Marine Service
Upgrades for advanced offshore equipment

Improve safety, performance & control
Cargotec has a long history of innovation and a strong tradition of investing in cutting-edge technology. We are confident that we are in the best possible position to help customers stay even more competitive. The systems we have developed are guaranteed to help your equipment compete in the future with increased capacity, efficiency, control and comfort. When you have to reduce down-time, increase safety and performance and optimise your operational efficiency, buying a whole new system is not your only option!

Whether it be a simple or complex upgrade, a conversion or a modernisation, Cargotec offers a complete range of solutions that effectively enhance safety and functionality, and extend the lifespan of existing offshore cranes and other advanced products. Our experience shows us that prolonging the life-cycle and expanding the functionality of an existing investment is often the cost effective solution that customers are looking for in their bid for an affordable, winning strategy for today and into the future.

Here we present some of the more popular upgrades, conversions and modernisations that relate to our MacGregor offshore cranes (and older Hydramarine models) as well as other advanced products. In addition to these, we stand ready to help with similar upgrades, conversions and modernisations for any other advanced equipment you may currently operate.

Neither your time nor your money should be wasted; come to the load handling experts and get a head start on your future.

Remote Access Support Agreement. Do not leave homeport without a support agreement that covers all the bases all the time. Those who have experienced the downsides of a weak service agreement know that nothing is more frustrating than being unable to complete a job because of a single component failure or troubleshooting issue that could not be solved on the spot. Yet, “on the spot” is often far out at sea. This is where our Remote Access Support Agreement really shines.

Not only can you rest assured that you have full support for any service or troubleshooting issues, but our ability to monitor system logs, undertake detailed diagnoses, make recommendations or even upload new software is guaranteed any hour of the day, any day, no matter where your ship is thanks to a dedicated satellite uplink. If, for example, remote trouble-shooting identifies a problem that can be solved by making a change or uploading something to the crane’s software, this can be done immediately, without sending an engineer.

With a single agreement, you gain peace of mind, added safety and reliability and can then extend guarantees to your clients. Read about how a remote access support agreement helped Siem Offshore on page 7.
Upgrade your systems

MacGregor Offshore products have a long pedigree, having evolved through decades of development in technologies, control methodologies and industry regulations and standards. Cargotec engineers and designers have a wealth of experience designing, modifying and upgrading a wide variety of control and hydraulic systems for numerous advanced and highly capable offshore products.

You will be surprised at the future your current equipment can have with a system upgrade. Such improvements can increased safety and/or redundancy, add additional operating modes, offer greater setup control or provide better system safety, redundancy and oversight.

Either way, you win.

Upgrade to AHC/AT. No other ability multiplies the usefulness of a winch system more than gaining active heave compensation (AHC) and auto-tension (AT). Being able to very accurately control critical loads at the seabed or near other subsea structures is a giant leap functionally, and opens the doors to a significantly expanded weather window and a vast array of potential new jobs.

We have extensive experience with AHC along with related operating modes and advanced control and monitoring systems and have done numerous winch conversions and upgrades. Take your non-AHC systems to the next level and benefit from the ability to eliminate heave and accurately control tension on-the-fly. This is an especially popular upgrade for whip winches.

Personnel Lift, AOPS/MOPS upgrade. Add new functionality while increasing equipment and personnel safety. MacGregor can equip winches with Personnel Lift, MOPS (Manual Overload Protection System) and AOPS (Automatic Overload Protection System) according to regulation EN13852 to significantly enhance the safety and functionality of the equipment.

Personnel Lift mode ensures two means of braking, lift safety factor of 10, dead- ship retrieval and blocking of AHC/AT and emergency release functions.

AOPS and MOPS are overload protection systems designed to release wire should an entanglement or other unforeseen situation threaten to overload the crane.

Component running-hours counter. Wear components have a lifespan and every engineer fears that they will fail at the worst possible time. Left untracked or managed only by working hours estimates, your complex systems are at risk of failing when you have no available spare or time for service.

