

**PATRICK FAAS MSc, AMRINA, P.E.**  
**NAVAL ARCHITECT**

Webb Institute, B.S. in Naval Architecture and Marine Engineering, 2007

University of Strathclyde and TUHH, MSc in Ship and Offshore Technology, 2019

Associate Member of the Royal Institution of Naval Architects 2017

Member of the Society of Naval Architects and Marine Engineers 2003

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Patrick is a Naval Architect at Solis Marine Engineering Ltd, providing engineering, design, and analysis services to the offshore, shipping, and renewable sectors. His work has included structural calculations and finite element analyses, weight estimates, stability assessments, hull form design, arrangements, hydrodynamic analyses, model testing supervision, regulatory compliance and approval, and broader engineering support for the marine industry. His work is focused on providing practical and functional designs which meet all operational requirements while remaining cost effective and simple to construct.

Patrick received his Bachelor of Science in Naval Architecture and Marine Engineering from Webb Institute in 2007. After graduation he began work as a Naval Architect with Elliott Bay Design Group. His work with EBDG included designs and engineering support for a broad range of vessels, including passenger and passenger-vehicle ferries, work boats, tugs, barges, fishing vessels, offshore support vessels, landing craft, research vessels, cruise ships, and more. Patrick became a licensed Professional Engineer in the state of Washington in 2012, followed by P.E. licenses in the states of Alaska, New York, and Louisiana.

In 2017 Patrick ventured abroad to undertake a joint master's program in Ship and Offshore Technology with the University of Strathclyde in Glasgow, Scotland and Hamburg University of Technology in Hamburg, Germany. For his master's thesis he developed a multi-vessel manoeuvring simulation tool for use in the evaluation and optimisation of towed manoeuvres. Upon completion of his master's degree in 2019 he returned to the UK to work on the development of a smart wind assisted propulsion system for SMAR Azure Ltd in Edinburgh. The work included structural design and analysis, mechanical design, work on a velocity prediction program and route analysis tools, validation of aerodynamic analyses, working to obtain approval in principle, and planning for construction and model testing of half-scale models.



### SOLIS MARINE ENGINEERING LTD

- **TRANSSHIP HYDROGEN TRANSITION PROJECT**

Innovate UK funded project assessing the transition to hydrogen power for an example vessel. In partnership with Strathclyde and Exeter universities as well as various manufacturing and low- or no-carbon powertrain companies. Project assesses a broad range of potential technologies including hydrogen fuel cells, hydrogen storage and handling, battery/hybrid power systems for peak lopping/shaving, plus the possible inclusion of energy saving devices. SME are providing vessel integration and installation engineering and design for the full scope of the project.

- **AQUANET POWER HYBRID WAVE ENERGY CONVERTER**

Concept design and assessment for the potential installation of oscillating water column wave energy converters to existing near and offshore wind or other platforms to hybridize the renewable energy conversion and take advantage of common infrastructure to enhance the overall system's levelized cost of energy (LCOE).

- **ISLAND PRIDE CONTAINER MOBILISATION**

Follow-up project mobilisation for the Island Pride assisting with seafastening design for scientific containers and equipment. Met tight schedule and installation requirements allowing the vessel to begin work on schedule and with all required operational requirements fully evaluated, including full access and walkways for stacked containers.

- **NEW 20-METRE ALL-ELECTRIC PASSENGER FERRY DESIGN**

Working in partnership with Pelagic Design Ltd, development of a concept design for a new all-electric passenger ferry for Plymouth Boat Trips. Performed weight estimate and stability assessment and developed fire control plan and lifesaving equipment arrangements for approval by the UK Maritime and Coastguard Agency (MCA). Developed a detailed route profile tool for assessing and optimising the operational profile and its resulting power consumption.

