



Marine & Offshore

MRO - MAINTENANCE, REPAIR AND OVERHAUL

MECHANICAL SERVICES

HYDRAULIC SERVICES

DIESEL ENGINES AND TURBOCHARGERS

SHAFT LINE AND PROPULSION SYSTEMS

LASER AND OPTICAL ALIGNMENT

IN-SITU MACHINING

METALOCK® COLD STITCHING

WELDING AND PLATEWORK

BOILER SERVICES

SPS (SANDWICH PLATE SYSTEM)

ANCILLARY EQUIPMENT FOR FPSOs AND TANKERS

ELECTRICAL SERVICES

CRANES AND DECK MACHINERY

REFRIGERATION

MARINE ELEVATORS

**LIFEBOATS, DAVITS, RESCUE BOATS,
LAUNCHING DEVICES**

LOAD TESTING

FIRE FIGHTING EQUIPMENT

ELECTRONICS

NAVIGATION AND STEERING

GMDSS (GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM)

VDR (VOYAGE DATA RECORDER)

CALIBRATION

AUTOMATION

LOGISTICS SERVICES

AUTHORIZED SERVICE REPRESENTATIONS



 **METALOCK**
BRASIL

ABOUT US

Metalock stands for a highly successful repair technology to cracked or broken cast iron or steel components. This cold process originated in the oil fields of Texas in the 1930's developed to eliminate the dangers of open flame welding in inflammable conditions.

The process has many advantages, such as the absence of heat, meaning the elimination of distortion, reduction in post repair machining and maintenance of pressure tightness.

Metalock International Association was created in 1953. The members funded associated companies throughout the world with most, not all, using the Metalock name. Today these and further independent companies are members of the Metalock International Association.

Metalock activities in Brazil started in São Paulo, in June of 1957, originally under the name Unilock. The basic activity was performing repairs to cold cast iron components, mainly for industrial and marine equipment, such as diesel engines, compressors, pumps and presses. At that time, most industrial machinery was made in cast iron and the repair market expanded because there was a shortage of spare parts, as a consequence of World War II. Steel subsequently partially substituted cast iron in machinery and Metalock Brasil diversified its activities. There was considerable demand for marine equipment repairs in Brazil and in January of 1961, the company took over Oficina Duncan, a marine engineering service company in Santos, adding marine engineering services to its activities.

Metalock Brasil expanded its engineering services in the industrial, marine and offshore markets in Brazil considerably, building itself a reputation for reliable services conducted in-house – cold stitching (Metalock®), mechanical, machining, in-situ machining, welding, plate work, boiler work, electrical, electronics, pneumatics, hydraulics, propulsion, refrigeration, electroplating and safety inspections.

Metalock Brasil is authorized service representative for more than 60 manufacturers of marine equipment and its technicians regularly attend training courses at these manufacturers abroad, keeping abreast of global technological developments and methods. In addition it has close working arrangements with other marine equipment manufacturers. Its repair teams are accustomed to working abroad, on board vessels during voyages and are readily deployed to anywhere in the world.

Metalock Brasil has workshops in Santos, São Paulo and Rio de Janeiro. It attends at all major ports in Brazil and South America, often using a qualified network of subcontractors, under its supervision, enabling it to offer local service, thus minimizing travel time and costs. It also provides riding squads for all voyage repairs, along the Brazilian coast as well as abroad. Through MIA, ISES and fellow representatives of manufacturers, it offers a global service network.

Metalock Brasil is ISO 9001:2015 certified by DNV.





SERVICES





Mechanical

Repair and overhaul of:

- Pumps (centrifugal, reciprocating, gear)
- Air compressors
- Heat exchangers
- Valve chests
- Deck machinery (windlasses, anchor winches)
- Reduction gearboxes

Authorized Service Representatives for:

- HD Hyundai
- IHI
- Kawasaki Precision Machinery
- Mirae Industries
- Nakakita Seisakusho
- Reintjes
- Shinko
- Teikoku

Hydraulics

- Steering gear
- Hydraulic power packs refurbishment
- Hydraulic power units and controls
- Hydraulic cylinder repairs

Factory Trained Service Engineers and Technicians

DIESEL ENGINES AND TURBOCHARGERS



- Overhaul of main engines (2 stroke and 4 stroke)
- Overhaul of auxiliary engines
- Overhaul of turbochargers
- Balancing turbocharger rotors with Schenk balancing machine HBU 20/40
- Re-blading of MET turbochargers
- Reconditioning of components:
 - Cylinder heads
 - Cylinder liners
 - Piston crowns
 - Piston skirts
 - Exhaust valve spindles, seats & cages
 - Exhaust valve stems
 - Crosshead pins
 - Connecting rods
 - Fuel injection equipment (valves, nozzles, bodies, fuel pumps)
- Fuel pump timing
- Repair and renewal of high pressure fuel pipes
- Removal of broken studs
- Remetal (babbitt) bearings
- Crankshaft rectifying, *in situ* and ashore
- Chocking engine bases (Epocast resin)
- Governors – Overhaul (Woodward, Zexel, Yanmar, Regulateurs Europa)



