



**CENTRUM**  
TRANSFERU TECHNOLOGII MORSKICH

# *Research labs and services*

## Maritime University of Szczecin

[www.am.szczecin.pl](http://www.am.szczecin.pl)



educates highly qualified maritime staff i.e. navigators and mechanics answering the needs of contemporary transport and fishing fleet as well as onshore staff prepared to implement computer software and systems for supporting transfer of information in the transport-forwarding-logistics industry.

It also implements research projects in international consortia. The research fields for potential project partners to be found at <http://www.am.szczecin.pl/en/research> and EU projects at <http://portalctm.am.szczecin.pl/>

University factsheet:

- educates 4 000 students a year in three faculties offering 9 specializations (Faculty of Navigation, Faculty of Maritime Engineering, Faculty of Economics and Transport Engineering),
- educates specialists for the Liquid Natural Gas terminal built in winouj cie, Poland to diversify the gas supply for Poland,
- has well-equipped laboratories, modern research-training vessel the m/s Navigator XXI and 16 technically most advanced simulators,
- is a member of many international organisations and associations

## Centre for Maritime Technology Transfer

[www.cttm.am.szczecin.pl](http://www.cttm.am.szczecin.pl)



**CENTRE**  
FOR MARITIME TECHNOLOGY TRANSFER

was founded as an answer to a need of making the inventions of the Maritime University of Szczecin researchers commercially successful. CMTT aim is to take the most promising ideas forward through intellectual property rights (IPR) licensing, new venture creation and consultancy.

## Maritime University of Szczecin Innovation Centre

[www.innoam.pl](http://www.innoam.pl)



is a company established to sell results of scientific research and inventions owned by the Maritime University of Szczecin. Possible forms of cooperation with industry: licence, establishing a new company with or without VC/seed involved (spin off / out), other kinds of IPR sale, joining consortia with other public and private bodies, projects implementation.

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*The Laboratory of Green Power Engineering*

The Green Lab offers services related to the testing of the quality of energy from renewable sources. Its innovation consists in combining individual power systems, generators in particular, and examining their combined impact on produced and transmitted energy.

### Research equipment:

test stands for

- squirrel cage generator,
- 0.4/15 kV transformer,
- medium voltage circuit breaker,
- high voltage and current converters,
- high voltage equipment and instruments, and
- station for converting signals from power devices
- stations for statistical data analysis (ALTA, Block Sim, Weibul ++).

### Services:

- testing of performance quality of energy generation and transmission systems, with a focus on wind power generation,
- testing of diagnostic susceptibility and assessment of technical condition of machines producing energy from renewable sources, including wind turbines,
- estimation of wind power generation system reliability, assessment of component hierarchy in wind turbines (identification of 'weak links').

### Contact:

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*The Faculty Research Laboratory*

The Research Laboratory of Marine Engineering Faculty is composed of four labs:

1. Laboratory of Fuels and Oils
2. Laboratory of Environment Protection
  - Oily Water Test Lab
  - Exhaust Gases Test Lab
3. Laboratory of Working Fluid Cleanliness Tests
4. Laboratory of Diffraction and Spectrometry

#### Research equipment:

Testers, analyzers, measuring instruments for: carbon contents analysis (MCRT-160); determination of sediment contents in fuels (TST9SETA and Stahope-seta); determination of dynamic /kinematic viscosity (TV2000); elemental analysis (SPEKTROIL-M); determination of lubricity of fuels (HFRR V1.0.3); sulphur level determination (SLFA-2800); measurement of density/specific gravity (DMA4500); determination of water in solids (Petrotest 6-15H); particle size (Mastersizer 2000, Hydro2000MU); zeta potential analyzer (Zetasizer); determination of dynamic viscosity with the Hoppler's viscometer; determination of a flash point by the Pensky-Martens closed cup method; exhaust gas analysis (MEXA-1230PM); X-ray spectrometry (SPECTRO XEPOS 03 STD GAS); infrared and fluorescence spectrometry (PERKIN ELMER Spectrum One FT-IR, Perkin Elmer LS-50B Luminescence); oily water analysis (HORIBA OCMA 310); exhaust gas emission analysis (CEB-II Pierburg –AVL, MIR – FTIR –Environment, PM-Particulate Matter, HORIBA 1230PM VAISALA OYJ); coulometric titration (831 KF from Metrohm Ltd.)