- **MORAY MET MAST DECOMMISSIONING**

Assisted KML with planning of marine lifting operations for removal of a damaged meteorological mast at a wind farm in the Moray Firth. Provided lift and structural evaluations for removal of the top truss sections, transition piece, through to final subsea cutting and removal of the monopile base. Evaluated the strength of the truss structure and bolted connections to allow for pre-removal of bolts to simplify rope access team scheduling. Assessed lifting and winch operations in coordination with applicable motion assessments, and to the requirements of DNVGL-ST-N001.

- **ISLAND PRIDE SALVAGE WINCH AND A-FRAME INSTALLATION**  
Designed a skid for installation of a 6,000-metre, 40-tonne salvage winch, A-frame, and HPU aboard the Island Pride, including all required Finite Element Analysis (FEA) to validate the skid and vessel structure. Obtained all relevant DNV approvals for installation to the requirements of DNVGL-ST-N001. Worked with the shipyard to meet tight fabrication and installation schedules for the project mobilisation requirements.
- **KEYNVOR MORLIFT (KML) ENGINEERING SUPPORT**  
Provided engineering support for various marine operations, including deck barge rock loading stability and longitudinal strength assessments, design of lifting padeyes for crane load testing, weight estimates and rigging assessments for crane lifting operations, and seafastening of equipment for marine operations to the standards of DNVGL-ST-N001.
- **SEIKONGEN SINKING INVESTIGATION FOR SOLIS MARINE CONSULTANTS (SMC)**  
Developed General HydroStatics (GHS) stability run files to assist with an investigation into the sinking of the fish farm support vessel Seikongen. Combined data from vessel documents, crew statements, images, and video footage to recreate the flooding and sinking which occurred following damage to the fish process water system.

### SMAR AZURE LTD

- **SMART WIND ASSISTED PROPULSION SYSTEM**  
Research and development for a novel wind assisted propulsion system. Tasks included structural and mechanical design, working towards approval in principle (AIP) by regulatory agencies, development of a velocity prediction program and route analysis for evaluating wind propulsion, and design of half scale models for wind tunnel testing.

### ELLIOTT BAY DESIGN GROUP

- **NCDOT NEW RIVER CLASS FERRY RODANTHE**  
Design of the new river class ferry for North Carolina Department of Transportation, including hull form, arrangements, structure, stability and subdivision, fire protection, resistance and powering, and Voith Schneider propeller integration.
- **STATEN ISLAND FERRIES OLLIS CLASS FERRY**  
Lead naval architect for the design of new 4,500 passenger ferries for Staten Island Ferries. Oversaw arrangements, weight estimate, stability, fire protection and safety, obtaining regulatory approval,

and model testing. Worked closely with SIF management and crew to ensure optimal integration with their facilities and operations. Assessment of (then) upcoming LNG regulations and consideration at the preliminary stage for potential impacts of designing around future decarbonisation retrofit options.

- NAUTILUS DATA BARGE

Assisted with the retrofit of a dedicated server facility onto a deck barge. Tasks included validation of structural design, weight estimates, environment assessment, mooring analysis, and shore connection methods.

- DIVING SUPPORT VESSEL

Diving equipment payload lashing calculations and structural analysis. Performed FEA for the supporting deck structure and attachments points for a launch and recovery system installed on an offshore supply vessel.

- KELLY SLATER WAVE CO

Weight and buoyancy support for the concept design of a surfing wave generator apparatus.

- DAY BOAT ALASKA CLASS FERRIES (TAZLINA AND HUBBARD)

Worked on the design for daily-operational ferries for the Alaska Marine Highway System. Beyond the standard design tasks, a heavy emphasis was placed on operational efficiency for the vessels. This including hull form optimisation for transit speed and design margin, plus evaluation of terminal approach, manoeuvring, and loading process to meet a strict twelve-hour day for crew requirements. Final FEA for the detailed design and installation of the side and stern car doors supporting structure.

- T-PONTOON

Design of a custom pontoon structure to assist in the floating free of newly constructed bridge pontoons from the graving dock due to insufficient buoyancy because of tidal restrictions.

