

HELICOPTER OPERATIONS AT SEA



A PRACTICAL VIEWPOINT
BY CPT. ROBERT HUBBLE

THE YEAR ON YEAR INCREASE IN THE WATERLINE length of Superyachts has afforded designers, clients and builders the opportunity to build ever more imaginative and challenging vessels. Thus enabling the provision of ever more exotic tenders of which the helicopter is no longer a rarity, especially in explorer yachts and support vessels.

Commensurate with the growth of embarked aviation has been a gradual shift in emphasis towards the helicopter being viewed as much an integrated part of the Superyacht as a Gymnasium, Jacuzzi or the fire suppressant system. This change in emphasis has been brought about largely due to legislation which came into force to protect all those involved with embarked helicopter activity by ensuring that the operations are carried out in a safe manner to recognised standards and practices.

The current legislation has drawn heavily on the experience of the offshore oil industry which in turn gained much its knowledge from the military who pioneered embarked helicopter operations. Both of these environments are harsh, unforgiving and demand high degrees of skill, reliability from the aircraft and high levels of cooperation from the ship or platform. I know from personal experience that safely recovering to a ship in a gale when miles away from land demands teamwork of the highest order. Of course, most current helicopter operations to Superyachts take place during daylight in relatively benign environments close to land in calm seas. However, with the advent of larger explorer yachts with ice class certification and hangarage, the temptation to push the boundaries of current practice is perfectly understandable and it will not be long before night landings

become more commonplace and operations in remote areas in more demanding environments will become the normal expectation of the client.

In order to move into this new sphere of operation the helicopter has to be totally integrated within the whole yacht right from the outset of the concept and design stages and it is here that the provisions of the legislation come into their own by ensuring that all the aspects of the helicopter are considered. Regardless of the envisaged level of helideck usage, these considerations range from refuelling and maintenance to hangarage and safe operational procedures with a trained and competent deck crew and command. This is in addition to the structural and aesthetic aspects of the design.

In recent years the aviation industry has spent much energy in researching the cause of accidents and in particular how good design allied with high quality training and personal awareness can mitigate against human fallibility. Accident prevention starts at the design stage, not only in the physical design of the landing platform but also in the design of procedures, routines and on board training programmes. A significant feature of these routines should be a comprehensive pre-flight brief which includes all the key personnel involved in the launch and recovery of the helicopter.

Despite helicopters having the image of being glamorous playthings, they are in reality highly complex pieces of precision engineering which require forethought, planning and awareness if they are to be used safely and effectively from a Superyacht. When operated in a considered manner it is only the imagination of the operator which restricts the activities of a helicopter. It can extend far beyond the ferrying of personnel to and from the yacht. A helicopter can view the passage ahead and can help plot a way through the narrows to an excluded beach or inlet. It can pre position supplies and equipment to the shore and can act as an airborne spotter, and guide ribs or tenders to the most advantageous point to view wildlife.

In order to get the best out of this embarked asset requires a mutual understanding of what is a safe and reasonable task. For this there has to be an understanding of the basic principles of helicopter operation. The Captain of the yacht is responsible for all activity on the helideck and when deciding if it is safe to operate the helicopter must consider not just what the weather and sea state are at the time of launch but also the forecast conditions at the likely time of recovery.

Indeed, getting back onboard the ship is probably the most demanding part of the flight, especially in marginal conditions. In coming to his decision the Captain must also take into account the ability of the pilot, how much he has flown to a deck, when he last flew to his deck and also how well trained and capable the deck crew are and their ability to deal with the prevailing

conditions. In deciding whether to fly or not the Captain and pilot should also consider the many 'what ifs' such as a ship machinery failure, deterioration in the weather, radio problems, minor unserviceabilities with the aircraft or ship, where is the diversion and can a sea boat be launched in the event of a ditching. Consideration then has to be given to whether the occupants are sufficiently dressed and equipped to survive a ditching or forced landing ashore. With a demanding client and an eager pilot desperate to prove his worth and push back the boundaries of his experience, saying no is extremely hard and here a good working relationship and mutual understanding between client and pilot is essential. A helicopter ceases to be an asset to the yacht when clients are loathe to use it because of having been frightened in the past. It is also vitally important for the command not to focus on the operating requirements of the helicopter at the expense of basic seamanship and ship navigation, a self discipline which can be easily forgotten in the adrenalin fuelled excitement of challenging conditions or the needs of the client.

