NEW BUILD - 13.8m Pilot Boat...

Listing ID - 1758

Description	**NEW BUILD - 13.8m Pilot Boat**
Date Launched	Built to Order
Length	13.8m (45ft 3in)
Beam	4m (13ft 1in)
Location	ex Shipyard, China
Broker	Geoff Fraser geoff.fraser@seaboats.net +64 21 61 222 5

1, GENERAL

1.1 General Description

This 13.8m fast pilot boat is one of our small-sized pilot boats developed based on our technology IP—the K-TOUGH Hull Platform—which is today's most advanced and rough sea capable basic hull technology infrastructure platform featuring the KINGTOUGH exclusive reconstruction in basic theory for hull design which is innovated particularly to remove the most striking headaches/problems of today's high speed boat operations due to limits/flaws in the human understanding behind the classic deep-V hull theory that has been employed for hull design of more than 99% of high speed boats of today including pilot boats. As such, the intention is to offer a series of small pilot boat solutions that can offer far higher value for safety and performance than the money to be paid for it while with no compromise in pilot carrying capability (no matter big or small, pilot boats are designed to only carry 6-8 pilots in the wheelhouse and we have kept 6 seats for pilots in this very small 13.8m boat which is same as in our delivered patrol boat version).

Compared with the classic deep-V hull theory based boats, all K-TOUGH Hull based boats will ride with fundamentally different behaviors that will change landscape of today's industrial capability for high speed boat operating safety, performance and comfort, detailing as follows:

Unlike the classic deep-V hull theory based boats that are rocking from portside to starboard and then again and again when riding at low/displacement speeds, the K-TOUGH Hull theory based boats can do low speed move extremely stable just like walking on land(video available as proof), securely extremely high level of comfort in low speed maneuvering for coming alongside quayside or leaving the harbor, which is of vital importance for pilot transit and the shifting of pilots between the pilot boat and commercial ship in adverse conditions;
Unlike the classic deep-V hull theory based boats that are highly lifting the forward hull section above water when transmitting the speeds from displacement speeds to planing speeds, the K-TOUGH Hull based boats are transmitting its riding mode from displacement speeds to planing speeds smoothly and gentle without significant bow up, because the unique hydrodynamic characteristics of the underwater section of our boats has been set to allow oncoming water to meet the dynamic forward waterline entry to evenly lift the whole boat along the hull length rather than simply hitting the forward hull section of the boat to cause a high water slope like what is found in the classic deep-V hull theory based boats;
Unlike the classic deep-V hull theory based boats that are riding with very exciting and unstable behaviors that get the dynamic forward waterline entry to be always changing and for most of the time to significantly move back to the midshio hull bottom and even the aft hull bottom to allow oncoming waves to directly hit the midship hull bottom to cause strong vertical acceleration to be imparted to both the hull structure and the crew onboard, the K-TOUGH Hull theory based boats can self lock their riding behaviors to sustain extremely smooth, soft and stable ride even over 60 knots and with nearly no speed loss even in open sea waves---The V-shaped bottom to meet waves in our boats at high speed has the deadrise angle to be approx. 60 deg. while the V-shaped bottom for competing boats to meet waves at high speeds only has the deadrise angle to be around 25-28 deg., which means
our K-TOUGH Hull based boats can easily cut through waves to make the way ahead without effort, thus hull slamming has been fundamentally reduced to extremely low level, which is a very irreplaceable capability for a modern fast response pilot boat because real-world mission is always combined with tough weather;
Unlike the classic deep-V hull theory based boats that are maneuvering with extremely large heeling angle and high tendency of throw-away phenomenon and side skidding, the K-TOUGH Hull theory based boats can self stabilize themselves even when doing very high speed sharp turning, making safe tactics operation secured with confidence;
Unlike the classic deep-V hull theory based boats that have to face very wet deck in rough seas due to unstable vertical stability at the bow and problematic design in the run of topside geometry(no matter the bow is conventional raked bow with flared topsides or is radical slender wave-piercing bow), the K-TOUGH Hull theory based boats can ride fully dry even in sea state five to allow extremely safe deck working capability;
Unlike the classic deep-V hull theory based boats that are facing terrible heaving motion and pitching motion (heaving and pitching motions refer to the situation when the whole boat is to be frequently and dramatically lifted and then lowered, and the bow highly lifted with stern deeply down and then the stern highly up and the bow deeply down in waves) when carrying berthing and boarding operations alongside commercial ship, there is very little sign of heaving motion or pitching motion in rough seas for any of KINGTOUGH boats designed based on same K-TOUGH Hull platform;
Unlike the classic deep-V hull theory based boats that are very sensitive in speed and loading condition, there is very little impact to the speed of our K-TOUGH Hull theory based boats even at overloading condition due to the special bottom profile of our hull design.

