

## **Will increasing regulations affect the demand for superyachts?**

**Chris van Hooren, Superyacht Builders Association (SYBAss)**

### **1. SUMMARY**

After several years of reduced demand, the superyacht market is again showing signs of improvement. At the same time, there is considerably more regulatory oversight in terms of both tempo and volume. Some fear this may discourage potential superyacht owners from entering the business.

This paper introduces the International Maritime Organization (IMO) and identifies the regulations it specifies for superyachts. The increased degree of regulation is illustrated by a number of amendments to IMO instruments that have recently entered into force or will do so shortly.

Steady growth in the number of vessels seems to indicate that increased regulation does not, in fact, affect demand for superyachts. Knowledgeable owners appear to understand that regulatory oversight ensures their safety at sea, and guarantees that the environmental impact of their superyacht will meet all international standards.

Nevertheless, it is an understandable reaction to chafe at regulations as compliance with new rules calls for new approaches that require additional time and costs. Regulations are often less appropriate for superyachts due to their specific characteristics and type of operation (although this may also create opportunities for progressive shipyards). This calls for better industry representation at the level where regulations are made or amended.

### **2. THE INTERNATIONAL MARITIME ORGANIZATION (IMO)**

Seafaring has always been one of the world's most dangerous occupations. In response to major disasters, states moved towards internationalising the laws that regulate safety at sea and, increasingly, aim to prevent pollution from ships. This led to the creation of the International Maritime Organization (IMO) in 1948.

There is no doubt that IMO has come a very long way since its inception. Globalisation has transformed international trade, new powers have emerged in shipping, and the plethora of measures established by IMO has provided the bedrock on which a safer and cleaner industry can continue to develop and flourish. Moreover, IMO's work has demonstrated beyond doubt that international standards are the only effective way to regulate an industry as diverse and truly international as shipping.

IMO standards are now firmly embedded in the collective consciousness and practices of the shipping industry and continue to have a strong influence today. Indeed, the comprehensive body of IMO conventions (some fifty in total), supported by literally hundreds of codes, guidelines and recommendations, govern just about every facet of the industry – from the design, construction, equipment and operation of ships to the training of seafarers, and from the drawing board right to the scrapyard. The main IMO treaties have been ratified by states that are, collectively, responsible for more than 98 per cent of the world's fleet.

### **3. THE YACHT CODES**

With a few exemptions, superyachts operating in international waters have to comply with relevant IMO conventions. This includes, among others, the International Convention for the Safety of Life at Sea (SOLAS), the International Convention on Load Lines (ICLL), the International Convention for the Prevention of Pollution from Ships (MARPOL), the Collision

Regulations (ColReg) and the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). SOLAS, ICLL and MARPOL are of special interest for the design and construction of vessels.

It is widely recognised that it has become increasingly impractical to apply to pleasure yachts the standards and requirements established by the major IMO Conventions. These were developed and have evolved to deal with merchant cargo ships and passenger ships, not superyachts. And this is the issue which has been addressed in two Yacht Codes.

### **3.1 The Large Yacht Code**

For superyachts carrying 12 guests or less, the UK Maritime and Coastguard Agency (MCA) published the Large Yacht Code in 1997. This provided a 'code' approach for vessels which were unsuited to the application of conventional merchant shipping regulations. The Code was notified to the IMO as the provisions for the United Kingdom under the equivalence arrangements of the ICLL, SOLAS and the STCW (IMO Circular Letter No 2937).

Since its original publication, the Large Yacht Code has made a significant impression on a maritime sector which previously found it very difficult to embrace conventional regulation. Enjoying international recognition and support within individual countries, the code has become the de facto international standard for this type of yacht.

The Large Yacht Code was developed, and is being kept up to date, in close cooperation with an industry working group to ensure that it keeps up to date with developments in the industry and amendments in the related international conventions. The third edition of the Large Yacht Code – LY3 [1] was launched in 2012 and incorporates "substantial equivalent" solutions for the crew accommodation requirements of the Maritime Labour Convention (MLC) issued by the International Labour Organization. This third edition of the code entered into force on 20 August 2013, coinciding with the date of entry into force of the MLC.