Schenk HBU 20/40 Balancing Machine, quality grade G2.5 (DIN-ISO 1940-1)

Authorized Service Representatives for:

- Bukh
- HD Hyundai (HiMSEN, MAN B&W, WinGD)
- J-ENG (Japan Engine Corporation) - UE Engine
- Mitsubishi – MET Turbocharger
- Nanni
- Steyr Motors
- Yanmar – Large Marine Engine

Experienced Service Engineers and Technicians for:

- MAN B&W
- WinGD Ex Sulzer/Wärtsilä
- MaK



Simplex®

Factory Trained Service Engineers for:

- Bonding of propeller shaft seals
- Vulcanizing of pneumostop thruster seals
- Airspace - Seal system with a dedicated air chamber ensuring the perfect separation of sea water and oil
- Rebabbitt stern tube bushes
- Propeller repairs
- Controllable pitch propellers

Authorized Service Representatives for:

- SKF Marine (SIMPLEX Seals)
- Kawasaki Heavy Industries

LASER AND OPTICAL ALIGNMENT



- Engine blocks
- Propulsion shaft line and stern tube
- Engine/alternator assemblies
- Electric motor/pump assemblies
- Crane pedestals

IN-SITU MACHINING

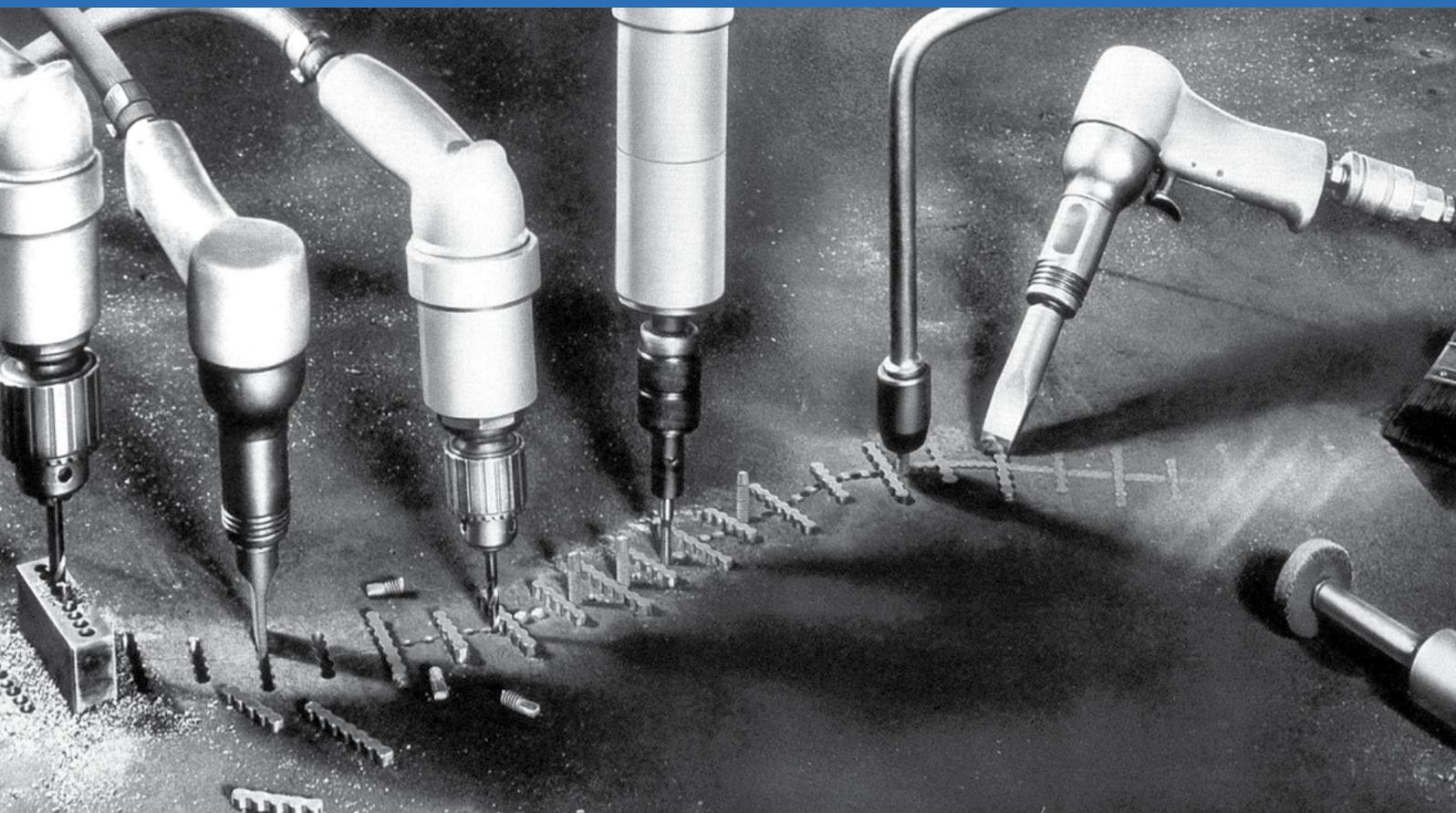


- Line boring of engine blocks up to 12 m
- Rectification of crankshafts (crankpins, main journals and radii)
- Cylinder cover/liner/block landings (including bushing)
- Machining of shaft ends
- Boring of housings
- Boring of holes

