ABSTRACT
MECHANICAL AND ELECTRICAL SCIENCE

BEAZIT ALI, ANASTASE PRUIU, ADRIAN POPA, LEVENT ALI
Naval Academy, Constanţa, Romania
METHOD FOR OBTAINING THE CHARACTERISTICS OF WINGS

Abstract: *This scientific work presents the way in which the small, and very small span wings can be obtained starting from the great span wings and using the two scales of the similarity theory. Basing on two scales model it can transcribe from a model at nature the coefficients c_x, c_y and lengthening λ of Gottingen - 612 profile.*

BEAZIT ALI, ANASTASE PRUIU, ADRIANA SPORIS, GHEORGHE ICHIMOAEI, LEVENT ALI
Naval Academy, Constanţa, Romania, Bureau Veritas Romania Controle International, Romania
FEATURES'ANALYSIS OF SMALL AND VERY SMALL SCALE WINGS EXPERIMENTED BY AERODYNAMICS TUNNEL AND CONFRUNTED WITH THE TWO SCALES SIMILARITY THEORY

Abstract: *It compares the NACA 6412 profile and the NACA 0015 profile specific features experimentally with using the two scales similarity theory. The results confirm the fact the two scales similarity theory represents a simple and method establish the hydrodynamic special features of profiles.*

BEAZIT ALI, ANASTASE PRUIU, ADRIANA SPORIS, GHEORGHE ICHIMOAEI, LEVENT ALI
Naval Academy, Constanţa, Romania, Bureau Veritas Romania Controle International, Romania
THE STABILITY ANALYSIS OF HYDROFOILS BOATS

Abstract:The lateral and longitudinal stability of hydrofoils which have an important interstice at the speedy boats market and especially used widely at the seas without wave beyond last years is analysed in this paper. The stability of hydrofoils especially for Surface Piercing types is important for the passenger and security of the cargo because of not having wet surface area when they cruise at high velocities on their foils at hard sea conditions.

AURELIA CHIOIBAS
Naval Academy, Constanţa, Romania
WAYS TO MEASURE CERTAIN SPECIFIC PARAMETERS DRAWING PROCESS

Abstract: *For proper conduct of thin sheet metal drawing process it is necessary to know the size and variation work force during the power stroke. One method of measuring forces involves using transducers resistive strain gauge, which is based on the property of electrical conductors to electrical resistance change lengthening or shortening to them. The principle of this method consists in measuring the variation in resistance of an electrical conductor insulated and fixed to a metal spring which acts on the external force which causes elastic deformation as the workpiece and the conductor. At the force variation, varying the electrical resistance of the conductor, through calibration can establish a link between the force acting and intensity variation of voltage or a current that flows through the conductor that can be conveniently measured by means of electrical measurement. Dynamometric sensing device used to measure the deformation force needed.*

AURELIA CHIOIBAS
Naval Academy, Constanţa, Romania
MODELLING OF THE DRAWING PROCESS PARAMETERS USING EXPERIMENTAL DATA - THE CASE A PIECE OF STEEL

Abstract: *This modeling is accomplished through surfaces responses method. The proposed method considers the links between process parameters and corresponding responses as surfaces in the dimensional space of variables. In this method the independent variables are varied simultaneously, taking a limited number of values considered in the experiment, called levels. This enables the highlighting interactions between independent variables, which contributes to more accurately determine the global optimum. Although the independent variables are varied simultaneously, their main effects and higher order and their interactions can be determined separately so that it can establish order and exclude those variables influence without significant influence.*

DORU COSOFRET, MARIAN BUNEA, CATALIN POPA
Military Technical Academy, Bucharest, Naval Academy, Constanta, Romania
MANAGERIAL INSTRUMENTS FOR ENERGY EFFICIENCY IMPROVEMENT ONBOARD TO OPERATING SHIPS

Abstract: The operating ship, and especially those ones older than 10 years, is the most affected by the IMO enforced standards, because of the deficiency and insufficient applicable instruments as existing in the international practice, due to the technique misalignments and the implementation costs impact against the freight rate levels. Once the structure of the world fleet counts 32% share of the old ships as reported for 2015, the conception of new improvement methods becomes very important and most of the specialized companies and seeking for practical solutions in respect of energy efficiency. Overcoming these needs, the approached research as presented in the paperwork is proposing a new algorithm for cost-benefit analysis, conceived by the authors as a pragmatic solution for optimizing the energy efficiency onboard the old operating ships, exceeding 10 years in service.

