

RoPax ferries

Seamless transfer between ship and shore



Throughout the lifetime of your ship

By harmonising the essential cargo flow elements of access, stowage, care and handling, MacGregor offers integrated solutions that optimise and enhance the functionality of your RoRo ship. To achieve this, our ship experts and technical teams work closely on cargo flow issues with shipowners, shipyards and consultants.

At the pre-project stage, before the final ship plans have been decided, we offer preliminary studies and engineering services. RoRo systems and equipment are then supplied as an integrated solution based on cargo type, space limitations, loadings, shipping routes, logistic factors and environmental conditions.

MacGregor is a global company with facilities located near shipyards and ports worldwide. Once the vessel is in service, MacGregor endeavours to provide lifetime support in the form of maintenance and service solutions that ensure the operative availability of the equipment.

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

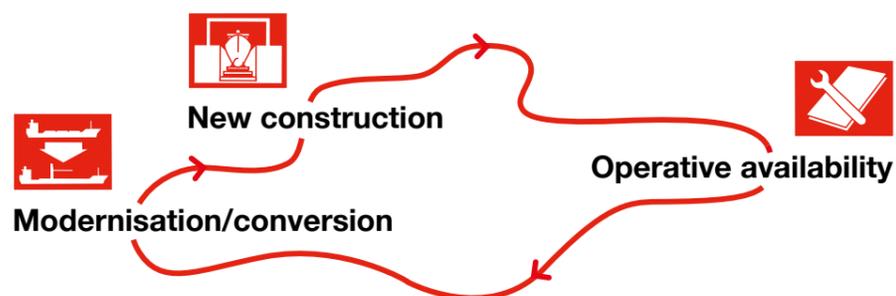


Photo: Color Line

Seamless transfer of passengers and vehicles between ship and shore

To be competitive, your vehicle/passenger ferries or RoPaxes need flexible cargo flow solutions that provide the fastest possible loading and discharging. Traffic flow between the quay and the ship must be smooth and efficient.

With our knowledge and experience of the entire logistics chain, we can offer you an optimal solution, including the ship-to-shore connection, which takes quay conditions and all your vessel's requirements into account.

Maximum flexibility

Be prepared for swift changes in your cargo mix. Vehicle/passenger ferries need to adapt to seasonal variations – more cars in the summer, more trucks in winter.

A flexible system of MacGregor hoistable car decks and ramps enables you to respond rapidly to these requirements by adjusting the deck heights. Consequently, your ship will be able to handle virtually any mixture of vehicles and cargo.

MacGregor stern ramps are specifically designed to match the various types of quays and conditions at ports where your

vessel will be calling. This applies to conventional quays as well as dedicated RoRo berths.

Reducing weight and maximizing cargo space increases profit

Naturally, every cubic metre of cargo space adds 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 cost per tonne of freight
- Greater cargo capacity

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.





Photo: ShipPax Information

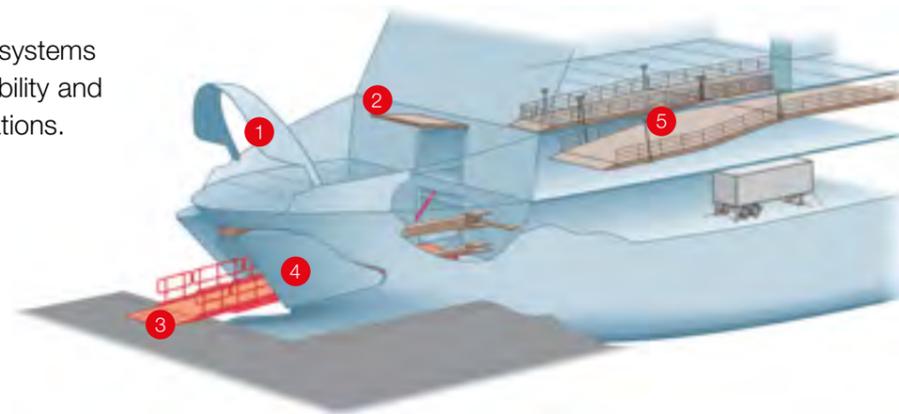
Photo: Mike Louagie

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Cargo flow solutions that keep 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. Bulwark visor

A bulwark visor allows loading on the weatherdeck. Opening the bulwark visor allows access to the upper deck via the shore-based linkspan.

2. Front door

A weathertight door in the deckhouse bulkhead is needed when the ship is configured for two-tier loading via a shore-based ramp.

3. Bow ramp/door

In the closed position, section 1 of the ramp functions as a weathertight door. Section 2 is detached from section 1 for safety reasons, to prevent the ramp section from damaging the door in the event of a collision.

4. Bow doors

The bow doors allow cargo access through the bow and are constructed as a part of the hull. The doors are designed with equivalent strength and a number of securing devices.

