THIS YEAR’S CONTRIBUTORS

VARNA MARITIME LTD - BULGARIA
REMontOWA HYDRAULIC SYSTEMS SP ZO.O. – POLAND
METALOCK SELIM GURKAN - TURKEY
METALOCK PORTABLE MACHINES BV - HOLLAND

www.metalockinternational.org
THE IMPORTANCE OF THE METALOCK SERVICE

The Metalock International Association plays an indispensable part in maintaining the best possible Metalock service to customers throughout Europe and the whole world. Shipping engineers and others with problems of machine fracture or breakage are urged to get in touch with their nearest Metalock company before making decisions as to replacement of scrapping.

The successful growth of the organization throughout the world has been achieved through the quality of work and emergency service provided. The Metalock process has its application not only in shipping but in every field of industry at one time or another. The work is executed only by specialist trained engineers who have built up a reputation for their skill and knowledge on the job.

Prompt appearance of the engineer when an emergency arises is also the subject of constant customer appreciation.

Communication is a by-word in the Metalock organization; the local engineer is never alone should an unusual problem occur; technical advice is readily available day or night, essential when working out tight schedules to keep down-time to a minimum - it’s these resources that do help to keep costs down.

Metalock is recognized throughout the shipping and industrial world, and by Lloyds and all the leading classification societies and insurance companies, as the ideal approach to problems involving metal fracture of breakage, and where a cold repair is desirable.

Metalock is a service as opposed to a product and the very essence of it’s service is the emergency value of the Metalock repair, a 24 hour service was quickly seen to be a normal expectation. Metalock Engineers were needed on the spot quickly and anywhere through the industrial world.

There are too many cases to mention where the Metalock Engineers have responded with promptitude in an emergency. They have occurred throughout the world, with many articles written and appearing in technical journals. It is encouraging indeed to observe the results which have been achieved in recent years in all our endeavours to improve the Metalock service.
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Metalock Selim Gurkan - Turkey

Metalock Portable Machines BV - Holland

SERVING THE METALOCK ORGANISATION

A WORLDWIDE REPAIR ORGANISATION SERVING THE MARINE AND INDUSTRIAL SECTORS

All Metalock companies who are members of the Metalock International Association are widely experienced in the cold mechanical repair to damaged castings using the Metalock cold repair process. They may also provide additional marine or industrial repairs and maintenance facilities. The facilities can vary from company to company and are continuously being expanded.

The following list, for easy recognition, illustrates the extent of services currently available from each member company.

- Metalock repairs
- In situ Machining
- Leak sealing (pipes, valves, flanges etc.)
- Dry-dock facilities
- Welding
- Electrical repairs
- Machine shop facilities
- Bearings re-metalled
- Reconditioning of Diesel Engine Components
- Brush Plating

The full member’s details can be found on our website: www.metalockinternational.org

REMEMBER: ONLY USE MEMBERS OF THE METALOCK INTERNATIONAL ASSOCIATION
Project: A major ship manager company contacted Varna Maritime Ltd to initiate a metalock repair process on a damaged Cylinder Casing of a marine main engine – WEICHAI CW 625ZIC-1. The following series of pictures describes the repair process performed in 2014 on company premises in Varna Bulgaria.

Process: 1 – The Damaged Cylinder Casing before the repair. 2 – Damage on Cylinder No.3, 3 – New Cast Iron Insert. 4 – The finished insert after milling. 5 – A view from inside-out on the prepared area with the installed insert.
**Process:**

6 – Drilling of holes for insertion of the Metalock Keys. 7 – Caulking of the already inserted Metalock Keys along with the studs. 8 – The repaired area is ground flush in line with the parent casting. 9 – Damaged Fin in the area of Cylinder No.3. 10 – Parent casting dressed to form an even aperture. 11 – Preparation of a cast iron insert by milling. 12 – Fitting the insert to the damaged area, and securing with studs. 13 – Caulking the Metalock Keys and studs. 14 – The completed area is ground flush to the parent casting.
Breakages occur generally because of overloading, misuse of equipment, or flaws in the castings. Fractures are inclined to follow certain patterns depending on the type of equipment involved and the environment in which they are used. This repetition provides Metalock engineers with a wealth of information, on the one hand to be absolutely confident in the repair and also to complete the work within the minimum of time. This long experience also provides the engineer with many techniques, and special fixtures and tools to facilitate the repair have been developed over the years.

(1) The fracture, after a survey and report has been presented to the customer, is positioned, realigned, and firmly held together by special fixtures and clamps. (2) By the use of special Jigs, groups of holes are drilled across the line of fracture to the tool depth of the casting. (3) The Metalock Key is a multi-dumbell shaped section of highly ductile alloy, the size and length being selected to suit the type of fracture. (4) The holes are then joined by the use of pneumatic chisels to conform to the shape of the Metalock Keys.
(5) Individual layers of Keys are inserted in the apertures and peened into a metal-to-metal condition, which becomes almost integral with the parent metal. (6) Holes are then drilled along the line of the fracture, then tapped (7), and filled with studs (8), each stud biting into it’s predecessor, resulting in a pressure-tight join and restoring a rigidity to the casting. (9) A Metalock stud is an important aspect of the Metalock process, bearing in mind that pressure repairs are often required. (10) The studs are then run down till the heads shear, the remaining rough metal being removed by pneumatic chisels. Finally the whole repair receives treatment from hand grinders (11) prior to it’s final coat of paint (12).