### **3.2 The Passenger Yacht Code**

Similarly to the Large Yacht Code, the Passenger Yacht Code for Yachts Carrying 13 to 36 Passengers (PYC) was published in 2010 by the Red Ensign Group (for UK and UK overseas territories and crown dependencies). This Code was also notified to the IMO as the provisions for the United Kingdom under the equivalence arrangements of the ICLL, SOLAS and the STCW (IMO Circular Letter No 3171).

The Passenger Yacht Code was also developed, and is being kept up to date, in close cooperation with an industry working group. At this time the Code contains provisions for motoryachts only. However, a special working group has drafted provisions for sailing yachts to be included in a future edition of the code subject to the completion of additional research. The fourth edition of the Passenger Yacht Code, including references to the full crew accommodation requirements of the MLC, has been published in January 2014 [2]. Edition five is expected in early 2015.

## **4. SOME REGULATORY DEVELOPMENTS**

Amendments to existing IMO Conventions, as well as new IMO Conventions considered necessary for the safety of international shipping or protection of the environment, are developed by IMO's Marine Safety Committee (MSC) and Marine Environmental Protection Committee (MEPC), both supported by a number of subcommittees.

It is inevitable that developments of the conventions that underlie the Yacht Codes will be included in future editions of these codes, either in full or in the form of equivalent provisions. Some new conventions or amendments to existing conventions that may affect the design and build of superyachts are listed below.

### **4.1 International Ballast Water Management Convention**

While ballast water is essential for safe and efficient modern shipping operations, the multitude of marine species carried in ships' ballast water can pose serious ecological, economic and health problems. The International Convention for the

Control and Management of Ships' Ballast Water and Sediments (BWMC) was adopted in 2004. Ratification is in progress and the BWMC is expected to come into force soon for new and existing ships.

The BWMC requires cumbersome de-ballasting procedures and the installation of a costly and space-demanding ballast water treatment system for vessels carrying ballast water. As superyachts do not carry cargo, de-ballasting can possibly be avoided with an innovative approach to trim, list and stability control (e.g. clever arrangement of tanks for consumables or a permanent in-board fresh water ballast system).

#### 4.2 Hong Kong Convention on the safe and sound recycling of ships

The Hong Kong Convention was adopted in 2009 to prevent, reduce or minimise the adverse effects of the recycling of vessels on human health and the environment. The ratification of the Hong Kong Convention is proceeding slowly and current indications suggest entry into force will not take place until 2016/2017.

Countries that have ratified this convention ensure that certain hazardous materials are not fitted on new ships while new builds are provided with an Inventory of Hazardous Materials (IHM) that must be kept up to date over the life of a vessel (e.g. after refits).

The creation of the IHM will be a significant administrative burden for shipyards as most hazardous materials are contained in the supplies of third parties. Requiring suppliers to provide the necessary certificates of conformity will be an onerous task [3] [4].

#### 4.3 Air pollution and energy efficiency

To reduce future emissions of CO<sub>2</sub> (a greenhouse gas), a new chapter has been added to MARPOL Annex VI making mandatory the Energy Efficiency Design Index (EEDI) for new ships over 400GT. The EEDI of a ship is the amount of CO<sub>2</sub> produced per transport work (tonnes-mile) under design conditions. The EEDI is based on design parameters, not operational parameters. The new Chapter 4 entered into force on 1 January 2013.

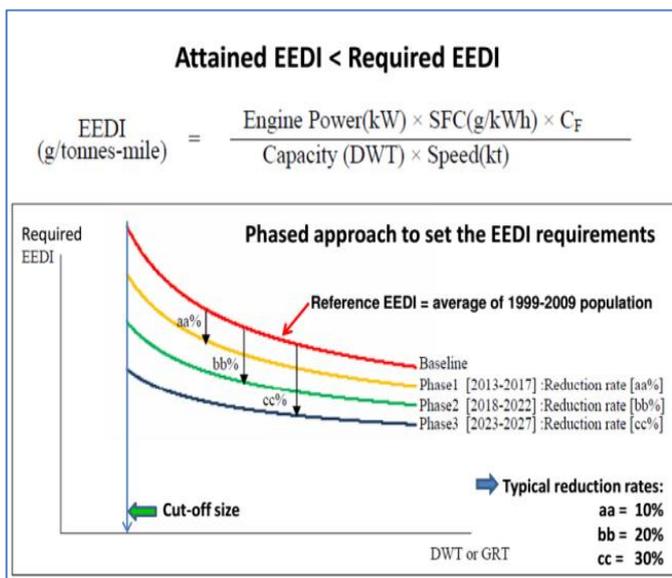


Figure 1: EEDI Requirements

For new ships, attained EEDI must be less than required EEDI. Required EEDI will decrease over time, relative to a reference EEDI representing the average of the 1999-2009 population of the type of ship under consideration (Figure 1).

