Ukrainian-Bavarian Higher Education Day: our proposals for cooperation

Odessa National Polytechnic University

Vice-rector for science and research professor Dmytryshyn Dmytro
The Odessa National Polytechnic University was founded in 1918. Over years of its existence the University accumulated a reach deal of academic and scientific traditions.

**Nobel laureate in physics professor I. Tamm worked at our University**

Since 1994 ONPU is a member of European University Association (EUA)
Since 1996 ONPU is a member of International Association of Universities (IAU)
Since 1998 ONPU is a member of European Association for International Education
Since 2008 ONPU is a member of Eurasian Universities Union (EURAS)

Today ONPU is the largest technical University in the Southern Ukraine.
150 Professors, Doctors of Science
500 Associated Professors, PhDs
21 Honored Scientists of Ukraine

During the ONPU existence about than 120 thousand graduates have been trained, here, including more than 10 thousand foreign students from 80 countries of the world.
University Institutes and Departments

- Mechanical Engineering Institute
- Institute of Industrial Technologies, Design and Management
- Power Engineering Institute
- Institute of Information Security, Radioelectronics and Telecommunications
- Computer Systems Institute
- Institute of Business, Economics and Information Technologies
- Institute of Electromechanics and Energy Management
- Ukrainian-German Technical Institute
- Ukrainian-Spanish Institute
- Ukrainian-Polish Institute
- Chemical Engineering Institute
- Humanities Institute
- Extramural studies Institute
- Foreign Students Training Institute

66 Departments provide B.Sc., M.Sc., Ph.D. and D.Sc. degree programs
ONPU has a powerful scientific and research base which includes

150 specialized scientific and research laboratories, conducting scientific researches in the following fields:

– Nuclear physics and nuclear power-engineering,
– Resources and energy-saving technologies,
– Environmental protection,
– IT - technologies,
– Radioelectronics,
– Mechanics and Robotics,
– Computer Science,
– New materials and nanotechnologies,
– Automation and Instrumentation,
– Pharmacology and organic and inorganic chemistry
Function and field of application
It is designed for capacity measurement of equivalent gamma radiation dose as part of radiation safety control equipment on the principle of dose rate conversion in frequency of electric impulses passing.
This unit is applied as part of autonomous control equipment for radiation safety or with standard information and measuring devices, which give corresponding inputs.

Main advantages of R&D project
The energy range and measuring range of dose rate are expanded. Unit for detection meets modern requirements of electromagnetic compatibility.

State of R&D project preparedness
The model was designed, pilot batch and the set of design and technical documentation were produced.
Function and field of application
The R&D project is designed for efficiency improvement of wind turbines with horizontal axis of rotation, especially when low wind speeds.

Main advantages of R&D project
Wind engine operated across all range of wind speeds gives maximally possible power, that when low wind speeds is 3-4 times higher compared to wind turbines with stuck vanes.

State of preparedness of R&D project
Acting pilot plant is designed and experimental studies in wind tunnel and on the testing ground were conducted.
Environmental protection

DOUBLE EFFECT CLOSED AIR CLEANING SYSTEM REMOVING POLYDISPERSE DUST

Function and field of application
This double effect closed system is designed for air aspiration with removal of polydisperse dust at small and large enterprises.

Main advantages of R&D project
Environmental effect is achieved through separate purifying of dust masses with diverse fractional composition and through total system isolation from environment. The technology does not require major investments.

State of preparedness of R&D project
The methodology of air purification system design is developed, that allows to perform both design calculation and the calculation of main indicators of cleaning quality.

Scheme for double effect closed cleaning system
1 – device for capture – return;
2 – mixing device;
3 – separating device;
4 – catcher of the main circuit
5 – catcher of the circular circuit;
6 – ventilator for the circular circuit;
7 – ventilator for the main circuit.
IT - technologies

SMART-bus stop

Function and application field
Field of application: urban passenger transport (UPT); social improvements.

Main advantages of R&D project
Main advantages:
– easing for people with sight disabilities to use UPT;
– variety of realization (4 options proposed) depending on budget and objectives.

State of preparedness of R&D project
4 options (3 represented at figure illustrating) are proposed and calculated
Function and field of application
The designed low-speed DC generator is operated as part of the wind power generating installation. Field of application: small wind energy market of Ukraine.

Main advantages of R&D project
Cheaper than equivalents low-speed low-inertia gearless generator with high overload capacity and improved heat sink.

State of preparedness of R&D project
The real scale model is designed with 1 kWh power and experimental studies were conducted.
New materials and nanotechnologies

ANTIFRICTION MULTI-COMPONENT ALLOY ON THE BASIS OF IRON AND COPPER

Function and field of application
R&D project is designed for service life increasing of car parts friction couples, for instance of camshafts, valve rockers, etc.

Main advantages of R&D project
This alloy is not expensive in production, because it does not contain rare elements. Also, the alloy can significantly increase the service life of friction couples, approximately double.

State of preparedness of R&D project
Documentation is prepared by 90% per cent. Some samples of the alloy were obtained, research continues.
Function and field of application
The R&D project is designed for efficient utilization in mining.

Main advantages of R&D project
The service life multiply, increases that does not require frequent upswing and pulling down of drilling rig from great deepness.

State of preparedness of R&D project
Experimental studies were conducted in lab conditions.
In 2016 the ONPU research teams together with NUGENIA specialists and the National Ukrainian Academy of Sciences filed two applications for EU Horizon-2020 program projects:

1. Improved methods to analyse NPP safety and to substantiate severe accident management strategies in view of Fukushima-Daiichi accident lessons

2. Improvement of methodical support for control and maintenance of NPP safety-related systems
Ukrainian-German Partnership

On June 22, 2017, the ONPU Centre for Energy Efficiency Technologies (CEET) started its activity. See Center details at website: ceet.opu.ua.

The center activity is supported also by partner companies:

VISSMANN

ISOVER

SAINT-GOBAIN

IBC Heiztechnik

wilo

OSRAM

Training for students from company in the CEET
Cooperation with German organizations:

- Support from Integrated and Returning Experts CIM.

- Support with equipment, CEET opening, prizes at students competition in the field of energy efficiency during the CEET official opening, capacity building for ONPU employees, expertise.

- Consultancy support from Senior Expert at CEET establishment.
ONPU has a rich experience in participation at different European Programs.

Over the last 5 years ONPU participated in 20 European projects.
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Thank You for Your attention!