

## ABSTRACT NAUTICAL AND MANAGEMENT SCIENCE

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### **APPLYING IPSEC IN RADIO NETWORKS FOR ENHANCED SECURITY**

**Abstract:** Mobile radio networks offer many advantages and provide a certain level of security. While the standards advance, information security and user privacy is regarded as a priority for all involved parties starting from telecom vendors, mobile operators, government and ending with mobile users. In this paper we will analyze the possibility of increasing the security level of cellular networks by combining their technology with the principle of IPSEC.

**DINU ATODIRESEI, VERGIL CHITAC, MIHAIL PRICOP, FLORIN NICOLAE, ALECU TOMA, IONUT SCURTU**

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### **„NS MIRCEA” COMPARTMENTS CLASSIFICATION AND NOISE ANALYSIS OF THE MARINE ENVIRONMENT BY ACOUSTIC EMISSIONS**

**Abstract:** This paper presents experimental conditions, equipment, and methods used to determine emissions measurements recorded sound (noise) produced by the technique and equipment on board „NS Mircea” held during march 2014 and the noise level recorded in the coastal marine environment. The results obtained allowed the classification of the vessel compartments after recorded and reported emissions standards in the field of noise and noise analysis for the coastal marine environment from different sources.

**VYACHESLAV BARDAN**

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### **THE ROLE OF GIURGIULESTI INTERNATIONAL FREE PORT IN THE DEVELOPMENT OF ECONOMY OF MOLDOVA**

**Abstract:** Moldova is one of the youngest maritime states in the world thanks to the 430 meters access to the Danube via Giurgiulesti International Free Port, commissioned in 2006. The port activity, lately, has fared ascending becoming a competitor to the ports states in the region, and on the other hand, the Republic of Moldova reached shortly, with a large number of ships registered under the national flag, which bring some income even if the state budget and bring great harm to legal, social, image etc. These and other issues are examined in this article.

**LIDIA BOIANGIU, DIANA MILITARU, BEBE-RADUCU IONASCU, MADALIN GANEA, STEFAN POPA**

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### **INFORMATION LABELLING FOR IMPLEMENTATION OF FMN CONCEPT IN ROMANIAN CIS**

**Abstract:** FMN (Federated Mission Networking) concept was developed in order to ensure global rules for establishing a federation of CISs (Communication and Information Systems) organized in a Mission Network (MN) to "enable effective sharing information among NATO, NATO Nations and/or other NATO / non-NATO entities participating in operations", according to "NATO FMN Concept". One of the major aspects of the management of information in such network is the security of shared information, in particular confidentiality. In the digital environment, confidentiality of shared information regardless of its format can be assured using confidentiality labels. The paper aims to outline how NATO requirements on labeling information can be implemented in Romanian CIS, both for legacy system as well as future systems in the way that they can achieve the FMN objectives in a national MN and/or coalition MN.

**COSTEL CUCOARĂ**

University Polytechnic of Bucharest

### **MONITORING STABILITY OF THE SHIP USING HARDWARE AND SOFTWARE EQUIPMENT**

**Abstract:** "The boat is safe in the harbor; but boats were not made for this." quote John A. Shedd  
The ship performance is often given by the ability to "survive" the problems that may arise far from shore. Both, passengers and loads, may suffer if ship stability is endangered. The main goal now is to improve and secure shipping using the latest technology in terms of monitoring and recording the optimum operational parameters of a vessel. Computer-assisted calculation units used for monitoring ship stability is not a requirement in default ships equipment, but is becoming increasingly useful use for new technologies to prevent and solve problems that arise due to the instability of the vessel. We are talking about equipment that will not replace existing measures and technology but will work together to supplement the information parameters about stability of the ship at any time during navigation. Improving monitoring systems throughout the transport loads can be a difficult operation on a Heavy ship, computer-assisted systems can however perform calculations in record time and can provide extra safety measures for the entire ship (including crew and passengers).

**DANIEL ADRIAN GÂRDAN, IULIANA PETRONELA GÂRDAN, EDUARD IONEL IONESCU**

Spiru Haret University

### **WAYS TO OPTIMIZE SERVICES MARKETING DECISIONS**

**Abstract:** The present paper take into consideration the development of decision support systems in marketing and highlight the main areas in which marketing decisions can be optimized. In a turbulent marketing environment as it is today, optimizing decisions represents the main task of any management level. Nowadays organizations can build effective marketing strategies only if they possess the tools and knowledge to plan and implement decision support systems. In the field of services marketing the dynamics of marketing environment, along with the greater involvement from the customer point of view determine a stronger relationship between performance and the decisions optimization process. Thus, it becomes imperative for services providers to anticipate and implement an optimal flow of decisions in order to maximize their answer to the environment change.