The significant reduction in required EEDI over the next 15 years will, apart from lowering design speeds, be a driver for the development of innovative low-resistance hull forms and more efficient propulsion installations, as well as the use of lower carbon fuels.

At this time, no EEDI reference lines - and hence no required EEDI values - are defined for LY3 and PYC yachts. Nevertheless, according to Regulation 20 of Chapter 4, the attained EEDI value shall be calculated for each new ship over 400 GT whose type is defined in MARPOL Annex VI Regulation 2. This seems to include PYC Yachts as they are considered to be passenger ships.

At this time IMO has defined only one reference line for passenger ships (cruise vessels). SYBAss has established that this EEDI reference line is unsuitable for PYC Yachts (Figure 2) and has brought this to the attention of the relevant flag states.

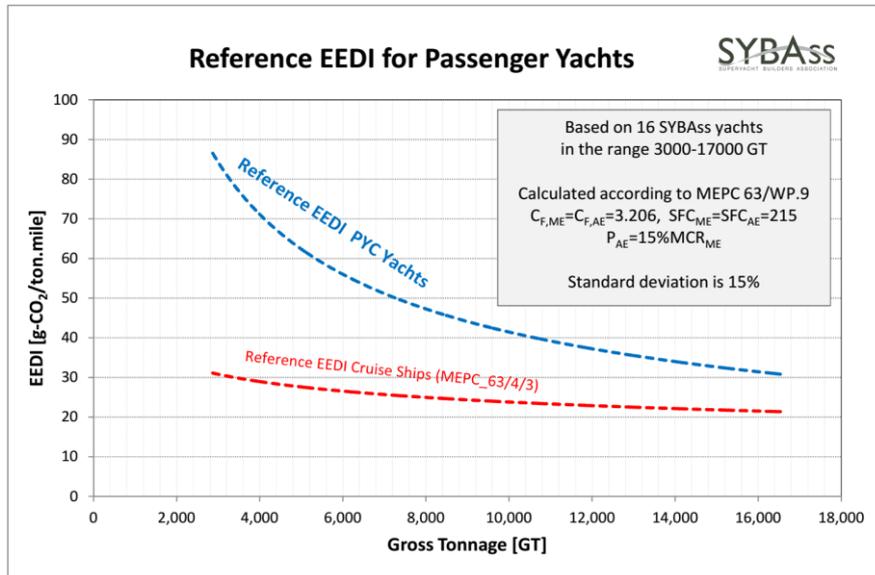


Figure 2: Reference EEDI for PYC Yachts and Cruise Ships

4.3 NOx emission limits

MARPOL Annex VI sets limits on NOx emissions from ship engines over 130 kW. The emission standards are commonly referred to as Tier I, II and III (Figure 3). Tier I and Tier II levels have already been mandatory for some time and could be achieved by in-engine measures.

