



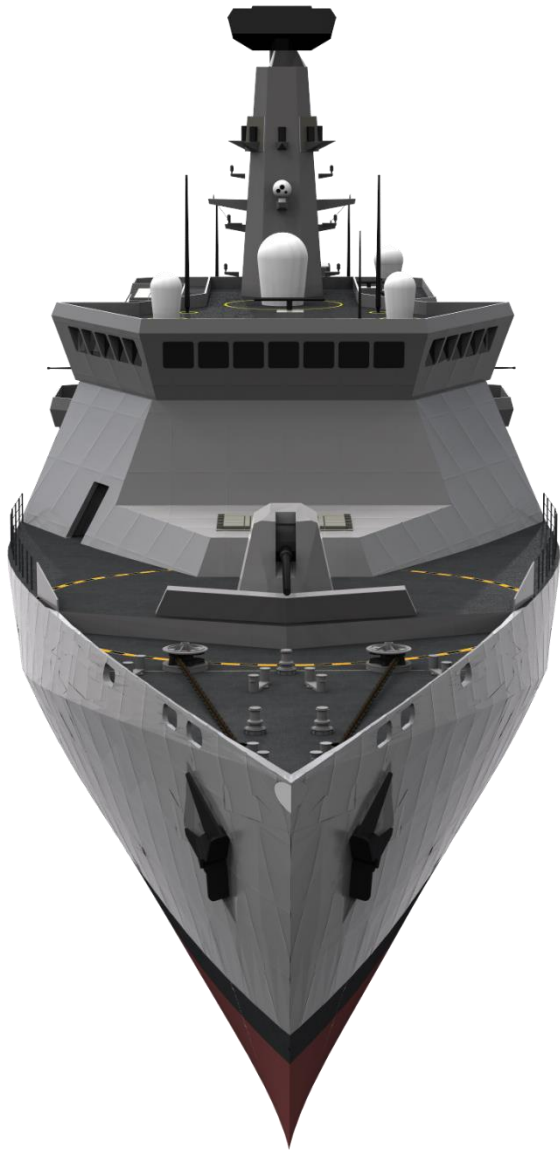
Project Spartan

An Innovative Light
Frigate Design for
General Purpose
Frigate (GPFF)

Steller Systems has developed an innovative design for a configurable, modular, survivable, affordable and exportable ship that will meet the Royal Navy's current and future requirements for a General Purpose Frigate (GPFF).

Our innovative solution includes a reconfigurable aft mission space with ramp access to embark Unmanned Vehicles (UXVs), a large hangar space, sufficient power generation to accommodate systems growth over the next 30+ years, and configurable survivability designed in from the outset. Our underlying focus on exportability has produced an affordable design solution that will support the UK shipbuilding and defence systems industries and, in turn, will enable the Royal Navy to build fleet numbers.





Designed for the Royal Navy and export markets

Steller Systems has worked closely with both the Royal Navy and export customers to define the range of roles and high-level requirements for a light frigate. Engaging with potential operators early in the design process has enabled our team to produce a single solution that meets the most onerous requirements, but which can be scaled back to suit individual budgets. Exporting from the UK will help the efficiency of British yards and will reduce the price of the ship for all customers.

The *Nodal Modular Physical Architecture* approach to the design allows for configurable options. Each node has the ability to accept different systems; for example a customer may wish to have a simple 30mm Small Calibre Gun system in place of the forward Mk41 Vertical Launch System (VLS), or place a SeaRAM or Phalanx in this position.

