

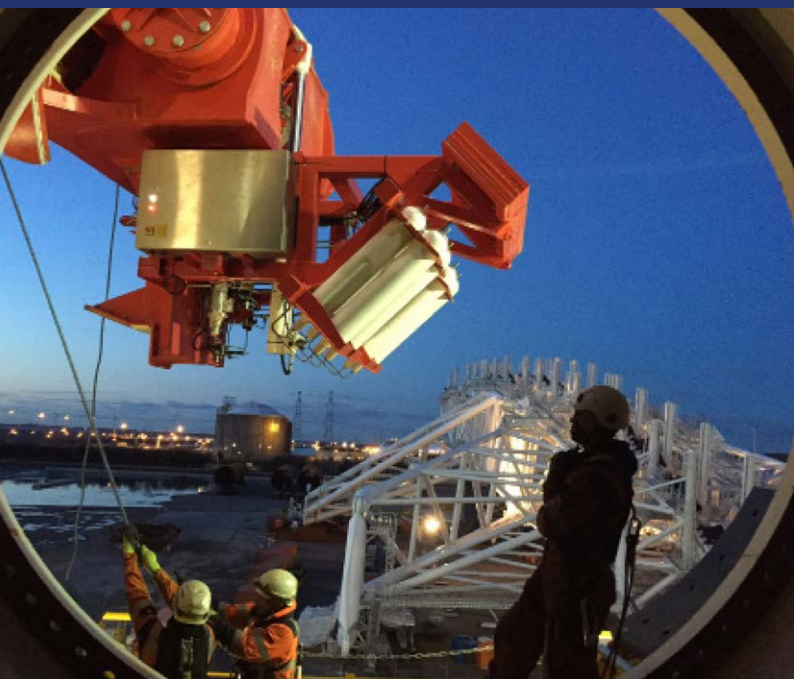


# **HOULDER**

ENGINEERING & INNOVATION / DESIGN & ANALYSIS / PROJECT EXPERTISE

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## **CAPABILITIES STATEMENT**





# CONTENTS

|   |           |
|---|-----------|
| <b>INTRODUCTION</b>   | <b>2</b>  |
| <b>MARKETS</b>  | <b>3</b>  |
| UPSTREAM OIL & GAS  | 3         |
| OFFSHORE RENEWABLE ENERGY   | 3         |
| LNG   | 4         |
| MARINE TRANSPORT  | 4         |
| DEFENCE   | 4         |
| <b>CAPABILITIES</b>   | <b>5</b>  |
| VESSEL DESIGN AND DESIGN REVIEW                                     | 5         |
| INSPECTION AND CLIENT REPRESENTATION                                | 5         |
| FEED STUDIES, FEASIBILITY INVESTIGATION AND CONCEPT DESIGN          | 5         |
| SPECIALIST EQUIPMENT SUPPLY AND MOBILISATION                        | 6         |
| STRUCTURAL DESIGN AND ANALYSIS                                      | 6         |
| ADVANCED ANALYSIS   | 6         |
| DEADWEIGHT SURVEYS, INCLINING EXPERIMENTS AND STABILITY ASSESSMENTS | 7         |
| CONSTRUCTION SUPERVISION  | 7         |
| MARINE ASSURANCE  | 8         |
| PROJECT MANAGEMENT, CONTRACTUAL ADVICE AND EXPERT WITNESS SERVICES  | 8         |
| <b>QUALITY &amp; HEALTH AND SAFETY</b>                              | <b>9</b>  |
| <b>CLIENTS</b>  | <b>10</b> |





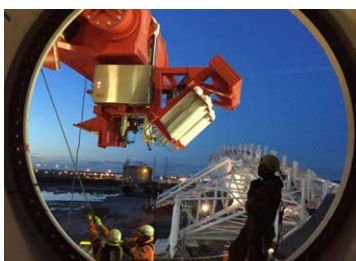
# INTRODUCTION

## ENGINEERING & INNOVATION / DESIGN & ANALYSIS / PROJECT EXPERTISE

In all our markets – offshore renewables, upstream oil & gas, gas ships and marine transport – customers want the same things – trusted partners, dependable technical support and innovative solutions. We deliver all three, whether the requirement is for design and build of new vessels, specialist marine equipment or complex project management. We do this globally for clients at the forefront of offshore development and technical improvement. Our engineers, naval architects, designers and project managers do more than simply offer their expertise in isolation. They combine forces to bring clarity to industry challenges, present fully thought through solutions and balance intellect, experience and practical knowhow.

