Inserve

marine technical services

Renown House
33/34 Bury Street
London EC3A 5AT
Tel: +44 (0)207 929 2379
Fax: +44 (0)207 929 2479
info@inserve.org
www.inserve.org

Mega Yachts – know the risks

20 years ago there was just a handful of yachts which would be termed mega yachts and which would have had values of around $50 million.

The demand for larger yachts increased throughout the 1990's as established yacht owners wanted to extend their cruising range, and for those wishing to charter, there was healthy supply of paying guests to help offset the running costs.

Shipyards more known for naval and commercial work turned their hands to yacht construction to help meet the demand for capacity. The traditional yacht builders had to invest in larger facilities as the 50 metre barrier was broken.

There are now over 200 yachts greater than 50 metres in length. Some sources report 125 yachts over 40 metres built in the last two years. It is said that there are currently 450 yachts in build of 30 metres and above.

So the industry is clearly booming with no sign of a downturn, and it is becoming more and more attractive to marine insurers. But what risks lurk beneath the glossy exterior? Let's take a look.

Private / commercial

There is a distinct difference between private yachts and commercial yachts. Yachts which are chartered and carry fee paying guests are considered to be commercial. As such they have to comply with certain rules for enhanced safety requirements laid down by the flag state, which more often than not is the MCA, as the leading red ensign flag, even though most large yachts are registered in the Cayman Islands or Bermuda.

The size of the yacht affects the rules which are applied. Up to 24 metres the yachts are surveyed by sub contractors approved by the flag state. Above 24 metres all yachts are surveyed by in-house surveyors in accordance with the MCA Large Yacht Code, which is in its second revision and commonly known as LY2.

Within LY2 the regulations governing the build become more stringent at 50 metres and again at 100 metres, although this is waterline length and doesn't include bow

flare and stern appendages such as swimming platforms. So it is possible to design a 60 metre yacht and stay within the 50 metre rules, and this is why it is common to find yachts with a waterline length of 49.9 metres.

LY2 is only applicable to yachts up to 3,000 GRT. Commercial yachts over 3,000 GRT are considered to be passenger ships, and at this point, a further level of requirements comes into force which also aims to secure a higher level of crew certification and passenger safety.

Class rules for yachts, including commercial yachts are notably less stringent than for commercial vessels. There are few restrictions on the levels of combustible materials which are used in yacht construction, and large quantities of wood, plywood and veneer are generally used. Fire dampers in ventilation ducts are often the fusible link type where there has to be a raging fire before they operate. Any yacht fires can be severe.

By comparison, private yachts do not have to comply with any rules and regulations. A private owner who is not interested in chartering his yacht and is not bothered about re-sale value, can ignore LY2 requirements and build whatever he likes. Although this is rare, there are large private yachts with very poor safety standards.

Design / construction

Most of the mega yachts are steel construction, some with aluminium superstructure, but very few with exotic materials, although some have high tensile steel.

German yards such as Lurssens have dominated the building of the very large yachts over 70 metres in recent years, leaving behind the Dutch and Italian yards that tend to be better known in the 50 to 60 metre range.

The steel hulls are filled and faired to provide a yacht finish and this can add significantly to the weight of the yacht. Paint coatings are expensive and hull damage repairs can be very costly for insurers. A minor contact damage can be very costly once steel renewals, fairing and painting are completed. Often, there is a dislike in carrying out a partial re-paint of a damaged area and some would argue that the entire hull must be re-sprayed.

Yacht design companies are now very sophisticated, but in the past, yacht designers have not always considered naval architectural issues. Some designs have been very artistic but difficult to achieve in reality once structural strength and stability have been considered.

Compromises have to be reached. Yacht designers might prefer to create a feeling of spaciousness but unfortunately fire subdivision and survivability in the event of a flood, creates the need for watertight doors and fire doors, often the scourge of the yacht designer.

There have been stability issues and well known cases where marble bathrooms

have been fitted and yachts have heeled over upon launching, but these are rare. Stability is generally satisfactory although damage stability can be marginal and most yachts will only have single compartmental flooding status.

