

Efficiency and economy ensured by cargo handling design expertise



Innovations for cleaner ships

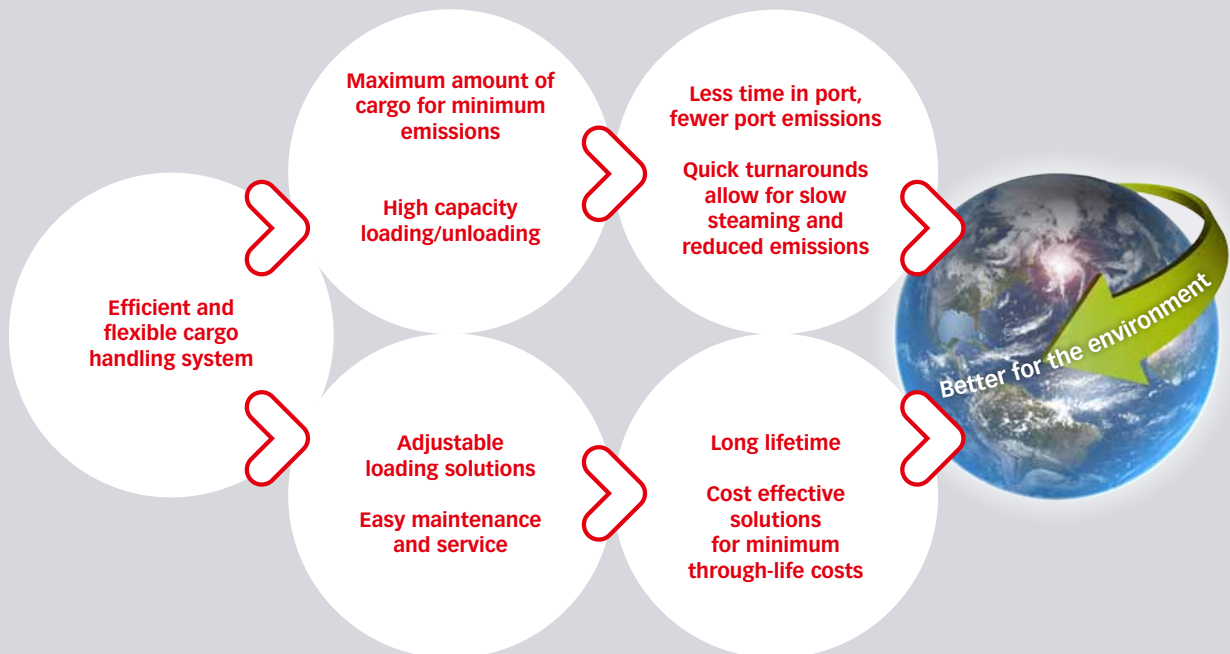
Efficiency delivers environmental benefits

Well-planned, efficient cargo handling and passenger access solutions bring environmental benefits by reducing emissions and energy consumption per transported cargo unit.

A ship with an efficient cargo system can carry more cargo, which means less fuel consumed per cargo unit. This has direct commercial and environmental impacts.

The most efficient arrangement for an operator's cargo handling needs can be determined if MacGregor's cargo handling experts are involved at an early planning

stage. MacGregor works closely with shipyards, shipowners, port authorities, suppliers, consultants and classification societies.



Innovative technology by tradition

Safety and the environment are high on the agenda when MacGregor develops new solutions.

Over the years the company has continuously developed its cargo system design skills optimising the use of steel and other materials such as lightweight plywood.

This expertise has a direct effect on a vessel's fuel consumption, stability

and load carrying efficiency. MacGregor solutions reduce time spent in port and allow slow steaming. By minimising the weight in relation to loading capacity, a vessel can carry a greater amount of cargo with lower fuel costs per tonne of freight.

Advanced solutions are available across all ship types and include innovative products for cranes, hatch covers and RoRo cargo and passenger access

equipment such as ramps, doors and lightweight plywood car deck systems, as well as winches and other equipment with electric drives.

MacGregor also develops dust-free conveying systems and totally-enclosed unloading and loading equipment for dry bulk materials. Biodegradable lubricating and hydraulic oils are further examples of the company's environmentally-sensitive approach.

Electric drives minimise environmental impact

Electrically-driven MacGregor solutions are available across all ship types. Environmental benefits were an important factor in their development. Electric motors, gears, actuators and winches replace their equivalent hydraulic components and therefore eliminate hydraulic oil leaks.

Benefits for you, better for the environment

For the shipowner:

- No oil pollution or damage to cargo by hydraulic oil
- Energy savings as no continuous running is needed
- Maintenance-friendly
- Easy to operate, monitor and service

For the shipbuilder:

- Cable wiring is easier than piping
- No flushing work is required
- No need for high-pressure hydraulic skills
- No pump units are needed
- Easy installation, reduced initial cost

Technical benefits

A major benefit is the availability of improved electric drives in the form of electric actuators, which replace the direct-acting hydraulic cylinders used for operating smaller items or in cleating and locking devices.

Energy savings

Electrical operation saves energy. The system does not have to be continuously running and no energy losses occur in the piping system. Power feedback is also a possibility. Electrical power consumption is reduced by the high power factor of the vector inverter control system.

