

# Cruise ships

Solutions to improve passenger flow and cargo handling efficiency



Photo: © Norwegian Cruise Line

# Passion for performance – united by the sea

MacGregor is a family of innovators. By engineering solutions that make the sea more accessible, safe and reliable, we support you whose livelihood depends on the changing conditions of the sea. To enable that we have a variety of strong product brands and committed experts with a passion for solving challenges – and the power of the sea is sure to provide those.

Our founders braved new frontiers in different times and places. Those origins merge at today's MacGregor, inspiring us to continue the stories, and create new ones. The spirit of our founders lives on in the pride we have for what we do, and our determination to find new solutions for the people we work with. Together with you we will write the next chapters.

We are a global team of professionals, who create value for you; the owners, operators, and ship builders in the offshore and marine industries. Understanding your business and way of life is key to our work. It is the foundation to addressing your needs with tailored solutions for load handling, cargo handling, mooring or essential auxiliary equipment. Your productivity, sustainability, and equipment lifetime benefit from our combination of expertise and technology. As innovators, we work together with you to set benchmarks in innovative solutions and value creation.

Our deep respect for and experience of the sea lays the foundation for adapting to its challenging conditions. Wherever we work around the world, we work together with a passion for performance and a love of challenges – united by the sea.



# Throughout the ship's lifetime

Travel is an experience and cruise ships are increasing in size and sophistication, demanding continuous innovations in ship design and improvements in onboard experience, a high level of comfort and the latest safety measures.

New environmental regulations and ship operators' growing concern for the environment make greener options, such as MacGregor's environmentally-friendly electric drive solutions, ideal for this purpose. MacGregor equipment has a long record of operational availability and reliability. Efficient operations depend on good service. Wherever your ships are, you can rely on our global network for maintenance and repair resources, as well as fast and efficient supply of original MacGregor spare parts, whenever you need them.

## Streamlining cargo and passenger flows

MacGregor's aim is to add value to your business throughout the ship's lifecycle and provide solutions which maximise the safety, efficiency and reliability of the equipment throughout its lifetime.

Our technological expertise and in-depth understanding, close customer cooperation and continuous development mean that we can deliver the most flexible and efficient passenger and cargo flow solutions possible, adapted to the ship's cargo profile and the logistics chain.

MacGregor offers integrated passenger access and cargo handling solutions that optimise and enhance the functionality of the cruise ship. To achieve this, our ship experts and technical teams work closely with shipowners, shipyards and consultants on issues related to passenger and cargo flow. Purpose-built access equipment is supplied as an integrated solution, based on

passenger needs, loading and unloading requirements, space limitations, logistical factors and environmental considerations. We can take overall project responsibility and supply complete turnkey deliveries.

## Lifetime support for your operability

MacGregor is a global company with facilities located near shipyards and ports in more than 50 countries.

Once the ship is in service, we endeavour to provide lifetime support in the form of maintenance and service solutions that ensure the operative availability of the MacGregor equipment. Our service network consists of more than 60 service centres.

Later in the ship's lifetime, our capacity to modernise and convert the original system helps shipowners get even more from their investment by optimising performance to match changing market needs.

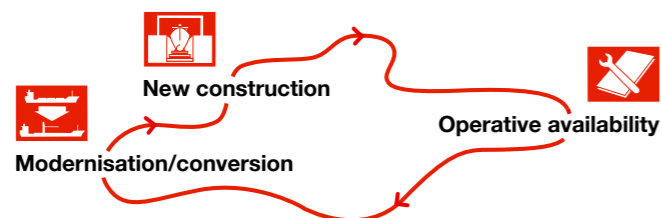


Photo: © MEYER WERFT

## Safe passenger access

MacGregor offers a comprehensive range of shell doors, platforms, cargo lifts, and service cranes, which ensure the smooth and safe transfer of passengers and crew, and enable easy cargo loading and unloading, to and from the ship.

We have a long experience in providing innovative engineering solutions, based on proven technology.