**POMPILIU GOLEA, PETRU BALOGH**

“Dimitrie Cantemir” Christian University – Bucharest, Faculty of Tourism and Trade Management - Constanta

**MARITIME SECTOR DEVELOPMENTS IN THE CONTEXT OF ECONOMIC GROWTH - MARITIME TRADE EVOLUTION**

**Abstract:** *The paper presents an overall image of all familiar processes related to the relationship between economic growth-maritime trade-maritime markets-world fleet output. The analyses are being converted from world economic analyses to those related to shipping capacities and their usage at microeconomic level. The main conclusions stand for an urge to issue some valuable judgements which may allow the development of sensible managerial strategies as a solution to accomplish economic competitiveness.*

**PETRU BALOGH, POMPILIU GOLEA**

“Dimitrie Cantemir” Christian University – Bucharest, Faculty of Tourism and Trade Management - Constanta

**THE RELATIONSHIP BETWEEN TECHNICAL AND ECONOMIC VARIABLES IN MARITIME TRANSPORT**

**Abstract:** *The current paper deals with the relationship between a vessel optimal speed and its profit in maritime transport, based on a model. The two variables are determined in turn by a series of other influential factors which are being presented in a systemic framework. The study of this relationship is especially important in terms of the planning of a vessel's voyage, which allows to assess the profits based on the evolutions of the respective freight and costs on different transport routes.*

**GHEORGHE ICHIMOAIE, CĂTĂLIN CLINCI, OCTAVIAN TĂRĂBUȚĂ**

Naval Academy, Constanta, Romania

**EXPERIMENTAL RESEARCH ON UNDERWATER EXPLOSION**

**Abstract:** *In this paper we underlined some aspects regarding underwater explosions – how shock waves are transmitted through water. The first aspect we studied was the formation and propagation of the shock wave. The second aspect represents the formation and the gas bubble pulsation.*

**COSMIN KATONA, ALECU TOMA**

Naval Academy, Constanta, Romania

**THE CARGO EVOLUTION TRANSPORTATION ON ROMANIAN WATERWAYS CERNAVODĂ – AGIGEA AND POARTA ALBĂ – MIDIA NĂVODARI**

**Abstract:** *The Danube – Black Sea Canal, third in the world after Suez Canal and Panama Canal, reduces with over 400 km the cargo route from the Black Sea to the center of the Europe and approximately 4000 km for the routes from Australia and Far East. The canal is part of the European project Rhin-Main-Danube and enable the interconnection of hundreds of inland harbor situated between the North Sea and Black Sea. The canal presents not only a great economic importance, being able to take about 80 million tons of cargo annually, but also a social meaning. It has a major contribution to the Romanian southeast farms, assure an expansion of irrigation, therefore implementation of the agricultural development program on modern principles, facilitate the supply of drinking water and industrial riverside villages.*

**PETAR KLIMOV**

Organization and Management of Naval Formations, Nikola Vaptsarov Naval Academy – Varna

**DEFINITION OF HAZARDS AND THREATS OF THE NATIONAL MARITIME AREAS**

**Abstract:** *The report shall identify the hazards and the threats acting on the security and safety of the territorial waters considering the time-spatial impact on the national maritime areas.*

**RARES MANIU, LAURENTIU ALEXANDRU DUMITRU**

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**EXPLORING THE POSSIBILITIES OF A SELF-REGULATING SDN CONTROLLER**

**Abstract:** *As the number of networked devices increases, traditional routing algorithms tend to be non-optimal for mesh topologies. With the power of controlling the data flows in Software Defined Networks, a controller can implement a dynamic communication path for each flow. If, in the same context, the controller would also implement a history evaluation algorithm combined with a genetic search method, it could achieve a dynamic resource allocation that tends to an optimal solution. This paper proposes the implementation of such a system on top of an Open Flow controller.*

**MIHAI MIHAILA-ANDRES, PAUL VIRGIL ROSU, ION FUIOREA**

Structure Analysis and Simulation Division, Institute for Theoretical & Experimental Analysis of Aeronautical Structures STRAERO 220, Bucharest, Romania

