



MARINE AND OFFSHORE



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 SERVICE
ANCILLARY EQUIPMENT FOR FPSOs AND TANKERS
ELECTRICAL SERVICES
CRANES AND DECK MACHINERY
REFRIGERATION
MARINE ELEVATORS



 **METALOCK**
BRASIL

ABOUT US

Metalock stands for a highly successful technology intended for the repair of cracked or broken cast iron or steel. 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 ancillary 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, 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. When steel partially substituted cast iron in machinery, Unilock, which was by then well established in the industrial market, diversified its activities. During those initial years, there was considerable demand for marine equipment repairs in Brazil. In January of 1961, the company took over Oficina Duncan, a marine engineering service company in Santos, and after this acquisition the new company adopted the name Metalock Brasil Ltda., adding marine engineering services to its activities.

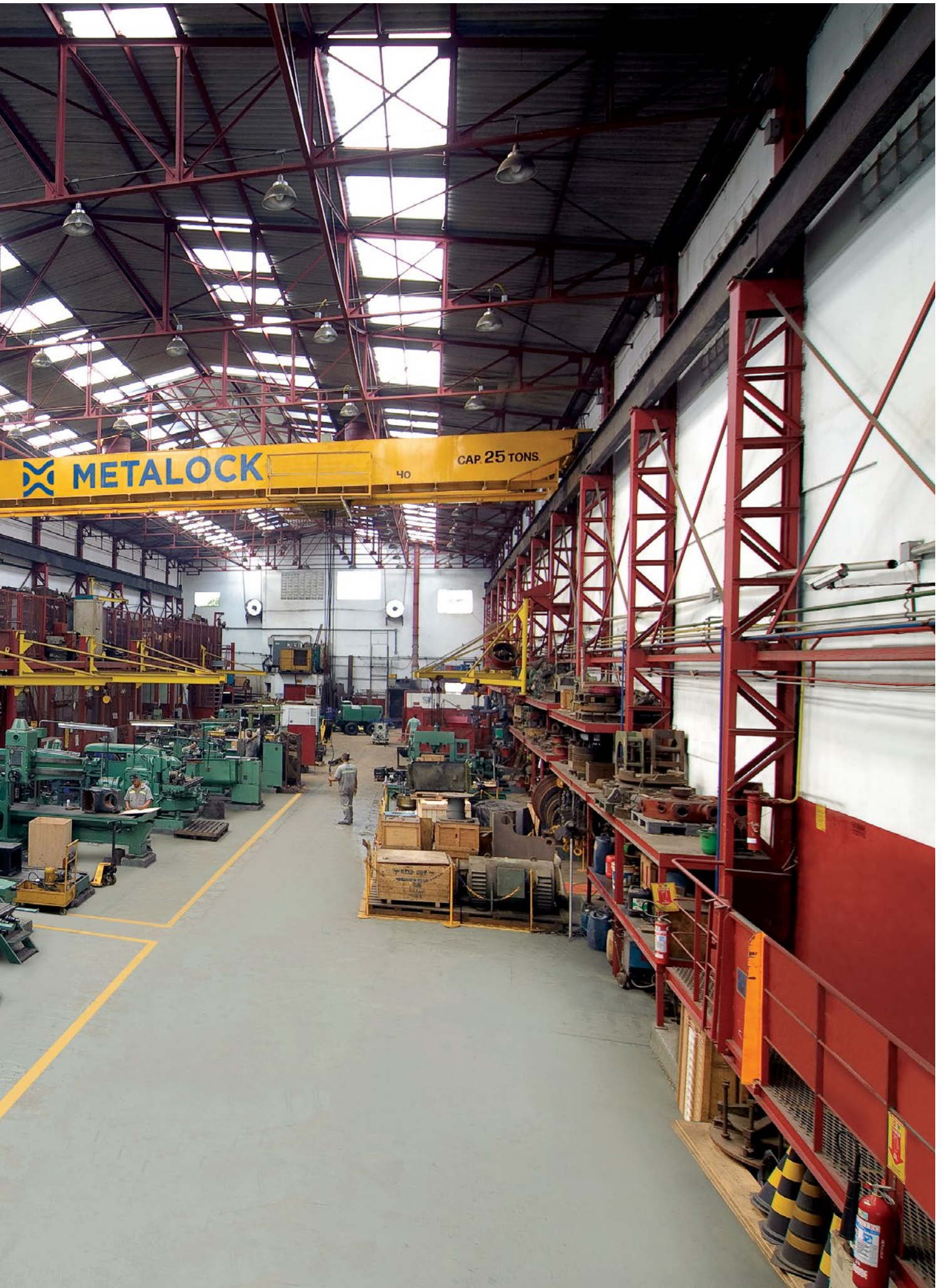
Metalock Brasil expanded its engineering services in the industrial, marine and offshore markets in Brazil considerably, building itself a reputation for reliable services conducted in-house – cold stitching (Metalock®), mechanical, machining, in-situ machining, welding, plate work, boiler work, electrical,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







