

# Shortsea RoRo vessels

Turning experience into profit



Photo: ShipPax Information

# Throughout the lifetime of your ship



Photo: denniz@corsman.se

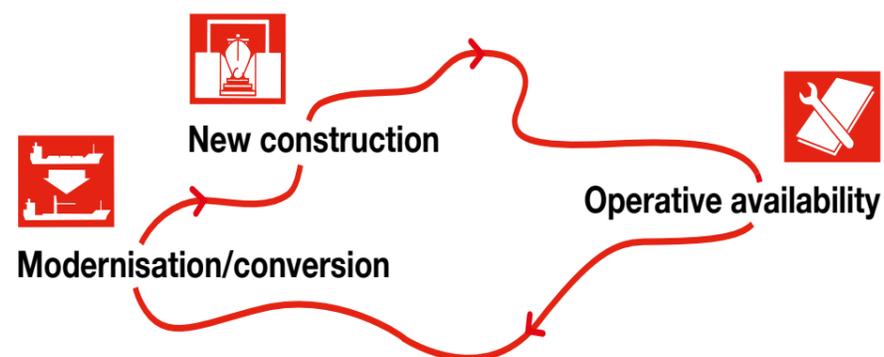
By harmonising the essential cargo flow functions of access, stowage, care and handling, MacGregor offers integrated cargo flow solutions which optimise and enhance the functionality of your RoRo vessel. This benefits its productivity, environmental impact and profitable service lifetime.

To achieve this, MacGregor's ship experts and technical teams work closely with shipowners, shipyards and consultants on cargo flow issues.

Early in the design process, before the final ship plans have been decided, we offer preliminary studies and engineering services. MacGregor RoRo equipment is then supplied as an integrated solution based on cargo type, loadings, space limitations, shipping routes, logistic factors and environmental conditions.

MacGregor is a global company with facilities located near shipyards and ports worldwide. Once a system is in service, we endeavour to provide life-cycle support in the form of maintenance and service solutions that ensure the operative availability of the MacGregor equipment.

Later in the vessel'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.



## Turning experience into profit

**Why choose MacGregor equipment?**  
MacGregor delivers flexible and efficient cargo access equipment, which provides the fastest possible loading and discharge times, essential for competitive shortsea shipping operations. Supported by a global service and maintenance network, MacGregor equipment keeps a ship operational and profitable.

MacGregor can supply stand-alone and turnkey deliveries. We have the flexibility, knowledge and resources to meet your needs throughout the lifecycle of your vessel. Tailor-made MacGregor equipment can be delivered in an efficient optimised package including installation, commissioning, crew training, aftersales services and spare parts. Consult us for the entire scope of your project to save time and money. The benefits are considerable; contact us to find out more.

### Why not choose the innovator?

Starting with the launch of the pioneer ramp cover in the 1950s, MacGregor originated and has continuously developed the RoRo cargo access concept, focusing on innovative weathertight and watertight solutions to secure ship integrity. Our aim is to improve your bottom line by streamlining cargo access on your ship, optimising cost-efficiency in the handling of rolling freight.

Advanced MacGregor equipment is

installed on shortsea and other RoRo vessels worldwide. All our RoRo solutions are suitable for newbuildings as well as for ship conversions.

### Maximum flexibility

Be prepared for changes in the cargo mix. Stern ramps can be designed to match the various types of quays and conditions at ports where the vessel will be calling. This applies to conventional quays as well as dedicated RoRo berths. The hoistable decks are built so that you can easily adjust the deck height in sections. Thus, your vessel will be able to handle a wide mixture of vehicles and cargo.

### Reducing weight and maximizing cargo space increases profit

Naturally, every cubic metre of cargo space is essential to the profitability of your operation and the RoRo equipment is designed to occupy as little cargo space as possible. Our product development programme is focused on minimising equipment weight in relation to loading capacity, providing:

- Lower fuel costs per tonne of freight,
- Greater cargo intake.

### Know-how based on experience

Newbuilding? Consult us at an early planning stage and profit from our know-how and experience throughout the process. Our customised technical solutions are designed to create

smooth traffic through the cargo decks, and incorporate the necessary watertight closures for damage stability. Factors such as vehicle envelopes, quay conditions, turning radius, clear height and drive way, and surrounding equipment all have an important bearing on the overall situation.