We are constantly strengthening our organisation and improving our way of working to make full use of the company-wide knowledge for the benefit of our customers.

## Innovative solutions

MacGregor access systems and equipment are designed to be efficient, economic and safe.

All equipment is reliable and incorporates the latest technology, designed to comply with all specific operating requirements and strict passenger safety regulations.

## Continuous research and development processes

Through research, development and prototype production, MacGregor continuously refines all of its equipment, so that it delivers on both an efficiency and performance basis.

Our solutions are based on the best features from previous deliveries, years of experience and know-how and incorporate the most recent developments and technology.

Therefore, we can deliver the most flexible and efficient solutions that optimise the functionality of your ship, meeting today's needs for higher efficiency, safety, reduce costs as well as environmental impacts. This benefits its productivity and reduces service downtime.

# Benefit from our turnkey deliveries

Complete deliveries on a turnkey basis are the most cost-efficient and time saving solution. Contact us regarding the entire scope of your project. The benefits are considerable.

## Complete turnkey deliveries

We can take overall responsibility and deliver purpose-built solutions, from the design to the integration, of a complete access system, delivered as a package or in modules.

Our solutions offer one main partner, one responsible party for the customer's project, a modular solution for shipbuilding, and accountability for the function of the whole MacGregor system during the ship's lifetime.

All products and equipment are ready-built, tested and integrated with the ship, thus simplifying the shipbuilding process for the shipowner and shipyard.

A complete delivery includes:

- design and planning
- manufacturing of steel structures and coaming
- quality control
- factory acceptance tests (FAT)
- installation and commissioning
- after sales services, spare parts and crew training

## Overall project responsibility

We are experts at overall project management, covering technical and commercial issues, sourcing, logistics and just-in-time (JIT) delivery.

We take responsibility for your project during manufacturing and manage the whole supplier and logistics network.

## Global manufacturing partner network

MacGregor is working with manufacturing partners around the world for the production of hatch covers, cranes and RoRo passenger access and cargo handling equipment.

We have a dedicated organisation whose task is to ensure compliance with high level standards. Our own quality control personnel and production personnel are there on site to ensure superior quality and constant development to best meet the needs of our customers.

Our Hatlapa, Pusnes and Porsgrunn operations have their own production sites in South Korea and Germany as well as our partners' production plants.



# Quality, environment, health and safety

MacGregor is actively engaged in considering all safety issues, liaising closely with the classification societies and authorities.

Product quality is ensured by our skilled engineers working in close cooperation with our own QEHS departments together with selected qualified long-term sub-contractors. Our role includes conceptual know-how and drawings, instructions, production supervision, quality control and installations.

## Production supervision and quality validation

We have state-of-the-art production arrangements for steel structures. Systematic quality validation processes for the manufacturing are made at pre-defined key stages. All production lines are supervised on a permanent basis and are regularly audited by class surveyors.

## Quality assurance, environment, health and safety systems (QEHS)

With regard to quality assurance, MacGregor's in-house processes are certified to ISO 9001:2008 standards worldwide in every location, including all product lines and service centres.

MacGregor is also certified to ISO 14000:2004 environmental and OHSAS 18001:2007 occupational health and safety standards in Sweden, Finland, and at our offshore facilities in Norway, China and Singapore as well as in the majority of MacGregor's branch offices of the Global Lifecycle Support.

MacGregor's quality assurance, environmental and health and safety systems (QEHS) cover both in-house and sub-contractors' activities to the extent that they are acting on our behalf.



# Product portfolio

- 1 Shell door
- 2 Mooring platform/door
- 3 Tender platform
- 4 Loading platform
- 5 Lifting platform
- 6 Deck machinery
- 7 Compressors
- 8 Steering gear
- 9 Cranes



## Shell doors

A wide range of MacGregor doors are available, tailored to suit each customer's needs. The doors may be side-, bottom- or top-hinged and delivered with or without frames.

