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INNOVATING HEAVY LIFT SOLUTIONS

PART OF THE Malin Group

TURNKEY TRANSPORTATION SERVICES

PART OF THE Malin Group

CONTENTS

MALIN ABRAM

OUR APPROACH

Malin Abram is your trusted advocate for all things heavy lift. From our beginning as a ship delivery outfit in the 19th century, Malin Abram has evolved to a full marine engineering service, working with a variety of clients worldwide, to deliver complex projects encompassing many disciplines. We do this by focusing on what matters: our client and their needs.

USING OUR EXPERT KNOWLEDGE, WE PROVIDE A BESPOKE SERVICE BASED ON INTEGRITY, EXCELLENCE, CREATIVITY, AND IMPARTIALITY.

We are experts in the handling and relocation of abnormal loads and cargoes. For many logistics projects this primarily involves hired in equipment, which ranges from cranes, heavy haulage, tugs and barges, through to specialist hydraulic jacking and skidding equipment.

Servicing client's specialist needs, we have through these heavy lift projects, designed, developed and fabricated an enviable range of specialist projects. This has enabled an evolution of our role, developing to become an ever more integrated element of client's build processes, and installation methodologies. We are proud to act as the first port of call for many clients who require assistance in mechanical handling and lifting operations beyond the realm of heavy lift logistics.

OUR TEAM

AS THE COMPLEXITY OF THE EQUIPMENT WE HAVE DESIGNED HAS EVOLVED, SO TOO HAS THE CAPABILITY OF THE MALIN ABRAM ENGINEERING TEAM, SPECIALISING IN THE DELIVERY OF A TURNKEY TRANSPORTATION SERVICE.

Our team is comprised of a unique mix of naval architects, structural engineers, mechanical engineers, draughting, lifting engineers and project managers, as well as hydraulics and control systems specialists.

Our diverse range of skills and expertise enables us to deliver bespoke solutions for our clients, whether the task is in their workshop, on site inland, at the water's edge or at sea above or below the waterline.

OUR SERVICES

YOU SIMPLY NEED TO OUTLINE THE NATURE OF THE CARGO TO BE MOVED, THE COLLECTION POINT AND THE DELIVERY OR INSTALL LOCATION AND WE ARE ON HAND TO TAKE CARE OF THE REST.

We will organise the collection at your site and transport to the port of loading. This may be by road and delivery to port cranes, or cranes that we will source locally and oversee. Or it may require a move via an inland waterway, with us sourcing and supplying a suitable tug and barge, arranging the loading at your facility and then the discharge at a larger transshipment port, to allow your cargo to be loaded to a sea going vessel.

All aspects of the project are covered by us - from sourcing and negotiating a suitable sea going vessel, to loading and securing to ensure the cargo is safely stowed for transportation. We are also here to manage all discussions with the local land and marine service providers for you, including ensuring that the local port authorities are aware of the movements and that any special procedures or permits that are required are in place.

The design work needed to ensure that the vessel is fit for purpose, and then drafting of all plans, design calculations and any negotiations with a third-party warranty surveyor is all handled by our in house team. For continuity of service, typically, this same team will attend on site and ensure that all loading and securing is executed to plan.

Our turnkey service is holistic: it comprises many services which together combine to create a door-to-door, a-z solution, tailored to your needs.

We understand that each client will have differing needs and as such, they require a specific solution. To provide this, we have six main areas which together form our turnkey solution. We can provide all or any depending upon your exact project requirements.

- Project Management
- Roll on / Roll off Engineering (Ro-Ro)
- Ship Launches / Float offs
- Stability checks and naval architecture services
- Towage analysis and engineering
- Transport and movement of vessel units and blocks

PROJECT MANAGEMENT

OUR APPROACH TO PROJECT MANAGEMENT PLACES THE CLIENT AT THE HEART OF EVERYTHING WE DO. OUR EXPERIENCED TEAM CAN MANAGE A WIDE RANGE OF PROJECTS OF VARYING COMPLEXITIES.

