

Maritime autonomous surface ships – identifying and covering the risks

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Tim Howse, Gard vice-president, London, has provided an extensive analysis of the risks involved with autonomous shipping.

Gard focused in the article on the challenges of adapting the existing regulatory regime and traditional marine insurance policy wordings to the various types of vessel termed “autonomous”.

For present purposes the IMO has established four degrees of autonomy:

- Degree one: Ship with automated processes and decision support: Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated and at times be unsupervised but with seafarers on board ready to take control.
- Degree two: Remotely controlled ship with seafarers on board: The ship is controlled and operated from another location. Seafarers are available on board to take control and to operate the shipboard systems and functions.
- Degree three: Remotely controlled ship without seafarers on board: The ship is controlled and operated from another location. There are no seafarers on board.
- Degree four: Fully autonomous ship: The operating system of the ship is able to make decisions and determine actions by itself.

In this article Gard looked at unmanned ships – either remotely controlled or fully autonomous, i.e. degree three and degree four.

Seafarers

The International Chamber of Shipping (ICS) has estimated the current global demand for seafarers at more than 1.5m persons, including officers and ratings. Seafarers could see the drive towards automation as a threat to their livelihood. A Hamburg School of Business Administration study prepared on behalf of the ICS found that “few vessels will be entirely autonomous in the next decade or two. With an overall increase of the world fleet, at least the number of officers on board will remain stable. At the same time the number of ‘crew’ on shore in supporting functions will increase, possibly significantly”. The study concluded

that there would be no shortage of jobs for seafarers in the foreseeable future, but there would be significant training needs because in the future the type of work available on board could differ from that which they do today.

Changing risk landscape

Although there are no clear statistics on the benefits of the presence of humans, human error has constantly been the most frequently reported cause of marine casualties.

Howse asked, would taking humans away achieve lower insurance premiums? He said that Gard believed that the human element would not disappear, but would shift from ship to shore. Cyber gained in prominence via this shift, given the communications link between the ship and humans ashore. Uncertainties connected with ship values, regulations, jurisdiction and all other risks in shipping would still be in play. Therefore, although there may be a shift in the way a risks were rated, much would depend upon the yet-to-be-seen direction of the shift.

The human element is embedded in the international regulation of shipping

Most international conventions, including those under the IMO's or Comité Maritime International (CMI)'s purview, envisage manned ships. The International Regulations for Preventing Collisions at Sea 1972 (COLREGs), for example, require a lookout by sight and by hearing. The International Convention for the Safety of Life at Sea (SOLAS) refers to manning levels and the actions required of a master. And, quite clearly, unmanned ships would represent a major challenge to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). From an insurer's perspective, Howse said that these were not the most problematic issues.

It would be possible, for example, to issue a policy treating personnel operating a ship ashore as 'crew' although, of course, so far as cover is concerned, if there was no crew, there would be no need for crew cover. "The point is that insurers can do a lot using bespoke wordings and we do not necessarily need to wait for regulations to catch up with technological changes", wrote Howse.

Fault-based liability, strict liability

The more pressing issue is the state of the international conventions concerned with liability. The 1910 Collision Convention, for example, is a fault-based regime envisaging liability in proportion to a ship's causative fault. What, then, happens when there is a collision between two autonomous vessels. Could artificial intelligence (AI) be 'at fault' and therefore to blame? What would be the position if there were a collision between a manned and an autonomous vessel? On the assumption that computers do not make mistakes, would the manned vessel alone be blamed? If a ship cannot, of itself, be 'at

fault', might it be necessary to extend the circle of persons who could be held liable for the actions of an unmanned ship? Should a regime of strict liability be introduced?

Howse said that "some quite knotty issues" would arise when the detail was tackled. He noted that for autonomous vehicles on land, AI is in a state of strict liability — liable for any mistake it should make.

"While there may be more questions than answers, Gard is evaluating some of these questions to offer practical solutions", said Howse.