OVIDIU CRISTEA, ARNOLD MOLDOVAN, NICOLAE BADARA, MIHAI BALACEANU, MIRCEA TARHOACA, AURELIAN-SORINEL CALINCIUC
Naval Academy, Constanta, Romania
A GREED AND SELF-POWERED LIFE RAFT FOR SEAFARERS

Abstract: The renewable energy systems are widely use, starting with powering the NASA's satellites and ending with standalone water pumping systems. There are grid connected and off grid renewable energy systems, from the level of GW power to the level of a few KW installed power. This article presents an idea which tries to implement the renewable energy systems where is more applicable, where there is a desperate need for electric energy and this one is definitely missing. An application of this kind is the implementation of PV modules on board of life rafts. A simulation in PVsyst of a self-powered life raft is presented.

OVIDIU CRISTEA, NICOLAE BADARA, AURELIAN-SORINEL CALINCIUC, ANDREI ANDRIES
Naval Academy, Constanta, Romania, ANCOM Bucharest, Romania
A METHOD TO ACQUIRE AND PROCESS THE ANALOG RADAR SIGNAL

Abstract: In our days the RADAR systems are essential to navigation for maritime, aeronautical and terrestrial applications. Basic RADAR systems were developed using analog components and some of this RADARs are still functioning due there good performances and redundancy; a very good example is found onboard of military vessels. Because in our days the RADAR systems are digital and because these RADARs need to work in the same network with the analog RADARs, this fact conducts to a much debated research theme: to realize a RADAR extractor which will make the analog RADARs compatible with digital ones.

DORIN ANDREI D. DASCALU
„ION MINCU" University of Architecture and Urbanism, Bucharest
THE IMPACT OF ARTIFICIAL LIGHTING ON THE CREW OF THE MARITIME TRANSPORT SHIPS

Abstract: the work presents the complex influences of the activity program on the crew   of the maritime transport ships from the point of view of the fragmentation during the day, as well as the fact that the technical personnel has mainly indoor activities which require artificial light, and thus causing the biological rhythm and the circadian cycles to lose correlation.

DORIN ANDREI D. DASCALU
„ION MINCU" University of Architecture and Urbanism, Bucharest
POSSIBLE LOW TECH NATURAL ILLUMINATION TECHNOLOGY ON-BOARD MARITIME VESSELS

Abstract: The paper treats a range of multiple solutions and possibilities of improving the ambient on board vessels by using Low tech technology

DUMITRU DASCALU
Naval Academy, Constanta, Romania
OBSERVATIONS RELATED TO THE DESIGN AND OPERATION OF AN ARTICULATED RUDDER

Abstract: Work shows a complex analysis of the effects of bearing mounting a naval articulated rudder

DUMITRU DELEANU
Constanta Maritime University

TRANSIENT AND STEADY – STATE RESPONSES FOR THE SHIP ROLLING MOTION WITH MULTIPLE SCALES LINDSTEDT POINCARE METHOD

Abstract: *In order to study the dynamic behavior of ships it is imperative to take into account the inherent nonlinearity of large – amplitude motions. Of the six motions of the ship, the roll oscillation is the most critical because it can lead to the capsizing. Among the models used in the literature to simulate a rolling ship we selected in this paper that one derived by Kan and Taguchi. The governing equation of motion contains a soft cubic term in the restoring moment, a linear damping and a single harmonic excitation forcing term. Exploiting the advantages of a new perturbation technique called Multiple Scales Lindstedt Poincare method, we succeeded to obtain the transient and steady – state responses both for primary resonance and the non-resonant case. The analytical solutions provided by the new method were found to be in excellent or, at least, in decent agreement with numerical simulations, depending on the magnitude of external excitation amplitude.*