S E R V I C E S

WORKSHOP



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:

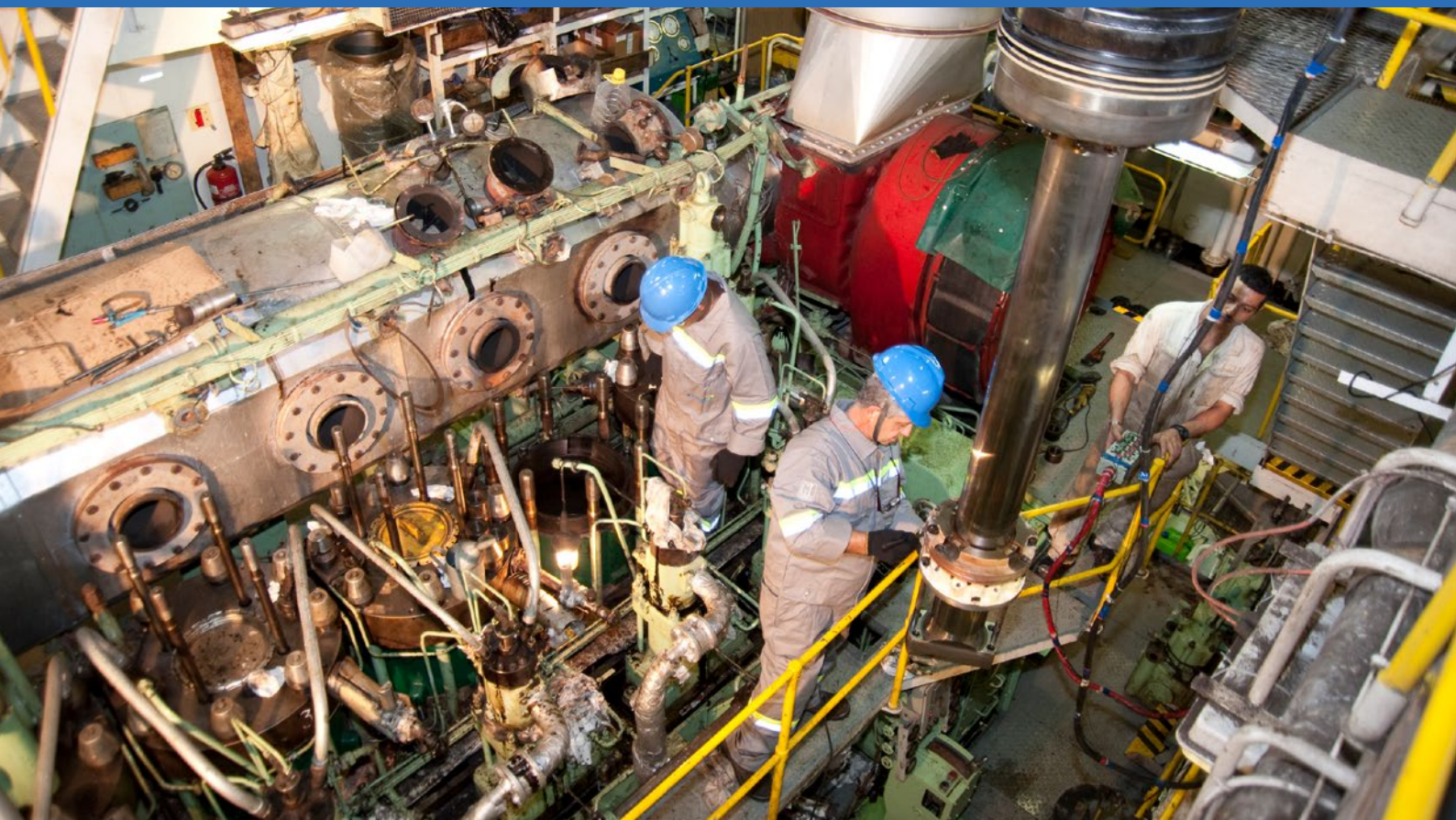
- Hyundai Cargo Pumps
- IHI
- Kawasaki Precision Machinery
- Mirae Industries
- Reintjes
- Shinko
- Teikoku

