PANORAMA

CASPIAN PIPELINE CONSORTIUM

Каспийский Трубопроводный Консорциум
Caspian Pipeline Consortium
Каспий Құбыр Консорциумы

CORPORATE MAGAZINE
No 1 (36) February 2022

MILES OF RELIABILITY

OPERATION
ON ROUTING INSTRUCTIONS

DIGITAL TRANSFORMATION
NEW QUALITY OF INTERACTION

THANKS TO CPC
EFFECTIVE DEVELOPMENT

HOBBY
ON THE SAME WAVELENGTH

CONTENT

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DEAR COLLEAGUES AND FRIENDS!

In the coming 2022, the Caspian Pipeline Consortium continues to implement current plans and starts new projects. Our company, being the main exporter of Kazakh oil and one of the largest taxpayers in Russia and Kazakhstan, has entered into a tax monitoring regime since January 1 – a project of the Federal Tax Service of the Russian Federation on digital transformation of reporting and taxation processes. In order to move to this qualitatively new level, CPC-R underwent special training and testing, showing the compliance of the corporate Internal Control System with federal standards. We also start the year with a Quality Management System certified according to the international standard ISO 9001:2015.

2022 will be an important milestone for the implementation of the Debottlenecking Program – by the end of the year, it is planned to complete projects designed to ensure the pumping of up to 83 million tons of oil per year through the pipeline. Work is underway at all construction sites from Tengiz to the Marine Terminal. The increase in the capacity of our pipeline system is approaching, but even with the current capacity, CPC has been leading among Russian stevedores for several years in a row. In the past 2021, we were again the first in terms of shipment volume, despite restrictions under the OPEC+ agreement, sometimes not too favorable weather conditions and other factors. It is important to note that in the situation of political turbulence, with which this year began in Kazakhstan, all conditions were created in the Atyrau region for the safe operation of CPC-K facilities, and work continued as usual.

I would like to express the hope that the historical period of the "early twenties" has exhausted its limit on surprises and will allow the close-knit multinational team of the Consortium to continue to professionally perform its work. Its results are visible in shipping figures, dividends, the scale of charitable and environmental programs. And for this, let me thank everyone on behalf of CPC management and shareholders. Time shows that our team is up to the task of any complexity. We have another year full of work ahead of us. There is no doubt that it will be productive and will receive a worthy assessment.

N.N. GORBAN,
GENERAL DIRECTOR
CASPIAN PIPELINE CONSORTIUM

AUTHOR
DMITRY KONSTANTINOV

PROGRAM CONTROL

ON DECEMBER 9, 2021, REPRESENTATIVES OF A NUMBER OF CPC SHAREHOLDER COMPANIES VISITED THE TENGIZ PS TO CHECK THE PROGRESS OF WORK ON THE IMPLEMENTATION OF THE DEBOTTLENECKING PROGRAM

Representatives of Chevron Caspian Pipeline Consortium Company Roman Vasilev and Sergey Lysenko, representative of Tengizchevroil LLP Viktor Kushnarev, representative of Kazakhstan Pipeline Ventures LLC Askar Murinov, representatives of NC KazMunayGas JSC Yerlan Abdrakhmanov and Ruslan Adiev, representative of Eni International N.A. N.V. Zhansaya Kasenova visited the head station of the Tengiz – Novorossiysk oil pipeline, where work under the DBNP started earlier than others.

Nurlan Bayzakov, Deputy Head of Staff of the DBNP, CPC Eastern Region, demonstrated to the representatives of the shareholders the facilities under construction and already ready within the framework of the Debottlenecking Program of the Tengiz PS. He reported on the progress of work, priority tasks and plans.

Works within the framework of the DBNP at the Tengiz PS include the construction of two VFRST-20000 tanks, the modernization of the oil metering unit, the replacement of three main pumps, the construction of four booster pumps, the construction of an electrical substation.

At the time of the shareholders' visit to the station, a set of tie-ins for the pressure reduction unit and commissioning work on two LACT-004 lines built as part of the DBNP were completed. Two new measuring lines of the oil metering unit received from TCO were ready for the start of commercial metering at the beginning of December, awaiting the conclusion on metrology.

During the visit of the shareholders' representatives, construction and installation work at the station did not stop. The stop was made only once – when the noise from tamping the soil at the construction site of additional lines of the oil receiving unit prevented hearing the report of the Deputy Head of Staff of the DBNP.

During the inspection of the DBNP facilities, representatives of CPC shareholders had the opportunity to talk with specialists from contracting organizations and get answers to their questions. In particular, the guests were interested in the technical characteristics of the new mainline and booster pumps, ensuring the declared increase in productivity, compliance with obligations to shareholders under the pumping plan, and other issues.

In general, based on the results of the site inspection, the shareholders were satisfied with the progress of work and compliance with the schedule. The next day, a four-hour production meeting was held at the East Region office in Atyrau with the participation of shareholder representatives, ER Regional Manager Mukhit Mazhenov, Team Leader, Quality Control, Engineering and Projects Alexander Antonov, Lead Engineer, Labor and Industrial Safety Alexander Zhdanov and other specialists.

During the meeting, representatives of the shareholders received detailed information on compliance with the requirements of labor protection, industrial safety and environmental protection during the work within the framework of the DBNP at the Tengiz PS. A videoconference was also organized for them with the management of VELESSTROY LLP, the general contractor – executor of DBNP works at CPC facilities in Kazakhstan. Astrakhanskaya PS became the next object of visit for representatives of CPC shareholders.

DURING THE VISIT OF THE SHAREHOLDERS' REPRESENTATIVES, INSTALLATION WORK AT THE STATION DID NOT STOP

It should be noted that in the subsequent period of the state of emergency, introduced throughout the territory of the Republic of Kazakhstan by the Decree of the President Kassym-Jomart Tokayev, all conditions were created for the safe operation of the facilities of CPC-K in the Atyrau region.

AUTHOR
PAVEL KRETOV

AESTHETIC, RELIABLE, HIGH-TECH

FOR TWO YEARS NOW THE TEAM OF THE CPC WESTERN REGION HAS BEEN WORKING IN THE CONDITIONS OF THE COVID-19 PANDEMIC. THE SITUATION DEMANDED THE MOST STRONG SANITARY RESTRICTIONS IN THE KRASNODAR REGION, BUT EVEN HERE THE CONSORTIUM'S OIL PIPELINES SUCCESSFULLY PERFORM ALL THE ASSIGNED PRODUCTION TASKS

Aleksey Dmitryukov, Operations and Maintenance Manager of CPC Western Region is confident that virtually all of the company's structural divisions have gained rich and valuable experience in operating facilities during the pandemic. This experience is taken into account in the instructions and guidance documents of the Consortium.

At every working meeting, the personnel of the company and contractors are reminded not to lose vigilance and reduce the requirements for sanitary protection measures. In addition to the use of masks and sanitizers that have already become customary, transparent screens are used to protect the workplaces of PS shift supervisors, similar to what is done in catering establishments or in institutions with a large flow of visitors.

The turnover of work permits at the stations is carried out completely contactless – for opening and closing they are left in specially equipped places, without passing from hand to hand. At the same time, the level of vaccination of employees of the Western Region of CPC has already exceeded an impressive 99%.

"When carrying out any work at the facilities of the oil pipeline, due to the elimination of duplication of functions, the number of employees of both CPC and contractors participating in the operation has been reduced to the maximum", notes Alexey Dmitryukov. "For example, in 2021, this was the case

ALL OF THE COMPANY'S STRUCTURAL DIVISIONS HAVE GAINED VALUABLE EXPERIENCE IN OPERATING FACILITIES DURING THE PANDEMIC

ALEXEY DMITRYUKOV

AN IMPORTANT AREA IS THE EXAMINATION OF INDUSTRIAL SAFETY OF FACILITIES WHOSE SERVICE LIFE HAS REACHED **20** YEARS

during the scheduled shutdown of the main oil pipeline for connection after the reconstruction of the booster pump station at the Kropotkinskaya PS".

Sanitary restrictions did not slow down the pace of implementation of the OPEX and CAPEX production programs at the facilities of the Western Region. In 2021, 33 contractors were working here only on the implementation of the OPEX program.

Another important area is the examination of the industrial safety of facilities whose service life has reached 20 years. This activity in the region began in 2021, it continues in the current year, and part of the work is scheduled for 2023.

"This is a serious area of the company's activity, based on the results of the diagnostic work carried out, important decisions are made on the possibility or impossibility of extending the operation of equipment, including decisions on the need to replace the equipment", explains the Operation and Maintenance Manager. "Thus, after carrying out diagnostic work in 2021, the company's management supported the proposal of the region and we carried out urgent work to replace the check valve with a diameter of 1050 mm at the 1216th kilometer of the oil pipeline".

Under the capital construction program at PS-5, located in the Stavropol Krai, near the village of Ptichye, a fire-fighting driveway and a parking lot for 20 cars were equipped. At PS-4, the only station in the Western Region, which is operated on a shift basis, work is being carried out to improve the comfort and safety level of the "Akhtuba" indoor residential complex. In the building, converted from the builders' dormitory, the wiring is being changed, a fire alarm is being installed, work has been done on piping and connection to the pumping station water supply.

Work continues on equipping block valve stations with secant gate valves with emergency diesel power plants. There are 31 such facilities in the area of responsibility of the Western Region, and at each it is necessary to perform construction, installation and commissioning works, test the control logic and protection systems.

As part of the capital construction project, a second new gas heater was installed at the Kropotkinskaya PS gas distribution station in 2021.

"This will ensure mutual redundancy of this equipment", comments Alexey Dmitryukov. "The gas is heated to +55 °C at the GDS, so that it does not arrive at the PS colder than +35 °C. This temperature ensures reliable operation of gas turbine engines driving the main pumps".

After completion of the landscaping stage, which was accompanied by laying tiles and asphalting, the Kropotkinskaya PS gas distribution station acquired a modern, aesthetic, pleasing look.

"We attach great importance to the aesthetics of production, and, of course, we are pleased that the authors of the anniversary book dedicated to the 25th anniversary of CPC have noted the photogenicity of our facilities", emphasizes Alexey Dmitryukov. "This is achieved by the daily painstaking work of all employees and the caring, proactive and creative approach of the management of pump stations".

Other capital construction projects expected to be implemented in the near future include the modernization of two chambers for cleaning and diagnostics: near the Kropotkinskaya PS and near PS-4.

The Western Region annually transports the largest volumes of oil through the pipeline system. A large production potential was laid in this area during the construction of the system and the implementation of the CPC Expansion Project, which was completed in 2018. That is why the Consortium's Debottlenecking Program (DBNP), which is currently being implemented in the Consortium, has required a smaller scale of activity here than in the "neighbors". At PS-4 and PS-5, an additional fifth capacity will be installed in the surge relief system and variable frequency converters (VFC) of electric motors of main pumps will be installed.

"This will give additional effective tools for managing modes to the OCC dispatchers, increase the safety of equipment operation, and eliminate overspending of electricity", sums up Alexey Dmitryukov.

AUTHOR
PAVEL SERGEEV,
REGIONAL MANAGER, PIPELINE MAINTENANCE,
CENTRAL REGION, "STARSTROY" LLC

AT MAJOR CONSTRUCTION SITES

REPAIR OF THE INSULATING COATING OF THE PIPELINE, UPDATING THE PAINTWORK AT THE FACILITIES, INSTALLATION OF EQUIPMENT AT THE DBNP IMPLEMENTATION SITES AND OTHER WORKS – THIS IS HOW THE DIVISIONS OF THE CENTRAL REGION OF STARSTROY LLC SPENT 2021

Transportation of oil through the pipeline system has its own specifics of the organization of maintenance. The Tengiz – Novorossiysk oil pipeline is a high-tech system with remote monitoring and control, which is carried out using the SCADA system and other advanced digital solutions. Information about the state of oil pipeline systems is collected by many sensors, after processing the received data, the system automatically makes decisions on changing the operating mode of the main and auxiliary equipment, including, if necessary, stopping faulty equipment and cutting off defective sections of the oil pipeline. High-quality and timely maintenance of the PS equipment, the linear part of the pipeline and control systems guarantees the trouble-free operation of the entire oil pipeline system as a whole. As a maintenance contractor, STARSTROY has been organizing maintenance, repairs and emergency response at the facilities of the CPC pipeline system for almost 20 years.