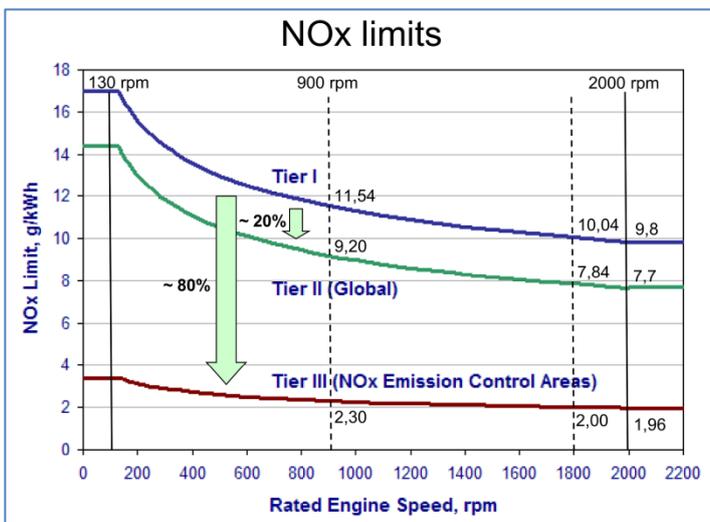


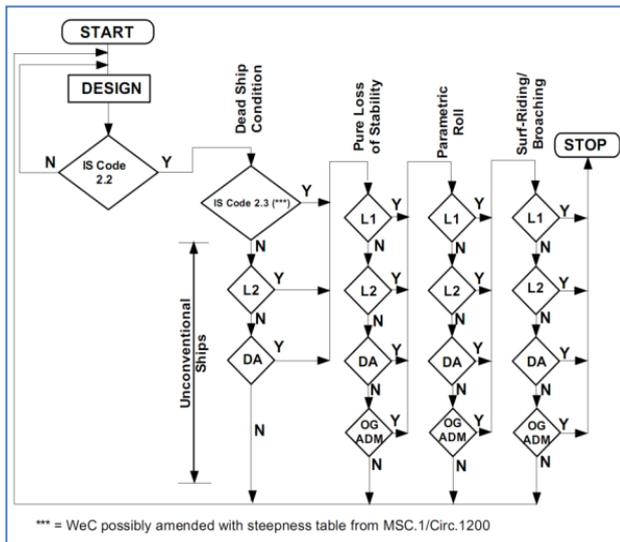
Figure 3: MARPOL Annex VI NOx limits (courtesy of MTU)

Tier III will apply only within NOx emission control areas (NECAs). Tier III will enter into force on 1 January 2016 for the NECAs already designated (North American and United States Caribbean waters). The entry into force for new NECAs will depend on when they are decided upon.

Given the present state of technology, only costly and space-demanding selective catalytic reduction installations appear to provide feasible solutions for meeting the very low Tier III NOx limits. To allow more time for innovations in this field, SYBAss and ICOMIA have obtained a five-year delay of entry into force of the Tier III NOx requirements for yachts of less than 500 GT. The related request and three underlying extensive studies are contained in [5].

4.4 Second-generation intact stability criteria

Significant changes in the design and operation of ships have occurred over recent decades. These changes, and their impact on the intact stability performance of ships, have motivated the development of so-called second-generation intact stability criteria by the IMO. Consolidation of various proposed criteria and the testing of various ship types is now in progress, with a target completion year of 2015. After adoption, the new criteria will be included in Part B (recommendations) of the Intact Stability Code 2008 (IS 2008) [6]. They will become mandatory once their performance has been proven to be satisfactory (Part A of IS 2008).



**Figure 4: Multi-tiered approach to intact stability**

Figure 4 illustrates the multi-tiered approach for the second generation intact stability criteria. In this process, the current criteria of the 2008 IS Code are applied for all ships covered under IMO instruments (this includes the Large Yacht and Passenger Yacht Codes).

In addition, each ship is also checked for vulnerability to pure loss of stability, parametric roll, surf-riding/broaching and excessive stability (the latter is not shown in Figure 4).

Vulnerability for each mode is first tested using simple but conservative criteria (L1). If a possible vulnerability is detected, then the more rigorous level 2 criteria (L2) are used, if necessary followed by direct stability assessment (DA). If the direct stability assessment shows an elevated level of risk, then ship-specific operational guidance (OG) will be developed.

The process is repeated for all four stability failure modes.

As an NGO participating in the work of IMO, SYBAss has determined that the original proposals of the level 1 criteria for pure loss of stability and parametric roll were unsuitable for superyachts because of their sleek lines. With the help of the Technical University of Trieste SYBAss has proposed more appropriate criteria which have been adopted [7].

The present level 1 criteria for pure loss of stability and parametric roll appear to be sufficiently simple and acceptable robust to be used by yard's naval architects during preliminary design stages, when it is still feasible to modify design parameters as necessary. Up to now very few superyachts were found vulnerable on level 1 [8], although vulnerability may be higher at light draught. Level 2 calculations are more sophisticated and require more detailed design information. Level 2 calculations, and certainly direct assessments, seem to be work for seakeeping specialists [9].

#### 4.5 The Polar Code

Ships operating in Arctic and Antarctic environments are exposed to a number of unique risks. Ice in the water can impose additional loads on the hull, propulsion system and appendages. Ice accretion or ice-related damages affect stability. Poor weather conditions and the relative lack of good charts, communication systems and other navigational aids pose challenges for mariners. The remoteness of the areas makes rescue or clean-up operations difficult and costly.