Manage your systems and monitor moving and other wear parts with confidence with a system that individually tracks each component’s running hours. Gears, motors, bearings, filters, etc. can be checked and replaced with a much higher degree of certainty. A custom running-hours list can be implemented in the HMI (human machine interface) for constant monitoring and more accurate maintenance.

Wire life-cycle calculator. Wire damage is often invisible, and owners should neither take risks, nor replace or cut short a lift-wire based on guesswork alone. When it comes to the condition of the single line holding that critical load, an intelligent tool is required.

This tool has been developed in close cooperation with our wire rope supplier. Built into the crane control system itself, the calculator bases its computations on formulas that contain, among other things, the number of sheaves, sheave angles, and the history of bend cycles and loads experienced. Based on the unique combination of these factors, the calculator will display the expected remaining and accumulated bend cycles for your wire in a graphical and intuitive manner.
Tugger winch AOPS or safety warning. Despite the obvious need to use a tugger winch’s constant tension mode when it is used to hold back an unused hook or to control a load, this detail is forgotten more often than you think. When the crane’s jibs are moved, the forgotten tension can easily tear a tugger from a crane or snap a wire. This is an extreme hazard to the entire deck area and the personnel working there.

But these risks can be averted. Include an Automatic Overload Protection System (AOPS) to your tugger winches to protect against overloads, or choose a simple automatic reminder to engage constant tension. Do not risk equipment and crew on someone’s memory; a simple upgrade could save a life.

Dual winch mode. Why work with one arm tied behind your back? Your crane has two lift winches and in some operations it is highly advantageous to be able to run both simultaneously; e.g. running tools while the main winch operates in AHC mode at the seabed. Very few offshore cranes have this “two-handed” ability; those who do have the clear advantage.

This added functionality is made possible by adding a separate joystick and a special screen on the operator panel so that the operator can have complete feedback and full control over both winches at the same time.

Float-the-Load function. Reduce the amount of manual compensating the crane operator has to do and keep personnel and loads safer with one, easy upgrade.

When a load is to be moved across a deck or close to the seabed, it is often important that the load’s vertical distance to the deck or seabed remains constant. However, changing the crane’s jib angles also changes this vertical position. “Float-the-Load” is an automatic compensation feature developed to keep the load at the same vertical height (relative to deck or seabed) by automatically adjusting the winch position when the boom angles change. This feature even runs simultaneously with active heave compensation in order to float the load over the seabed when vessel movement must also be compensated.

Automatic Hook Positioning (AHP). Uncontrolled pendulum of the unused hook and subsequent entanglement/impact on the wire in use, or damage to the mechanical hook stop are dangers that can be encountered when moving a crane’s jib. This is because a crane’s geometry causes the distance between the hook and jib tip to increase or decrease when the main or knuckle jibs are moved.

In order to avoid such unwanted relative movements, the automatic hook position function can be implemented. When engaged, it will keep the distance between the crane tip and the relevant hook close to constant by adjusting the winch position automatically. The operator has less to worry about and the risk of wire damage and entanglement is greatly reduced.

Function Speed Limiting (FSL). Operators often express that they dislike having to hold a joystick at an exact position for long periods for the sake of precise speed control (precise lowering/hoisting or fine control when moving loads about a deck). It is too easy to accidentally move the joystick too far, lose focus and mismanage speed, and too stressful to constantly stare at speed indicators while maintaining the exact joystick position for hours.

We developed a simple tool that allows the operator to redefine each function’s maximum output speed using a scale that can be adjusted exactly with a touch of a finger. This upgrade helps do away with accidental joystick movements, incorrect speeds and aching hands.
Structural upgrades. Increasing demands on performance do not necessarily mean new equipment purchases. Often, your existing machinery can be afforded greater capacity, increased reach, or be made to better suit a new location or changes in other associated structures or systems. Our engineers can evaluate any conversion, make recommendations and calculate all associated loads and stresses as well as pre-test performance aspects to avoid hazards, failures or collision issues. We can also ensure that any custom or standard structural upgrade meets all relevant engineering and industrial standards, and help meet the unique, technical stipulations you may have. A wide range of upgrades is possible; some of the more popular structural upgrades provide larger lift radius, higher lifting capacity or increased wire capacity.