PEDRO CASTRO FERNANDES, MARIO MONTEIRO MARQUES, VICTOR LOBO
CINAV – Escola Naval

IMPLEMENTATION OF A MACHINE LEARNING ALGORITHM IN AN AUTONOMOUS SAILBOAT

Abstract: *The sea always pumped up human's curiosity. We have been exploring it since the beginning of time. It had always an important role in the society since we make use of it in several activities like collecting resources, dispatching merchandise or just for recreating activities. The number of ships crossing the oceans is incredible high, and there are a lot of illegal activities.*

A robotic sailing boat is a complex system. It has several parts that come together in a specific order to achieve the goal of sailing. The important sensors are the wind meter, the compass and the GPS sensor, but, this project, as also other sensors like a SD card reader sensor and a 433MHz trans-receiver. This sensors describes the environment. This paper presents an online machine learning agent developed to control a small scale sail autonomous sail boat. Implement this is a big challenge, as we are running our project into an Arduino mega, clocking at the speed of 16 Mhz. Design this agent is complex, because, sailing depends on a lot of variables, and we have restricted processing capacity. In this paper we describe the variables that we used to construct the different matrix and how they become a usable information to the boat successfully sail.

GHEORGHE ICHIMOAEI, CATALIN CLINCI, OCTAVIAN TARABUTA, BEAZIT ALI
Naval Academy, Constanta, Romania

A STUDY REGARDING SHOCK WAVE PROPAGATION WHEN AN UNDERWATER EXPLOSION OCCURS

Abstract: *In this paper we briefly studied the effect of underwater explosion on ship hull. For a qualitative analyze, we studied the effect of underwater explosion for two cases: for a compact explosive charge and for a multiple explosive charge.*

NICOLAE JULA, ALEXANDRU SOFRONIA, TEODOR LUCIAN GRIGORIE
INSOFT Development & Consulting, Bucharest, Romania

A NEW APPROACH RELATED TO THE CORONA DISCHARGE SURVEILLANCE

Abstract: *The paper presents a new solution used to detect the Corona discharge, based on the data fusion from two CCD (charge coupled device) image sensors used in UV and visible spectrum. The potential of the method comes from the fact that the Corona discharge is caused by a very intense electrical field, which ionizes the surrounding air and generates a discharge light, detectable by both CCD sensors, in UV and visible spectrum. The image of the Corona discharge pass from the same lens, and using a beam splitter is directed to the two CCD sensors. Further, the UV and visible images are processed, the fusion of the obtained results leading to the exact positioning of the Corona discharge in the scanned area of interest. The optical detection system is integrated in an Unmanned Aerial Vehicle (UAV), and, together with the telemetry data (global coordinates, speed, attitude angles, …), transmits to the Ground Control Station (GCS) the data acquired by the sensors installed on board; the most important are the video streams in various spectra, which depend by the specifics of each developed mission. The data are real-time transferred to a Ground Mission Analysis System (GMAS) which realize the processing.*

In the paper are successively exposed: the operational concept of the Corona discharge detection by using CCD image sensors, the architecture of the developed optical detection system, and the mechanism used in the image data processing for location and evaluation of Corona discharge.

DANIEL MARASESCU, MARIAN RISTEA, ADRIAN POPA, IONUT-CRISTIAN SCURTU, ANASTASE PRUIU

Naval Academy, Constanta, Romania

CONSIDERATIONS REGARDING THE VON MISES STRESS DEVELOPED ON A 2000X100X4MM PLATE DURING THE IMPACT WITH A 6.2KG CYLINDRICAL BODY

Abstract: This article is illustrating several studies and analysis regarding the impact on a steel plate. The von Misses stress of 2000 x 1000 x 4mm steel plate is particularly emphasized.

