

## **STRUCTURAL ANALYSIS ON SUPERFICIAL LAYER WITH CARBIDE ELECTRODES**

MIHAELA BARHALESCU<sup>1</sup>, CORNEL MUNTEANU<sup>2</sup>, CONSTANTIN DUMITRACHE<sup>3</sup>

<sup>1</sup> *Constanta Maritime University, barhalescum@yahoo.com*

<sup>2</sup> *Gheorghe Asachi Technical University of Iasi, cornelmun@yahoo.com*

<sup>3</sup> *Constanta Maritime University, ldumitr@yahoo.com*

The paper shows some theoretical and experimental aspects with reference to the superficial processing using electrical sparking.

The tests objective was the superficial processing through sparking process on alloy and non alloy steel samples using a sinter carbide W and Ti electrodes type WCo8 and Ti15Co6.

The paper shows metallographic analysis on sparking superficial layers. The analysis was made on NEOPHOT 32 (special microscope) and MC-2 and MC-6 (metallographic microscope).

Optic metallographic analyses of sparking superficial layers obtained using "hard" carbide electrodes W and Ti sinterysed had as a result a white layer resistant at normal chemical reactive attack on sample surface. Under this layer a transition zone will form which is obvious at hardened proofs and under "hard" working condition.

## **SOME APPLICATIONS OF THE FINITE ELEMENTS METHOD IN OBSERVATION OF THE MAGNETIC FIELD AND THE THERMAL PROCESSES IN 3 – PHASE INDUCTION MOTORS**

BOHOS APRAHAMIAN

*Assoc. Prof., PhD, Nikola Vaptsarov Naval Academy,  
Varna, Bulgaria, e-mail: bohos@abv.bg*

The magnetic field of 3 – phase induction motors is studied using the finite elements method and the professional programming system ANSYS Emag. A model of induction motor, presenting a 20 degree sector of the motor, including two stator and two rotor grooves and two casing gills is studied due to the motor's symmetry. Full pattern of the motor's magnetic field is obtained in steady-state regime. All magnetic flux density vector flows are calculated and displayed too. Our study enables us to obtain the magnetic field of all induction motor's parts in different steady-state working regimes.

The transitional and stationary thermal processes in 3 – phase induction motors are studied using the finite elements method and the professional programming system ANSYS Emag too. Full pattern of the motor's temperature field is obtained as well in transitional and in stationary temperature rate. All heat flows are calculated and displayed too. Our study enables us to obtain the overheat of all induction motor's parts in different working regimes.

# SAINT VENANT EQUATIONS: AN ATTEMPT TO MODEL A TSUNAMI WAVE PROPAGATION

DELEANU DUMITRU

*Constantza Maritime University, [dumitrudeleanu@yahoo.com](mailto:dumitrudeleanu@yahoo.com)*

By means of the homotopy analysis method, the solution of the unidimensional Saint Venant equations are obtained in this paper. These equations are a commonly accepted governing approximation for Tsunami wave propagation in the deep ocean as well as near-shore regions which include inundations. The dependent variables are the fluid height and the fluid velocity field. Analytical results agree well with the basic features of the tsunami waves. Numerical results are also presented and shown graphically.

## COMPUTATIONAL ULTRASONIC STRESS-RELIEF PROCESS

CONSTANTIN DUMITRACHE<sup>1</sup>, CORNELIU COMANDAR<sup>2</sup>, MIHAELA BĂRHĂLESCU<sup>3</sup>,  
ADRIAN SABĂU<sup>4</sup>

<sup>1</sup> *Constantza Maritime University, [ldumitr@yahoo.com](mailto:ldumitr@yahoo.com)*

<sup>2</sup> *Gheorghe Asachi Technical University of Iasi [ccom@tuiasi.ro](mailto:ccom@tuiasi.ro)*

<sup>3</sup> *Constantza Maritime University, [mihaelabarhalescu@yahoo.com](mailto:mihaelabarhalescu@yahoo.com)*