Some of the advantages of Metalock process: • Dampens and absorbs compression stresses • Provides a good ‘expansion joint’ for such castings as cylinder liners, diesel heads or any vessels subject to thermal stresses • Distributes the tension load away from fatigue points • Maintains relieved conditions of inherent internal stresses where rupture occurred • Maintains alignment and original surfaces, since lack of heat produces no distortion • The vast majority of repairs can be done in situ, with consequent savings in time with little or no dismantling.
Remontowa Hydraulic Systems Sp z o.o. repair a cracked Hydraulic Press Slide.

Process: The Hydraulic Press Slide had approximately 2.4 meters of cracks. The damaged surfaces of the Slides were cut out and new inserts were fabricated to fit the prepared aperture. The insert was manufactured from a special steel and incorporated Masterlocks used in the reconstruction of the damaged surfaces and also secured into place with Metalock Keys and screws. Finally the sliding bed was machined to achieve very precise linear interpolation. For reconstruction of the sliding surface copper plates were used, secured by screws. The repair was completed within 12 days.
Metalock Selim Gükan were asked to repair a Yanmar N21L-SV 880KW Engine following a Con Rod Failure that caused damage to the Cylinder Block.

**Process:** The damaged area was dressed using hand tools to form a uniformed shape. A template of the aperture was made to enable a new casting to be manufactured, this was secured into position using special Metalock Studs that interlocked with each other. The first part of the repair was peened, securing the insert into place. Metalock keys were inserted into pre drilled apertures across the joint face and peened into position, becoming integral with the parent casting. The repaired area was ground flush with the parent casting to complete the repair.
Metalock Portable Machines BV were asked to repair an 1868 Windmill – Shaft Casing – over the years the Casing had cracked with a section ready to drop off.

**Process:** Pictures 1, 2 & 3 – The damaged section was removed by chain drilling and cutting the section out to form a new aperture. 4 – A New Insert was manufactured to form the aperture 5 & 6 – The new Insert was placed into the new Aperture and clamped secure ready for repairing using the Metalock cold repair process 7, 8 & 9 – The repair well underway showing the Metalock Keys and Studding prior to dressing back to the form of the original casting. 10 – The finished repair showing the overall size of the Shaft Casing and ready to return back to the Windmill.
63rd ANNUAL CONFERENCE

This year the 63rd Conference was held in Punta Cana at the Hard Rock Hotel in the Dominican Republic. The Dominican Republic is one of the Caribbean’s most geographically diverse countries, with stunning mountain scenery, desert scrublands, evocative colonial architecture and beaches galore. The conference was well attended with over 22 countries represented by their Members and partners, hosted by Metalock Venezuela.

Every attending delegate gave a Presentation on Metalock Repairs with many talking about their company and services they offer. (The full list can be found in the Directory in this year’s News publication)

COUNCIL OF MANAGEMENT

PRESIDENT: Mr Jonathan Eder (U.S.A.)
VICE PRESIDENT: Peter Dinies (Brazil)
COUNCILLORS: Mr Andre Mortimer (Venezuela)
Mr Andre De Bruin (Holland)*
Co SECRETARY: Mr David Fowler (Great Britain)
DIRECTOR: Mr Dietmar von der Fecht (Germany)

* Elections were carried out at the Annual General Meeting for a new Council Member

METALOCK INTERNATIONAL ASSOCIATION

Metalock is the name for our uniquely formed Keys made of special alloys, with either a high content of nickel steel or chromium (MN211 or MN555). Slots are cut transverse to a fracture and Metalock keys are inlaid by cold working into the parent metal. The alloys have a known tensile strength and the serrations of the Keys having known shear strength; a precise amount of strength is restored to the casting as each key is inserted.

Masterlock is our name for inlays of high strength alloy inserts. These inserts are inlaid at points of high strength concentration or in sections subject to overloading and subsequent fracture. The Masterlock is held in place by a series of Dowels and cold-worked into matching half holes between the parent metal and the alloy insert. Masterlocks can be of various shapes and dimensions and the size and shape vary with the requirements of each repair.

Remember: only use Members of the Metalock International Association who have access to all new repair procedures using the very latest specialist alloys designed for the perfect repair.

- We offer a repair procedure for the greatest return of strength
- We offer a repair procedure for pressure repairs
- We offer a repair procedure for repairs in a corrosive environment
- Only Members of the Metalock International Association can use Metalock alloys MN211 & MN555
- Only Members of the Metalock International Association are issued with a yearly signed Charter

APPLY FOR MEMBERSHIP TO THE METALOCK INTERNATIONAL ASSOCIATION

For further information may we suggest you visit our website and complete the on line application form from our home page: www.metalockinternational.org alternatively email the Company Secretary with your enquiry, enquiries@metalockinternational.org

REMEMBER – ONLY USE MEMBERS OF THE METALOCK INTERNATIONAL ASSOCIATION, ASK FOR A COPY OF THEIR SIGNED M.I.A. CHARTER

All member’s details can be found online: www.metalockinternational.org