УДК 556.07 :[502.175:504.51]

**D.A. Archibisov1, 2, E.V. Kasperovich1, M.S. Lyakisnev1, O.E. Petrenko2, V.A. Shvetsov2**

*1Kamchatka’s directorate for technical supply of sea supervision, Petropavlovsk-Kamchatskу,   
683031, 2Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003*

*e-mail: d.a.archibisov@mail.ru*

**SURVEY OF MODERN SAMPLE SPLITTING DEVICES OF SEA-FLOOR SEDIMENTS.   
NECESSITY AND TENDENCIES OF THEIR MODERNIZATION**

Necessity of sea-floor sediments sample splitting and analysisduring environmental inspection of water bodies was corroborated. Modern sample splitting devices of sea-floor sediments are examined. We demonstrated topicality of development, test and adaptation of devices used for sea-floor sediments sample splitting which have better specifications compared with existing ones.

**Key words:** discharge point, pollutants, oil and petroleum products, sea-floor sediments, sampling devices.

УДК 62

**O.A. Belov**

*Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003;*

*e-mail:beloff.oa@gmail.ru*

**THE ESTIMATION OF TECHNICAL READINESS   
OF THE SYSTEM UNDER THE HUMAN FACTOR INFLUENCE**

The human factor in any technical system is a weakly formalizable phenomenon which inevitably makes such systems probabilistic. The human factor influence along with the other conventional factors must be taken into account for the determination of the readiness level of the system and the estimation its technical condition. Taking into account the probabilistic nature of the given phenomenon, conventional methods of the estimation of the technical readiness turn out to be ineffective. The article presents estimation approach of the technical readiness under the human factor influence.

**Key words:** probabilistic approach, technical readiness, the human factor, the statistical model, variation, the uniformity factor, vocational training, the readiness level, forecasting.

УДК 664.951.2:639.211.2

**M.V. Blagonravova**

*Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003*

*е-mail:* [*mblagonravova@mail.ru*](mailto:mblagonravova@mail.ru)

**DEVELOPMENT OF DRY LOW-TEMPERATURE SALMON SALTING TECHNOLOGY**

The article deals with research results as for development of dry low-temperature salting with coarse salt. The technology offered in the article allows to simplify technological process of slightly salted fish manufacture considerably and reduces its time. It makes salting possible directly in the places of fish catch which are usually difficult of access that is certainly an actual problem for Kamchatka.

**Key words:** salting, biochemical maturing, slightly salted, buffer capacity, mass fraction of salt.

УДК 621.313.333

**A.A. Marchencko1, O.A Onischenko2 , S.U. Trudnev1**

*1Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003;   
2Odessa national maritime academy, Ukraine, Odessa, 65029*

*e-mail: Marchencko29@mail.ru*

**CHARACTERIZATION OF VOLTAGE DURING TESTS   
OF ASYNCHRONOUS ELECTRIC MOTORS UNDER LOADING**

Method of asynchronous electric motor loading without use of additional loading is given in the article. At present semiconductor frequency converters allowing to change electric drive characteristics in wider range gained distribution. Voltage frequency variation influences the moment on the machine shaft and electric motor current. Applying these properties it is possible to receive average current and the moment equivalent to rated current and the moment that is necessary at machine repair test. The mathematical model of asynchronous electric motor with possibility of change of the listed parameters was developed by the authors for given hypothesis test. Then the model was transferred to Simulink program for implementation of fast calculations. Two main problems were solved during research. First, values of voltage under frequency were estimated experimentally. Secondly, for estimation of converter’s parameters we revealed voltage values corresponding to rated current of the electric motor. Then for detection of dependence experiment was made on several electric motors of type 4A of various capacities. The results of carried out experiments testify to possibility of receiving rated current of the electric motor without mechanical loading at cyclic transfer of the machine to the short-time generating mode.

**Key words:** asynchronous engine, power, opposition circuit mode, rated current, frequency converter, moment, switching, voltage frequency.

УДК 628.3(571.66-25)

**V.V. Potapov1, 2, A.E. Brovkin2, L.M. Khoroshman2**

*1Scientific research geotechnological centre Far Eastern Branch   
of Russian Academy of Sciences, 683012, Petropavlovsk-Kamchatsky;   
2Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003*

*e-mail: Nigtc@kgsnet.ru*

**CONDITIONING OF NATURAL WATER PURIFICATION AT SEWAGE DISPOSAL PLANTS   
OF MUNICIPAL UNITARY ENTERPRISE “PETROPAVLOVSK WATER UTILITY”   
WITH NEW GENERATION COAGULANTS AND FLOCCULANTS**

Main problems of natural water purification with coagulation are described in the article. Results of experiments concerning the use of new generation coagulants for water purification at sewage disposal plants of municipal unitary enterprise “Petropavlovsk water utility” are given. Problems of natural water purification on the territory of the Russian Federation are given consideration.