Navigation

In our view the biggest area of risk is presented by navigation related issues. Yachts generally operate away from established trading routes. They go into relatively small crowded marinas and harbours, they navigate close to land, visit unusual parts of the world for sightseeing and exploring, anchor in unusual locations for watersports and beach access etc.

Some of the areas visited close to shorelines and around coral reefs will not be well charted so while echo sounders will be fitted, the seabed can change quickly in these locations, and groundings and contacts with the seabed do happen often.

The commercial entity for a yacht is the satisfaction of the owner who will always request to venture as close to the shore as possible when anchoring. It is a common occurrence for 50 metre style yachts to turn their propellers into tulips by striking uncharted rocks whilst weaving around each other trying to get into the best position. A lot rests with the skill of the captain as a negotiator to appease the owner without endangering the yacht.

A 50 metre yacht might have a draft of around 3 metres, and for a 100 metre yacht, the draft might be around 4 metres – not dissimilar to a small cruise ship. At the larger end, the captains are well aware of the limitations when close to shore and in any case, the tenders are larger and more suitable for carrying owner and guests to and from the shore.

Bridge equipment tends to be modern and extensive with electronic charts and heavy reliance on electronic aids. Traditional means of passage planning and position fixing are rarely followed. The use of paper charts is rarely encountered and often there isn't a proper chart table anyway. Electronic charts are not always of the approved type where they can replace paper charts entirely.

The general atmosphere on the bridge of a mega yacht is quite relaxed. The bridge is often seen as a social place rather than a work place. Bridge designs often include plenty of seating areas for guests, music is often played and this all detracts from the more traditional approach to navigation where the navigator stays on his feet and keeps a proper look-out and takes regular position fixes by a number of means.

Boat handling skills are generally very good, with Captains becoming quite adept at maneuvering the yachts - having regular practice, and rarely taking pilots. Some though, do not allow the chief officer to gain any experience and this can give problems when the chief officer steps up to become captain.

Maneuvering is often made easier by the use of bow thrusters and with modern bridge control systems. Again there is much reliance on the control systems, and back-up systems and other means of control are rarely tested. Shiphandling without

the bow and stern thrusters is now a dying art within the industry.

Dynamic position systems are becoming more common, but the navigators are rarely afforded sufficient training.

While getting bigger, the yachts are not so big that they can ignore the effects of heavy weather. Good weather forecasting and a good understanding of meteorological issues is important. Weather routing is rarely used but communication systems on yachts are very good and internet type weather forecasting is available to include wave heights.

With an increase in size comes an increase in range. Once the yachts became large enough to hold sufficient quantities of fuel, and the range reached 2,500 miles and beyond, then it effectively meant that worldwide cruising was possible.

Owners are looking for more exciting cruising grounds than just the Mediterranean and the Caribbean and the yachting industry is following the cruise industry in this regard. Large yachts will often use the berths intended for cruise ships when they visit some of the out of the way places which are emerging as favoured ports of call. Some of the more well known “explorer” yachts are converted from commercial vessels such as ocean going tugs, and this makes them a little more rugged and perhaps better suited for cruising in remote locations.

Marinas are getting busier and there are lots of bumps and scrapes when entering and leaving, ropes and ingestion of mooring chains around propellers etc. In close quarter situations, stabilizer damages are quite common particular the fixed fin and zero speed stabilizers.

In some berths such as Bonifacio, Corsica, yacht length is limited to 50 metres whereby some captains pull the trump card by using the waterline length instead of the overall length. Traffic flow is then impaired and there is contact between yachts and fouling of anchors and propellers.

Crewing

The yachting industry is suffering from a shortage of well qualified and experienced seafarers, as is the shipping industry in general. Figures vary but current personnel shortages in the region of 5,000 have been mentioned. Yacht crews tend to spend long periods of time on board, with very little leave. There is rarely a proper work/leave structure and the industry therefore tends to attract younger people who enjoy traveling and don’t mind spending long periods away from home. Older, more experienced, more qualified seafarers are not so common on yachts other than perhaps in captain positions, and to a lesser extent the chief engineer’s position.

There may be an operating crew of around 15 to 20 on a 50 to 60 metre yacht and well over 50 on a 100 metre yacht, although this can increase significantly when the owner’s entourage arrives during a cruising period. On charter yachts the crewing levels are more stable.

