



CU SUSȚINEREA



COMPANIA NAȚIONALĂ ADMINISTRAȚIA  
PORTURILOR MARITIME SA CONSTANȚA



INSPECTORATUL ȘCOLAR JUDEȚEAN CONSTANȚA

**BOOK OF ABSTRACTS**

CONSTANȚA, 26 MAI 2017



**SECTION I**

***MECHANICAL ENGINEERING STUDENTS  
SESSION***

## **Stability Study of ROMAN 12215 DFK Dump Truck during Shipment of Dredged Land for the Construction of a Warehouse in Port of Constanta**

Iuliana BUTNARIU

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Some investments in the field of construction works on the port platforms raised (and continues to raise) very complex problems regarding the engineering and management of technological resources in conditions of market economy efficiency. The improvement of these issues requires economic analyzes of the evolution of costs, technological equipment and means of transport, which are the object of study of this paper.

**Keywords:** *efficiency, port administrative space, means of transport, efficiency, tipper stability.*

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## **Considerations Regarding the Lifting Mechanism of an Onshore Crane**

Alin-Ionuț CHIRACU

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The main parameters of lifting machines are the sizes that determine their performance. It is the minimum set of data that must be indicated in the design theme or to be adopted according to the destination of the crane needed to perform the design calculations. For the beneficiary, they represent those sizes that determine whether the type of crane meets the conditions for the execution of certain works.

For the correct operation of the mechanism, the kinematic parameters must be set for calculating the lifts and traction cables. The calculation of lifting machines is based on their own methodology, geared to their specific operation and operation.

**Keywords:** *lifting-lowering mechanism, quay cranes, transshipment, kinematic parameters.*

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## **Importance of Multimodal Transport for the Constanta City-Port**

Mihai-Alexandru TRANDAFIR, Ciprian PEICIU

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Transport is a branch of the economy that, with specific means, makes the movement of material goods and people to meet the material needs of society.

Containerization and intermodal transport have revolutionized general cargo, with important implications on the work of modern seaports.

**Keywords:** *transport system, efficiency, seaports.*

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## **Studies on the Rotation Mechanism of the 16 tone Portable Crane from the Constanta Port Operator SOCEP S.A.**

Andrei DRĂGHICI

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The crane rotation systems are some of the most important systems that make up the crane. They serve the handling of goods by loading and unloading operations, the orientation of the crane arm in view of the operations taking place in the port. These systems are several types depending on the type of crane, but also on their servicing. The calculation of the rotation system plays a very important role in the construction of the crane, with a very important role in its stability. All factors of work and meteorological factors are taken into account.

**Keywords:** *crane, rotation systems, loading and unloading, crane arm.*

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## **Trends and Innovations in Solar Energy Domain**

Angelica-Elena DULGHERIU, Cătălin OPRAN, Mircea RUSU, Ioana VIERU  
*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Elena-Rita AVRAM  
*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Solar energy is in a continuous expansion, new technology being discovered almost every day, putting current equipment in a shadow. Our article describes innovations in solar energy domain such as ceramic solar collector, which can extract around of  $650 \text{ W/m}^2$ , despite their heat loss coefficient, competing with traditional solar panel. Another equipment that could improve efficiency are the organic solar cells all made by blade and slot- die coating techniques, a brand new technology that allows us to use different material for production of solar cells. Our article will also talk about heatwaves and climate changes in Romania, assessment of the renewable energy potential using a clustering based data mining method, and strategies and policies to support solar energy development in European Union and also in Romania.

**Keywords:** *solar energy, innovations, solar collector, renewable energy.*

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## **Aspects of the Oil Industry in Romania and the Marine Drilling Platforms**

Ștefania-Anca HERGHELEGIU, Alexandru ROTARU  
*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ  
*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This paper presents the opportunities for the Black Sea drilling activities. The work is aimed at carrying out activities on board specialized ships, on seaports or in ports with no adverse consequences, both in terms of operator and equipment safety and operational efficiency.

The paper highlights the necessity to use advanced work technologies, only applicable to smart and specialized machines, equipment and installation, which performs precise, accurate movements both in onshore and offshore operation, served by specialized personnel.

**Keywords:** *marine drilling, safety, petroleum platforms, equipment, specialized personnel.*

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## **The Calculus of the Constructive Parameters of the Wheel with Cups**

Adriana MUNTEANU

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The idea of the work comes from the period of specialized practice carried out in the third year of study at the port operator SC COMVEX SA, which has an excavator with a wheel for manipulating ore or coal. The wheeled excavator is a continuous-action machine that picks up bulk material from a warehouse with the help of cups and unloads it onto conveyor belts mounted on the special metallic frame made for this purpose. The material is further taken up by intermediate conveyors and guided either to a temporary warehouse or to loading terminals in road transport means or by rail or ship, thus reaching the beneficiary. The objective of the study is to determine the technical and constructive parameters of the working equipment of the excavator, of the wheel with cups. The paper is dedicated to the calculation of the technical and constructive parameters of the wheel with cups assembly.

**Keywords:** *port operator, SC COMVEX SA, excavator, wheel with cups, calculus, constructive parameters.*

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## **Methods to Save Energy during the Pumping Processes**

Roxana OCHESEL, Mariana GHEORGHE, Irina-Alina DIAC, Virgil MUNTEANU, Radu-Alexandru  
CONSTANDACHE

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Elena-Rita AVRAM

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The largest part of the energy consumed in water treatment and distribution installations is used for pumping, meaning this segment is the main cost generator. In the context of durable development, a key role is played by energy savings, also achievable in this field.

In this article we mean to present some of the measures currently adopted in order to improve the efficiency of pumping processes conducted in various units, which supply the necessary water flow to certain consumers or applications. Centrifugal pumps characteristics, as well as connection and utilization strategies of those pumps, will be mentioned.

