Industrial & Environmental Services
About us

METRICA S.A. was established in 2005. The company is based on the experience and technical knowledge of its personnel that has been in the field for more than 15 years. From best-in-class surveying & environmental instruments to the broadest solution portfolio in the measurement world, Metrica is helping customers to understand, plan and implement solutions for simple, complex or unique applications that are related to Surveying, Heavy Industry, Shipping and the Environmental sector. Our clients benefit from our broad capabilities and deep subject matter knowledge. We are happy to be involved in the most revolutionary and critical projects that our customers are working on and encourage them to achieve great accomplishments.

Our aim is to establish long term relationships based on trust, cooperation and sincerity.

Certificates

From May 2007 we operated under the Certificate of Quality Management ISO issued by ABS Quality Evaluations. Calibration of vertical cylindrical tanks is provided according to ISO 7507-1, ISO 7507-2, ISO 7507-4 (international standards).

Our Services

- Dry dock for yachts/ship
- Hull scanning
- Draft marks & water lines
- Ship/yacht as built survey
- Interior naval design
- Construction & installation planning
- Shaft alignment & vibration analysis
- Damage Analysis
- Sounding tables
- Ballast Water Treatment
- Weapon systems inspection
- Intelligent 3D CAD
- As-buicts
- Refineries as built surveys
- Construction planning
- Tooling and large part inspection
- Machinery as built surveys
- As-built 3D models
- As-built 2D drawings
- Full colour visualisation
- Tunnel as built survey
- Gyroscopic survey
- Monitoring
- Forensics

Client list

MARINE
- Hellenic Shipyards S.A. (Skaramaga, Elefsis, Perama, Salamina, Syros)
- Hellenic Navy
- China (Cosco Shipyards)
- Ukraine (Shipyards)
- Almi Marine Management S.A
- Suez Fortune Investment LTD
- GENIMAR Shipping & Trading S.A.
- NOVA OSTRIA Shipping S.A.
- SEA TRADERS S.A.
- GOLDENPORT ShipManagement Ltd
- WORLDWIDE GREEN TANKERS Ltd
- ALPHA MARINE
- C.CARABELAS Technical Office
- NAVINCO Ltd.
- Naval Architects & Marine Engineers

INDUSTRY
- METKA
- SIEMENS WATER TECHNOLOGIES CORP.
- PETREX Inc.
- Hellenic Petroleum S.A.
- Halcor Metal Works S.A.
- Larco S.A.
- Elval S.A.
**Marine Applications**

**Dry Dock**

**DRY DOCK FOR LARGE SHIP** when important repair on the body is required: Depending on the damage of the ship body and the possible deformations METRICA S.A. can measure in 3D the vessel in afloat condition in order to determine any deformations (center line deformation, twist, hogging etc) for damage evaluation, as also to measure at the dry dock before and after the repairs to certify the good geometry.

**DRY DOCK FOR YACHTS** when shafts or bearing repairs are required: Depending on the frequency of faults in the shaft system and/or vibrations while sailing at high speed, METRICA S.A. can measure the deformation between the afloat and the dry dock yacht position that is the main reason for these problems and support your engineers to eliminate the effect of the wrong alignment during dry docking.

**Hull Scanning**

Long-range laser scanning of the inside and the outside of the hull structure provides scan data to an accuracy of 3mm. Laser scanning can be performed to define possible deflections of the hull (sagging, hogging, bent, twist) as also to every stage of the construction process to make sure the hull doesn’t differ from the design. This ensures the fit of windows, decking, cabin areas, propulsion systems, electrical systems, as well as design features on the bow and stern. With accurate scan data, a CAD model can be made to monitor that the ship’s parts will fit correctly the first time, saving time and money. From the CAD model accurate shapes of the constructions can also be exported and be ordered for absolute fitting.

**Draft marks & water lines**

When important modifications/repairs are planned marking of draft marks and water lines are essential. If the exact cross section at the frames has to be known for different applications then METRICA S.A. can scan the vessel body while at dry dock with a 3D laser scanner and produce in CAD the exact cross sections in order that a Naval engineer can design modifications or estimate repairs.
Construction & installation planning

METRICA S.A. provide detailed designs and construction studies regarding vital structures of the yacht/ship such as piping (schematic and isometric drawings), installation drawings (incl. assembly plans), hull accessories (incl. equipment integration plans) etc.

Marine Applications

Ship/yacht as built survey

A quite common project in shipyards is the renovation of yachts. The new design has to be based on detailed and accurate as build drawings. METRICA S.A. by scanning with a 3D laser scanner the vessel interiors can provide better than 5 mm accurate as built 2D plans and 3D CAD drawings that naval architect will need.