At this juncture it is perhaps important to point out the difference between staff, crew and guests. Owners and guests on a commercial yacht cannot exceed 12 in number or the yacht would need to hold a passenger ship classification. Therefore any staff that owners bring with them are signed on as a supernumaries to ensure that the maximum number of official guests can be carried. Whilst this practice is common within the industry, use of the supernumary clause within the articles of agreement should be discouraged. The reason for this is the limitation of the life saving appliances. The yacht has safety equipment based upon the maximum number of crew and guests and the supernumary (staff) are not generally accounted for. Obviously there is usually scope for a small number of supernumaries onboard, but it is the crew on board a yacht who are required to undertake fire fighting, first aid and sea survival training to deal with emergency scenarios. The supernumaries however are not trained in these areas and as such become potential additional casualties for the crew to deal with.

Navigating officers and crew are generally not so highly qualified, often having “Yachtmaster” type qualifications, or low grade commercial “tickets”. Charter yachts are better in this regard, but for owners of private yachts which do not carry fee paying guests, there are few rule requirements. Private yachts can employ navigating personnel without any formal qualifications. The flag state do not apply any minimum manning levels etc and the only body who is in any position to require the right numbers of suitably qualified staff is the insurance company. Of course, the owners do not want to employ just anybody, and there will be a degree of professionalism required. Captains often become very close to their owners, and professionalism, trust and friendship exist.

Private yachts often pay high salaries so while there can sometimes be a lack of competence among the crew, good people are often attracted whether formally qualified or not, and this apparent lack of crew competence is often offset in other areas, i.e. private yachts tend not to trade so extensively, and have more time and money for maintenance.

Fatigue can be an issue at times, particularly when chartering or working for a demanding owner. Long hours can be worked trying to meet the demands of the guests, preparing tenders and other leisure equipment, taking guests to/from the shore, and also take the yacht from A to B over night, ready for more fun and frolics the following day.

The quality of rest periods for the crew can be poor on some yachts. Crew cabins are quite cramped and it is common to have two sharing a cabin but on some yachts four berth cabins are found. On one yacht the four berth cabin for the deck hands was affectionately termed the pig pen, and while it might have seemed humorous to some the new ILO Maritime Labour Convention will help to put a stop to this kind of thing, and yacht owners will have to relinquish more space to the crew in future.

Traditionally, crew members would drift into yachting. They might be back packing around the world, need some money and find day-work on board yachts painting and cleaning. After a period of day working, some would be offered jobs sailing on

board. It was quite common for crew to move around from yacht to yacht, gaining more experience and aiming for bigger yachts and more money. Jobs were often heard about in bars in the evenings where yacht crews gather, and in all yacht destinations there are well known places to go to meet old friends, discuss yachts, jobs, latest news and gossip.

Interior staff such as stewards, stewardesses and cooks often drifted into yachting from seasonal work in hotels or from working overseas as au pairs.

Officer positions, if you can call them that, were also traditionally filled in this way if the day worker had sufficient engineering or nautical knowledge or took the trouble to obtain it though studying, although few followed any form of structured training regime as would be found on commercial ships.

More recently the crewing has become more formal and the traditional day worker entry level has diminished but not gone altogether. (This is quite a good thing as there were a lot of day worker injuries, essentially due to poor supervision) Crewing agencies are now extensively used to provide officers, interior staff and crew with the necessary qualifications and experience – as best they can. Shortages in personnel and a laxity in the requirements, particularly for the private mega yachts, raises the risk of staff being employed who are lacking in certain areas.

Crew training is rarely seen as an obligation of a yacht owner. Few owners encourage their crew to log their sea time and extend their knowledge by attending courses and passing certificates, as in the commercial world. Some yacht courses now exist specifically for yacht crews which is good, but more use needs to be made of them. The hire and fire mentality still exists in a lot of cases, and crew members often move around from yacht to yacht, which is good for experience but makes it difficult to build a proper career.

Officers are now more commonly entering yachting from the commercial shipping world, looking for a better lifestyle, and while they were previously seen as intruders by the traditional yachties, it is generally recognized that they are needed for their qualifications, although some have difficulty adapting.