**Keywords:** *pump, efficientization methods, water distribution, centrifugal pumps, pipes.*

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## **Non-Power-Driven Barge with Crane for Loading/Unloading Containers**

Alexandru PETRO

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinators: Prof. PhD eng. Ionel NICOLAE, eng. Tiberiu AXINTE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This paper considers the non-power-driven barge with deck crane, which loads/ unloads containers abroad a ship or on the quay, where the ship can't come alongside because of various causes or because the port is not equipped with quay cranes or transbordor cranes. It describes the barge and the crane, which has been modeled in 3D with the help of design programs that made the exterior and the models control cabin. The inside the operators cabin was designed in 3D: the control board (joysticks, buttons, control equipment) and all the systems that allow the safe development of loading/unloading operations of the containers. The conclusion of this study reveals how important is the usage of this type of barges, equipped with deck crane, as a means of transportation for containers from berth to the ship, which is located in the inner harbor.

**Keywords:** *barge, crane, containers, design in 3D.*

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## **Considerations Regarding the Use of Renewable Sources of Energy in Port of Constanta. Wave's energy**

Eduard-Gabriel POPESCU, Alexandru-Răzvan NICU

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The energy forecasts reveal that there will be changes in consumption in the coming decades, in the direction of increasing consumption, which will lead to using renewable energy sources.

The full use of wave energy is prevented by the fact that this energy source is uneven. In this context, wave energy can only be used if the waves are high and constant over time. Contemporary technology allows only partially the transformation of wave energy into electricity.

**Keywords:** *energy, renewable, wave, port, operating principles.*

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## **Pipelines Used in Installations Providing Water Supply**

Marcel NICU, Horia-Ştefan PANAINTE, Marcel STOIAN

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Elena-Rita AVRAM

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In this paper the pipelines used in installation for water supply systems will be presented. This article will present also the requirements for the constructions and installations in order to meet the needs of water for domestic, industrial or firefighting purposes. The water supply system includes facilities outside the buildings, called outdoor water supply installations and indoor installations, called indoor water supply installations.

**Keywords:** *water supply, pipes, pipes, installation*

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## **Fluid Flow through Pipelines**

Costel PITI, Adrian COCORU

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Elena-Rita AVRAM

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Pipes' materials must match the environment in which it operates. Each environment has certain characteristics that can adversely affect the pipeline structure. The pipeline design must take in account the development of cities. Also, the project documentation is done by specialized organizations in this field, who are authorized to perform work for the right specified. The design, the construction and the reconstruction of pipelines is performed in accordance with eco-design rules, norms, standards and rules of construction and nature protection developed in accordance with the international legislation.

**Keywords:** *pipelines, natural gas, transport, materials.*

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## **Prototype System used on Tugs for River and Maritime Activities**

Cornel NEDELCU, Silviu GRIGORAȘ, Roxana NEAGU, Nicolae-Cătălin BĂLCESCU  
*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinators: Lecturer PhD eng. Mirela COTRUMBĂ, Lecturer PhD eng. Alexandru PINTILIE  
*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In this work is presented the mode of accomplishment of the model of one prototype system, it's functioning as well as the purpose for which it was achieved. In the first stage were established the devices that make up this system, the materials used and the layout were chosen. In the second stage It went to actually achieve the hydraulic arm, all parts were assembled, from the electric motor to the fire-extinguishing system. In the end a prototype system was used on tugs for river and maritime activities.

**Keywords:** *model, hydraulic arm, fire extinguishing system, prototype system, tugs, cardboard, electric wires.*

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**SECTION II**

***MANAGEMENT AND INDUSTRIAL  
ENGINEERING STUDENTS SESSION***

## Strategic Plan for Uncertainty and Risk Situations

Răzvan Sebastian CRĂCIUN

*Student, Faculty of Engineering, "Dunărea de Jos" University of Galați*

Coordinator: Prof. PhD eng. Cătălina MAIER

*Faculty of Engineering, „Dunărea de Jos” University of Galați*

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**Abstract** The paper presents a case study on the analysis, from the point of view of the manager of an industrial unit, a situation of assimilating a new product exclusively for export.

To assimilate this product, three technological options were proposed. On the market this product can be delivered by competitive firms, these companies are X, Y and Z.

Using the pessimistic criterion (Wald), the optimistic criterion (Hurwicz), Laplace's criterion and the criterion of regret (Savage), we will find out what strategy we need to use to get the maximum benefit under uncertainty and risk, in the form of competitive firms, market demand for the product, the cost of production and other factors.

**Keywords:** *engineering, economics, management, strategies, benefits, Wald, Hurwicz, Laplace, Savage.*

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## Creep of LDPE/MWCNT Nanocomposites

Lucian-Marian JIANU

*Student, Faculty of Engineering, "Dunărea de Jos" University of Galați*

Coordinators: Prof. PhD eng. Felicia STAN, Prof. PhD eng. Cătălin FETECĂU

*Center of Excellence Polymer Processing, Faculty of Engineering, "Dunărea de Jos" University of Galați*

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**Abstract** In this paper, the viscoelastic behavior of low density polyethylene (LDPE) filled with multi-walled carbon nanotubes (MWCNTs) was investigated by static creep test under constant load at room temperature. The LDPE/MWCNT samples used for creep tests were obtained by injection molding. For each MWCNT weight fraction (wt. %), the initial load was held for 2 hours and the displacement was monitored. To investigate the effect of MWCNT wt. % on the creep behavior of LDPE/MWCNT composite in different loading conditions, the experimental creep data were analyzed using the modified four element model.

**Keywords:** *low density polyethylene, traction, relaxation.*

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## **Study on the Weldability of Steels Used in the Construction of the Oil Tank with the Capacity of 25 m<sup>3</sup>**

Adrian ANTON

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Assoc. Prof. PhD eng. Melat BORMAMBET

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In the present paper is analyzed the weldability of steels used for welding of a 25 m<sup>3</sup> reservoir assembly for the storage of petroleum products, determining the weldability groups of the steels used for the construction of the tank.

Any defects that may occur after the welding process and which may endanger the structure, such as: brittle tearing, hot cracking and cold cracking and the conditions for the appearance of possible defects due to the welding process and the methods for their reduction and elimination are presented.

**Keywords:** *weldability, brittle tearing, cracking*

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## **Considerations on the Efficiency of the Port - Constanta City Interface**

Daniel-Alexandru BOBE

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** There is always room for improvement, and one place in need of that is some of the entry points of the Constanta harbor, Gate 1.

