Technology bulletin

September 2018

The Standard
for service and security

Standard Club

Introduction

This bulletin explores the impact of technological advancements upon both the shipping and insurance industries.

Callum O'Brien
Deputy Underwriter
T +44 20 7522 7578
E callum.obrien@ctplc.com

The pace of technological change in the shipping industry has accelerated exponentially in the last two years. In order to monitor these changes and consider the implications for its membership, The Standard Club has established a Technology Working Group. This is made up of representatives from across the company, including claims handlers, underwriters, loss prevention experts and IT directors from our London, Athens and Singapore offices for a diverse range of inputs. This technology bulletin highlights some of our main areas of research to date and provides some forward-thinking insight into how our industries may change in the future.

Technological developments for shipping

Autonomous ships inspired the first area of research for the Technology Working Group, as it is arguably one of the most divisive topics on the future of shipping. In our second article, we have given our view of when and why these ships may become a reality. Further, we look at the main barrier to autonomous technology – regulation. Traditionally, shipping regulation has been slow to react to change, will this be the case for autonomous vessels?

Drone technology has developed vastly over the last few years and we are seeing increased use by shipowners, surveyors and classification societies for various applications. Ben Burkard and Julian Hines explore these applications and comment on cover implications.

Five years ago, 3D printing was considered by many to be the next technological breakthrough for the mass market in home and personal use; however, many have since realised that there are far greater applications for industry. Graeme Temple explains the current ability of the technology and its potential uses for the shipping industry.

i

The Technology Working Group will continue to monitor industry developments and share insights. If you wish to get in touch, please contact us at:

TechnologyWorkingGroup@ctplc.com

In this edition

Transformations for the insurance market

First, Robin Patterson gives his insights into how increased data from technology may be used to enhance an underwriting model.

Following increased media attention on the topic, Nicholas Mavrias briefly discusses blockchain and its applications for marine insurance.

We then have a contribution from Tom Maleczek from Charles Taylor InsureTech, exploring how technology may change the very traditional insurance market of Lloyd's.

Our final article provides a recap on club cover for cyber risks. Cyber risks are becoming an increasingly prevalent topic across all industries, but the shipping industry has been identified as particularly vulnerable and, as such, shipowners should consider their exposures.

Autonomous ships

Autonomous ships are a much-discussed topic in the industry, but how realistic is this technology and how soon should we expect it?

Callum O'Brien
Deputy Underwriter
T +44 20 7522 7578
E callum.obrien@ctplc.com

Defining autonomy

The term 'autonomous ship' is mainly used to depict a self-sailing crewless vessel, but there are actually various degrees of autonomy. It is first important to distinguish between these levels of autonomy before commenting on when and why these vessels could start to become a reality.

Lloyd's Register has defined seven levels of autonomy (from AL 0 to AL 6 see box on page 3), which we have grouped as follows for simplicity:

- Manned ship – traditional crewed vessel with a human operator making decisions
- Remote ship – controlled by a human operator ashore
- Automated ship – running pre-programmed software and can only operate within the scope of the algorithm
- Fully autonomous ship – operating system can calculate consequences and risks, and make decisions by itself.

We are likely to see a steady transition from manned (AL 0), through the intermediate stages, to fully autonomous (AL 6) ships happening whilst the technology is tested and algorithms are improved through machine learning.

What types of ship will become autonomous first?

In our opinion the most likely initial applications for an autonomous ship will be in simple inland or coastal liner trades – mainly bulk carrier, passenger or roro ships. A good example would be a roro ferry operating across a Norwegian fjord. The waters are relatively calm and traffic-free, and the route is simple.

When will autonomous ships become a reality?

To use the most publicised example, the *Yara Birkeland* (an inland electric container ship) is expected start trading remotely in 2020 and fully autonomously by 2022, with the shipbuilding contract just recently signed. So, we are likely to see the technology in action within the next few years. However, the timeframe will vary hugely depending on the type of trade, trading pattern and, crucially, the level of autonomy being referred to.

