

Project HYDRA: A Platform Based Ship Design

TRAVISIONS 2018 Entry Abstract

In contrast to traditional individual ship design and development, a Platform-based approach provides a cost-effective means of developing a fleet of vessels with variable primary roles. By introducing a platform design which enables a client to select, at build, a vessel variant from an assortment of pre-determined primary roles; results in savings to the shipyards in both design and production costs; savings which can then be passed onto the customer. Moreover, based on the commonality in design and equipment, clients can expect to experience additional fleet-wide through life cost savings in areas such as operations, maintenance, training and spare parts. Shipyards will be able to produce platform-based vessels faster and with less risk as most 1st of class issues can be resolved for all potential variants following construction of the first vessel. Material and long-lead procurement costs will also be reduced as commonality in machinery will allow for high volume orders to vendors and suppliers. Finally, the designer need only design one platform capable of being built for various variants. This reduces design time but constitutes a major challenge in producing an optimum platform for its designated variants. Such a challenge must be met with innovation and skilled engineering.

Project HYDRA is a concept-stage platform-based ship design, built for a 40-year life-span with an in-service date of 2025. To become a serious market competitor, the platform-vessel is required to meet anticipated future emissions standards and be capable of operating 350 days a year. Based on a User Requirement Document (URD) the HYDRA Platform was designed to be built as any one of three designated variants: A **Research** vessel, a

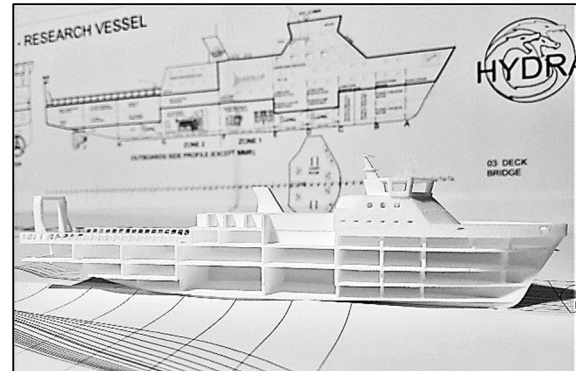


Figure 1 – A 3D model of the concept design portraying the internal arrangement of the vessel.

Submarine Rescue vessel, or a **Coast Guard** vessel. Additionally, the URD specified three key common secondary capabilities; firefighting, humanitarian aid and towing of the largest container ship.

HYDRA's challenge was to design a common platform that adequately accommodated all potential variants, while surpassing its competitors in terms of performance and capability. The initial baseline vessel performance criteria and variant capabilities were developed through market research of existing ships. A detailed system design was then conducted to ensure commonality across all variants in terms of equipment, performance and size.

To ensure compliance with future emissions regulations, HYDRA sought to incorporate the ability to seamlessly transition through life from diesel to any potential future marine fuel alternative. Thus, innovative ideas were incorporated into the power and propulsion arrangement, including the use of fuel cell and dual fuel diesel generator to support an IFEP arrangement with DC distribution. Furthermore, a tanking arrangement has been designed to be compatible with any future fuel option.

Single Sheet Characteristics

A common platform designed for:



KEY FEATURES

SUBSAR

Organic Hyperbaric
 Treatment facilities
 NSRS compatible
 8 resuscitation wards
 20 IC wards
 Laboratory facilities
 Medical offices

COAST GUARD

4 x Scan Eagles
 1 x Helicopter
 1 x Large hangar
 2 x 11[m] RIBs
 2 x 7[m] RIBs
 1 x State-of-the-art Ops Room
 Accommodation for maintenance and
 boarding teams

RESEARCH

Accommodation for
 30 scientist
 180 [m²] Dry laboratory
 120 [m²] Wet laboratory
 80 [m²] Equipment bay
 3-tiered L&R system

PLATFORM CHARACTERISTICS

MAIN

DIMENSIONS

Length over all	89.5	[m]
Length on waterline	83.5	[m]
Beam	15.7	[m]
Depth	8.9	[m]
Draught (SLL)	4.42	[m]
Design Displacement	3577	[tons]

SPEED

Cruise speed	14	[knot]
Top speed	20	[knot]

PLATFORM FEATURES

Class 1 Lloyds Fire Fighting		
Towing Bollard Pull	110	[ton]
Towing Winch Force	300	[ton]
Humanitarian Aid	200	Survivors
Platform TEU capacity (NEO)	18	[TEU]

MACHINERY AND PROPULSION

Integrated Fully Electric Propulsion		
Diesel Generator	2x4.2	[MW]
Fuel Systems	2x4.4	[MW]
Steerable Azipull Thrusters	2x3.2	[MW]
Fwd. Tunnel Thruster	1x0.8	[MW]
Fwd. Retractable Thrusters	2x0.8	[MW]

CAPACITY

Total DFO capacity	531	[m ³]
Convertible to Future Fuel tank	370	[m ³]
Total Freshwater	74	[m ³]
Deck Area	400	[m ²]

ACCOMODATION

Single Standard	24
Single Deluxe	22
Double Standard	6
Officer Suite	2
Captain Suite	1