The first thing needing improvement is the road that leads to the entry point it is a two lane road with a roundabout near the entry point, which in rush hours may cause poor driving conditions. Another thing that needs changing is public transportation, is do new itch old vehicles that are slow in traffic.

The infrastructure needs renewal, something that catches your eyes: a new facade for the entry point and buildings o the harbor, a new obelisk.

As week now pollution is a problem getting bigger by the day. One way of decreasing pollution and helping nature in the same time is the use of renewable energy: wind or wave energy, solar panels. Let us not forget that NOx eliminated by cars is also a big pollutant that should be decreased.

**Keywords:** *entry point, public transportation, pollution, wave energy, infrastructure development.*

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## **The Hydraulic Analogy**

George TURCU, Giovanni BOLOCAN

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Elena-Rita AVRAM

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This paper aims to draw attention to what could be one of the most effective methods of teaching engineering sciences, namely the analogy method. The learning process consists in the association between what is to be learned and what is already known [1]. In the light of this statement, this article aims to illustrate concisely the correspondences between certain sizes and processes in electrotechnics and hydraulics. The prevailing equivalences between the components and the hydraulic and electric systems in the industrial energy sector are presented in tabular form. Some of these are then rendered in more detail to emphasize their importance in forming a comprehensive insight into the analogy. In conclusion, not only can the analogy between concepts be a productive learning method, but it can also be used as a pattern of thinking to bring innovations in any field, especially in engineering.

**Keywords:** *analogy, electric, hydraulic, electro-hydraulic, electronics, energy, engineering, energetic agents.*

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## **Comparative Study Regarding Single Arc and Multiarc Welding in Building of a 40 m<sup>3</sup> Gas Reservoir**

Sorin CRIVĂȚ

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Assoc. Prof. PhD. Melat BORMAMBET

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In this paper are doing a comparative study about mono and multiarc welding applied for a benzine tank with 40 m<sup>3</sup> volume. The study follow identification on technic and technological solutions to obtain a big productivity and a good mechanical properties in weld metal and heat affected zone.

**Keywords:** *tank, welding procedure, monoarc, multiarc, MIG, MAG.*

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## Hydro Energy Production in Buildings

Alexandru-Nicolae ENACHE, Victor-Andrei CARAS, Luigi-Florentin FRATILA, Burak ISLEAM,  
Nicolae-Mădălin POPINIUC

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Rita-Elena AVRAM

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The growing use of variable energy sources is pushing the need for energy storage. With Pumped Hydro Energy Storage (PHES) representing most of the world's energy storage installed capacity and given its maturity and simplicity, the question stands as to whether this technology could be used on a smaller scale, namely in buildings. Demand for green energy production is arising all over the world. A lot of emphasis is laid in making the buildings green. Even a small amount of energy savings made contribute to saving the environment. In a building the water flowing in the pipe has sufficient energy to run a micro hydro turbine. The feasibility of producing electrical energy from the energy of pipe water is found. The motivation is to find the feasibility of generating power using a low-cost turbine. The PHES has some disadvantages, such as the large volume required, seem to point out PHES as an ill-suited solution for energy storage in buildings, an important finding for building design and energy policy.

**Keywords:** *Green energy, Pumped Hydro Energy Storage (PHES), Energy storage in buildings, variable energy sources, micro hydro turbine.*

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## Energy Recovery of Waste

Laura-Maria HORTU, Aila IBIȘI

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Elena-Rita AVRAM

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Considering the significant calorific value, waste characterization and massive pollution with landfills, which are not subject to ecological management, energy recovery has been pursued, while at the same time reducing the risk of pollution. In the past, almost all municipal waste has been stored underground without being treated beforehand. Until recently, the main alternative, taken into account in this procedure, was incineration. Incineration of municipal solid waste is a debated waste management technology. In some countries, it is the main waste management option, while in other countries this has been ignored on the premise that it leads to the destruction of natural resources. This activity compromises recycling through the fact that it requires a constant waste stream, contributes to global warming, and causes air pollution through emissions and toxic dusts resulting from such a process. Local authorities have begun to consider other options for waste management, such as plasma gasification. This presentation explains how this process works and the benefits of using it.

**Keywords:** *waste, energy, plasma, gasification.*

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## **Non-Destructive Testing for Welding Qualification Procedure Used for the Execution of the Double-Board Section on 9000 TDW Oil/Chemical Tanker**

Ana-Maria IGNAT

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Assoc. Prof. PhD eng. Melat BORMAMBET

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This article is about the non-destructive testing for Welding Qualification Procedure used for the execution of the double-board section on 9000 TDW oil/chemical tanker.

The qualification of welding procedures was made in agreement with SR EN ISO 15614-1:2008-„Specification and qualification of welding procedures for metallic materials. Welding procedure tests. Part.1: Arc and gas welding of steels and arc welding of nickel and nickel alloys.”

A welding procedure is qualified if the imperfections in the test piece are within the specified limits of quality level B in EN 5817:2015.

**Keywords:** *welding, non-destructive testing, visual testing, ultrasonic testing, liquid penetration testing, butt weld.*

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## **The Use of the Microbial Cell in the Process of Water Treatment, with the Production of Electricity**

Simona IORDACHE, Adriana PĂUNESCU, Mădălina VERDEȘ

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Elena-Rita AVRAM

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In this article we are showing the benefits of using the microbial fuel cell in the process of wastewater treatment, which has been widely studied in the last years. A microbial fuel cell (MFC) is a device that uses bacteria as catalysts to oxidize organic materials and generate current. This process is one of the best alternative sources of energy production which adds wastewater to the list of renewable resources of energy.

Studies prove that continuous electricity generation can be obtained by using different biodegradable fuels including pure substrates such as acetate and organic pollutants in wastewater. This method is an innovative technology which has been a major progress for bioconversion processes in the electricity generation.