#### Services:

tests of standard physical and chemical properties of fuels and lubricating oils; tests of metal particle contents in fuels and oils by the emission spectrophotometry method; analysis of sulphur level in petroleum products; analysis of coking residues in petroleum products by the Micro method; analysis of exhaust gases from diesel engines; tests of oily water; tests of hydraulic oil cleanliness, determination of cleanliness class; analysis of particle size by the laser diffraction method; analysis of Ca, Ba, Si, Pb, P, S contents in apatites, phosphates, dust sulphur, smoke-box ashes, grain dusts, using the energy dispersion X-ray Fluorescence method (EDXRF); infrared spectrometry and excitation / fluorescence emission measurements, using a scanning system and computer data analysis (FL Win Lab software).

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*Research Centre for Ship Operation Risk Analysis*



The Centre does comprehensive research into safety issues at sea and harbour areas, and the safety of offshore facilities.

#### Research facilities:

The lab's wide range of facilities includes hardware and software for these systems:

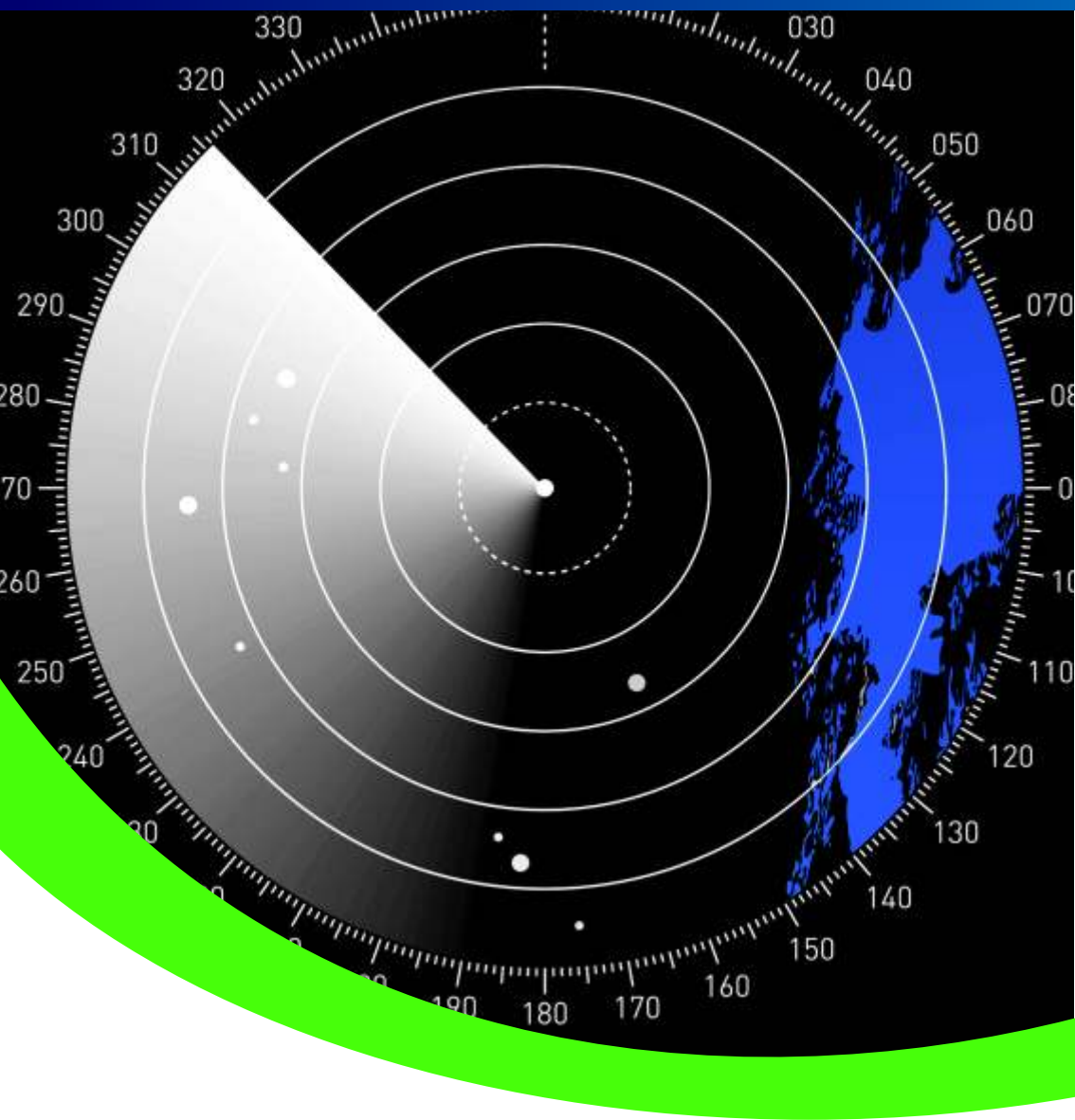
- AIS system
- SOLID WORKS system
- NASTRAN system
- ArcGis system
- DNV PHAST system
- GOLDSIM system
- IWRAP MK system.