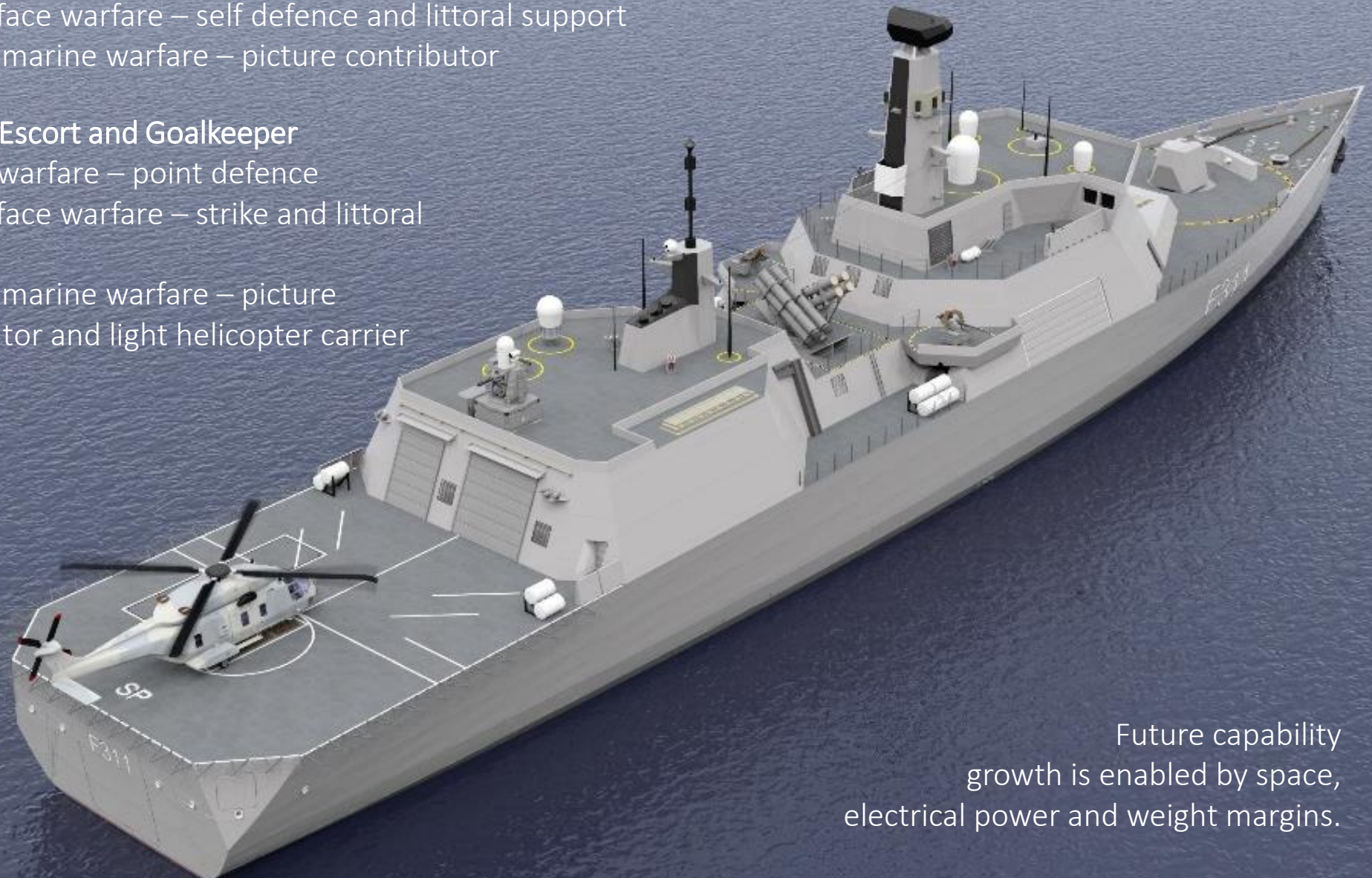
A flexible, adaptable multi-role platform

General Purpose Patrol Frigate

- Anti-air warfare – self-defence
- Anti-surface warfare – self defence and littoral support
- Anti-submarine warfare – picture contributor

Task Group Escort and Goalkeeper

- Anti-air warfare – point defence
- Anti-surface warfare – strike and littoral support
- Anti-submarine warfare – picture contributor and light helicopter carrier

