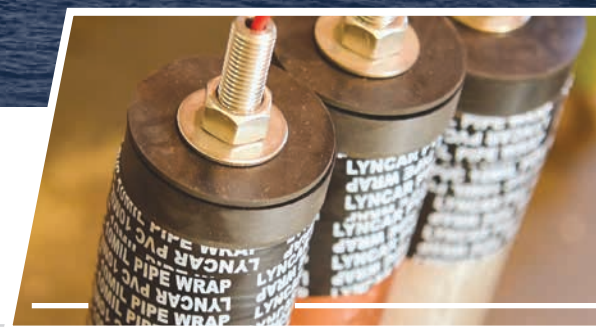
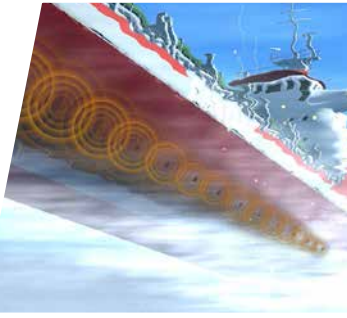


# MARELCO™

# 60 YEARS OF INNOVATION



## ANTIFOULING AND ANTI-CORROSION SYSTEMS

CRUISE SHIPS | FERRIES | NAVAL VESSELS | LUXURY YACHTS | OFFSHORE PLATFORMS | TUG BOATS

# PRODUCT CATALOGUE

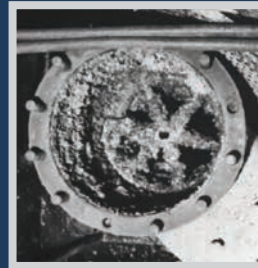
 **EMCS**  
INDUSTRIES LTD.

# ANTIFOULING AND ANTI-CORROSION SYSTEMS

## INTRODUCTION

Corrosion and marine growth fouling has posed both an operational and financial problem to the marine industry for decades. This includes ship owners, ship builders, offshore operators and many other applications where exposure to salt water is unavoidable.

The MARELCO™ systems provide a highly cost effective method of controlling the effects of this exposure and therefore dramatically reducing operating cost and extending the life of your marine vessel.



Main suction valve without MARELCO™ protection.



Main suction valve of sister ship after 9 months with MARELCO™ protection.

## ABOUT BIOFOULING AND CORROSION

### BIOFOULING

Biofouling is arguably *the* major challenge faced by the shipping industry and leisure vessels. It is best described as the accumulation of barnacles, mussels, bacteria, algae and other crustaceans on wet surfaces of the Vessel. Biofouling results in sea life blockage of the sea suction, sea chests, fire suction, cross over tanks, sea water piping systems, box coolers, heat exchangers and growth on the exterior of the Hull itself.

Biofouling can shut down critical systems on large ships and luxury boats such as Engine Cooling and HVAC systems that depend on the intake of sea water to function. Biofouling is also responsible for decreasing the speed of a vessel due to the drag created by the sea life on the hull and speeding up corrosion. This dramatically decreases fuel efficiency, increases emissions and results in high maintenance costs.

### CORROSION

The hulls of large ships are built of steel and steel or metal underwater are subject to corrosion. In order for this to take place the steel needs to be exposed to oxygen, water is a supply of oxygen. Corrosion is also caused by an electrical exchange, especially between metals of different types. Metals are comprised of atoms and since atoms have electrons, metal contains an electrochemical charge.

Corrosion occurs whenever two or more dissimilar metals are grounded. Metals can be grounded by physically touching or through a highly conductive solution such as saltwater, freshwater with high mineral content and polluted freshwater. It is therefore very important that all vessels built with steel hulls must be fitted with anti-corrosion systems.

## HOW WE HELP YOU CONTROL BIOFOULING AND CORROSION

**There are three MARELCO™ systems to effectively deal with Biofouling and Corrosion:**

- The MARELCO™ MGPS Electrolytic Anode System will prevent marine growth and trap corrosion in sea water piping systems, sea chests, box coolers, cross over tanks and other internal areas exposed to the intake of sea water.
- The MARELCO™ ICCP (Impressed Current Cathodic Protection) System is designed to combat exterior corrosion of the vessel.
- The MARELCO™ NOXX™ LFP (Low Frequency Pulse) System will prevent marine growth on vessels that operate in both salt and fresh water and are built out of any material, including wood.
- MARELCO™ HYBRID - A system that combines the MARELCO™ MGPS Electrolytic Anode System and the MARELCO™ NOXX™ LFP system to increase protection on intake grids, strainers, pipes and seachests in vessels that operate well known high fouling routes or in warm water areas where the marine fouling is hard to control.

# THE MARELCO™ MGPS ELECTROLYTIC ANODE SYSTEM

The Copper and Aluminum Anodes produce ions in small concentrations that are carried by the sea water into the exposed areas of the Vessel. In the case of a Copper Anode this results in the food source passing through the system rather than building up on the surfaces and attracting Barnacles and other Crustaceans. The system therefore keeps the Pipes and Pumps protected (See Fig 1). Without antifouling protection, pipes become blocked with sea life which reduces the efficiency of the seawater cooling system adding considerable maintenance costs.