Electric drives are easy to service

Electric drives are energy efficient, maintenance-friendly and are easily monitored. 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. In addition, the electromagnetic brake of an electric motor experiences virtually no wear because it activates at

almost zero speed. This makes electric drives almost maintenance-free.

Ease of operation

Quiet drive technology with smooth, stepless speed control over a wide range delivers precise operation. Automated speed-up and slow-down functions contribute to easy operation. Routine inspections are simplified by the nature of the machinery.

Efficient transshipment technology

Offshore transshipment technology enables the efficient transfer of cargo at sea, making it possible to use fewer but larger ships without expensive and ecologically-harmful port dredging operations.



MacGregor's latest range of electrically-driven offshore winches employs the most advanced anchor handling, towing and mooring technology; variable frequency controlled electric motors deliver excellent starting, acceleration and deceleration torque and feature overload protection.



MacGregor high capacity, electrically-driven selfunloading systems for dry bulk cargo carriers, floating transfer terminals and offshore supply vessels have totally enclosed conveying lines, water spray nozzles and dust collectors that ensure virtually dust-free cargo handling operations.

Customer-driven innovations

MacGregor's goal is to provide customer-driven innovations that are environmentally-friendly and easy, convenient and safe to use. Electrically-driven MacGregor product solutions are ideal for dry cargo, RoRo and offshore vessels.

*Variable frequency drive (VFD)
electric cranes are accurate
and energy-efficient.*

For offshore vessels:

- Electric offshore winches

For dry cargo vessels:

- VFD electric cranes
- MacRack hatch cover drives
- Dust-free dry bulk cargo handlers
- MacPiler gantry cranes

For RoRo vessels:

- Stern quarter ramps
- Stern ramps
- Side ramps
- Ramp covers
- Internal ramps
- Car deck systems
- Lifting/loading platforms
- Shell doors



Electrically-driven shell doors for cruise ships.



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



MacRack is an economical, competitive and eco-friendly electric drive system combining lift and drive operations for side-rolling hatch covers.

Efficient deck machinery



MacGregor's broad range of merchant ship and offshore deck equipment is strengthened by the Hatlapa product portfolio. In addition to an expanded line of premium winch products, MacGregor's portfolio now also includes steering gear, compressors and deck handling equipment, the latter marketed under the Triplex brand.

In line with MacGregor's commitment to deliver sustainable solutions, its Hatlapa range of winches is available with variable frequency electric drives.



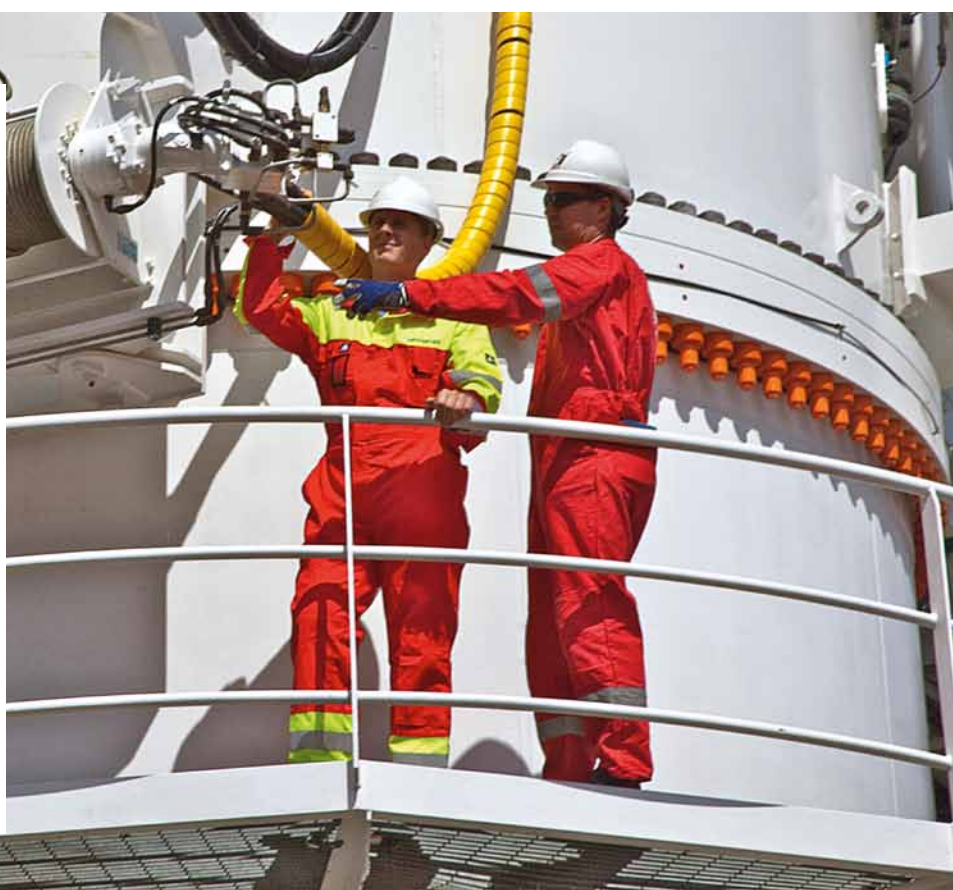
Electric anchor handling and towing winches offer both environmental and commercial benefits.