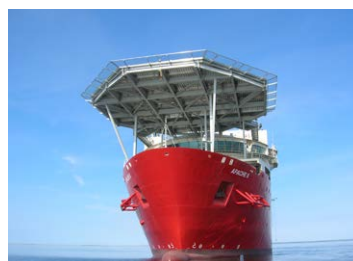
The offshore energy, subsea, marine and liquefied gas industries are all seeing considerable growth. The market for specialist use vessels, bespoke equipment, skilled engineering and detailed analysis has grown alongside them.

Houlder provides global engineering & innovation, design and analysis and project expertise from offices in London, Aberdeen, Portsmouth and Tyneside. Our growing team of multi-disciplinary professionals works to deliver timely, cost effective and high quality solutions across the marine industry.



### Engineering & Innovation

Our engineering is immediately recognisable for its ingenuity. We are at our best when applying corporate brain power to develop new ideas and solve exacting problems within challenging constraints.



### Design & Analysis

Clients expect the full range of naval architectural analysis and engineering services required to optimise their vessel and rig performance. Our design teams also combine creativity, pragmatism and discipline.



### Project Expertise

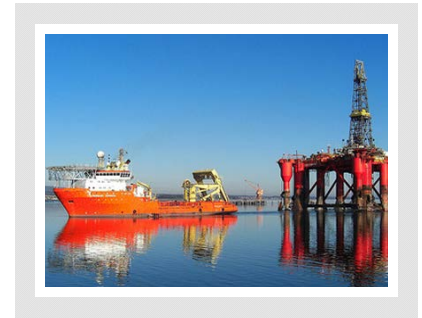
Strong leadership, robust procedures and commercial insight are required to deliver new infrastructure and assets successfully. Houlder's engineering and design knowhow are backed by disciplined project management and professional services.



# MARKETS

## UPSTREAM OIL & GAS

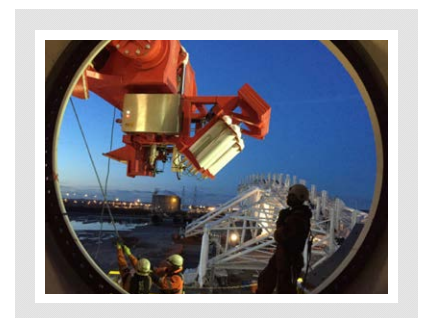
Those accountable for drilling and subsea operations need trusted partners and suppliers to maintain safe and economic operations. Houlder has been earning this trust for over forty years by working with oil majors, contractors, vessel owners and field operators worldwide. The company has built a significant track record designing pioneering vessels, leading drilling rig upgrade work and supplying specialist back deck equipment.



This experience means design, analysis, engineering, procurement, installation and commissioning are all managed seamlessly by integrated project teams – meaning our clients can focus on their own, often challenging, drilling and subsea businesses. The benefits of this approach include cost and schedule certainties. Framework agreements also provide transparency and flexibility whether the company is providing discrete engineering packages, specialist equipment on a turnkey basis or total management of your most significant projects.

## OFFSHORE RENEWABLE ENERGY

Offshore renewable energy is rapidly increasing in scale and complexity. This, combined with its unique cost drivers, means ingeniously engineered solutions have the opportunity to add real value at this early stage of development. Clients in the market come to Houlder for this added value, knowing that the company works from first principles to support wind, wave and tidal projects deliver their targets effectively.



The company's largest impact has been on the offshore wind industry within which it shares specialist equipment expertise, vessel design skill and engineering knowhow. These have combined to develop personnel access and walk to work systems, pile and turbine handling equipment, floating accommodation and turbine installation vessels.

The need for innovation will increase as wind farms move further offshore. Houlder has become trusted on these issues and is already advising its clients on future requirements.



# MARKETS

## LNG

Liquefied Natural Gas is increasing in importance due to the efficiency savings and environmental benefits it presents. This has led to a requirement for innovative design and engineering related to its transportation, storage and transfer. Clients benefit from the combined expertise of highly experienced professionals from across the business.