**Keywords:** *microbial fuel cell, wastewater treatment, bioconversion, electricity generation.*

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## **MyScada Systems for Monitoring Thermal Power Plants**

Ștefan ROIBU, Marcel STOIAN, Hiulia-Elis MUSTAFA,  
Ciprian-Constantin APALAGHIȚEI, Lucian-Valentin STOIAN  
*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Assoc. Prof. PhD Gabriel PRODAN  
*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** With the help of a MyScada application, an application was developed to monitor and record the working temperature of the working agent in the circuit of a heat exchanger. The working fluid temperature is achieved by means of Dallas temperature sensors that work together with an Arduino + Shield Ethernet data acquisition board.

**Keywords:** *MyScada, Arduino, Shield Ethernet, boiler, temperature.*

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## **Wind Energy: Trends and Enabling Technologies**

Bogdan-Alexandru UNTARU, Ion-Alexandru ȘERBAN, Cosmin-Mihai DUMITRU, Mihai CIOBANU,  
George-Daniel BOGDAN, Ionuț-Cristian MOCANU  
*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. AVRAM Elena - Rita  
*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The problems that directly affect our planet are caused by the use of fossil fuels to cover the global energy needs. One of the worst consequences of using these types of fuels is the increase in CO<sub>2</sub> emissions that could reach 36 billion metric tons in 2020 and 45 billion metric tons by 2040. Another consequence is the increase in the population that is expected to exceed 9.6 billion inhabitants by 2050, which implies the need to use renewable energy sources, including wind energy.

The objectives of the article are sustainability and reduction of carbon emissions as well as the costs generated by wind systems and economic policies to promote them. Another aspect addressed in the paper is represented by the challenges, both economic and social environmental.

**Keywords:** *global energy needs, sustainability, reduction of carbon emissions, renewable energy sources, wind energy.*

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## **Analysis of Welded Joints and Determination of the Welding Process for the Production of LPG Cylinder with the Volume of 4.75 m<sup>3</sup>**

Adrian VIDINEI

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Assoc. Prof. PhD eng. Melat BORMAMBET

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This paper presents the analysis a welds and welding procedure establishing for a GPL tank with 4.75 m<sup>3</sup> volume. After identification a welded joints from the structure we do an optimization a welding procedure using a technical factors method. This analyze it is an step in decide the optimal welding procedure and obtain a welded joints with a good mechanical properties.

**Keywords:** *GPL tank, welds, welding procedure, methods.*

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**SECTION III**

***MARINE AND NAVAL ENGINEERING  
STUDENTS SESSION***

## Modern Techniques to Simulate Ballasting and De-Ballasting the Ship

Maria-Cătălina ACSENCIUC

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In this article is discusses about the ballasting and de-ballasting operations of the ship in accordance with the rules laid down in the international conventions (BWM Convention), highlighting the importance of ballasting the ship under actual operating conditions. The study case aims to reproduce the ship's ballast process using the LCHS System simulator created by Transas. It has been pointed out the modifications of specific ship parameters such as the angle of inclination, the trim, the draft at the aft and the aft, depending on the specific ballast stages of the ship in two stages: in the first stage, the ship is de-ballasted with fully loaded tanks and in the second stage the ship has empty ballast tanks, we unload the cargo onboard and we complete by onboard the ballast water. Also, the changes in the ship's shear force and bending moment diagram and the metacentric height data were analyzed.

**Keywords:** *BWM Convention, LCHS System, shear force and bending moment diagram, ballast, ship.*

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## Analysis of Integrated Propulsion and Governance Systems POD`s and AZIPOD

Nicolae-Cătălin BĂLCESCU

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The paper presents a study of the technical characteristics and performance of POD`s and AZIPOD propulsion and governance systems. This article explores the main advantages and disadvantages of these new propulsion systems compared to conventional propulsion systems. In the first part of the paper we analyze the classic type of steering and propulsion, namely the modern systems POD and AZIPOD. In the second part of the paper AZIPOD azimuth system is studied. Finally, some consideration is given to the space occupied by the propulsion system on board the ship, considerations of the volume of cargo used and the ship's handling capacity.

**Keywords:** *modern systems POD`s and AZIPOD, steering rudder, propulsion.*

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## **Dynamic Positioning System and it Uses in the Naval Industry**

Ionuț-Gabriel CARAIGNAT

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Assoc. Prof. PhD eng. Greti-Mihaela CHIȚU

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** A dynamic positioning system (SPD) is a complex control system that proceses information from different sources, analyzes them and then take action to keep the ship at a certain point. The possibility of fine precizion that dynamic positioning systems can provide has led to the expansion of the operational window for seagoing work in calm weather to stormy weather. In the present paper we will study the dynamic positioning system on some of it working sides like mode of operation, its role on the ship and its influence on the stability of the ship during operation, advantages and disadvantages of using this system.

**Keywords:** *dynamic positioning system, offshore ships, stability of the ship, naval drilling.*

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## **Optimization Study of Techniques and Technology to Obtain Fresh Water on Board**

Mariana-Elisabeta TANUR (CÎRLIG)

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Maintaining water quality requires special measures because water degrades over time. These measures aim the water treatment maintained in order to reduce the number of microorganisms below the allowable limit in the reports numbers the increased size and number of cruise ships has led to concerns on the impact of their waste discharges on the natural environment. In the industry innovations like biological degradation, treatment plant technology or multi-stage flash evaporation plants. The innovation of it is based on biological degradation and membrane separation. This process produces the highest quality discharge without requiring any addition or generation of chemicals that are hazardous to the environment or ship operation. These plants are used for ships and on land based installations for producing process and potable water and are also used for reduction of the volume of industrial waste water.

**Keywords:** *biological degradation, treatment plant, multi-stage flash evaporation plants.*

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## **Estimating the Forces Acting on an Anchored Ship**

Andreea-Lidia DIACONU

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This paper presents general guidance on the assumptions made and the methodology used to estimate the forces acting on a ship at anchor in different environmental conditions. The process described in this paper is a simplified approach to estimating these forces and is designed to be achievable through the application of relatively straightforward calculations. As a result, a number of assumptions have been made which are briefly described. Calculations consider the environmental forces acting on an anchored vessel from wind, current and waves. For wind and current loads, data is presented in the form of non-dimensional coefficient curves, for wave drift forces, three dimensional surface plots are presented.