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 Main Engines (2 stroke and 4 stroke)
- Overhaul Auxiliary Engines
- Overhaul of Turbochargers
- Balancing Turbocharger rotors with Schenk balancing machine HBU 20/40
- Re-blading of MET turbos
- 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 & Vibracon elements)
- Governors – Overhaul (Woodward, Zexel, Yanmar, Regulateurs Europa)



Authorized Service Representatives for:

- Hyundai Global Service - Engine and Machinery (HIMSEN, MAN B&W, WINGD)
- J-ENG (Japan Engine Corporation) - UE Engines
- Mitsubishi – MET Turbochargers
- Steyr Motors
- Yanmar – Large Marine Engines

Trained service engineers and technicians for:

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

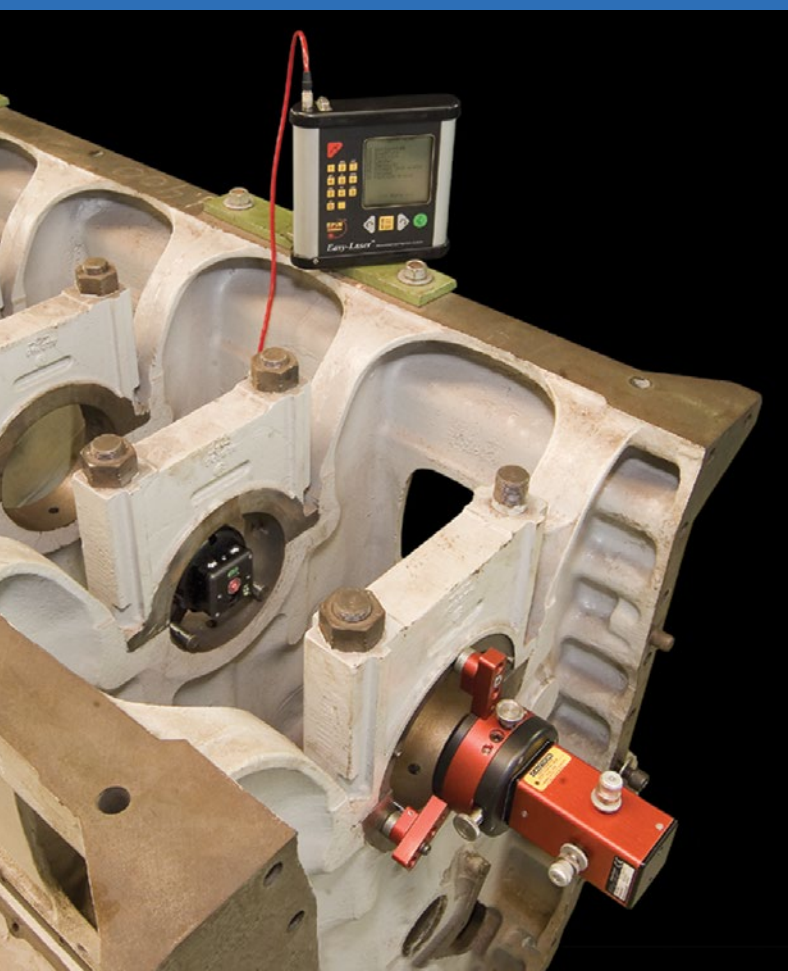


- Bonding of Propeller Shaft Simplex® Seals and Vulcanizing of Pneumostop Thruster Seals
- Rebabbitt Stern Tube Bushes
- Propeller Repairs
- Controllable Pitch Propellers

Authorized service representatives for:

- SKF Marine (SIMPLEX Seals)
- Hyundai Global Service
- Kawasaki Heavy Industries

LASER AND OPTICAL ALIGNMENT



- Engine Blocks
- Propulsion Shaft Line and Stern Tube
- Engine/Alternator Assemblies
- Electric Motor/Pump Assemblies
- Crane Pedestal