What are the advantages?

The advantages of autonomous ships are plentiful. They eliminate human error, reduce crewing costs, increase the safety of life, and allow for more efficient use of space in ship design and efficient use of fuel. A three-year research project by MUNIN (Maritime Unmanned Navigation through Intelligence in Networks) predicted a saving of over $7m over a 25-year period per autonomous vessel in fuel consumption and crew supplies and salaries.

What are the disadvantages?

Despite the operational savings, there will be a large capital expenditure in initially investing in the technology, especially in the early stages of its development. This is not just for the ship itself, but also the setting-up of onshore operations to monitor fleet movements. There may also be incompatibilities between the current marine infrastructure and an unmanned vessel.

Further, the lack of crew will make maintenance of moving parts incredibly difficult on long voyages and breakdowns could result in significant delays.

Conclusion

In our opinion, there is no viable economic benefit for a completely autonomous (AL6) ocean-going ship in the immediate future. Despite a belief in the technology, there will always be value in a human presence on board overseeing operations, the safety of the ship and the safety of the cargo. There will definitely be an application with small inland and coastal craft, but in a 20,000 TEU trans-Atlantic container ship we are only likely to see the lower levels of autonomy to aid the crew in navigation.

What are the regulatory barriers to autonomous ships?

Autonomous ships are becoming a reality.
How will the regulatory and legal systems adapt?

Heather Maxwell
Senior Claims Executive
T +44 20 7680 5655
E heather.maxwell@ctplc.com

Whilst the high investment in onshore and offshore infrastructure is undoubtedly a hurdle to autonomous technology being broadly adopted in the shipping industry, perhaps a more daunting obstacle is the unreadiness of the regulatory and legal systems which keep the shipping industry in check. The predicted degrees of ship automation and the timeframes to implementation can vary dramatically, but the simple fact is that the current legal framework lacks the basic language required to account for autonomous ships in any capacity.

COLREGS

The COLREGS, for example, outline the 'rules of the road', providing navigation instructions for ships to follow to prevent collisions at sea. But they specifically only apply when 'one ship can be observed visually from the other'. Rule 5 (Look-out) insists above all on perception and judgement to assess the 'special circumstances' and to make a full appraisal of the risk of collision. Whilst it is feasible that a ship remotely operated or monitored from ashore could satisfy these conditions, it is difficult to see how a fully autonomous ship ever could. Not least because the UN Convention on the Law of the Sea 1982 requires (under Article 94) that each ship must have a master who is 'in charge' at all times.

SOLAS

From a human perspective, we must consider SOLAS. SOLAS sets minimum standards of safety at sea and includes an obligation for masters to assist a ship or person in distress. Regulation V/33 explicitly requires masters to deviate to save life. In some cases, autonomous ships may be better at responding to distress signals, but sometimes there can be no substitute for visual identification.

Other conventions

Theoretically, there needs to be a complete overhaul of the current framework by which the shipping industry operates, which will include the rewording of civil liability conventions (ie Salvage, Nairobi Wreck Removal, CLCs for oil pollution), the UNCLOS 1982 and all domestic shipping legislation (eg the Merchant Shipping Act in the UK).

P&I cover

There is work to be done from a P&I perspective too. Is an autonomous ship poolable? Should a remotely operated ship, controlled from on shore, be considered equivalent to an ROV operated from aboard a traditional ship and therefore excluded from pooling? Our view is that autonomous ships would not fall outside the definition of 'eligible vessels' for pooling purposes, nor would they be distinguishable from conventional manned ships for the purposes of the risks and liabilities excluded from cover.

Conclusion

There is no doubt that such amendments will take a considerable amount of time and effort, and with the *Yara Birkeland* on the brink of full autonomy, we must start soon. According to the UN, the Law of the Sea Convention 1982 was implemented as an update to the centuries old freedom-of-the-seas doctrine in order to account for 'the technological changes that had altered man's relationship to the oceans'. Now is the time to re-evaluate our relationship once again.

