

# Marine

## News

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## Dredging & Construction

*A torrent of work beckons*

**Salvaging an Ecosystem**

**For the Greater Good**

**High Speed Craft**

**COTS Solutions**

**Maritime Education**

**Early Exposure +  
Immersion = Employment**



A man in military camouflage and sunglasses is seated at the helm of a fast craft. He is looking at several electronic displays. The largest display on the left shows a live video feed of the vessel's wake. Other smaller displays show radar and navigation data. The man's hands are on the controls, and he appears focused on the task.

# Fast Craft and Innovative *COTS Solutions*

***Many variables drive the design decisions for High Speed Craft and RHIBs. Commercial off the Shelf Solutions often tie all of these together.***

**By John Haynes**

The world is changing fast and nowhere is this truer than in the fast boat sector. When selecting a new boat, the questions used to be relatively simple: how long, how many engines, what fuel type and how fast? Military and professional maritime organizations have been driving the evolution of extreme fast craft for over 30 years. Naval architects, engineers and boat builders have risen to the challenge, producing unique boats in aluminium, fiberglass and composites engineered to deliver high performance. The next stage has been ensuring that structures, equipment and crews can withstand the resulting forces. Commercial off the shelf (COTS) equipment is an increasingly important part of

the solution, for more than one reason.

## **Changing Requirements, New Platforms**

Since the millennium, RHIBs and High Speed Craft (HSC) have been at the cutting edge of maritime operations for everything from counter terrorism, homeland security and law enforcement to extreme weather rescue. Looking to the future, navies and coast guards around the world will make financial, environmental and operational decisions to use fewer ships and more boats to secure their coastlines and waterways. For military and security applications, the next generation of RHIBs and HSC will need to be larger, faster, multi-role craft with the same navigation, communication

and information systems that are found on a ship's bridge. Many fast craft will include modular design features that allow them to vary their internal and deck layouts for different mission profiles or as their role changes over time.

Although Offshore Patrol Vessels (OPV) are used all over the world to cover large areas of water, it is the ship's boat

that is launched to board a suspect craft. Visit, Board, Search, Seizure (VBSS) are maritime boarding actions that range from anti-piracy to conducting customs, safety and other compliance inspections. As sophisticated criminals increasingly use sea transport the specification of law enforcement and security craft is evolving. The motivation is high when typical illegal cargoes include narcotics, arms and people. Smugglers operate from all sizes of vessels while the boarding teams and naval forces usually transit from a larger vessel to the target in 25 to 40 foot RHIBs.

An increasing role for larger RHIBs and HSC is asset protection or high interest vessel escort which requires a moving security zone as ships approach or leave a port. This level of positive control requires multiple craft supporting interoperability between military, police and government agencies. OEM boat builders providing craft to this sector need to fully understand the end-user requirements. Specialist solutions include lightweight ballistic protection, shock mitigating seating linked to control systems and sophisticated surveillance electronics. With a full situational awareness suite the electronics may now be higher value than the standard boat. But with all this technology various organizations still require an alongside ramming or 'hard contact' capability to physically intercept other craft.

The call for extreme fast craft with specific requirements and capabilities has led to innovative designs including catamarans, multi-hulls and novel hull forms. However the process of one-off craft design and bespoke equipment can mean that in the period from concept through tender to launch the requirement has changed, technology is outdated or the craft has simply become too complex for its original LOA. Timelines and budget constraints are increasingly driving procurement decisions. By identifying

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the priority roles and accepting a level of compromise various Commercial Off The Shelf (COTS) hull, engineering and equipment solutions are increasingly viable.

RHIBs make excellent personnel carriers. The inflatable collar makes the craft extremely versatile by providing high stability and the ability to fender off vessels without

damage. Foam collar designs offer a heavy duty fender that can be cut, perforated or shot but will not deflate. Tampa Yacht Manufacturing (TYM) is working with clients around the world to create cost effective COTS fast craft platforms. Robert Stevens of TYM said, "A RHIB with air filled tubes is often a good choice for stopping and searching other craft. If resistance is expected then foam filled tubes backed up with ballistic protection may be required. A proven performance hull can be utilized for various applications. Our designers simply re-configure the layout and onboard equipment for patrol boat, law enforcement or fast rescue applications."