IN-SITU MACHINING

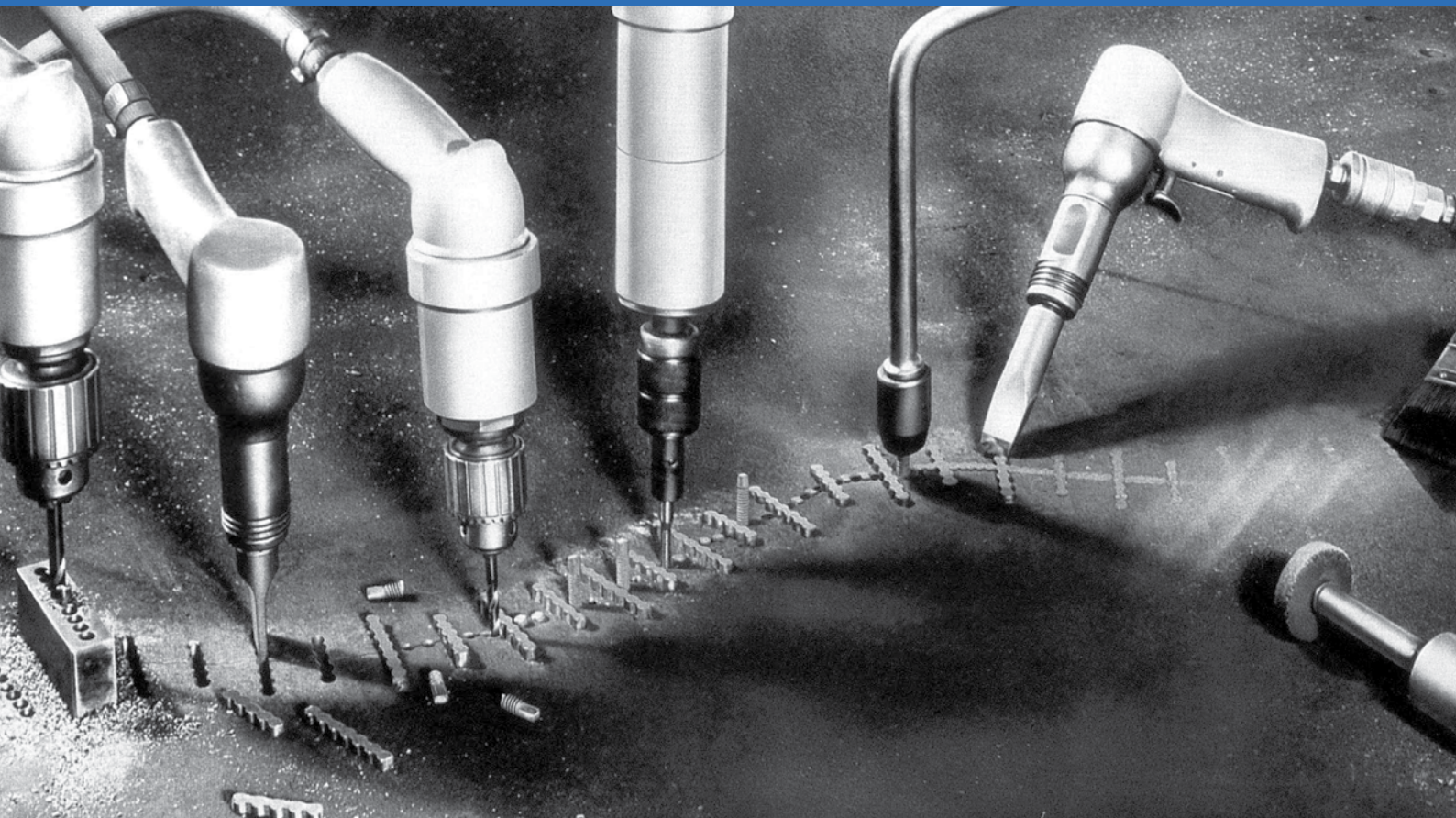


- Line Boring of engine blocks up to 12 m
- Rectification of crankshafts (crankpins, main journals and radii)
- Cylinder cover/liner/block landings (including bushing)
- Machining of shaft ends
- Boring of housings
- Boring of holes

Equipment:

- Crankshaft rectification equipment up to \varnothing 1000 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





- Structural and Shell Plating
- Tanks (including Stainless Steel)
- Pipework
- High pressure piping
- Gangways
- Deck
- Crane sections
- Hatch Covers

