



AUTOMATION OF SHIPS IN PORTS AND HARBOURS

FOR THE BRITISH PORTS ASSOCIATION



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Photo courtesy of Shoreham Port



The Port Futures Programme was launched by the British Ports Association in 2018 to examine global emerging trends in the ports and shipping industries. This rolling programme of activity will address key issues for ports over the next 50 years, including technology, infrastructure and skills, as well as potential opportunities for and challenges to British ports that these issues present. Projects are grouped around four key drivers of change:

- Technology & Automation;
- Climate Change and the Environment;
- Politics, Regulation and the Law; and
- Social and Economic change

The British Ports Association (BPA) represents 100 port members and over 80 associate members. Our port members own and operate over 350 ports, port facilities and terminals of all sizes across the UK, facilitating the majority of the UK's maritime trade, 95% of which is carried by sea.

Setfords Solicitors are working with the BPA as part of their Futures Programme where Setfords have first hand experience of the developments that are taking place in the Legal And Regulatory framework relating to Marine Autonomous Surface Ships ("MASS") in the UK, Europe and, Internationally. Andrew Higgs of Setfords gives an overview of what is happening at the International Maritime Organisation ("IMO") and Susan Macpherson highlights some of the developments in the MASS Technological world, and, the practical and regulatory effects that these Ships will have on UK Ports and Harbours.

We take the view that there are business opportunities for both Major and Minor Ports in the British Isles for the use of Maritime Autonomous Surface Ships ("MASS"). Initially, these are likely to be short sea, coastal traffic within UK and Irish domestic, territorial and inland waters for UK-flagged and registered merchant ships/cargo ships. The primary reason for this is that it will take some while for the IMO's regulatory review to be completed (December 2020 ?), and the legal and regulatory framework of a single nation State (such as the UK and the Republic of Ireland) will move rather more quickly than the international maritime community.

Serious consideration could also be given to bi-lateral arrangements between the UK ports and European neighbours in the Island of Ireland, Belgium, France, Netherlands and Scandinavia, wherever appropriate.

What is "MSC 99"?

The Headquarters of the International Maritime Organisation ("IMO") is in North Lambeth, London, and was set up by the IMO Treaty, 1948. The Maritime Safety Committee ("MSC") is the leading Committee, where a number of sub-committees report to MSC. I was the International Liaison Officer for the International Union of Marine Insurance ("IUMI") for five years (2008-2013), where IUMI was one of the original six Non-Government Organisations ("NGOs").

"MSC 99/5/5" dated March 2018 proposed a plan of approach for a regulatory scoping exercise for the use of MASS. This was led by the UK, with support from Australia, Canada, Denmark, Estonia, Finland, Japan, the Netherlands, Norway, Singapore, Sweden, and the USA; ie 12 nation State Administrations, of which 7 are European nation States. To view the full paper, please [click here](#).

The Swedish Chairman's summation expressly referred to the importance of "clear definitions" being a priority; albeit broad and provisional only. In effect, this exercise is one of a so-called "regulatory gap analysis". There is a provisional MSC deadline of December 2020 for this IMO regulatory review to be completed.

I attended the MSC 99 Working Group, on behalf of the International Federation of Ships Masters Association ("IFSMA"), who together with the ITF, represent the interests of seafarers at IMO and the so-called "human element", which is of the utmost importance, in my view, in these discussions.

Although there are more than 50 IMO legal instruments, the initial review of the "MSC 99" Working Group, and "MSC 100" Intercessional Correspondence Group, is to focus primarily on the SOLAS Convention, as amended over the last 100 years (Chapter V- Safety of Navigation), and COLREGs, which were first drafted in the City of London by Trinity House, in the 1830s.

It seems quite likely that this review might lead to "soft law" IMO guidelines for MASS operating in territorial/inland waters, and therefore subject to Port State Control and Coastal State jurisdiction, since the implementation of any regulatory review will be facilitated considerably where the flag State of the MASS is one and the same as the Port and Coastal State, and follow the principles of the UN Law of the Sea Convention, 1982 ("UNCLOS"), the so-called umbrella treaty. Bipartite arrangements between nation State Administrations can also be negotiated and agreed, of course.

The United Kingdom and Ireland in the British Isles, and the European nation States in EU waters, are best-placed to take a leading role in this new IMO regulatory review, together with leading Commonwealth States, such as Australia, Canada and Singapore, and the leading developed nation States of Japan and the USA, given their technological expertise and commercial influence.

