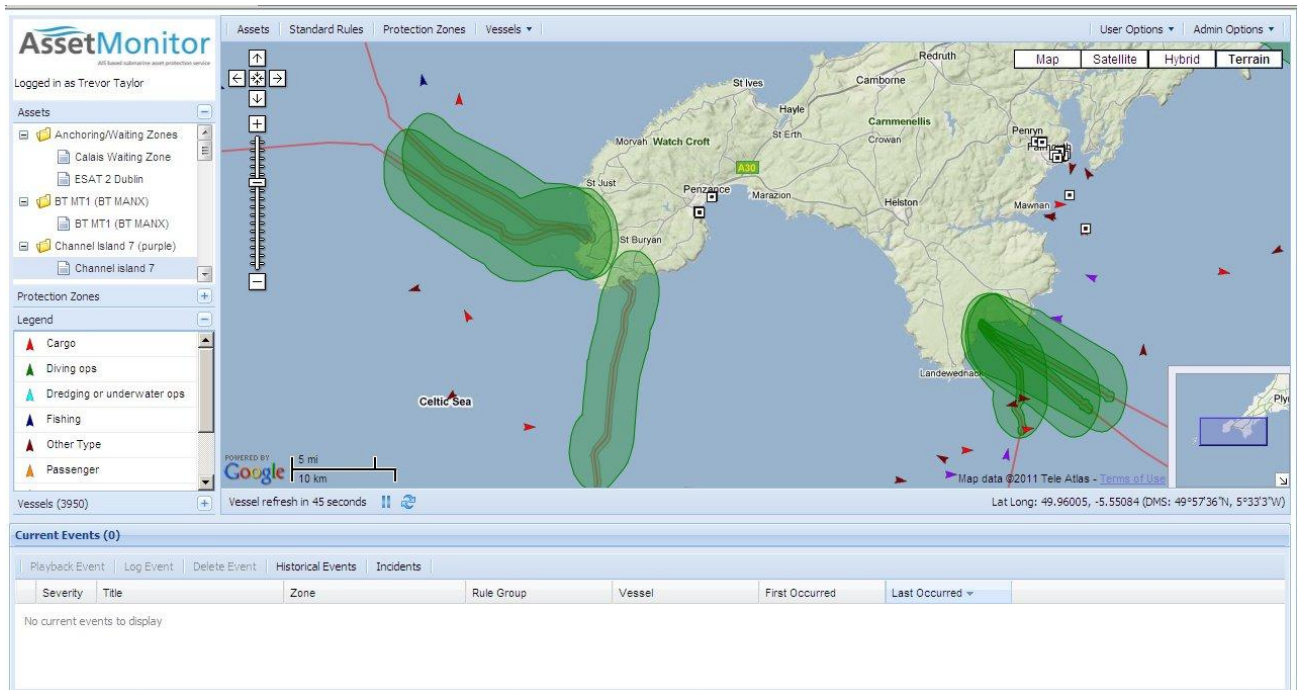
For questions on this white paper, please feel free to contact Mick Green at BT Subsea (mick.p.green@bt.com)

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7. IMO – International Maritime Organisation - is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships

# Appendix 1

AIS representation of ships and correlation with position of submarine cables.



## Appendix 2

Ships that have damaged submarine cables with their anchor deployed whilst underway



**Ship 1**



**Ship 2**



**Ship 3**



**Ship 4**



**Ship 5**



**Ship 6**



**Ship 7**



**Ship 8**

### Appendix 3

#### Summary of Ship Attributes

Ship	Location	Date	Type	Length (m)	Breadth (m)
1	English Channel	March 06	Tanker	88	12
2	English Channel	March 07	Cargo	135	16
3	North Sea	March 07	Tanker	93	14
4	English Channel	Nov 07	Cargo	98	17
5	English Channel	Jan 08	Cargo	90	14
6	Irish Sea	March 08	Cargo	116	16
7	North Sea	Sept 08	Dredger	117	16
8	Mediterranean	Dec 08	Tanker	244	42



## **Appendix 4**

Loss Prevention Bulletin issued to Protection & Indemnity Clubs by ICPC



Loss Prevention  
Bulletin - 18 March 20