



Alliance

NEW ENERGY OF UKRAINE

Fundamentally New Methods of Getting of Electric Energy from the Sea Waves

April 22-24, 2009

Białystok/Białowieża, Poland



KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

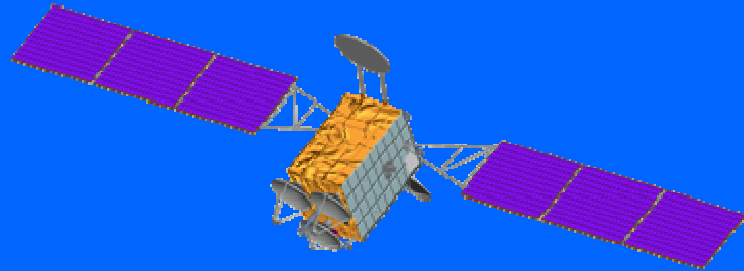
UNIA EUROPEJSKA
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FUNDUSZ SPOŁECZNY



Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego



EXPERIENCE



The Inventors worked/work in rocket-space giant of the former USSR - Yuzhnoye State Design Office.

They have strong many years experience in rocket's and spacecraft's engineering, design and manufacturing, especially perspective space technique.

They worked long time (after staying to the civil path, 1992) in alternative/renewable energy area (wind, solar, sea waves).





Introduction: Proposed Project




*ELECTRIC GENERATING DEVICE
WHICH USES POWER OF SEA WAVES*

*Gyro-Wheel Wave Electric Power Plant
(GW2EP2)*





Problems

- Climate Change and Environment Destruction
- Exhaustible Store of Natural Unrenewed Sources of Energy 
- Insecurity of Weapon Energetics 
- Far Future Trends of Thermonuclear Reactors 



Team

- Projects Inventor and Main Designer – Volodymyr V. Tolmachov, Emeritus Engineer-Designer and Inventor of the USSR



- Yuzhnoye SDO Specialists



- R&D Power Engineering Institute Specialists





Development Main Objective and Task

The main objective of creation:

to provide with ecologically clean, low-cost and constant Energy the customers of coastal areas, to protect the coast-line from wave destruction



The main task of creation:

maximally effectively to invert the mechanical power of sea waves into Electric Power for customers





Main Problems of Technical Realization and its Solutions

The sea Gyro-Wheel Wave Electric Power Plant is not a universal for different aqua-areas due to changing length and amplitude of the waves in the areas

Solution: the geometric and kinematic schemes were developed which allow to change only ponton's construction for the device, not working mechanism