A Brief History of the Automation of Ships (1964 to-date)

IMCO "MSC VIII/11" dated March 1964 and a "Note by the Secretariat" more than 50 years ago, which was located by my learned academic CMI colleagues in the IMO this year gave the following definition.

This definition refers to "those processes in which machines -often including electronic controls – adjust and control their own performance with little or no human intervention, once the operation has started." Furthermore, "a distinction is generally made between (i) a fully-automated system, (ii) a partly-automated system and (iii) remote control." This situation has not changed materially.

It also states that: - "the auto-pilot, has been widely used for a considerable time"; ie, in 1964!

Arguably, we have lived in an "Anthropocene Era" for more than 200 years, (ie since the Industrial Revolution in Europe), and the COLREGs are a living document and legal/regulatory example and evidence of this evolution of all ships, merchant shipping, the sea and seafarers.

My "Open Letter" to the UK Department of Transport

The UK Government Department of Transport issued a call for evidence in May 2018, and I wrote an "Open Letter" seeking to argue that it was timely that there should be (a) a generally-accepted understanding of the three different categories of all ships, as a matter of public international law at IMO, and (b) to suggest three key and universal "characteristics" of all ships, on all voyages; that is, in circumstances where (i) each and every IMO legal instrument has a different definition of a ship and (ii) each and every nation State has a different definition of a ship. In short, not really an ideal starting point. However, I have written to suggest the following possible solution to the conundrum. In short, SOLAS Part A Regulation 1(Application) and 2 (Definitions) refers to "all ships engaged in international voyages", and therefore any such ship might properly be generically described as:-

- "(i) Any merchant ship, (ii) seagoing vessel, or (iii) waterborne craft,
- [...or other such anthropogenic/man-made vehicle.....]
- That is not permanently attached or otherwise secured to the seabed or shore line."

Furthermore, the proposed characteristics of (a) all ships (b) on all voyages (per SOLAS Chapter V (Safety of Navigation) might well be appropriately described to be, as follows:-

- Capable of floating on seawater, [ie buoyant, and with intact stability], and
- Capable of being made seaworthy [ie for a particular sea area, or voyage/passage], and
- Capable of being navigated, in navigable waters – [ie manned, operated and controlled by a person(s), who is/are sentient human beings, whether these persons are aboard or ashore, and requiring good seamanship, competence and skills.]

These suggestions still do not resolve the issue of what might be considered to be a “small ship”; although this is generally understood to be ships of less than 100GT, and/or less than 24m LOA.

In my view, this is a political decision for the UK government, European and other nation States, where my work with the UK MASS RWG since January 2016 suggests that the licencing of “small ships” is akin to licencing/registering bicycles on our roads, or drones operating out of line of sight of their owners and operators. In short, it is a voluntary arrangement involving the Small Ships Register. Time will tell how this regulatory issue of licencing/registration might be satisfactorily resolved.

The practical effects of automation in UK Ports and Harbours – An Introduction

Whilst Andrew has outlined that the IMO are looking internationally in depth at the issues surrounding MASS, its Secretary General, Kitack Lim has pinpointed the real practical issue for Ports when he said:

“The advent of Autonomous ships is increasing the importance of communication between Ships and Ports, which will not only deal with safety issues, but also the Port will provide Services”

The biggest practical hurdle is going to be the application of existing Port Regulations to make the navigation of these Ships through Harbours safe and secure.

This was discussed at the UK Ports Conference towards the end of May when Steve Guest, Business Development and Marketing Director at Kongsberg Norcontrol, suggested that there would be a higher level of autonomy/remote operations in the ports and shipping sectors in the short and long term future.

It is also anticipated by Ports that there will be a greater emphasis on sustainability (e.g. Alternative bunkering), plus a greater use of Smart Data in operations and customer propositions. Underpinning it all, there is expected to be a greater imperative for focus on human factors in safety and skills.

We see that the application of this technology to smaller coastal feeder ships working on short sea routes is going to impact UK Ports and Harbours, later followed by larger Cargo Ships on long sea trips, which are more the market of the UK's larger Ports.