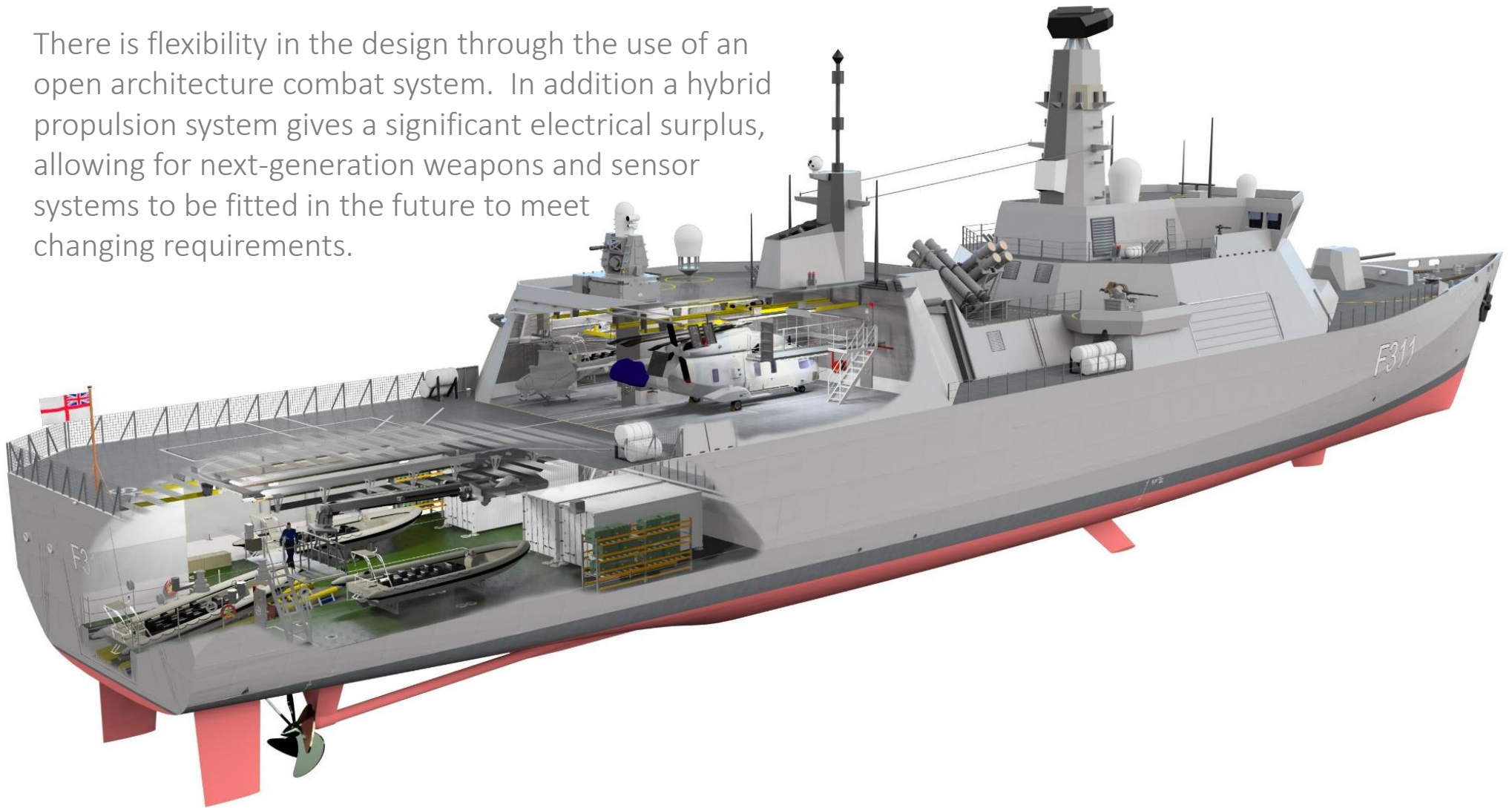


Future capability growth is enabled by space, electrical power and weight margins.

Designed for the future

Spartan has been designed with the space and the margins to allow for future growth and through-life upgrades. The design includes a large hangar and a stern garage, capable of accommodating a range of unmanned vehicles as well as future systems. The ship is designed to operate a wide range of unmanned vehicles and deploy Special Forces.

There is flexibility in the design through the use of an open architecture combat system. In addition a hybrid propulsion system gives a significant electrical surplus, allowing for next-generation weapons and sensor systems to be fitted in the future to meet changing requirements.



Key feature: adaptable stern garage

With a large, reconfigurable multi-mission stern garage with access to a stern ramp, *Spartan* has been designed to be adaptable in a rapidly changing world. This adaptable space is designed to accommodate waterborne assets such as Rigid Inflatable Boats (RIB), Unmanned Underwater Vehicles (UUV), Unmanned Surface Vehicles (USV), Variable Depth Sonars (VDS), humanitarian aid stores and equipment containers.