	Autonomy Level (AL)	Description
AL 0	Manual	No autonomous function. All action and decision-making performed manually (n.b. systems may have level of autonomy, with human in/on the loop.), i.e. human controls all actions.
AL 1	On-board decision support	All actions taken by human operator, but decision support tool can present option or otherwise influence the actions chosen. Data is provided by systems on board.
AL 2	On & off board decision support	All actions taken by human operator, but decision support tool can present options or otherwise influence the actions chosen. Data may be provided by systems on or off-board.
AL 3	Active human in the loop	Decisions and actions are performed with human supervision. Data may be provided by systems on or off-board.
AL 4	Human on the loop, operator/supervisory	Decisions and actions are performed autonomously with human supervision. High impact decisions are implemented in a way to give human operators the opportunity to intercede and over-ride.
AL 5	Fully autonomous	Rarely supervised operation where decisions are entirely made and actioned by the system.
AL 6	Fully autonomous	Unsupervised operation where decisions are entirely made and actioned by the system during the mission.

Lloyd's Register seven levels of autonomy

The use of drones in shipping and cover implications

Drone technology has traditionally been associated with the military but has more recently become popular for personal and commercial uses, with high-definition video cameras installed. As these become more common in shipping, we consider the risks and rewards of using drones.

Ben Burkard
Underwriting Director
T +44 20 3320 2301
E ben.burkard@ctplc.com

Julian Hines
Loss Prevention Manager
T +44 20 3320 8812
E julian.hines@ctplc.com

A drone is defined as any unmanned aircraft. It is more formally referred to as an unmanned aerial vehicle (UAV).

What are the potential uses in shipping?

Deliveries

Companies are currently experimenting with drone delivery services for ships at anchorage, for items such as spare parts, mail, stores, documentation and medical equipment. Drones launched from onshore are capable of delivering to ships up to two miles away and it is estimated that the use of drones could reduce the cost of these services by a factor of ten.

Surveys

Currently, the biggest single use of drones in shipping is for inspection purposes and some class societies are already using drones as part of their survey programme. This allows for a much more comprehensive survey given the ease with which drones can access hard-to-reach areas as well as reduce risks. Examples include:

- inspection of flare stack, tops of cranes and confined spaces. If repair work is necessary, the drone's findings can be used in writing job specifications and access requirements
- remote inspection of the hull exterior or interior of tanks and other areas where surveyors cannot get to during typical on/off-hire condition surveys or routine inspections
- inspection during repair, conversion and newbuilding of ships or prior to handover

- damage surveys (aerial/tank) after an incident
- inspection prior to reactivation of ships
- inspections of moorings and anchorages
- inspection of tow arrangement from tow lines through to the unmanned towed object
- aerial videography for ship launch, delivery, mobilisation, demobilisation, loading of project cargo
- port authorities testing ships' emissions as they enter port
- search and rescue.

Legal and regulatory issues

It is likely that Flag states will continue to drive the legal side. In the UK, for example, if a drone is to be operated for commercial purposes, it must follow UK CAA guidelines. Under these guidelines, drone operators must first be approved and have appropriate insurance in place prior to submitting an application. The USA and countries in Europe and South-East Asia follow similar regulations. It is probable that most countries and classification societies will require drone pilots to have completed some form of BVLOS certification (Beyond Visual Line of Sight) for the flying of drones outside the line of sight.

Currently, the only industry standard is for operations in the UK offshore sector: Unmanned Aircraft Systems (UAS) Operations Management Standards and Guidelines – Issue 1 2017.

Loss prevention advice

A prudent owner considering the operation of drones onboard their vessel should:

- gain clarification of regulatory approval (Class) to use the drone
- ensure pilots have BVLOS certification and type-approved training for the use of drones
- where necessary, have a valid Activity Permit from the relevant civil aviation authority for every flight
- complete a detailed risk assessment for the use of the drone
- have appropriate operating procedures in place, including a permit to work.