**HEAT TRANSFER AND THERMAL STRESS ANALYSIS OF WATER COOLING JACKET FOR ROCKET EXHAUST SYSTEMS**

**Abstract:** *The article focuses on the heat transfer and thermal stress analysis of water-jacket cooling for rocket exhaust systems. Due to the large number of tubes used in the water-jacket cooling adapters, a full geometry 3d analysis of fluid flow, heat transfer and stress would be prohibited in terms of computational time and hardware resources. Moreover, a coupled fluid-thermal-stress analysis of such a complex geometry would cause an even greater number of numerical problems. Consequently, equivalent thermal and mechanical properties were calculated in order to decrease the resource needed to evaluate the rocket exhaust system. Using a constant heat flux for the interior wall (value estimated numerically from a previous full 3D exhaust gas flow computation) and a constant free air convection heat flux coefficient for the exterior wall, the equivalent heat transfer coefficient was computed based on the total heat transfer rate through the interior and the exterior walls assuming zero heat flux through the symmetry walls. An equivalent layered shell material is defined in order to model both the fluid and the structural domain of water-cooling adapter. The mechanical and thermal characteristics of this equivalent material are defined based on the simpler fluid-thermal-stress analysis of just one water cooling tube. Finally, some applications are presented to model the thermal stress problem of the full water-jacket cooling adapter.*

**ANDRIAN SIROJEA MIHEI**

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**THE MARITIME DIMENSION OF ROMANIAN SECURITY**

**Abstract:** Romania's integration in NATO and the European Union gave its coastal water boundaries a new transnational, Euro-Atlantic dimension. Practically speaking, Romania emerged from the "gray zone", bringing the eastern flank of the alliances in close proximity to the "frozen conflicts" around the Black Sea coast. Any coastline border modifications in the Black Sea - like the recent annexation of the Crimean peninsula to the Russian Federation - will likely generate disputes regarding the proper delimitation of continental shelf and economic exclusive zones to the Black Sea. The energy resources in Romania's maritime waters can actually transform the country in an important exporter of natural gas to Europe. Romania can become an important player in the energy market, as an alternative to the Russian gas. The exploitation of its energy resources requires the careful placement of off-shore drill equipment, installation of underwater gas infrastructure, and development of proper security measures to insure the integrity of the entire system from an environmental and safe standpoint, all this in addition to offering protection from all the other known security challenges for the area. The Romanian political system will therefore have the important task of creating the proper legislation for the maritime energy security and facilitating the implementation of the monitoring systems, underwater security, measures needed for the smooth and safety operation of off-shore drilling, distribution activities of natural gas and not only.

**IOAN GABRIEL MOISE**

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**SOME ASPECTS OF THE MODERNISATION NATIONAL LAW IN THE EUROPEAN NAVAL AREA**

**Abstract:** Water is life on this planet, in a proportion of decisive fundamental. Over 70% of the world is constituted by the planetary ocean, and more than 90% of international trade is done by sea. Approximately 70% of the world population lives less than a hundred miles of oceans and seas. The Europe's maritime interests are mainly related to the welfare, prosperity and security of its citizens and communities. About 90% of the EU's foreign trade and 40% of its internal trade relies on maritime transport. The EU is the third largest importer and fifth largest producer of fishery and aquaculture worldwide. More than 400 million passengers pass through EU ports every year. EU is based on open and secure seas and oceans in order to be able to operate free trade, transport, and tourism and ensure ecological diversity and economic development. The lack of protection against a wide range of threats and risks sea, seas and oceans can become arenas for international conflicts, terrorism or organized crime. In this context, the European Union is under pressure to take more measures to act more quickly and with fewer resources, by strengthening cooperation between different sectors and national authorities. As the increasing interconnection between internal and external dimensions of maritime security, it is necessary that all parties share the same goals and the same efforts to achieve coherence between sectoral and national policies and to allow civil and military authorities to react effectively together. The Black Sea regional constellation has substantially changed in recent years and will continue to evolve. In these circumstances, regional cooperation initiatives of the EU would usefully complement the wide range of activities currently undertaken at bilateral and sectoral levels. The EU presence in the Black Sea region opens up new perspectives and opportunities. This requires a more coherent, long-term enabling fully seize these opportunities, to bring increased stability and prosperity in the region. A greater EU involvement in the Black Sea regional cooperation will contribute to this objective.

**NEDKO DIMITROV, SIYANA LUTZKANOVA**

"Nikola Vaptsarov" Naval Academy, Varna, Bulgaria

**THE ROLE OF THE BULGARIAN NAVY IN THE MARITIME CRITICAL INFRASTRUCTURE PROTECTION SYSTEM**

**Abstract:** The security environment of the national maritime critical infrastructure is analyzed in the context of identification of and fight against the modern security threats. The contribution of the Navy is outlined based on its tasks and capacity. The Navy's role in the national maritime critical infrastructure protection system is figured out and some future development areas are mentioned.