Key feature: large, flexible hangar



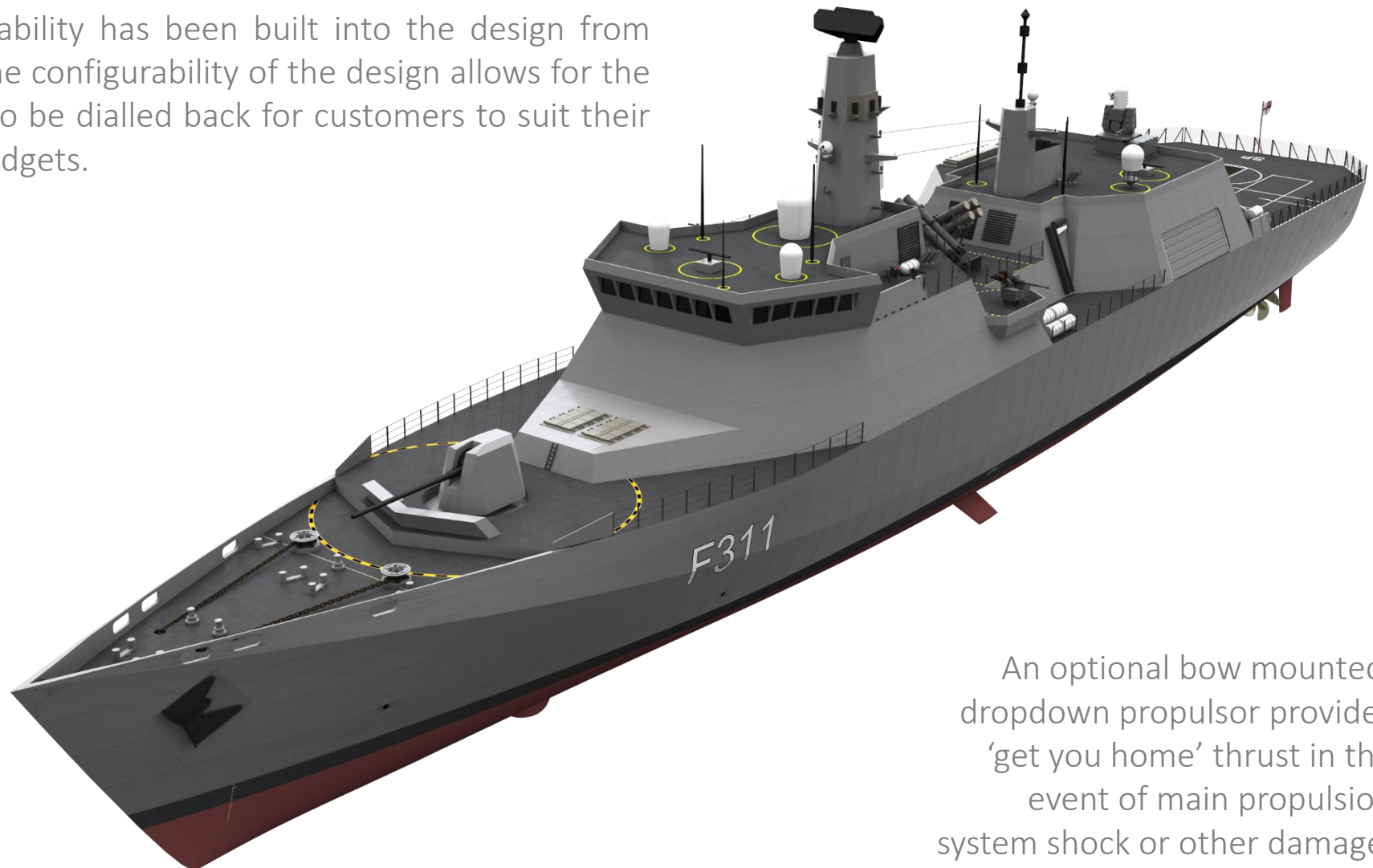


Operational flexibility comes from large, adaptable spaces. The large hangar has space for an organic helicopter capability, based on an NH90-sized helicopter, as well as other Maritime Unmanned Aerial Vehicles (MUAV) and a crane-launched RIB.

Survivability built in from the keel up

In order to allow for the highest levels of survivability, *Spartan* has been designed with three separate powered zones, separated sensors and primary weapons, and an alternative operations room. The CODLAD propulsion system also has sufficient redundancy to maintain propulsion even after significant damage.