Machinery

The machinery is mostly medium and high speed diesel engines driving propellers, but occasionally there will be other unusual installations such as waterjets and gas turbines. Yachts can have quite complex machinery installations which are not always fully understood by those on board and great reliance is then placed on shore support, which might not always be there.

Diesel engines and marine machinery in general are often selected for their power / weight ratio. Weight is often critical when building a yacht because they commonly go over-weight during construction, normally due to the materials used in the accommodation areas, so designers do all they can to keep weight down elsewhere.

So there is tendency for yacht designers to select an engine installation with the best

power / weight ratio rather than the best reliability or fuel economy. Marine diesel engines installed on yachts are often at a high rating or pleasure craft rating, which affords perhaps a 10% increase in power output compared to the same engine when installed on a commercial vessel, fishing boat or ferry. This is based upon the engine manufacturer's expectation that the annual running hours will be relatively low.

This theory falls down where a lot of mega yachts are concerned. Mega yachts, particularly those that charter or are used extensively by an enthusiastic private owner, can accrue almost as many running hours per year as a ferry or other vessel in commercial service.

When engines are given a pleasure craft rating maintenance needs to be enhanced / increased in frequency, and this often overlooked.

Machinery monitoring is mostly electronic and there is much reliance on alarms when things go wrong. Traditional watchkeeping is rarely practised. Yacht engineers rarely make a "round" of the engine room and fill in a log book in the conventional sense. Record keeping is poor. Machinery spaces tend to be unmanned, with the engineers attending regularly throughout the day but responding only to alarms at night when something goes wrong.

There can be some radical designs for machinery and machinery installations, and some yachts have impressive speed and power. However, most of the time the larger yachts potter about at reduced power levels, which might on the face of it appear to be of some benefit to longevity but it can have the opposite effect in that the engines become affected by incomplete combustion, bore polishing, internal fouling etc. Large high performance engines need to be operated at reasonable power levels.

The high standards which are demanded by yacht owners force people to err on the side of caution, so as not to risk the wrath of the owner should the yacht break down. This can create a "fear of damage" whereby during maintenance for example, a potential problem is found. Claims are sometimes made for "damages" which would never be considered damage in the commercial shipping world.

Maintenance

Levels of maintenance are generally very good, but not always focused in the right areas. A planned maintenance system often exists but is rarely followed. Unlike a high speed ferry for example, a mega yacht is not built and delivered with an operating manual and a maintenance schedule.

Large amounts of money are spent during refits and maintenance periods, and there tends to be a policy of total renewal, rather than make do and mend, which does have a beneficial impact on reliability.

Maintenance is however, rarely organized properly. Yachts often go into shipyards without any clear repair specification having been drawn up, and the outcome is a haphazard and inefficient approach to maintenance.

Yacht yards may have some degree of liability cover but rarely sufficient for the values at stake with large yachts, hence they require a Waiver of Liability to be signed and this effectively transfers the risks during repairs to the yacht insurer.

There is a lot of reliance on shore contractors and engine manufacturer's representatives. Levels of supervision of the contractors is not as good as it could be, and rarely is there a "superintendent" in attendance, to ensure that contractors are properly supervised and repair work conducted to a satisfactory standard.

When an item of machinery fails or begins to wear out, the tendency is to renew it with same or better. There isn't a claim mentality on board yachts, so few maintenance related claims are experienced.

We have mentioned that yacht engines are often selected at a power rating above that which is normally applied in the commercial field. As a result, overhaul intervals are reduced.

One of the more common engines found on yachts is the MTU engine. These are well engineered and reliable if they are maintained according to the manufacturer's maintenance schedule.

The problem for yachts, is that engines such as MTU have to be removed and sent back to the factory for their major overhaul. This might be after 10,000 running hours in the commercial world, but at the higher yacht power rating, this will reduce to say 6,000 hours. On a busy mega yacht this could be accrued after two years. The problem then arises that the yacht has to be dry-docked, engine removed and overhauled and refitted. This can be quite some operation, as designers rarely allow for this, and holes have to be cut in the side of the yacht, with all the problems that this brings.

Therefore there is a tendency to continue with intermediate overhauls and ignore the need for the major overhaul until it becomes absolutely necessary, which can mean delaying it until something fails.

