Bulettin of the Volga State Academy of Water Transport №53 – 2017

Section I
Waterways, ports and hydraulic engineering constructions

Astashin A.E., Sotkina S.A., Samoylov A.V., Ryzhov E.V., Malysheva N.A.
The Landscape conditioning of the dynamics of channel network of elementary streams in the Izhma river basin in Nizhny Novgorod region in the period 2001–2017

Key words: *landscape, the elementary stream, the drainage basin of the Izhma river, the dynamics of the channel network, Nizhny Novgorod oblast.*

The article presents the author's landscape zoning scheme of the territory of the Izhma river drainage basin. The results of the analysis of the dynamics of the channel network elementary streams are done on materials of topographic maps and satellite imagery for the period 2001–2017 years, and also on the results of the field research. The fact of progress of the channel network of elementary streams in the northern part of the basin is stated , where on the eluvial loam the active process of overgrowing fields by forests around extinct or endangered villages occurs. In the southern part of the basin, the most densely populated and economically developed, there is a process of shrinking regular elementary streams. The determinism of the intensity of a network development of elementary streams by landscape conditions is revealed

Section II
Informatics, management systems, telecommunications and radiolocation

Kogan D.I., Fedosenko Yu.S., Handurin D.A.
Concepts and algorithms for solving multi-criteria modifications of the assignment problem

Keywords: assignment problems, linear scalarization lexicographic method, area of compromises, effective estimates, pareto-optimal solutions, multicriteria dynamic programming.

Concepts, schemes and algorithms for solving assignment problems with several solution estimating criteria are considered. Examples of numerical implementation of the considered approaches are given. New approaches to assignment problems, initially formulated as maximin (minimax), using multi-criteria compromise schemes, are described. In addition, the minimax problem of the distribution of the pairs of heterogeneous tasks between agents is studied

Proidakova E.V., Reshetova A.A.
Research of the system with adaptive algorithm of search for a break in the flow

Keywords: adaptive algorithm, conflict flows of demands, cybernetic approach, simulation modeling.

In this paper an analytical study of an adaptive transport control system with an algorithm for searching for a discontinuity in a flow is considered. A cybernetic experiment was put in place and a simulation model was constructed. A numerical study of the adaptive system was carried out.

Solovyov A.V.
Principles of interaction of the navigator with a unified target-oriented management system of marine power plant

Key words: automatic control system, ship power plant, a single digital solution, the control scenario.

In the article the questions of interaction of the navigator with a unified target-oriented management system of a ship power plant is considered . The article presents a list of the most important properties of managed objects of ship power plant. It describes the principles that should be implemented in the interface for better interaction of the vessel with a unified target-oriented management system of a ship power plant. The concept of information support of decision-making by the navigator in any of the executed scenarios or manual control facilities of ship power plant is offered by the author

Section III
Shipbuilding, ship repair, and ecological safety of the ship

Gramzow E.M., Moskvicheva Y.A.
Ice cake resistance at the movement of icebreaking air cushion platforms

Keywords: ice cake, ice resistance, the resistance of the ice fragments, ice conditions, icebreaking platform on an air cushion.

The analytical calculation method of resistance of ice cake at the movement of icebreaking air cushion platforms is given in this article. The results of the comparison of calculations with data model and field tests showed satisfactory convergence

Kupaltseva E.V.
The Particularity of mathematical models of «small» passenger vessels with hybrid or all- electric power plant

Key words: hybrid and all- electric power plant, non-standard energy sources, passenger vessel, mathematical model

This article reflects specifics of developing a mathematical model of the vessel with the hybrid or all-electric power plant. Such components as the required power, mass - dimensional characteristics and the ability to embed all necessary equipment are the defining feature of developed mathematical model

Lyubimov V.I., Gakkel A.A., Baryshev V.I.
Analysis of WIG ship development and outlook of their use in Russian transport system

Key words: transport system, high-speed vessels, WIG ship, construction features, operation spheres

The article considers the trends of creating WIG ships in our country and promising directions for their use in the transport system of Ru

Naumov V.S., Plastinin A.E.
Determination of probable areas of oil spills in Tsimlyansk reservoir

Keywords: accident, accident site, transport ships, oil spill, Tsimlyansk reservoir

The article presents the results of statistic studies on the determination of dislocations of centers of transport vessels accidents in the Tsimlyansk reservoir. The actual and theoretical boundaries of accident areas are determined. The coincidence of coordinates of stationary and mobile sources of oil spills is defined. The research results have been used in the developing of a plan for the prevention and elimination of oil spills in the Volga-Don basin of inland waterways

Ngo G.V., Sakhno K.N.
Experimental studies of compensation prosses of deviations of ship system pipelines

Keywords: pipelines, design, installation, deflection, compensation area.