Scientifically known as MGPS (Marine Growth Protection System) the MARELCO™ system also eliminates blockages without adding chemicals and is therefore completely

environmentally safe. The Aluminum anode ions prevent corrosion in the inside of Seachests and Pipes by creating a film on the internal surfaces, however they also release aluminium hydroxide which acts as a flocculant to the Copper released from the copper anodes. Depending on the composition of the piping system, an Iron Anode is added for increased effectiveness.

A customized system can be added at any time during the life of a vessel and is largely self-managed. The anodes are replaced every few years as they are used up, this can be done by Divers or more commonly during a scheduled Drydock.



## MARELCO™ ANODES

MARELCO™ Corrosion Control uses impressed current Copper and Aluminum sacrificial anodes to control corrosion of seawater piping systems. EMCS Industries Ltd. has been continuously improving the MARELCO™ system over time and the solution has proven itself in hundreds of installations throughout the world for the last six decades.



## MARELCO™ ANODE CAGES

Used to protect intake pumps and piping systems or submersible pumps, most commonly found on offshore platforms where salt water is pumped from the ocean to cool drilling machinery. The system prevents the intake from the ocean becoming completely plugged with marine life and also serves to protect the entire system from corrosion due to salt water exposure.



## MARELCO™ TREATMENT TANKS

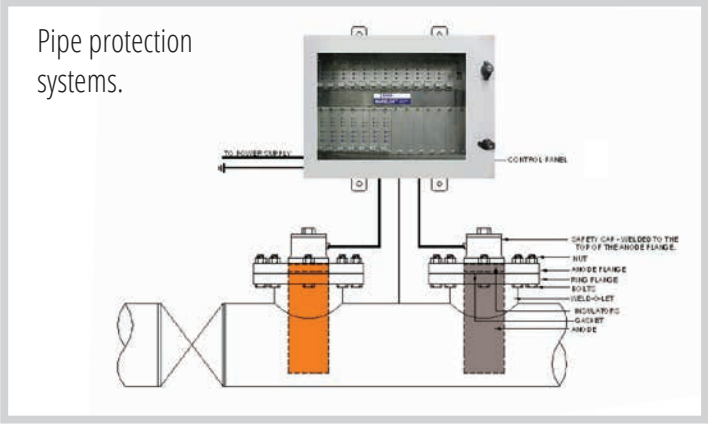
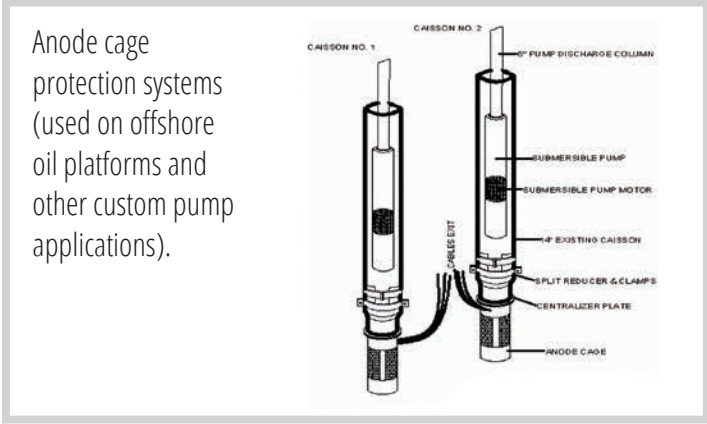
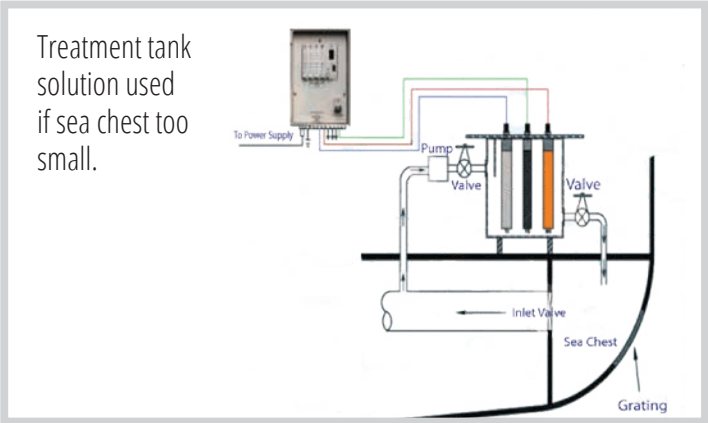
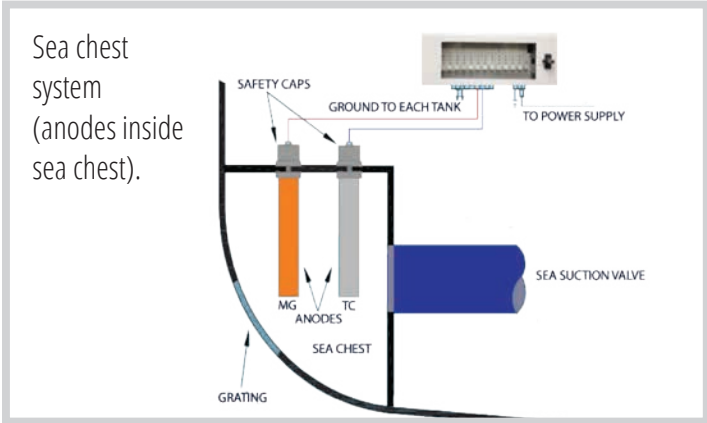
The MARELCO™ Treatment Tank System is a unique innovation. The Treatment Tank is an alternative to having the Anodes installed in the sea chest, crossover fire suction etc. The Seawater is pumped from any area and run through the tank that contains the Anodes. The treated water, now full of ions, is pumped back into the source. The tank can be placed anywhere on deck and is easily accessible for replacing Anodes without dry docking. The Treatment Tank is also used as a Scrubber system where it treats the sea water used to remove soot from the exhaust in the stack. The reduction of emissions is becoming increasingly important in order to create a greener environment.