We focus on your requirements by engaging early in the process and being on hand throughout the project life cycle. Detailed planning and risk or opportunities which present themselves during the project.

On successful projects, particularly complex challenges such as turnkey heavy lift operations, developing an integrated approach is essential; many elements need to come together for a project to be successful. It is not enough to be able to manage one of these elements individually, they need to be managed holistically and we are on hand to help.

Things often change over the course of the project. Some of these can be predicted with contingencies put in place, but sometimes they come from nowhere and having good project management processes in place enables our project managers to quickly and effectively assess the impacts of such changes and find the best solutions.

Cost is a common concern for many clients and our turnkey solutions provide you with everything you require for the agreed budget. Our use of integrated project management can present opportunities to save money at various stages of the project and our expertise in all things heavy lift will always be used to find the most economical solutions.

Your dedicated project manager will know the project inside out, have a detailed knowledge of the scope and act as the single point of contact for you and all of the contractors who may be involved. This gives the project manager a unique and privileged overview of the project. A small change in one part may have a large knock on effect to others. This is where our place as your trusted advocate really comes into play as we will identify these at the early stages, with the potential for large cost savings. Contrast and compare this to having all of the contractors running their own individual smaller projects and delivering just their scope. It is then where large problems caused by small changes will become apparent.

You can be safe in the knowledge that once you hand the project to us, we will take care of everything from beginning to end. From fabricating an item and delivering it to site, carrying out motion analysis and securing calculations, to chartering the correct vessel, loading and attending on site to supervise operations, we can do it all. Keeping our clients in the loop and engaged at each stage is crucial and plays an important role in our approach.

Malin Abram will approach your heavy lift project with integrity, excellence, creativity and impartiality. We work closely with our clients to create a foundation for the successful delivery of project deliverables.

MALIN ABRAM

ROLL ON / ROLL OFF ENGINEERING

ROLL ON / ROLL OFF (OFTEN SHORTENED TO RO-RO) ENGINEERING IS ONE OF THE KEY SERVICES WE PROVIDE AT MALIN ABRAM. WE PROVIDE EXPERTISE IN ALL ASPECTS OF RO-RO OPERATIONS.

This covers the early stages where we undertake suitability surveys of the port or berth to ensure they are adequate, source the most suitable vessel or carry out analysis on a proposed vessel, to engineering of the operation itself and securing the cargo for the upcoming voyage. We remain in contact with the vessel on route to its destination and provide daily updates on your cargo to give you peace of mind.

Ro-Ro engineering requires a detailed knowledge of trailer operations. Selecting the correct trailer arrangement for the cargo is important – What ground clearance does the cargo have? Where does it need to be supported? What is the allowable ground bearing pressure on the quay? How many axles and power packs are required? Being able to answer these questions will allow the correct trailer specification to be selected, reducing potential time and cost spent on the project.

Whilst choosing the trailer arrangement is important, the engineering required to plan and execute a successful load out by rolling on to a barge or vessel is crucial. The ballasting must match the tide and the progress of the trailers whilst maintaining the stability of the vessel. Therefore, controlling the ballast pumps and keeping a clear line of communication between the key personnel is critical for successful operations. Not only do Malin Abram undertake the engineering but we also supervise operations and the experience of our engineers and naval architects will ensure that your cargo is in the best hands.

One of the most difficult elements of a ro-ro operation is ensuring that the correct vessel is selected. Applying our knowledge and expertise to the problem, we can source the perfect vessel to meet your requirements. It can be easy to select a vessel (whether it is a barge or a ro-ro cargo ship) which is big enough, but this doesn't always mean it is the most suitable. For example, is the deck strong enough? Does it have adequate ballast capacity? What is the draught and can it safely navigate and load out or load in at the designated ports? As with other elements of ro-ro operations the selection of a vessel which does not meet all of your requirements (or one which is over-specified) can have cost implications on the project.