#### Services:

- examination of vessel traffic lanes on shipping routes, approach and port channels,
- examination of traffic streams on shipping routes, approach and port channels taking account of vessels' technical and operational parameters
- examination of cargo transport streams, particularly dangerous goods on various shipping routes, approach and port channels,
- examination of shipping routes in view of their adjustment to specific vessel traffic streams,
- estimation of potential consequences of accidents involving two ships or ship's collision with port or offshore structures and underwater pipelines,
- examination of potential ecosystem areas polluted due to ship's collision,
- estimation of the technical scope of ship's damage due to collision, by simulation methods,
- estimation of the technical scope of damage sustained by port or offshore structure, including underwater pipelines, by simulation methods,
- optimization of port engineering structures and facilities.

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*The Centre of Navigational Technologies*

The Centre provides services related to the safety of maritime transport and offshore operations using modern integrated navigational bridge systems with the dynamic positioning function.

**Research facilities:**

- FMBS simulator – class A full mission bridge simulator with three navigational bridges, one equipped with DP 2 system,
- DP laboratory for dynamic positioning of vessels and offshore facilities (DP simulator),
- Laboratory of Networks and Mobile Technologies of Data Transmission,
- Laboratory of Innovative Marine Electronic Technologies, including navigational data integration.

**Services:**

- development and analyses of innovative functionalities of integrated systems, dynamic positioning, identification, pilot, docking and anti-collision systems,
- design of hydroacoustic and other positioning system configurations,
- modeling of dynamic positioning control systems for vessels,
- safety assessment of manoeuvring in restricted areas and during DP operations,
- safety analysis of manoeuvring in a modernized or newly designed port area.

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*M/S NAVIGATOR XXI*

The training/research vessel owned and operated by the Maritime University of Szczecin meets Polish Register of Shipping requirements for navigation in the North Sea and other open seas up to 200 nautical miles away from a place of shelter, and permitted distance between two places of shelter not longer than 400 nautical miles, as well as the entire Baltic Sea and other landlocked seas.

#### Research facilities:

- integrated data management system TRAC-C (Kelvin Hughes U.K.)
- multibeam echosounder EM 710 (Kongsberg Maritime) for depths from 3 do 2000 m,
- remotely operated vehicle - OFFSHORE HYBALL (HYDROVISION -U.K.)
- sidescan sonar 272 TD (EdgeTech USA)

#### Services:

- monitoring the condition of Baltic and other sea waters,
- taking samples of seabed surface and deeper layers, transmission of data to recipients on land,
- hydrographic survey and seabed inspections,
- inspection of underwater infrastructure, detection of underwater rubble and other objects,
- detailed examination of underwater structures under construction and the state of dredging work,
- making maps of seabed environment.

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