Shipbuilding, Productivity and Lasers

by Torben Andersen
Partner - Odense Maritime Technology A/S
Who am I

- Started at OSS in 1965
- Shipbuilding Expert
- Extensive knowledge about Productivity
- Senior Vice President within R&D at OSS
- Introduction of Lasers at OSS
  - Many years of discussions in the industry about technologies with e.g. TWI, Osaka University, Force and others
- R&D Projects
  - 10KW Laser installed in 1997 at Odense Steel Shipyard (OSS) for production of navy vessels
- Co founder of Odense Maritime Technology in 2010
Shipbuilding

Odense Steel Shipyard

- Odense (1917 – 1980), founded by Mr. A.P. Møller
- Lindø (1959 – 2012)
- Emma Maersk (2006), world largest container vessel
- Odense Maritime Technology (2010)

Mr. A.P. Møller

Mr. Mærsk McKinney Møller (Chairman)
Shipbuilding

Odense Steel Shipyard – Lindø 2009
Shipbuilding

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Mr. Mærsk McKinney Møller (Chairman)
Emma Mærsk

Length o.a. ................. 397.7 meters
Breadth ............................. 56.4 meters
Accommodation ............... 30 persons

Main engine ................. 110,000 BHP
Container capacity ........... +15,550 TEU
Reefer capacity .............. 1,000 FEU
World’s first double hull VLCC build at Odense Steel Shipyard
Shipyards working together

1970’+80’
- Global Shipbuilding Family (GSF)
  - Hitachi Zosen
  - Samsung
  - Newport News
  - Odense Steel Shipyard

1990’
- GSCAD (Global Shipbuilding CAD)

Today
- Smart Marine 3D
Productivity

What is productivity?

- Usually defined as:

- KPI (Key Performance Indicators) often like:

- Equally important is:

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**Welding robot:**

Gantry with 12 offline programmed welding robots – welding 6 km per week (two shifts)
Surviving

Global industries
- Shipbuilding
- Shipping
- Global trade pattern
- Economic activities
- Fluctuating needs for ships
Laser Technology?

Why is laser important?
- Respect for new technologies
- Reducing costs
- Better products → Improving productivity!

Why not just well proven technology?
- New focus in shipbuilding industry in Canada
- Setting a new level in shipbuilding

What’s the catch?
- Buzzwords!
- Technological seduction
History of Laser at OSS

History of Laser welding and cutting

- 1994: Laser welding for ship elements at Force
- 1997: Installation of laser welding and cutting machine at OSS
- 1998: Production of ship elements by laser welding
- 2000: Trials with laser hybrid welding
- 2001: Production of blocks with laser hybrid welding

10KW Laser installed at OSS welding profiles to a girder in the double bottom of a container vessel 80 meters/hour
Laser present status

What is the present status?

- Promising results for cutting and welding
- Actual production carried out at shipyards
- Improved technology (fibres and robots)
- 2x16KW disc laser at Lindoe Welding Technology for offshore windmill tower construction
- 20 times higher welding speed
- 50% reduction of costs compared to other welding technology
- Lasers are applied in European shipbuilding industry for cruise ships
Final comments

Technologies
Many options available due to development of new and improved technologies
- Modern 3D tools
- Standardized key elements
- High precisions in manufacturing processes
  - Laser
  - Robots

A Modern Shipyard
Not many real modern shipyards due to lack of investments
- New Technologies
- New Layouts
- Surroundings
Have a nice Journey!

This is just in time/at the right time, and you are the ones who can make the vision of a maritime future for Canada come true.