Equipment:

- Crankshaft rectification equipment up to \varnothing 1200 mm
- Portable line boring equipment up to 12 m
- Flange facers from 25 up to 3200 mm
- Chamfering machines
- Liner landing skimming machines
- Drill machines with magnetic bases
- Slides up to 5500 mm
- Boring bars
- Liner honing machine up to \varnothing 980 mm





Repairs to casting constructions:

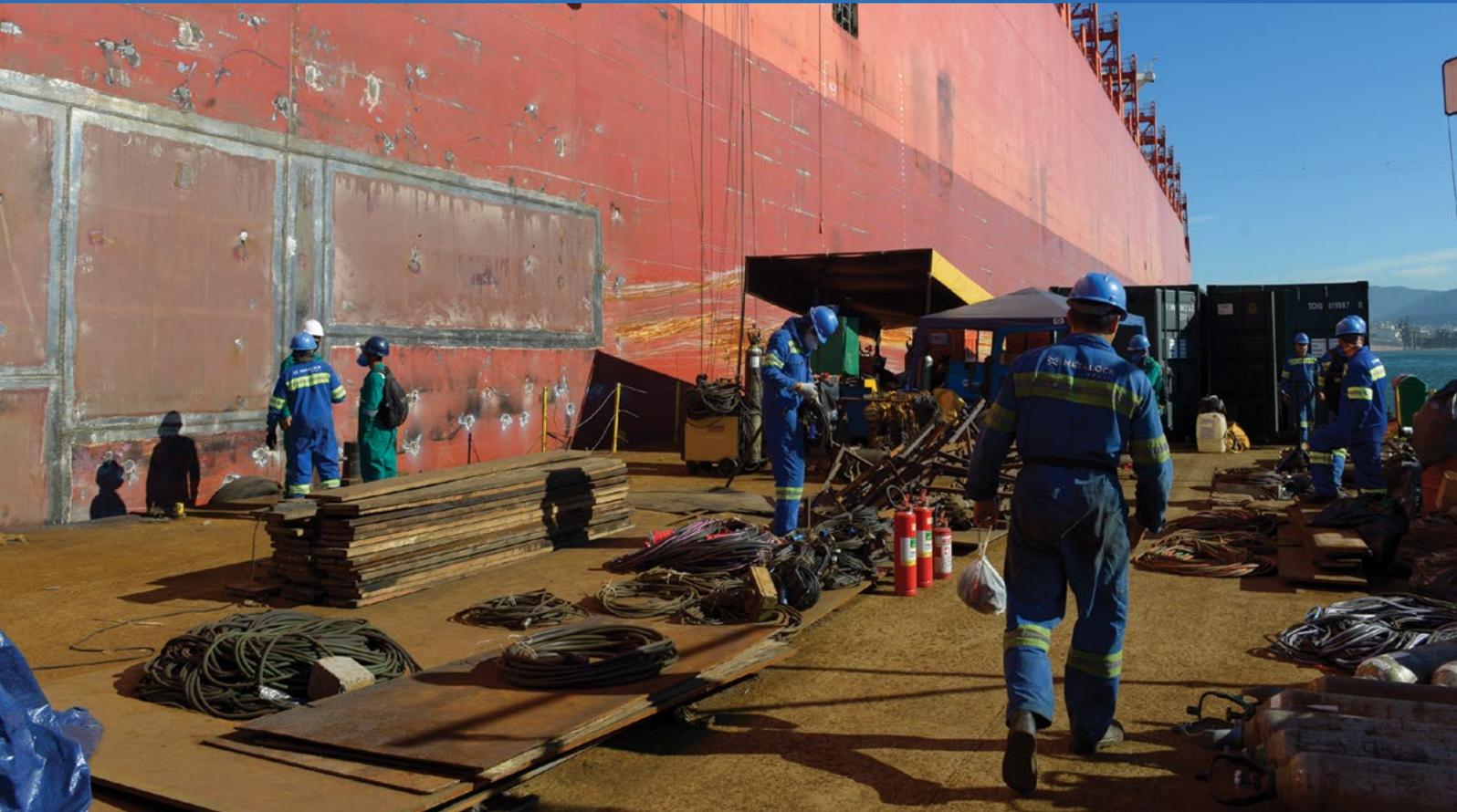
- Compressor and pump casings
- Motor frames
- Engine blocks
- Gearboxes

Advantages:

- Repairs cracks to cast iron, steel, aluminium and other alloys
- Maintains alignment, surfaces, and dissipates stresses
- Absorbs compression forces
- The vast majority of repairs can be done in-situ, minimizing the need for disassembly and reducing downtime
- A fraction of the cost of replacement