IONUT – DRAGOS NEAGU, ADRIAN POPA, BEAZIT ALI, LEVENT ALI

Marine and Offshore Consultants, Naval Academy, Constanta, Romania, Bureau Veritas, Romania

CONSIDERATIONS REGARDING THE STRUCTURAL RESPONSE OF A 10000X500X100MM PILE DURING PILE DRIVING WITH A 450KG RAM, FALLING FROM 1M HEIGHT

Abstract: Piles are used when the building soil don't have enough strength cu support the structure.
One of the pilling methods is to drive the pile. In fact, a vertical pile is hit with a ram. This method is a very good one, because the soil around the pile is compressed and the structure bed is strengthened that way. The negative aspect of this method is the pile is solicited in other ways than it was design.
In this paper are presented the results of a dynamic FEM analysis for a 10000x500x100mm pile when it is hit by a 450kg ram, falling from 1m height.

IONUT – DRAGOS NEAGU, ADRIAN POPA, BEAZIT ALI, LEVENT ALI

Marine and Offshore Consultants, Naval Academy, Constanta, Romania, Bureau Veritas, Romania

CONSIDERATIONS REGARDING THE STRUCTURAL RESPONSE OF A 10000X500X100MM PILE DURING PILE DRIVING WITH A 450KG RAM, FALLING FROM 2M HEIGHT

Abstract: Piles are used when the building soil don't have enough strength cu support the structure.
One of the pilling methods is to drive the pile. In fact, a vertical pile is hit with a ram. This method is a very good one, because the soil around the pile is compressed and the structure bed is strengthened that way. The negative aspect of this method is the pile is solicited in other ways than it was design.
In this paper are presented the results of an dynamic FEM analysis for a 10000x500x100mm pile when it is hit by a 450kg ram, falling from 2m height.

IORDAN NOVAC, CATALIN FAITAR

Constanta Maritime University

CONSIDERATION UPON FIXED ANTI - ROLLING PASSIVE SYSTEMS

Abstract: Tanks anti - rolling Passive Systems, are those systems which have no separate source of movement and no special automatic control system like the Bilge keel, anti – rolling tanks (passive), fixed fins and passive moving weight system. For a vessel, roll motion has the highest amplitude at resonance (this motion is known as synchronous rolling). From the research done so far, the best thing to reduce this movement is increasing amortization. There are many ways to reduce roll motions, and the most known is equipping the vessel with bilge keels. If ship requires more control, there are methods such as anti-roll tanks and fins. Tanks have the advantage of functioning when the ship is not underway. The use of tanks with liquid free surfaces for reducing roll motion of ships is an old concept. Many research engineers have studied the design of anti-roll tanks. However, most of the past research has concentrated on studying the randament of anti-roll tanks in damping the roll motion of the vessel.

IORDAN NOVAC, CATALIN FAITAR

Constanta Maritime University

SHIP'S GENERAL DYNAMICS PRIORITY RESEARCH DIRECTION IN THE XXI CENTURY. CFD APPLICATIONS

Abstract:To make a robust hull shape the designer must have extensive knowledge in how the global parameters affect the performance. CFD(Computational Fluid Dynamics) could be used to gain more knowledge in how to make a robust hull shape. CFD applications could be used to gain more knowledge in how to make a rugged hull. CFD applications have been increasingly used in designing more ships, more

precisely how can it be applied in conceptual stages of ship design. Constraints of time and computational development make a selection of chosen access more complicated. As a standard option on ships optimization, they were used simulations like hybrid computing schemesand meta-modelling.

ADRIAN POPA, MARIAN RISTEA, IONUT-CRISTIAN SCURTU, DANIEL MARASESCU
Naval Academy, Constanta, Romania
GOOD PRACTICE EXAMPLE: DESIGNING 100KN DELTA EYE PLATE
Abstract: *This article is presenting the steps carried for the design process of a 100KN delta eye plate, which is a simple but important element used in different setups for offshore installation, by using CAD/CAE methods applied on ANSYS 12.1 Workbench.*

