- modelling and simulation
- control design
- system troubleshooting
- technology transfer and training
- energy efficiency investigation
- software tools

industrial systems and control

Capability Statements – Marine Industry

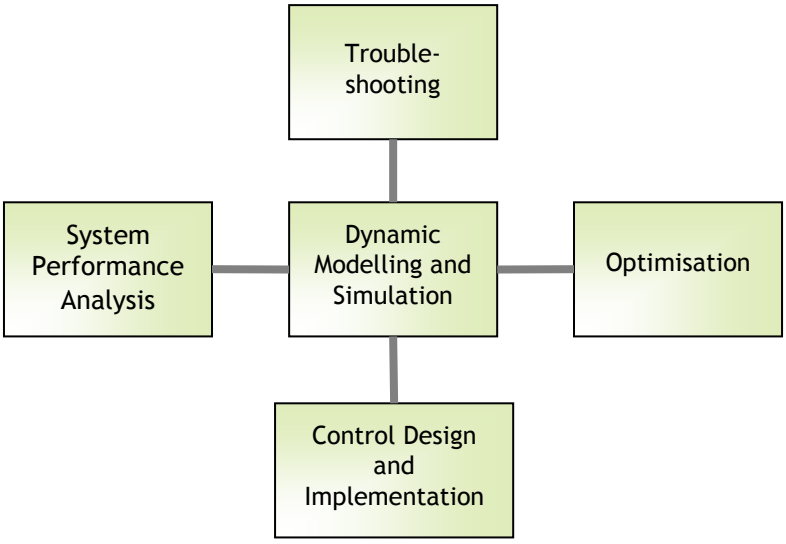
Independent Control Consultancy Services

ISC provides high quality independent control engineering consultancy services to the marine industry. With a multidisciplinary team of individuals, we specialise in control system analysis, design and implementation, often using high-fidelity well validated dynamic models, and troubleshooting existing controls.

We thrive on:

- Solving challenging and practical control problems
- Providing our clients with an insight into system responses through high-fidelity models
- Optimising control design and parameters to yield the best possible operations.

Solutions used can range from simple classical feedback/feedforward to advanced control, including Kalman Filtering and Predictive Control. Nevertheless, simplicity remains a key driver in our solutions, alongside maximising performance.



Consultancy Service Examples

- Design, Development and Implementation of Control System for Motion Compensated, Hydraulic, Offshore Wind Turbine Access System (TAS)
- Control Loop Investigation and Recommendations for HMS Astute
- Analysis of Hydraulic Damping for a Launch and Recovery A-frame
- Optimised Gain Scheduled Integrated Fin-Rudder Roll Stabilisation

See over for more details

Our Expertise

- In-depth understanding of control technologies
- Extensive experience in diverse industrial applications
- High-fidelity modelling of system behaviour
- Expert analysis of complex problems
- Proven project management and research skills

Our Core Competencies

- Dynamic modelling and simulation
- Control system design and implementation
- Troubleshooting
- Optimisation
- Algorithm development
- Benefits analysis
- Independent Appraisals
- Research
- Training

Our Philosophy

- Approaching problems with an open mind
- Dedicated to identify practical and innovative solutions without compromising performance
- Imparting understanding and empowering clients to drive improvements themselves

Providing Industry Support since 1986

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Industrial Systems and Control Ltd. wholly owns and manages Applied Control Technology Consortium
Registered in Scotland 105188

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About ISC

ISC has been a leading industrial control engineering consultancy for over 20 years, providing consultancy, training and software development to large and small clients alike. Our first class consultant engineers utilise a variety of dynamic modelling packages such as LabVIEW and MATLAB/Simulink for the design, analysis and optimisation of control systems.

We strive to help our clients fully understand the project outcomes, and who rely on us delivering the best solution through our combination of theoretical understanding, extensive practical experience and professional approach.

We are flexible and open minded. Last but not least, we are always prepared to go the extra mile needed to deliver practical, innovative and optimised solutions for our clients.