Ports up and down the coasts of the UK may find that their customers will be utilizing these ships perhaps in areas such as where there is surveying going on, construction and servicing of wind farms, work on adjacent nuclear reactor sites and transportation of bulk cargoes. It has been voiced in the Industry that cruise ships and super yachts would not fall into this category because of the high level of personal service, but a degree of automation is likely as these developing industries won't be shy of cost cutting exercises or the greater utilisation of automation on board and ashore.

The overriding message from IMO is that Automation is coming to all sectors of transportation within Ports and is part of an evolution in transport, with the advent of automated or driverless cars, trucking and Terminals.

The Owners and Operators of our Ports, which are planning expansions to Port Facilities for the needs of their customers' are working generally within the existing rail and road transport systems. Now they will have to factor in the needs of another type of customer; the Customer that operates autonomous or semi autonomous ships.

What is happening in the Technological World?

One of The UK's first autonomous and unmanned ships is the C- Worker 7. In Norway, The Norwegian Maritime Authority and the Norwegian Coastal Administration have signed an agreement for sea trials, which are taking place in the Trondheim Fjord, the first place in the world to be formally designated by a Coastal State for the testing of MASS.

The Yara Birkeland, which is the world's first autonomous and electric container vessel, is due to be constructed by Norwegian shipbuilder VARD and to be delivered for launch in 2020. The vessel will gradually move from manned operation to fully autonomous operation by 2022. It has been licensed around the coast of Norway by Kongsberg which has worked with and has now purchased Rolls Royce. Its designers expect it to replace 40,000 truck journeys a year, reduce NOx and CO2 emissions and improve road safety in a densely populated urban area. This was initiated to improve logistics at Yara's fertilizer plant.

See the article in Port Technology here: https://www.porttechnology.org/news/rolls_royce_maritime_sale_to_advance_robot_ships
These ships are battery powered and will require Ports to have sufficient Charging Facilities at the Dockside to recharge the batteries. In some Ports, this surely means a review of existing supplies of electricity to the berths.

The proximity of this activity to our UK ports brings ever closer the likelihood that Port customers importing goods from (say) the Baltic States and perhaps the Republic of Ireland will in the future adopt the use of smaller MASS on short sea routes to and around our UK shores.

Bernard Twomey of Rolls Royce advocated at IMO in May 2018 that Local and National Agreements will be required and that we should stop referring to MASS only, but instead talks about an "Autonomous Infrastructure."

What are the Challenges and Opportunities for UK Ports?

Some of the Challenges will be in the areas of Safety, Security, Cyber Security and breakdowns in communication systems. Also, fires on board, mechanical breakdown, communication with Autonomous ships, Pilotage, Tugs & Towage. There will be alterations of quays needed for alongside berthing and the reduction of crews on board, which means perhaps an opportunity for the Port as well as a challenge. How too will the Ports Insurers (marine and non-marine) view the risk of MASS operating in confined spaces in the Insured Port?

The Opportunities for ports can be seen in terms of increased port jobs in the Port Services Industry requiring high levels of technical skill by Shore based Operators and back up service providers. So too, a re-assessment of costs and payment for this new Market, possibly having an impact on Harbour dues and other commercial agreements.

This can open up new business, so Ports should engage with Owners and Operators of MASS and Customers to open up a dialogue on the capabilities of these autonomous or semi-autonomous ships. Also review Port plans. With the prospect of some types, of MASS visiting our ports, now is the time to start dusting off these documents and thinking longer term. The advent of Automated Terminals and platooning of trucks means that we are entering a new world of automation, which may make the use of Port Land more efficient and streamlined. Perhaps the face of the Waterfront needs to change and some land areas need to be regenerated. Parts of the UK are more ready for this than others.

Alec Don, the Chairman of the British Ports Association, has called on UK Government and industry to grasp these opportunities. Earlier this year in an address to the industry and Maritime Minister at the British Ports Association Annual Lunch, he said: "as a country we have to be prepared to release this wave, to facilitate investment; to make it easy to invest in ports, in port connectivity and in industrial sites connected to ports. It is these sites that will generate and hold the jobs we need to carry Britain forward". The BPA's estimate of £1.7 billion in short and medium term investment at the top end shows the ambitious nature of this sector of Industry.

Ports need to consider the suitability of quays, channels and the mix of users and obstacles to navigation; such as Lifting Bridges and locks. Regulations for their use and operation need to take account of MASS and embody detailed procedures to cater for them.