5. Hoistable car deck

Hoistable car decks make it possible to quickly change the configuration of the clear heights. They are divided into panels and the end panels are used as access ramps and are as wide as practical for efficient driving on and off. The access ramps can also be hoisted with a full load of cars.

6. Stern ramp/door

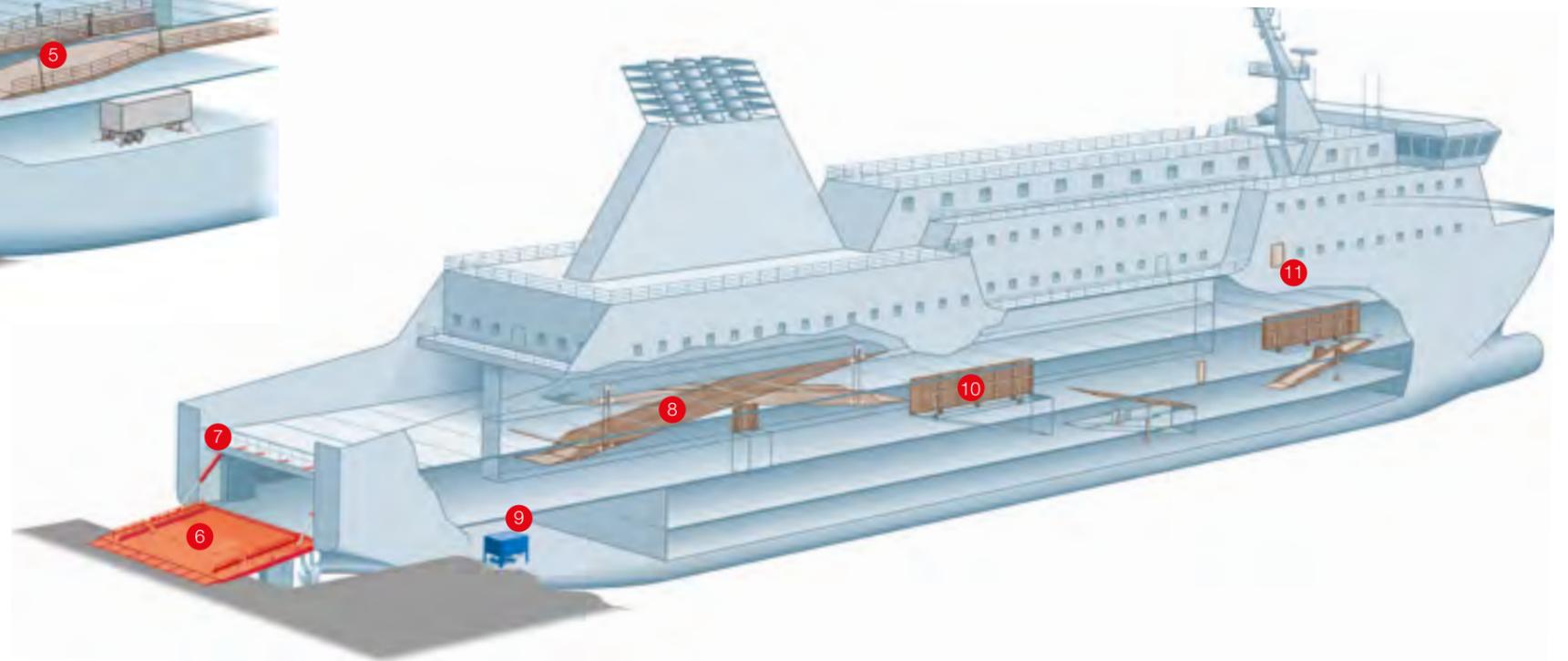
The stern ramp often functions as a weathertight door. The length and width of the ramp are optimised to handle tidal variations and smooth internal cargo flow. The ramp is designed to suit adapted RoRo berths or conventional linkspans.

7. Stern platform

Two-tier loading by the stern can either be directly onto the upper deck or via a stern platform, depending upon the shore ramp arrangement.

8. Hoistable ramps

Hoistable ramps make more efficient use of the cargo space than fixed ramps. For ships with both bow and stern loading the tiltable ramp offers greater flexibility.



9. Hydraulic Power Pack

The hydraulic power pack delivers the pressurised hydraulic oil supply to all equipment installed on board.

10. Ramp cover

The ramp cover fulfils the same requirements for load-carrying capacity and weathertightness as the surrounding fixed deck.

11. Side doors

A series of standard doors are available; for example passenger, bunker and pilot doors. These can be supplied with or without frames.



Smooth cargo flow via linkspans

Interface between ship and shore

The success of the interface between the shore and the vessel 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.

Multiple-tier loading for fast turnaround times in port

RoRo terminals globally are undergoing massive expansion and modernisation. 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 – a factor that has a great impact on our customers' bottom line.

Electric and hydraulic operating machinery is becoming simpler and safer with increased redundancy. We will help you choose the best machinery for your needs, all built according to highest local and international safety requirements.