Doors can be hydraulically or electrically operated. Electrically-driven shell doors eliminate the possibility of environmentally-damaging hydraulic oil leaks. They have a sleek and streamlined design, the electric motor is quiet, and there is no additional noise generated from a power pack, as this is not required.

- Passenger entrance doors
- Pilot doors
- Provisions handling doors
- Luggage/store handling doors
- Shore connection doors
- Garbage access doors
- Tender access doors
- Mooring platform/door
- Tender platform
- Bunkering doors



Electrically-driven shell door.



Photos: Shippax Information/Mike Louagie

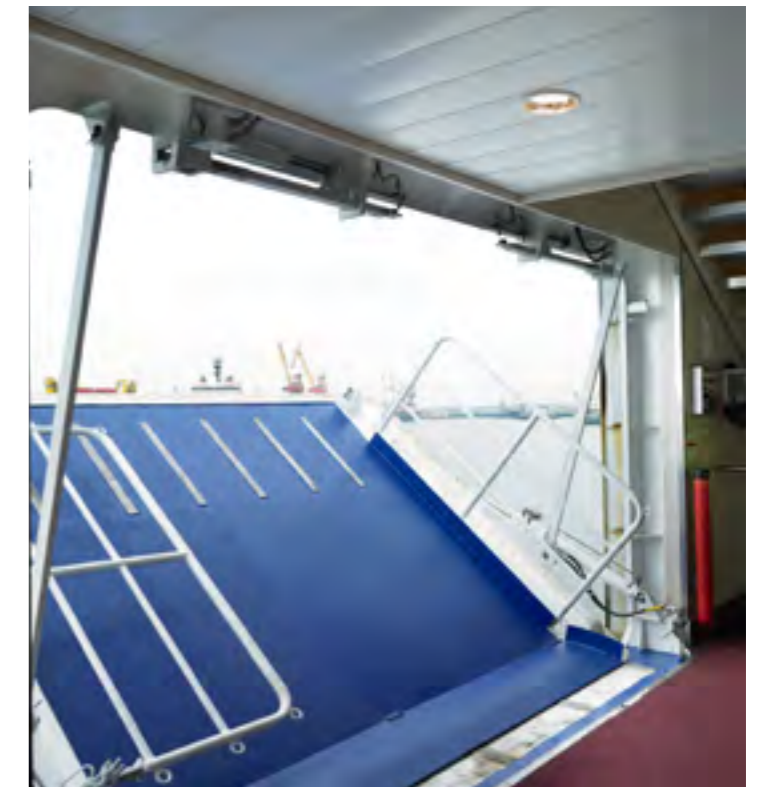




Photo by Dickelbers, Licensed under CC BY-SA 3.0 via Wikimedia Commons

### Mooring platform/door

The mooring or observation platform/door provides a better view of the mooring process.

In the closed position, the unit forms a door flush with the hull shape and flare of the ship's bow. In the open position it is folded down, providing a platform. The platform can be hydraulically or electrically operated.



### Tender platform

The tender platform provides access to the tender boats. It is equipped with bollards and foldable portable fenders and has one hinged gangway with a foldable railing and one side-hinged door.

The platform is secured in the closed position by cleats located in the frame/coaming. It can be hydraulically or electrically operated.





### Lifting and loading platforms

We can supply lifting platforms for use between deck levels and loading platforms for transferring loads into the ship. The platform will be purpose-built, weight optimized and designed for easy reliable operation.

Platforms can be hydraulically or electrically operated.



### Control system

The equipment is easily monitored and operated via user-friendly control panels. They have few buttons and switches which makes the equipment easy to control. Operational sequences are switch-controlled via Programmable Logic Controllers (PLCs).

When Bus connections can be used, local Onboard System Monitoring (OSM) is possible. The user-friendly interface makes it easy to carry out diagnostic fault-finding and real time condition monitoring of the system.  
Option: Radio remote control and/or touchscreen interface.