Are liabilities arising from drones operated onboard ships covered by P&I?

Whether the use of drones is, or should be, excluded by the pool has been considered by the International Group, and whilst it is acknowledged that it is an area that should be subject to ongoing debate, the position currently remains that liabilities arising from the operation of a drone is not included within the list of excluded losses set out in the Pooling Agreement.

However, in order to meet the requirements for pooling, the other provisions in the rules and the pooling agreement must be complied with. These will include the fact that the use of drones must be able to be considered to be part of the management and operation of the entered ship, and any contractual arrangements must meet the requirements of the general contracting principles set out in the pooling agreement. In relation to services being provided by the ship, we would require either a knock for knock allocation or that the member does not assume responsibility for liabilities that they would not otherwise have had at law. Any services to the entered ship should be considered under the principles of best endeavours.

In the case of uncertainty of whether these principles have been met or if an extension is required, please get in touch with your usual club contact.

3D printing & the marine industry

This article considers how 3D printing could be used both onshore and aboard to reduce delays relating to machinery breakdown

Graeme N Temple
Braemar, Managing Director – Asia
T +65 6517 6860
E singapore@braemar.com

What is 3D printing?

There are currently seven different additive manufacturing techniques referred to as 3D printing.

Material jetting is the most well-known manufacturing technique, where layers of plastic wire are melted on top of each other forming a 3D structure.

Powder-bed extrusion is the most interesting 3D printing technique for the marine industry, as this method can produce accurate and complex metal structures for spare parts.

What are the benefits?

Warehousing and shipping costs of spare parts for ships can be reduced by producing items on demand at any location. The parts can also be produced without the heavy scantlings previously created in the casting process and with efficient lightweight designs.

In a shipboard machinery breakdown scenario, delays can be reduced as replacement parts can be produced at the next port instead of being sent from the original equipment maker's central warehouse. Small basic parts such as valves, pipe fittings or impellers could even potentially be made on board in the event of a failure.

Where are we now?

Engineers at Europe's largest port – Rotterdam – are already exploring the use of additive manufacturing processes to quickly carry out repairs to damaged ships. The port has opened the Rotterdam Additive Manufacturing Lab (RAMLAB), an on-site facility that includes a pair of six-axis robotic arms, which is capable of additively manufacturing large metal industrial parts.

This enables RAMLAB to pursue faster fabrication options – 3D printing large ship components in metal and then finishing the pieces using traditional CNC milling and grinding methods within days. Recently, a tug propeller was made and successfully tested.

Additionally, this year, a Dutch crane manufacturer is reported to have printed a 3D offshore crane hook, which successfully passed its load test and all associated control checks.

On-board production

Whilst the implementation of additive manufacturing on shore has a seemingly successful future, it is less likely that ship-borne 3D manufacturing will be as popular, especially for large components. A lot of components still require finishing by machine, thread-cutting or polishing, which are specialist skills.

Further, mechanical components used on board are made from a wide variety of different alloys. To effectively implement shipborne 3D manufacturing, a similar range of materials would need to be kept on board, raising issues of degradation and space for storage in the correct controlled conditions.

Manufacturers and Class would still inevitably need to verify the quality of components, even if they are produced using OEM-approved programs and machines, as there is a risk that parts could be produced negligently.

The future

Despite these issues with on-board production, shoreside manufacturing is likely to be a reality soon, starting with Class-approved local workshops in strategic places to introduce this technology.

There are currently seven different additive manufacturing techniques referred to as 3D printing.

1. Material jetting
2. Powder-bed extrusion
3. Material extrusion
4. Binder jetting
5. Directed energy deposition
6. Vat photo-polymerisation
7. Sheet lamination.

Big data: how may increased data from technology be used to improve the underwriting model

As the pace of generating, collecting, harvesting and distributing data accelerates across the maritime sector, opportunities may present themselves for insurers to build a better risk picture and to refine their underwriting models and internal processes.