To confirm above, we have carried out back-to-back sea trial comparison between this K-TOUGH Hull theory based 10.6m boat in patrol boat version with a classic deep-V hull theory based 20m fast patrol boat. Though this 20m boat is 5-6 times heavier and the construction cost is 4-5 times higher, the real-world rough sea handling capability is something to be second killed by the very small 10.6m boat with the hull length to be only 9m which only has approx. 1.4% of speed loss when operating in sea state five as recorded by GPS, which is something that has been far better than what the classic deep-V hull theory can reach.

To secure a truly hard-working boat in hard work, the vessel will be constructed just like the other many of our KINGTOUGH boats to an extremely high commercial standard with particular attention to minimising noise

transference and vibration while enhancing structural rigidity and integrity, and offering best crew comfort and mission-capability.

Principal particulars:

- LOA: 13.8m
- Waterline Length: 12.4 m
- BOA: 4.0 m
- Hull Beam: 3.4 m
- Chine Beam: Approx. 3.2 m
- Depth(at hull side of midship): Approx. 1.8 m
- Freeboard(at bow in static condition): Approx. 1.45 m
- Freeboard(at bow in dynamic condition): Approx. 1.65 m
- Draft (hull): Approx. 0.7 m
- Displacement (lightship load): Approx. 6.5 tonnes
- Displacement (full load): Approx. 8.5 tonnes
- Deadrise(Transom): 28 deg.
- Deadrise(Forward entry): 55-65 deg. subject to the level of speeds
- Engines: 3 x SUZUKI DF300 300HP@5700-6300RPM
- Max. speed: 38 knots at half load displacement/100% MCR/Beaufort Scale sea state two/clear hull
- Cruising speed: Approx. 30 knots
- Fuel capacity: 1 x 1200L
- Range: No less than 150 NM at max. speed and no less than 2000 NM at cruising speed
- Compliment: 8 persons
- Seakeeping ability: Sea state five
- Construction: marine grade aluminium
- Compliance:CE Class B

1.2 Design and Attributes

i. Vessel Layout:

The vessel is laid out with the hull to include one reinforced anti-collision fore peak tank, one void tank with watertight access hatch for stowage of manual operated anchor and its dedicated nylon rope, one fresh water tank compartment with one small cabin above the flooring of same watertight compartment, one fuel tank compartment and one void space for stowage of service items while the deckhouse is laid out with one large fully closed, air-conditioned deckhouse to accommodate two separate functional areas for the medical service and the boat control as per shown in the GA drawings.

Taking in mind for intention of stable, efficient and long voyage navigation in the special adverse conditions of tropical Western Pacific Seas to cater tough mission in coastal water, the vessel is specially laid out with best available ergonomics for improved comfort, better sustained duty-efficiency and capability, highlighted as follows:
The console station is separated into helmsman control station and crew control station to get the functional areas exclusively focused to simplify boat handling and communicating work while the fore windows are designed to be forward facing so as to effectively and efficiently stop the burning sun from shining directly onto the dashboard to secure easy and precision data obtaining from the instruments;.
The deck is designed with 360 degree of walk around the whole deckhouse, featuring wide side decks and raised deck bulwarks together with grab rails for unrivalled crew maneuvering safety in all handling conditions;
The collar is designed to be heavy-duty, over-sized EVA foam coated with 4mm elastomeric polyurethane, and is to be bonded to the specially moulded D-shaped/half-round installation channel at the gunwale, thus achieving best safety and durability to ensure the highest level of protection to the hull against strong, frequent impact by other vessel in boarding/disembarking;