## THE MARELCO™ LIBERATOR CONTROL PANELS

The MARELCO™ Constant Current Control Unit is a high quality steel dust and splash proof cabinet that incorporates all solid state circuitry and heavy duty components produced to meet any specification. Individual anode printed circuit cards regulate the current to the anodes.



Here are some applications where the MARELCO™ MGPS system can be used:

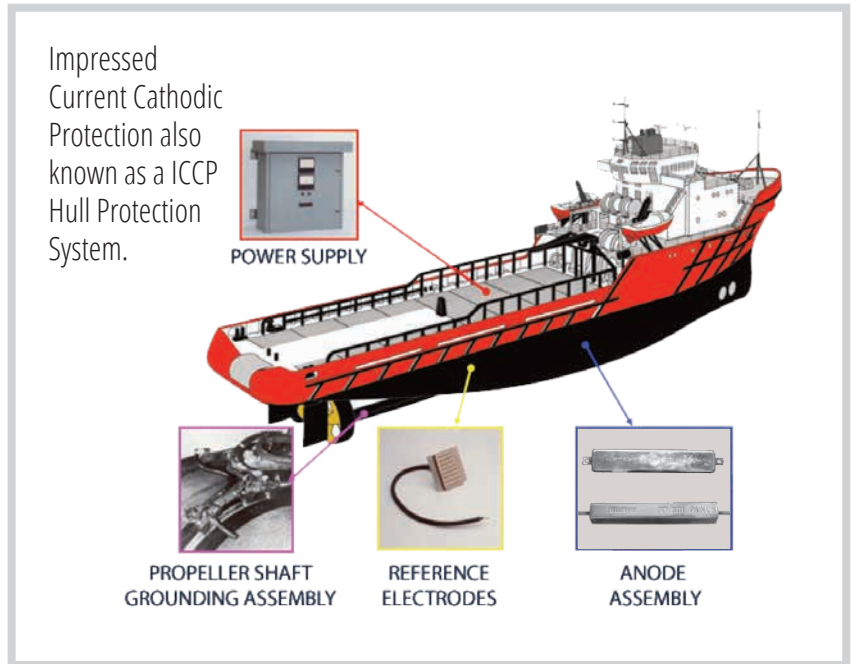


# MARELCO™ ICCP HULL PROTECTION SYSTEM (IMPRESSED CURRENT CATHODIC PROTECTION)

For larger structures such as a Hull of a ship, the impressed current is evenly distributed over the entire wetted area of the Vessel. The ICCP System will give adequate corrosion protection to the hull of a ship over the life of the vessel in conjunction with a compatible protective coating system.

Copper and Aluminum anodes cannot economically deliver enough current to provide protection. In these cases, Impressed Current Cathodic Protection (ICCP) systems are used. These consist of anodes connected to a Control Panel that distributes impressed DC power to the Anodes. ICCP systems are only used where Corrosion protection is required, ICCP does not stop Marine Growth.

Cathodic protection reference electrodes are custom manufactured and placed strategically along the Hull. They provide remote monitoring and control of the protection parameters. The output of the ICCP system is optimized to provide enough current to provide protection to the Hull. Our ICCP systems are often designed with multiple independent zones of anodes with separate Cathodic reference electrodes. ICCP can be used for Shaft Grounding preventing spark corrosion in bearings and gear boxes.



## DIFFERENCE BETWEEN A MGPS AND AN ICCP SYSTEM

- ICCP Anodes are located on the exterior hull of the vessel and used in conjunction with a reference cell to protect the Hull only. MGPS Anodes protect the internal salt water systems of a vessel
- ICCP neutralizes and protects the ship's hull from corrosion, MGPS protects the internal salt water systems from corrosion.
- ICCP does not provide protection from marine growth. MGPS provides protection from corrosion and marine fouling (internal systems only).