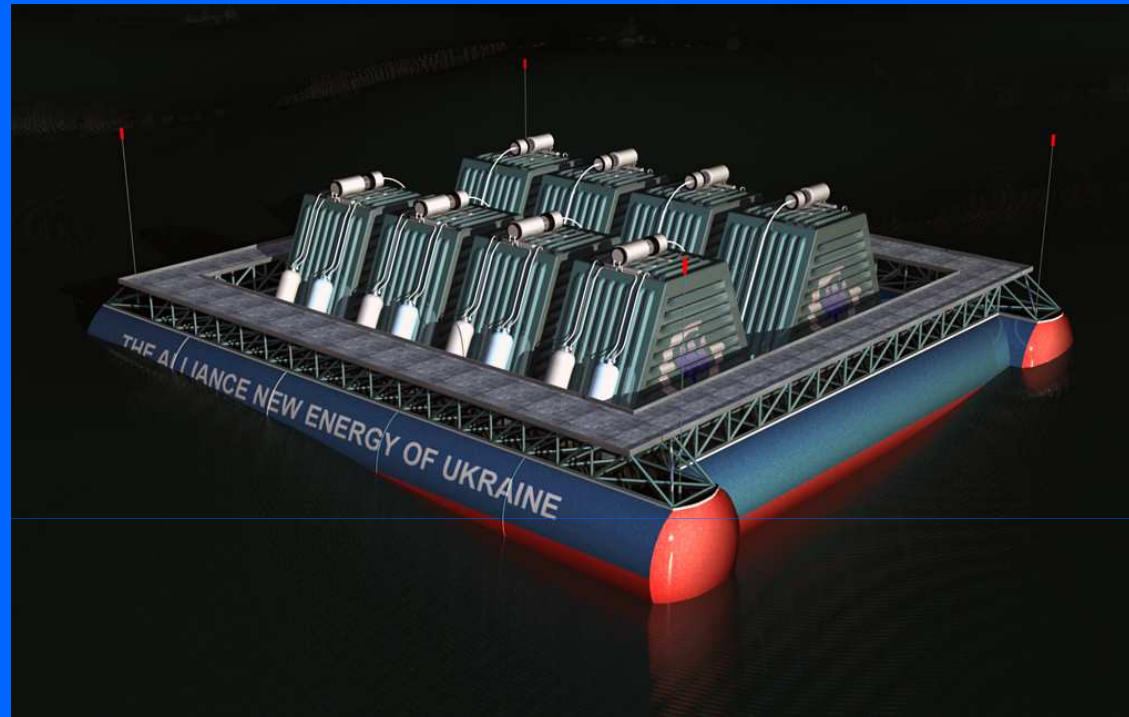
Stability to variable surging sea waves

Solution: developed special and specific device for perception of the waves





Ponton Part and Energetic Units

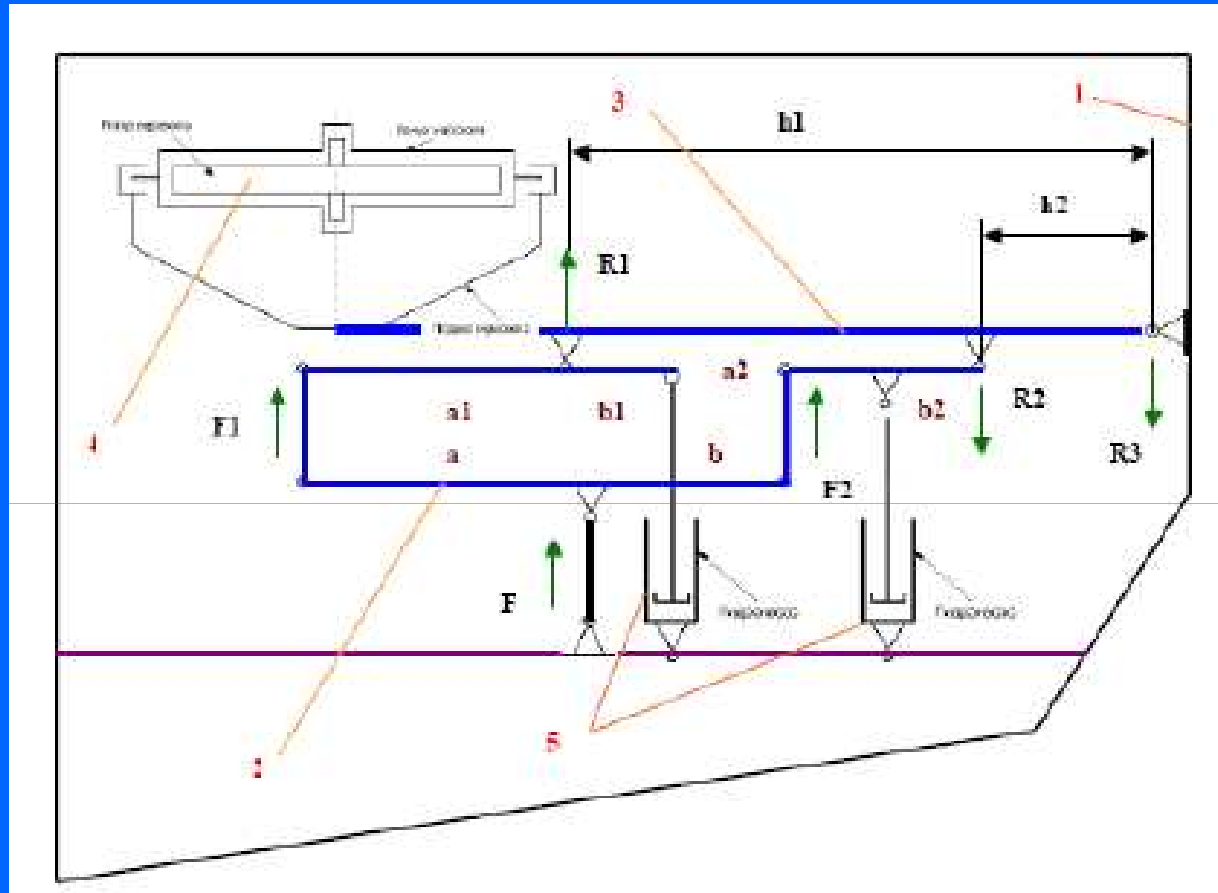


**Ponton Tests,
Katsiveli, Crimea,
Sea Hydro-Dynamic Institute polygon**





Device Functional Scheme



- 1 – gyro and mechanical units box body
- 2 – mechanism of getting of effort from the box body 1
- 3 – mechanism of transformation of moments
- 4 – gyroscope with hanger bracket (2nd gyro is not indicated here)
- 5 – pumps
- 6 – control system (no on the scheme).



GW2EP2 Animation Demonstration



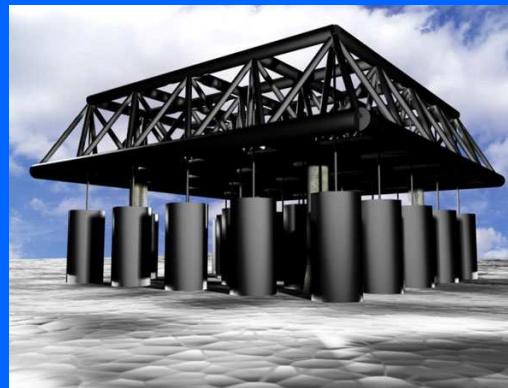
Competitors



Ocean Power Technologies, Inc.
(Australia)
OPT PowerBuoy™



Ocean Power Delivery Ltd. (the UK)
Pelamis Sea Wave Converter

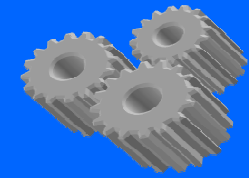


ManchesterBobber (the UK)
The Uni of Manchester



Main Principal Decisions

- New principal decisions of main Device's units and principal kinematic schemes were found



- Weight specific characteristics – 50...70 kgF of engine mass Eng./kW – typical for modern swimming plants (ship's engines)
- Equipment and Machine Details which are using into the Device have long-time capacity for work (lifetime)



Some Technical & Economic Characteristics

- **A RANGE OF POWER** - 10kW ... 1MW