The IMO will shortly adopt the International Code for Ships Operating in Polar Waters (the Polar Code) intended to establish additional provisions for consideration beyond the existing requirements of the SOLAS and MARPOL Conventions. The more comprehensive Polar Code will replace the existing IMO Polar Guidelines and become mandatory under the new SOLAS Chapter XIV for new and existing ships.

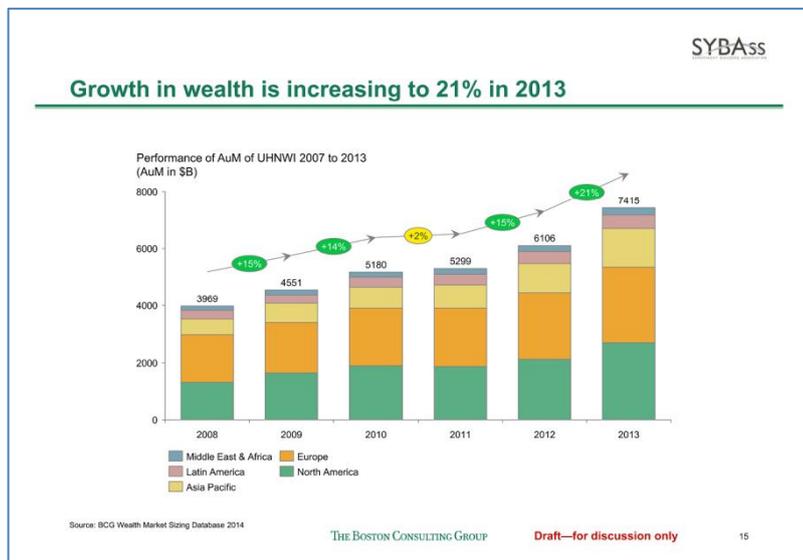
The Polar Code will address operational and design issues. Recent studies have demonstrated that, depending on the applicable ice class, compliance with the Polar Code may affect the design of a superyacht considerably. This is especially the case with regards to structural strength, intact and damage stability, subdivision and tank arrangement, machinery and lifesaving appliances.

#### 4.6 PYC and sailing yachts

IMO instruments have no special provisions for sailing yachts. As mentioned, specific requirements for sailing vessels will be included in the Passenger Yacht Code in a way similar to that used in the Large Yacht Code. With additional research required, the anticipated date for this extension is 2016 [10].

### 5. THE DEMAND FOR SUPERYACHTS

Superyachts operating internationally are subject to the same or equivalent standards as merchant ships. Some people seem to fear that the surge in regulation is in danger of swamping the superyacht industry and may convince owners to cash out or not enter the business at all.



Potential new build demand can be estimated by looking at the growth in number of Ultra High Net Worth Individuals (UHNWI) and their propensity to buy superyachts.

In 2013, total Assets under Management (AuM) of UHNWI grew by 21 percent (Figure 5). The number of billionaires is at an all-time high and for most countries exceeds pre-crisis levels.

It can therefore be concluded that the potential demand for new builds shows a healthy growth.

But what about the propensity; is it adversely affected by increased legislation?

Figure 5: Growth in Wealth in recent years

Figure 6 shows the development of the superyacht fleet over the last 20 years [11]. (Expected) dates of entry into force of (new) regulation are indicated. It demonstrates a steady increase in the number of superyachts. This can be expected to continue over several years, irrespective of future demand being affected by the currently low propensity to buy superyachts among the fast growing group of UHNWIs from Asia (Figure 7). The only relative decline was between 2012 and 2014 – this was the result of lower order numbers in 2009 and 2010, when the impact of the global financial crisis first made itself felt.

From the above one may conclude that increased regulation has not affected the demand for superyachts.