Those investing in Floating Storage Regasification Units (FSRU), bunkering barges and LNG vessels benefit from Houlder expertise in vessel design, preliminary feasibility studies, specification preparation and subsequent evaluation.

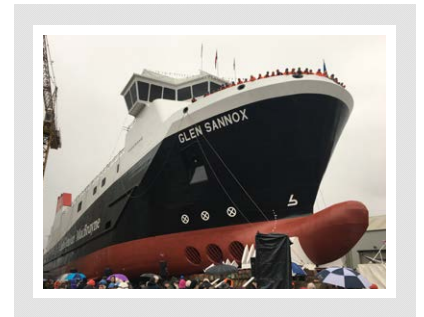
LNG projects are exercising some of the brightest minds in the marine sector. Houlder is now at the heart of the industry sharing proven process, systems and control engineering alongside naval architecture and vessel design.



## MARINE TRANSPORT

Whether they are offshore support vessels, cruise and passenger ferries or carriers and tankers, the market for cutting edge specialist vessels is still buoyant. Houlder's engineers and naval architects continue to lead new build, conversion and life extension projects for a wide range of applications.

We provide design services and act on behalf of our clients, whether the requirement is for discrete design and analysis tasks or total project management through to delivery. Integrated teams are deployed globally to ensure the right shipyard is selected and work supervised to ensure the vessel meets its specification.



## DEFENCE

Houlder has provided technical consultancy, engineering and equipment to the UK Royal Navy, Royal Fleet Auxiliary, Ministry of Defence and prime defence contractors for over thirty years. Known for its high competence and grip on the latest innovation, Houlder was singled out as an important provider of technical and commercial advice in Sir John Parker's 2017 National Shipbuilding Strategy which outlined plans to transform naval shipbuilding in the UK. The company is now providing a range of advisory services to the UK Ministry of Defence's current new build programmes.







# CAPABILITIES

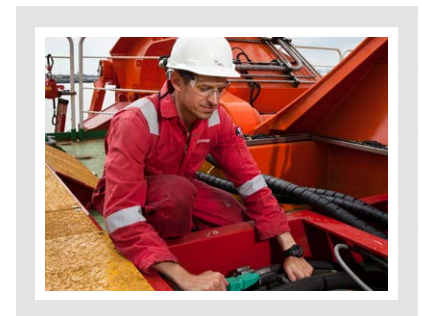
## VESSEL DESIGN AND DESIGN REVIEW

Houlder undertakes new vessel and conversion design, specialising in offshore support vessels, cable laying ships, floating production, storage and offloading units (Oil, Gas & LNG), passenger and crew accommodation and other specialist vessels. Our teams work at every stage from initial feasibility through to providing shipyard drawings. We also deploy plan approval teams on a global basis to help deliver non-standard vessels to time, budget and specification. All our activities are based on a through life approach and the company defines success on the operability of the finished asset – be that a brand new or converted vessel.



## INSPECTION AND CLIENT REPRESENTATION

Houlder deploys senior naval architects and marine engineers to assess floating assets on behalf of clients across all its market sectors. Personnel formally survey hull and superstructures and assess electrical, hotel and propulsion systems as part of procurement, pre and post damage or significant works and as due diligence. Clients have used our personnel to survey vessels in locations as diverse as the Thames Estuary and Hobart, Tasmania. Results have been used to aid decision making, begin conversion work, as part of warranty claims or during arbitration.



## FEED STUDIES, FEASIBILITY INVESTIGATION AND CONCEPT DESIGN

Houlder undertakes design and engineering studies for clients looking to build a case for investment. The company forms multi-disciplinary teams to support these clients by developing concepts from the earliest phase of activity – often when there is very little confirmed beyond an outline proposition. The company has developed a proven methodology for moving from desk study through to a stage when a project can be given an accurately costed and scheduled green light. The outcome from working with Houlder in this way is a design sufficiently detailed to provide shipyards or fabricators with a specification to bid against. In many cases Houlder then goes on to provide more detailed design and supervise delivery.