**Keywords:** *ship, anchor, external forces, environment condition, assumptions, graphics.*

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## **Study of Dimensioning Methods of Centrifugal Purifier**

Nicoleta IFRIM

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In this paperwork is presented the study of dimensioning methods of centrifugal purifier. The separating centrifugal separator is a machine in which two liquids of different densities are separated from each other. Solids may also be separated at the same time. Using centrifugal force, they are used for separating suspensions consisting of two or more phases of different densities, i.e. they can be used for liquid-liquid separation, for liquid-liquid-solid separation or for liquid-solid separation. They are equal as effective at separating liquid mixtures at the same time as removing solids. Gravity disc work on the back pressure of separated water, it limits the flow of separated water hence it holds the water inside the purifier and builds up the back pressure. If diameter size is large, then more water will flow out of the purifier and oil and water interface will expand out word and if diameter size is small then back pressure of separated water is higher than it will push the oil layer inward and interface of oil and water will shift inside. Gravity disc size now can be determinate using four methods which will be analyzed in the content of this paperwork.

**Keywords:** *purifier, gravity disc, interface, suspension, centrifugal force, back pressure.*

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## **The Study of Residual Stresses and Deformations Due to Welding Processes**

Ionuț IUREA

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In this paper, it's about the non-demountable joining of metal parts, using local heating and / or pressure, with or without the use of fillers. Identify welding schemes and specific welding techniques and determined the deformations and stresses in the metallic structure, in the case of welding of the ship floor.

**Keywords:** *metal parts, welding schemes, welding techniques, deformations, stresses, ship.*

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## **Analysis of the Automation Processes of the Pipeline Manufacturing Line**

Nicoleta-Diana MĂLĂIESCU

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In this paper we will talk about the benefits of optimization of the pipeline manufacturing line. In the first part of the paper is analyzed the automated welding process compared to manual process specific to the technological flow of piping manufacturing. And in the second part is analyzed the automated cutting process. The work will be completed with a comparative study on the manual and the automated cutting process.

**Keywords:** *cutting machine, welding machine, optimization, process.*

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## **Hydrodynamic Analysis of the Heavy-Lift Ship with Weight on Board**

Mihai-George MALAȚOV

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This paper work analyses hydrodynamic behavior of a heavy-lift ship. Initially, it analyses docking operation of a heavy-lift vessel. For this ensemble, in different exploitations situations, it studies hydrodynamic forces that manifest on this ensemble and its reactions.

**Keywords:** *hydrodynamic forces, heavy-lift, ensemble, docking operation*

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## **The Study of Ship Roll Stabilization Systems**

Raluca-Maria MARCU, Florentina-Irina MACHIDON, Larisa-Mădălina ONICEANU

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Disturbing movement is a secondary movement of a solid body relative to the main axis of inertia of the ship. The mobile system can have at most six disruptive movements, usually oscillating, three along the longitudinal, transverse and girder axis and three around them (rolling, pitching and yaw disturbing movement). The roller is the balance movement around the longitudinal axis due to the high waves parallel to the forward direction of the ship. In sailing, pitching is the longitudinal movement of a ship in marsh or stationary.

The phenomenon that causes the ship to deviate from a road through sudden jumps, regardless of the action of the carriage, is called lurch. Stabilization systems can be broadly classified into: Passive systems- in which no separate source of power is required and no special control system like the Bilge keel and Active Systems- in which the moment opposing roll lies produced by moving masses or control surfaces by means of power like the active fins. The conclusions from the study are about the importance and usefulness of these systems for operating the ship in good condition.

**Keywords:** *stabilizer, oscillations, rolling, pitching, yaw, ship motion*

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## **Structural-Constructive and Aerodynamic Analysis of the Flettner Rotor**

George-Ciprian MITACHE

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinators: Assoc. Prof. PhD eng. Teodor POPA, Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Wind is a renewable and environmentally sound source of energy that is freely available on the world's oceans. As shipping faces the challenge of reducing its dependence on fossil fuels and cutting its carbon emissions this paper seeks to explore the potential for harnessing wind power for shipping. I will analyze the unconventional marine propulsion system that is based on the Magnus Effect principle. I will present the operating principle of the Flettner rotor along with the strengths and weaknesses of this innovative technology.

**Keywords:** *Flettner rotor, ship, unconventional system, wind, Magnus Effect, fuel*

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## **Some Considerations about Modern Propulsion Systems**

Nicoleta PODAȘCĂ (DOHOTARIU)

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The paper presents aspects and trends in ship propulsion. Two propulsion systems have been reviewed: pod-propulsion and azimuthing thrusters. Pod – propulsion is an industry standard today in passenger cruise and has been applied also for product tankers, icebreakers and offshore vessels. Space saving is obvious, big propulsion motors are moved from the tank top outside the ship. An azimuthing thruster replaces a conventional propulsion and rudder steering system, which perform both the propulsion and steering function.

**Keywords:** *ship propulsion system, offshore vessels, azimuthing thrusters, Pod's, Azipod*

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## Techniques for Simulation and Optimization of the Thermodynamic Cycle of Marine Engines

Paula-Daniela SURDU

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This paper aims to present the 3D6S Diesel engine which equips „Ovidius” school ship. The first phase presents an analysis of thermal regime and the characteristics of four-stroke naval engines with compression ignition (CIE). In the second phase is presented the indicated diagram with p-V coordinates and the thermodynamic cycle with the CyclePad software simulation. The paper finishes with the influence of compression ratio on thermal efficiency.

**Keywords:** *thermal regime, CIE, diesel engine, CyclePad, thermodynamic cycle, compression ratio*

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## Different Methods of Stability and Rolling Behavior of Ships

Alexandru-Florin SÂMPETRU

*Student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinators: Assoc. Prof. PhD eng. Teodor POPA, Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Severe ship motion is often the limiting factor for performing offshore marine operations from a ship-shaped single hull vessel. Excessive motions may complicate the operations and may cause damage to the ship hull structure, the ship machinery and/or the ship equipment. Both human factors as acceleration induced human fatigue, and technical factors as structural failure due to e.g. slamming loads, propeller ventilation or inertia forces due to high accelerations, can be the reason to abort a marine operation. The roll motion is particularly important, as it has very low damping and may also lead to capsizing.