Clean operations rely on good service

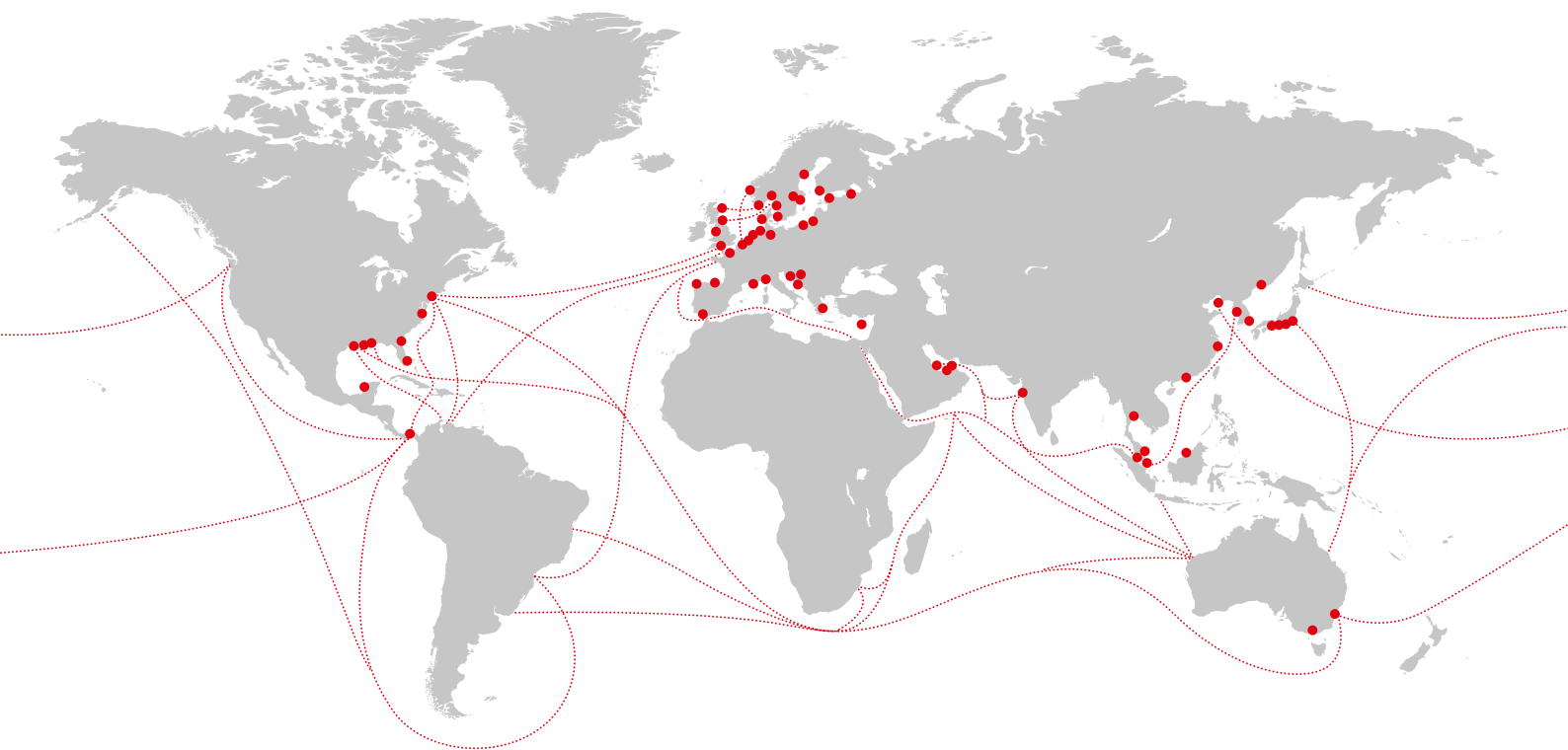
MacGregor's global service network is the widest in the industry, providing locally-based service for its customers.

Effective training, service and maintenance ensure that equipment delivers continuous, reliable and sustainable performance. In addition, they extend the useful life of equipment, reducing its impact on the environment.

With a MacGregor Onboard Care agreement, equipment is thoroughly serviced at regular intervals. Well maintained equipment is much less likely to be a danger to humans or to the environment.



MacGregor's worldwide presence and service centres



Lloyd's Register Quality Assurance certifies that the Quality Management System for MacGregor is ISO 9001:2008 compliant.

MacGregor is the world's leading brand of engineering solutions and services for handling marine cargoes and offshore loads. MacGregor products serve the maritime transportation, offshore and naval logistics markets, in ports and terminals as well as on board ships. Our cargo flow solutions integrate cargo access, stowage, care and handling functions to suit a particular ship's cargo profile. This benefits its productivity, environmental impact and profitable service lifetime.

MacGregor is part of Cargotec. Cargotec's class B shares are quoted on NASDAQ OMX Helsinki.

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