ii. Hull Form

The hull is well proven and will be variable deadrise deep V high performance planing in form, incorporating a fine forward entry, two well immersed and full-length outer tunnels(also called revised reverse chine), extended waterline length, wide chine beam, high freeboard,
flared bow above waterline, slightly curved down buttock lines from stern transom till 3/4 of waterline length, down angled and wide chine flats on bottom sides of the mid hull body, giving a softer ride and safer handling with superior stability in all sea conditions, providing high speed maintained in waves while also having capability to self correct when running in following seas.

iii. Seakeeping Ability:

iii.i Seakeeping Ability in Head Seas

Seakeeping ability in head seas for any planing hull is dependent on trim angle and deadrise of the V-shaped hull bottom that encounters the wave. In our design, we have given strict control on longitudinal center of buoyancy(Lcb) and Longitudinal center of gravity(Lcg) so that there will be no big change to distance between Lcb and Lcg no matter at displacement speeds or fully planing speeds, making the vessel ride with extremely low trim at the bow, thus the vessel will be able to run much flatter with the forward fine entry formed by approx. 65 deg. of high deadrise to be always in best effective contact with water to efficiently cut through head seas, ensuring truly soft, smooth, high speed and comfortable riding quality with no significant hull slamming even in high waves.

iv Seakeeping Ability in Following Seas, Side/Quartering Waves

Seakeeping ability of a planing hull in following seas, side/quartering waves is dependent on dynamic stability of the vessel. No matter what type of boat it is, the dynamic stability of the vessel will be subject to the capability of the underwater hull configuration in gripping/locking water so that the tracking course cannot be easily affected by outside factors/forces generated by following seas and side/quartering waves. In order to achieve superior dynamic stability for top quality in safety against steep following seas and side/breaking waves, below trade-offs have been made in the hull form design:

1) Chine flats to be slightly down angled and well immersed into water till 3/4 of waterline length, which will work with the deep V underwater main hull body and the two full-length outer hull tunnels to give superior grip to the water to better enhance the stable tracking capability even in the event of being strongly impacted by breaking waves.

3) Low L/B ratio on the well immersed chines to give dynamic beam to ensure high quality of running attitude no matter in big following seas or breaking waves.

4) Each heavy equipment/machinery to be carefully selected and to be laid out at a possibly low position of the V hull bottom with the wheelhouse and tank positioned close to the longitudinal center of gravity so as to lower down the vertical center of gravity while also lock the position of longitudinal center of gravity of the vessel for improved stability with little impact to the riding trim no matter what tank loading scenario it is, which is of vital importance in maintaining high quality running in following seas, high speed turning and side waves.

5) High buoyancy bow with lots of flares above waterline to give superior response to waves even at crash stop to ensure that the bow will not swamp when coming across with big, steep following and side waves, thus to also achieve fully dry ride

v. Static Stability:

The underwater hull section features low L/B ratio at the main chine, full-length outer hull tunnels and wide, slightly down-angle chine flats, which will come to generate strong grip to the water with significant lateral resistance to stop the vessel from rolling even in the event of moving weights casually distributed on the deck so as to get best-in-class static stability always in place for top quality in safe boarding and disembarking.

vi. Damaged Stability:

The hull is divided by three watertight bulkheads to form four watertight sub-divisions to meet class and flag state requirement for damaged stability and will remain afloat and upright with flooding in any single main compartment.

vii. Deck Condition:
The vessel is designed with high freeboard along the waterline length and incorporates with wide, slightly down-angled reverse chine flats, spray rails, raised deck towards the bow and large draining port for gravity draining to work with flared bow to ensure truly dry deck at all speeds and maneuvering conditions.