Financial limitation of liability

Regimes providing protection by means of a right to limit financial liability (usually by reference to the tonnage of a ship) muddy the waters even further. The Convention on Limitation of Liability for Maritime Claims (LLMC) 1976, for example, in the context of breaking the right to limit liability, refers to "a person" and the "personal act or omission, committed with the intent to cause such loss, or recklessly and with knowledge that such loss would probably result". These words are difficult to reconcile with an unmanned vessel using AI – who would be 'the person' and where lies the requisite intent or knowledge of probable consequences of a reckless act? Will this be by reference to the owner of the autonomous vessel or might he, quite reasonably, argue that he was entitled to rely entirely upon the software engineers who designed the AI? Therefore, the test should be by reference to their acts or omissions and knowledge, and not the acts or omissions and knowledge of the shipowner.

Cyber risks

Most marine property wordings contain an exclusion for losses resulting from cyber threats, although Hull and Machinery insurers may provide coverage for an extra premium. P&I club cover does not exclude cyber risks per se, except in the context of the general exclusion for war and terrorism. (Gard P&I Rule 58.1). The war and terrorism exclusion does not apply where the claim is made against a certificate of insurance provided by the club under certain international conventions. (Rule 58.2.)

There is a separate facility within the Group Clubs for war risks which would include cyber as a means of inflicting harm, but this operates only up to an aggregate limit of \$30m in respect of crew and personal injury claims.

A cyber terrorist attack would not be covered under many marine property wordings, but there could be some cover under IG club wordings and the additional limited war risk insurance. These IG P&I club arrangements might be enough to cover a one-off cyber-attack involving, say, a virus affecting one ship resulting in it suffering a casualty.

But the situation would become much more strained if several ships were attacked within the same incident.

Gard is looking at scenarios such as if the remote-control centre operating multiple ships encountered a terrorist cyber-attack resulting in multiple ship casualties.

Gard has called for discussions on an international marine cyber fund, perhaps combined with an international cyber limitation regime, to tackle aggregation issues.

Product liability

The existing suite of international instruments funnels third party liabilities towards the shipowner. The entire structure of marine insurance is designed, with this funnelling in mind. The property insurers cover the hull, with the clubs covering liabilities towards third parties for damage including pollution. This is on the basis that, traditionally, the 'buck stops' with the shipowner, save in cases where there might be recourse against a manufacturer or software maker. Recourse cases are, however, the exception rather than 'the norm'.

Howse said that this would likely change as autonomous vessels gained prominence. Whilst the industry has a reasonable understanding of how today's electronic navigation systems work, the same cannot be said for complex navigation algorithms and the systems underpinning AI. EU product liability laws, through EU Directive 85/374, generally envisage protection in a private use context and it may be difficult to bring claims where the defect is due to compliance with mandatory regulations issued by public authorities or where the state of scientific and technical knowledge at the time of circulation hampered discovery of the existence of the defect. It may also be difficult to establish product liability in tort. The product liability route may, therefore, offer only limited comfort.

The future

Although technology is, as usual, ahead of regulations, this is not yet an issue here because there is, so far, no serious talk of an international autonomous vessel. Gard's view is therefore that, before the industry experiences changes in international, i.e. IMO, regulations, we will experience changes to domestic laws, and the creation of guidelines, applying primarily to domestic trade, to be enforced by Flag State and, indirectly, Classification Societies. Where nations are hesitant to make changes until the RSE is concluded, legal interpretation of existing laws allowing for domestic trade should continue to be the norm.

Since club rules, and indeed the Pooling Agreement, require compliance by a shipowner with Class Rules and Flag State regulations, Gard is now focusing on insurance solutions designed to cover the domestic needs both of owners of, and those considering an involvement in autonomous vessels. This is in addition to the solutions which Gard provides to meet the changing risk landscape consequent upon the increasing shift in focus to cyber and product liability risks. It's in this area that we see the greater scope for

change, because presently cyber and product liability risks don't sit as comfortably as they could within the normal marine property and the club/liability suite of insurance wordings.