Welding Processes:
SMAW / FCAW / MIG / TIG

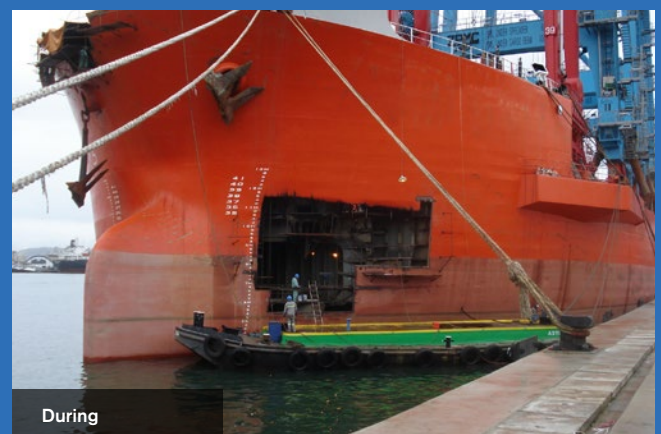
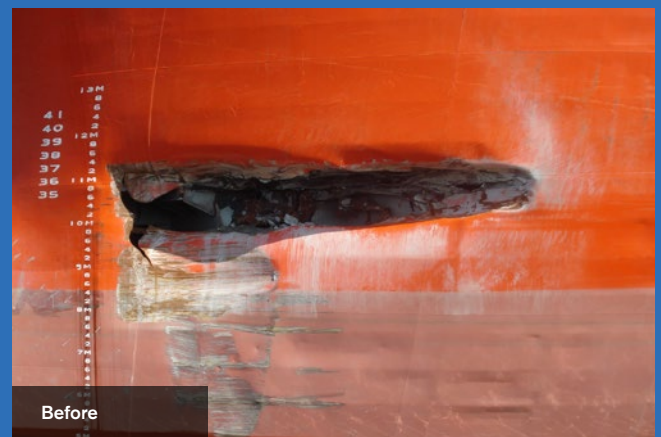
Elaboration of Welding Procedure Specification (WPS) and Welding Procedure Qualification Record (WPQR) specific to each project

Approved Welding Procedure

- Manual Arc Welding of Higher-Strength Hull Structures Steel Grade E36 - DNV GL

Welders certified by class

- Lloyds Register to ASME IX 4G & 6G
- DNV GL ASME IX





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

Boiler Inspections

(Water/steam side – Oil fired side – Exhaust gas side – Combustion gas side, furnace and chambers)

Repairs to:

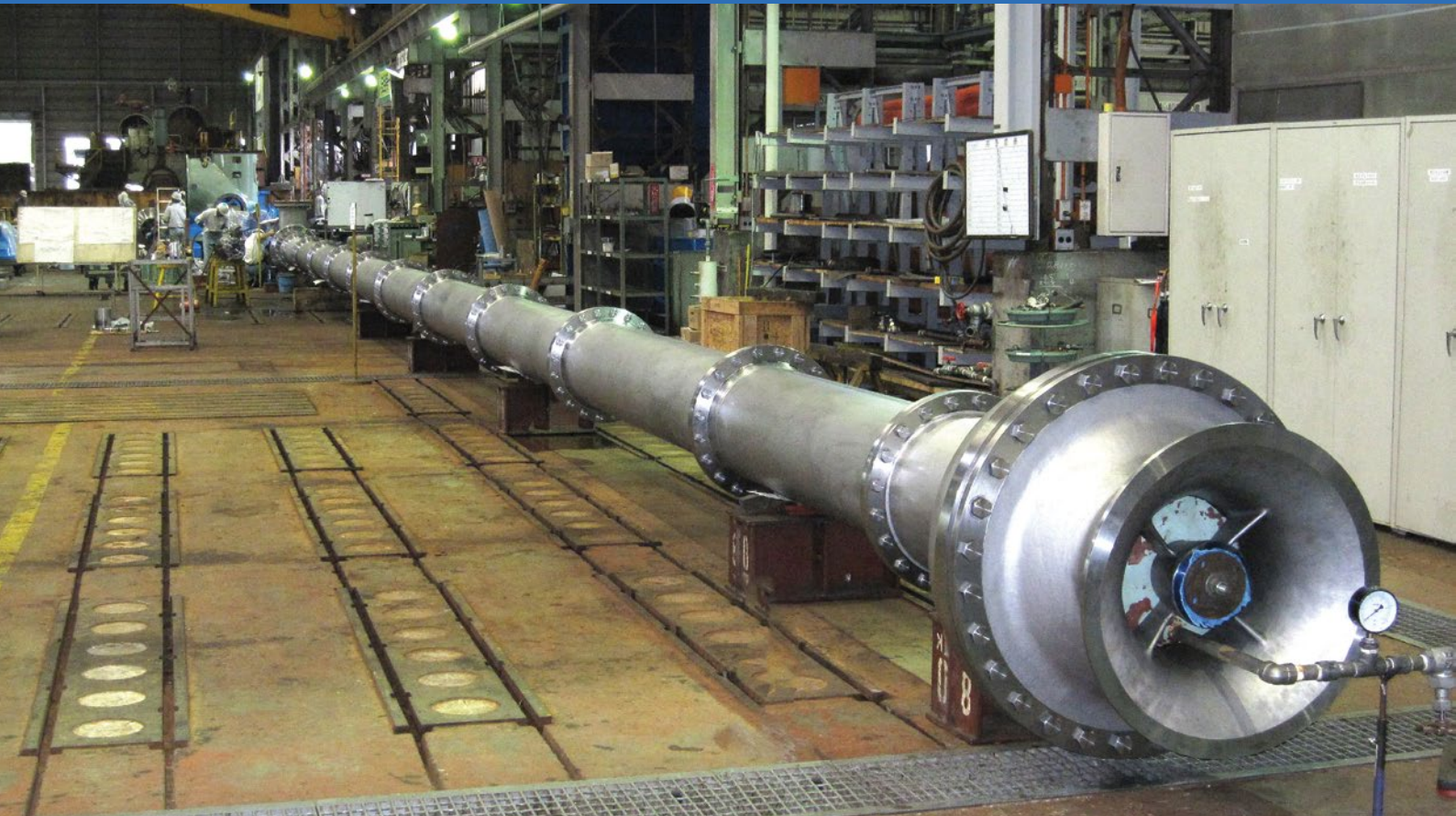
- Plating, shells, pipes and stays
- Supports and securing arrangements
- Heaters and economizers
- Circulation pumps
- Valves and cocks
- Safety Valves – strip / overhaul / lap faces / adjust / set pressure / popping test
- Re-tubing
- Welding cracked tubes and tube plates
- In-situ machining of tube plates
- Combustion chamber – structural and TIG welding
- Refractory repairs and renewal
- Burners – troubleshooting, repair and installation
- Automation and Control



Technicians certified to Brazilian Standard NR13

Authorized Service Representatives for:

- Kangrim
- Sunflame
- Volcano



- 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)



ELECTRICAL SERVICES



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
- Thermographic survey LV & HV
- Balancing of electric motors 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 GmbH
- Hyundai Global Service (Electro Electric Systems)
- JRCS
- KTE
- Marelli Motori
- Shanghai NSE Co., Ltd.
- Taiyo Electric Co
- WEG



Certified by DNV-GL 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:

- Davit International GmbH
- JMU (ex IHI)
- Oriental Precision (OPCO)

REFRIGERATION



- Domestic Reefer systems
- Stores
- Air Conditioning systems
- Provision Reefer systems
- Compressor Overhauls