In the presented paper, the authors consider the problem of improving the manufacturability of ship system pipelines at the stage of designing. Solutions of the problem of manufacturing and installation of marine pipelines without removing the measurements are presented. Experimental studies of deviations compensation in two stages have been made: the scoping of compensation opportunities and the actual measurements of pipelines deviations. The conceptual basis of the compensation of total variance by pipelines movement have been confirmed and the algorithm for deviations compensation of pipelines with the use of mutually parallel sections with joints and additional overmeasures have been developed

Samuleev V.I., Mukhin Yu.P., Kalachev V.K.
Analysis of electric propulsion systems with the use of flettner rotors in the modernization of ferries project 1809

Key words: rotors of the Flettner propeller electric installation, pulse width modulation, a system of active movement, fuel economy, wind conditions, modeling.

Recently in the periodical literature and the press often appear very unusual, successful approaches to solving the problems of fuel economy and efficiency for ship propulsion and power plants. This conclusion was madden in connection with the successful tests, launched in 2010, the year of the vessel type «ro-ro» under the name «E-Ship-1». The design is unusual in that for saving energy as propulsion applied rotating cylinder called as Anton Flettner rotors. The authors presented a feasibility study of application systems including propulsion for example, stated in early articles systems modernization project of the ferry in 1809

Smirnova (Igonina) M.V., Cheban E.Yu., Volodchenko E.V., Berdnikova E.Yu., Solina E.S.
Hydro-ecological research of the Gorky and Cheboksary reservoirs sites and their tributaries in summer of 2017

Keywords: Gorky reservoir, Cheboksary reservoir, hydrochemical parameters, tributaries, pollution, chemical analysis, blue-green algae.

The results of hydro-ecological studies in the lake area of the Gorky reservoir and on the site of the Cheboksary reservoir and their tributaries are considered. The influence of r. Sanakhta and r. Trotsa on the content of organic substances in the value of BOD5 in the water of the Gorky reservoir, and the r. Kerzhenets into the Cheboksary reservoir was observed. The water of r. Kudma is heavily diluted with the Volga flow, which enter at the mouth of r. Kudma opposite Kadnitsy. That is why its influence on the Cheboksary reservoir is not noticeable. It has been defined that the removal of impurities from tributaries to the reservoir strongly depends on the flow velocity at the mouth of tributaries and in the reservoir. The preliminary results of the study on two different high-speed mode sections of the Gorky and Cheboksary reservoirs, showed that the influence of tributaries is most noticeable at low velocities in the reservoir

Cheban E.Yu., Zotova N.E.
Optimization of solar boat hull by computer fluid dynamics methods

Key words: computer fluid dynamics (CFD), ship hull optimization, ship waves, wave resistance, turbulence models, calculation grid

The study of the hull shape of solar boat has been made to ensure the minimum resistance. The numerical methods of NUMECA/FineMarine™ software complex have been used to study the resistance of the boat with two floats. Recommendations on their shape considering boat speed have been made

Shurganova G.V., Zhikharev V.S., Gavrilko D.E., Golubeva D.O., Zolotareva T.V., Ruchkin D.S.
Special features of the species structure and spatial distribution of zooplankton communities of upstream of the Nizhny Novgorod hydroelectric power station, zone of the river hydraulics of the Cheboksar water reservoir and the estuary area of the Oka river

Key words: zooplankton, species structure, spatial distribution, plankton community, invasive species, Cheboksary reservoir, Gorky reservoir