Roll reduction systems are often classified into passive and active systems. An example of a passive system is the free surface tank, where water (or some other fluid) is allowed to flow freely inside the tank, and the effect of the internal flow is to counteract the motion of the vessel. The idea behind the active systems is that the counteracting moment is controlled in some way or another. Over the years, several various systems have been proposed to actively reduce the roll motion. In this work I will describe some of them, systems who are used both on commercial vessels and also on yachts.

**Keywords:** *stability, gyro compass, dynamic position.*

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**SECTION IV**

***DEBUTANT-ENGINEERS RESEARCHERS  
STUDENTS SESION***

## **Maintenance Methods of Onshore Machines and Installation**

Florin-Cătălin BĂLAN

*Master student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The physical machine wear can be improved by his maintenance system activities, as well as a set of operations of controls and revision, which will allow the detection in time of eventually defections.

All this control, revision, maintenance and machinery repair activities directed in the purpose of keeping in working conditions on a long time, sets up what in specialty literature is called maintenance system and repair of machinery.

**Keywords:** *maintenance, control, revision, system, repair, machinery, crane.*

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## **Calibration of Torsion Meter in Sea Trial on Shaft Line**

Gabriel-Dumitru BOJOI

*Master student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This article proposes to highlight the stages of calibration and verification of axial load requirements in large samples, as engine parameters to be in operating mode standards.

**Keywords:** *axial line, calibration, large samples, vibrations, torsion, engine, Torsion Meter.*

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## **Analysis of Cracks in the Main Trolley of the 52 t / 28 m Deck Bridge**

Nicolae-Viorel DOROȘ, Seczat ILHAN

*Master students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** It was determined that at the main used to load/unload ships there are some cracks in the structure of the chassis. The way they appear and the crack evolution in time are not know but it is quite sure they were done which increases the induced efforts and stress value in the area and chassis structure. Further, there are remarks on the cracking mechanics and crack dynamics; on the induced strew at crack peaks and cracking criteria for the elastic and elastic-plastic models. Some conclusions are drawn regarding the case shown and the way it must be mended.

**Keywords:** *load/unload ships, chassis structure, trolley cranes, efforts and stress, crack dynamics, elastic-plastic models.*

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## **Evolution of Cranes**

Victoria-Cristiana RADU

*Master student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** The evolutionary progress has forced man to lift his outlook to the highest heights and thus forced him to create ways to enhance his ideals in order to achieve the full efficiency of space and materials.

As such, this work aims to effectively detail the revolutionary development of the device that has allowed the continued ascension of the human being over time.

**Keywords:** *cranes, progress, winch, windlass, Filippo Brunelleschi, Leonardo da Vinci.*

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## **Prevention System for the Multiple Water Mixing with Salt Water at Navodari Sluice-Gate**

Iuliana TOMA

*Master student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In order to determine the parameters of the hydraulic cylinders for the prevention of pollution saline and frost sluice-gate at Navodari, it is considered like hypothesis of calculation, that a fixed wall is located between the two liquids are in motion and at the same level of hydrostatic motor. It calculates the difference in pressure on the wall.

**Keywords:** *the pressure difference, the sluice gate, salted water, fresh water.*

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## **Thermal Analysis of Heterogeneous Welding**

Elvira-Augustina USTINOV

*Master student, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Alexandru PINTILIE

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This article refers at the thermal analysis of an heterogeneous welding with Ansys analysis program. The welding of two different materials produces a particular influence in each material because of heat and composition of it. The analysis is made between structural steel and stainless steel.

**Keywords:** *analysis, thermal, steel, stainless, structural.*

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## **Designing of the Discharge - Loading Installation - Derrick**

Gigi DODE, Georgian DOROIMAN, Andrei HERCIU

*Master students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Maritime transport vessels are generally equipped with a handling facility for special construction goods for the purpose of carrying out cargo discharge operations. This paper aims is to present this installation, called loading / unloading that is adopted and designed in relation to the ship's destination. The loading / unloading facility offers the possibility of handling goods independently of the port facilities, thus ensuring their operability in any port of call.

**Keywords:** *loading / unloading, cargo, transport vessel.*

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**SECTION V**

***THE PREAMBLE OF ENGINEERING  
STUDENTS SESION***

## **Draw a Trajectory Using Matlab**

Sebastian NECULAI, Andreas BĂLAȘA

*Highschool students, „Alexandru Ioan Cuza” Marine Technical College Highschool of Constanta*

Coordinator: Prof. Irina PAVEL

*„Alexandru Ioan Cuza” Marine Technical College Highschool of Constanta*

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**Abstract** Mathematical models are often used in various fields of activity, due in particular to their ability to rigorously condense the essence, and their ability to be programmed using electronic computers.

MATLAB (MATrix LABoratory) is a high-performance, interactive program package for mathematical, scientific and engineering computing.

As an experimental model, in the paper I have exemplified the applicability of Matlab in the field of maritime transport by determining the loxodroma for certain angles. Loxodroma is the curve drawn on a map of the earth globe, which cuts all meridians at the same angle.

**Keywords:** *modeling, trajectory, mathematical models, Matlab, loxodroma.*

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## **The Mooring System**

Bogdan-Adrian PÂNTIA

*Highschool student, „Alexandru Ioan Cuza” Marine Technical College Highschool of Constanta*

Coordinator: Prof. eng. Mirela DEDIU

*„Alexandru Ioan Cuza” Marine Technical College Highschool of Constanta*

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**Abstract** The mooring system has the role to ensure the link between the ship and the sea bottom, in special designated places and on relatively low bottoms. The ships may stay moored in the port basins or port roads, or in coastal places (shelters) according to the coastal type on bad weather. The ship is fixed to the bottom of the waterway with the help of the anchor, through the anchor chain that can be lifted on board with the anchorage system. In order to allow a secure mooring of the ship and the release of the anchor at lifting, the anchor is made in such a way that the friction force is maximum when there is a horizontal force applied on it, and minimum when the force applied is vertical.