### Quality 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 selected qualified sub-contractors.

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 and at our offshore facilities in China and Singapore. MacGregor's quality assurance, environmental and health & safety systems (QEHS) covers both in-house as well as sub-contractors' activities to the extent that they are acting on our behalf. We have long established trading relationships with our major sub-contractors and suppliers.



## Flexible, cost-efficient cargo access equipment that keeps you ahead

MacGregor supplies a full range of RoRo cargo access solutions suitable for ships operating on shortsea routes. Our electrical and hydraulic systems offer superior reliability, durability and maintenance-friendly installations.

### 1. Stern ramp/door

The stern ramp also functions as a watertight door and is fitted with a rubber seal in a channel around the opening of the hull. It is normally operated by hydraulic cylinders acting directly on the ramp, although other options are available. The length of the ramp is chosen to cope with tidal variations, whether the quay is conventional, RoRo berths, or designed to match the linkspans.

### 2. Hoistable ramp

The hoistable ramps allow more efficient utilisation of cargo space than fixed ramps. It is possible to choose between ramps designed to have only one end raised or lowered between the car decks, or ramps where both ends are adjustable – so-called tilting ramps. A choice can also be made between ramps which, in closed position, form a watertight hatch and ramps without sealing.

### 3. Shell door

We offer a range of standard doors, such as bunker doors and pilot doors with optional choices of frames. Framed doors can be welded as complete units directly into the hull, which saves installation time.

### 4. Ramp cover

The ramp cover is a hatch cover over a fixed ramp. It fulfils the same requirements for load carrying capacity and tightness as the surrounding fixed deck. Options are side-hinged or end-hinged ramp covers. The side-hinged ramp cover, built in sections, provides the best solution when a long ramp is required. The ramp cover is usually operated via a direct-acting cylinder, but jigger-winch operation can also be selected.

### 5. Front door

When the ship is equipped with a fixed ramp or a non-tight hoistable ramp to the weather deck within an enclosed superstructure, a watertight door is needed.

### 6. Internal access ramp

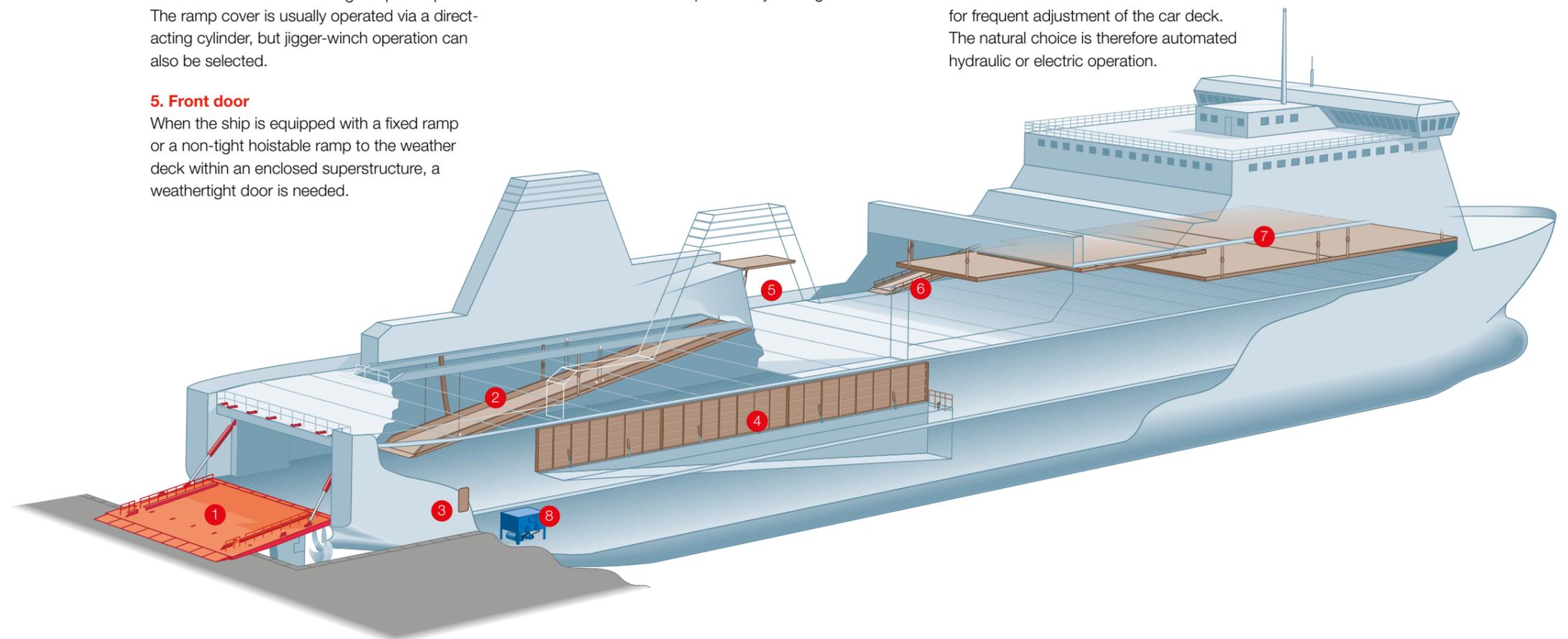
Providing virtually no loss of cargo space, internal access ramps are installed together with the hoistable car deck to form an integral part of the deck surface. They are hoisted with a load of cars and secured in the raised position by locking bolts.