<sup>4</sup> *Constantza Maritime University, [ady\\_sabau@yahoo.com](mailto:ady_sabau@yahoo.com)*

In the article [4] is published a mathematical model of optimization thermal stress-relief process which are conditioned by the plastic yield speed phenomenon. This new paper take in advance thermal stress-relief process and complete with overlapping ultrasonic stresses which is acting during cooling after welding process. In conformity with theory, Nevill and Brotzen [5] said that residual stresses are decreased because these overlapping stresses determined the altering of metallic yielding stress. In this article, using numerical method Runge-Kutta [1] is computed the overlapping ultrasonic stresses above welding residual stresses at OLC45 steel.

## THE RAMSEY ALGORITHM

ENG. GABRIELA – SIMONA DUMITRESCU

*Theoretic High School „TRAIAN” Constantza, e-mail:[profdumi@yahoo.com](mailto:profdumi@yahoo.com)*

This algorithm improved the best bounds known for approximating the independent set and graph coloring problems and prove that the approaches used to date to obtain such results can not be improved much further. I start with the Ramsey algorithm for finding independent sets in graphs, which is actually a schema of algorithms parameterized by the pivoting function applied, similar to the greedy algorithm. It has the property that its solution on any graph is at least as large as the one the corresponding greedy algorithm finds.

The algorithm Ramsey is related to a classical problem in extremal graph theory [1].

# **THE OFF-SHORE PETROLEUM TERMINALS IMPACT ON THE MARINE ENVIRONMENT**

R. HANZU-PAZARA<sup>1</sup>

<sup>1</sup> *Constanta Maritime University, hanzu@imc.ro*

In the present days the energy request at the world level is growing-up. This increasing needs a necessity of more quantities of basic fuel, especially oil and coal. To satisfy the industrial and civil requirements and to cover the necessary quantities the transport field, mainly the maritime transport increase the transport capacity of their units. For the oil transport at sea, the tanker ship capacity has been expended from around 30,000 tones up to over half a million tones. These developments of maritime transport capacities impose to be developing new operational capacities. The operational capacities, the terminals, are difficult to be expend and improve when are placed in a limited space as harbors. This aspect conduct to necessity to create new terminals, placed outside of port area, in open sea, with possibility to receive and operate ships with tonnage more over the harbor terminals possibilities. This positioning in the open sea area has the risk of damaging the environment higher than port terminals. In the present paper will be presented some aspects of the impact on marine environment of the off-shore petroleum terminals.

## **SOME ASPECTS REGARDING THE LNG OFFSHORE TERMINALS**

FEIZA MEMET<sup>1</sup>, ENDER ASYALI<sup>2</sup>

<sup>1</sup> *Constanta Maritime University, Romania, feizamemet@yahoo.com*

<sup>2</sup> *Dokuz Eylul University, Izmir, Turkey, ender.asyali@deu.edu.tr*

The important role of natural gas as a primary fuel in the energy industry led to the increase of its transportation on board the ships. This kind of transportation is made under the form of Liquefied Natural Gas (LNG), on board of special vessels, called LNG carriers which are equipped with cryogenic tanks. LNG carriers deliver it to terminals for storage and re-gasification, after which LNG is supplied to consumers from the LNG production plant, situated offshore.

This paper presents the vaporization technology based on open-rack vaporizers (ORV), a modern technology for LNG terminals. Also, is discussed the environmental aspect connected with the construction of the terminal.

## **ANALYSIS OF THE MOST OCCURED AND TYPICAL FAILURES OF SLOW SPEED MARINE DIESEL ENGINES (SSMDE) RELATED TO CRANKSHAFT (CS).**

JULIAN MOSKOV

*Naval Academy – Varna, Bulgaria e-mail : [moskov1201@abv.bg](mailto:moskov1201@abv.bg)*

This report is a description of the case with main engine MAN 8L42MC, in which case, known by the experience, a failure related to turning round the crankshaft main journal from 1<sup>st</sup> to 7<sup>th</sup> movement is ascertained. Registering the problem is realized by means of the ship Mean Indicated Pressure (MIP) system. The deviations in the operation characteristics of the engine cylinders are indicated. Conclusions are reached and the procedure on restoring the engine normal operation mode is described with the purpose of diagnostics and avoiding similar failures in future.

