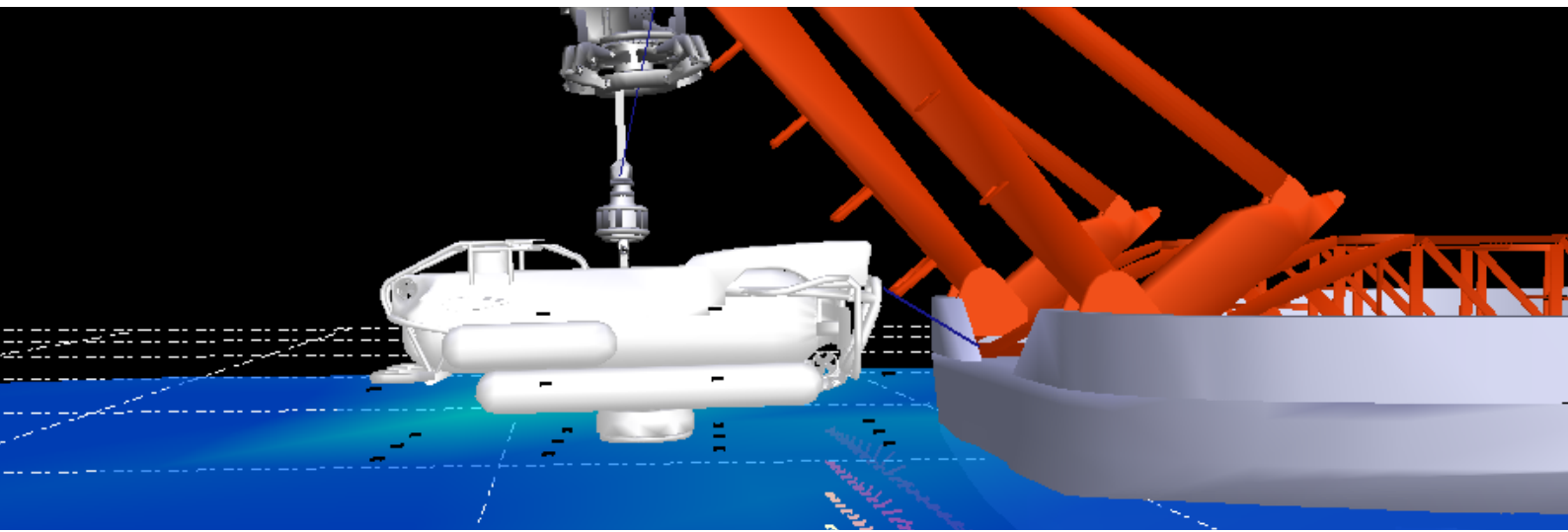


Physics-Based Simulation Systems



SEA has an excellent track record in developing advanced simulation applications, that can be applied to de-risk complex, expensive or dangerous engineering activities in order to improve operational safety and effectiveness.

SEA has successfully demonstrated the application of systems engineering principles to divide complex equipment simulations into federated components, supporting re-use and flexibility.

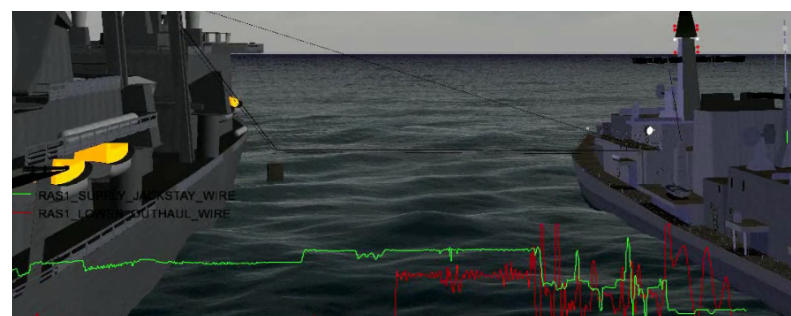
Our knowledge of industry standards such as the High Level Architecture (HLA) and technical flexibility allows the development of bespoke physically accurate simulations, which can combine existing software or new applications to generate a powerful solution.

The benefits of accurate physics-based simulations can be applied throughout the project life cycle, supporting initial engineering design, informing the development of operational limits and entry into service, and also providing input into operator synthetic training.

Simulations and Systems:

Replenishment at Sea Simulation Capability - (RASSC)

The RASSC simulates the transfer of heavy loads between any chosen supply and receiving ship, and has been developed to support the UK MoD in evaluating system performance for future Heavy RAS operations. Developed by SEA, the system simulates the response of the ships to forces arising from the propulsion, steering, transfer system and the complex hydrodynamic interactions between the two ship hulls.



- Evaluation of heavy RAS operations
- Validation against sea trials and tank test data
- Includes complex hull interaction hydrodynamics

Key Features:

- Accurate validated physical behaviour
- Realistic 3D engineering visualisations
- Real-time distributed simulations using HLA
- Re-use of existing simulations where appropriate
- Open-source and licence-free applications
- Tailored to meet customer requirements
- Complex hydrodynamic and aerodynamic interactions

Key Benefits:

- Improved safety and operational effectiveness
- Optimised system design via simulation
- Early prediction of system performance
- Alternative to expensive or dangerous trials activities
- Flexible simulation architectures support easy modification
- Re-use of existing models and tools
- Pull-through of technology into synthetic training

Ship/Air Interface Framework - (SAIF)

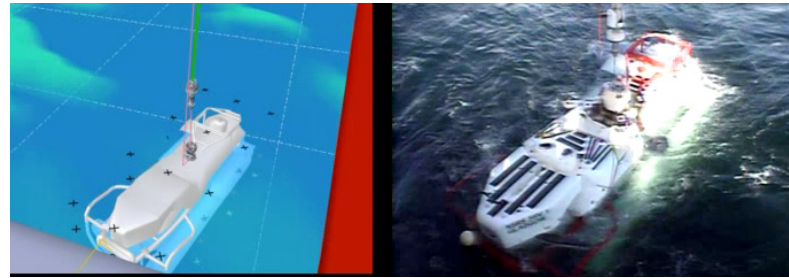
The multi-national SAIF programme is led by SEA, and has developed a suite of simulation tools that integrate advanced aircraft flight dynamics simulations with models that predict the characteristics of ship platforms. The resultant system has provided experienced test pilots with a realistic environment in which to assess the safe operating limits of a helicopter operating from a naval vessel, years before the real flight trials can be undertaken.



- Flexible architecture – supports helicopter, fixed-wing and UAV operations
- Rapid integration – new ship types easily applied to simulation
- High-fidelity – airwake model generates realistic pilot workload levels

Nato Submarine Rescue System - (NSRS)

A prime example of the use of simulation to improve safety has been the development and use of the NSRS simulation, which models the recovery of a Submersible Rescue Vehicle (SRV) on to a mother ship using a portable launch and recovery system. SEA developed an independent and validated simulation that allowed the recovery limits of the SRV to be assessed in challenging high sea state conditions. This has allowed the NSRS project team to assess the performance of the equipment without resorting to difficult or dangerous sea trials.



- Evaluation of NSRS SRV recovery in high sea states
- Alternative to sea trials in dangerous conditions
- Includes hydrodynamics and lifting gear physics

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