### 7. Hoistable car decks

Divided into sections that can be individually employed. Some applications require two levels of hoistable deck panels. Working or stowed positions can be obtained depending on the cargo mixture. The mixture of cargo handling on board shortsea RoRo vessels calls for frequent adjustment of the car deck. The natural choice is therefore automated hydraulic or electric operation.

### 8. Hydraulic power pack

Supplies oil flow and hydraulic pressure to all MacGregor equipment installed onboard. Comprises piston pumps connected to a common supply line and pumps for oil cooling and filtration.

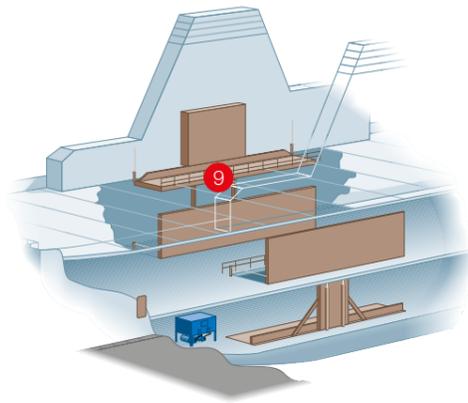


# Technology you can rely on

## 9. Lifting platform for cargo

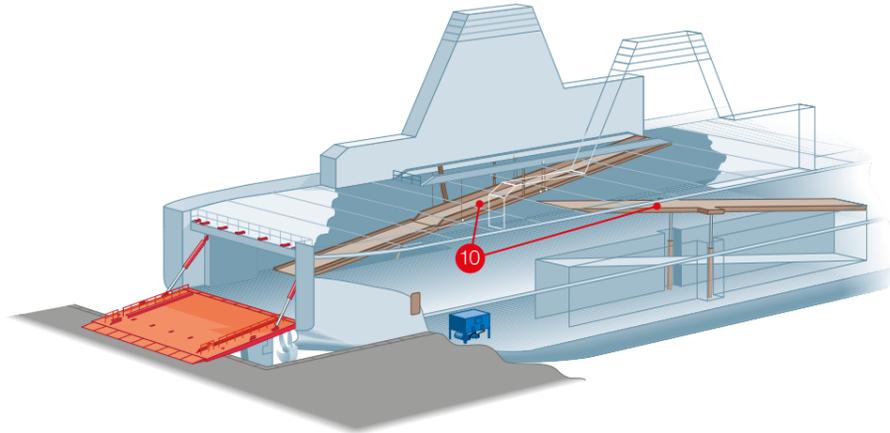
A lifting platform is an efficient solution when limited space means a ramp is not practical. Various types of lifting platforms, such as the L-type, can serve two or more decks without taking up cargo space.

Another type can serve two or three decks from the main deck, upwards or downwards. It can also function as a hatch cover, carrying cargo on the upper deck.



## 10. Two-piece hoistable ramp

When the clear height is extremely high, a two-piece hoistable ramp can be the best choice. It gives the advantage of not having to hoist a considerable amount of cargo on the ramp. To maximise cargo space, one part of the ramp is hoisted upwards while the other goes into a recess in the main deck.