### Wide Range of Operations

Maritime organizations use RIBs and HSC to perform a wide range of operations. The consistent aim is that crews arrive safely at their destination ready to do a job, or in some cases 'fit to fight.' When extreme fast craft simply have a design objective for 'unbreakable boats with a surplus of engine power' then 'man' becomes the weakest link. To maximise crew performance, increase sea time and ensure a high mission success rate professional operators need to identify what sea conditions could be encountered during transits, then ensure that the type and size of craft they are using is suitable for the purpose.

Brunswick Commercial & Government Products (BCGP) is continuously expanding their ranges of inboard and outboard craft ready for outfitting to client specifications with high end onboard electronics and various COTS component and equipment options. Jeremy Davis, Director of Sales, told *MarineNews* in April, "BCGP has been a flagship range for over fifty years in the 15 to 27 foot range. To meet the changing needs of our professional clients we are now building Whalers up to 42



## VESSEL DESIGN

CTruk THOR Twin Hulled Offshore Raider



feet and our Impact RHIB range up to 40 feet. To ensure that we cover all mission requirements BCGP now offers the Sentry aluminium series, based on a supply agreement with Metal Craft Marine to produce our hulls up to 45 feet.”

### **COTS Systems: smart & cost-effective**

Patrolling is often at low speeds, interception is not. Border forces, law enforcement and critical asset security operators have discovered that to run these multi engine rigs at full power it is essential to have stronger steering systems, more responsive throttles, performance exhaust systems plus drives and propellers that transfer power into thrust and control. The high performance components industry that has emerged around the demanding race boat community of Southern Florida has developed COTS materials that can be retrofitted as upgrades, or specified on new professional sector boats.

Navigation and communication units with are classic example of COTS systems. It is relatively simple to identify potential systems, then do side by side comparison of functions and durability. There is no reason why a modern nav or comms system should fail, however as all boat operators will tell you, ‘electronics and water still don’t mix!’ A cost effective solution is to hold spare units to ‘plug and play’ or have an ASAP delivery agreement for unit



Image shows BCGP and Metal Craft Marine joint production 36' Sentry configured for on water rescue support within the vicinity of civil aviation runways.

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replacement. Integration is still an ongoing issue with both bespoke and COTS hardware including GPS / chart plotter / radar / AIS units and the associated software. Beyond this, many organizations, especially law enforcement and SAR, now need traditional marine electronics to integrate with PC applications, tablets and smart phones.

Fuel management is an important consideration for all planing craft. If fuel budgets become an issue crew training is usually reduced with craft only launched for operational purposes. Top speeds for interceptors can exceed 60 knots, but these 'burst speeds' are rarely used as high performance boats have a recommended cruising speed linked to optimum fuel range. Commercial planing craft, including pilot boats, crew boats and windfarm support craft generally operate at fewer than 30 knots or they burn too much fuel and cannot complete the day's work.

As a result of high fuel prices in Europe, workboat and windfarm support boat operators need hard data to ensure that their transits are profitable. These vessels are on contracts that require them to operate continuously seven days a week, only stopped by significant wave height limits. Electronic COTS systems are now available that utilise various sensors to record the fuel consumption history of any vessel. The systems are designed to manage and ultimately reduce fuel consumption for professional operators. For example, C-Sense Project Leader, Pierre-

Alexis Dormegnies said, "The Eco-Pilot has an onboard memory which allows two years of fuel consumption to be recorded. The precise analysis of fuel consumption history enables Eco-Pilot to model a set of typical future consumption figures, suggesting economic actions to reduce fuel consumption."

It is no coincidence that smugglers of people and contraband often select RHIBs. This is simple market forces at work as RHIBs are relatively cheap and ready to use, off the shelf. If the buyer finds a boatyard that asks no questions, the RHIB concept allows for stretched hulls and multiple outboard set ups. With no procurement process to go through, no pollution or environmental compliance, no health and safety concerns and no fuel budgets this can deliver a very simple and efficient platform. At the recent Fast Patrol & Interception conference in London, high level maritime agencies from three countries demonstrated that simple is good. They all showed smugglers boats that had been impounded then re-badged as interceptors. These are known as 'modified boats' or 'reformed boats'. This Captured Off The Smuggler version of COTS can be viewed as innovative re-cycling and effective budget management.

Looking globally various regions are building fast craft fleets from zero. Some organisations consider the craft to be a mobile platform that gives them a presence across a



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**shock**  
MITIGATION



specific area of sea or coastline. The term 'L1' associated with a tender simply means that in order to get the maximum number of craft for their fleet budget, the lowest bid typically wins. As specialist COTS solutions evolve to respond to these end-user requirements the percentage of COTS equipment on all fast craft is likely to increase.



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