Our Hatlapa, Pusnes and Porsgrunn branded equipment has been designed in Germany and Norway since 1919, 1875 and 1857 respectively.

### Deck machinery

Winches hold the ship in position berthed at pier and windlasses secure it while anchored at sea. Our Hatlapa and Pusnes deck machinery serves the needs of any cruise ship perfectly.

- The variable frequency driven (VFD) deck machinery utilises step-less control from zero to nominal speed, thereby ensuring smooth, accurate and safe operation.
- The pole changing type deck machinery utilises a PLC control and 3-speed motor which provides high tension and high slack rope speed while ensuring safe operation.



### Compressors

Our Hatlapa branded compressors are either air-cooled, water-cooled or screw compressors. They can be used for starting air, service air and control air. Every compressor is put through its paces on a modern test bench, and all well-known classification societies are present on a regular basis to carry out testing procedures.



### Steering gear

The steering gear controls the rudder that turns the ship while in motion. Our Hatlapa and Porsgrunn branded rotary vane steering gear is compact and suitable for the smallest compartments. The maximum torque can be applied at all angles, thus increasing safety, particularly when sailing in narrow straights. It also enhances maneuverability during berthing.





### Cranes

GP electro-hydraulic cranes are robust and solid, all crane movements are smooth and fast, with stepless speed control.

Components are chosen for their durability even in the most hostile marine environment. The standard range covers capacities up to 10 tonnes, with outreaches of up to 24m.

### Control system

The crane is controlled from a platform above the slewing ring, and a portable electric remote-control unit is available as an option.

The equipment is easily monitored and operated via user-friendly control panels. They have few buttons and switches which makes the equipment easy to control.



### The North Star Experience

MacGregor has delivered a new experience onboard *Quantum of the Seas* called North Star that features a viewing gondola. Its two sister ships will also feature the North Star experience, that can lift guests 91m above sea level to give them a panoramic view.

The viewing gondola can accommodate 14 guests and one crew member. The gondola is fitted with a stabilising system to ensure that it remains levelled with respect to the vessel's deck. It damps gondola movements, providing a comfortable ride.

Safety is paramount and we have delivered the highest safety standards and proven, reliable technology. The system is designed for 100 percent redundancy with two separate power units, each large enough to drive the crane in reduced speed mode; it is also provided with a diesel-driven emergency power pack. Additional safety features include automatic cut outs and safety valve over-load protection on all crane motions.

The North Star is controlled using a separate PLC safety system in addition to a MacGregor CC3000 crane control system. All the crane movements are smooth and immediate, with stepless speed control, essential for this type of guest experience.





# Innovative solutions for cleaner ships

Cruise ships operate in some of the world's most fragile ecosystems and a rising demand from authorities and operators requires that onboard systems are as environmentally-friendly as possible.

MacGregor's extensive portfolio of environmentally-friendly electric drives has over a decade of proven reliability and performance.

They are energy efficient, cost-effective, quiet and enhance operational efficiency.



## Environmentally-friendly electric drives

There is a growing recognition of electric-drive system benefits from the industry. Compared to traditional hydraulic systems, our electrically-driven versions consume less energy, they are quieter with no noisy power packs required and less maintenance.

Electrically-operated systems eliminate the risk of hydraulic oil spills into the water or damage to cargo. They are also more energy efficient, because the electric drives only run when manoeuvring the equipment.

## Save time, money and energy during shipbuilding

It is easier to install electrical cables than hydraulic pipes. No flushing is required and it is easy to change an electrical cylinder if needed. Lower power consumption enables a ship to be designed with reduced power generation needs.

## The main advantages of electric drives are

- Ease of installation
- Power savings
- Reduced operating noise
- Simplified onboard maintenance
- Ease of monitoring on board
- No hydraulic pipes or separate power pack are required
- Enhanced ship eco-profile

# Improving your fleet's efficiency

MacGregor offers integrated cargo flow solutions for maritime transportation and offshore industries. Our customer-driven engineering and service solutions support customers in their onboard, port and offshore operations worldwide.