viii. Quality of Comfort:
The hull has been carefully traded off using our technical insight with special attention to quality of comfort to ensure the crew and passengers in best energetic condition with high level of mission-concentration even after long-time navigation:
The designed comparably low L/B ratio on the main chines gives best compromise for stability with high GM figure to secure stable and comfortable riding.
The best-in-class control for riding trim helps secure the fine forward entry and will be always in best contact with water to smoothly and softly cut through waves which is another important factor in deciding real-world riding comfort in tough conditions due to the fact that hull slamming can be largely avoided.

ix. Strong Bow Protection:
The bow will be structurally reinforced to enhance abrasion resistance and then to be externally protected with over-sized, heavy-duty EVA foam collar in order to ensure that the bow structure can absorb all reasonable loads/impacts transmitted and to give good seagoing abilities, ensuring extremely strong protection for pushing and boarding mission.

x. Boarding Safety:
Particularly to cater boarding safety and low speed maneuvering quality, the vessel is designed to feature a bow boarding platform with safety grab rails and push knee/cut-off bow protected by heavy-duty EVA foam collar as shown in the GA drawings.

x. Attributes:
The vessel will be designed to provide the following attributes:
1) Shall be sea going and capable of undertaking sea voyages under its own power at any design loaded condition and draught.
2) Shall be capable of working in coastal and offshore waters of Pohnpei State, regardless of sheltered, unsheltered or open seas with waves up to sea state five.
3) Shall offer stable platform with all-around maneuvering quality throughout the whole deck from fore deck to the aft deck.
4) Shall be applicable for good day and night helm visibility.
5) Shall be good for handling control in all defined conditions with low noise.
6) Shall offer a structural life span of 15 years under normal operations and reasonable maintenance, allowing for 500 hrs/year of government use.

xi. Operation Conditions:
The vessel and equipment package will be suitable for operation in tropical weather conditions of coastal water, detailed as below:
Ambient Air Temp. : Max 40 deg. C
Seawater Temp.: Max 30 deg. C
Relative Humidity: Max 85%
Sea Conditions: Sea state six according to Beaufort Scale
As a special note, max. speed at open throttle may be slightly reduced due to impact to performance in max. power output of the two outboard motors when at extreme weather with sea water temperature higher than 35 deg. C.

1.3 Compliance and Survey

The vessel is to be designed to the latest Rules and Regulations for Class B boats.
As such, the vessel will be designed and built for patrol missions in restricted service areas of waters with reasonable weather as defined by applicable notation, and generally the range to refuge is no more than 20 nautical miles in water.

Furthermore, the vessel shall comply with the requirements of the main class for stability purposes of the applicable survey rules.

The vessel will be delivered with B class CE certificate according to ISO standard.

1.4 Quality and Control

The shipyard is accredited to ISO 9001:2008 which is certified by RINA and CCS, both are members of International Association of Classification Societies (IACS).

1.5 Documents

The following documents will be used for the construction of the vessel:
• Design Document Package
• Vessel Specification Document
• Survey regulations as determined.
• Components suppliers documentation.
In the event the drawings differ from this specification, the specification will take precedence.

As Built Drawings:

One set of drawings as per normal boat building practises will be supplied in English language upon the vessel completion corrected to 'As Built' as follows:
• General Arrangement,
• Hull Construction,
• OBM bracket Construction,
• Arrangement of OBM Installation Well,
• Deck Plan and Structural Installations,
• Cathodic Protection,
• Steering System,
• Fuel System Schematic,
• Bilge Schematic,
• Firefighting & Life Saving Equipment Plan,
• Equipment Number Calculation,
• Electrical schematic,
• Navigation Equipment Layout,
• Radio Equipment Layout,
• Internal Communication Systems Layout(not applicable as decked boat in our case),
• Air Horn system Layout
• Any other relevant system/circuit diagrams of the boat
• Deck Equipment arrangement
• Safety Plan

Reports:

One set of the following reports will be provided in English language upon the vessel completion:
• Vessel stability
• Sea trials