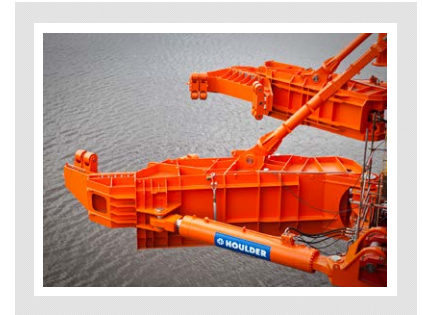




# CAPABILITIES

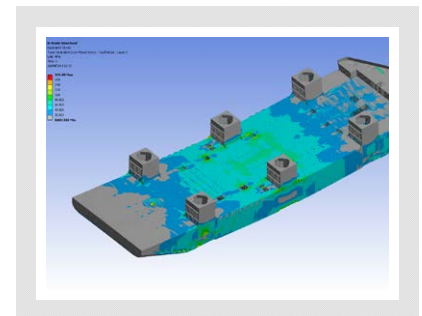
## SPECIALIST EQUIPMENT SUPPLY AND MOBILISATION

Houlder supplies specialist deck equipment including flexlay handling systems and carousels, personnel access and crew transfer systems, launch and recovery technology and subsea equipment handling and control mechanisms. Clients come to the company when their equipment requirements are non-standard and innovative engineering is required to deliver the required performance. Houlder deliver on a turnkey basis - taking accountability for every stage demonstrating initial feasibility through the complete design cycle to installing and commissioning the results.



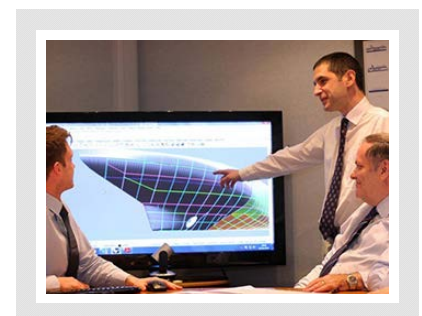
## STRUCTURAL DESIGN AND ANALYSIS

Houlder has an in-house team of structural engineers able to support new projects and respond to client requirements for checks and analysis. Personnel are typically time served and well-versed in standards and regulations. Projects vary from the support of deck equipment mobilisations and general steel replacements to comprehensive fatigue assessments and global strength analysis of ships and semi-submersibles. Drawings and calculations are typically prepared for Class Societies submission with Houlder often acting on our clients' behalf during approvals.



## ADVANCED ANALYSIS

Houlder has the capability to perform advanced analyses either in support of in-house designs or directly on behalf of clients. Recent studies have included seakeeping analyses to determine airgap clearance for semi-submersibles, and dynamic lifting analyses for installation of subsea components. Analysis of mooring systems, both inshore and offshore, is regularly undertaken. Discrete event simulation is also used to determine operational downtime during marine activities caused by weather, equipment unavailability or other restrictions.

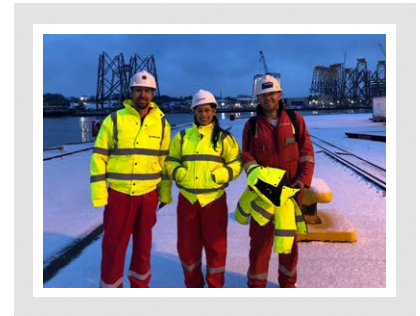




# CAPABILITIES

## DEADWEIGHT SURVEYS, INCLINING EXPERIMENTS AND STABILITY ASSESSMENTS

Houlder has an in-house team of naval architects that can be deployed globally to report on vessels and semi-submersibles. They have experience working in major centres of shipbuilding across the world. Based on this proven track record, the company is able to deliver surveying and inclining procedures that fully comply with Class and statutory guidelines. We understand the challenges of maintaining a fleet effectively and can respond flexibly and at short notice.



## CONSTRUCTION SUPERVISION

Houlder is well placed to supervise major vessel and semisubmersible build and upgrade projects. This varies from managing a whole onsite team – sometimes up to two hundred personnel - on a 24 / 7 basis to integrating individual project managers, supervisors and QHSE staff to act on the client's behalf during wider shipyard operations.