# Smooth cargo flow via linkspans



Photo: Color Line/Anders Martinsen  
MacGregor linkspans can be designed for multi-tier loading and discharging for fast turnaround in port.

## Interface between ship and shore

The success of the interface between the linkspan and the ship is the key to ensuring optimum traffic flow. MacGregor is a recognised global leader in developing linkspans and other RoRo port and terminal solutions, with a clear focus on safety. MacGregor systems and equipment have a long track record of availability, performance and reliability.

## Fast turnaround times in port

New safety requirements have resulted in wider ferries with increased freeboards. Our RoRo systems provide the high

flexibility at the quay interface which they require.

MacGregor linkspans can be designed for multi-tier loading. Two-tier loading is becoming a necessity with large new ferries and three-tier loading systems have been built. The key to competitive door-to-door handling is fast loading and discharging of vehicles and passengers, reducing the turnaround time in ports.

Electric and hydraulic operating machinery is becoming simpler and safer with increased redundancy.

## MacGregor linkspan types:

- RoRo pontoon linkspans**  
 Allowing ferries to berth at quays that are otherwise unsuitable because of their size and shape and/or tidal conditions. Berths can also be created at sites without regular quay facilities.
- Shore ramps**  
 A variety of articulated shore ramps, permanent or mobile, is available to provide direct access to all RoRo decks. All designs provide smooth cargo flow arrangements that are independent of tidal variations and ship's trim.
- Water taxi terminals**  
 Ideal for coastal shuttle services, providing smooth, safe access for foot passengers and provisions.
- Floating car parks**  
 Low draught, multi-storey, moveable parking garages can easily accommodate several hundred cars.
- Passenger gangways**  
 MacGregor gangways are built for smooth passenger access between the ship to the terminal. All comply with the rules and guidelines to suit senior citizens and passengers with impaired mobility.

# Energy saving, eco-friendly electric drives

Electrically-driven MacGregor RoRo cargo access equipment is a result of our intensive R&D work, responding to customers requesting products that improve performance and protect the environment.



## Innovations for eco-friendlier ships

Electrically-driven RoRo cargo access solutions are environmentally-friendly, cargo safe, energy efficient and easy to service. Electric actuators replace the direct acting hydraulic cylinders used for operating smaller items and in cleating and locking devices.

## Environmental benefits

Electrically-driven MacGregor solutions minimise the environmental impact and reduce the amount of hydraulic oil carried onboard, minimising the risk of cargo damage by hydraulic oil.

## Energy savings

Compared with a hydraulic system, electric operation saves energy! Hydraulic drives require continuous pump operation, whereas electric drives run only when the equipment is manoeuvred. Energy losses are also much lower than with a hydraulic system. For example, electrically-driven systems are not affected by pressure drops within the piping system.

## Operative availability

MacGregor's ambition is to ensure the operative availability of your cargo flow systems. Our experts are on standby worldwide to provide a rapid response to your needs.

## Global presence — local service

We operate in approximately 50 countries and 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.

## Planned maintenance

MacGregor's planned maintenance concept relies on the solid foundation of our world-wide service network, and allows you to plan your operating budget.



In addition, it is also possible to feed power back into the ship's power supply when larger winches, such as those found on quarter ramps, lower heavy loads.

## Electric control system

All equipments are operated by control panels. The operation sequences are controlled by PLC's (Programmable Logic Controllers) via push-buttons, joysticks or switches. Lamps indicate the status of cleats and whether they are locked or unlocked.

## Easy to monitor and service

Electric drives are easy to monitor and service. When using all electric components, onboard monitoring systems (OMS) make diagnostic fault-finding easy.

The equipment can be linked to remote diagnostic systems (RDS) to provide continuous data input for round the clock analysis. The health of a piece of equipment can be assessed at any time. Automated speed up and slow down functions make electric drives easier to operate than hydraulically driven equipment.