WELDING AND PLATE WORK



- Structural and shell plating
- Tanks (including stainless steel)
- Pipework
- High pressure piping
- Gangways
- Deck
- Crane sections
- Hatch covers

Welding Processes:
SMAW / FCAW / TIG

Elaboration of Welding Procedure Specification (WPS) and Welding Performance Qualification Record (WPQR) specific to each project

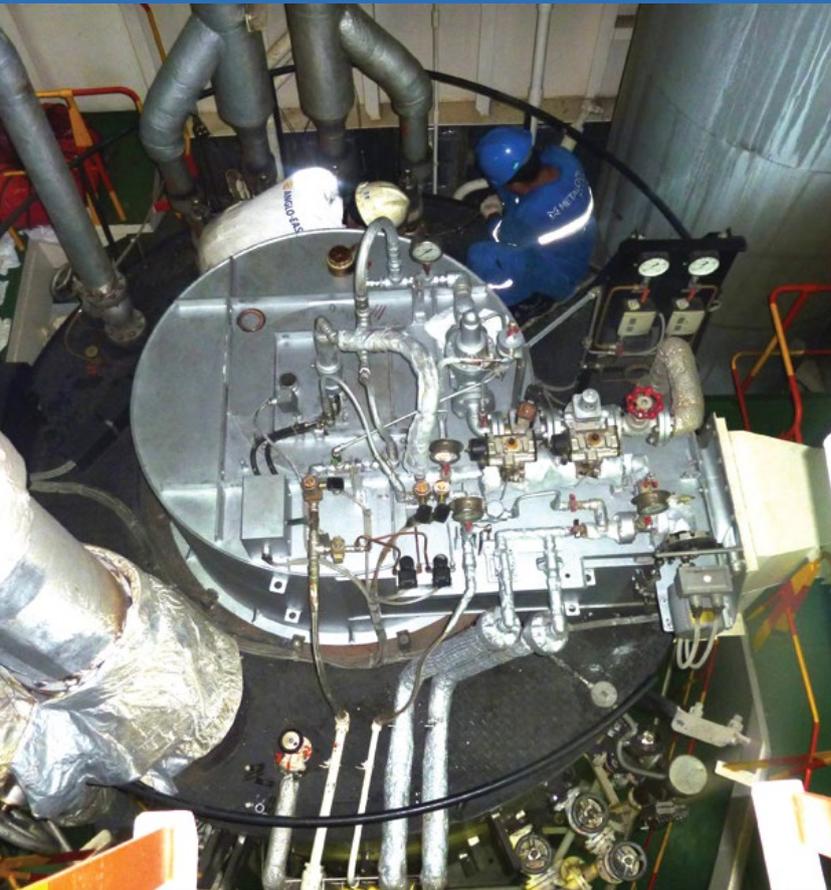
Approved Welding Procedure

- Manual arc welding of higher-strength hull structures, steel grade E36 - DNV

Welders Certified by Class

- Lloyd's Register to ASME IX 4G & 6G
- DNV ASME IX





- Steam and Oil Fired Boilers
- IGG – Inert Gas Generator
- Incinerator

Boiler Inspections

Services

- Plating, shells, pipes and stays
- Supports and securing arrangements
- Heaters and economizers
- Circulation pumps
- Safety valves and cocks
- Re-tubing
- Welding cracked tubes and tube plates
- In-situ machining of tube plates
- Combustion chamber – structural and TIG welding
- Refractory repairs and renewal
- Burners – troubleshooting, repair and installation
- Automation and control

Authorized Service Representatives for:

Kangrim · Sunflame · Volcano

SPS (SANDWICH PLATE SYSTEM)



Sandwich Plate System, SPS®, is a structural composite used for new build and as a repair solution for vessels and assets. It is used for:

- Structure reinstatement
- Strengthening and improved impact resistance
- Reducing and repairing fatigue damage
- Reducing noise and vibration
- Port and infrastructure repairs
- Blast and ballistic prevention
- Anti-piracy and citadel protection.

Over 200,000 m² of SPS has been used to deliver class-approved, permanent repairs ranging in size from 1m² to over 1,000 m², and can be delivered as a cold work in-situ repair to:

- Eliminate the need for dry docking
- Protect the safety of personnel on board
- Repair areas with limited or restricted access.

SPS is a more sustainable choice:

- Fewer emissions from welding
- Less steel needed
- SPS is also recyclable.