Interior Naval Design

METRICA S.A. produces interior layouts, generally in 3D or 2D if needed, to further optimize the available spaces, with the rest of the yacht/ship components. Detail modelling of all furniture and walls, up to the smallest piece that assures no clashes with the rest of yacht/ship components. Production of accurate construction drawings or unfolded drawings of curved surfaces (teak deck prefabrication) is also feasible.

Construction & installation planning

METRICA S.A. provide detailed designs and construction studies regarding vital structures of the yacht/ship such as piping (schematic and isometric drawings), installation drawings (incl. assembly plans), hull accessories (incl. equipment integration plans) etc.

Shaft Alignement & Vibration Analysis

The smooth operation of vessels engines is affected directly by correct alignment. METRICA S.A. can provide accurate 3D measurements via portable 3D long range CMM and solve any kind of geometry problem. We can also offer Shaft alignment, Line Bore, Balancing, Vibration Analysis using Easy Laser technology.
Marine Applications

Damage Analysis

During its lifetime, a ship may encounter accidents, such as collision and grounding, for which damage consequences in the forms of loss of human life, pollution of the environment, and economic losses may be substantial. Determining the root cause of such events is essential both in order to implement corrective actions, and also to prevent further failure and improve overall safety. METRICA S.A. implements inspection and assessment of the damaged structure/material, provides with the necessary data (as build design, xxxxx. Aaaaa), monitors the progress of the repair and verify that everything is aligned with the plan.

METRICA’s S.A. experienced stuff with state-of-the art geodetic equipment can:

a. inspect misalignment / geometry deformations recording that appear from small to large scale structures
b. calculate and quantify the deviations from design nominal values
c. inspect and report the compliance with geometric and dimensioning tolerances
d. monitor the progress of the repair
e. guide the relevant workshops for the proper actions (as far it concern geometry issues

Benefits

- Damage analysis is a reliable and numerical evidence to prove the extent of damage and a credible witness for negotiators and/or insurance companies.
- Increase the credibility of a statement of claim with a neutral and objective damage report.
- Accurately and timely records and digitally reconstruct the as-built geometries for further analysis and repair strategies.
- Minimizes the costly risks from wrong decisions.
- Results can be integrated with other formats and data in order to multi parametrically examine each specific case and to simulate current conditions and future actions.
Ship Tank Calibration - Sounding Tables Productions

METRICA S.A. is capable of scanning any tank in less than a working day and produce accurate calibration tables. Despite the size, shape and tank deadwood, as - built geometries can be surveyed in detail and digitally reconstruct them on specialized software's. Free liquid surface and other mechanical parameters can be simulated for any ship heel, or trim condition, as also the true geometry shape of sounding devices is recorded. The results are scalable and defined accordingly to each specific user needs.

Ballast Water Treatment Installation

Ballast water is essential to the safe and efficient operation of modern shipping, providing balance and stability to un-laden ships. However, to prevent the environmental and health risks that derive from this necessity, a ballast water management plan has become compulsory on all ships trading worldwide. METRICA S.A. offers an extremely fast measurement process and delivers accurate 3D modeling of pipe network and other critical areas so that chief engineers can:
- Agree on an efficient Ballast Water Management plan
- Accurately implement the BWT plan
- Easily install the BWT system
- Keep complete records of the area of interest

Military Sensor and Weapon Systems Alignment

Military sensors and relevant systems are complex electronic and mechanical constructions which their operational effectiveness and a priori designing targets are fulfilled through the accurate absolute or relative positioning on the rest of the ship electronic and propulsion systems as also the metal structure. Metrica S.A. with geodetic instrumentation that begins from sub-millimeter can measure, monitor, scan and provide guidance to the final installation according to the almost always tough tolerances. From frigates to offshore patrol ships and submarines, METRICA S.A. can provide measurement services (geometric and dimensioning tolerance inspection) for:
- sonar, passive arrays installation - alignment
- gyro - compass calibration
- weapon systems basement flatness & alignment according to center or/and weapon line
- optical and communication systems (e.g. radar) alignment and tolerance inspection
- erection of infrastructure for weapon system installation / penetrations on ship hull
- motion reference units (MRU) installation
- offset calculation between weapon and other ship systems
- CL and WL marking / benchmark positioning
- submarine torpedoes tubes straightness inspection and alignment / WL extraction
- geometric compliance with tolerances on gun systems

Ballast Water Treatment Installation

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Ballast Water Treatment Installation
Industrial Applications

Shaft Alignment & vibration analysis

One of the most important parameters for the operational qualification of a machine is the set up procedure according to the manufacturer specifications. METRICA can measure and verify the position of big machines such as screw machines, cranes etc. Determination of possible deviations in geometry such as alignment, perpendicularity, flatness etc. can be done using high accuracy instruments.