The present state of the species structure and spatial distribution of zooplanktonocenoses of the upstream of the Nizhny Novgorod hydropower station, the zone of river hydraulics of the Cheboksary reservoir and the estuary area of the Oka River according to 2017 data is presented in the article. On the basis of the method of multivariate vector analysis, zooplankton communities were identified. The character of the change in the species structure of zooplankton after its passage through the Nizhny Novgorod hydropower station aggregates is analyzed. Based on the saprobiological analysis, the water quality of the investigated water areas has been estimated

Yakovlev S.G.
Booster the pump regulation at the impeller run-out

Keywords: booster pump, cavitation-free operation, bilge pump

The use of a booster pump enables to provide cavitation-free operation of the bilge pump. The inevitable run-out of the booster pump impeller will lead to a decrease in its pressure. Within acceptable limits of the pump efficiency reduction it is advisable to increase the frequency of the booster pump rotation, restoring the desired pressure

Section IV
Financial and accounting-analytical problems of the modern economy

Grechko N.M., Gagarkina A.A.
The internal control system of settlements with counterparties in organizations

Key words: internal control system, accounts receivable, accounts payables, counterparties.

The author's model of internal control of settlements with counterparties (suppliers and buyers) in organizations is presented in the article. The authors have worked out a questionnaire to test the accounting staff of the organization to receive a preliminary opinion on the status of settlements with counterparties

Markova N.A.
Strengthening the role of households as the gross domestic product final consumers and the change in the system of financial relations

Key words: household finance, gross domestic product, household final consumption expenditure, money savings of the population

The article deals with the gross domestic product dynamics, the analysis of its use composition and structure; analysis of households final consumption expenditure in Russia; strengthening the role of households as the gross domestic product final consumers; it justifies the allocation of three key groups of financial relations when building the financial system of the country

Rusakova O.V., Butchenko V.N.
Some issues of the 0 per cent vat rate application by transport companies in regard to international cargo transportation

Key words: value added tax, international cargo transportation, zero rate, export.

The article considers the problem of assigning cargo transportation as the international one in order to apply the zero rate of VAT. The authors present the tax consequences of the cargo owners in the form of the VAT tax deductions refusal in case of incorrect determination of the cargo transportation status. The article provides a critical appraisal of the upcoming changes in tax legislation

Section V
Economics, logistics and transport management

Anosov N.M., Tarbeev K.A., Shpak A.S.
Information exchange organization during dangerous cargo transportation in the chain of goods delivery

Key words: combined transportation, dangerous cargo, control system, emergency

This article gives an overview of the existing control systems in the sphere of dangerous cargo transportations by various transport modes and provides the conditions for their use. The study developed a system of monitoring, processing and transmission of data, allowing real-time monitoring of dangerous goods in conditions of container shipping. The main objectives of the developed system are the provision of cargo preservation, fire prevention, increasing the safety during dangerous cargo container shipping and reduce the effects caused by accidents

Vedernikov Y.V., Vedernikov D.Y.
Modern government and corporate views on the development of Maritime transport of Russia

Keywords: sea cargo fleet, the experience of planning the development of Maritime transport, government and corporate programs of sea cargo fleet development.

The article analyzes the current state of planning of the marine transportation fleet development on the state and corporate levels. The work is based on the legal acts of the Russian Federation, Executive bodies of state authorities and the water transport organizations

Goncharenko S.S., Kostrov V.N.
The Northern Sea Route as a strategic thoroughfare

Key words: *Northern Sea Route, infrastructure, northern rivers*

The article presents the analysis of possibilities of intensifying the exploitation of the Northern Sea Route and its infrastructure, as well as adjacent areas and river basin

Domnina O.L., Shuvalova Y.I.
The auto insurance market: the status analysis and development trends

Key words: car insurance, motor hull insurance, CMTPL, development trends, forecast, major problems

The main part of insurance premiums in Russia is for car insurance. In recent years this segment of the insurance market is unstable in its development. This article is aimed at the analysis of existing trends in the development of motor hull insurance and CMTPL, identifying the reasons for these trends and predicting in car insurance development taking into account the factor analysis

Kostrov V.N., Vakulenko R.Y., Bulganina S.V., Vas'ko A.A., Stepanova A.V.
Marketing research of car services consumers

Key words: marketing research, car service, clientele, survey.