Costs increase dramatically in maintenance situations where engines have to be removed from the yacht, and of course, if there is an engine damage and insurers have to pay for the removal and repair, the claim can be very high indeed.

Drydockings are a high risk area. Docking plans are not always referred to and sometimes not available, whereby damages can be caused when docking down. For the larger yachts, commercial drydocks are often used and there isn't the degree of supervision or care taken. Dedicated yacht yards are few in number and very busy. Surprisingly, the standards of workmanship in yacht yards can be quite low. Workforces are stretched and repairs and refits often go over time and over budget.

Rarely is a repair specification drawn up and agreed in terms of cost and time, prior to a yacht entering a yard, leaving the contractual obligations undetermined and repairs often proceed in an ad hoc fashion, to no particular quality standards.

Safety

Fire risks in machinery spaces are generally quite good. The typical oil on hot surfaces type of fire in the machinery space is rare. The engine exhaust systems are often water cooled where for example MTU engines are used, and any lagging and insulation is kept in good condition. Similarly, the engine rooms are kept very clean and any fuel or oil leaks dealt with immediately.

Fire risks elsewhere are worth considering. Petrol is often carried on board for use in tenders and jet skis, sometimes in quite large quantities. Where yachts use helicopters or sea planes, jet fuel is also sometimes carried, with the associated risks, particularly when refueling.

Fires are a concern when yachts are tightly packed into a marina, and a fire on one yacht will spread to others and the result could be catastrophic.

Charter yachts are required to have formal safety management and security, and some are being very professionally operated. Outside of this, there is no requirement for safety drills and practices and there is very little safety awareness among the staff.

On the other hand, high risk operations such as hot work and tank entry are rarely practiced other than in shipyards.

Liabilities

Crew injuries are quite common as the crew partake in various tasks such as washing and cleaning the outside of the yacht without the proper safety harnesses and a reluctance to wear proper personal protective equipment, PPE, in favour of casual yachting clothes. A permit to work system is rarely followed, nor other formal procedures such as posting notices when divers are down or posting notices to prevent radars being switched on when working aloft.

There is a “gung ho” approach to a lot of tasks such as launching and recovering jet skis and tenders, jumping on and off the yacht from the tenders, tender driving etc. Tenders and jet skis when driven by guests present a significant risk. Some marinas and harbours have speed restrictions and in some cases total bans on jet skis which can result in fines.

Day workers injuries occur due mainly to a lack of safety training, supervision, knowledge of the cleaning and painting products they are using and things like inadequate ventilation of the work space.

There is rarely a structured regime where cleaning and maintenance tasks are organized harmoniously in advance. There can be times when an area has been cleaned and painted by the deck crew, only for the engine staff to come along and dismantle it for maintenance.

Yacht security can be quite poor on the smaller yachts where crew numbers are

limited. There is rarely a formal gangway watch, preferring instead to rely on locked external doors and CCTV coverage from the crew mess or bridge areas, but it wouldn't prevent a determined intruder. On the larger yachts the situation is better, with more advanced security systems.

Furnishings, ornaments, art can be very valuable and not often alarmed in any way, so thefts do happen. Some ornaments and valuables are not really suitable for carriage on board a yacht and can be damaged in bad weather conditions.

Pollution

Pollution risks are quite low. The yachts generally burn clean diesel oil. Bunkering is carried out with cleanliness and care. Fuel tank vent pipes are not welcomed on a yacht so the fuel tanks are mostly arranged to overflow internally into an overflow tank which is alarmed.

Bilge areas are kept clean and dry, so there isn't the volume of bilge water to dispose of, and what there is can be retained on board or disposed of through the oily water separator.

Processing black water and galley wastes can be a problem area and while there can be some unsavoury discharges, they rarely develop into pollution incidents.

Management

The management of large yachts is an interesting aspect of the overall risk profile. Management expertise is often lacking where an owner may trust the management of his yacht to his lawyer or accountant, who doesn't have any real understanding of technical issues.

Yacht management companies are commonly used to provide crewing, technical and often chartering services. The technical support can be rather relaxed, and there is often nobody acting as a superintendent, in the true sense of the word, i.e. going on board to ensure that the yacht is being operated safely and is being properly maintained.

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