**Keywords:** *anchor, flexible knots, stopes, windlass capstan, anchor capstan, buoy line, hawse chain.*

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## **Liquefied Gas carriers and their Operational Technologies**

Adrian-Laurențiu PĂUN

*Highschool student, „Alexandru Ioan Cuza” Marine Technical College Highschool of Constanta*

Coordinator: Prof. eng. Mirela DEDIU

*„Alexandru Ioan Cuza” Marine Technical College Highschool of Constanta*

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**Abstract** The Liquefied Natural Gas carrier is a tanker ship used for transporting liquefied gases in bulk as well as liquefied and refrigerated gases. Liquefied Petroleum Gases – L.P.G. – are gases resulted from the oil refinement: butane, propane and butadiene. These refinery gases are transported as liquids with the help of specialized tanker ships that take the name of the liquefied gases they carry: butane tanker, propane tanker, propene tanker, etc. Liquefied Natural Gases – L.N.G., come from shafts and represent a mixture of various gases transported with LNG tanker ships, the temperature of the gases being -164 degrees Celsius.

The transport on sea of the liquefied gases requires the building of complex port terminals or of some offshore terminals that developed along with the evolution of the ships.

**Keywords:** *tanker ships, ships with membrane tanks, ships with self-supporting tanks, semi-refrigerated tankers, fully-pressurized tanks, port terminal.*

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## **The Universe: The Fight of Religion and Science**

Andrei-Ștefan PINTILIE, Victor-Cristian AXINCIUC

*Highschool students, "George Călinescu" Theoretical Highschool*

Coordinator: Prof. Nicolae LAZĂR

*"George Călinescu" Theoretical Highschool*

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**Abstract** The main subject will be the creation of the universe. A conflict will spark between religion and science and the winner will be the one that seems more „realistic”. As we will present both of them, things will start binding so that we can come up with the best response for a question that no one can answer to: Was it God who created the universe, or the big explosion that everyone call „THE BIG BANG”?

**Keywords:** *Space, Religion, Science.*

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### **8-Bit Decoder**

Claudiu-Ionuț CRISTEA, Cornel-George VIDEANU  
*Highschool students, Technological High School of Electrotechnics and Telecommunications  
of Constanța*

Coordinator: Prof. eng. Costea CARMEN  
*Technological High School of Electrotechnics and Telecommunications of Constanța*

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**Abstract** A device used for decoding a 8 bit binary code into ASCII characters that are displayed on a LCD Display.

**Keywords:** *binary, ASCII, decoding.*

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### **Distomat**

Adrian-Ovidiu GHEORGHE  
*Highschool student, Technological High School of Electrotechnics and Telecommunications  
of Constanța*

Coordinators: Master Instructor Nicolae OASE, Prof. Elena STURZA  
*Technological High School of Electrotechnics and Telecommunications of Constanța*

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**Abstract** At the moment, all cars with a manufacturing year beyond 2013 have implemented the ultrasound or infrared detection system. It helps the consumer to park the car with greater precision due to the fact that the car has a board, a display that shows the driver the distance to the front of the car or the back of the car.

**Keywords:** *automobile, detection, ultrasounds, Arduino.*

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## Playing Sounds with Arduino Sounds

Bogdan ȚUȚUIANU, Cătălin CONSTANTIN

*Highschool students, Technological High School of Electrotechnics and Telecommunications of Constanța*

Coordinator: Prof. eng. Carmen COSTEA

*Technological High School of Electrotechnics and Telecommunications of Constanța*

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**Abstract** Arduino is an open-source hardware and software company, but also a community that connects all of its users. They design and produce kits with microcontrollers to produce both digital projects and some who can interact with the physical world outside. This plate uses Atmega microcontrollers in multiple varieties.

**Keywords:** *Arduino, open-source, sensor, microphone, microcontroller, breadboard.*

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## Ecological Fuels. Liquid Hydrogen

Marian ALECU, Sezen ALI, Iulia BACIU, Marian CIOARĂ, Bianca PARPALEV

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD Elena - Rita AVRAM

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Since the global warming does not give us any chance and one of its main causes is represented by the NO<sub>x</sub> eliminated by the outstanding number of existing engines, the time of fossil fuels is almost gone and they need to be replaced gradually and efficiently.

Liquid hydrogen is an alternative to these fuels, it has no harmful effects, basically by burning liquid hydrogen, only water is eliminated in the atmosphere in vapour state. It can be used for internal combustion engines with pistons, but also in combustion cells thus creating electric engines.

Of course, every new start is difficult, and replacing fossil fuels with liquid hydrogen is something that would be done in a long period of time, but doing this replacement to public transportation would be a great start considering the fact that they are always powered from the same source, not different gas stations. This can be a good promotion for the usage of liquid hydrogen as a fuel.

**Keywords:** *liquid hydrogen, bus, engine, fuel.*

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## Historical and Contemporary Landmarks of Constanța City Port

Viștian BENEĂ, Ionela-Larisa TUMBEA, Irina TĂNASE

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** Following our research on this project, we have set out to explore and centralize these aqueduct galleries. When arriving at their airfields either in front of the Mosaic Edifice or even in the Carol I Park, we noticed a lack of interest of the authorities in the status of these landmarks, either in terms of tourism development or economic development. Awareness of this disinterest is the first step in the economic development, primarily of the Commercial Port, by facilitating access to it. Renovation of galleries would be an important point in projects to improve the transport of goods and access of port workers to workplaces or visitors to the port.

**Keywords:** *city, port, infrastructure, galleries, gates, access, mobility, efficiency, transportation.*

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## Consideration of Technologies, Tools and Equipment of Execution of the Artificial Islands

Cosmin-Andrei CANAREICA, Elena IVAN

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In this paper we are presented technologies and equipment used in the execution of any work on the high seas. The case study refers to the carrying out of the group of artificial islands in the form of a palm, The Palm Island in Dubai. The idea it was absolutely fabulous, appears to be unusual, but machinery, installations and equipment necessary for the realization of such a project have degree of universality and belonging to the firms Jan De Nul Group, in Luxembourg and Van Oord Dredging and Marine contractors, in the Netherlands. Specify that the latter has been carried out and the work expansion with 42 ha of illuminating the Romanian seaside, 2015. The work of the front is attractive because there are few people who know how the islands in Dubai were constructed.

