



GDANSK UNIVERSITY OF TECHNOLOGY

FACULTY OF OCEAN ENGINEERING AND SHIP TECHNOLOGY

CHAIR OF SHIP TECHNOLOGY, QUALITY SYSTEMS AND MATERIALS SCIENCE



***R & D profile and activities
Chair of Ship Technology,
Quality Systems and Materials Science
to demonstrate its capabilities***

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Contents of presentation:

- **Who we are? *General Information Faculty of Ocean Engineering and Ship Technology of GUT***
- **What is the kind our research activity? *Area of activity of Chair of Ship Technology, Quality Systems and Materials Science***
- **What we have done and what we can do? *Capabilities of Laboratory of Ship Technology and Offshore Structures***



The Faculty of Ocean Engineering and Ship Technology of GUT is the only faculty in Poland which since the beginning of 1945 has continuously been educating engineers, doctors in Naval Architecture and Marine Technology.

Our faculty is a member of such organization as ‘The European Association of Universities in Marine Technology and Related Science’ (WEGEMT), ‘The Association of Polish Maritime Industries’ and ‘The Association of Shipbuilding Faculties of Nordic Countries’.



Field of Faculty Activity:

- Naval Architecture,
- Marine Engineering,
- Transport,
- Power Systems



FACULTY OF OCEAN ENGINEERING AND SHIP TECHNOLOGY



CHAIRS:

1.Theory and Ship Design

2.Ship technology, Quality Systems and Materials Science

3.Mechanics, Structure Design and Strength of Ship

4.Ship Power Plant

5.Ship and Ocean Structures Deck Equipment and Systems

6.Automatics and Turbine Propulsion



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Scientific and technological fields of interest:

A – Technological problems (Production engineering) in shipbuilding

1. Measurements processes in ship hull manufacturing and assembly (including laser scanning)
2. Systems for manufacturing of ship hull structures in reduced tolerances
3. Automation of processes of straightening of hull sections (panels)
4. Technology problems of „building and repair of green ship" and scrapping

B – Static and Fatigue Strength of Ship Structure

1. Fatigue strength of ship hull structure components
2. Fatigue properties of laser welded steel joints
3. Influence of weld imperfections on strength especially fatigue properties of ship hull structure



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Scientific and technological fields of interest:

C – Materials and Corrosion

1. New materials for ship structures
2. Alloys for new type of fast craft hulls
3. Corrosion resistance of materials and welded joints
4. Corrosion processes a ship structures
5. Corrosion fatigue of materials and ship hull structures
6. Applications of Acoustic Emission (AE) for estimation of state of corrosion in hull plate or level of fatigue damages

D – Quality Systems

1. Quality And Environmental Management Systems (ISO 9001 and 14000) for shipbuilding sector



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Examples of our participation in research programmes:

RISPECT-Risk-Based Expert System for Through – Life Ship Structural Inspection and Maintenance and New-Build Ship Structural Design – *FP7*

CORFAT - Cost Effective Corrosion and Fatigue Monitoring for Transport Products – *FP7*

CORET- Advanced coating of interior of tanks for rising environmental safety- *EUREKA E! 016800*

DeLight - DE-LIGHT Transport Project - *FP6*

SAND-Core - Coordination Action on Advanced Sandwich Structures in the Transportation Industry *FP6*

INCOWATRANS - A new generation of environmental friendly inland & coastal ships for Polish east-west waterways -*Eureka E!3065,*

SANDWICH - Advanced composite sandwich steel structures – *FP5*

ASPIS - Application of steel Sandwich Panels Into Ship Structure - *EUREKA E!3074*



Laboratory of Ship Technology and Offshore Structures



Laboratory of Ship Technology and Offshore Structures

- ✓ test stands area – 600 m²
- ✓ investigations of structural elements with dimensions up to 17 m x 7 m.
- ✓ max. load application – 2000 kN – tension,
- ✓ 4000 kN – compression,
- ✓ multiaxial load application, multipoint load and fatigue load generators,
- ✓ macroscopic and fractographical analysis,
- ✓ data acquisition to 200 channels simultaneously



What we can do

- Measurements in ship hull manufacturing and assembly.
- Analysis (including FEM modelling) of ultimate and fatigue strength of ship and offshore structural elements (including effects of corrosion) under probabilistic and determined loads and complex dynamic structure responses.
- Fatigue strength of ship hull structure elements, including laser welded steel joints.
- The chair has a practical knowledge of ship structural behaviour from experiments in its own laboratory
- **Validation of results analytically obtained**



Role in Projects

We are looking to be in project:

- ✓ Partner
- ✓ Workpackage Leader



Which Projects

AREA 7.2.5.2. Competitive surface transport products and services

- *SST.2011.5.2-1. Strengthening the European maritime transport sector Competitiveness*
- *SST.2011.5.2-3. Cost-effective modernization of the inland fleet for freight transport*
- *SST.2011.5.2-4. Exploring and fostering international collaboration in the waterborne transport sector*

AREA 7.2.8. 'THE OCEAN OF TOMORROW'

- *OCEAN.2011-1. Multi-use offshore platforms*



Thank you for your attention