Ports also need to assess the existing and new shore-based Facility Providers to see if their operating practices can be tailored to the needs of these ships as well as the location of Onshore Facilities for remote operation of systems. Line of Sight Control Towers should be considered. Strategically what impact does this have on port land? Will the Port seek to use its own MASS in Port management, where at present automated Tugs are already being trialled in the Port of Copenhagen?

A Voluntary Industry Code of Practice produced by Maritime UK is only looking at best practice in context of giving practical guidance for the design, construction and safe operation of small MASS of up to 24 metres in length either registered or operating in UK waters (at sea and Inland Waters). This whilst the more complex regulatory framework which Andrew has described is developed.

Regulation and Management of our Ports and Harbours

There is a raft of Legislation and Guidance Regulating the Use and Management of Harbours .There are powers to regulate the Harbour enshrined in the Harbour Act 1964 as amended by the Marine Navigation Act, 2013 and The Harbour Directions Guidance which requires Harbour Authorities to manage and run safe harbours They have particular responsibilities in relation to the safety of "Vessels" including all people within the Harbour. efficient navigation and the protection of the port environment.

Port Operations are governed by The UK Port Marine Safety Code 2016, The Pilotage Act 1987 and IMO's "MEPC 1/ Circular 834" dated 15/4/2014 which contains consolidated Guidance for Port Reception Facility Providers and Users.

The Port Marine Safety Code in particular recommends harbour authorities review and be aware of their existing powers to ensure that they are still relevant to the safe operation of the harbour. With the arrival of unmanned ships now mean that these services are delivered in a different way requiring port facilities to be manned more at the Port of Entry? Additional powers may be needed if a risk assessment concludes that this would be desirable.

Some ports may not be able to accommodate these MASS within the main shipping channels and may only have one single channel in which to operate Also, Harbour Masters may just decide to refuse entry but that raises the whole issue of Public Navigation.

We have examined a number of Ports Harbour Byelaws where it appears that "Vessel" is a commonly used and defined term and we would suggest that Harbour bye laws in the future start to address the terminology where Seagoing Vessels are known in future as "Ships". There are also the International Regulations for the Prevention of Collisions at Sea (COLREGs), which apply to all "Seagoing Vessels"; even those racing for fun or pleasure and Regulations relating to Pleasure craft.

Practical Regulatory Issues for the UK

The Regulations in the UK applying to Ports need to be reviewed much in the same way as the issues being considered by the regulatory review being carried out by MSC at IMO, namely:-

- Amendments may be required if, in the context of MASS, the existing provision clearly applies and it is not clear how MASS can comply with it. Clarifications may be required applying the same test, where it is unclear whether the existing provisions apply, and
- No action is required where provisions have some relevance to MASS; although they are not deemed to require further regulatory action (for the time being at least).

The Way Forward?

We would like to suggest that serious consideration should be given by Harbour Masters, and Port and Harbour Authorities, to the following three suggestions:-

- To use the appropriate nautical nomenclature of all "ships" so as to include all "small ships" (including for example, Jet Skis, RHIBS etc); that is, if you do not already do so, and
- To review your Bye-Laws for consistency, and the operation of MASS (as appropriate), and
- To register your port or harbour as the home port; in order to facilitate Port State Control of "all ships", including "small ships", which is understood to be an issue for Harbour Masters.

It is disappointing to note that Annual Port Freight maritime statistics (2017) for the transshipment of goods in UK waters are unavailable, since only the port of loading/unloading are recorded; and not the final destination. It occurs to us that MASS, and the major and minor ports that service MASS, would be well-placed to provide such transshipments from large cargo ships to smaller feeder cargo ships, to take freight off the congested roadways, and to reduce pollution and other adverse environmental effects . Transshipment statistics would be helpful in this regard, in our view.

Andrew Higgs and Susan Macpherson will be presenting in more detail on these subjects and with updates on the International regulatory framework for MASS and the practical implications for UK Ports and Harbours at the BPA Annual Conference on 11th October 2018 at the Sage in Gateshead.



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Andrew is an experienced commercial litigator, specialising in dispute resolution, arbitration, mediation, insurance and legal risk management; both in the City of London (Commercial & Admiralty Courts), and also internationally. Andrew joined Setfords in March 2017, having practiced with a leading City of London law firm for more than 30 years. More recently, he worked as the Liaison Officer for the International Union of Marine Insurance at the International Maritime Organisation, for five years (2008-2013).

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