**Keywords:** *trailing suction hopper dredger, artificial islands, expansion of the seaside, equipment for construction.*

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### **Renewable Sources of Energy in Port of Constanta**

Cristina CANDOI, Mădălina-Andreea CIOBANU, Doina CONDRAT, Oana GHILEZAN, Teodora GOGA  
*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD Elena-Rita AVRAM  
*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** In this paper a concept that has the aim to replace the electricity in port of Constanta with alternative energy sources is presented. To achieve this goal we will take into consideration to use the energy from the sun and wind energy. Renewable energy refers to forms of energy produced by transferring the energy from renewable natural processes.

"The Solar cell" is an electrical component that directly converts the radiation energy, usually solar radiation into electricity. This property of converting the radiant energy is based on the photo-voltaic effect, which is a particular case of the photoelectric effect.

The wind energy is a clean and renewable energy, but it is intermittent, having variations during the day and season, and even from one year to another. Using vertical wind turbines can be favourable in ports because they can be easily mounted on buildings, they do not make a lot of noise and they can also catch the lowest wind breeze.

**Keywords:** *sun, wind turbine, wind, renewable energy, photo-voltaic, energy.*

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### **Considerations on the Modeling of Marine Drilling Installation and Equipment**

Andrei DUMITRU, Florin-Critian MOISE  
*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinators: Lecturer PhD eng. Mirela COTRUMBĂ<sup>1</sup>, eng. Daniel NEAGU<sup>2</sup>

<sup>1</sup> *Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

<sup>2</sup>*Group Petroleum Services*

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**Abstract** In this paper there are presented offshore drilling technologies with the help of self-lifting platforms, the focus being on the Prometeu platform of Group Petroleum Services (GSP) Constanta. The authors participated in the thematic study on „Construction, Functioning and Working Conditions on a Marine Structure for Drilling”, organized and carried out at GSP and thus the idea was born of this work, which ends with the modeling of platform and of the installations on the Prometeu platform.

**Keywords:** *drilling technologies jack up drilling rig, modeling, installation, Prometeu platform.*

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## **Considerations on Modeling of Installation and Equipment for Assembling and Installing Submarines Pipelines**

George-Robert NICOLAU, Florin-Cristian MOISE, Elena-Mădălina VASILE

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD eng. Mirela COTRUMBĂ

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract:** This paper presents the technology for assembling and installing submarine pipelines using the barge of Group Petroleum Services (GSP) Constanta. The authors participated in the thematic visit titled „Construction, Operation, Technology Flow and Working Conditions on a Marin Structure for Assembling Submarine Leaders”, organized by the faculty at GSP and thus the idea of this work was born. It presents the S-LAY type of launching technology of the pipes and the modeling of the BIGFOOT1 barge

**Keywords:** *launching pipelines, Bigfoot1 barge, upgrading, S-lay launching, technological assembly stages, modeling.*

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## **Combating Air Pollution by Reducing Emissions**

Vlăduț DUMITRAȘCU, Bogdan MIU, Ionuț TUDOR, Robert SLABU, Denis CURSEIT

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD Elena- Rita AVRAM

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** One of the great challenges of pollution levels reached by mankind, mainly due to fossil fuel combustion, refers to the global temperature rise. Basically, emissions contribute accelerated degradation of biomass. Most know that after the Government Emergency Ordinance no. 9/2013, regulating environmental stamp for cars, it was repealed by Law no. 1/2017. Romanians are "ecstatic" because now you can much more easily registered a car with pollution norm under euro 4. Given that in a few months data estimates about 130,000 Volkswagen cars under Euro 4 they were registered in previous months. Given the financial situation of the population in Romania I says Law. 1/2017 is "the most generous gift" from the Romanian government.

But we must be aware that with the increasing number of old cars registered, emissions will increase dramatically, so we can expect a biological conflict in the coming years.

In this sense, different solutions can be addressed, affordable to maintain control of emissions by implementing mandatory on any car a catalyst that advanced particulate filter, predominant use of HEPA filters, Disallow EGR on cars, promoting implementation of LPG as fuel plants because its emissions are almost insignificant compared to that diesel fuel. Collectively, these solutions will ensure a cleaner climate and of course major pollutant decrease disease risk in considerable percentages.

**Keywords:** *pollution, cleaner climate, filter, catalyst, emissions.*

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## Optimizing of Public Transport. Bus with Electric Motor

Tudor NICULACHE, Andreea-Mădălina ȚILINCĂ, Andreea-Georgiana DRĂGHICI,  
Adina MOISE, Cristian GORDIN

*Students, Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

Coordinator: Lecturer PhD Elena- Rita AVRAM

*Faculty of Maritime, Industrial and Mechanical Engineering, Ovidius University of Constanta*

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**Abstract** This paper is referring to the optimization like a set of research, operational work that seeks to find the best solution to solve problems with a strong impact on the environment. One of the most important issues faced in this article is the pollution. At present, public transport is the main malefactor for acute urban pollution by emissions. To solve them, a solution would be to implement and adopt the replacement of the diesel engine of the public transport buses with an electric motor. In any field there are advantages and disadvantages. The advantages of the electric motor to the diesel engine are: zero physical and chemical pollution and very low noise pollution; reducing CO<sub>2</sub> and NO<sub>x</sub> emissions but also fuel costs; the use of electricity from renewable sources (hydro power plants, wind farm, photovoltaic panels). The disadvantages of the engine are: they have a low battery life; recycling and storage of batteries entails high costs; the cumbersome loading of these batteries, the lack of a proper charging infrastructure on our country. But at the moment there are foreign companies that develop ultra-fast charging systems for condensers, as well as the installation of high-power chargers with a shorter duration. The solution of the production of such charging technologies in the territory of our country would prove necessary and beneficial, given the increased interest of the authorities, as well as of the citizens for electric motor transport. In conclusion, the adoption of these engines would increase economic autonomy, with a view to developing and optimizing transport, as well as being an important step for the environment, reducing pollution as much as possible.

**Keywords:** *electric motor, electric bus, renewable energy, pollution, public transport.*

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