Consultancy Service Examples

→ Design, Development and Implementation of Control System for Motion Compensated, Hydraulic, Offshore Wind Turbine Access System (TAS)

Initially contracted to assess the performance attainable for a hydraulically actuated gangway, when compensating against boat motions. This involved modelling the various sources of errors – from sensing, actuation and control performance – to achieve the target performance whilst minimising cost and complexity. ISC were then engaged to implement the entire control system, which included MMI using touch panel computers, real-time control and I/O, solving kinematics, and extensive monitoring and safety logic. Full factory testing has been completed and Sea Trials are due imminently (as at May 2012).

→ Control Loop Investigation and Recommendations for HMS Astute

ISC were engaged to investigate a specific control loop on HMS Astute, reviewing current performance and making recommendations for improvements. A simple, but sufficient math model was built to demonstrate the proposed changes ahead of commissioning.

→ Analysis of Hydraulic Damping for a Launch and Recovery A-frame

Modelling exercise to analyse the hydraulic damping within a launch and recovery A-frame, to allow proposed system changes to be reviewed to ensure they would deliver the intended improvements on the vessel.

→ Optimised Gain Scheduled Integrated Fin-Rudder Roll Stabilisation

Gain scheduled roll stabilisation controllers were optimised using models of vessel and wave dynamics. Our solution was tested on a nonlinear model of the vessel, and out-performed more advanced methods developed by academic groups.

→ Active Heave Compensation Design and Implementation for Ocean Survey Vessel

A model of ship motions and heave compensation control were developed. The new algorithms were implemented on the ships PLC and tested during sea trials.

Clients Include

- BAE Systems Barrow
- QinetiQ
- Houlder
- Rolls Royce Marine
- Saipem
- Caley Ocean Systems

Other Services:

- **Training:**

  Off-the-shelf or bespoke

  Introductory or advanced

  Theory or application

  Generic or industry specific

- **ACTC Membership:**

  Free entry to technical events

  Free training entitlement

  Site visits by consultants

  Free access to members-only software and technical dissemination reports

  Access to industrial forum for networking and promotion of services and products

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ISC Projects List – Marine Industry

Houlder Ltd	Analysis of Hydraulic Damping for a Launch and Recovery A-frame
Houlder Ltd	Design, Development and Implementation of Control System for Motion Compensated, Hydraulic, Offshore Wind Turbine Access System (TAS)
BAE Systems Barrow	Control Loop Recommendations for HMS Astute
Rolls Royce Marine	NGMV Design facility for General Ship Motion Control Applications
Caley Ocean Systems	Feasibility Study for a Catenary Control for a Cable-laying Vessel
Caley Ocean Systems	Active Heave Compensation Design and Implementation for an Ocean Survey Vessel
QinetiQ	Optimised Gain scheduled Integrated fin-rudder roll stabilisation (both mono- and multi-hull)
Yellowfin	Propulsion control prototype design, including 6 DoF modelling and validation
Saipem	Crane Barge Positioning
Teaching Company Scheme (with Brown Bros / Lloyd's Register)	Implementation and Assessment of H-inf Robust Control in Marine Applications
EPSRC /MOD	Design of Submarine Autopilots for Course and Depth Keeping
Muirhead Controls	Fin Roll Stabilisation Control System Design
Rolls Royce Marine (Brown Bros)	Autopilot Design for HMS Britannia
Rolls Royce Marine (Brown Bros)	McDermott Barge Thruster Allocation Logic Design for Energy Minimisation.
Rolls Royce Marine (Brown Bros)	Improvement of Autopilot Performance.
Rolls Royce Marine (Brown Bros)	Simulation and Design of Heave Control for SWATH Vessel
Rolls Royce Marine (Brown Bros)	Rudder Roll Stabilisation Feasibility Studies.
Rolls Royce Marine (Brown Bros)	HMS Endurance Type 23 Autopilot Design and Trials.
Rolls Royce Marine (Brown Bros)	Effect of Rudder Slew Rate on Rudder Roll Stabilisation Performance.
Thales Optronics (Barr & Stroud)	Submarine Motion Simulation for Periscope Performance Studies.
Thales Optronics (Barr & Stroud)	Optronic Mast Stabilisation System Performance Evaluation.
DRA, Haslar	Preliminary Study for Submarine Positioning System.

Practical, innovative and optimised solutions for our clients

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