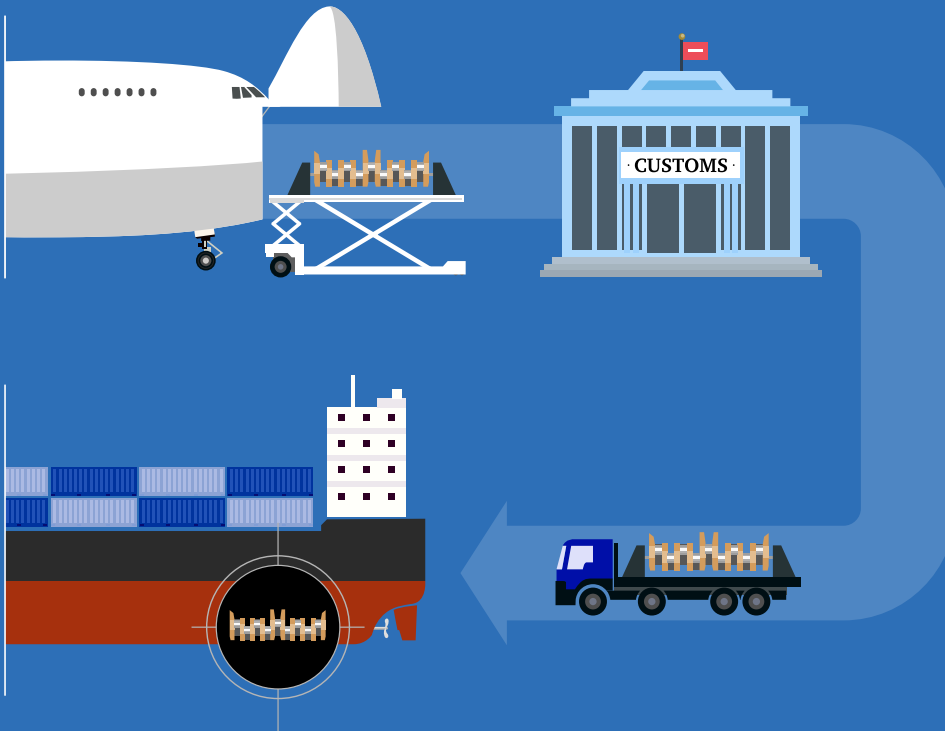
MARINE ELEVATORS



- Annual and 5-yearly Survey and Certification
- Repairs and Maintenance
- Preventive Maintenance
- Modernizations and Retrofits
- Spare Parts

Authorized Service Representatives for:

- Hyundai Elevator



SHIPS SPARES IN TRANSIT

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

AIR AND SEA FREIGHT

AUTHORIZED SERVICE REPRESENTATIVES

ELECTRONICS

- ALPHATRON MARINE
- AMI
- BEMAC UZUSHIO ELECTRIC
- CONSILIUM (RADAR)
- DECKMA VIA SKF MARINE
- GRAVINER
- HEADWAY
- HIGHLANDER
- ICS ELECTRONICS
- MACGREGOR GERMANY INTERSCHALT
- JOTRON
- JRC
- JRCS
- KANGRIM
- KANNAD MARINE
- KELVIN HUGHES
- KTE
- NABTESCO
- NAKAKITA SEIKAKUSHO
- NK CO. LTD.
- OROLIA
KANNAD · McMURDO · NETWAVE · RUTTER
- RIKEN KEIKI
- SAAB TRANSPONDERTECH
- SAIERNICO ELECTRIC
- S&SYS SAMSUNG HEAVY INDUSTRIES POWER & CONTROL SYSTEMS DIVISION
- TAIYO ELECTRIC
- WÄRTSILÄ SAM ELECTRONICS · TRANSAS
- YOKOGAWA

ELECTRO-MECHANICAL

- DMW CORPORATION
- EMOD MOTOREN
- EPOCAST ITW ENGINEERED POLYMERS
- EVOQUA
- FUKUI SEISAKUSHO
- HYUNDAI GLOBAL SERVICE
ENGINE AND MACHINERY (HIMSEN, MAN B&W, WinGD)
ELECTRO ELECTRIC SYSTEMS
- IKNOW ex TSUJI MARINE SERVICES
- INTELLIGENT ENGINEERING
SPS SANDWICH PLATE SYSTEM
- J-ENG UE ENGINE
- KANGRIM
- KAWASAKI HEAVY INDUSTRIES
- KAWASAKI PRECISION MACHINERY
- MARELLI MOTORI
- MET TURBO (MITSUBISHI)
- MIRAE INDUSTRIES
- NAMURA SHIPBUILDING CO.
- OPTIMARIN
- PANASIA
- REINTJES
- SHANGHAI NSE
- SHINKO
- SKF MARINE SIMPLEX · TURBULO
- S&SYS PURIMAR
- STEYR MOTORS
- TAIYO ELECTRIC
- TEIKOKU
- WEG
- YANMAR · LARGE MARINE ENGINE

LIFE SAVING APPLIANCES

- ALAMARIN JET
- D-I DAVIT INTERNATIONAL-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 FR.P
- MANSEI INC.
INCLUDING MIURA MACHINE VIDER
- NISHI-F
- NK CO. LTD. THE SAFETY CO.
- ORIENTAL PRECISION
- QINGDAO BEIHAI
- SEKIGAHARA SEISAKUSHO
- SHIGI
- STEYR MOTORS
- SURVIVAL SYSTEMS INTERNATIONAL
- VIKING · NADIRO
- ZHENJIANG AUX MACHINERY



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