The article shows the results of the survey among car services consumers in the city of Nizhny Novgorod. Criteria of car service enterprises selection by clientele are revealed and ranked. The authors consider the requirements for components of the "5P" marketing complex of maintenance centers presented by vehicles' owners

Mineev V.I., Veselov G.V., Ivanov M.V., Lykova E.S.
The development of foreign trade pass free transportations in the European part of Russia: problems and solution

Key words: *foreign trade transportations, efficiency, competitiveness of transportations.*

The article considers the main problems of development of foreign trade pass free shipping on the river-sea rout in the European part of Russia

Mordovchenkov N.V., Sirotkin A.A.
Specifics and possibilities of carrying out market researches in the transport services market

Key words: *market researches, transportations, transport services.*

The structure of market researches on river transport is presented. The form for registration of pent-up demand for passenger traffic is developed. The authors offer an integrative econometric model for definition of the influence of passenger transport appeal taking into account possible investments into the human capital, the transport infrastructure efficiency, the gross regional product gain and the efficiency of infrastructure formation and functioning.

Niurkin A.V., Niurkin S.I., Telegin A.I.
Foreign experience of piggyback transportations in Western Europe

Key words: piggyback transportation, piggyback technologies, piggyback terminal, contrailer, ro-ro

The article considers foreign experience of the use of specialized modes for transportation of heavy trucks or trailers (semi-trailers) on specialized platforms. The advantages and disadvantages of such transportations are described

Tsverov V.V., Ponomarev E.V.
The algorithm of fragmentary process control customs clearance for the delivery of goods

Key words: delivery of goods, customs clearance, delivery management, delivery time

The article suggests an algorithm for managing the time of customs operations to ensure the delivery of goods on time in supply chains

Section VI
Operation of water transport, navigation and safety of navigation

Lobanov V.A.
CAE-studies of ices distribution in ice channels

Key words: icebreaker, propulsion and steering complex, ice conditions, ice channel, CAE-system, finite element modeling.

In the article statistical processing of natural data on distribution of ices in ice channels is made. With the use of CAE-technologies the process of ice channels creation by multiscrew shallow-draft icebreakers in solid ices is studied. The authors revealed the qualitative features and conducted quantitative assessments of ice fragmentation and concentration degree in prepared channels for different modes of vessel operation and its propulsion. Comparative analysis of natural and experimental data is carried out

Section VII
Actual problems of law and state

Lazarev A.M.
Boundary issues theft and appropriation of another's property was found

Keywords: theft, discovery, seizure, assignment, acquisition of title

The article touches upon the problem encountered in forensic practice in cases of appropriation of personal property: things lost by the owner or other owner of or left unattended. Law enforcement officers and judges give different legal estimation (qualification) of such actions of citizens: either it's theft of another's property or assignment of findings. There is a need to distinguish between crimes and civil legal action. The author attempted to find a way to resolve the problem.

Sokolov S.A.
A study of the historical and legal disciplines as basis of spiritual-formation pravstvennogo and patriotic awareness law students

Keywords: *spiritual, moral and patriotic education, historical and legal discipline, sense of Justice, legal culture.*

The work is devoted to development of spiritual and moral and patriotic consciousness of law students in the process of studying the historical and legal disciplines. The author comes from Tog, that is quite a natural continuation of the policies for the modernization of legal education is the introduction in educational process of new methods of teaching historical and legal disciplines, ed. quality educational-methodical works (textbooks, manuals, workshops, collections of tests, recommendations and guidelines).

Sosenkov F.S.
LDPSS – the liberal democratic party of Russia unity: political and legal position and legislative ideas

Key words: the liberal democratic party of Russia, Vladimir Zhirinovsky, a unitary state, state unity, territorial integrity, centrifugal forces, separatism, the centralization of power/

Considers the issues of national unity in the ideology of the liberal democratic party of Russia and the political and legal views of its leader Vladimir Zhirinovsky. The basic directions of ensuring the unity of Russia, the party defined the doctrine of unitarianism, the protection of constituent peoples and the Russian language, the broad powers of the President. The author comes to the conclusion that the position of the liberal democratic party on issues of national unity can be described as a cross between nationalism and conservatism