A typical ro-ro engineering package from Malin Abram could include:

- Suitability survey (of port / quay / vessel / cargo)
- Load out / in ballast calculations
- Longitudinal strength calculations
- Mooring analysis
- Stability analysis
- Method statement
- Risk assessment
- Sea fastening design
- Fabrication drawings (transport cradles / grillages / load spreading)
- Swept path drawings

MALIN ABRAM

SHIP LAUNCHES / FLOAT OFFS

IN AN INDUSTRY CONSISTENTLY STRIVING FOR IMPROVEMENTS TO SAFETY, WE ARE ON HAND TO OFFER AN ALTERNATIVE TO TRADITIONAL DYNAMIC LAUNCHING OF SHIPS.

The benefits of a controlled launch, or float-off include:

- Increased outfit opportunities
- Increased safety
- Reduced risk

Whilst this process may seem relatively straightforward at first glance, such operations require extensive pre-planning and engineering works. This is to ensure the equipment, usually drawn from a wide range of suppliers, is compatible with the vessel being launched; the trailer arrangements used for loading, the semisubmersible barge, the shipyard load out quay and the nominated berth or open water location for the float-off operation.

Our experienced project management and engineering teams have the capability to manage, engineer and deliver an end-to-end solution from the early design stage through to the completion of all on-site operations, acting as a single point of contact for turnkey projects and offering you the full range of services required to launch a vessel. Ship launches and float offs offer a host of challenges which are entirely unique. Malin Abram have been involved in, and innovative in our approach to, numerous ship launches. Our clients place their trust in us, and we appreciate that this puts us in a highly privileged place.

These operations can involve many parties – the client, the equipment owner, various contractors, the port authorities, local government, and barge owners. As a single point of contact for all parties, our Malin Abram project manager will look after the launch from beginning to end.

The traditional ship launch method is becoming less desirable to many shipbuilders. Although planned, there is an element of risk introduced as the vessel is uncontrolled as it is launched into the water.

By using a barge to float a vessel off the entire operation is controlled and planned stage by stage. The vessel is always under control, whether it is secured on the barge or it is under tow. With this increased level of control a greater amount of outfitting can be carried out prior to launch which can ultimately reduce costs and the time until the vessel is ready to enter service.

A typical turnkey ship launch or float off project will be long-term and Malin Abram would be involved from an early stage in the ship build.

A ship launch project may include the following:

- Initial discussions with the client – going over the options for the launch. These may be dictated by the size and weight of the vessel, local regulations, client requirements or available locations. Suitability surveys may be undertaken at this stage, if required
- Identifying a suitable barge (if float off is the solution)
- Engineering – float off ballast calculations, load out ballast calculations, barge deck strength checks, vessel hull verification, towage analysis, mooring analysis
- Identification of suitable equipment and contractors
- Regular communication and updates with project stakeholders

At Malin Abram we are proud of our commitment to impartiality and creativity in our approach to problem solving and these values are key to ensuring that the best possible solution is found for your ship launch.