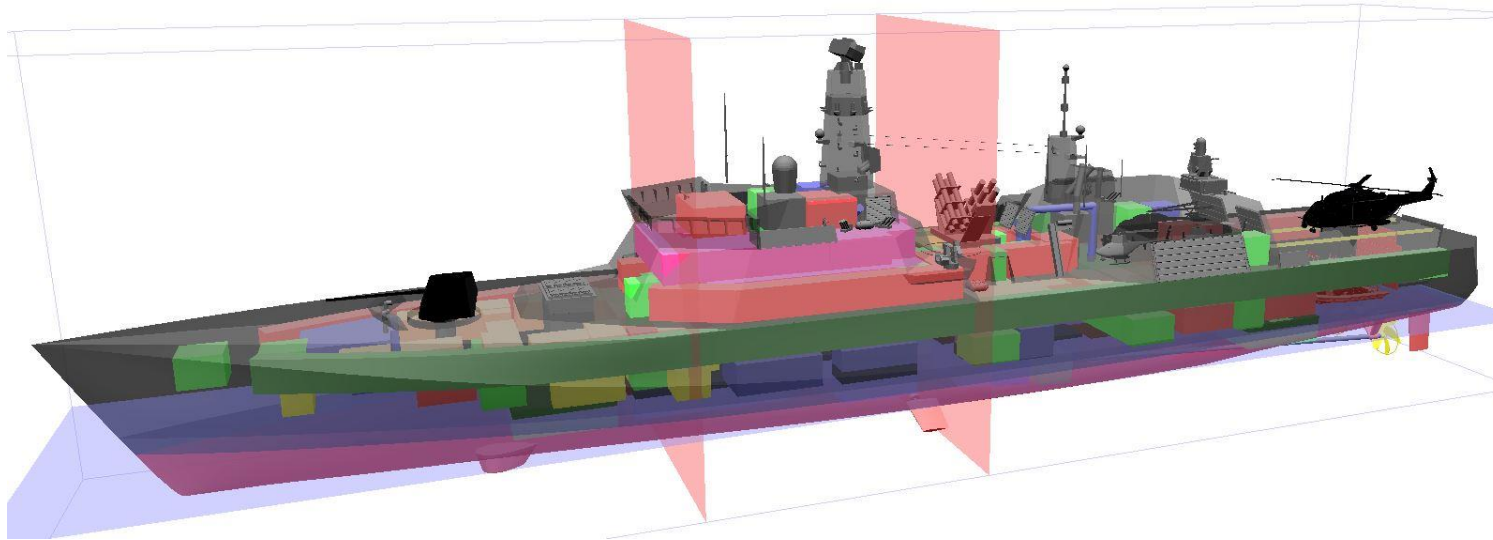
Whilst survivability has been built into the design from the outset, the configurability of the design allows for the survivability to be dialled back for customers to suit their needs and budgets.



An optional bow mounted, dropdown propulsor provides 'get you home' thrust in the event of main propulsion system shock or other damage.

The main operations room is supplemented by a secondary operations room with space for five operators, either for UXVs or to take over prime functions in the event of damage.

The ship has three zones, all with independent power and the means to fight-on should one be compromised.



Blastproof doors are provided, whilst blastproof bulkheads are optional. System positioning has been used to reduce vulnerability whilst allowing for a reduction in capability for design to cost.

Vertically and horizontally separated passageways and technical galleries allow for ease of movement as well as vulnerability reduction of key services.

Steller Systems has been working with *Survivability Consulting Ltd. (SCL)* to design in cost-effective survivability from the outset. *SCL* is a micro-SME that specialises in delivering assessment, advice and software services in the fields of survivability and lethality for the UK MOD and defence industry. This includes the assessment of platforms through all stages (concept, initial design, detailed design and in-service), optimisation of structural and systems layout, vulnerability reduction technologies, lethality and escape and evacuation.

SCL

“Design it for war and make it work for peace”



A sea change in naval procurement

Steller Systems believes that a shipyard-independent, export-focussed, high power team should drive the design through to fruition. This requires an alliance of UK exporters to join up *UK plc* and a sales force with a consultative approach to sales. This approach would involve capturing requirements from potential customers and configuring the design to meet buyers' needs.

The team should work alongside, but independently of, the government and Royal Navy. By being shipyard-independent and focussed on the export market, the team will not be focussed solely on the Royal Navy requirement, but will deliver what the whole market needs; this in turn will bring economic advantages to the Royal Navy through efficiencies of scale, and will result in wider benefits to *UK plc*.

Spartan is a highly configurable design that meets many navies' needs now and in the future. The Royal Navy will benefit from a survivable and highly capable ship that will be the backbone of the fleet for many years. Ensuring that the design remains attractive to the global export market will bring economic advantages to the Royal Navy through efficiencies of scale, and will result in wider benefits to *UK plc*.



The potential market for *Spartan* is significant; the Royal Navy requires at least five GPFFs, whilst significant additional export opportunities have been identified.



Steller Systems is a privately-owned, completely independent naval architecture and systems engineering consultancy. We offer a wide range of naval architecture services covering all stages of a vessel's life cycle, from initial concept design through to full detailed design, structural analysis, design review, stability analysis and emergency response. We have experience in all sectors of the industry, having worked extensively on military surface ships, submarines and unmanned vessels, and in the private sector with a range of commercial vessels and super yachts.

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