Ultra Deep-Water Lifting System (UDLS). A completely separate system, this new technology radically extends the reach of your heave compensated offshore crane in terms of depth. While the weight of your crane’s steel wire normally applies painful penalties as depth increases, using your existing crane together with our UDLS system means it can lower, lift and heave compensate full loads to many thousands of metres! Using the UDLS’ neutrally buoyant fibre rope system, it eliminates the wire weight penalty for the vast majority of the depth so that your existing offshore crane can lift its full load to previously impossible depths and keep it safe and under control. Full video monitoring of the UDLS crane/vessel hand-over system along with anti-twist control guarantees the safest way to reach the ultra-deep with heavy loads, and without relying on a separate ROV.

Power Management System (PMS). Improvement in fuel economy is always welcome, as is better timing and communication between power users (like offshore cranes) and the power generation/management system on the vessel. With our Power Management System, all intentions to change power requirements (start more pumps, shut down crane etc) are automatically communicated to the vessel by the crane. This ensures that power is available when needed, and that it is stepped down when the job is done. Avoid heavy motor starts before sufficient power is available, decreases in power during crane operation, and unnecessary provision of large amounts of power when it is not required. Fuel savings and better communication is always a smart decision.

Other upgrades

Arctic operations package. Do not assume that your current setup is well suited to harsh northern latitudes and extended periods of extreme cold and ice build-up when critical operations are at stake. Such environments are tough on equipment and crew, and few can guarantee reliable services there. Be one who can.

The arctic package introduces machinery components and designs specifically aimed at ensuring the safe, reliable function of equipment and more comfortable working conditions for personnel in heavy-ice environments with extremely low temperatures.
Upgrade the operator environment

A critical factor in good system design is the quality of the operator’s environment. We continually strive to provide the most informative, intuitive, safe and comfortable cabins for the operators so they can get the most out of the system with the greatest ease and least distraction. Fighting with difficult or uncomfortable equipment increases the potential for errors, ineffective practices, accidents or sick-leave.

Our long experience developing environments with the human factor in mind has resulted in a range of improvements that can benefit existing systems. Effective and intuitive interface layouts, enhanced tactile feel, an excellent view with proper shading and a comfortable position with flexibility and powerful monitoring and control tools within easy reach - these make a surprising difference. Get the best out of both operator and machine.

Profibus joysticks / large consoles. Greater control, smoother movement and immediate, finger-tip access to critical functions are only a few of the benefits of upgraded joysticks. The two ergonomic joysticks are comfortable, even for long periods, and offer noticeably better precision and more buttons so the operator doesn’t have to take his hands off the sticks during a critical operation. Foot-pedals for tuggers, horn etc are no longer required, and the operator can temporarily switch from one winch to the other at the press of a single button.

Other vital functions may also now be placed in larger consoles on either side of the operator chair (+ room for functions of your choice) so the operator has even more immediate access to important emergency and mode switch buttons.

Recaro operator chair. Creating a suitable environment where stress and discomfort are minimized is essential to helping operators maintain sharp focus. Operators sit for long hours focusing their attention above their heads and beneath their feet. They maintain watch over a wide field of view, operate numerous controls, manage monitoring, feedback and communication tools, operate the system with precision and must act at a moment’s notice to emergencies. A moment’s inattention must not occur because of a headache or aching neck, back or legs.

One excellent solution is the fitting of a Recaro seat. Known for being especially effective at supporting the natural curve of the back, they hold the operator securely in the chair and maintain comfort for long operations.

Additional operator screen. Observing and quickly processing large amounts of information is critical for an operator. Increase operational awareness, speed up decision-making and enable greater confidence and safety by providing multiple operator displays.