**FLORIN NICOLAE, MARIAN RISTEA, ALEXANDRU COTORCEA, FILIP NISTOR**

Naval Academy, Constanta, Romania

**THE RELATIONSHIP BETWEEN PORT LOGISTICS AND GLOBAL LOGISTICS PERFORMANCE**

**Abstract:** This paper presents the current state of development of the logistics sector in Romania, through a system of reference and reporting generally accepted in the international and regional economy. The key standard of the logistic performance used in the analysis conducted in this paper highlights the place and role of our country in the international supply chain. The authors identify and argue the relationship between shipping, port logistics and the final cost of the products.

**FILIP NISTOR, HARALAMBIE BEIZADEA**

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**PLANNING AND ORGANIZATION OF PRODUCTION IN THE SHIPYARDS**

**Abstract:** Despite the situation of overproduction and low cost transport new ship orders worldwide bloom for the first time after a long period of decline, driven by an efficient design and low prices on new construction. Owners invest in ships with new design energy efficient to reduce transport costs and to increase revenue. Accordingly, planning and organization of production in the shipyards plays a strategic role in the further development on this market. In this paper the authors will present complex production process in a shipyard and the main problems they face.

**VALENTIN ONCICA, IONUT-CRISTIAN SCURTU**

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**MODERN AUTOSHIP ANALYSIS FOR „ACADEMIC STAR” CUTTER STATUS**

**Abstract.** The present paper is based on the first analysis of shape for the „ACADEMIC STAR” Cutter. Measurements in situ were used to 3D draw the cutter forms in AUTOSHIP software. Results from Autohydro component are analyzed and presented related to actual ship construction and stability requirements. Based on this analysis the ship owner can decide if the ship is according to actual nautical and stability requirements.

**ANDREI POCORA, SERGIU LUPU, ELENA CARMEN LUPU**

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**ASSESSMENT OF APPROXIMATE ERROR VALUES USED IN ASTRONOMICAL NAVIGATION FOR POSITIONING**

**Abstract:** Finding the vessel's position on the terrestrial sphere represents the most important activity carried out by the officer of the watch onboard, in order to ensure the safety of the vessel, crew and cargo. The ship's position can be determined by several methods such as: coastal observations, astronomical observations, radar or through data provided by satellite global positioning systems. In order to determine the position of the vessel with astronomical observations, the officer of the watch uses a series of nautical tables and formulas of spherical trigonometry applied to the spherical triangle of position. The approximate values accuracy of the trigonometric functions used in computing can directly affect the position determined by astronomical observations. The purpose of this paper is to evaluate the errors of approximate values of the trigonometric functions used by the officer on watch for fix positioning with astronomical observations.

**CATALIN POPA, ROUDAINA HOUJEIR, DAVID QUANSAH**

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**INTERNATIONAL STRATEGIES IN THE GLOBAL GOVERNANCE OF LIQUIDITY CENTRIC CRISIS**

**Abstract:** Earlier evolution within the global international financial system crisis, depicted mainly by the functional crisis provocative effects, had recalled for the rethinking of market functionality, in order to reveal, prior to any other kind of strategy, the international institutional weaknesses in the financial system supervision on a global scale. The contemporary imbalanced developments, correlated with a still differentiated monetary and financial political framework, had transformed, progressively, the perceptions of real estate's values toward those levels forced by creditors. Before the last crisis dawn, many financial institutions, determined by a strong competition in the credit sector, had left away the prudential attitudes and had borrowed money from different investors, guarantying the long terms transactions, with short time securities from speculative markets, on setting and fuelling a market bubble. Today, the trend is reversed one, the banking system behaving too prudential and blocking a flexible access of the economic entities to the finances in order to support the economic recovering. In this order, the paperwork is meant to recall for redesigning the risks models, considering not only but the cause-effect diagrams, but also the consistent global vocation of it.

**CIPRIAN RACUCIU, SERGIU EFTIMIE**

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**SECURITY THREATS AND RISKS IN CLOUD COMPUTING**

**Abstract:** Cloud computing presents complex challenges to companies that are trying to identify and mitigate risk. This research document aims to identify the biggest concerns related to cloud adoption strategies and to provide a context in making risk management decisions.

**CONSTANTIN SCHIPOR**

University "Alexandru Ioan Cuza", Iasi, Romania

**ECONOMIC PERFORMANCE ANALYSIS OF EUROPEAN SOCIAL MODELS**

**Abstract:** The European economy faces many problems in the management of micro and macroeconomic aggregates. Over time, in Europe, have arose many European economic models that attempted to explain the efficient functioning of an economic mechanism. Most often many of these models have failed, but it seems that there is still one social welfare model desired by all economic agents operating throughout Europe. The hypothesis of the research assumes that the Scandinavian model is efficient, while Anglo-Saxon model, Continental and Mediterranean are inefficient. The purpose of this study is to highlight the efficient organization of Scandinavian model in relation to the other three. A high employment rate and productivity levels well above the European average places Scandinavia as the best economic model. The results are extracted from the application of statistical descriptive methods and correlation analysis.