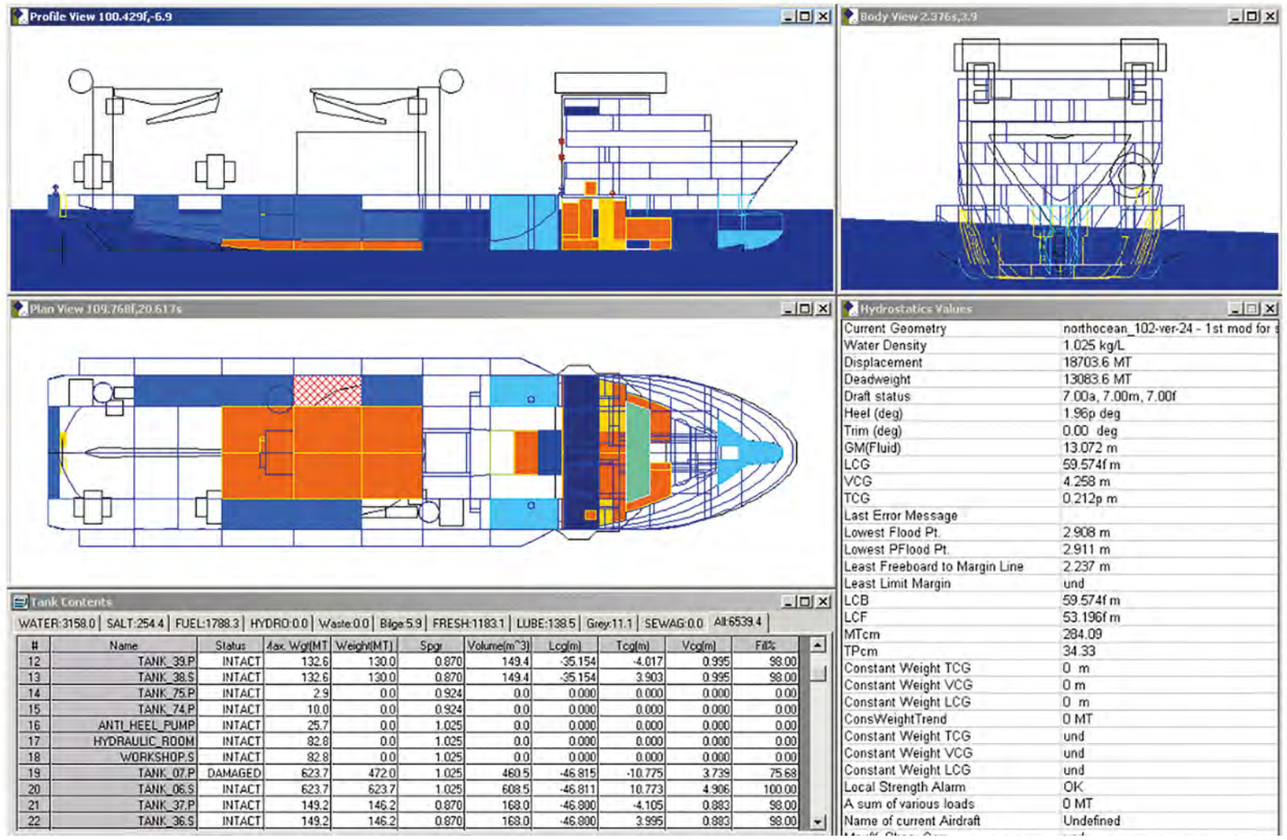
STABILITY CHECKS AND NAVAL ARCHITECTURE SERVICES

SHIP STABILITY IS A CRITICAL COMPONENT OF A VESSEL'S ABILITY TO SAIL FROM ONE PORT TO ANOTHER. AS CARGO IS LOADED OR UNLOADED, THIS ALTERS THE SHIP'S FLOATING CONDITION AND CHANGES THE STABILITY, MAKING AN ASSESSMENT OF A VESSEL'S STABILITY A KEY PART IN SUCCESSFULLY DELIVERING CARGO ONBOARD.

Our dedicated engineers have the experience and expertise to undertake static, and more complex dynamic, vessel stability checks against various standard industry codes, tailored to your specific requirements. These can range from a basic check on a vessel's metacentric height, to the building of a computer model to further assess both damaged stability and longitudinal strength of a vessel.

We make use of a range of techniques to assess the stability of various vessel types. Utilising computer software we can model any vessel and run complex cases and detail the results in easy to read reports. On the other end of the scale we can perform manual calculations, and often do so when reviewing work as part of our warranty and third-party review service.