## **AN ESTIMATING OF ELECTRICAL POWER FOR SUPPRESION OF HARMONICS IN THE ELECTRICAL DISTRIBUTION BARS AND SYSTEMS WITH THE CURRENT IMPULSES INFLUENCE**

MARIN NEDEV<sup>1</sup>, PETKO PETKOV<sup>2</sup>, VLADIMIR CHIKOV<sup>3</sup>, GINKO ANGELOV<sup>4</sup>

1. *Nicola Vaptsarov Naval Academy, Varna, Bulgaria* [dean-eng@naval-acad.bg](mailto:dean-eng@naval-acad.bg)

2. *Nicola Vaptsarov Naval Academy, Varna, Bulgaria* [petkov\\_varna@abv.bg](mailto:petkov_varna@abv.bg)

3. *Technical University, Varna, Bulgaria* [Vladimir\\_128@abv.bg](mailto:Vladimir_128@abv.bg)

4. *Burgas, Bulgaria* [ginkoele@abv.bg](mailto:ginkoele@abv.bg)

There made an estimating of electrical power, needed for suppression the high harmonics in the electrical power distribution systems by the active filters with applying of current impulses. These metod is based on summerising of instantaneous current value and current impulses with the constant pulse width from the special function generator. The mentioned method is compared to other known solutions for decreasing of high harmonics. There is an estimating of possibility of applying in the autonomic electric power system.

## **COMPOSITE AND POLYMERIC MATERIALS USED IN NAVAL INDUSTRY**

ALEXANDRA NIȚĂ

*Constanta Maritime University, alexandranita@imc.ro*

Composite and polymeric materials are used through the marine industry for numerous applications including primary and secondary structure, superstructures, piping, shafts, foundations, ducts, and gratings. The object of this paper is to set out the general architecture of composite materials and to present the strength properties for the composite and polymeric materials from the marine industry. The study of the architecture of composite materials allows us to understand the phenomena of coupling between stretching, bending, and twisting. It is important to study the properties of this materials and to understand how structural composites behave because they are being used more extensively in the construction of ships and marine structures than ever before.

## **A DINAMIC CURRENT UNIT FOR GETTING SYMMETRY OF THRE FAZE ELECTRICAL POWER SYSTEM**

PETKO PETKOV<sup>1</sup>, GEORGI STOILOV<sup>2</sup>, MARIN NEDEV<sup>3</sup>, VLADIMIR CHIKOV<sup>4</sup>, GINKO ANGELOV<sup>5</sup>

1. *Nicola Vaptsarov Naval Academy, Varna, Bulgaria* [petkov\\_varna@abv.bg](mailto:petkov_varna@abv.bg)

2. *Nicola Vaptsarov Naval Academy, Varna, Bulgaria* [gstoilov47@yahoo.com](mailto:gstoilov47@yahoo.com)

3. *Nicola Vaptsarov Naval Academy, Varna, Bulgaria* [dean-eng@naval-acad.bg](mailto:dean-eng@naval-acad.bg)

4. *Technical University, Varna, Bulgaria* [Vladimir\\_128@abv.bg](mailto:Vladimir_128@abv.bg)

5. *Burgas, Bulgaria* [ginkoele@abv.bg](mailto:ginkoele@abv.bg)

In the paper is subscribed a possibility of design and producing the electronic unit for dynamic current symmetry for three phase electrical distribution bar and system in cases of nonsymmetrical electrical loads. There is shown the investigated algorithm for control of the microprocessor's unit. There is subscribed the results of experiment with the produced electronic microprocessor's unit in real maintenance.