Today, half of the world's oceangoing ships are fitted with MacGregor equipment. Turn to us when you want a reliable partner to keep that equipment up and running throughout your ship's lifetime.



## Full service portfolio

MacGregor offers you lifecycle support for ships, ports and terminals, offshore and rigs. We complement our products with original spare parts and support services around the clock.

We are only a phone call away, often just around the corner and we serve our customers in their own languages. Our goal is to provide top-of-the-line service and sustainability throughout the lifetime of our products. MacGregor's cargo and load handling product knowledge and expertise is unparalleled.

- Spare parts
- Service and maintenance, both on-demand and planned
- Service agreements, e.g. MacGregor Onboard Care (MOC) contracts
- Damage repairs
- Modernisations and conversions
- Retrofit, overhaul and modification services
- Refurbishing of steering gear with new pump sets and control units (including class society test)
- Hydro check for steering gear
- Replacement of certain equipment
- Reconditioning of compressors
- Rental service of winches
- Remote control valve systems
- Remote diagnostics for cranes
- Inspections
- Installations
- Drydockings
- Training for crew and personnel
- 24/7-support services
- Consultancy services

# Global presence, local service

MacGregor has the expertise and global resources to help you increase the earning potential of your fleet throughout its lifetime.

We add value to your business by taking responsibility for your onboard cargo flow systems and helping you achieve optimum operational availability.

## Cargo flow experts

MacGregor's cargo flow experts are on standby worldwide to provide a rapid response to your needs. We operate in approximately 50 countries and we are constantly strengthening our local presence to meet changing market needs.

MacGregor's service network consists of more than 60 service centres in major ports around the globe, staffed by specialists. We supply original MacGregor spare parts and repair services on a planned schedule, on demand or on an emergency basis.

## Global presence, 24/7

Our service portfolio covers all cargo handling equipment on board, offshore and in port. Armed with our world-class expertise in cargo and load handling, we can provide service to our customers all over the world.

Our worldwide service network means that we are able to respond rapidly to our customer's needs.

## Economy and ecology go hand-in-hand

MacGregor continues to develop environmentally-friendly cranes, hatch covers, RoRo cargo handling solutions on board and in port, winches and other equipment with electric drives, as well as dust-free conveying systems with totally enclosed loading and unloading equipment for dry bulk materials.

We can supply bio-oil for our hydraulic systems and we are preparing to meet the upcoming standards for equipment recycling. We focus intensively on our environmental responsibilities, adapting our bulk handling systems for operation even in densely populated areas.