**Key words**: coagulant, flocculant, color of water, turbidity, purification efficiency.

УДК 621.311.11

**N.V. Rodimov**

*Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003*

*e-mail: kok1632kol@mail.ru*

**METHODS OF ENHANCEMENT AND SYSTEM SAFETY OF POWER SUPPLY**

Present pattern methods of main substations in town districts are compared in the article. Arguments are given for new pattern method of main substations and evaluation of power load center to decrease adverse effect on consumers of feeding voltage such as loss of power, voltage depression, unstable frequency and also unreasonable expenditure on feeding cable lines going from main substations to consumers are confirmed by mathematical calculations.

**Key words:** power load center, power main substations, power quality.

УДК 621.313.322:629.5

**S.U. Trudnev, A.A. Marchenko**

*Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003;*

*e-mail: trudnev@mail.ru*

ANALYSIS AND RESEARCH OF PARALLEL OPERATION   
OF SYNCHRONOUS GENERATOR AND STATIC CONVERTER

The article deals with enhancement of electric power systems. The mathematical model of diesel generator set and static converter is developed. We analyzed the dynamic mode of ship electric power system on the example of the virtual model developed in the program Matlab. The positive effect of the integration of modern static converters in generator sets is detected. The necessity of improving the existing marine plants that will ensure the quality of the output parameters of electrical energy with minimal deviations is reasoned. The efficiency of the implementation of the static converter in the ship's power plant is proved.

**Key words**: generator, model, Matlab, loading, diesel.

УДК 620.193:629.5.023

**V.A. Shvetsov1, P.A. Belozerov2, N.V. Adelshina3, O.A. Belavina1,   
O.E. Petrenko1, D.V. Shunkin1, V.V. Kirnosenko4**

*1Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003;****2****Russian Military Department****,*** *Petropavlovsk-Kamchatsky;  
3Military-eastern region of Russian Military Department, Petropavlovsk-Kamchatsky, 683000;   
4Open joint-stock company «Каmchatskenergo», Petropavlovsk-Kamchatsky, 683030*

*e-mail:* [*oni@kamchatgtu.ru*](mailto:oni@kamchatgtu.ru)

**IMPACT OF OPERATOR’S QUALIFICATION ON RESULTS   
OF PROTECTIVE POTENTIAL MEASUREMENTS OF STEEL HULLS   
OF VESSELS AND SHIPS**

According to State Standard 9.056-75 during maintenance of hull protection systems from corrosion it is necessary to measure ship hull potential periodically. But ships and vessels crew don’t perform this duty. One of the reasons they don’t do it is the absence of qualified specialists-operators onboard the ships. Research aim is to find out if crew members with different qualification level can measure protective potential of steel hulls of vessels and ships. To achieve this goal we made planned experiments and necessary mathematical-statistical calculations. In the result of research we stated that potential measurements can be done with the use of the method offered by the authors by any operator regardless of his qualification. At the same time measurements results are characterized by high metrological characteristics.

**Key words:** corrosion of vessels and ships steel hulls, electrochemical protection of ship hull from corrosion, measurements of protective potential of ship hull, comparison electrode, method of potential measurement of vessels and ships steel hulls.

УДК 597.5(265.5)

**S.S. Grigoriev1,2, N.A. Sedova2**

*1Kamchatka Branch of Pacific Institute of Geography, Russian Academy of Sciences,   
Far-East Department, Petropavlovsk-Kamchatsky, 683000,   
2Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003*

*e-mail:* *sgri@inbox.ru*

**TAXONOMIC VARIETY OF MARINE FISHES NEAR NORTH EASTERN RUSSIA BASED   
ON DISTRIBUTION OF THEIR EARLY STAGES OF DEVELOPMENT**

Information on spawning and early development of 129 species (34 families, 9 orders) in seas and inland water bodies of Northe astern Russia is available. Typically marine fishes are divided into 2 groups based on the method off ertilize habit: 1) with pelagic eggs, 2) with demersal eggs. Depending on features of spawning fishes were divided into ecological groupings. Eggs and larvae of walleye pollock (*Theragra chalcogramma*) were significantly dominated by their abumdance and distribution. The eggs and larvae of flat fishes were in the second place. among them more abundant were spring spawning species: flat heat sole (*Hippoglossoides elassodon*), Bering flounder   
(*H. robustus*), and Alaska plaice (*Pleuronectes quadrituberculatus*). In summer eggs and larvae of summer spawning, yellow fin flounder (*Limanda aspera*), Sakhalin flounder (*L. sakhalinensis*), and long head dab (*L. proboscidea*) dominated. In summer among other fish species the significant concentrations in plankton can form larvae of sand lance (*Ammodytes hexapterus*) and capelin (*Mallotus villosus catervarius*). Species diversity of pelagic early development stages of fish increases from spring to mid-summer, and then decreases.

**Key words**: spawning, eggs, larvae, taxonomic variety.

УДК 502:911.375(571.66-25)

**N.A. Ilyushenko**

*Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003*

*e-mail: KGTU.Ecol@ya.ru*

**ECOLOGICAL CAPACITY OF URBAN SYSTEM   
IN TOWN PETROPAVLOVSK-KAMCHATSKY**

We analyzed functioning issues of urban systems, ratio of natural and anthropogenic elements in them. We also defined the notion of ecological capacity of urban systems and the main its components. Results of ecological capacity estimation of the territory of town Petropavlovsk-Kamchatsky by means of estimation of particular urban system capacities: demographic capacity, territory’s reproductive potential, ecological techno capacity and total maximum permissible town load.