We also offer a wide range of additional naval architectural services through our experienced and diverse team of naval architects and engineers. This includes technical support with vessel design, construction, modification and repair. We can carry out vessel condition and cargo surveys, assist in compliance and approval with classification society requirements, and carry out design evaluations in conjunction with various standard industry regulations.



At the beginning of any transportation project a key consideration is the suitability of a vessel or barge to safely move your cargo from load port to discharge port. This is one area where having an expert at hand will pay dividends. The team at Malin Abram can perform vessel inspections, carry out analysis taking into consideration any cargo limitations and the route the vessel will take to determine whether the vessel will be able to withstand the many forces it will experience during the voyage. If any areas show cause for concern, then we are on hand to advise and find a solution.

For new builds and modified vessels, ensuring the design meets regulatory criteria is key. New vessels, including those which have been re-purposed or modified, require stability books which show that the vessel meets the requirements for classification societies. Malin Abram can produce these stability books and undertake any engineering or design challenges you may face. A deep understanding of the regulations allows us to find the balance between the amount of steelwork used and satisfying the rules.

Stability checks and naval architecture services do not just apply to operational vessels. Vessels being launched, whether in the traditional way or by floating off, also need to be stable. We specialise in vessel float offs which combines many elements of naval architecture, assessing barge stability at all stages along with the vessel being launched. Whatever the requirement, Malin Abram are your expert partner for all of your naval architecture needs.

TOWAGE ANALYSIS AND ENGINEERING

THE WORK CARRIED OUT BY TUGBOATS NATURALLY COMES WITH SIGNIFICANT RISK HOWEVER, WITH THE CORRECT PREPARATION AND KNOWLEDGE THESE RISKS CAN BE BOTH MINIMISED AND MANAGED.

Our expertise in towage requirements and design, means that we may engineer and design a towing arrangement to meet your exact needs or offer advice on an existing design, highlighting any limitations it may have.

Tugs are a vital consideration in any marine transportation, particularly so on barge movements. Ensuring the correct tugs are used for any towage operation is key – too weak then the vessel and its cargo are at risk, too powerful and the financial implication can be substantial. Tugs come with sizeable costs – from mobilisation and demobilisation, to day-rates, and fuel.

Tugs are often specified based on their bollard pull capacity. This is a way of identifying how powerful a tug is. Malin Abram have vast experience in running bollard pull calculations, which can be used to identify the most efficient tug for a marine transportation, or to identify the minimum requirement in terms of bollard pull capacity.

However, identifying a suitable tug is of little use if the towing equipment used during the operation does not meet minimum requirements. Marine Warranty Surveyors will pay close attention to towing gear therefore identifying what is required and having the calculations run to industry standards to back it up is crucial. Malin Abram have the expertise to identify the equipment and offer solutions tailored to each voyage.

Making use of computer software, towage simulations can be run for a specific voyage, which enable dynamic analysis to be carried out based on various environmental inputs, showing the effects on the tow. This can be useful for many reasons, in particular the identification of acceptable weather windows for a movement and how many tugs may be required. This is important in narrow waterways and allows for good management of the operation, providing all parties (tug masters, barge masters, port authorities) with knowledge of what to expect at certain stages of a tow.

Communication is crucial in all aspects of any project and it is no different when it comes to towage. Ensuring all parties are aware of the minimum requirements from the beginning, through to detailed operations planning, we are on hand as your expert partner throughout.

Our experience allows us to offer guidance on vessel selection and we can create and provide towage plans for manoeuvres such as large vessels berthing in port or barge hand over procedures between tugs at sea. We are here to ensure that these challenging operations are safe and successful.