# Prevent hazards and reduce risks

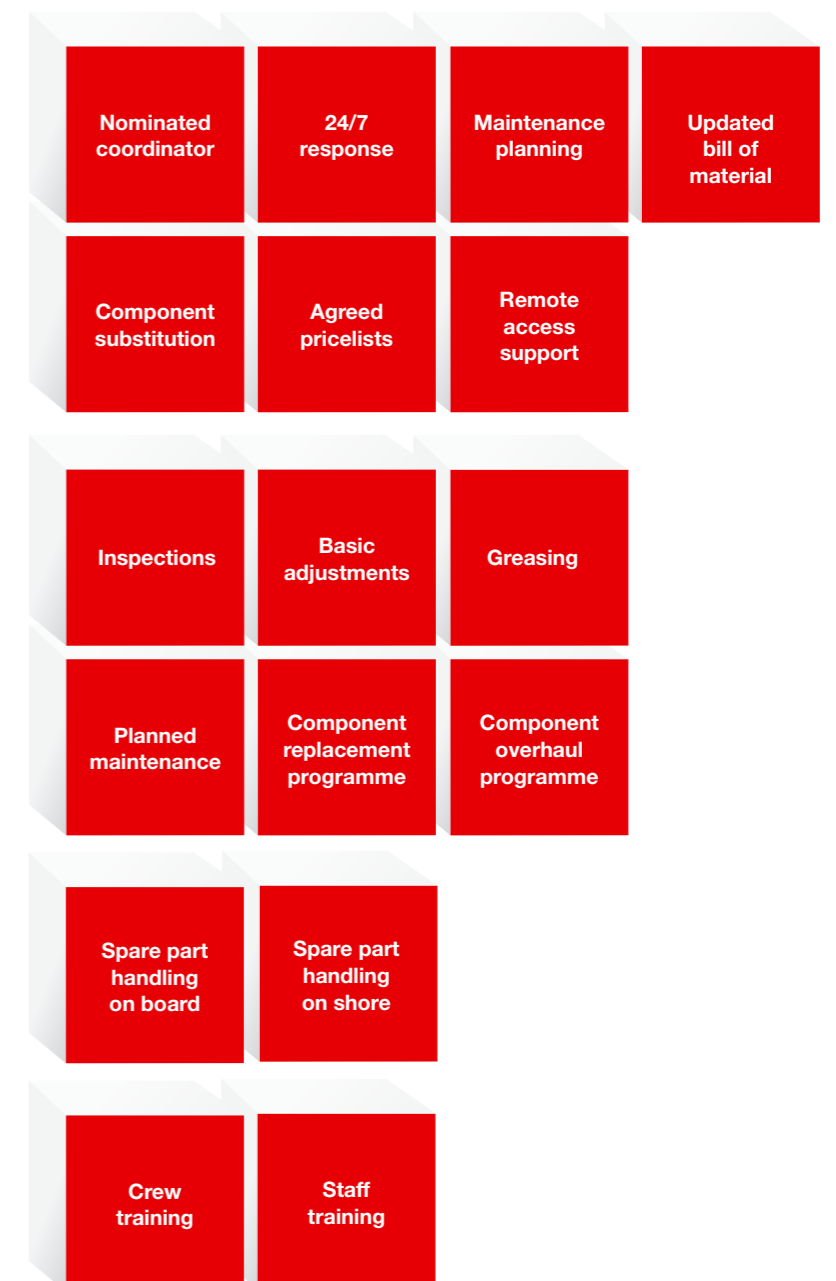
A MacGregor Onboard Care (MOC) contract offers you sustainable ship operations and revenue earning capabilities by ensuring the operative availability of equipment through planned maintenance solutions and our global service network. After identifying your unique needs, we can offer you a combination of services that best fits your requirements. MOC solutions are customised to your needs from the four main elements and the element modules:

**AVAILABILITY SUPPORT** assists the customer in maintaining optimum operation, while helping to reduce the administrative burden. All contracts are facilitated by the MOC coordinator, who acts as the single point of contact for technical, maintenance planning and budgeting support.

**ONBOARD MAINTENANCE** aims to keep the customer's equipment continuously available for its designed operation and to prolong its effective working life. This is achieved through condition monitoring along with preventative, corrective and condition-based maintenance.