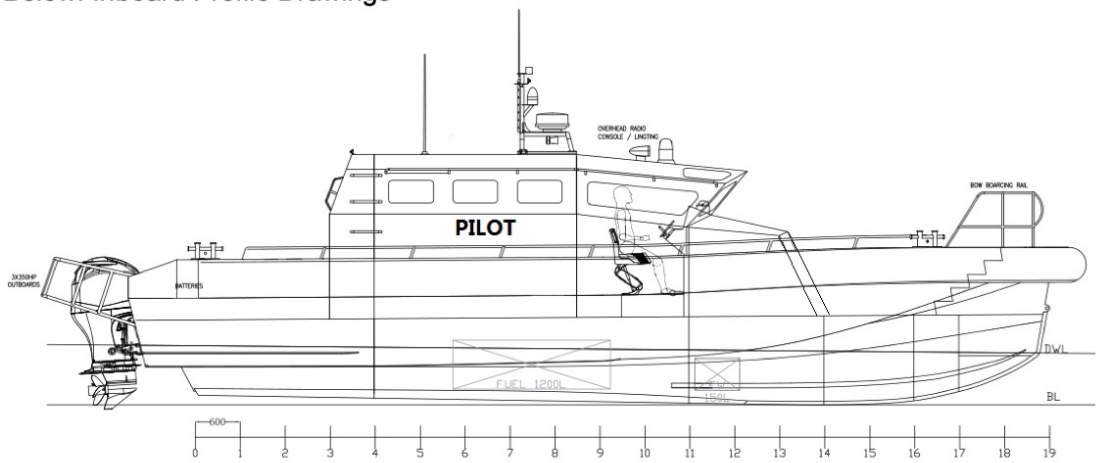
Manuals:
One set of the following manuals shall be provided in English language upon the vessel completion:
• Main Engines
• Navigation Equipment
• Builder generated component list detailing suppliers contact details
• Owner's Manual(covering operation and maintenance)

Certificates:
The following certificates shall be provided in English language upon the vessel completion:
• Builder's certificate.
• Speed trial certificate.
• Compass adjustment certificate.
• Fire fighting equipment.
• Navigation lights.
• Life saving appliances.
• Manufactures statement of origin.
The Builder shall construct the vessel in a manner consistent with best trade practices and in accordance with good commercial quality finishing.
All materials used and equipment fitted shall be of good marine quality and suitable for its intended application.

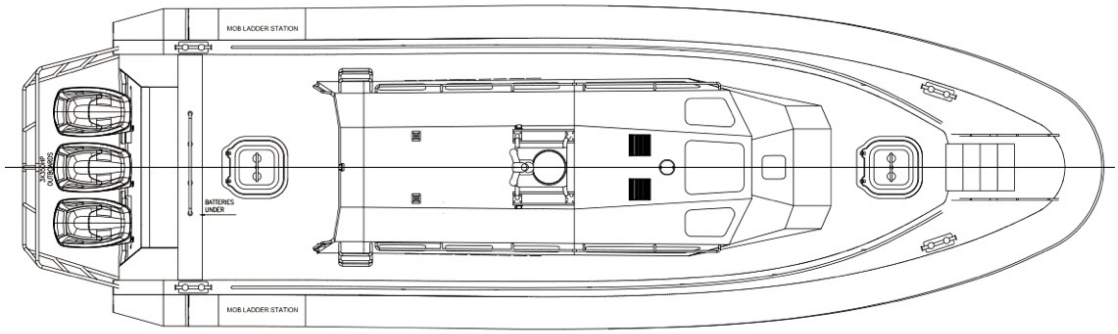
1.7 Alternatives
The Builder may wish to propose alternative materials, equipment or methods which would be more economical and/or practical for the Builder to supply and fit than those stated in this specification. In such cases the Builder will discuss the proposal with the Purchaser, and obtain the Purchaser's approval prior to proceeding with the alternative.

Equipment marked "or equal" and "or similar" may be substituted for equivalent quality items, subject to approval by the Designer and the Purchaser.