- **MASS** (for 120 kW), **tones** - around 50
- **DIMENSION** (for the Black Sea), **m** - 10 x 10 x 3
- **SPECIFIC GRAVITY**, **kg/kW** - up to 400
- **MATERIALS** - metal, plastic, concrete
- **POWER COST** ~ 0.06USD per 1 kW/h
- **LIFETIME** (without renewal and rectification) - up to 10 years

- **PILOT MODEL DEVELOPMENT TIME** - 11-12 months
- **COST OF THE EXPERIMENTAL WORKS**
(for 120 kW mechanical device) - 600 kEURO



Necessary Experimental Investigations and Activities

- To choose schemes of control system for the GW2EP2 operation
- To allot maximally well-handily the power sources and approach its to coastal Customers
- To increase the work steadiness of the Station and Power System in a whole



Main Advantages

- **All energy producing mechanisms are working without contact to aggressive sea water**
- **High sensitivity to the sea wave oscillations**
- **Can use at a kind of additional engine onto vessels**
- **Protection of coast-line from devastation by dissipation of wave energy on the GW2EP2 construction**



Conclusion

1st :

The scientific and experimental works demonstrate the reality of creation of a powerful gyrowheel plant

2nd :

Hope to develop international co-operation for further works and manufacturing in Poland: Gdansk, Szczecin, etc.



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