



# Complex Weapons

**Sula Systems is one of the few truly independent providers of Complex Weapon expertise in the UK. We deliver high quality support to a range of Complex Weapons programmes at all stages of development, using extensive domain knowledge, systems engineering, systems capability analysis and engineering judgement.**

## Our Expertise

Sula's systems engineers and analysts have capabilities ranging from high level system architecting through to detailed technology research and development. We have extensive knowledge and experience of topics such as:

- Technologies including seekers, aerodynamics and Guidance & Control.
- Numerous aspects of Complex Weapon analysis, modelling and simulation.
- Platform integration in air, land and maritime environments.
- Standards, design verification and certification.

## SeaWolf

Sula provided extensive support to the SeaWolf Mid-Life Upgrade programme, including:

- Defining the modelling requirements for design studies and progressive acceptance.
- Developing high fidelity missile representations for integration into the AMS modelling suite.
- Supporting system level design verification and certification.
- Conducting hazard analysis of the vertically launched missile.

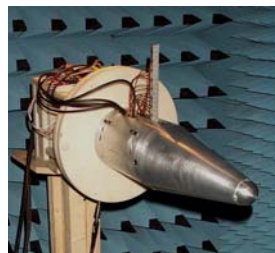


- Supporting Reliability and Maintainability Demonstrations.

## Complex Weapon Concepts

Sula has developed a number of concepts, ranging from technologies and subsystems through to entire weapons, including:

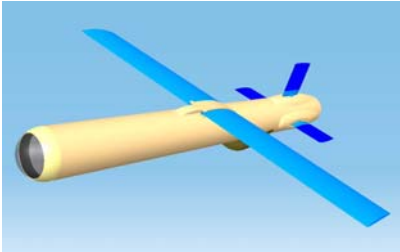
- Designing a Guidance & Control strategy for an agile air-to-air missile.
- Developing a prototype multi-spectral seeker that synthesised a radar aperture from RF elements placed along the fins of a rotating missile, leaving the nose free for IR sensors.



- Producing a conceptual design for a very low cost man-portable air defence missile system.

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- › Developing an affordable weapon concept to counter the increasing threat posed by prolific, low cost battlefield UAVs.



### Ship-Launched Sea Skua

Sula played a major role in the capture and review of design and verification evidence to support the Ship-Launched Sea Skua Certificate of Design.

We also developed the algorithm predicting the most opportune time to launch the missile as the ship rolled; undertook detailed own-ship hit modelling and firing circuit analysis; and conducted extensive system safety and reliability studies on behalf of MBDA.

### FASGW Platform Integration Risks

Sula conducted a scoping study on the risks to the Surface Combatant Maritime Rotorcraft programme of potential options to satisfy the Future Anti Surface Guided Weapon (FASGW) requirement.



We assessed the integration risks of various FASGW Heavy and Light weapon system options, proposing outline risk avoidance and mitigation strategies where appropriate.

### TRACER Guided Weapon Overwatch

In response to the TRACER requirement for a UK Formation Reconnaissance vehicle,

Sula acted as the Design Authority for the Guided Weapon Overwatch Variant in the LANCER Team. This concept integrated a mix of Brimstone and Hellfire II missiles onto an armoured vehicle to provide organic long-range protection of the Scout vehicles with an upgrade path to a tri-mode 50kg class weapon. This solution would provide the army with a long range, non line of sight, anti armour overwatch system.

Our role included missile selection, design of the launcher elevation mechanism and its integration into the LANCER vehicle, efflux hazard analysis and management, minimising the risk of fratricide, performance analysis and missile loading trials.



### Other Projects

Sula is leading the technology workstream of the Network Enabled Air Defence and Surveillance (NEADS) concept phase. This has involved close liaison with UK and international Complex Weapon manufacturers to develop credible effector options for that programme.

Sula produced the safety cases for a number of legacy complex weapon systems including Sea Dart, SeaWolf and Harpoon.

We produced a standards roadmap for the Low Cost Loitering Carrier, showing at what stage different standards need to be incorporated in the development of a prototype, land-based operational system and a potential future maritime variant.

Sula provided technical support to the development of a night-vision sight for the High Velocity Missile (HVM).

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