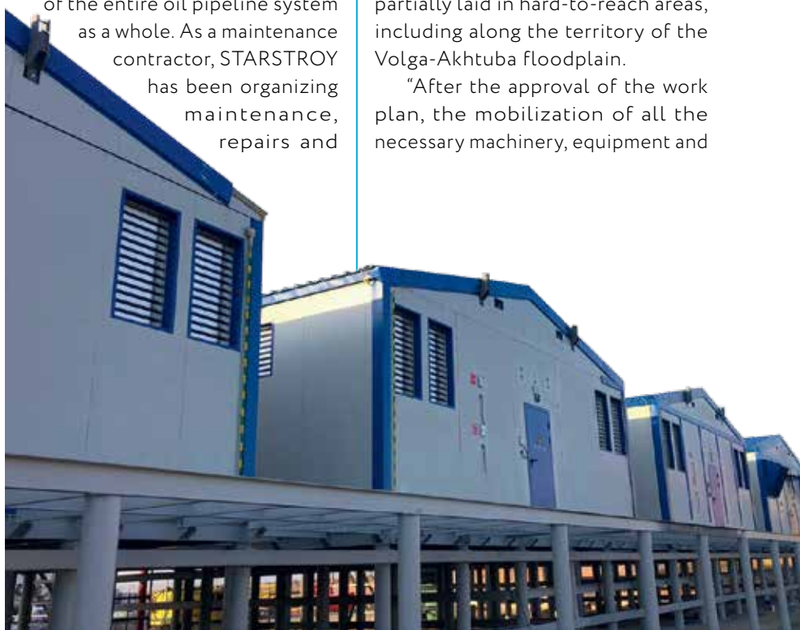
Speaking about the reliability of an oil pipeline, it should be noted that it is largely determined by the quality of insulating materials and the technology of their application. To ensure reliable operation of the linear part of the main oil pipeline and restore the design specifications, instrumental inspections of the pipeline route are regularly carried out, including for compliance with insulation compliance with regulatory requirements. In 2021, ERP (Emergency Recovery Points) units of the Central Region of STARSTROY LLC examined a 500-kilometer section of the pipeline and completed 167 repairs of the insulating coating. The section of the linear part to be repaired was partially laid in hard-to-reach areas, including along the territory of the Volga-Akhtuba floodplain.

"After the approval of the work plan, the mobilization of all the necessary machinery, equipment and

IN 2021, STARSTROY EXAMINED A 500-KILOMETER SECTION OF THE OIL PIPELINE AND COMPLETED

167

REPAIRS OF THE INSULATING COATING



personnel, we enclose the repair site along the perimeter of the working pit with a Larsen-type sheet piling", explains the algorithm for repairing the insulating coating in the Volga-Akhtuba floodplain section, master mechanic of the Astrakhanskaya ERP Vyacheslav Latsygin. Then, using the Varisko pump unit, we lower the groundwater level in the working pit, after which the section of the pipeline with an insulation defect is opened, the location and nature of the insulation damage is determined, and repairs are carried out.

The external condition of the objects of the oil pipeline system is an equally important component of the reliability of the entire system. Here, in addition to aesthetic criteria, we need to talk about a much more important function – protective. The equipment and elements of the sites of the mainline ball valves (MLBV) must be reliably protected from the effects of external weather factors. There is every reason for this: on the territory of the Astrakhan region and the Republic of Kalmykia, the daily temperature difference sometimes reaches 40°C.

> ALL WORK WAS CARRIED OUT IN COMPLIANCE WITH SAFETY AND ENVIRONMENTAL REQUIREMENTS

In 2021, as part of the planned work to update the paintwork of the linear part facilities, the STARSTROY ERP of CR completely renovated the polymer paintwork of equipment and site elements at the sites of the mainline ball valves (MLBV), radio shelters (RS) and pig launch/receive units (L/R). To accomplish the task, the ERP personnel underwent preliminary training in applying a weather-resistant two-component coating in accordance with the technological maps. All work was carried out in compliance with safety and environmental requirements.

Collaboration between companies is not limited to maintenance. An illustrative example is the participation of STARSTROY personnel in the preparation of PS process pipelines for connecting main pumping units at A-PS-4A and Komsomolskaya PS, as well as the drainage tank of the surge relief system (SRS) at PS-2. These works were carried out as part of the implementation of the Debottlenecking Program (DBNP) during the periods of planned shutdowns of oil pipelines in August, October and December 2021. CPC and STARSTROY specialists jointly and promptly developed and approved work plans focused on sequential emptying, cutting out sections of technological pipelines intended for connecting new equipment, their degassing, sealing and preparation for welding and installation work. The main attention was paid to the exclusion of emergency situations, as well as the impact of hazardous and harmful production factors on the personnel involved in the work and the environment, through organizational and technical measures and the use of certified personal protective equipment, including respiratory organs (PPE, RPE). Thanks to careful preparation and experience in performing such work, the tasks were implemented with high quality and within the schedule of scheduled shutdowns of the oil pipeline.

The organization of the maintenance system for the CPC oil pipeline system in accordance with the requirements of the standards, the joint efforts of the specialists of CPC Central Region and the CR divisions of STARSTROY in 2021 proved the possibility of jointly solving both current maintenance issues (with constant readiness for prompt response to emergency situations), as well as more complex tasks focused on the modernization of facilities equipment and further expansion of the throughput capacity of the Tengiz – Novorossiysk oil pipeline system.

AUTHOR
PAVEL KRETOV

ON ROUTING INSTRUCTIONS

KROPOTKINSKAYA PS HAS A SPECIAL PLACE AMONG THE FACILITIES OF THE WESTERN REGION AND THE ENTIRE CPC PIPELINE SYSTEM. FIRSTLY, THIS IS THE LARGEST CONSORTIUM STATION IN RUSSIA OVER 30 HECTARES. SECONDLY, HERE IS THE RESERVE DISPATCHING POINT OF CONTROL OF THE ENTIRE LINE. AND THIRDLY, THE STATIONS ACCEPT OIL FROM RUSSIAN PRODUCERS. ITS NUMBER IS RECORDED BY ACCOUNTING UNITS WHICH WERE MODERNIZED IN 2021

In November 2004, the acceptance of Russian oil into the CPC system began through the Kropotkinskaya PS metering station. Oil arrives in tank cars at the Kavkazskaya railway station, then is delivered to the newly built Kavkazskaya oil heating station of Naftatrans JSC and enters the CPC system via an 18-kilometer pipeline with a diameter of 700 mm. At the Kropotkinskaya PS, oil passes through a dirt filter and enters the oil quantity and quality measurement system (LACT), which consists of four measuring lines (one of which is a reserve one) with a maximum capacity of 1545 m3/h. The system is based on the principles of measuring the volume of oil with flow meters, measuring oil parameters with various sensors and transducers, calculating the mass of oil by flow computers according to a certified measurement technique.

A few years ago, the British company Solartron notified us that "it will no longer provide technical support for its production flow computers", says Boris Sedov, Lead Engineer, Oil Measurement, CPC Western Region. "On this occasion, CPC decided to replace the secondary equipment of the Solartron information processing system with domestically produced equipment. It is produced on the basis of the IMC-07 measuring and computing complex by "Oil and Gas Systems" LLC in the city of Ufa.

The implementation of the project to modernize the system began in the spring of 2021 with the development of technical documentation, which subsequently successfully passed the conclusion of a metrological examination at the Research Institute of Metrology. In the summer, the measuring complexes as part of the information processing system were manufactured in Bashkiria and successfully passed factory acceptance tests. The installation of new equipment at Kropotkinskaya PS was completed in six days in December, after two weeks of preparation.

THE IMPLEMENTATION OF THE INFORMATION PROCESSING SYSTEM MODERNIZATION PROJECT BEGAN IN THE SPRING OF 2021

In the course of modernization, the automated workplace of the LACT operator was significantly improved. Only one IMC-07 replaces five previously used flow computers, and to ensure reliability, IMC-07 version 8 with a hot backup function was chosen. The operator's advanced workplace allows you to track all trends and processes in dynamics.

It is also important that as part of the reconstruction of the LACT, not only secondary equipment was replaced, but also flow viscometers. Those that were installed earlier gave a signal that was not supported by the new ICC, which required the use of intermediate equipment. By the time the LACT was put into pilot operation, the specialists of the CPC Western Region Commercial and Crude Movement Operations Service had developed the entire list of technical and metrological documentation.

According to the plan, the pilot operation of the upgraded LACT information processing system of the Kropotkinskaya PS should be completed in April 2022. After that,

the equipment will be transferred to commercial operation.

"All measuring instruments used by us are periodically verified", says Boris Sedov. "Moreover, verification is carried out only by representatives of the regional center for standardization, metrology and testing. The accuracy indicators of all measuring instruments are regularly monitored using various standards. For example, in flow meters, the measurement error should not exceed 0.15%".

The organization of metrological support in the Western Region is carried out by Metrology Engineer Evgeny Degtyar.

"We carefully approach the choice of a contractor: this is accreditation for the right to carry out work, and the qualifications of personnel, the availability of standards", he lists. "Equipment subject to verification is verified within the time limits established by the standard. When carrying out calibration, an important condition is the compliance of the accuracy characteristics of the equipment with the measurement procedure and project documentation. On an ongoing basis, we carry out internal metrological control and supervision over the condition and use of measuring instruments at all objects of the WR".

Sergey Petrov, Lead Specialist, Commercial and Crude Movement Operations, handles the registration of oil coming from shippers in the Western Region. His interaction with the supplier's specialists is regulated by routing instructions from the Moscow office of CPC.

"Previously, we had a continuous reception of oil – now it is periodic, as the batch is formed", Sergey Petrov notes. "Automatically selected oil sample is subjected to acceptance tests in the laboratory of Kropotkinskaya PS. Based on the test results, the ballast is calculated, a quality passport and oil acceptance and delivery certificates are issued.

From 2004 to 2014, the laboratory was located in a small room next to the operator room of the oil metering station. In 2014, the laboratory moved to a new building, where all conditions are created for comfortable work of the staff and high-quality oil testing. In addition to the laboratory hall, where acceptance tests are mainly carried out, the laboratory has special rooms for washing chemical glassware, chromatography and weight rooms, as well as a room for documentation, warehouses for glassware and equipment, chemical reagents and standard samples.

All laboratory personnel have high professional skills and regularly improve their skills. The work is carried out under the guidance of Testing Laboratory Head Tatyana Glushchenko. Ensuring the functioning of the Quality Management System in the testing laboratory and quality control of tests is carried out by an experienced specialist – Sergey Pakhomov, Engineer, Quality, Testing Laboratory.

The fourth unofficial feature of the Kropotkinskaya PS is that it is the only station in the pipeline system not covered by the Debottlenecking Program. As we understand from the results of the visit to the station, meetings with the management and specialists of the PS, in the course of the Expansion Project and subsequent planned upgrades, such a significant potential was laid at the Kropotkinskaya PS that there were simply no bottlenecks left. ●

KROPOTKINSKAYA PS IS THE ONLY STATION NOT COVERED BY THE DEBOTTLENECKING PROGRAM

AUTHOR
DMITRY KONSTANTINOV

NEW QUALITY OF INTERACTION

SINCE JANUARY 2022, CPC-R JSC HAS SWITCHED TO TAX CONTROL IN THE FORM OF TAX MONITORING. THIS MODERN TOOL FOR EFFECTIVE INTERACTION BETWEEN A TAXPAYER COMPANY AND THE FEDERAL TAX SERVICE OF RUSSIA IS BASED ON DIGITAL TECHNOLOGIES AND OPTIMIZES REPORTING PROCESSES THROUGH ELECTRONIC DOCUMENT MANAGEMENT

The production activities of the Caspian Pipeline Consortium, along with the company's financial performance, allow it to act as one of the major taxpayers in the Russian Federation and the Republic of Kazakhstan. For the period 2018-2020, the amount of tax payments by CPC-R JSC to the budgets of all levels amounted to 59 billion rubles. The scale of the tax turnover of the Consortium is also evidenced by the fact that the relevant activities of the company are in the tax control zone of the Interregional Inspectorate for Major Taxpayers No. 2 of the FTS of Russia.