• RoRo pontoon linkspans

Allow ferries to berth at quays that are 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. They are built and installed in full compliance with guidelines for senior citizens and passengers with impaired mobility.

• Floating car parks

Low draught, multi-storey, moveable parking garages offer a solution to the parking problems of ports and crowded cities that have a waterfront. They can easily accommodate several hundred cars. A moveable car park can be relocated if the parking situation changes. It can be towed to a new site where land is extremely scarce or expensive.

• Passenger gangways

MacGregor gangways are built for smooth passenger access from the ship to the terminal. All comply with the rules and guidelines to suit senior citizens and passengers with impaired mobility, increasing the confidence of boarding and disembarking passengers.



Photo: ShipPax Information

Linkspans designed for two tier loading and discharging enable fast turnaround times in port. Consequently the vessel can reduce speed, minimise fuel use and reduce emissions.



Hexagonal triple berth floating pontoon linkspan for Aqaba Ports Corporation. The linkspan bridge accommodates three vehicle lanes and two walkway lanes.

Eco-friendlier ships with electric drive

Electrically-driven MacGregor RoRo equipment improves performance and minimises environmental impact.



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 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.

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

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 our 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 worldwide marine service network,

and allows you to plan your operating budget.

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 equipments and systems.

Drydockings

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

Modernisation

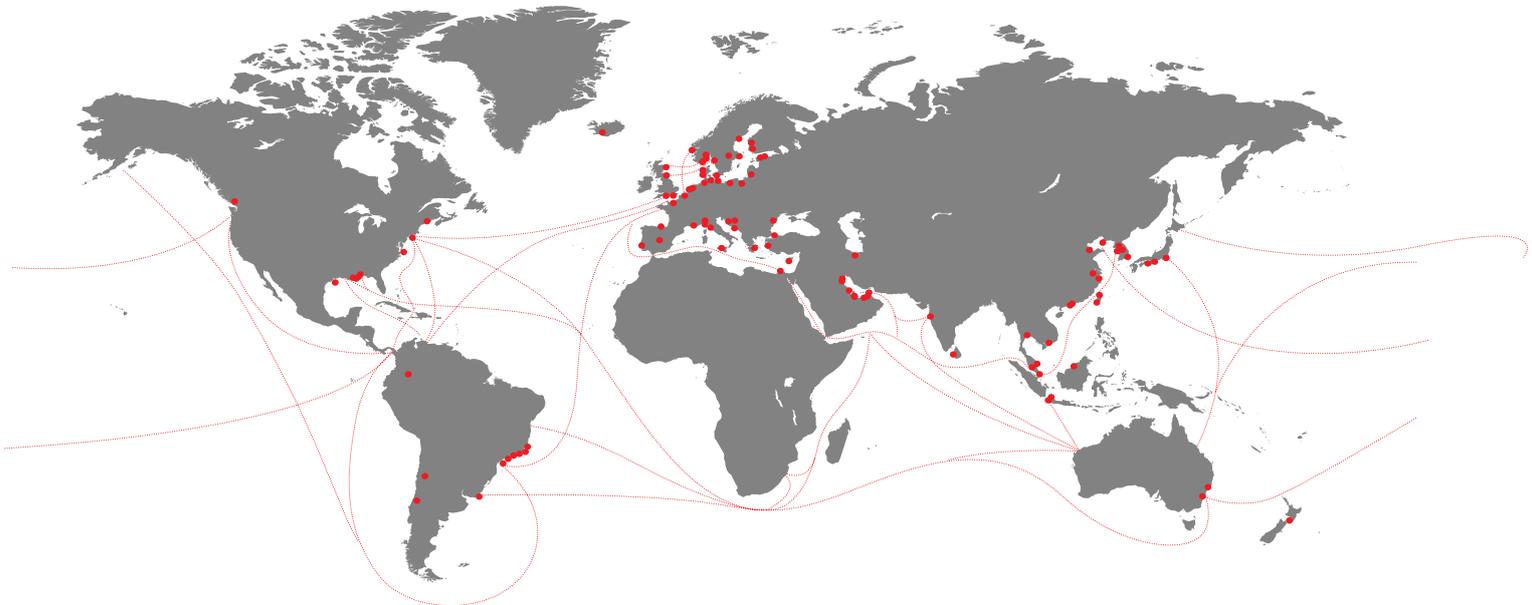
MacGregor has the expertise and the resources to upgrade ageing cargo access equipment to the latest performance standards.

Conversion

MacGregor's conversion packages adapt, enhance or change the original functionality of the system, re-designing it to meet 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
- Hägglunds
- Interschalt
- KGW
- KYB - ASCA
- KYB - Kayaba Industries / Navire Cargo Gear
- Luezhoe
- MacGregor
- MacGregor-Conver
- MacGregor-Hägglunds
- 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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