# SACRIFICIAL ANODES

Corrosion can affect ship hulls, harbour terminals, jetties, offshore platforms, bridges, piers, dams, storage tanks, automobiles, aircraft, trains, chemical plants, historic structures, and much more.

It is estimated that corrosion costs The United States around \$276 billion a year in damages, while natural disasters cause around \$17 billion in damages. Over a third of these corrosion related damages could be prevented using existing technology. One of the most useful tools in preventing corrosion is the use of sacrificial anodes.



Sacrificial Anodes are highly active metals that are used to prevent a less active material surface from corroding. Sacrificial Anodes are created from a metal alloy with a more negative electrochemical potential than the other metal it will be used to protect. The sacrificial anode will be consumed in place of the metal it is protecting, which is why it is referred to as a sacrificial anode.

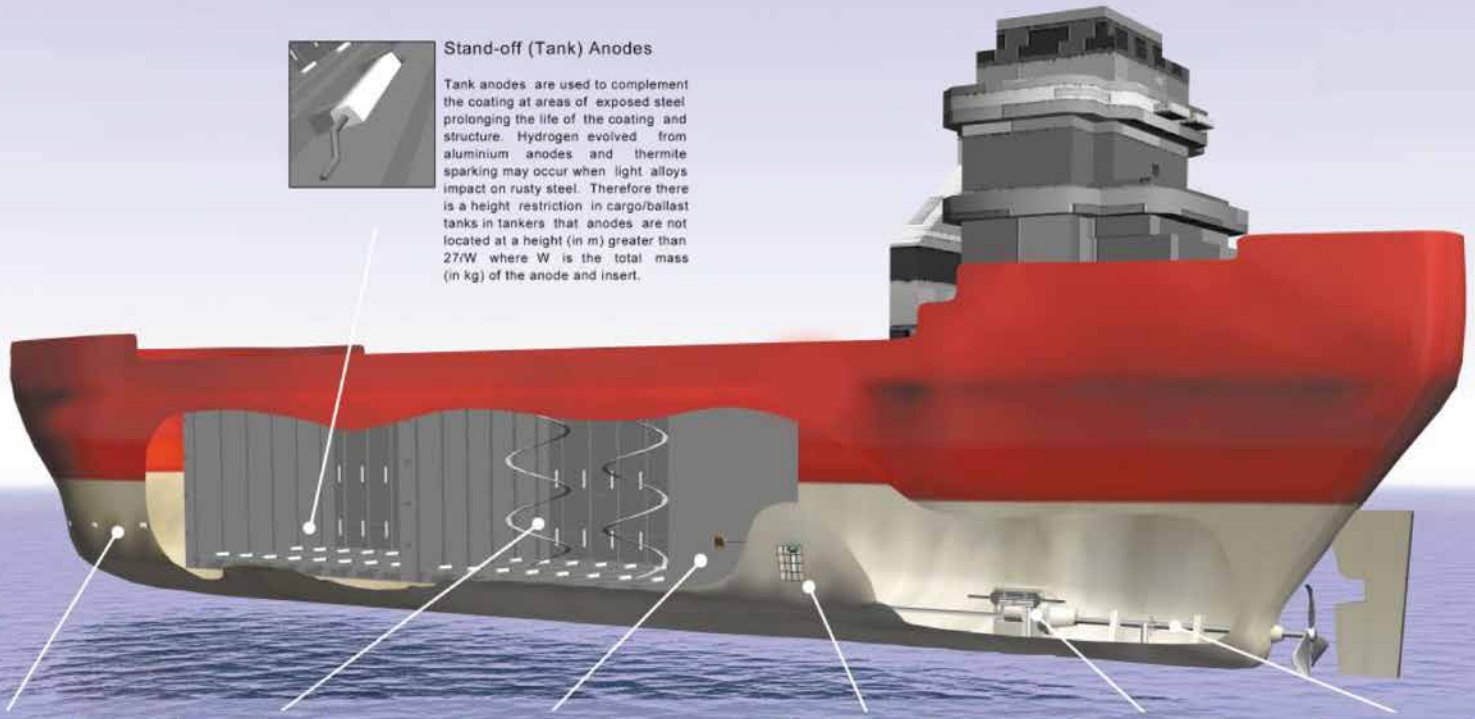
The materials used for sacrificial anodes are either relatively pure active metals, such as zinc or magnesium, or are magnesium or aluminum alloys that have been specifically developed for use as sacrificial anodes. In applications where the anodes are buried, a special backfill material surrounds the anode in order to insure that the anode will produce the desired output.

Since the sacrificial anode works by introducing another metal surface with a more negative electronegative and much more anodic surface. The current will flow from the newly introduced anode and the protected metal becomes cathodic creating a galvanic cell. The oxidation reactions are transferred from the metal surface to the galvanic anode and will be sacrificed in favour of the protected metal structure.