Like many business processes in modern Russia, taxation has now entered the stage of digital transformation. The number of new participants in tax monitoring has increased significantly. Since 2022, another 131 companies have joined the project. In total, 339 companies will participate in tax monitoring in 2022. During the six years of the formation of this institute, the number of participants has grown more than 50 times.

This is a fundamentally new, high-quality and convenient approach for companies to work with tax authorities, based on organizing access to accounting and tax accounting data in an electronic data showcase. The innovation contributes to a more efficient and operational interaction of the taxpayer company with the department of the Federal Tax Service, reduces tax risks, makes it possible to increase the level of tax planning, reduces the uncertainty of the tax treatment of transactions, speeds up the preparation and submission of tax returns.

59 BILLION RUBLES
WAS THE AMOUNT OF TAX PAYMENTS BY CPC-R FOR THE PERIOD 2018–2020

ALEXEY KHODAKOV,
CHIEF ACCOUNTANT, CPC R:

«IT WAS VERY IMPORTANT AND SIGNIFICANT FOR OUR COMPANY TO ENTER THE FEDERAL TAX MONITORING PROJECT. THE PREPARATION AND TESTING OF THIS PROCESS ALLOWED THE LEADERSHIP AND MANAGEMENT OF CPC TO REVIEW MANY SYSTEM-FORMING BLOCKS OF OUR ACTIVITIES. THE COMPANY IS DEVELOPING STEADILY, WE HOPE THAT THE INCREASE IN PUMPING WILL GIVE AN INCREASE IN OUR REVENUE, AND, ACCORDINGLY, THE COLLECTION OF TAXES IN RUSSIA AND KAZAKHSTAN WILL INCREASE. CPC IS AN OPEN, TRANSPARENT COMPANY. WE ARE READY TO RESPOND TO THE DEMANDS OF THE TIME, TO ANY STRATEGIC PROJECTS THAT ARE BEING IMPLEMENTED AT THE FEDERAL LEVEL. WE HOPE THAT THIS SIGNIFICANT STEP WILL CONTRIBUTE TO OUR FURTHER COOPERATION WITH THE TAX AUTHORITIES ON A CONSTRUCTIVE BASIS.

The development of services for the automation of all information interaction processes is actively underway. Since this year, the documents submitted by organizations upon entry into tax monitoring are checked completely automatically. Preparations for integration with Automated Information System "Tax-3" are actively underway: the participants of the working group have successfully tested most of the integration scenarios and are ready for direct connection of information systems to the system of the Tax Authority. According to the results of the year, each participant has something to be proud of.

AT A GLANCE

Developed on the "1C:Enterprise" platform in accordance with the requirements of regulators and the logic of tax accounting in Russia, the "Data Showcase" system has a fairly rich functional structure. Simplified, its architecture can be considered as consisting of two subsystems: the tax monitoring subsystem and the ICS subsystem (internal control system).

The tax monitoring subsystem allows you to organize a repository of published accounting and tax accounting data, automated formation of accounting and tax registers, generation of declarations with the possibility of sequential decoding. Data is loaded into the tax monitoring subsystem at CPC-R from the Navision accounting system. Based on the uploaded data, the system allows you to create

TATYANA DEEVA,
HEAD OF INTERREGIONAL INSPECTORATE FOR MAJOR TAXPAYERS NO. 2 OF THE FTS OF RUSSIA:

«CPC-R JSC, AS THE MAJOR TAXPAYER, HAS BEEN REGISTERED WITH INTERREGIONAL INSPECTORATE FOR MAJOR TAXPAYERS NO. 2 OF THE FTS OF RUSSIA SINCE APRIL 2018. IN A SHORT PERIOD OF TIME, THE ORGANIZATION HAS CERTAINLY CARRIED OUT A HUGE, LARGE-SCALE WORK, INCLUDING RELATED TO THE TRANSITION TO TAX MONITORING.

THE INTERREGIONAL INSPECTION DEVELOPS A UNIFIED PRINCIPLE OF ADMINISTRATION OF MAJOR TAXPAYERS IN OIL AND GAS INDUSTRY, VARIOUS FORMS AND FORMATS OF INTERACTION, AND CPC-R ACTIVELY PARTICIPATES IN THE IMPLEMENTATION AND INTRODUCTION OF NEW APPROACHES AND TRENDS.

CURRENTLY, WE ARE ACTIVELY COOPERATING WITH THE TERRITORIAL TAX AUTHORITIES IN THE CONSTITUENT ENTITIES OF THE RUSSIAN FEDERATION, TAKING INTO ACCOUNT ALSO THE RECEIPT OF REGIONAL AND LOCAL TAXES. WITHIN THE FRAMEWORK OF TAX MONITORING, THIS INTERACTION IS IMPLEMENTED ON THE PRINCIPLE OF "ONE WINDOW" IN THE INTERREGIONAL INSPECTION.

CONGRATULATIONS TO CPC-R JSC ON JOINING THE TAX MONITORING. WE WISH YOU SUCCESS IN IMPLEMENTING YOUR PLANS AND NEW PROJECTS. WE HOPE FOR PRODUCTIVE COOPERATION IN THE DEVELOPMENT OF MECHANISMS OF THE INTERNAL CONTROL SYSTEM AND INFORMATION INTERACTION.

VALERY YASHIN,
DEPUTY TEAM LEADER, INTERNAL AUDIT, CONTROLS AND COMPLIANCE, CPC-R:

THE ORGANIZATION OF THE INTERNAL CONTROL SYSTEM IS BASED ON A RISK-BASED APPROACH, WHICH MEANS CLOSE INTEGRATION OF THE ICS WITH THE COMPANY'S RISK MANAGEMENT SYSTEM.

THE INTERNAL CONTROL GROUP HAS BEEN IN THE COMPANY FOR MORE THAN 10 YEARS. SINCE 2015, PROCEDURES AND METHODOLOGY FOR INTERNAL CONTROL AND AUDIT HAVE BEEN DEVELOPED, AND THE IMPLEMENTATION OF THE RISK MANAGEMENT SYSTEM HAS BEGUN ACTIVELY. IN CONNECTION WITH THE ENTRY OF THE COMPANY INTO THE TAX MONITORING REGIME, IN ORDER TO COMPLY WITH THE REQUIREMENTS OF THE FEDERAL TAX SERVICE FOR THE ORGANIZATION OF THE ICS, THE COMPANY FINALIZED THE EXISTING DOCUMENTS, FORMALIZED AND IMPLEMENTED A NUMBER OF INTERNAL REGULATORY DOCUMENTS REGARDING THE ICS. DOCUMENTS SUCH AS THE REGULATION ON THE INTERNAL CONTROL SYSTEM OF CPC-R JSC, THE METHODOLOGY FOR MANAGING RISKS IDENTIFIED FOR THE PURPOSES OF TAX MONITORING OF CPC-R WERE PREPARED. THE CODE OF BUSINESS CONDUCT AND THE RISK MANAGEMENT STANDARD ALREADY EXISTED IN THE COMPANY.

THE TASKS OF THE ICS ARE TO MAINTAIN AND IMPROVE THE CONTROL ENVIRONMENT, TIMELY IDENTIFICATION AND ASSESSMENT OF RISKS, IMPLEMENTATION OF CONTROL PROCEDURES, AS WELL AS MAINTAINING THE INFORMATION EXCHANGE AND COMMUNICATION SYSTEM, MONITORING AND EVALUATING THE EFFECTIVENESS OF THE INTERNAL CONTROL SYSTEM.

THE COMPANY USES THE "THREE LINES OF DEFENSE" SCHEME. BY THE FIRST LINE, WE MEAN DIRECT CONTROL OVER THE IMPLEMENTATION OF COMPANY PROCEDURES BY STRUCTURAL DIVISIONS IN THE REGIONS. THE SECOND LINE OF DEFENSE IS THE CONTROL OF THE WORK OF DIVISIONS BY THE MOSCOW OFFICE, THE ACTIVITIES OF VARIOUS COMMITTEES AND COMMISSIONS. THE THIRD LINE OF DEFENSE IS THE WORK OF EXTERNAL AND INTERNAL AUDIT, INSPECTIONS OF REGULATORY BODIES, INCLUDING STATE ONES (FTS, CUSTOMS COMMITTEE).

reporting forms for both accounting and tax accounting.

The functionality of the ICS subsystem allows the enterprise to carry out its activities in terms of reflecting risks and performing control procedures, generating and publishing regulated reporting on internal control. Share Point platform serves as the source of data loading into the ICS subsystem of CPC-R. Based on the uploaded data, regulated ICS reporting forms are created and published in the showcase: risks identified for tax monitoring purposes, information on risks for individual transactions, a matrix of risks and control procedures, control procedures for tax monitoring purposes, results of control procedures, information on organization of the ICS and assessment of the level of the organization's ICS.

The system interface is segmented by tabs on the main page for ease of use. The first one displays a list of received notifications: about the publication of data for the reporting period, about received responses to a request, about a request for a motivated update, and others. The second tab contains a library of regulatory documents published as part of tax monitoring: accounting policy, tax settlement registers and others.

THE ADVANTAGE OF PUBLISHING ANY REPORT IN THE SHOWCASE IS THE FLEXIBILITY OF ITS CUSTOMIZATION

The third tab is designed to accommodate standard accounting reports, such as balance sheet, account analysis, account card, and more. The fourth tab contains summary and analytical registers, which are designed to systematize tax accounting data. The fifth tab is for publishing tax returns.

The advantage of publishing any report in the showcase is the flexibility to customize it. At the top of the standard report form there is a command panel where you can set arbitrary groupings by analytics, configure filters according to the necessary parameters, and so on. Also, the indicators of all reports can be sequentially decrypted to the level of postings.

After the publication of all the necessary data in the showcase, interaction with the tax office is carried out. The system implements a tool that allows you to generate official requests from the Tax Authority and requests from the taxpayer to provide a reasoned opinion. When forming a request, the inspector fills in the details of the card, after which it is automatically sent to the responsible employee of the enterprise. The response to the request is entered into the card in text form, to which scanned copies of the requested documents are added. When the response is sent, the inspector receives an email notification.

The showcase implements mechanisms for generating machine-readable reporting formats. The "Tax Monitoring" section contains published reporting forms, such as an application for tax monitoring, information exchange regulations, accounting policies for tax purposes, and information about organizations with a participation share of more than 25%. For all the listed forms, the system allows you to generate regulated printed forms and automatically convert data into the xml format, provided for by the requirements of the Federal Tax Service of Russia.

ZHANNA ELKINA,
LEAD TAX SPECIALIST, CPC-R:

THE TRANSITION TO TAX MONITORING IS A SIGNIFICANT STAGE FOR OUR COMPANY. WE HOPE THAT THE ABILITY TO PLACE PRIMARY DOCUMENTATION IN THE "DATA SHOWCASE", AS WELL AS INFORMATION ABOUT CONTRACTORS AND SUBCONTRACTORS, WILL OPTIMIZE THE COURSE OF COUNTER INSPECTIONS CARRIED OUT BY THE TERRITORIAL TAX INSPECTORATE AT THE PLACE OF REGISTRATION OF THE ENTERPRISE.

MARINA KRASHENINNIKOVA,
HEAD OF TAX MONITORING DEPARTMENT, FTS OF RUSSIA:

FEDERAL LAW NO. 470 "ON AMENDMENTS TO TAX LEGISLATION", ADOPTED AT THE END OF 2020, WILL SOLVE THE URGENT ISSUE OF THE TRANSITION OF COUNTER-TAX AUDITS IN ACCORDANCE WITH ARTICLE 93.1 TO THE AUTO-DEMAND MODE. RELATED REGULATIONS WILL BECOME EFFECTIVE FROM JANUARY 2024 ONLY FOR PARTICIPANTS OF TAX MONITORING.

