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- Proceedings of the 2014 International Conference on Energy, Environment, Development and Economics (EEDS 2014)
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- Proceedings of the 2014 International Conference on Water Resources, Hydraulics & Hydrology (WHH 2014)
- Proceedings of the 2014 International Conference on Chemistry and Chemical Engineering (CCE 2014)

Santorini Island, Greece, July 17-21, 2014

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Plenary Lecture 1

Floating Offshore Wind Turbines: The Technologies and the Economics



Prof. Paul D. Sclavounos

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Abstract: Wind is a vast, renewable and clean energy source that stands to be a key contributor to the world energy mix in the coming decades. The horizontal axis three-bladed wind turbine is a mature technology and onshore wind farms are cost competitive with coal fired power plants equipped with carbon sequestration technologies and in many parts of the world with natural gas fired power plants.

Offshore wind energy is the next frontier. Vast sea areas with higher and steadier wind speeds are available for the development of offshore wind farms that offer several advantages. Visual, noise and flicker impacts are mitigated when the wind turbines are sited at a distance from the coastline. A new generation of 6-10MW wind turbines with diameters exceeding 160m have been developed for the offshore environment. They can be fully assembled at a coastal facility and installed by a low cost float-out operation. Floater technologies are being developed for the support of multi-megawatt turbines in waters of moderate to large depth, drawing upon developments by the offshore oil & gas industry.

The state of development of the offshore wind energy sector will be discussed. The floating offshore wind turbine technology will be reviewed drawing upon research carried out at MIT since the turn of the 21st century. Floating wind turbine installations worldwide and planned future developments will be presented. The economics of floating offshore wind farms will be addressed along with the investment metrics that must be met for the development of large scale floating offshore wind power plants.

Brief Biography of the Speaker: Paul D. Sclavounos is Professor of Mechanical Engineering and Naval Architecture at the Massachusetts Institute of Technology. His research interests focus upon the marine hydrodynamics of ships, offshore platforms and floating wind turbines. The state-of-the-art computer programs SWAN and SML developed from his research have been widely adopted by the maritime, offshore oil & gas, and wind energy industries. His research

activities also include studies of the economics, valuation and risk management of assets in the crude oil, natural gas, shipping and wind energy sectors. He was the Georg Weinblum Memorial Lecturer in 2010-2011 and the Keynote Lecturer at the Offshore Mechanics and Arctic Engineering Conference in 2013. He is a member of the Board of the North American Committee of Det Norske Veritas since 1997, a member of the Advisory Committee of the US Navy Tempest program since 2006 and a member of the Advisory Board of the Norwegian Center for Offshore Wind Energy Technology since 2009. He has consulted widely for the US Government, shipping, offshore, yachting and energy industries.

<http://meche.mit.edu/people/?id=76>

Plenary Lecture 2

The Influence of a Magnetic Field in the Fuel of a Gasoline Engine



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Abstract: This work examines the effect of magnetic field in a four stroke gasoline engine. The magnetic field that was created affected the fuel just before it enters to the engine. As a result there was a change in the combustion of the engine as well as variations in the exhaust gases. The engine was functioned without and under full load.

Brief Biography of the Speaker: Dr Charalampos Arapatsakos is a Greek citizen, who has been born in Athens. He has studied Mechanical Engineering. He is Professor on Democritus University of Thrace in Greece. Prof C. Arapatsakos has participated in many research programs about biofuels, gas emissions and antipollution technology. His research domains are mainly on biofuels and their use in internal combustion engines, the power variation from the use of biofuels, the gas emissions, mechanical damages, internal combustion engines, antipollution technology, renewable sources of energy, gas emissions, vehicle design, elements of machines, resistance of materials, technical mechanics, heat transmission.