MARIA GEORGETA POPESCU, GEORGETA CLAUDIA NICULAE, IOANA GABRIELA STAN, IULIANA VERONICA GHETIU
Petroleum-Gas University of Ploiesti
GUI INTERFACE TO PERFORM FUNCTIONAL CALCULATION OF THE SHALE SHAKER, CLEANING ELEMENT OF THE SYSTEM OF DRILLING MUD
Abstract: This paper describes the execution and usage methodology offered by MATLAB facilities, by designing a GUI graphical interface used to calculate the dimensional elements of V belt transmission and the perturbing force necessary to achieve the vibratory motion. The paper also covers all stages of spring calculation, as well as cinematic calculation notions concerning the perturbing system*.*

MARIA GEORGETA POPESCU, GEORGETA CLAUDIA NICULAE, IOANA GABRIELA STAN, IULIANA VERONICA GHETIU
Petroleum-Gas University of Ploiesti
THE INFLUENCE OF GEOMETRIC ELEMENTS OF THE HYDROCYCLONE ON THE EFFICIENCY OF CLEANING THE DRILLING MUD
Abstract: *The paper presents the algorithm for establishing the tangential, axial and radial velocities of particle cuttings from the drilling mud while the mud passes through a cyclone. The paper also includes a comparative analysis of speed values depending on the geometry of the hydro-cyclones and provides examples for various constructive types. Hydro cyclone geometry correlated with feed rate and the characteristics of the cleaning mixture influence the efficiency of the cleaning process.*

ANASTASE PRUIU, DANIEL MARASESCU, DORIN-SILVIU BANU, ION ADRIAN GIRBA
Naval Academy, Constanta, Romania, Military Technical Academy
ABOUT THE STUDY OF REQUESTS BUCKLING VERIFICATION OF THE ELEMENTS OF POWER PLANT PROPULSION
Abstract*: On study based of requests from the power propulsion plant, the authors develop in this paper a study of buckling heat engine piston rod at the head of the cross, the strut rod and shaft intermediaries for power propulsion plant.*

MARIAN RISTEA, DANIEL MARASESCU, ADRIAN POPA, IONUT-CRISTIAN SCURTU
Naval Academy, Constanta, Romania
STUDIES REGARDING THE STRUCTURAL RESPONSE OF A 2000X100X4MM PLATE AFTER THE IMPACT WITH A 6.2KG CYLINDRICAL BODY CONSIDERING THE EQUIVALENT STRESS
Abstract: *The present article is included in a wider series of studies which were developed by the development team; the initial premises of the article consists in an impact analysis of a 6.2kg cylindrical body with velocity of 5 m/s on a 2000x1000x4mm plate, by using dedicated software which applies the finite element theory.*

MARIAN RISTEA, DANIEL MARASESCU, ADRIAN POPA, IONUT-CRISTIAN SCURTU
Naval Academy, Constanta, Romania
STUDIES REGARDING THE STRUCTURAL RESPONSE OF A 2000X100X4MM PLATE AFTER THE IMPACT WITH A 6.2KG CYLINDRICAL BODY CONSIDERING THE EQUIVALENT STRESS, WITH IMPACT SPEED 10M/S

Abstract: This article is included in a series of reports which are covering a complex study on the impact of a 6.2kg cylindrical body which is moving with a velocity of 10 m/s, on a 2000x1000x4mm plate, byapplying the Finite Element Method, on Ansys Worbench 12.1 for "Mircea cel Batran" CAD / CAE laboratory.

ANCA STOICA, DIANA MILITARU, DAN MOLDOVEANU, ALINA POPA
Military Equipment and Technologies Research Agency

TACTICAL DATA LINK – FROM LINK 1 TO LINK 22

Abstract: Tactical data links (TDL) are elements of C4ISR system, which provide a continuous data exchange in (nearly) real time about space, ground, air, surface and subsurface platforms including allied, neutral and foe units data. The main scope of TDL is to provide the operation monitoring capability (for commander) and to send particular commands and data (for subordinates), being one of the basic components of network centric warfare concept implementation. A TDL uses data link standards in order to provide communication via radio waves or cable to transmit, relay and receive tactical encrypted data. This paper aims to outline a comparison between the main TDL standards and their capabilities.