Roll alignment inspection

Production systems in industries such as paper & steel require perfect alignment to lead to a high quality production or to prevent failures/wasted material. METRICA S.A. can inspect the parallelity of rollers of most kinds used in the industry. Our team has the professional experience to efficiently adapt to the challenges that are unique for every plant.

Turbine inspection

Both productivity and trouble-free operation of a turbine depend on the high-precision measurement of the in-built components. METRICA S.A. uses comprehensive measuring devices for reaching the highest alignment, needed in turbine units. All measurement tasks can be conducted with a minimum of time and excellent results that lead to reduced downtimes, higher energy efficiency and of course decreases the vast amount of money needed to repair turbine units when they fail.

Windmill Shaft Alignment inspection

Shaft Misalignment is one of the most common sources of wear of wind turbine drive train when rigid couplings connect the shafts. Proper shaft alignment of a wind turbine is critical for prevention of component failures, up-tower repairs, and catastrophic failures. These measurements also minimize wasted energy. METRICA S.A. uses the latest technology and high precision instruments to assure the operational qualification of the wind turbine which leads in optimization of the power delivery from the wind turbine.

Typical problems arising from poor machine alignment are:

- Lost production time
- Leaking seals
- Increased vibration levels
- Higher energy consumption
- Bearing failure
- Shaft breakage
- Coupling wear
- Quality problems
- Worse working environment

Why is alignment important?

- Improves product quality
- Optimize production efficiency
- Extends equipment life
- Reduces downtimes & repair costs
**Reﬁneries as built surveys**

It is very diﬃcult and also challenging to fulﬁll a survey application inside a reﬁnery. METRICA S.A. has the ability to provide 3D measurements, as build drawings and fitting veriﬁcation of 3d cad design inside an existing installation. The accurate and complete survey is accomplished with 3D Laser Scanner that reduces to 1/10 the conventional measuring procedure.

**Volumetric calculations**

In case of repairs in oil or gas tanks then accurate measurements of the tank is needed at high density in order than deformations and mechanical stability can be calculated and in some cases volumetric tables need to be recalculated. METRICA S.A. can accurately measure by 3D laser scanner in 1 day the exact geometry in a density up to 1 cm grid.

**Crane Runways & Crane Geometry**

Regular surveys of crane runways help to ensure maximum reliability in production, avoid production stoppages and cost-intensive repair work, prevent breakdowns and detect damage to building structures at an early stage of development. Optimum structure properties can only be ensured by perfectly aligned crane runway and crane geometry, which give you the certainty of safety all along the line. METRICA S.A. use survey methods that are fast, safe and reliable. Our engineers are able to conduct a whole range of special surveys:

- Alignment of travel wheel guide rollers
- Survey and assessment of ground and guide rails (also for storage and retrieval machines)
- Assessment of clearance dimensions before new cranes are ordered and installed
- Measuring the ﬂatness of magnet poles
- Dynamic deﬂection of crane girders, crane runway supports and beams when a load is applied
- Check of vertical differences between building columns
- Measuring the ﬂatness of slewing rings
Building & Heritage

The importance of building, landscape and heritage recording and documentation is well recognized at international level. The versatility of laser scanning technology combined with the ability to handle complex environments means that METRICA S.A. can deliver accurate measurements for a wide range of applications. Whether it’s a large infrastructure hub, a heritage site, an underground tunnel or an office building, by applying innovative laser scanning technologies METRICA S.A. can provide a precise measurement solution:
- Producing 2D drawings or 3D CAD models for refurbishment and restoration projects
- Internal building surveys for floor plans
- 3D urban modelling for planning studies
- BIM (Building Information Models)
- Digital 3D documentation, mapping, and representation of ancient monuments, archaeological sites and items of cultural heritage
- Production of drawings to aid restoration and reproduction work
- 3D data collection for movies and walkthroughs for virtual tourism applications within websites and DVD's

Special Applications

Tunnel as build survey

It is significant during a tunnel construction to have a complete as built survey by scanner in order to have accurate comparison with design as early as possible to reduce risks and cost and to accurately determine the volumes involved fast in order to obtain fast payments.

Gyroscopic survey

During long tunnel construction, it is necessary for safety and cost reasons to examine with gyroscopic measurements the correct alignment of excavation works. METRICA S.A. offers gyroscopic measurements services providing high accuracy alignment measurements.

Monitoring

A very crucial issue for large scale structure such as Highways bridges tunnels or dams is monitoring. Monitoring such structures help us avoid accidents in project lifetime. METRICA can provide this kind of measurements with high tech h/w and s/w. It is a total complex solution for permanent monitoring.

Forensics

It is significant during a tunnel construction to have a complete as built survey by scanner in order to have accurate comparison with design as early as possible to reduce risks and cost and to accurately determine the volumes involved fast in order to obtain fast payments.