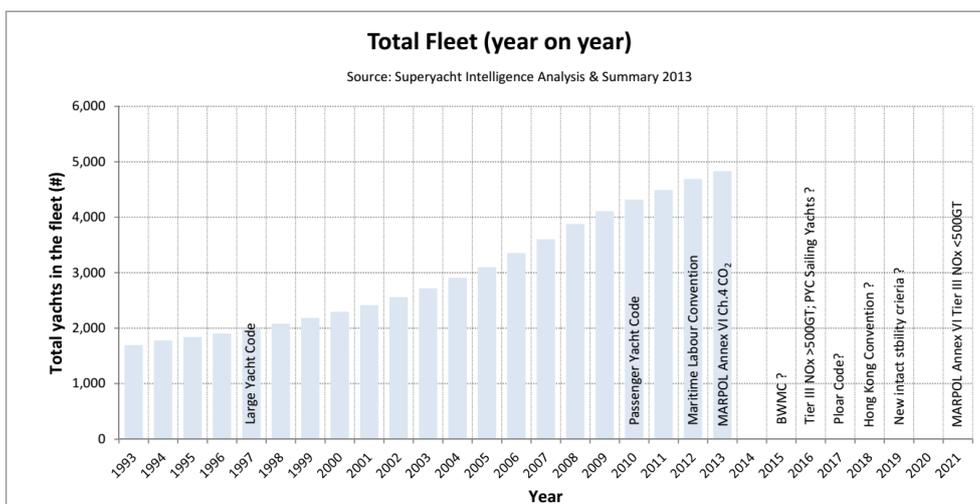


Figure 6: Timeline Superyacht Fleet and Regulations

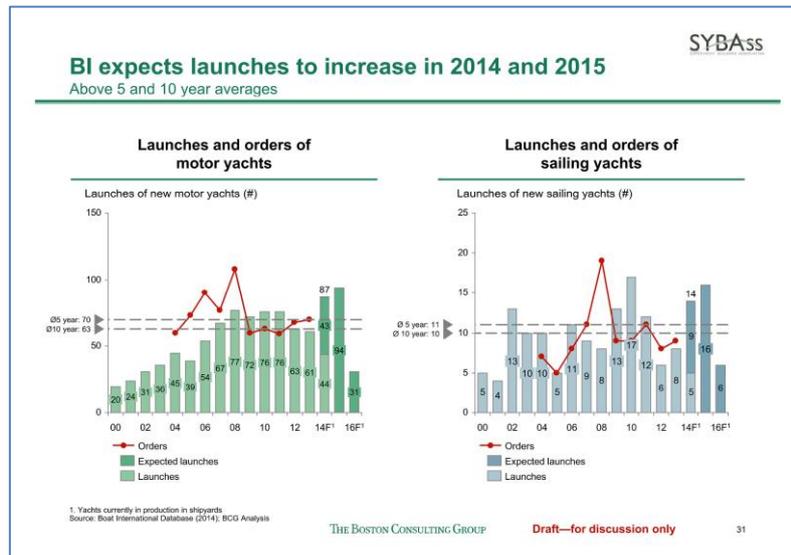


Figure 7: Launches and Orders

## 6. CONCLUSIONS

While regulatory oversight for internationally operating vessels has existed for many years, it has noticeably increased in tempo and volume over the last decades, and will continue to do so over the next decade. This is not surprising considering the world fleet has doubled over the last two decades [12], posing greater potential loss of life. At the same time, the number and average size of superyachts launched has increased every year, and they are manned by larger crews. Coupled with the ongoing effort to lower the environmental impact of the maritime industry and the movement towards strengthening seafarers' rights, this has led to a surge in regulation.

Given the steady growth of the number of superyachts, the increased legislation does not seem to have discouraged owners from ordering new superyachts in the past or in the coming years. Knowledgeable owners obviously understand that the regulatory oversight ensures improved safety for themselves, their guests and their crews, whilst the environmental impact of their superyachts meets the standards established by the international community. Owners lacking maritime knowledge should be spared regulatory horror stories, instead coming to see regulations as proof of a safe and sound investment [13].

Nevertheless, it is understandable that those who work in the yachting industry chafe at new regulations. International standards are set by the international community and there is not much our industry can do about them other than realising equivalent solutions that suit our ship type better. Compliance with new rules calls for an innovative approach involving extra time and cost, although it may also create opportunities for progressive shipyards [14]. The problem is that regulations are often drafted with large merchant vessels in mind, making them less appropriate for superyachts because of their different characteristics and type of operation. This can be avoided to some extent by active industry representation on the level where regulations are made or amended.

For this reason the REG flag states have created Industry Working Groups which meet annually to discuss possible improvements or desirable extensions of the mentioned Yacht Codes. Input to IMO committees and subcommittees can be achieved through relevant Non-Governmental Organisations (NGOs) with IMO observer status. Another possible route is through official national IMO delegations that often consult their industry stakeholders with regard to amendments or new conventions. It should, however, be noted that some disciplines in our industry could do a lot better when it comes to regulatory representation.

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