WE HAVE ALREADY DEVELOPED THE FUNCTIONALITY FOR THE NEW CLAIM SYSTEM, TESTING IS TAKING PLACE IN A PILOT GROUP OF PAYERS INTEGRATED INTO THE AUTOMATED INFORMATION SYSTEM "TAX-3". IN CASE OF COUNTER CHECKS, THE VOLUME OF REQUESTED DOCUMENTS WILL NOT DIFFER FROM THE REGISTER PUBLISHED BY THE COMPANY IN THE DATA SHOWCASE. A TWO-LEVEL MODEL HAS BEEN CREATED, IN WHICH THE REQUEST OF THE TERRITORIAL AUTHORITY IS APPROVED BY THE MAIN ADMINISTRATOR, THAT IS, FOR YOU, BY INTERREGIONAL INSPECTORATE FOR MAJOR TAXPAYERS NO. 2 OF THE FTS OF RUSSIA. IF THERE A REQUEST FOR THE AMOUNT OF DOCUMENTATION IS CONSIDERED EXCESSIVE, IT WILL NOT BE APPROVED, AND THE COMPANY WILL NOT RECEIVE IT.

WE EXPECT TO LAUNCH THIS FUNCTIONALITY IN 2022-2023, YOU WILL NEED TO IMPLEMENT THE CORRESPONDING ELECTRONIC SERVICES. OF COURSE, IT WILL BE POSSIBLE TO GET AWAY FROM THE INCREASED VOLUME OF DOCUMENTS AS A RESULT OF INSPECTIONS, WHICH YOU SPOKE ABOUT. THIS IS OUR NEXT WORK WITH YOU WITHIN THE FRAMEWORK OF TAX MONITORING.

PRELAUNCH SEQUENCE

CPC-R JSC has been registered with the Interregional Inspectorate for Major Taxpayers No 2 of the FTS of Russia since 2018. In 2019, joint work began to prepare the company for the transition to reporting in the form of tax monitoring. Entry into the federal project was agreed with CPC shareholders, Ernst & Young was invited as a consultant.

Preparations for the transition to reporting in the form of tax monitoring took about three years at CPC-R. Within its framework, a number of business processes were revised, the systems of internal control, risk management, and tax reporting were improved, new regulatory documents were developed, such as the regulation on the internal control system, risk management methodology, and identification of tax monitoring. In August 2021, the company submitted to the Federal Tax Service a roadmap on entering the tax monitoring system.

On August 24, 2021, CPC-R submitted an application to switch to tax monitoring from 2022. The documents submitted by the company on compliance with the conditions for entering tax monitoring underwent a comprehensive audit by the Federal Tax Service, which resulted in a positive decision.

On November 9, 2021, a working meeting of representatives of the Caspian Pipeline Consortium and the Federal Tax Service was held in Moscow at the Interregional Inspectorate for Major Taxpayers No. 2 of the FTS of Russia. During the event, the parties noted the compliance of CPC-R JSC with the established criteria for the transition to tax monitoring from January 1, 2022, subject to all stages of the transition.

AUTHOR
PAVEL KRETOV

INDEPENDENT SYSTEM EVALUATION

AT THE END OF 2021, CPC RECEIVED A QUALITY MANAGEMENT SYSTEM (QMS) CERTIFICATE FOR COMPLIANCE WITH THE REQUIREMENTS OF THE INTERNATIONAL STANDARD ISO 9001:2015. CERTIFICATION WAS CARRIED OUT BY TÜV AUSTRIA

Rudolf Lukavsky, Head of the Austrian trade mission of the country's embassy in Russia, presented the certificate of successful completion of the audit to CPC General Director Nikolay Gorban.

"Our specialists help Russian companies to ensure a high level of quality and technology. The issues of industrial safety, environmental protection, energy efficiency are important both for Russia and for the whole world, for the well-being of future generations", said the Austrian diplomat.

Timely completion of the certification audit allows the company's management to have a complete and objective view of all aspects of the current Quality Management System. Even during the initial implementation of this system in the Consortium in 2011, procedures were developed, internal audits were carried out, and many employees were involved. Gradually, step by step, the company has built such a quality management system which they are deservedly proud of.

"An independent assessment, analysis of resources for development and optimization will never be superfluous", said Nikolay Gorban, CPC General Director, at the certificate awarding ceremony. "The best way is certification. For CPC employees, the ISO 9001:2015 certificate of conformity is not only a recognition of the high quality of our services in the international arena, but also a motivation to move forward, find reserves to improve the quality of work, and set new ambitious goals".

The certification audit was carried out by TÜV AUSTRIA, a reputable specialized company with a 150-year history.

"Our company inspects about 80% of all pipelines in Europe – checks their integrity, safety, carries out certification", Dmitry Yartsev, General Director of TÜV Austria Standards and Compliance, told "CPC Panorama". "Of these, Russians are most familiar with such arteries as Blue Stream and Turkish Stream. The entire onshore part of these pipelines, where they leave the Black Sea outside the Russian Federation, is under the inspection of TÜV AUSTRIA, our company also operates throughout the CIS. For example, in Kazakhstan, TÜV AUSTRIA serves the world's largest producer of natural uranium Kazatomprom, the national operator for the exploration, production, processing and transportation of hydrocarbons KazMunayGas, the National Bank of Kazakhstan and others".

QUALITY SERVICE PROVISION

The CPC audit was conducted from September to November 2021. The inspectors reviewed the relevant procedures in all major subdivisions of the Consortium. As part of the audit, such basic areas of activity as transportation and offloading of oil, the work of testing laboratories, the technical operation of equipment, personnel management and training, transport and logistics support were checked. The high level of procedures, deep knowledge of the company's specialists and well-established mechanisms for interaction between departments made it possible to pass the audit without comments.

RUDOLF LUKAVSKY

"We conducted a very thorough examination and made sure that the quality management system at CPC complies with the international standard ISO 9001:2015, which is followed by all leading companies today", said Dmitry Yartsev. "In terms of the volume of investments, in terms of the level of implemented activities, the Consortium does much more than many other enterprises in the industry. It is especially worth noting that the top management of CPC retains full control over all areas of management – financial, administrative, and infrastructural. Our auditors saw a complete system that provides quality services to shippers, with constantly improving mechanisms. We saw specialists who know the company's goals well and clearly follow the procedures. Corrective actions are taken in a timely manner for any incidents".

Among the world's best practices and the applied experience of shareholders, the auditors noted the "CPC Life Saving Rules". In 2018, following the recommendations of the International Association of Oil and Gas Operators, CPC supplemented the rules with aspects for organizing the safe conduct of earthworks, offshore operations, compliance with process safety requirements, and other.

CPC Life Saving Rules have enshrined the right and obligation of any employee and contractor representative to stop work if it is unsafe. If such conditions are detected, it is necessary to report this to representatives of the Health, Safety and Environmental Protection (HSE) Division or the head of the facility and record the event in the observation card. CPC employees regularly analyze all facts of work suspension, conduct a systematic assessment of recurring violations and implement additional measures to minimize them. In 2021, more than 5,000 observation cards were registered with the CPC, in 8% of them, that is, in 40 cases, the application of the right to suspend work was noted.

ONLY THE BEST PRACTICES

The health and safety of the company's employees and contractors, as well as people living near pipeline facilities, are the most important priorities of CPC's production activities. The corporate policy in the field of labor protection, industrial safety and environmental protection ensures the management of the consortium's production activities in compliance with all state and international requirements and practices, as well as internal


СЕРТИФИКАТ

TÜV AUSTRIA

соответствия системы менеджмента требованиям стандарта
EN ISO 9001:2015

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Ул. Павловская, д. 7, строение 1
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Транспортировка товарной нефти по магистральному трубопроводу «Тенгиз-Новороссийск».

procedures and instructions. Policy facilitators and coordinators are the specialized subdivisions of the Consortium, they ensure compliance with and popularization of the goals and requirements of the HSE policy in the workforce.

conditions are not only a legal and moral obligation, but also pay off economically. CPC was one of the initiators of the creation and actively participates in the work of the Safe Driving Association, its goal is to reduce accidents to zero through the

THE HEALTH AND SAFETY OF WORKERS, AS WELL AS PEOPLE LIVING NEAR PIPELINE FACILITIES, ARE CPC'S TOP PRIORITIES

In 2017, the company was declared the winner of the All-Russian competition "Health and Safety" in the nomination "Methodology in the field of control and ensuring safe working conditions" for the innovative project "The concept of creating a Safe Work Culture". Since 2018, the Consortium has become a partner of the Vision Zero International Zero Injury Program, which helps to create a culture of injury prevention and proves that safe and healthy working

safe and accident-free operation of corporate vehicles. Thanks to a set of measures taken, the Consortium has had zero statistics in the field of road accidents for four years.

Austrian auditors have also studied the CPC's successfully functioning Environmental Management System (EMS). In the regions of its presence, the Consortium has identified areas of activity that affect environmental safety and the state of the environment. They are ranked taking into account the probability and severity of the consequences, permanent control measures are determined for each aspect, which are included in the work plans, regular events are fixed in the internal regulatory documentation. The main result of the EMS is to increase the environmental safety of production activities by reducing both the impact on the environment and the likelihood of environmental consequences. In order to reduce the likelihood of emergencies, the Consortium's specialists perform scheduled and unscheduled inspections, review plans for the prevention and elimination of oil spills, assess the readiness of contractors to respond to emergency situations (ES).

When establishing CPC, its shareholders agreed to use only the best practices in management, design, construction and operation of oil pipeline transport facilities. And the work on improving all aspects of the production activities of an international company never stops.

DMITRY YARTSEV

AUTHOR
PAVEL KRETOV

DURING THE SCHEDULED SHUTDOWN

ON JANUARY 18, 2022, AT 07:40 MOSCOW TIME, A SCHEDULED 12-HOUR SHUTDOWN OF THE TENGIZ-NOVOROSSIYSK MAIN OIL PIPELINE HAS BEGUN. DURING THIS TIME, WORK WAS PERFORMED THAT CANNOT BE CARRIED OUT ON AN ACTIVE PIPELINE: MAINTENANCE, REPAIR AND CONNECTION OF EQUIPMENT, AS WELL AS WITHIN THE FRAMEWORK OF THE DEBOTTLENECKING PROGRAM

Among the important works on the linear part of the oil pipeline was the replacement of flange valves on the launch chambers of the cleaning devices of PS-4 and Kropotkinskaya PS, in the latter case with the use of fire work. Composite coupling P1 was installed at the outlet of the pipeline from the Astrakhanskaya PS. Due to the fact that insulation removal and sandblasting are required before installing the coupling, this operation was also performed with an inactive pipeline.

At other facilities of the linear part of the pipeline, checks of the tightness of valves were carried out, maintenance of block valve was carried out. In general, maintenance of instrumentation equipment, as well as power, mechanical equipment and SCADA systems was carried out at the pump stations of the Consortium.

Among the major works in the CPC Eastern Region, it is worth noting the replacement of spring-loaded safety valves in the chambers for receiving cleaning and diagnostic equipment on the 204th and 390 km of the oil pipeline route.

At Atyrau PS, a repair structure P7 was installed on the air vent of the recirculation line. The revision of the spindle assembly of the ball valve on the recirculation line of the main pumping unit was carried out.

CPC energy and instrumentation specialists, together with representatives of contractors, checked the operation of emergency protections and interlocks at the entrance to the Tank Farm of the CPC Marine Terminal and at two reduction stations. The operability of the automatic switching on of the reserve and the autostart of the diesel power plant were tested.

Among the works carried out as part of the technical re-equipment of the fire and gas detection system (FGDS) at the Shore Facilities of the Marine Terminal, wire jumpers were installed and connected for unlocking signals for doors of buildings and premises, and power cabinets were replaced.

The entire scope of work planned for the period of shutdown of the oil pipeline was successfully completed. On January 18, 2022 at 19:26 Moscow time, the pipeline was put back into operation.