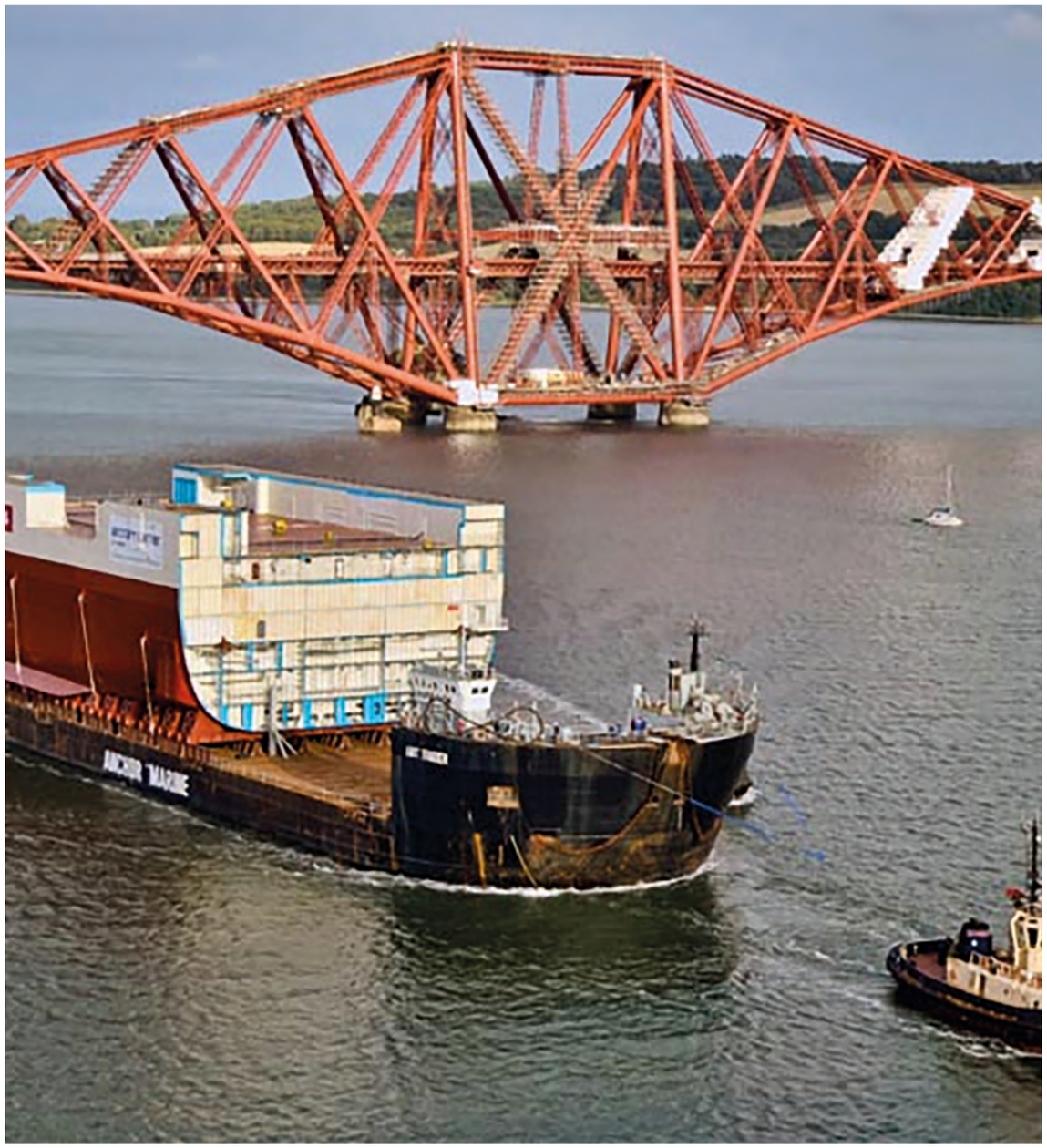
TRANSPORT AND MOVEMENT OF VESSEL UNITS AND BLOCKS

COMBINING OUR KNOWLEDGE AND EXPERIENCE ON ALL ASPECTS OF CARGO TRANSPORTATION, FROM TRAILER STABILITY AND RO-RO OPERATIONS TO SEA FASTENING DESIGN AND DAMAGE STABILITY, WE OFFER A TURNKEY SOLUTION FOR SEA TRANSPORTATION OF VESSEL UNITS OR BLOCKS, FROM BUILD SHED TO DELIVERY LOCATION.