Robin Patterson
Performance Analytics Manager
T +44 20 7522 7532
E robin.patterson@ctplc.com

Vessel location

Vessel location information, made available via Automatic Identification System (AIS) broadcasts from ships and received by terrestrial and satellite receivers, has been now been collected for a number of years. This data offers the potential for new ways to analyse exposure: where ships are trading, what routes they take, how far and fast they travel – in essence, detailed behavioural insights that until now have been hidden from view. These geospatial analyses could translate to tailored pricing of insurance products as well as alerts and notifications to ships in proximity to geophysical and human events, with a view to providing live risk management guidance.

Perhaps more importantly, electronic records of trading behaviour could help pave the way towards connected insurance policies that automatically adjust premiums and generate documentation according to variable inputs. Marine war risk policies may seem the most obvious beneficiaries of live location data – with premiums and endorsements for calls to high-risk areas being automatically generated and distributed to assureds and their brokers. These sorts of advances potentially translate to efficiency savings for insurance carriers, assureds and their brokers, provided workable systems can be established and all parties benefit, whether financially or otherwise.

Telematics

A recent development that could yield further insight in the maritime sector, both to owners and insurers, relates to telematics – on-board systems monitoring and broadcasting numerous aspects of a vessel's operation. Benefits to ship operators may include more effective maintenance spending, better operational reliability and improved fuel efficiency. From an insurer's perspective, aggregated and anonymised telematics data could help provide insight to improve the process of the setting of terms, pricing and risk selection, as well as support connected policies and drive operational efficiencies. The motor insurance industry has seen numerous carriers offering telematics-linked insurance products – with the transparent picture of risk and assured behaviour that is obtained reportedly translating to lower premiums for assureds.

Office systems

More broadly, increased data could help improve insurer operational efficiency by reducing the manual effort involved in data entry and producing or amending policy documentation. Provided appropriate connections can be established, data could seamlessly be integrated between sources, systems and decision-making.

Vast data

A constraint to the ease with which increased data can be harnessed is how to store and interrogate such large volumes of data. It is also important that the right data is collected. A single ship might broadcast its location every minute of every day, generating half a million data points a year. When multiplied out over the world fleet and across multiple years, it is clear that data of this scale could have the potential to overwhelm. Advances in analytical capability, principally driven by machine learning and Artificial Intelligence (AI) technologies, may pave the way to handle these vast quantities of data. The club maintains a watching brief on these new data sources and technologies with service to the membership in mind.

Blockchain: some potential implications for marine insurance

Blockchain presents tremendous potential for the shipping industry. This article looks to shed some light on this technology and illustrate some potential implications for the marine insurance industry.

Nicholas Mavrias
Senior Claims Executive
T +65 6506 2802
E nicholas.mavrias@ctplc.com

Moses Lin
Director, Incisive Law LLC
T +65 6305 9089
E moses.lin@incisivelaw.com

Blockchain explained

Blockchain is a ledger of transactions and data that is stored on multiple machines (nodes). Storage of data on multiple nodes means that the database is decentralised, which makes it virtually incorruptible, traceable and free from a single point of failure. Furthermore, transactions can only be processed after verification by a majority of the network; making the alteration of a transaction impossible, minimising the risk of fraudulent activities.

Possible applications

Real-world use of blockchain as a platform for self-executing 'smart contract' computer codes within marine insurance includes:

- **Automation of the claims payment process:** Automatic payouts triggered when loss/damage to cargo is detected.
- **Claims-handling:** Contracting parties have access to all documentation such as bills of lading, charterparties and reports. This reduces human errors in document review and increases efficiency in assessing claims.

- **Risk assessment:** Streamlines processes by connecting brokers, insurers and third parties in a common ledger that captures data about identities, risk and exposure, and integrates this information into insurance contracts.

What this means for the insurance industry is that transactions could be simplified and relieved of administrative burdens.