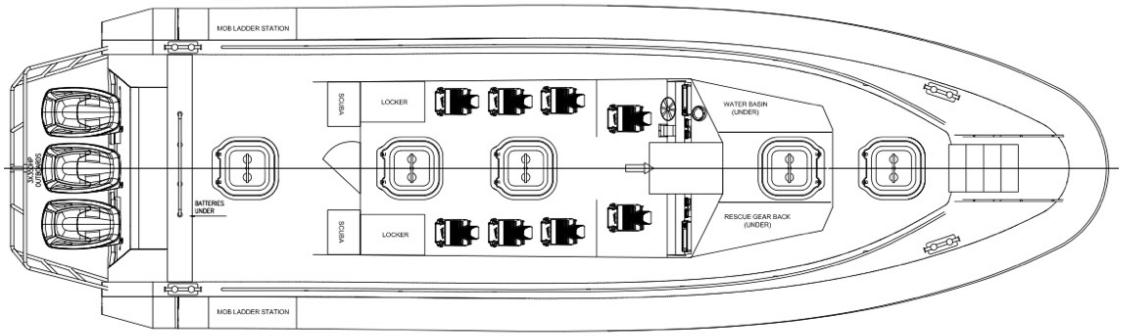
Below: Inboard Profile Drawings

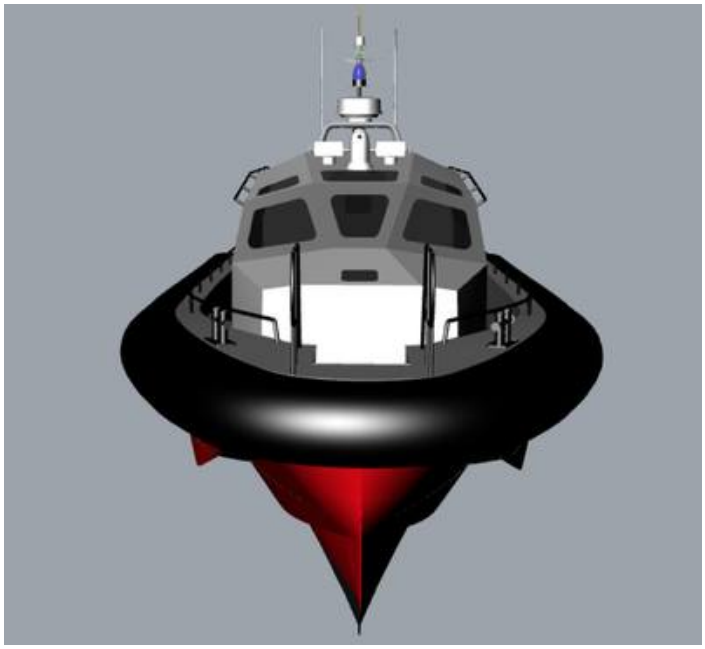


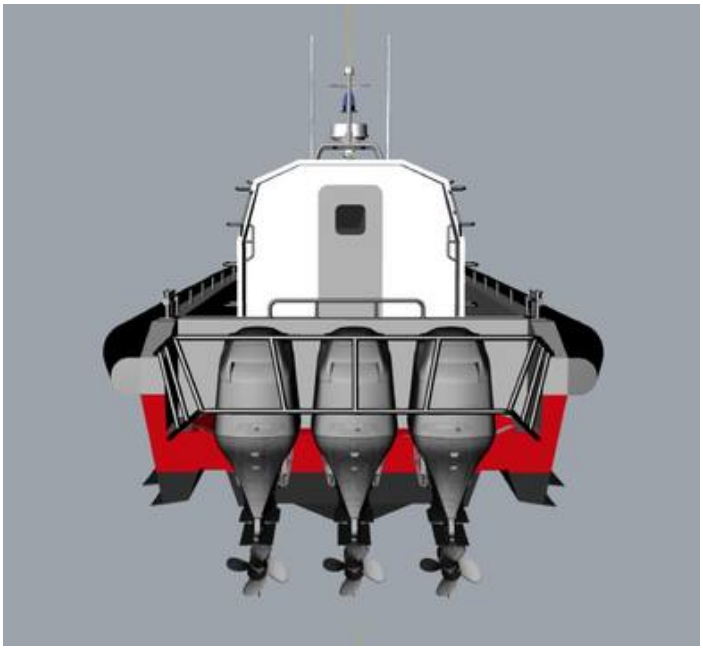
Below: Weather Deck Plan



Below: Main Deck Plan







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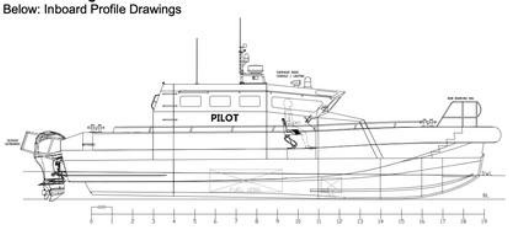