A helicopter flies by inducing airflow over the rotating airfoils and deflecting this downwards thereby producing lift from the rotor. When the helicopter is in a hover it has to generate enough lift to support its own weight. In forward flight the amount of power required to generate the lift is reduced by a horizontal component of air. This is called Translational lift which generally becomes apparent with 20 knots of wind across the disc and means that the engines normally only need to produce full





power in a still air hover. It is this power requirement which determines the payload of the helicopter and although the manufacturer may state a certain figure, the realities of operating in hot temperatures can severely reduce the power available and hence the payload. With such a reduced power margin the recovery of the aircraft to the deck requires that the ship give the most advantageous wind; if the ship can provide a course and speed to give 20 knots or so across the deck then the helicopter will remain in translational lift for much of its flight thereby maintaining a greater power margin. This is especially important should a twin engine aircraft suffer a single engine failure with no shore diversion and is an important consideration at the pre-flight brief where all contingencies should be discussed.

As with ship propeller theory, the propeller or rotor is only truly efficient when in a freestream; recirculation generated by hovering in proximity to superstructures reduces that efficiency thereby increasing the power required from the engines. Again, good ship/helicopter understanding will ensure that at the time of take off and landing the ship will generate, insofar as possible, the best possible wind across the deck. This is relatively simple with a decent amount of sea room but can still be compromised by the need to keep deck motion within limits for the aircraft. When at anchor the ability to manoeuvre is far more restricted and it may be the case that a helicopter can only be operated subject to the serviceability of manoeuvring and positioning devices such as bow and stern thrusters. In a tight anchorage the factors impinging on the ship and helicopter become more complicated and may well require some tactful negotiation with adjacent yachts especially when the approach path of the helicopter needs to be factored into the equation. Again, a full pre-flight brief will address these considerations. Thinking 'outside the yacht' is essential if operating from alongside a quay as safeguards must

be taken to ensure that onshore activities do not create a hazard for the helicopter in the form of loose items or rubbish that can get drawn into the engines or damage the rotors. Equally, it is important that the downwash from the helicopter does not cause damage to adjacent yachts or shore facilities.

As mentioned earlier, the secret of safe and effective helicopter operations is communication and mutual understanding among all the crew. To this end it is important that new crew are swiftly encouraged to consider the helicopter in their daily routines, it is not uncommon for a new view on a subject to generate an innovative way of securing soft furnishings or evolving routines to increase the safety and efficiency of the operation. In this respect it is vital that the whole crew feels involved with the helicopter and a continuing education programme is a cornerstone of this involvement. The questions generated may well highlight problem areas and by becoming part of the solution process the crew will not consider the helicopter as someone else's part of the ship.

For a Superyacht Captain, having a helicopter on board significantly increases his responsibilities and greatly adds to the flexibility of his operation. The aim is to get the most out of the aircraft whilst minimising risks to the client and crew. The helicopter, if fully integrated into the operational and working routines of a ship can be a tremendous asset. But as with all things it takes continual effort, communication and mutual understanding to get to that state of integration.

Throughout this article the phrase communication and mutual understanding has been frequently used. This is to emphasise a maxim long extant in aviation that there is no such thing as a silly question and the aim should be to generate an environment where it is acceptable to ask questions which to others may appear to have obvious answers. Ask yourself, how

many times you have been pleased that someone posed a question that you wanted to ask but did not do so for fear of appearing foolish. Accident statistics are sadly over populated with events where had a passenger or crewmember voiced a concern then the chain of events leading to a catastrophe would have been broken and many lives would have been saved.

There are many variables in the equation which governs safe helicopter operation and this article has only the space to highlight a few but there is one factor which underpins the safe and effective operations of helicopters at sea and is no different to all seagoing activity namely that of trust borne out of training, mutual understanding and communication. >||

About the Author

Trained as a Royal Navy officer and specialising as a helicopter pilot, Robert has over a quarter of a century of embarked aviation experience including a significant number of day and night deck landings. He is now utilising these skills through Helios Maritime Aviation, working on a number of projects helping designers translate, interpret and apply the MCA large yacht requirements to the needs of yachts both with a helicopter deck and also those with a helicopter hangar.

During his full time RN career he operated and instructed on all the serving types of helicopter in a variety of environments from

the arctic to desert and in a variety of roles which included VIP transfers, anti terrorism and SAR (search and rescue). Specialising in operating the Lynx helicopter from frigates and destroyers he was flight commander on several ships and was responsible to the Captain for all aspects of embarked aviation including planning of maintenance, integrating the operation of the aircraft within a tight programme as well as educating and training ships personnel in all pertinent aspects of embarked aviation.

Promoted to become the Chief Pilot of a trials and evaluation squadron he was subsequently appointed to be accountable for the standards and practices of all Lynx operations both embarked and ashore and was instrumental in designing procedures, training and integration of new technology within the Lynx fleet.

Possessing both rotary and fixed wing licences, Robert is also an Airline Captain qualified on Airbus jet and Dash 8 turboprop aircraft where he is a CAA approved Type Rating Instructor and is also an airline CRM Manager and instructor (The exemplar for Bridge Resource Management). He still instructs with the Royal Navy as a reservist on the Lynx operational conversion squadron.

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