An additional screen (or several) provides much more oversight and immediate access to greater information as well as other tools, such as the real-time crane load calculator. An extra screen can be placed together with the main operator display or elsewhere and reduces the amount of switching and menu browsing required by the operator to access information and provide input. It also provides interface redundancy. An extra display can also be placed on the ship’s bridge.

Foil sunshades and vertical front window grill. Success in every operation depends on the system operator having an unobstructed view and the fewest possible distractions or stress factors.

The new front-window safety grill has narrower, round vertical struts and makes use of line-of-sight shadows to provide the best possible view from the operator chair. A clearer view = easier, safer and more efficient work.

Golden-foil window shades for all windows provide the absolute best in sun protection and comfort. No other shade does such a good job while also reflecting unwanted heat while remaining transparent for an uncompromised view.
The MV Siem Swordfish, a state-of-the-art multipurpose offshore vessel, is equipped with several HM cranes, one of which is a 150 tonne heave compensated offshore crane for subsea work.

During a critical mission in the Gulf of Mexico in 2008, a massive lightning strike occurred in the immediate vicinity of the vessel and its offshore crane while the crane was in operation. The crane control system immediately detected anomalies and generated a series of alarms. Feedback from the load cell and a few other critical components had been lost due to the lightning strike. The crane could still be operated, but only in interlock override mode or through the emergency HPU and secondary control panel.

Fortunately this vessel had a Remote Access Support agreement with the Cargotec Offshore Competence Centre in Kristiansand, Norway. Siem immediately called the hotline and took advantage of the dedicated support network. Within an hour the software and electrical engineers in Norway were able to log into the crane’s control system via satellite uplink and review the crane’s log and systems status. By analysing the crane’s internal communications system, they quickly located an electronic signal card that had been damaged.

The Swordfish staff had kept their recommended crane spares up-to-date and were able to find a replacement card on board. With guidance from the Norway office, ship staff replaced the damaged card and then restarted the crane control system together with the engineers in Norway. They confirmed that the crane was fully functional and set to work completing the operation. What could have been a terribly expensive show-stopper turned out to be a mere three-hour delay thanks to Siem’s Remote Access Support agreement and an up-to-date onboard spares system.

This event made it clear just how valuable these elements are. A mission was saved and a customer thanked their lucky stars that all their bases were covered before the unforeseeable happened.

Peace of mind all the time? You too can enjoy it.

Upgrade your crew’s knowledge and skills

The equipment that makes your critical missions possible is of vital importance. But are your equipment operators and maintainers properly trained? Are they prepared to carry out the safest and most efficient work with these critical systems in any scenario? If not, you have no guarantee that the equipment will perform the way you need it to, last as long or be as maintenance-friendly as you had hoped. Do not compromise on safety or efficiency. Make sure your staff know all aspects of proper operation in normal and emergency use and can troubleshoot and properly maintain that equipment.

Our Competence Centre offers popular training courses for operators and maintenance personnel, including full theory, practical sessions and highly realistic simulator training. Such training is designed to give your staff a full understanding of design, operation and maintenance and covers normal and emergency operation. Offshore crane training even takes advantage of an immersive training simulator that can be set up to mimic your crane. With follow-on simulator training, more extensive emergency training and complex lifts can be covered in scenarios that would be far too dangerous or difficult to practice in reality.

Fully immersive simulator training for offshore cranes
Cargotec improves the efficiency of cargo flows on land and at sea - wherever cargo is on the move. Cargotec’s daughter brands Hiab, Kalmar and MacGregor are recognised leaders in cargo and load handling solutions around the world.

MacGregor is the global market-leading brand in marine cargo handling and offshore load handling solutions. Customer-driven MacGregor engineering and service solutions for the maritime transportation, offshore load handling and naval logistics markets are used on board merchant and naval ships, on offshore support vessels, and in ports and terminals.

Global presence and local service bring our solutions closer to our customers.