## Stand-off (Tank) Anodes

Tank anodes are used to complement the coating at areas of exposed steel prolonging the life of the coating and structure. Hydrogen evolved from aluminium anodes and thermite sparking may occur when light alloys impact on rusty steel. Therefore there is a height restriction in cargo/ballast tanks in tankers that anodes are not located at a height (in m) greater than  $27/W$  where W is the total mass (in kg) of the anode and insert.



Flush mounted (Hull) Anodes



Tank Descaling with Magnesium Ribbon



Impressed Current Cathodic Protection



Anti-Fouling



Engine Anodes



Shaft Earthing

## GALVANIC ANODE CATHODIC PROTECTION (GACP)

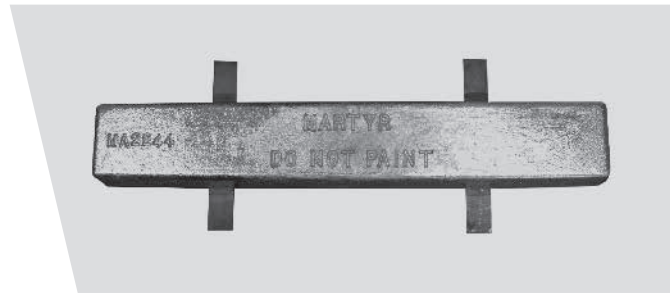
Well known to have 'Ultra Reliability' an increasing requirement for the offshore Oil & Gas sector. EMCS have DNV 'Type Approval' certification for production of Galvanic Sacrificial Anodes for prevention of Microbiological Induced Corrosion (MIC) or Accelerated Low Water Corrosion (ALWC). A galvanic anode is the main component of a galvanic cathodic protection (CP) system used to protect buried or submerged metal structures from corrosion. They are made from a metal alloy with a more "active" voltage (more negative reduction potential / more positive electrochemical potential) than the metal of the structure. The difference in potential between the two metals means that the galvanic anode corrodes, so that the anode material is consumed in preference to the structure. The loss (or sacrifice) of the anode material gives rise to the alternative name of sacrificial anode.

## HULL ANODES

Coatings are the first barriers to protect vessel hulls against corrosion. Due to microscopic pinhole defects in the coating and damage to it whilst in service localised pitting will occur. Hull/flush mounted anodes are used to complement the coating at areas of exposed steel prolonging the life of the coating. Hull anodes are also employed to reduce corrosion rates on areas of the hull that are local to propellers and the propellers themselves. Alloys of Zinc, Aluminum and Magnesium with the necessary trace elements to provide correct performance are used for the manufacturing of Sacrificial anodes (Aluminum Anodes, Zinc Anodes and Magnesium Anodes). All types of Hull anodes ranging from weld-on to bolt-on types are available upon request.

## HARBOUR TERMINALS AND JETTIES

It is now evident that piles corrode at rates far in excess of what is known as acceptable due to an increase by the presence of colonies of bacteria caused primarily by Sulphur Reducing Bacteria (SRB). This phenomenon is known as Accelerated Low Water Corrosion (ALWC) or MIC (microbiologically induced corrosion). Identified by orange soft organic bacteria (Ferric 3+ oxides), with a black layer (ferric sulphide) hiding bright, pitted steel. Research revealed that Cathodic Protection greatly reduces the corrosion rate.



## STAND OFFSHORE ANODES

### ALUMINUM

Aluminum alloy anodes are now mostly preferred due to their higher electrochemical efficiency which enables them to operate at different temperature co-efficient. The anodes are less dense than zinc making them lighter and easier for handling when fitting. Systems can be designed to protect uncoated steel such as installations that have been in operation for many years. Cathodic Protection Systems shall be designed to deliver sufficient protective current to polarise the steel structure in the submerged zone and maintain that potential. For steel susceptible to hydrogen induced stress cracking (HISC), the potential value is targeted between -0.770V and -0.830 V versus the Ag/AgCl seawater reference electrode.

### ZINC

EMCS Limited Stand-off anodes are designed so that they have a minimum distance from the steel surface they are protecting of 300mm, to ensure uniform current distribution to the surface. The life period of a system is not less than five years. The anode core will support the anode to maintain the anode shape during later stages of the anode's life. Zinc material is often referred to the American Military Specification, MIL-A-18001 K. Zinc is a well-proven anode material and its capacity is virtually unaffected by the operating current density, although the driving voltage diminishes with increasing temperature therefore it has limited application.

# MARELCO™ NOXX™ LFP (LOW FREQUENCY PULSE) ANTIFOULING SYSTEM

EMCS Industries is proud to offer an Antifouling solution that will work from the smallest recreational vessel to the largest cruise ship. The system works regardless of the material used on the Hull or inboard applications. The MARELCO™ NOXX™ LFP antifouling system uses extremely low power, adds very little weight to the vessel and is a tried and tested solution in fresh and salt water since 1974.



**ONLY 0.1A  
PER EMITTER**



**MAINTENANCE COSTS, FUEL BILLS, AND  
SCRAPING TIMES ARE ALL REDUCED!**

The MARELCO™ NOXX™ LFP Emitter is an electronic device fitted on the inboard side of a vessel to protect any internal water system or hull. The system can be installed during a haul out/dry-dock or while still in the water.