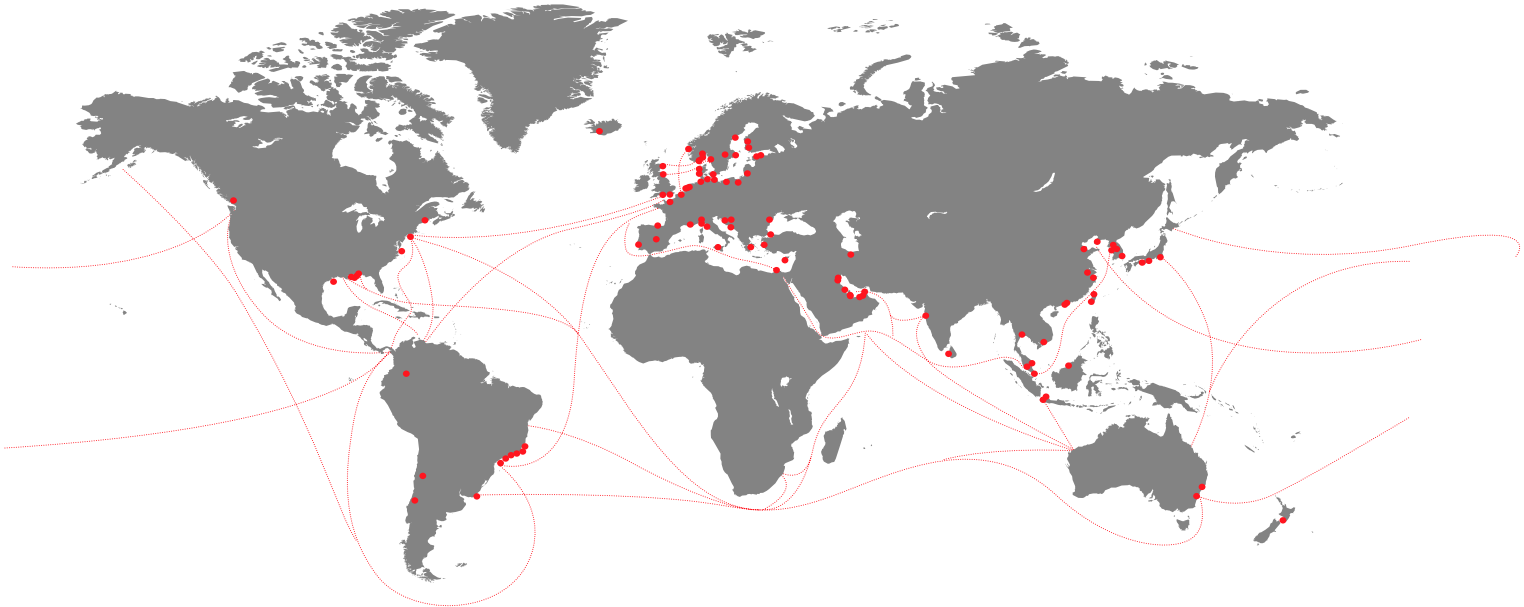
**SPARE PART MANAGEMENT** ensures guaranteed spare part availability. Spare part management can relieve the customer of the associated financial burden of asset management, releasing capital for other purposes.

**CUSTOMER TRAINING** provides personnel with the knowledge and skills to operate and maintain the equipment correctly, helping to improve safety and avoid unnecessary breakdowns. Training programmes can be delivered either on board or ashore and enable customers to utilise their investments to the maximum effect.



Wherever needed, you can rely on our support.  
We serve our brands globally:

- Ankerlökken Marine
- Allset
- ASCA
- Becker
- BMH
- Conver-OSR
- Grampian Hydraulics
- Flintstone
- Greer Marine
- Hamworthy
- Hatlapa
- Hydramarine
- Häggglunds
- Interschalt
- KGW
- KYB - ASCA
- KYB - Kayaba Industries / Navire Cargo Gear
- Luezhoe
- MacGregor
- MacGregor-Conver
- MacGregor-Häggglunds
- MacGregor-Kayaba
- MacGregor-Navire
- Navire Cargo Gear
- Nordströms
- Ozean Service & Reparatur
- Platform Crane Services (PCS)
- Plimsoll
- Pusnes
- Porsgrunn
- Rapp Marine
- Triplex
- Vestnorsk Hydraulikkservice (VNH)



MacGregor shapes the offshore and marine industries by offering world-leading engineering solutions and services with a strong portfolio of MacGregor, Hatlapa, Porsgrunn, Pusnes and Triplex brands. Shipbuilders, owners and operators are able to optimise the lifetime profitability, safety, reliability and environmental sustainability of their operations by working in close cooperation with MacGregor.

MacGregor solutions and services for handling marine cargoes, vessel operations, offshore loads, crude/LNG transfer and offshore mooring are all *designed to perform with the sea*.

*MacGregor is part of Cargotec (Nasdaq Helsinki: CGCBV).*

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