AUTHOR
PAVEL KRETOV

MILES OF RELIABILITY

OLEG SKOMSKY IS A LEAD ENGINEER FOR OIL AND GAS PIPELINE OPERATIONS IN THE CPC WESTERN REGION. IN THIS ISSUE, WE TALK ABOUT THE FEATURES OF MAINTENANCE AND REPAIR AT OIL PIPELINE FACILITIES. OLEG MARYANOVICH – A PERSON WHO IS PERSONALLY RESPONSIBLE FOR THESE WORKS IN HIS AREA

By first education, he was a sailor and planned to connect his profession with the exploration of the World Ocean. However, in the early 1990s, Soviet ships went to sea less and less frequently. Then Oleg Skomsky "shifted the helm" and went to work in the Production Association of the main oil pipelines of Kazakhstan and Central Asia, now KazTransOil JSC.

Oleg Skomsky joined the Caspian Pipeline Consortium in 2002 as an operator of a fuel treatment unit of the Kropotkinskaya PS. The station was still operating in pilot operation mode at that time. In 2015, Oleg Skomsky was appointed Lead Engineer for Oil and Gas Pipeline Operations.

"We have a delicate 543-kilometer section of the oil pipeline that

THE 543-KILOMETER SECTION OF THE OIL PIPELINE REQUIRES CONSTANT ATTENTION

"I worked as an operator of an oil pumping station on the Pavlodar-Shymkent oil pipeline, where I reached the position of shift supervisor, Oleg Maryanovich recalls. "This pipeline was built by my father-in-law. At the same time, I received a specialized education at the Karaganda State Technical University".

requires constant attention", says Oleg Maryanovich. "For 444 km, the pipeline crosses farmland belonging to almost 300 different land users".

In order not to cause damage to farms during the inspection or repair of the pipeline, it is required to work as reliably, accurately and responsibly as possible.

OLEG SKOMSKY

Particularly aggressive environments include rice paddies (artificial flood fields), where constant humidity is combined with high temperatures. In such conditions, it is important to monitor and maintain the impeccable condition of the pipeline insulation coating. CPC uses RD-4000 PCM+ instruments to inspect pipe insulation. These tracers are not only able to determine the location and depth of the pipeline, but are also so "sensitive" that, by amplifying the signal from the metal, they determine violations of the integrity of the insulation. In such cases, additional flaw detection and repair are assigned.

Instrument inspections of the entire pipeline are carried out annually. At least once every five years, flaw detection is performed using in-line diagnostic devices. It allows you to identify potentially dangerous defects affecting the throughput of the linear part in advance and eliminate them in a timely manner.

"More than 20 years have passed since the completion of the pipeline construction, so now we have more reasons to respond", notes the Lead Engineer for Oil and Gas Pipeline Operations. "It is important to track scratches, risks, dents, corrugations, scuffs, metal losses, especially in rough terrain".

The mountainous section of the Western Region accounts for 35 km of the route. Here, it is especially important to monitor the condition of crossings through water barriers: to widen the channel (in narrow places, the pipeline can be washed out), strengthen the banks, and prevent the accumulations of logs and dry trees – this would lead to congestion on the river during floods or heavy rainfall.

The protective structures provided for by the initial construction project are also maintained in working condition. At the ramparts, trenches and barns equipped on the slopes, the specified altitude marks are checked, regular clearing of vegetation is carried out.

Oleg Skomsky remembered the scale of the Pipeline System Capacity Expansion Project completed in 2018 for its scale. As a lineman, he took an active part in connecting all four new pump stations in the CPC Western Region to the pipeline.

It was a large amount of work related to the preparation, pumping, sealing of sections of the pipeline", recalls Oleg Skomsky. "The operations carried out during the scheduled 72-hour shutdowns of the pipeline involved a large number of people, ensuring clear interaction between various services and teams. There were many experienced specialists at the construction site, communication with whom greatly enriched me professionally".

35 KM

OF THE PIPELINE ROUTE FALLS ON THE MOUNTAINOUS SECTION OF THE WESTERN REGION

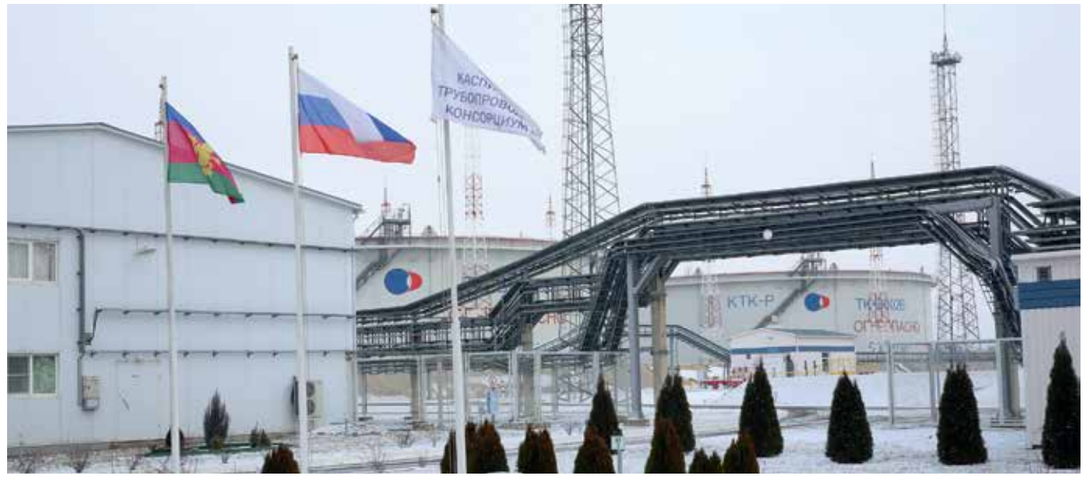
During the operation of the oil pipeline, new intersections of the pipeline system with roads, pipelines and other communications appeared. Such places also require increased attention both during the construction of the intersection and during further operation. It is important to organize and coordinate joint actions with the owners of these communications in case of possible emergencies and repair work.

"My task is to organize and control the high-quality implementation of timely maintenance and routine repairs of structures and equipment of the linear part of the oil pipeline", explains Oleg Skomsky. "We closely cooperate with the specialists of our contractor – STARSTROY LLC. We learn from each other, discuss and solve all emerging issues.

AUTHOR
PAVEL KRETOV

AMONG THE ENTHUSIASTIC

IN DECEMBER 2021, OLEG SHCHERBININ, MANAGER OF KROPOTKINSKAYA PS, TURNED 50. SIX MONTHS BEFORE THAT LEAD THE TEAM OF THE LARGEST CPC PUMP STATION IN THE RUSSIAN FEDERATION



Oleg Olegovich came to pipeline transport in 1998, after graduating from the Stavropol State Technical University with a degree in automation of production processes. He started as a mechanic for instrumentation, then moved up to the position of chief engineer of the Georgievskaya LODS, which is part of the North Caucasian Transnefteprodukt OJSC. The linear production and dispatching station pumped oil products produced by the Samara and Volgograd refineries, and also transported oil through the Malgobek – Tikhoretsk pipeline. Azerbaijani, Kazakh and Turkmen black gold passed through this artery.

OLEG SHCHERBININ HEADED KROPOTKINSKAYA PS IN JUNE 2021

"The period of the late 90s – early 2000s was turbulent, but in spite of everything, we reliably, trouble-free and uninterruptedly filled our tasks for the storage and transportation of raw materials and the finished product, supported the safe operation of the equipment", recalls Oleg Olegovich.

In 2010, Transnefteprodukt became part of Transneft JSC. The merger with the largest oil transportation company in the world was accompanied by an intensive exchange of managerial and operational experience. In particular, the Georgievskaya LODS underwent a major reconstruction, during which the process equipment was replaced.

Three years later, Oleg Olegovich was transferred to the position of first chief engineer, then deputy director of the Tikhoretskaya oil terminal. This is the most important tank farm in the pipeline system of Chernomortransneft JSC, four pipelines approach it and the same number exit. The team of the oil terminal is responsible for the operation of 500 km of the linear part.

"We implemented a major investment project for the construction of two main and one booster pumping station at the oil depot, the construction of two 50,000 tanks, and the reconstruction of loopings on the Tikhoretsk-Novorossiysk oil pipeline", Oleg Shcherbinin continues. "Together with the Construction Directorate of Chernomortransneft, I supervised the work of construction organizations, the number of contractors at times reached 2.5 thousand people".

In 2016, he moved to CPC as Deputy Manager of PS 4. This station is the very first one launched under the Expansion Project in the Western Region of the Consortium. It is the only one in WR, which is operated on a shift basis.

"Great, solid team!", notes Oleg Olegovich. "Shift work always leads to closer, more trusting relationships with colleagues. When you spend so much time with them, it's like a second family". Oleg Yuryevich Gavrilov, the wonderful head of PS 4, did a lot to improve the comfort of the shift camp so that nothing distracts from work: improved water supply, fire alarm and sewage systems.

Nowadays, Kropotkinskaya PS, which Oleg Shcherbinin headed in June 2021, is also actively improving:

"Here I met no less enthusiastic colleagues, from whom I myself have a lot to learn. We help and prompt each other. Now we are improving the convenience and safety of maintenance of PS equipment. Thus, we take out the block valve from the square so that the tank farm operators can operate it, being outside the danger zone. We are laying footpaths to simplify access to control facilities, for safe bypassing of equipment by operational personnel and patrolling by security guards. The nearest plans include the reconstruction of treatment facilities and industrial storm sewers, the construction of a new office campus and a canteen. We'll keep working!

AUTHOR
GULNAR MALGAZHDAR

EFFECTIVE DEVELOPMENT

THE END OF 2021 IN THE ATYRAU REGION OF KAZAKHSTAN WAS MARKED BY A NUMBER OF EVENTS THAT BRING REPUBLICAN MEDICINE AND SOCIAL INFRASTRUCTURE TO A NEW LEVEL

In early November 2021, the famous Russian orthopedic traumatologist, pediatric surgeon Andrey Koltsov visited the Atyrau Regional Children's Hospital. PhD in medicine, member of the Russian Guild of Orthopedic Prosthetists, ISPO, FESSH, Head of the Children's Orthopedic Department No 1 of the Federal Scientific Rehabilitation Center named after G.A. Albrecht (St. Petersburg) conducted a series of master classes and six demonstrative surgical operations.

The choice of location was not accidental: the day before, the Atyrau Regional Children's Hospital received a new medical equipment from the Caspian Pipeline Consortium as a gift, which allows performing complex operations in the specialty of Andrey Koltsov.

Designed and manufactured in Germany, the multifunctional device Acculan 4 can be used in other surgery. One of the advantages of the system is battery power, which allows the surgeon to perform complex operations more accurately and confidently without worrying about connecting wires. Previously, for such operations, hospital patients had to be sent to Nur-Sultan or Almaty. Now such operations can be carried out in Atyrau.

"With the development of modern medicine, methods and surgical equipment for performing ultra-precise operations are changing", said a traumatologist, surgeon of the Atyrau Regional Children's Hospital Sergey Khvan. "For many years we have been using Soviet-made surgical equipment. Now, with the support of CPC, modern medical equipment has been purchased, which not every clinic in the world can boast of. It has become much easier for us to work with it".

Health care support is one of the priority areas of CPC's charitable activities. Since the first year of the Consortium's existence, the company has been constantly implementing social programs aimed

traumatology, dermatology, cardio and

CPC PRESENTED NEW MEDICAL EQUIPMENT TO THE ATYRAU REGIONAL CHILDREN'S HOSPITAL TO PERFORM COMPLEX SURGICAL OPERATIONS

at supporting medicine, education, culture, children's sports, as well as the infrastructure of cities and towns located in the areas where the main oil pipeline passes.

"One of the main tasks of the CPC is the manifestation of social responsibility in the regions of presence", said Kairgeldy Kabyldin, Deputy CPC General Director, Republic of Kazakhstan Government Relations. "We have been cooperating with district and regional medical institutions for a long time. In 2020, our company purchased a computed tomography complex, an X-ray machine, ambulances for a number of district hospitals. For the "Zhuldyzai" Medical Rehabilitation Center, we purchased innovative

MULTIFUNCTIONAL DEVICE ACCULAN 4

equipment designed for high-quality rehabilitation of patients with disorders of the musculoskeletal system and improving the health of children with disabilities".

STRONG SUPPORT

"Zhuldyzai" Medical Center in Atyrau specializes in rehabilitation of children with special needs. Every year, about 300 small patients with cerebral palsy, Down syndrome, mental retardation and other diseases are treated here. High results of the center's work are ensured not only by experienced specialists, but also by modern high-tech equipment supplied by CPC.