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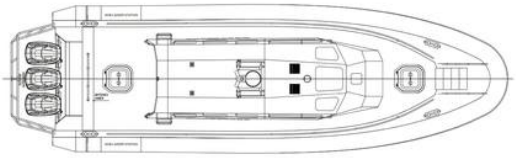

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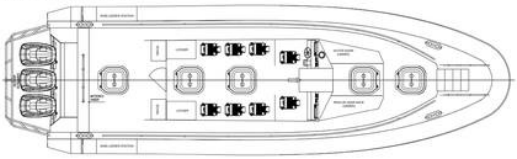

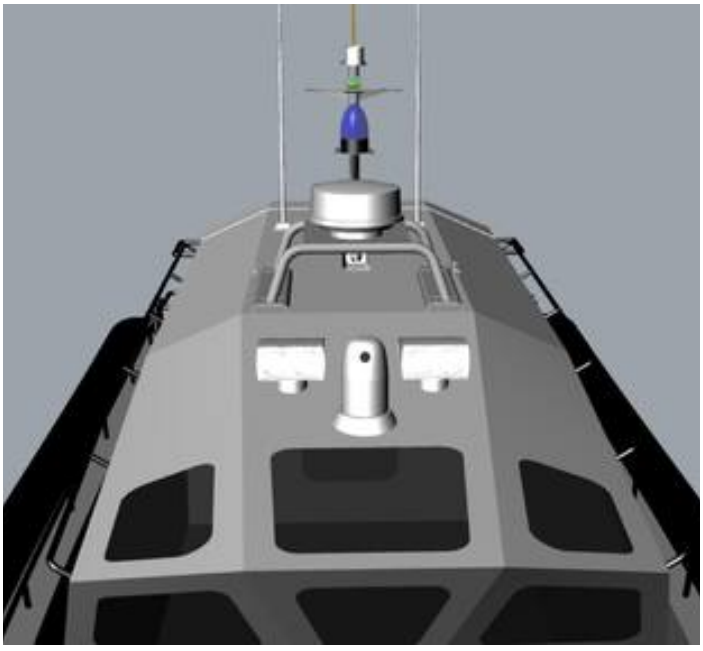

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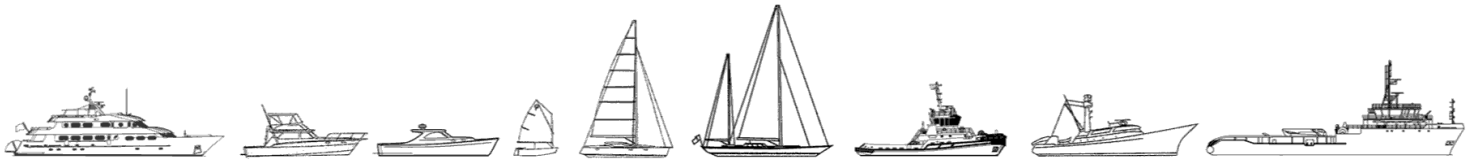

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