The MARELCO™ NOXX™ LFP antifouling system is comprised of a Control Panel and a series of emitters operating on either 12, 110 or 220 volts DC with a minimal energy requirement of 0.1 amps per emitter. The compact Control Panel may be fitted in any convenient location. The emitters are fitted on the inboard side of the vessel.

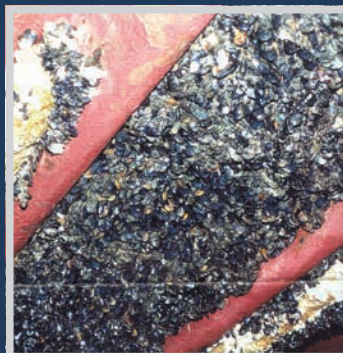
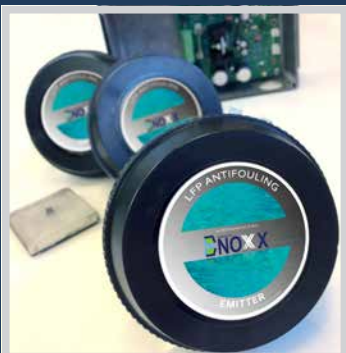
The MARELCO™ NOXX™ LFP emitters produce a low frequency pulse which is transmitted through the hull sea chest, crossover, intake grid depending on the application. The signal is interpreted by the crustacean larvae as a predatory environment and therefore provides complete protection against marine pests such as barnacles, mussels, teredos, pinworms and all other common fouling in salt and fresh water.

The MARELCO™ NOXX™ LFP antifouling system is environmentally friendly due to its inboard location and frequency range that are unlikely to interfere with sea mammal communication. The system also reduces your carbon footprint due to better fuel efficiency.

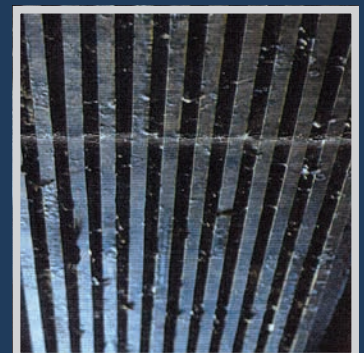
The MARELCO™ NOXX™ LFP antifouling system is easily installed. The equipment operates 24 hours/day, 7/7 days a week, providing complete protection against all marine and fresh water fouling.

The MARELCO™ NOXX™ LFP antifouling system does not interfere with any electrolysis, marine depth-sounder or radio equipment. The installation of this equipment does not remove pest growth already present, but will prevent any further fouling starting from a clean situation.

The MARELCO™ NOXX™ LFP antifouling system is extremely reliable and long lasting. The MARELCO™ NOXX™ LFP Emitters are warranted for 60 months and the Control Panel and electronic parts carry a 12 Month warranty.



Before



After





## WHY?

Millions of dollars on research have been spent on the development of effective externally applied coatings to prevent marine growth with limited effectiveness and constant recurring costs - some countries prohibit them because they are a pollutant.

Neglecting marine growth will incur high cleaning costs and can account for speed losses and resulting increase in fuel consumption and harmful emissions.

### Customers such as:

- BC Ferries
- Alaska Marine Highway
- Charleston Navigation Co. Inc. (South Carolina)
- TxDOT Ferry System
- Elliott Bay Design Group
- Canadian Coast Guard Services
- Marinette Fincantieri Marine Group
- + many others

## KEEPING YOUR BOAT'S BOTTOM CLEAN!

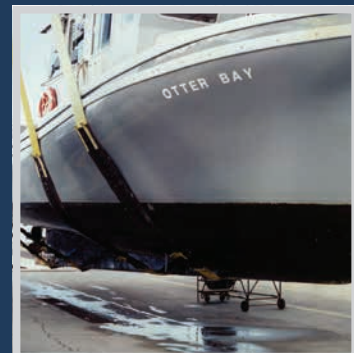
- Eliminates expensive cleaning
- Chemical Free
- Simple Installation



Before



After



## CUSTOMER COMMENTS

### Charleston Navigation Co. Inc. - Charleston, S.C.

*"We operate three pilot boats ... we are thoroughly satisfied with this system. We attribute the noticeable absence of customary barnacles to the Low Frequency Pulse devices ..."*

### C.D.M., - North Vancouver, B.C.

*"In comparison with other yachts, in same environment, it was evident that MARELCO™ NOXX™ kept marine growth off the hull. We are pleased with the operation of the system and the savings and security which the system provides."*

### B.C. Ferry Corporation Pacificats, "Explorer" and "Discovery"

*"These vessels were so severely beset by mussels breeding on, and up through the raw water intake piping system that they required docking and cleaning every six to eight weeks at substantial cost. The first ferry, "Explorer" was equipped with the MARELCO™ NOXX™ LFP System in December 1999. The "Discovery" was equipped several months later. When last checked the video taped by divers near the end of 2000, both hulls were free of mussels, barnacles and weed."*