Projects in the oil & gas market tend to be floating rig Special Periodical Survey work, steelwork replacements and major upgrades of accommodation, equipment and topsides. Houlder's marine work includes life extensions of dive support and offshore vessels, pipe and cable lay conversions and numerous deck equipment mobilisations. Houlder teams have also supervised the build of militarised vessels for the UK Ministry of Defence, converted fast passenger ferries and outfitted subsea support vessels.

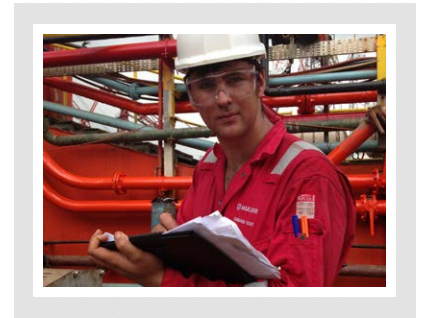




# CAPABILITIES

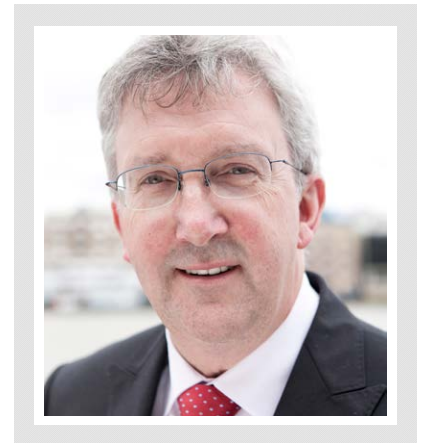
## MARINE ASSURANCE

Houlder is able to assist clients with their decision making process by utilising the expertise within the company. Independent reviews, third party verification and physical inspections are used to provide the assurance that a vessel or contractor has the capability to perform the task or project as intended. The assurance process can be used by clients to satisfy senior management, other stakeholders and insurers that risks have been managed and suitable mitigation measures are in place.



## PROJECT MANAGEMENT, CONTRACTUAL ADVICE AND EXPERT WITNESS PROVISION

Houlder has a wealth of experience in the marine environment which means it is well placed to provide project leadership, technical and commercial advice and representation. Principal staff, such as Marine Design Director Mike Simpson (pictured), typically have chartered professional status and in excess of thirty years' management experience on which to draw. They are able to provide marine industry knowhow to clients to protect investments and drive through successful projects. Team members are also regularly engaged to provide advice, represent clients during contract negotiations or act at arbitration hearings and in the courts of law should that be required.





# QUALITY & HEALTH AND SAFETY

Houlder works alongside external accreditors, industry regulators and classification societies to ensure our Quality regime delivers against client objectives. Our business systems are certified to ISO 9001:2008 standard by LRQA. They are also approved by the UK Ministry of Defence and have been subject to an Achilles FPAL Verified Capability Report.

Clients rightly expect work to be undertaken safely and Houlder’s approach to design and safety management during site works, fabrication, equipment installation and mobilisations is proven to be robust and highly effective. Site safety managers are deployed to undertake inductions, briefings and ‘tool’ talks that reinforce our safety policies and the continuous improvement messages required for success.

## HOULDER LOST TIME EXAMPLE DATA

|                              |   |
|------------------------------|---|
| Houlder Office               | 170,000 man-hours worked without incident |
| EnSCO 71 upgrade             | 130,000 man hours worked without incident |
| Turbine Access System (TAS)  | 5,000 man hours worked without incident   |
| Aquatic Reel Skidding System | 10,500 man hours worked without incident  |
| MPI Discovery Gripper Arm    | 14,000 man hours worked without incident  |
| Aquatic Flexi-lay Carousel   | 6,000 man hours worked without incident   |

Houlder is certified to OHSAS 18001 Standard. Houlder is a member of the British Safety Council and actively looks for opportunities to engage with industry to discuss safety and improve performance.







# CLIENTS

WE HAVE WORKED WITH CLIENTS THAT RANGE FROM OIL & GAS MAJORS WITH FLEET WIDE REQUIREMENTS TO ENTREPRENEURS WITH STRONG IDEAS NEEDING COMMERCIALISATION.

Specific clients include:

|   |   |  |   |
|---|---|--|---|
|    |    | <br>MAERSK |    |
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|  |  |          |  |
|  |  |          |  |

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