Bills of lading

While it may take time for blockchain technology to become mainstream due to reservations about its novelty and its lack of regulation, the first potential breakthrough area in this field may be via the use of electronic bills of lading in cargo transport. Currently, P&I cover extends to typical P&I liabilities arising under any approved system of electronic bills of lading to the extent that these liabilities would also have arisen under paper bills of lading.

Drawbacks

The use of blockchain may pose the following legal challenges:

- The legal framework of a number of jurisdictions may not yet be fully equipped to deal with blockchain transactions (eg anti-money laundering requirements and anti-corruption laws will have to be updated to accommodate anonymity in blockchain transactions).
- There may be difficulties in incorporating into a self-executing smart contract code, an apportionment of liability and contributory negligence for each party.
- Transactions under blockchain may be subject to any given node in the network; thus, it may be difficult to pinpoint which country has legal jurisdiction in the event of a dispute. To counteract this, an ancillary contract should be entered into and it should include, amongst others, governing law and jurisdiction clauses.

Conclusion

In conclusion, as to whether blockchain technology will one day gain wide-spread acceptance and replace traditional models of contracting completely will largely depend on whether the outstanding legal issues above are resolved. In the meantime, even if this technology is partially adopted, insurers are likely to continue concluding separate contracts with their assureds in order to accurately capture the parties' rights and obligations. Having said that, with every new innovation, further issues will inevitably surface after blockchain is widely adopted. In the meantime, legal practitioners and insurers will have to work together to identify and address as many of these issues as possible so as to maximise the benefits of the technology.

Technology and the future of Lloyd's

Over the last five years, there has been significant investment by the London Market Group, Lloyd's and organisations within the market to consider how to make it easier to do business with the London market and enable the London market to grow and adapt to changes in the global insurance market.

Tom Maleczek
Chief Technology Officer,
Charles Taylor Insuretech
T +44 20 7767 2725
E tom.maleczek@ctplc.com

Technology for the London market

Although not necessarily a pioneer of digital transformation, the commercial and specialty insurance industry is not immune from the need to find ways to optimise the cost of operation, reduce friction in transactions or offer increased value to its customers.

In 2014, the London Market Group (LMG) and the Boston Consulting Group (BCG) co-authored the *London Matters* paper highlighting the importance of the London market to global insurance but also emphasising the need for investment in transforming processes and infrastructure to make it easier to do business. Off the back of this paper, a market-sponsored initiative was introduced to analyse and transform the operating model for commercial and specialty insurance written in the London Market – this initiative is called the London Market Target Operating Model (LMTOM) programme.

LMTOM has already delivered several projects to improve the efficiency of placing business, audit and compliance. The most recent focuses on how delegated business is underwritten and managed throughout the insurance lifecycle. These projects incorporate the use of technology to ensure data quality, enhance data distribution across the market, automate manual processes, create and leverage digital insurance assets, and reduce transactional friction in doing business in the London market.

In addition to the LMTOM initiatives, there continues to be significant investment across the insurance industry in both personal lines and commercial & speciality insurance. These range from cost optimisation initiatives using Robotic Process Automation (RPA), which automate repetitive and prescriptive administrative tasks, through to using Artificial Intelligence (AI) and advanced analytics to enable risk prevention and minimise indemnity losses when an event occurs.

Other innovations in insurance

Two other technologies that are anticipated to be materially disruptive forces in the insurance industry are distribute ledger technology (often referred to as blockchain – see page 8) and the Internet of Things (IoT).

Examples of the potential that these technologies have to disrupt commercial and specialty insurance include:

- the ability for blockchain to remove the need for a central market administration for placement, claims and reserves – effectively the role of the Lloyd's Bureau digitally (and often automatically) across the market participants
- sensors and real-time monitoring of commercial assets (eg planes, oil rigs, ships, commercial property), allowing insurers and risk management service providers to identify events before or as they happen and avoid or minimise claims. This could force insurers, brokers and adjusters to consider new risk prevention services to supplement the traditional insurance products and services in order to preserve revenues and market share in a landscape where claims volumes reduce and, as a result, so do premiums.