**Key words**: urban system, ecological capacity, demographic capacity, reproductive potential, ecological techno capacity, total maximum permissible load.

УДК 597.552.511(571.66-15)"2014"

**A.V. Klimov, S.I. Subbotin, L.N. Smorodina, L.Ph. Urusova, O.B. Tepnin**

*Kamchatka Research Institute of Fishery and Oceanography (KamchatNIRO),   
Petropavlovsk-Kamchatsky, 683000*

*e-mail: klimov@kamniro.ru*

**RESULTS OF REGISTRATION TRAWLING SHOOTINGIN   
THE EPIPELAGIC COASTAL WATERS OF WESTERN KAMCHATKA IN 2014**

Data of annual registration trawling shooting carried out within the framework of realization of “Conception of Far Eastern basin-type program aimed at Pacific salmon study is given in the article. Analysis of obtained results concerning distribution and number of Pacific salmon fry, their nekton environs is also provided in the article. We demonstrated specific differences in salmon growth form.

**Key words:** pacific salmon, young salmon, early marine period of life, nekton, plankton, epipelagic, western Kamchatka.

УДК 582.263(571.66-11)

**A.V. Klimova, S.O. Ocheretyana, G. Klochkova**

*Kamchatka StateTechnical University, Petropavlovsk-Kamchatsky, 683003*

*e-mail: annaklimovae@mail.ru*

**CASE OF UNUSUAL DISCOVERY OF UNICELLULAR ENDOPHYTIC GREEN ALGAE   
IN FROND OF** ***SACCHARINA BONGARDIANA* (PHAEOPHYCEAE, LAMINARIALES)**

Unusual case of discovery of Chlorohytrium-like unicellular green algae inpetioles of biennial plants *Saccharina bongardiana*, collected in the conditions of strong anthropogenic pollution is described in the article. Study history of *Chlorohytrium*-like endophytes with water plants including representatives of genus *Chlorophytrium* which are a development stage of multicellular green algae is also stated. There are also authors opinions concerning groundlessness of putting *Spongomorpha aeruginosa* in the list of sea algal flora of eastern Kamchatka only on the base of unicellular endophytes location here similar to sporophyte of this species called *Chlorochytrium inclusum.*

**Key words:** *Chlorohytrium inclusum*, *Saccharina bongardiana, Spongomorpha aeruginosa*, endophytism, epiphytism, biotic relationship, life history, eastern Kamchatka.

УДК 593.96(265.5)

**Е.G. Panina, V.G. Stepanov**

*Kamchatka Branch of Pacific Geographical Institute Far-Eastern Branch   
of Russian Academy of Sciences, Petropavlovsk-Kamchatsky, 683000*

*e-mail:* [*panina1968@mail.ru*](mailto:vgstepanov@inbox.ru)

**LIST OF SPECIES OF THE SEA CUCUMBERS IN THE FAR-EASTERN SEAS OF RUSSIA: THE ORDER Synaptida (=Apodida) Cuénot, 1891 (Holothuroidea: Synaptida)**

Species composition of the order of apodalsea cucumbers (Synaptida) in the Far-Eastern seas of Russia is given in accordance with modern nomenclature of the mentioned order. For every species of sea cucumbers we provided synonymy, info about distribution in the Bering, Okhotsk seas, Sea of Japan, at south-eastern Kamchatka and Kuril Islands. Some species are illustrated by original pictures of zooms appearance.

**Key words:** holothurian, sea cucumber, Holothuroidea, Synaptida, Apodida, synonymy, list of species, distribution, Far-Eastern seas of Russia.

УДК 005.51:639.2(470+571)

**Y.S. Morozova**

*Kamchatka State Technical University, Petropavlovsk-Kamchatskу, 683003*

*e-mail: mus@kamchatgtu.ru*

**SECTORAL PLANNING IN THE RUSSIAN FEDERATION:   
PROSPECTS FOR IMPLEMENTATION IN THE FISHERIES COMPLEX**

Problems and prospects of implementation of strategic planning in the fisheries complex, due to a change in Federal legislation are identified. The diagram for organization of strategic planning in the fisheries sector using some mechanisms of the state private partnership is proposed.

**Key words:** fisheries sector, strategic planning, sector planning, state-private partnership.

УДК 316.64(571.66)

**O.G. Ogij**

*The Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003*

*е-mail: yldus78@mail.ru*

**ETHNIC, RELIGIOUS, CIVIL IDENTITY   
AND THE TOLERANCE PROBLEM IN KAMCHATKA**

Оn the basis of the data of sociological research the problem of compatibility of civil, ethnic and religious identity is analyzed in the article. The hypothesis about influence of migration character change on tolerance level of the population in the region is tested. The comparative analysis of social directives in international relations of Russian population and representatives of other nationalities is carried out.

**Key words:** sociological research, identity, ethnic tolerance, religious tolerance, risk.