DENIZ ÜNSALAN, KUNSEL IZET-ÜNSALAN
Dokuz Eylül University, İzmir, Turkey, Ovidius University

ULTRACAPACITORS FOR TORPEDO PROPULSION

Abstract- Ultracapacitors are electrochemical devices that are able to supply high time rates of energy and have the advantages of having virtually infinite charge-discharge cycles and are fast charging. Those properties have made them attractive for the storage of intermittent energy. Their main drawback so far has been considered their lower energy storage capacities. However, in the last few years, breakthroughs in efforts to improve their energy capacities have been achieved mainly by the use of carbon nanotube technology and carbon aerogel materials.
Propulsion systems of torpedoes launched from both surface and submarine ships have to provide high powers for higher speeds, have to have a sufficient supply of energy to achieve higher ranges, have to be re-useable and be serviceable onboard, as well as being silent and free from exhaust gas signature, if possible. Those requirements has lead the authors to consider ultracapacitors as sources for torpedo propulsion- able to supply higher powers, re-useable for exercises, rechargeable onboard the ship, silent and free from exhaust gas. Higher ranges are achievable by the allocation of the space saved from the air supply/fuel storage requirements and the replacement of heat engine by the more compact electric motor for ultracapacitor banks. It is deemed that the ultracapacitors of the near future shall also be feasible alternatives for Aluminum-Silveroxide torpedo batteries since they are rechargeable.
A parametric analysis involving the comparison of the proposed system by an existing hypothetical 21 inch (533 mm) torpedo propelled by a heat engine running on the Otto fuel.

DOREL DUMITRU VELCEA
Military Technical Academy, Bucharest

COMPRESSION STAGE NUMERICAL ANALYSIS OF A MARINE ENGINE

Abstract: The departing information were rather scarce in terms of real processes taking place in the compression stage, but at the end we managed to have a full picture of the main parameters evolution during the compression inside this existing marine engine.
The target of this paper was to show how, by using the reverse engineering techniques, one may replicate and simulate the functioning conditions and parameters of an existing marine engine.
The air flow jet that enters the cylinder swirling via the intake valves has changing characteristics, same can be said about the exhaust jet through the exhaust valves as they open and close, and they can be ascertained, along with the turbulence creation from swirl and tumble due to compression and squish.
The mail goal of an engine's design is to maximize the efficiency factors, to develop the most power from the least amount of fuel. Regarding fluid dynamics, the combustion and volumetric efficiency depend on the fluid dynamics in the engine manifolds and cylinders. Analysis in cold flow involves modeling the airflow in the transient engine cycle without reactions. The endgame is to catch the process of mixture formation by accurately accounting for the interaction of moving geometry with the fluid dynamics of the induction process.

DOREL DUMITRU VELCEA
Military Technical Academy, Bucharest

STUDY OF A FLAMMABLE FLUID PASSING THROUGH A MIXING T-JUNCTION BY USING THE ANSYS FLUID STRUCTURE INTERACTION CAPABILITIES

Abstract: The pipelines used to transport oil and others chemical products must be made with good materials that support high tensions and are resistant to corrosion. In engineering literature, there have been various researches about the behavior of the fluid through the tee junction. Some of these works relate to effects of the fluctuation of temperature in the pipe. The purpose of this article is to study the Fluid-Structure Interaction of a heated flammable fluid (a $C10H22$-Decane component of gasoline in gaseous phase) passing through a T-Junction where the cold fluid (20^0C) is mixing with the warm fluid (90^0C). The software used is ANSYS 16. The problem of mixing different temperatures of a certain fluid into a T-Junction and the study of the effects of fluid pressure and fluid temperatures on the stress distribution of the structure is by no means an easy problem to solve. The ANSYS capabilities of treating such Fluid Structure Interaction Problems with different interconnected modules is instead making this problem a trivial problem to solve. The T-Joint under scrutiny is performing well regarding structural safety as demonstrated inside this paper.