Today, the "Zhuldyzai" center is equipped with modern correctional equipment that allows to restore and significantly improve the development of fine motor skills, motor functions, muscle strength and coordination of children's movements, increase joint mobility and muscle endurance after injuries and operations.

"Our cooperation with CPC began in 2020", says Ulzhalgas Mukhambetova, Director of the "Zhuldyzai" Medical Center. "In 80% of cases, the success of recovery depends on rehabilitation techniques and appropriate equipment. Today, we have all the conditions to provide the necessary assistance in this direction, and we highly appreciate the support that CPC provides us".

The first device purchased by CPC for the center was the Biokinect in 2020. This complex for the diagnosis, treatment and rehabilitation of children with pathology of the musculoskeletal system, works by the method of biofeedback and develops the skills of self-control and self-regulation of various functions in patients. The universal exercise machine, focused on restoring movements in the lower extremities, consists of a treadmill and a suspension system. On it, children learn to stand and walk, undergo both passive and active rehabilitation.

"About 200 programs have been uploaded to Biokinect", explains Ulzhalgas Mukhambetova. "The simulation course is designed for children over five years old who can stand on their own, hold on and be able to follow commands. The device activates the processes of neuromuscular self-regulation. For example, the screen simulates a situation when a child is walking along a path and an unexpected obstacle appears in front of him, say, a fallen tree. In order to step over it and not fall at the same time, the child receives a command from the brain to the muscles and makes movements with his feet that were previously inaccessible to him. If our patient does not know how to stand and walk, then thanks to the suspension system, he learns this quickly".

Another complex acquired by the Consortium is called LOGO PRO. It is an automated speech therapist with a computer and a touch screen. Special software contains a set of role-playing games focused on the development of imagination, attention, thinking and memory.

"The complex is designed for children from five years old", says the speech therapist of the rehabilitation center "Zhuldyzai" Shynar Akhmetova. "In the process of classes, the child develops fine motor skills, thinking, corrects stuttering, develops the ability to speak cleanly and correctly. Thanks to the interactive tactile pad and play sets, children learn to count and distinguish colors. In case of an incorrect answer, the program gives a hint, and if the answer is correct, it motivates with praise for better results.

In addition to the development of speech and thinking in general, the LOGO PRO complex is also able to improve the state of the respiratory system, memory and attention. Classes are held 3-4 times a week, lasting from 5 to 40 minutes. Sand therapy module helps to develop tactile abilities.

motor volume of the upper limbs. The complex, which can be used by four at the same time, increases joint mobility, strength and endurance of muscles after injuries and operations, restores and develops fine motor skills, coordination of hands, fingers and forearms, as well as cognitive functions of the brain of patients of all age categories.

"The complex is aimed at children from three years old", says Amangul Serikkalieva. "On the one hand, they seem to play, but at the same time develop motor skills. We gave each simulator a name, the boys especially like the "steering wheel". There is a "saw", the exercises on which allow you to develop your fingers. The children who came to us after injuries do not notice how actively they begin to work with both hands".

HIGH RESULTS OF THE CENTER'S WORK ARE ENSURED NOT ONLY BY EXPERIENCED SPECIALISTS, BUT ALSO BY MODERN HIGH-TECH EQUIPMENT SUPPLIED BY CPC

In September 2021, the arsenal of correctional equipment of the medical center was replenished with four more sets. Among them, the children's favorite «labyrinth», which trains the hands and both hemispheres of the brain. Such sets of eco-friendly wood are equipped with offices of a psychologist and an occupational therapist.

"Labyrinth" has 12 boards-levels, with each of which the tasks become more difficult", explains occupational therapist Amangul Serikkalieva. "As a result, visual and motor memory develops, concentration and stability of attention, observation, coordination of movement and motor skills increase".

Also, a multifunctional training table is installed in the occupational therapist's office to restore the

Another rehabilitation complex for ergotherapy was developed according to the Montessori system. Its functions are aimed at the development of fine motor skills. At the end of the course, children are able to hold pencils and a pen.

"The exercises involve a tweezer grip and index finger, the development of which contributes to the development of speech", the occupational therapist continues. "Boys are also very fond of this device, they are interested in which figure will fit. They begin to think, not only the arms move, but also the spine, the brain works. As we know, fine motor skills of the hands are directly related to the speech zone. This is what the training complex is focused on, strengthening the coordination connection of the

brain with the limbs, developing cognitive functions (related to the perception and recognition of drawings, shapes, colors), as well as abstract and logical thinking".

For the treatment of children with cerebral palsy and Down syndrome, a vacuum massage device was purchased, which promotes the regeneration of skin tissues and tones the muscle structure.

"Initially, vacuum massage was used in cosmetology", nurse Oralkhanym Kazhgalieva comments. "Having discovered a positive effect, it began to be used in medicine, in particular, in rehabilitation. It is especially necessary for children with cerebral palsy and children with Down syndrome, as they have weak muscles and increased fluid secretion. The device is very convenient, allows you to adjust the flow and gives the effect immediately".

Treatment at the rehabilitation center "Zhuldyzai" is free, children are sent by district polyclinics. The course of treatment is 20 days according to the type of day hospital. Upon admission, a multidisciplinary group (MDG) is held – a council of neurologists, rehabilitation therapists, an occupational therapist, a speech therapist. Specialists draw up an individual rehabilitation plan, prescribe treatment. The new equipment purchased by CPC undoubtedly improves the quality of services provided.

FOR 20 YEARS OF ITS WORK, THE CONSORTIUM HAS INVESTED ABOUT 11 BILLION TENGE (MORE THAN 25 MILLION US DOLLARS) IN CHARITABLE PROJECTS IN KAZAKHSTAN

HOME SWEET HOME

For 20 years of its work, the Consortium has invested about 11 billion tenge (more than 25 million US dollars) in charitable projects in Kazakhstan. These projects included the construction and reconstruction of schools, kindergartens and hospitals in the Atyrau region.

On December 21, in the village of Talgairan (a suburb of Atyrau), the construction of the Regional Family-Type Children's Village was completed. A large-scale charitable project was implemented with the support of the Caspian Pipeline Consortium.

The opening ceremony of the Children's Village was attended by CPC General Director Nikolay Gorban, Deputy CPC General Director for Republic of Kazakhstan Government Relations Kairgeldy Kabyldin, Akim of Atyrau Region Makhambet Dosmukhambetov, as well as employees and pupils of the social institution.

"Supporting the regions of presence is one of our company's priorities", said Nikolay Gorban, CPC General Director, at the opening ceremony. "Today we are opening a new socially significant facility, the need for the construction of which was due to the needs of children left without parental care. The implementation of this project will undoubtedly have a positive impact on the social climate of the region".

The regional children's village on the banks of the Ural River includes eight two-story residential buildings, each of which is designed to accommodate eight to nine children together with "mom", as the children call the teacher who is constantly next to them. Four houses are furnished and equipped for children with disabilities.

More than 50 orphans and children brought up without parental care have recently settled in cozy cottages with a developed infrastructure. All of them moved from a similar institution "Shanyrak". For new settlers aged from three to 18 years, all the necessary conditions for education, training, rehabilitation and preparation for independent living have been created. On the territory of the village with an area of three hectares there is a sports complex, a summer sports ground, a boiler room, a checkpoint, an administrative building, a medical, dressing and vaccination rooms, a medicine storage room, a psychologist's office, a sauna.

"Our project is unique, because there is no other such facility throughout Kazakhstan", emphasized the director of the Regional Children's Village Gulsara Botataeva. "I visited all 16 children's villages that exist in every region, but there is no such village as ours anywhere else in our country. The new project has everything that is usually missing in ordinary family children's villages. For example, in our cultural and sports complex there are dance, assembly, sports and gyms. There is a sauna complex, playgrounds, which are equipped with entertainment and educational equipment. In the administrative block there is a co-working center where a child can learn the basics of professional activity and develop creatively, as well as a center for self-knowledge and social adaptation. A spacious and modern conference room allows children to study online. In short, our children's village has all the conditions for a comfortable stay, as close as possible to home.

The new Children's Village was created within the framework of the Cooperation Agreement between the Caspian Pipeline Consortium and the Akimat of Atyrau Region.

"The construction of the Family-type Children's Village began in December 2019, but due to the pandemic, the commissioning date for the facility was postponed for a year", said Akim of Atyrau Region Makhambet Dosmukhambetov. "Today, thanks to the financial support of CPC, a unique project for orphans and children left without parental care has been implemented – a family-type Children's Village, which has all the conditions for comfortable living. We see that the implementation of the construction project finds a lively response from the regional administration, the management of the institution and, of course, the pupils of the Children's Village themselves".

In the spring of 2021, as part of cooperation with the Akimat of Atyrau Region, another important social facility was opened – the Youth House, designed for graduates of orphanages, family-type children's villages, boarding schools for orphans and children left without parental care.

AUTHOR
PAVEL KRETOV

NEW LEVEL OF DIAGNOSIS

THE COVID-19 PANDEMIC HAS BECOME A STRESS TEST FOR THE WHOLE WORLD HEALTH SYSTEM. DOCTORS AND MEDICAL STAFF OF HOSPITALS ARE AT THE FRONT OF THE DEFENSE. IN CONDITIONS OF MAXIMUM LOAD ON MEDICAL INSTITUTIONS, WHEN BOTH PEOPLE AND EQUIPMENT ARE WORKING LITERALLY AT THE LIMIT, CPC'S CONTRIBUTION TO THE MATERIAL SUPPORT OF REGIONAL CLINICS OF KUBAN IS OF SPECIAL VALUE

Irina Sergacheva, Deputy Chief Physician of the Dinskaya Central District Hospital, will not remember the same difficult period in her practice.

"A high burden fell on the outpatient unit and the ambulance service", says Irina Valentinovna. "At the peak of the pandemic, the number of ambulance calls increased to 200 per day. The Dinskaya district polyclinic alone received up to 100 house calls. And here, of course, the cars recently presented to us by CPC, equipped with all the necessary modern equipment, were very useful. They saved many lives while transporting seriously ill patients".

The management of the Dinskaya CDH has formed separate infectious teams for ambulance and emergency care. Infectious disease doctors were on duty in each medical institution of each settlement of the district.

"In addition to the increased flow of patients, due to routing, our hospital received patients with an infectious profile for certain nosologies from Krasnodar, which also increased the load on the infectious diseases department", explains Irina Sergacheva. "In turn, we also cooperated with the nearby infectious diseases hospitals of the region, sending there patients with COVID-19 from the Dinskoy district".

In the district hospital, access control has been strengthened, visits are prohibited, control over the use of personal protective equipment has been increased. The consumption of PPE and sanitizers in the medical facility has increased several times at once. But the staff coped, and the equipment did not disappoint. The Deputy Chief Physician especially notes the biochemical and hematological analyzers transferred by the Consortium in 2019. As well as the X-ray room equipment – a gift of 2018.

The hospital team was highly appreciated by the Governor of the Krasnodar Krai, the Ministry of Health of Kuban and the administration of the Dinskoy district. Certificates of honor were awarded for the work of doctors and nurses, employees of hospitals and polyclinics.

"At the beginning of the pandemic, when there were no vaccines yet, a lot of our employees were sick with coronavirus", continues Irina Valentinovna. "We must pay tribute to their dedication: as soon as they were able to return to duty, they immediately set to work".

Today, the doctors of the Dinskaya Central District Hospital propagate the need for vaccination among the residents of the district by personal example. They regularly appear in the media, use the influence of social networks, including their Instagram accounts.

"Our chief physician, Sergey Leonidovich Chikishev, was the first to be vaccinated himself", Irina Sergacheva notes. "And today almost all doctors are vaccinated. There are 95% of them in the ambulance.

IRINA SERGACHEVA

Our plan for vaccination has been overfulfilled, but we do not stop and continue to move on".

An effective measure was the proposal, implemented at the initiative of the regional Ministry of Health, to vaccinate patients upon discharge from hospitals. This is especially in demand by elderly and people with limited mobility – there is no need to visit a medical facility once again, permission for vaccination is given by a doctor who knows the patient well, all necessary diagnostics and analyzes have been performed.