Cyber risk

One final impact to consider, which will be relevant to all industries, is the increasing emergence of cyber risk. This ranges from business continuity risks through to ransomware and even espionage. The challenge for insurers will be to create products that can indemnify this risk to businesses, but crucially to advise the insured on how to protect against cyber threats and effectively respond to them when they occur.

Cyber risks and P&I insurance implications

Modern vessel navigation and propulsion have become increasingly dependent on computer software. A number of shipboard systems have been identified as being vulnerable to cyber-attack. In this article, we outline how standard P&I cover generally operates in respect of shipboard cyber risks.

Rupert Banks
Regional Claims Director
T +65 6506 2882
E rupert.banks@ctplc.com

Poolable cover

There is no express cyber exclusion in the club's rules. As such, a member's normal P&I cover will continue to respond to P&I liabilities arising out of a cyber attack so long as the cyber attack in question does not constitute 'terrorism' or another war risk excluded under rule 4.3 of the club's rules.

In the context of war risks, terrorism is broadly understood to denote acts aimed to kill, maim or destroy indiscriminately for a public cause. Accordingly, if a cyber attack were to be perpetrated by an individual or group for the purposes of merely causing general disruption and for no public cause, then this would be unlikely to constitute terrorism for the purposes of the rules, and a member's cover will respond in the normal manner. However, in the event of any dispute as to whether or not an act constitutes terrorism, the club's board is given the power under rule 4.3 to decide and such decision shall be final.

Relevant extensions

In the event that a particular cyber attack does constitute 'terrorism' or another excluded war risk, then the club's excess P&I War Risks clause may respond, but not to the extent that the cyber attack involves the use or operation of a computer virus as a means for inflicting harm.

Where a cyber attack does constitute an excluded war risk under the P&I rules and is also excluded under a member's primary and excess P&I war risks covers, the club's Bio-chemical Risks Inclusion clause provides a limited buy-back (for owned entries only) up to $30m in respect of liabilities to crew as well as sue & labour expenses where the liability is directly or indirectly caused or contributed to by or arises from the use of any computer, computer system, computer software programme, malicious code, computer virus or computer process as a means of inflicting harm.

However, cover under this extension is subject to certain exclusions, notably liabilities arising out of the use of the ship or its cargo as a means of inflicting harm. As such, if a malicious third party were to hack into the navigation controls of a ship and then deliberately steer her into collision with another ship or object, those crew liabilities and sue & labour expenses that would otherwise be covered under the clause would be excluded given that the ship would have been used as a means of causing harm.

Conclusion

In an age where cyber threats are becoming increasingly prevalent, shipowners are urged to be alert to the vulnerability of ships to cyber attack. The above is a brief summary of how standard P&I cover generally operates in respect of shipboard cyber risks. Naturally, each case is dependent on its facts.

The Standard Club issues a variety of publications and web alerts on topical issues and club updates.
Keep up to date by visiting the news section on our website www.standard-club.com

@StandardPandI
The Standard P&I Club

This bulletin is published on behalf of
The Standard Club Ltd by the managers' London agents:
Charles Taylor & Co. Limited. Registered in England No. 02561548
Authorised and regulated by the Financial Conduct Authority
FRN 785106.
Registered address:
The Minster Building, 21 Mincing Lane, London, EC3R 7AG

Telephone: +44 20 3320 8888
Emergency mobile: +44 7932 113573
E: pandi.london@ctplc.com
Website: www.standard-club.com

The Standard Club Ltd is regulated by the Bermuda Monetary Authority. The Standard Club Ltd is the holding company of the Standard Club UK Ltd and the Standard Club Asia Ltd.
The Standard Club UK Ltd is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. The Standard Club Asia Ltd is regulated by the Monetary Authority of Singapore.

The Standard Club issues a variety of publications and web alerts on topical issues and club updates.

Keep up to date by visiting the news section on our website www.standard-club.com

@StandardPandI
The Standard P&I Club

Charles Taylor