**PETRU SERGIU ȘERBAN, VALERIU NICOLAE PANAITESCU**

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**SIMULATION OF SHIP TO SHORE INTERACTION IN SHALLOW AND NARROW WATERS**

**Abstract:** In recent years research efforts in ship hydro mechanics are devoted to the practical navigation problems in getting larger ships safely into existing harbors, which are usually characterized by narrow and shallow waters. This paper presents a case study of ship to shore interaction when a bulk carrier passes at different speeds through a narrow waterway in Suez Canal. The trials were conducted using NTPRO 5000 navigational simulator and it was studied the ship to shore interaction and also ship squat phenomenon, which, in general, appears in shallow waters, but with a more pronounced effect on canals passage. The results analysis showed that the greater the speed the more pronounced the bank effect is, which translate into an earlier swing of the ship towards opposite bank, an increased final ship-bank distance and a significant yawing moment causing a visible sway. Also it was observed that the ship motion isn't related to the under keel clearance and if the speed is too big, an uncontrolled maneuver could lead into a collision with the opposite wall of the canal. The paper can be useful for maritime officers, masters and pilots, who must take into account ship to shore interaction effects when maneuvering in restricted navigation conditions, in order to prevent any accidents.

**NIKOLA STOYANOV**

"Nikola Vaptsarov" Naval Academy, Varna, Bulgaria

**A POSTERIORI ANALYSIS OF THE BULGARIAN-ROMANIAN TACTICAL EXERCISE "DIRECT THREAT 2014"**

**Abstract:** Evaluating the effectiveness of the use of modeling and simulation (M & S) in the training of naval cadets is a vital part of tactical preparation. Placing the proper tasks in preparation training process is the only way to meet the new challenges related to the increasing possibilities of the modern naval weapon systems and naval tactics. The posteriori analysis is a means of helping to assess the quality of individual and / or group simulator training.

At the end of 2014 a Bulgarian-Romanian tactical exercise, "DIRECT THREAD" 2014 was conducted.

*The purpose of this study is to apply a posteriori analysis to the training carried out at the "Naval Tactical Simulator" and "Ship Bridge" navigation simulator in order to show strengths and weaknesses of the exercise whose idea is to be an inherent part of preparation of the Bulgarian and Romanian naval cadets.*

**OCTAVIAN TARABUTA, CATALIN-PAUL CLINCI, GHEORGHE ICHIMOAEI**

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**BIOMIMETIC APPROACH TO UNDERWATER CURRENT CORRECTIONS FOR AUTONOMOUS UNDERWATER VEHICLES' INERTIAL NAVIGATION SYSTEMS**

**Abstract:** *Autonomous Underwater Vehicles' (AUV) guidance on a desired course is done by two main navigation systems, acoustic and inertial. Acoustic navigation systems depend on fixed reference points - acoustic transponders laid on the sea floor in the case of long baseline (LBL) grids - while the inertial navigation systems (INS) are based on integration of own accelerations and velocities in order to compute a dead reckoning path of the AUV. Both methods pose, respectively, either technological/operational constraints or a low accuracy of navigation on the preset trajectory, due to a hydrological factor having a great impact on the AUVs motion: underwater currents. In the INS navigation case, which relies only on internal signals as input of computing the estimated course, underwater currents add a still undetectable error for the present navigation sensors.*

*The authors propose a method of underwater current correction for INS navigation based on a biomimetic approach. Fish and aquatic mammals are using hydrodynamic reception, i.e. detection of subtle changes of water pressure around them that signal the presence of a moving body (friend or foe) within their sensorial envelope. Fish use their lateral line as a pressure sensing system, allowing them to react in changing their course for attacking prey or social schooling. By considering that the lateral line system can also explain navigation of fish during migrations, the authors present a study of how the pressure distribution differences on the AUV's body can measure the speed and incidence of an underwater current hence satisfactorily trigger current corrections of INS-based AUV navigation.*

**VALENTIN S. VASILEV**

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**IMPLEMENTATION OF THE OODA-LOOP IDEA ON DESIGN OF OFFSHORE OBJECT SECURITY ZONES**

**Abstract:** *Security zones with temporary dimensions are required for establishing trustworthy protection of an offshore object. Their boundaries are determined according to the threat's evolution stage. Implementation of the OODA-loop contributes to the optimization of the reaction time.*