WITH THE HELP OF CPC, DIAGNOSTIC CAPABILITIES IN THE DINSKAYA CENTRAL DISTRICT HOSPITAL HAVE REACHED A NEW LEVEL

At the end of 2021, CPC strengthened the material base of the Dinskaya Central District Hospital with the supply of a modern Pentax EPK 3000 endoscopic imaging system. The equipment used for gastroscopic examinations will also help improve the safety of patients and medical staff during the Covid-19 pandemic. How? Unlike fiberscopes previously used in the clinic, the new device minimizes physical contact between the doctor and the patient.

The Japanese EPK 3000 is a video processor that displays an HD-quality image on the monitor from flexible endoscopes – diagnostic, treatment and video surveillance tools. The technique allows early detection and treatment of pathologies of the gastrointestinal tract, which today are among the top 5 so-called diseases of civilization.

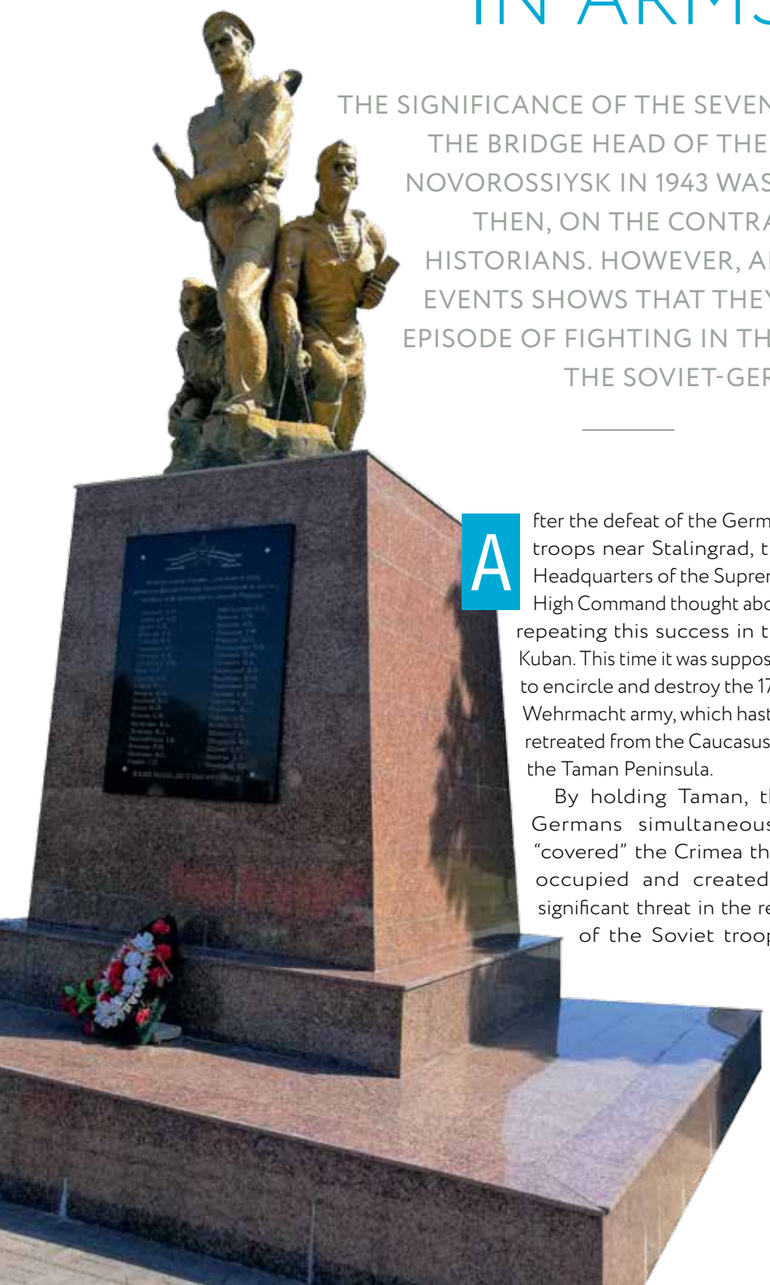
SVETLANA PROTSIK

"A wonderful gastroscope with high controllability, i-scan technology, powerful xenon illumination", Svetlana Protsik, an endoscopist, shares her impressions. "It has a good, close to natural color reproduction, the smallest details are visible. We can say with confidence: the diagnostic capabilities in the Dinskaya Central District Hospital have reached a new level".

At the ceremony of handing over endoscopic imaging systems to four rural hospitals in the Krasnodar Krai, including the Dinskaya Central District Hospital, Vice Governor Anna Minkova thanked the CPC shareholders and CPC management for their sensitivity to the social problems of the region and for their active participation in bringing the regional healthcare system up to modern requirements and standards, for the benefit of all residents of Kuban.

AUTHOR
PAVEL KRETOV

BROTHERS IN ARMS



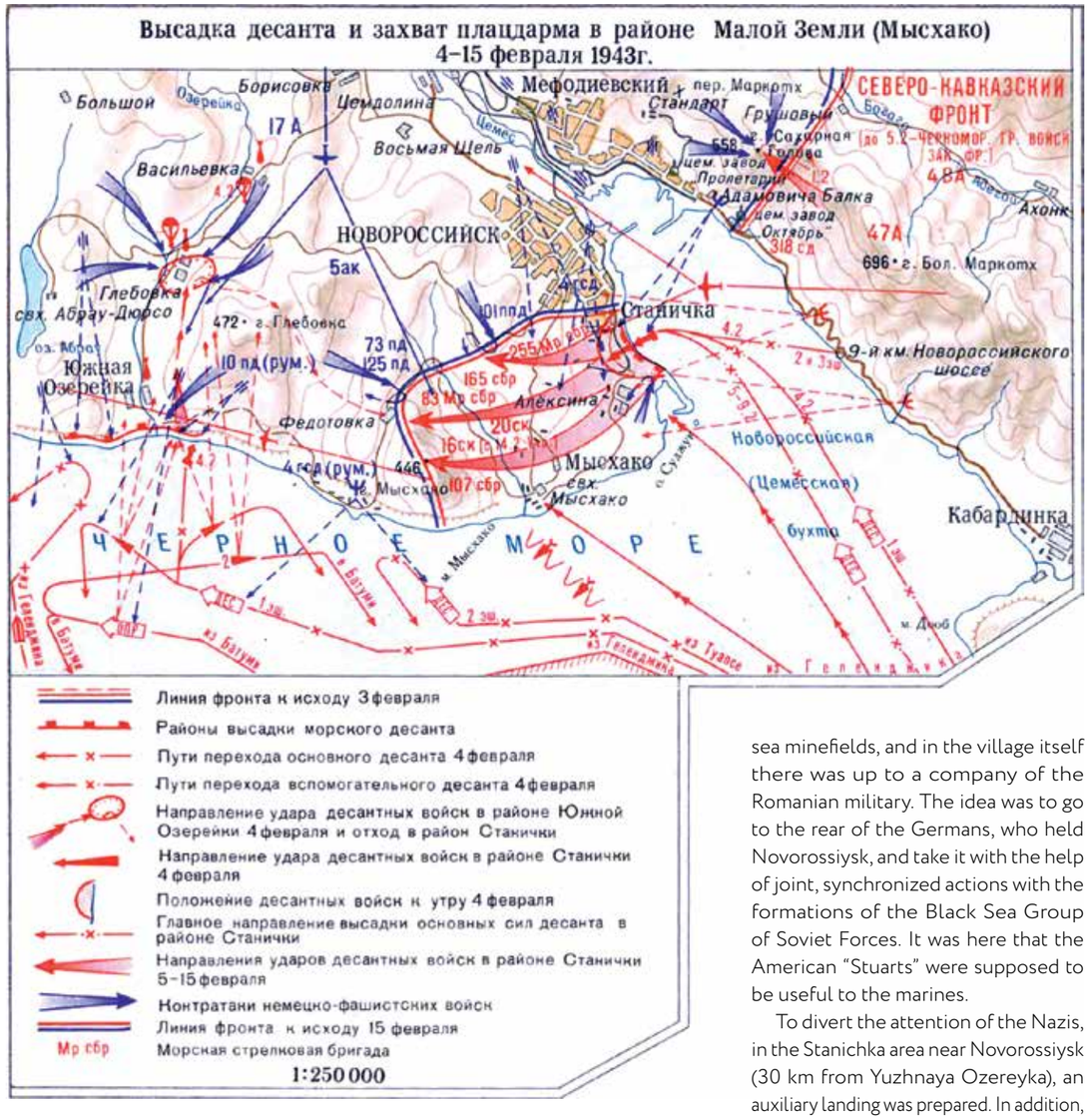
THE SIGNIFICANCE OF THE SEVEN-MONTHL DEFENSE OF THE BRIDGE HEAD OF THE MALAYA ZEMLYA NEAR NOVOROSSIYSK IN 1943 WAS SUBSEQUENTLY PRAISED, THEN, ON THE CONTRARY, DOWNPLAYED BY HISTORIANS. HOWEVER, AN OBJECTIVE LOOK AT THE EVENTS SHOWS THAT THEY WERE NOT AN ORDINARY EPISODE OF FIGHTING IN THE SOUTHERN SECTION OF THE SOVIET-GERMAN FRONT

After the defeat of the German troops near Stalingrad, the Headquarters of the Supreme High Command thought about repeating this success in the Kuban. This time it was supposed to encircle and destroy the 17th Wehrmacht army, which hastily retreated from the Caucasus to the Taman Peninsula.

By holding Taman, the Germans simultaneously "covered" the Crimea they occupied and created a significant threat in the rear of the Soviet troops. The depth of defensive fortifications here reached an impressive five to six kilometers. Three infantry, mountain rifle and cavalry divisions dug in on the Taman Peninsula. Three more divisions of the Nazis formed the reserve.

Preparations for the landing of Soviet troops near Novorossiysk continued for several months. Two motorized rifle brigades were removed from the front, which were re-equipped with personnel and Lend-Lease tanks. Light "Stuarts" did not differ in the thickness of the armor, but with a weight of 12 tons, they could be transported on special landing craft – "bolinders". These boats got their name from a Swedish shipbuilding company that carried out orders from the tsarist government. From the sea, fire support for the paratroopers was to be provided by two cruisers, the leader of destroyers, patrol and torpedo boats.

Yuzhnaya Ozereyka was determined as the place of the main strike. Intelligence reported that there was a gap in the



Materials provided by the Research Institute of Military History of the Military Academy of the General Staff of the Armed Forces of the Russian Federation

Mondadori Portfolio/akg-images/East News

sea minefields, and in the village itself there was up to a company of the Romanian military. The idea was to go to the rear of the Germans, who held Novorossiysk, and take it with the help of joint, synchronized actions with the formations of the Black Sea Group of Soviet Forces. It was here that the American "Stuarts" were supposed to be useful to the marines.

To divert the attention of the Nazis, in the Stanichka area near Novorossiysk (30 km from Yuzhnaya Ozereyka), an auxiliary landing was prepared. In addition, the warships of the Black Sea Fleet were supposed to "imitate" the landing of marines on the shore at Cape Iron God, near Anapa and the village of Blagoveshchenskaya.

In the first hour of the night on February 4 in Yuzhnaya Ozereyka, Glebovka, Vasilievka, Stanichka and Anapa, the silence was first broken by the rumble of aircraft engines, and then by explosions of numerous bombs. A few minutes later, ships joined the shelling of the coast. Despite the fact that they fired more than two thousand shells at the enemy, the effectiveness of artillery preparation turned out to be

TASS

quite low. The artillery battalions of the Germans, machine-gun and mortar crews, sheltered by mountains, suffered almost no damage and confidently held their pre-targeted lines. The landing of marines, which began at 2:30 a.m., they met with unrelenting heavy fire. As a result, all three "bolinders" were lost, and most of the tanks could not even overcome the beach strip.