# THE IMPORTANCE OF TRAINING IN LEADERSHIP IN MARITIME UNIVERSITIES

I I. RICARDO RODRÍGUEZ-MARTOS

<sup>1</sup> *Department of Nautical Sciences and Engineering, Universitat Politècnica de Catalunya, rrodriguez@cen.upc.edu*

There is a lack of training in managing and leadership for future captains and officers. On the other side, companies pay more attention of a good management that of a good leadership. This article tries to underline the importance of leadership and also deals with the question about the possibility to combine managing with leadership. Another important question to face is if man can be trained to be a leader and which concepts should be learned in this case. how a manager can also becomes a leader and how leadership can and should be learned. It will be also made a reference to the special aspect of multicultural crews and finally some ideas about the topics that should be taught for training in leadership

## MODEL FOR NOX CALCULATION

<sup>1</sup>SABAU ADRIAN, <sup>2</sup>STAN LIVIU, <sup>3</sup>DUMITRACHE CONSTANTIN

<sup>1</sup>*Constanta Maritime University, ady1\_sabau@yahoo.com*

<sup>2</sup>*Constanta Maritime University, liviustan14@yahoo.com*

<sup>3</sup>*Constanta Maritime University, ldumitr@yahoo.com*

This paper describes the extension of the computer code made by author [1] to simulate nitric oxide formation. Complex kinetic mechanisms are applicable only for simple flame computations (e.g. one dimensional, laminar, etc.). For real turbulent flame calculations, their use is impractical, due to the complexity of the interacting processes (turbulence, radiation, heat transfer, etc.) which must be considered to obtain realistic results. A model derived by systematic reduction of multi-step chemistry is used in for the evaluation of the nitric oxide formation. This reduction is based on the partial equilibrium assumption of the considered elementary reactions using the extended Zeldovich mechanism describing the thermal nitrous oxide formation

## VIABILITY OF THE APPLICATION OF LiBr ABSORPTION MACHINES FOR AIR-CONDITIONING ON BOARD OF A SHIP USING RESIDUAL ENERGY

SANTIAGO ORDÁS<sup>1</sup>

<sup>1</sup> *Universidad Politècnica De Catalunya, sordas@fmb.upc.edu*

In this paper, energetically and environmental-friendly refrigeration machine is presented. LiBr absorption machine is proposed for air conditioning purposes on board of a ship. The heat source used by the absorption machine is hot water, produced by the main engine scavenging air, when the ship is sailing, and the auxiliary engines exhaust gas, when the ship is anchored or in port. The use of absorption machines on board is viable from an economical and technical point of view.

## **SHORT SEA SHIPPING ALTERNATIVES IN FRONT OF THE ROAD ALTERNATIVE IN THE WESTERN MEDITERRANEAN**

F. XAVIER MARTÍNEZ DE OSÉS<sup>1</sup>, MARCEL·LA CASTELLS

<sup>1</sup> *Universitat Politècnica de Catalunya, [fmartinez@cen.upc.edu](mailto:fmartinez@cen.upc.edu)*

<sup>2</sup> *Universitat Politècnica de Catalunya, [mcastells@cen.upc.edu](mailto:mcastells@cen.upc.edu)*

The full implementation of short sea shipping alternative faces a set of technical, administrative and legal obstacles, not seen as a real alternative at all. As shippers has not find always the most satisfactory service nor the best price that could motivate a modal shift. There is the need for balance the infrastructures, using tariff principles based on the necessity for reflect the exact external costs generated by the different infrastructures, the EU published in 1998 the White Paper on Fair Payment for Infrastructure Use: A Phased Approach to a Common Transport Infrastructure Charging Framework in the EU COM (1998) 466. This paper analyzes on selected multimodal transport chains with a sea leg, the pollutant emissions of dferent powered ships compared with the ones of their road alternative. These pollutant emissions will be translated to environmental costs, based on existing quantification databases. In some cases, the maritime transport provides savings in those costs against the truck, what would justify a kind of ecological bonus to be used by the administration to promote the sea option. The paper will conclude in a brief discussion on how the demand would react in front of a price bonus in the maritime sector.