We project manage an end-to-end transportation solution from the early engineering stage, through to the completion of all on-site operations, understanding the difficulties surrounding transport of complex, out-of-gauge cargo, ensuring detailed, concise planning and execution, all of which are key for successful delivery.

Vessel units and blocks come in various sizes and weights which means that no transportation is the same. Each one requires its own unique plan when it comes to transporting them from the fabrication yard to the build yard. We have a long history of vessel unit and block transportation, ranging from small units to blocks weighing thousands of tonnes.

The transportation of these units poses a special challenge. Load out operations can be limited by the size of the cargo, the size of vessel required or the layout of the fabrication yard which are often lacking in available space. For those which can be loaded by crane, the centre of gravity is rarely central and specific lift designs are required. Due to the nature of the cargo, lifting can cause structural problems, an area we have particular expertise in mitigating. Designing a suitable rigging arrangement and / or analysing the cargo structure ensuring no damage is caused during lifting operations are some measures which can reduce the risk to your cargo.



For heavier, larger units such as blocks, trailers may be employed for load out on to a barge. These load outs will require even more planning and detailed engineering, but this is something we enjoy doing here at Malin Abram and such a challenge allows us to impart our expertise and use some of our creativity to find the best solutions. Deck grillages will be required to spread the load on the barge. These will be designed to consider the loads experienced by the cargo and will tie in with cargo and vessel structure to avoid any damage during the voyage.

Once cargo reaches a certain size in relation to the vessel, understanding the interaction between the two becomes critical. Simplified assumptions are harder to justify and the clearest way to check how they interact is by running FE analysis on the cargo, the vessel, supports and sea fastening. This detailed engineering gives a small insight into the complexities of the engineering required for these types of heavy lift projects.

We have a long history of assisting ship builders move small and large sub-assemblies between different points of manufacture. A range of skills and competencies are required for such transport operations to be successful, with any gaps having potentially significant risk and cost implications.

Our expert engineering team ensure that the appropriate seagoing vessel is selected, and our chartering experience ensures that the vessel is chartered under the best terms and in line with project requirements. Our engineering team then carry out the detailed engineering required to deliver the ship unit, including load-out ballasting calculations, trailer stability and strength, sea fastening, support design and vessel stability during the sea voyage.

The integration of all services, including technical and operational requirements are managed by our in-house project managers, providing a fully integrated offering. When an operation goes live, our marine and site operations team attend on site to ensure that all subcontractors are working as part of an integrated team. We complete safety reviews, daily toolbox talks and daily progress reports, all of which are fed back to the client, to keep them abreast of progress at all times.

YOUR PARTNER

WE PLACE YOUR NEEDS AT THE HEART OF ALL THAT WE DO.

We focus on the project requirements and are committed to finding the most suitable solution. This means we are not tied to using certain equipment or suppliers and can truly obtain the best working, and most cost-effective solution.

We are proud of this commitment and our mission to find the most innovative methods to solve even the most difficult problems, often with a relatively simple solution. We are here to act as your partner, to guide you through all of your options at each stage, outlining the opportunities along the way and working to minimise any potential risks.

We provide our clients with one point of contact who has an overall view of the project and who will select a dedicated team, tailored to your requirements.

We also provide, if required, project management services to enable us to manage the project for you, from start to finish.

Additionally, our first class Quality Approval system is accredited to DNV-ISO 9001:2015. All of our engineering is presented in a clear and easy to follow format, with the justification required to allow for fast and efficient approval by 3rd party warranty.

QUALITY ASSURED

Quality assurance is paramount to all that we do - our quality procedures for design and implementation of technical analysis are rigorous and we pay particular attention to model quality checks and standardised use of software throughout our Group.

