Leica
MADE TO MEASURE

Industrial Metrology

Practice Report

Leica Total Stations and A.M.S. software at the “Chantiers de l'Atlantique” shipyard (France)

“Chantiers de l'Atlantique” has started to use Leica 3D measuring systems in 1995. Due to the good performance of the Leica products they have increased the number of measuring systems considerably.

The “Chantiers de l'Atlantique” is the biggest French shipyard. It is located at St. Nazaire close to the mouth of the river Loire. The Shipbuilding began around 1861 and today more than 130 years later the “Chantiers de l'Atlantique” is among the leading shipbuilders world wide. This may be judged also according to the orders already received for the coming years.

Oders of ships:

for 1999……
- One 208-m cruise ship (47’900 Grt)
- One 100-m geophysics seismography ship (12’500 Grt)
- Two 180-m cruise ships for the Renaissance line (32’000 Grt each)

for 2000……
- Two 180-m cruise ships for the Renaissance line (32’000 Dwt each)
- Two 294-m cruise ships for the Celebrity line (87’000 Dwt each)

for 2001……
- Two subassemblies for 82-m oil platforms

Passenger ship in dry dock at Chantiers de l’Atlantique, St. Nazaire

Leica equipment used:

“Chantiers de l'Atlantique” has started to use Leica 3D measuring systems in 1995. Due to the good performance of the Leica products they have increased the number of measuring systems considerably,and now own the following equipment:

- six T1610,
- three T1100 theodolites for alignment tasks
- two TC 2002,
- one TDM5000 and two TDA5000 industrial total stations which are operated within the Leica / A.M.S. Dimensional Control and Analysis system (DCA).

Cooperation with A.M.S. Software company

A.M.S. is a Finnish company with long term experience in measurement and analysis SW for shipyards. The software has been developed by this company in close cooperation with shipyards to meet their specific requirements.
The modules of the DCA Software, which are DCP10, DCP 20 and DCP 30 comprise the following functions:

- DCP10 together with a total station is the shop-floor 3D measurement module
- DCP20 provides the dimensional report generation and visualization of the as-built structure compared to design
- DCP30 simulates the joining of the sections and hulls by outputting the joint parameters for the production with the goal to use as little excess material as possible.

Two departments use these systems: ”Precision Action” (Action précision), which is responsible for the precision checks and “On-board Assembly ” (Montage Bord), which is responsible for the quality of the parts during final assembly.

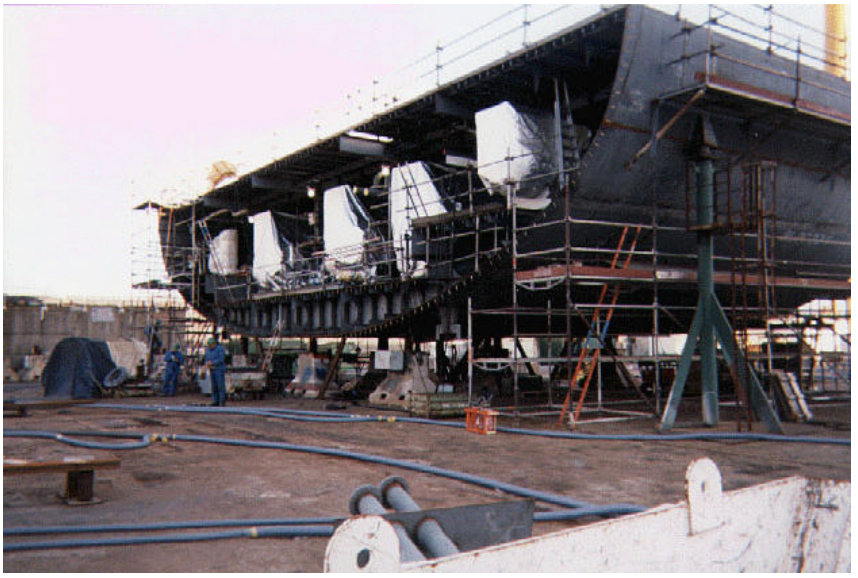
Application of the Leica TDM/TDA5000 with DCA10 SW on handheld PC

Increasing applications with Leica Systems

The number of applications for which the Leica systems are used has increased significantly since 1997, in particular due to the experience and know-how gained by those two departments:
They have been able to match the possibilities offered by the Leica / DCA equipment with the numerous control tasks to be performed in the shipyard. This covers applications at different workshops

- ❑ Plating and Drawings workshop
  - Setting the plotting and oxyacetylene cutting machines
  - Dimensional check of the deck plating
- ❑ 120 and 180 t workshop
  - Aid to shaft assembly, rudder and stabilizer installation
  - Plotting drafts
  - Cutting the plating and bow bulb overlengths
  - Dimensional check of the bottom plating
- ❑ Pre-assembly and flanging
  - All dimensional checks of plating and blocks
  - Length of the shaft assembly
  - Forecasting plate creep
  - Plotting and cutting butts
- ❑ Installing new machines
  - Alignment
  - Control

Large bottom section, prepared for joining



Avoiding excess material is one of the major goals in shipbuilding.

It can now be realised by applying up to date measuring equipment and know how in the applied SW.

All the users at the “Chantiers de l'Atlantique” highlight the savings the Leica systems have allowed them to make in terms of time and money. With the purchase of two TDA 5000 systems (chosen because of the ATR) and associated software, they expect further productivity improvements in overlength management, which is a crucial problem for all shipyards and the main key to cut production costs. They are convinced that this tool fully meets their requirements.

Leica, through its cooperation with A.M.S., is proud to contribute to the success of the “Chantiers de l'Atlantique”, and will continue to help achieve its goal of becoming the best performing shipyard in Europe.

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Useful links:

DCA TPS Software

TDM5005 Total Station

Application Reports

Leica Industrial Products

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