SPS
TECHNOLOGY

ANCILLARY EQUIPMENT FOR FPSOs AND TANKERS



- Installation, commissioning and maintenance of sea water lift pumps (authorized by DMW)
- Overhaul, repair and testing of pressure safety valves (authorized by Fukui Seisakusho)
Testing capability up to 300 bar
- Overhaul of cargo oil pumps and cargo oil pump turbines (authorized by Shinko)





Rewinding and overhaul of:

- Low voltage AC & DC rotating machinery - motors and alternators
- During the rewinding of the customer's alternator Metalock Brasil can arrange generator rental
- Transformers

Repairs to:

- Circuit breakers
- Switchboards

Further services:

- Predictive, preventive and corrective maintenance to electrical machinery
- Health care of electrical machinery
- Vibration analysis – SPM (Shock Pulse Method)
- Thermographic survey LV & HV
- Balancing of electric motor and alternator rotors
- Secondary injection testing for protection relays
- Repair, maintenance and commissioning to frequency inverters and soft-starters
- Electrical installations
- Electrical engineering services
- Field maintenance



Authorized Service Representatives for:

- Emod Motoren
- HD Hyundai Electric
- KTE
- Marelli Motori
- Taiyo Electric
- WEG



Certified by DNV for repairs to Explosion Proof Motors under IEC 60079-19 for protections: d, e, n and t

CRANES AND DECK MACHINERY

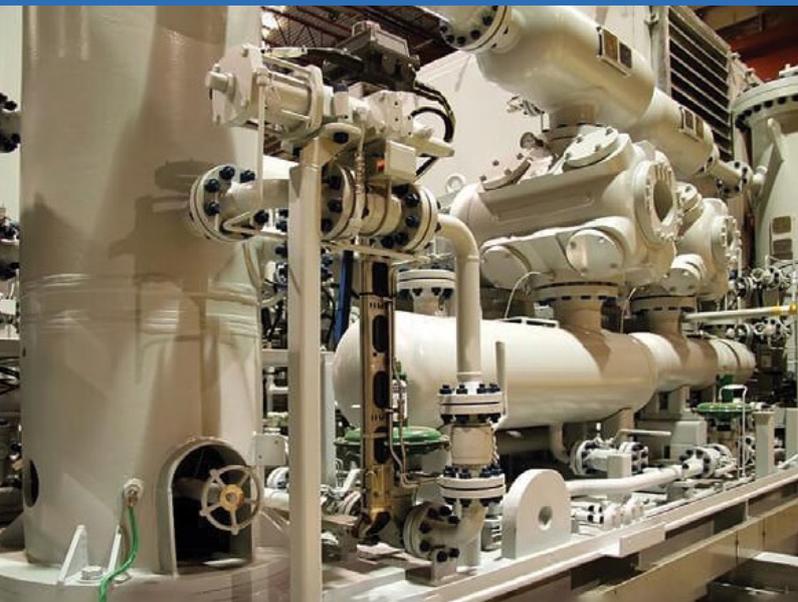


- Jibs
- Gearboxes
- Renewal of brake bands
- Spreaders
- Windlasses
- Anchor winches
- Load testing

Authorized Service Representatives for:

- D-I Davit International - Hische
- Global Davit
- JMU (ex IHI)
- Oriental Precision (OPCO)

REFRIGERATION



- Domestic reefer systems
- Stores
- Air conditioning systems
- Provision reefer systems
- Compressor overhauls

MARINE ELEVATORS



- Annual and 5-yearly survey and certification
- Repairs and maintenance
- Preventive maintenance
- Modernizations and retrofits
- Spare parts

Authorized Service Representatives for:

- Hyundai Elevator

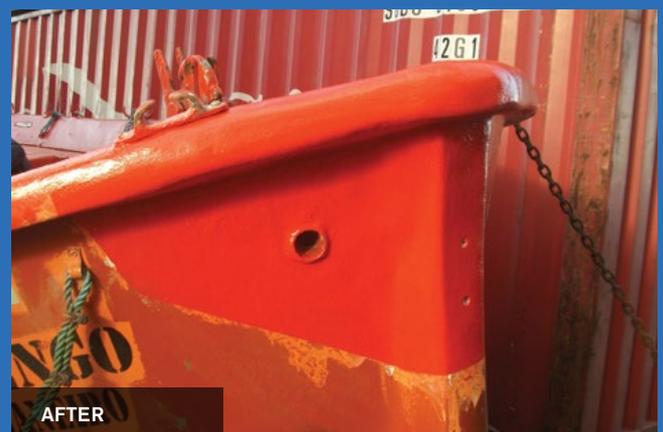


- Annual and 5-yearly inspection, Services and maintenance
- GRP (Glass Reinforced Plastic) repairs
- Structural repairs
 - Engine and propulsion systems maintenance, repairs and commissioning
 - Inspection of accommodation ladders and gangways
 - Replacement of lifeboat release and retrieval systems

In compliance with IMO SOLAS MSC Res. 402(96), 404(96), MSC Circ 1331 and MSC Circ 1392

Classification Societies:

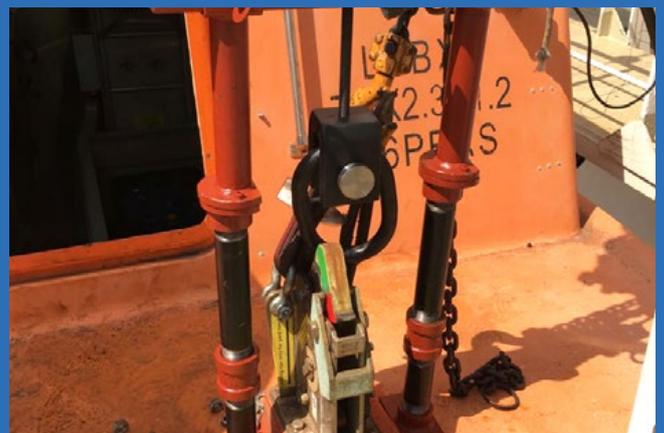
- ABS
- BV
- DNV
- LR
- ClassNK
- RINA



LOAD TESTING



- Lifeboats
- Davits
- Rescue boats
- Launching and releasing systems
- Accommodation ladders
- Gangways
- Cargo gears
- Cranes
- Load testing up to 300 MT (using water bags, load cells and flow meters)
- On-load hook tester up to 10 MT





Fire Fighting & Life Saving Appliances

- SCBA (Self Contained Breathing Apparatus)
- EEBD (Emergency Escape Breathing Device)
- Escape set
- Medical oxygen resuscitator
- Fire extinguishers
- Fire hose & hydrants
- Immersion suit
- Lifejackets
- Anti-exposure suit

Fixed Systems

- CO2 high pressure
- Dry powder system
- Foam system
- Galley system
- LAFF system
- Deep fat galley system
- BA compressor
- Medical oxygen system
- Chem/inert gas system (Novec, FM200, Inergen)

In compliance with:
MSC. 1/CIRC. 1432 & 1318
Res. A.951

DNV Certified



ELECTRONICS



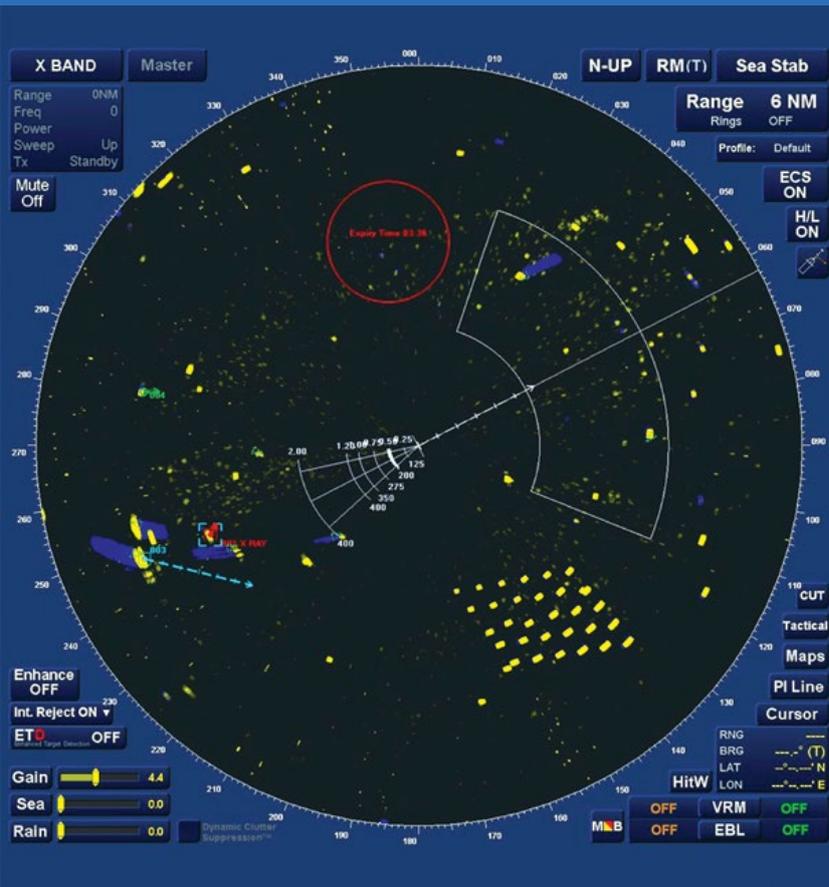
Activities and Services

- Corrective, predictive and preventive maintenance
- Installation survey
- Initial survey
- Periodical survey
- Renewal survey
- Retrofitting
- Newbuilding installation
- Commissioning
- Design and integration

Accreditations

- ABS
- BV
- DNV
- Lloyd's Register
- ClassNK
- RINA





- AIS (Automatic Identification System)
- IBS (Integrated Bridge Systems)
- Radar
- Conning
- ARPA (Automatic Radar Plotting Aid)
- ECDIS (Electronic Chart Display and Information System)
- Electronic charts (UKHO)
- Gyrocompass
- FOG (Fiber Optic Gyrocompass)
- Magnetic compass
- Auto-pilot
- Speed log
- Echo sounders
- GNSS (Global Navigation Satellite System)
- BNWAS (Bridge Navigation Watch Alarm System)

GMDSS (GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM)



Bridge equipment:

- MF/HF
- VHF
- Inmarsat - C
- SSAS (Ship Security Alert System)
- EPIRB (Emergency Position Indicator Radio Beacon) (SBM - Shore Based Maintenance)
- SART (Search And Rescue Transponder)
- AIS (Automatic Identification System)
- LRIT (Long Range Identification & Tracking)
- VSAT (Very Small Aperture Terminal)
- TV-at-sea
- Internet-at-sea

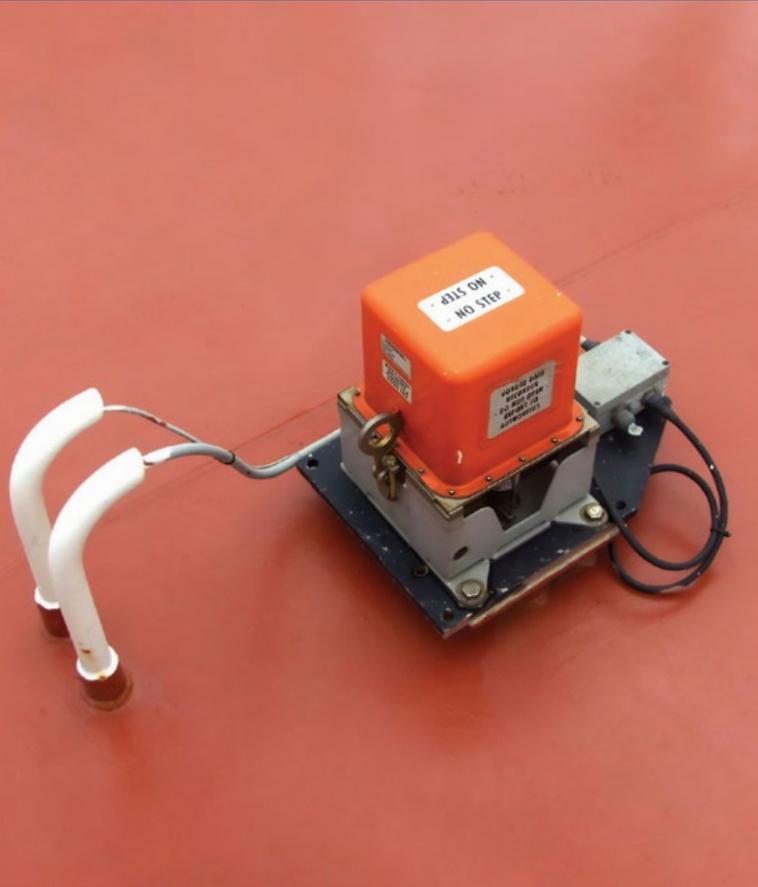
Shore-based equipment:

- GMDSS (Global Maritime Distress and Safety System) Stations
- AIS (Automatic Identification System)

Activities:

- Safety radio survey (GMDSS and MODU)
- Mandatory annual testing of AIS, EPIRB, LRIT, SART, AIS-SART and SSAS

VDR (VOYAGE DATA RECORDER)



- APT (Annual Performance Test) for VDR and SVDR
- Installation
- Integration
- Retrofitting and upgrading
- Commissioning

Manufacturers Represented:

AMI
Headway
Highlander
JRC
Hensoldt (Kelvin Hughes)
Seas of Solutions (Netwave, Rutter)
SAL Navigation (Consilium)
S&SYS (Samsung)
Wärtsilä - ANCS

CALIBRATION



Instruments:

- UTI (Ullage Temperature Interface)
- Pressure
- Environment (Multigas Detector, Explosimeter, Oxygen Detector)
- Temperature
- Electrical
- Dimensional

Authorized Service Representatives for:

- Riken Keiki
- IKM (Instrutek)



- MSB (Main Switch Board)
- ICMS (Integrated Control and Monitoring System)
- MEAS (Main Engine Automation System)
- PMS (Power Management System)
- UMS (Unattended Machinery Space)
- AMS (Alarm Monitoring System)
- AVR (Automation Voltage Regulator)
- PLC (Programmable Local Controller)
- Oil mist detector
- Fire control system
- Propulsion control system
- Control panels
- Inverter systems
- Oil / water separation