Our safety procedures onsite and while working on vessels have been formed and developed to cover the specific risks associated with our work and the expectations of our clients.

We are committed to safety and risk management at all stages of a project from concept through to detailed design and implementation to deliver a system fit for purpose. This is achieved through our phased approach to design and development together with a safety assessment process (HAZOP) to ensure that potential hazards are captured early in the design development phase and that risk reduction measures are implemented to ensure that the remaining risks are considered to be as low as is reasonably practicable (ALARP).

We hold ISO 9001, ISO 14001 and ISO 45001 accreditation with DNV GL and our fabrication facility is accredited with ISO 1090-1 Execution Class 4 and ISO 3834-2. Our IT systems are protected and accredited to Cyber Essentials Plus.

DID YOU KNOW...

MANAGEMENT SYSTEM CERTIFICATION
DNV·GL
ISO 9001 = ISO 14001
ISO 45001

CYBER ESSENTIALS PLUS

MEET THE TEAM

JAMES IAN BOWIE

ENGINEERING DIRECTOR

James began his career as a summer intern with Malin Abram, before gaining a degree in Naval Architecture and joining full time as a graduate. Having worked through the graduate programme and many years as a Team Leader, James now hold the position of Engineering Director. James has experience in a variety of projects from marine heavy lift transportation, to design and manufacture of bespoke jigs and has been involved in major site operations worldwide.

GARY PATERSON

DIRECTOR

Gary is Director of Malin Abram, having joined the company after completing an MEng in Aeronautical Engineering at The University of Glasgow. Gary has a broad experience on the logistics side of Oil & Gas projects, most notably working as an in-house Heavy Lift Specialist on the TCO project. In addition to being AP (Appointed Person) qualified, he also specialises in seafastening design and global and local structural checks on vessels and barges.

CHRIS CAIRNS

COMMERCIAL DIRECTOR

Chris is the Commercial Director for Malin Abram. Having graduated in 2011 with a degree in Quantity Surveying, Chris spent the first 5 years of his career in the oil and gas industry with a worldwide oil and gas subsea contractor in Aberdeen, where he managed numerous high profile tenders for major oil and gas projects. Chris joined Malin Abram in 2016, where he has enjoyed being involved with tendering various heavylift and marine scopes and seeing them through to project execution. Chris is responsible for the teams' tendering activities, ensuring compliance and tender deadlines are achieved.

JOHN A MACSWEEN

GROUP MANAGING DIRECTOR

John is the Managing Director of the Malin Group. Having graduated with a degree in Naval Architecture and Ocean Engineering from Glasgow University, John joined Henry Abram and Sons as a Graduate Marine Superintendent. From here he has spear-headed development and diversification efforts, resulting in the Malin Group, home to several successful sub-brands, which focus on marine manufacturing, support, and technology sectors all over the world.

RYAN HOMER

PROJECTS DIRECTOR

Ryan is Projects Director at Malin Abram, with extensive experience across a wide variety of projects. He graduated with a degree in Engineering & Enterprise Management from the University of Strathclyde, following this up with a degree in Marine Studies from the University of Plymouth and gaining his OOW Unlimited CoC. Ryan joined as a Trainee Marine Superintendent. He has been involved in a diverse range of projects within the company, from short shipping to major turnkey projects.

STEVEN THORNLEY

SALES DIRECTOR

Steve joined Henry Abram & Sons in 1994 from Babcock Power as a Marine Superintendent and in 2009 Steve was promoted to Project Manager, with responsibility of running the teams on the BP Projects in the Caspian Sea, North Sea Oil Operators, as well as developing company sales. Steve has been involved in various contracts with BAE, such as the Auxiliary Oilers, LPD Vessels, T45, CVF and Astute projects. Part of a management buyout of Henry Abram and Sons and Malin Marine Consultants in 2012, Steve was promoted to Sales Director, with responsibility for developing the customer base and creating strong customer relationships.