- 520 FLOATING BRIDGE

Preliminary calculations assessing the tow of various configurations of rectangular bridge pontoons from their construction sites to the installation location.

- AMHS COLUMBIA REPOWER

Structural design, weight estimate, FEA, and vibration analysis for a repower of the Alaska Marine Highway System ferry vessel COLUMBIA. Provided engineering support to the owner and shipyard during installation and performed the inclining experiment and updated the stability booklet after.

- RESEARCH VESSEL BOLD

Performed stability analysis for the research vessel (former offshore supply vessel) BOLD.

- AET INNOVATOR

Assisted in the design of the lightering support vessel AET INNOVATOR. Tasks included hull form design, stability and loading, subdivision, and deck equipment installations.

- **NORTHERN EAGLE**  
Stability assessment for the fishing vessel NORTHERN EAGLE following processing equipment improvements. Recommended adjustment of fixed ballast resulting in improved vessel handling.
- **BAE SAN FRANCISCO CRUISE SHIP DRYDOCKING**  
Assisted with the drydocking of several Princess Cruises ships in floating drydock at BAE Systems San Francisco shipyard. Designed custom pockets installed in the wing-wall of the floating drydock to allow for removal and maintenance of the ships' active anti-roll fins. Performed stability and wind assessments to meet the requirements of MIL-STD-1625.
- **QIT'RWIK**  
Stability assessment for the landing craft QIT'RWIK operating in the Katmai National Park.
- **INCIDENT RESPONSE SUPPORT**  
Took part in dedicated incident response preparedness for several commercial marine companies and ferry operators. Available for immediate assistance on an ongoing basis. Assisted with structural evaluation of cracked trunk barge, and for the mooring and removal of a vessel grounded in a river.
- **LANDING CRAFT RAMP FEA**  
Analysis for the design of a new retractable ramp on a landing craft for unloading heavy machinery.
- **USCG BALLAST WATER PILOT STUDY**  
Review and summary of the available ballast water treatment technologies. Development of two concept installation design packages for retrofit of ballast water treatment systems to existing vessels for USCG evaluation of regulatory impact.
- **AMHS AURORA ACCOMMODATIONS UPGRADE**  
Survey of the AMHS ferry AURORA for design and retrofit of new crew accommodations.
- **DEEP PACIFIC AND LILLI ANN**  
Performed inclining experiments and stability analyses for the two fishing vessels DEEP PACIFIC and LILLI ANN following modifications.
- **DRYDOCK CAISSON TOWING**  
Calculations assessing the tow of a newly constructed drydock caisson to delivery, including drag forces plus the effects of yaw, lift, and possible vortex-induced forces and their impact on control.
- **WELL STIMULATION VESSEL**  
Structural analyses for equipment foundations and masts for the design of a well stimulation vessel.
- **WASHINGTON STATE FERRIES – 64 CAR FERRY**  
Performed scantling calculations, structural design, weight estimate, and stability analyses for the new design of a 64-car ferry for Washington State Ferries.
- **USCG ICE BREAKER HEALY**  
Assisted with a deadweight survey of the USCG Healy following modifications.

### EMPLOYMENT HISTORY

2020 to Present	Solis Marine Engineering Ltd Naval Architect
2019 to 2020	SMAR Azure Ltd Senior R&D Engineer
2007 to 2017	Elliott Bay Design Group Naval Architect
2006 to 2007	Elliott Bay Design Group Naval Architecture Intern
2005	Horizon Lines, LLC Engine and Deck Cadet Intern
2004	Puget Sound Naval Shipyard Shipyard Intern (Plate, Sheetmetal, and Lofting)

### TRAINING RECEIVED

SNAME – Ship Design for Construction  
ANSYS – Workbench Training  
NavCad – Propeller Design and Optimisation  
GHS – Probabilistic Damaged Stability  
Cold Regions Engineering (Alaska P.E.)  
OrcaFlex – General Training