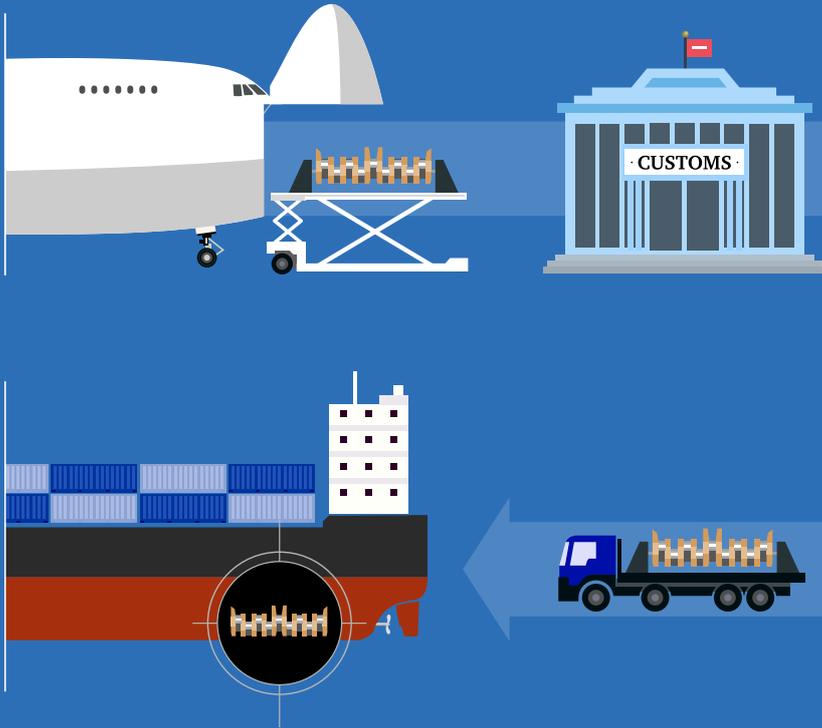
Electric and Hydraulic Automation

- Crane system
- Power pack
- Mooring & anchor winch
- Steering gear
- Cargo control system
- Ramp control system
- Hatch cover and folding control system
- Watertightness integrity surveys

BWTS (Ballast Water Treatment Systems)

- Engine space 3D scanning and project
- Design and Engineering
- Installation and Commissioning
- Service and Troubleshooting

LOGISTICS SERVICES



SHIPS SPARES IN TRANSIT

- CUSTOMS CLEARANCE
- DELIVERY TO VESSEL
- COLLECTION FROM VESSEL AND DELIVERY ABROAD

AIR AND SEA FREIGHT

AFTER SALES NETWORK



● SANTOS · RIO DE JANEIRO · SÃO PAULO

● REPRESENTATIVES

ELECTRO-MECHANICAL

- ALCONZA
- BUKH
- DANFOSS SONDEX
- DMW CORPORATION
- EMOD MOTOREN
- EPOCAST ITW ENGINEERED POLYMERS
- FUKUI SEISAKUSHO
- HD HYUNDAI ELECTRIC
- HD HYUNDAI HiMSEN · MAN B&W · WinGD
- IKNOW ex TSUJI MARINE SERVICES
- J-ENG UE ENGINE
- KANGRIM
- KAWASAKI HEAVY INDUSTRIES
- KAWASAKI PRECISION MACHINERY
- MARELLI MOTORI
- MET TURBO mitsubishi
- MIRAE INDUSTRIES
- MITSUBISHI MARINE MACHINERY VIA SAMAYU
- NAKAKITA SEISAKUSHO
- NANNI
- REINTJES
- SHINKO
- SKF MARINE SIMPLEX
- SPS TECHNOLOGY
- STEYR MOTORS
- TAIKO KIKAI
- TAIYO ELECTRIC
- TEIKOKU
- VICTOR MARINE
- WEG
- WOODWARD
- YANMAR - LARGE MARINE ENGINE

ELECTRONICS & AUTOMATION

- ALPHATRON MARINE
- AMI MARINE
- BEMAC UZUSHIO ELECTRIC
- CAIM
- CONSILIUM
- CSSC FOG
- ERMA FIRST
- DECKMA VIA SKF MARINE
- GRAVINER
- HEADWAY
- HENSOLDT KELVIN HUGHES
- HIGHLANDER
- HYUNDAI ELEVATOR
- ICS ELECTRONICS
- INTELLIAN
- JOTRON
- JRC
- JRCS
- KTE
- NABTESCO
- NAKAKITA SEISAKUSHO
- NK CO. LTD.
- OCEAN VOYAGER
- OPTIMARIN
- SEAS OF SOLUTIONS
KANNAD MARINE · McMURDO · NETWAVE · RUTTER
- RIKEN KEIKI VIA NAKAYAMA
- S&SYS SAMSUNG HEAVY INDUSTRIES
POWER & CONTROL SYSTEMS DIVISION
- SAAB TRANSPONDERTECH
- SAIERNICO ELECTRIC
- SAL NAVIGATION
- SPECS
- TAIYO ELECTRIC
- VOLCANO
- WÄRTSILÄ - ANCS
SAM ELECTRONICS & LYNCSO MARINE
- YDK TECHNOLOGIES YOKOGAWA

LIFE SAVING APPLIANCES AND FIRE FIGHTING

- D-I DAVIT INT. - HISCHE
- FASSMER-MARLAND
- FASSMER SERVICE
- GLOBAL DAVIT
- HATECKE
- HOEI SENPAKU
- HYUNDAI LIFEBOATS & BADA
- IKNOW ex TSUJI MARINE SERVICES
- IMC - JMU ex IHI MARINE
- JIANGSU JIAOYAN MARINE
JIANGYIN XINJIANG F.R.P
- MANSEI
- NISHI-F
- ORIENTAL PRECISION
- QINGDAO BEIHAI
- SEKIGAHARA SEISAKUSHO
- SHIGI
- THE SAFETY



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