## Electrically-operated MacGregor RoRo equipment

- Stern quarter, stern and side ramps
- Ramp covers
- Internal ramps
- Car deck systems
- Lifting/loading platforms
- Shell doors
- Linkspans

## Advantages of electric drives compared with hydraulic drives

### For the shipowner:

- No oil pollution or damage to cargo by hydraulic oil
- Energy saving as no continuous running is needed
- No change in operating time in cold conditions
- Maintenance friendly
- Easy to monitor

### For the shipbuilder:

- Cable wiring is easier than piping
- No flushing work required
- No need for high pressure hydraulic skills
- No pump unit needed

# Keeping your operation up and running

## On demand service

Our service centres worldwide solve problems as they arise, helping to keep your ship up and running. We also provide a comprehensive damage assessment and repair service.

## MacGregor Onboard Care (MOC) service contracts

An MOC service contract offers a modular service concept where you can choose the necessary modules to suit your individual needs in terms of operating security, budgets and comfort.

## Crew training

Tailor-made theoretical and hands-on crew training in the maintenance and operation of MacGregor's equipment and systems.

## Drydockings

Let us know your schedule well in advance and we will plan drydocking services for you accordingly.

## Modernisation

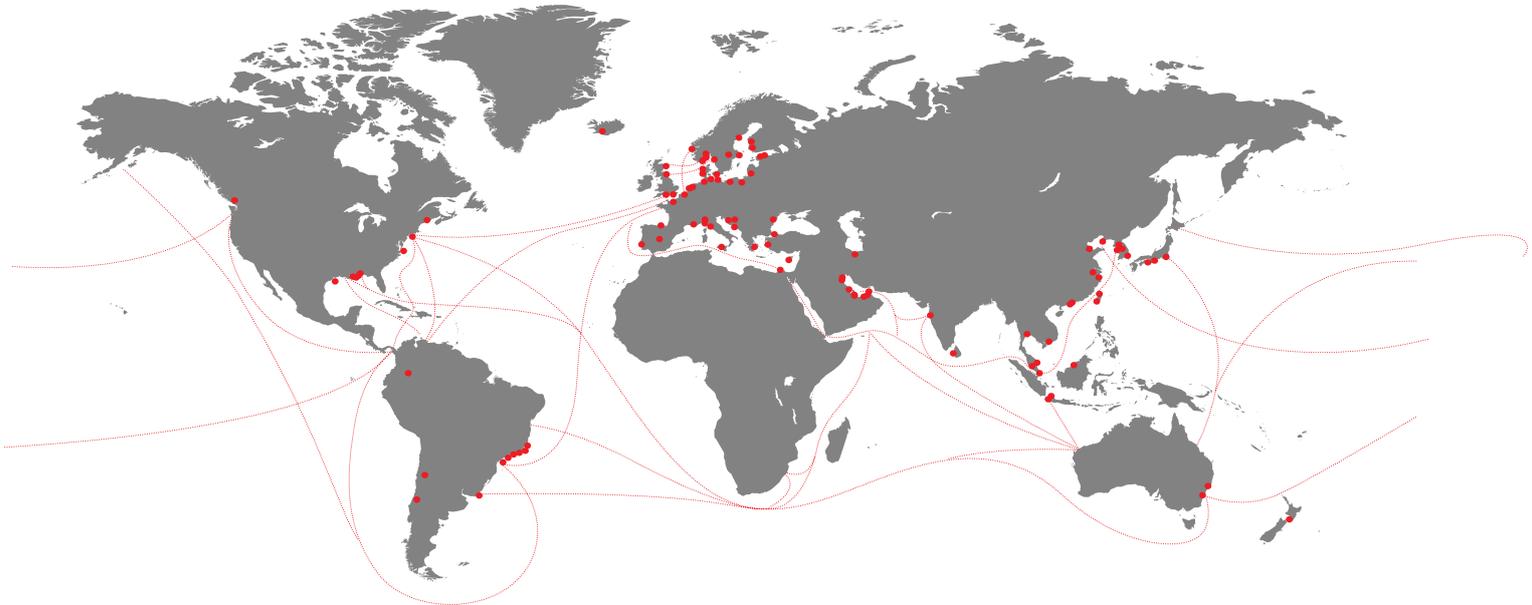
MacGregor has the expertise and the resources to upgrade ageing cargo access equipment to the latest performance standards.

## Conversion

MacGregor's conversion packages adapt, enhance or change the original functionality of the system, re-designing it to changing market requirements.

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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