### George Poor, Chief Engineer - Alaska Marine Highway System

*"We have been using the MARELCO™ NOXX™ LFP System since our vessel construction. We haven't had to worry about mussel or barnacle growth on our Alaska Marine Highway Fast Vehicle Ferries, and our two aluminum Catamaran Passenger Ro-Ro vessels since original construction 12 years ago. The system prevents marine growth from settling in the raw water systems; the Piping and Seachest and Bowthrustrer tunnel surfaces within 3' of a MARELCO™ NOXX™ LFP emitter have almost no attached barnacles or mussels. The system takes up little space, requires low power, is low maintenance, and is environmentally friendly. We are very satisfied with the overall system performance."*

# MARELCO™ SEAFARER ANTIFOULING MONITORING SOFTWARE

The MARELCO™ monitoring system consists of two parts; the MARELCO™ SEAFARER software application and the new MARELCO™ LIBERATOR Control Panel. The two products are sold together to provide the most comprehensive antifouling system management available today. Gone are the days of regular manual intervention by scarce human resources on board the vessel, and welcome a complete self management and diagnostic system that will ensure maximum efficiency of your antifouling system.

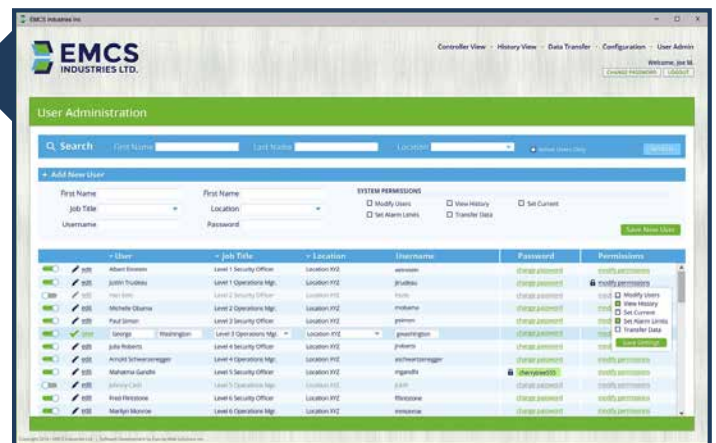


## FEATURES INCLUDE:

- Multiple Control Panels controlled from one central location
- Shows layout, location and status of an Anode or Transducer in real time
- Controls each anode or emitter automatically.
- Each virtual card shows all detailed information and stores in data log.
- Logs the date that its settings were most recently changed.
- Fully configurable with sophisticated system setup interface.
- Communicates all information a local PC, Tablet or Smart Phone on the vessel.
- Remote management of the vessels antifouling systems
- The User Admin screen to create and modify users and their permissions.
- All system features are included but can be configured to suit any security protocol.

## LIBERATOR CONTROL PANEL VIEW

- Each new Liberator Control Panel can have notes associated with it, which can be set in the Configuration screen. These notes indicate the location of the new Liberator Control Panel and other details.
- When there is more than one new Liberator Control Panel on a ship, each new Liberator Control Panel is selected from a drop-down list.
- Each card has a short description that indicates where on the ship the anode is mounted.
- Each card displays the date and time of the last reading.
- The most recent current and voltage is displayed. If the user has sufficient privileges the current can be adjusted.
- The voltage upper and lower limits are set using slider controls (if the user has sufficient privileges).
- The Open CCT and Short CCT indicators show the card's status. The open and short circuit card statuses are triggered by hitting the voltage upper and lower limits.
- The Service Required indicator shows when an anode voltage has reached a value that would indicate that the anode should be replaced in the near future, but it is still operating.



- Each card shows the date that its settings were most recently changed.
- Each card has a direct link to its history and change logs.
- If the Service Required indicator is on (the service required voltage threshold is exceeded) the background colour of the card changes to yellow to make it obvious at a glance.
- If the Short CCT or Open CCT indicator is on the background colour of the card changes to red to make it obvious at a glance.



## CARD VIEW

The card view screen is accessed either from the History View main menu link or by selecting the History/Logs link at the bottom of each card.

This screen consists of a set of collapsible panels that represent each of the cards in a controller. One of the panels is expanded at a time, so if a different panel is selected the previously selected panel collapses. If this screen has been navigated to by selecting the History/Logs link on the bottom of the card on the Controller View, that card is automatically expanded.

Within the panel the card details are displayed (same details as the individual card on the Controller View). In addition a graph of the voltage and current readings is displayed. The default date range is one year, but this date range can be set using calendar controls. Additional information such as installation date, notes, and a history of changes to settings for the card are also displayed here.

The change log for the card is also displayed, which lists all changes that were done through the monitor system software as well as manual changes made on the hardware controller. Data transfers are also listed.

## CONFIGURATION

The configuration screen contains all system setup parameters and consists of three sections: controller information, communications, and data transfer.

The Controller Information section allows the user to select a controller and set the address of the controller. The number of cards in the controller is also set here and a label can be set for each card in the controller.

For each card the user can indicate the anode's location on the ship's hull by selecting the card and moving the anode within the ship outline using their mouse.

The controller can also be given a name and notes entered that will be shown on the Controller View and Card View screens.

## COMMUNICATIONS

The Communications section sets the communications type and parameters for all of the controllers. The communications type can be either serial or TCP/IP and if serial is selected, a Com Port must be selected. The rate that the monitor software polls each controller card is also set here.

In the Data Transfer section each type of transfer method can be configured. For the Remote data transfers and FTP, the URL, username, and password for the remote server are specified. Similarly for Email transfer, the email address can be specified and for File transfers a default file location can be specified. If data transfers are automated (Remote, FTP or email), a data transfer frequency must be specified. The ship name needs to be entered so the central database has a ship associated with the anode data.

Job Title	Location	Username	Password	Permissions
Level 1 Security Officer	Location: V02	admin	change password	modify permissions
Level 1 Operations Mgr	Location: V02	john	change password	view history
Level 2 Security Officer	Location: V02	john	change password	set alarm limits
Level 2 Operations Mgr	Location: V02	john	change password	set alarm limits
Level 2 Security Officer	Location: V02	john	change password	transfer data
Level 3 Operations Mgr	Location: V02	john	change password	view history
Level 4 Security Officer	Location: V02	john	change password	modify permissions
Level 5 Security Officer	Location: V02	john	change password	modify permissions
Level 5 Operations Mgr	Location: V02	john	change password	modify permissions
Level 6 Security Officer	Location: V02	john	change password	modify permissions
Level 6 Operations Mgr	Location: V02	john	change password	modify permissions

## USER ADMIN

The User Admin screen allows an administrator to create and modify users and their permissions.

By default all users appear in the list and the column headers can be selected to sort the users based on that column. The list of users can be narrowed down (Search) by filtering by name, location, and active users.

Each user can be assigned any combination of system permissions – modify users, view history, set anode current, set alarm limits, and transfer data. Users can also be assigned a job title and location.

In the list of users each user can be edited by selecting the Edit link. The name, job title, location, and username fields then become editable. The user's password can be reset and permissions added or removed. Users can be made inactive using the slider switch in the first column.

# OUR STORY



## MARELCO™

EMCS Industries Ltd. was established in 1955 in the beautiful West Coast city of Victoria, BC Canada. The company was established by Frank Chappel and Lauder Ramsay after they had invented the revolutionary MGPS seawater protection technology. 60 years later, the company is manufacturing its MARELCO™ antifouling and anti corrosion product lines internationally to meet the highest standards of quality and workmanship to service the marine industry. EMCS Industries Ltd. has a vast worldwide distribution network to service it's world class customers.

Our history began with the invention of the patented Electrolytic Anode product sold under the product name "Cathelco Systems". The product was manufactured and marketed world-wide for several decades by Electrolytic Marine Corrosion Services which was the original name of the company in 1955. In 1983, the company name was changed to EMCS Industries Ltd. In 1989 the original patented product name was changed from "Cathelco Systems" to MARELCO™ and to this day is the original MGPS system fully engineered and invented in Canada in 1950 and marketed globally under the MARELCO™ trade name.

In order to stay ahead in an ever changing marketplace, EMCS Industries Ltd. has remained at the leading edge of innovation by actively developing new specific marine antifouling products such as NOXX™ LFP and Treatment Tank (Scrubber systems) that all carry the quality MARELCO™ reputation for quality and provide our customers with a comprehensive antifouling and anti-corrosion solution designed to save money, reduce energy usage, minimize the carbon footprint and increase the life of our customers Marine assets.

At EMCS Industries Ltd. we are proud of our world class products which solve fouling and corrosion problems for our world class customers in the marine industry.

## WORLD CLASS PRODUCTS FOR INDUSTRY LEADING CLIENTS

For the past 60 years EMCS Industries Ltd. has been proudly serving world class customers such as: Norwegian Cruise Lines, BC Ferries Corporation, Washington State Ferry Corporation, Princess Cruises, Holland America Lines, Seabourn, P&O Australia, the Canadian and United States Coast Guard, Oceania, Allied Shipbuilders, Seaspan and many others.



*"Allied Shipbuilders has undertaken dozens of dry dockings of vessels fitted with EMCS cathodic protection equipment, protecting the most structurally complex, inaccessible and vulnerable parts of the ship - the sea bays and sea chest. Our experience has been the protection provided by these systems is complete. Repairs and maintenance in these areas is virtually non-existent, saving the vessel owners time and money.*

*The service provided by the company, EMCS has always been outstanding.*

*Allied is pleased to hear the company continues under new ownership and the key personnel from before remains with the new company.*

*We look forward to continuing our successful relationship with EMCS."*

**Chuck Ko**  
Allied Shipbuilders Ltd.

**MARINE ANTI FOULING & ANTI CORROSION SOLUTIONS**  
250.656.5366 | [emcsindustries.com](http://emcsindustries.com)