Dawn was approaching, the losses among the sailors and marines were growing, and at the headquarters of the operation it was decided to abandon the continuation of the landing. By this time, only a part of the troops of the first echelon - 1450 people - had been landed in Yuzhnaya Ozereyka. Deprived of support and communication with the command, the detachment fought for several days with superior enemy forces in the Glebovka area, then in groups tried to break out of the encirclement.

The fate of the landing force in the Stanichka area, which was planned to be auxiliary, but due to circumstances became the main one, turned out differently. In fairness, it should be added that such a possibility was not excluded by the operation plan. But 250 marines under the command of Major Caesar Kunikov did not know about it. The Marines were preparing to take their last stand, diverting the attention of the enemy from Yuzhnaya Ozereyka. "We will give our will, our strength and our blood drop by drop for the life and happiness of our people, for you, dearly beloved Motherland", the Kunikovites took the oath before loading onto the landing ships. Having secured the bridgehead, Major Kunikov sent an open radiogram to the command: "The regiment landed successfully, we are acting according to plan. I'm waiting for the next echelons".

The Germans threw all available resources into the fight against the regiment - infantry, tanks, artillery, aviation. In the first day alone, the defenders of the bridgehead repulsed two dozen powerful attacks, but the Germans failed to cut off the paratroopers from the coast or wedge into their defenses. And when the ammunition ran out, the marines captured a German artillery battery with a sudden attack and turned the guns towards the enemy.

"There was total confusion. No one knew what happened... Kunikov's soldiers dug in one by one or in small groups and fired so furiously from everywhere that the uninitiated had the impression that an entire division had landed", writes German journalist Paul Karel in the post-war book "Tragedies on the Southern Front".

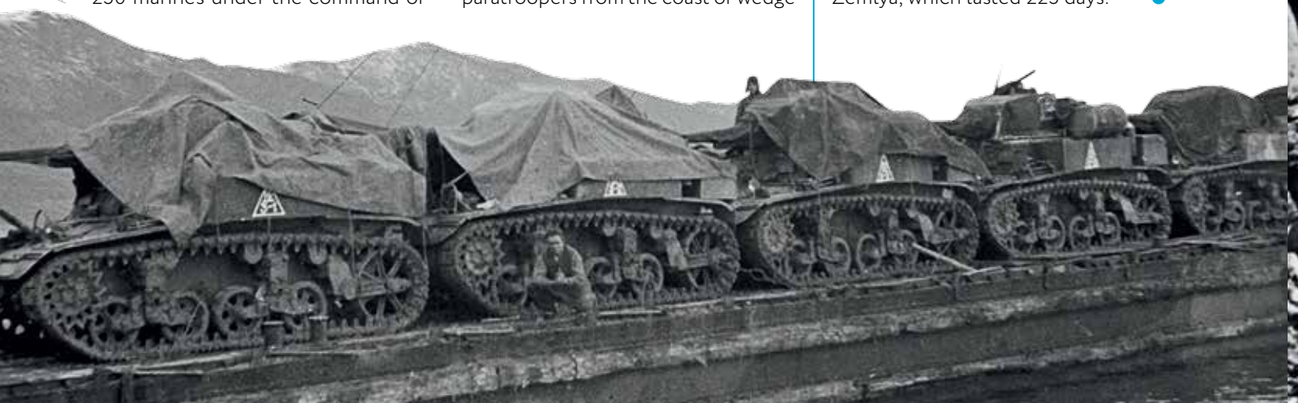
Building on success, the command landed a rifle division, four brigades, two regiments and other units on the bridgehead. They built a whole city on Malaya Zemlya - dug 32 kilometers of trenches, equipped 230 hidden observation posts and more than 500 firing points, placed a command post at a depth of six meters.

The fighting on Malaya Zemlya continued for several more months. On September 9, 1943, the operation to capture Novorossiysk began, in which the bridgehead in the Stanichka area played a role – one of the three groups of troops attacked from it, ensuring the blockade and capture of the city. By September 16, Novorossiysk was liberated. This date is also considered the end date of the defense of Malaya Zemlya, which lasted 225 days.

THE DEFENSE OF MALAYA ZEMLYA LASTED

225

DAYS IN 1943

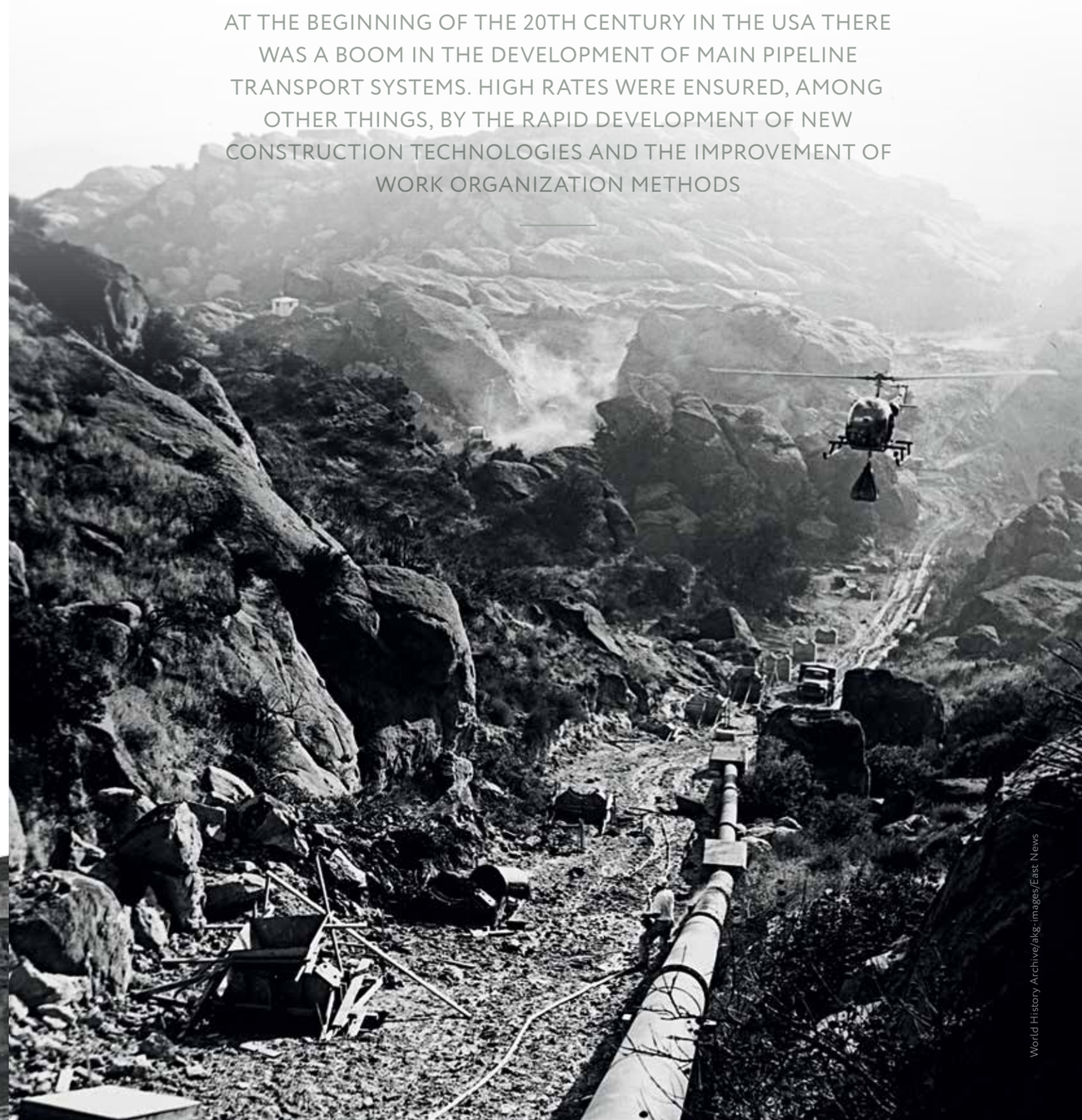


Alexander Sokolenko/RIA Novosti

AUTHOR
PAVEL KRETOV

IMPACT PACE

AT THE BEGINNING OF THE 20TH CENTURY IN THE USA THERE WAS A BOOM IN THE DEVELOPMENT OF MAIN PIPELINE TRANSPORT SYSTEMS. HIGH RATES WERE ENSURED, AMONG OTHER THINGS, BY THE RAPID DEVELOPMENT OF NEW CONSTRUCTION TECHNOLOGIES AND THE IMPROVEMENT OF WORK ORGANIZATION METHODS



World History Archive/akg-images/East News

If in 1914 there were 14 thousand km of main oil pipelines in the USA, then in 1925 there were already 70 thousand km, in 1933 – 180 thousand km. 190 million m³ of oil and gasoline were pumped through them per year.

Until the 1930s, pipelines up to 200 mm in diameter dominated in the United States. Such a relatively small diameter was explained by the fact that, as a rule, several companies were developing at the fields, and each of them could only use its own infrastructure for transporting hydrocarbons.

IN 1933

190 MILLION

M³ OF OIL AND GASOLINE PER YEAR

WERE PUMPED THROUGH THE MAIN OIL PIPELINES OF THE UNITED STATES

At the turn of the 1920s and 1930s, the transition from steel arteries, consisting of pipes connected by threaded couplings, to fully welded pipeline systems was completed in the New World. If the old screwed-up pipelines were moved to a new place, then the ends of the pipes were cut off, and the joints were connected by welding. The same period was marked by a technical revolution in power plants: diesel engines replaced steam engines. The latter continued to be used only in the state of California, where they also participated in heating the pumped oil.

In 1930, US oil pipeline workers received the first centrifugal pumps, starting a rapid process of transition from plunger pumps. By the way, this year also became the time for the start of the mass construction of oil product pipelines. Over the next five-year period, the Americans will lay 8.5 thousand km of pipelines with diameters from 150 to 200 mm for light oil products.

By the mid-1930s, almost 25 thousand people were employed in the pipeline transport sector. The staff of the average PS consisted of a mechanic (he also served as the head of the station), three machinists, three oilers and three measurers.

The pace of creation of pipeline transport facilities in the United States at that time is well illustrated by the history of the construction of a large oil product pipeline on the Great Lakes. The almost 2,000 km long pipeline connecting Tulsa and Minneapolis and having branches to Omaha and Chicago was completed in November 1931. And a little more than a year has passed since the beginning of the research. What provided such speed?

Firstly, aerial photography was actively used in the study of the future route. Experience has shown that the involvement of aviation reduced the survey time by several months and made it possible to "straighten" the route by an average of 1.5 km out of every hundred. In turn, the reduction in the length of the pipeline, the materials used and the volume of construction work more than compensated for the cost of aerial photography. The use of aviation gave a special effect in highly rugged and mountainous terrain.

Andrea Slatter/Shutterstock/FOTODOM

Secondly, the high pace of construction was supported by the widespread use of heavy machinery, steam engines and other mechanisms. The pipes were connected using gas welding, with an average of 22 minutes required for one seam on a pipeline with a diameter of 150 mm, and 16 minutes on a pipeline with a diameter of 100 mm.

THE BUILDERS USED UP

400 TONS OF DYNAMITE

WHEN LAYING TRENCHES IN ROCKY AREAS

In a record four months in the 1930s, a 640-kilometer oil pipeline was built near the Texas port of Ingleside. 1.3 thousand people were employed in its construction. The builders used up 400 tons of dynamite when laying trenches in rocky areas. It required the use of a significant number of pneumatic installations.

In the second half of the 1930s, gas welding was replaced by electric welding. And by the end of the 1930s, the method of submerged arc welding spread in the United States. It significantly improved the quality of the welding process and the reliability of the weld formation. Progress in this area has made it possible to completely switch to the ceiling method, which requires less equipment and personnel. The entire laying party began to consist of a manager, four workers, two tractor drivers, two welders and their assistants. In turn, the compactness of the work site has improved the quality of construction supervision. Improvement in welding has made it possible to use stronger grades of steel for pipes, reducing the thickness of their walls.

The progress in pipeline construction technologies is clearly visible in the comparison of the construction of California's Caliola – Martinez and Bakersfield – Martinez oil pipelines near San Francisco. The first one, 270 km long, was laid in 1914 in 10 months. The second, with almost twice the length (500 km), was completed in 1937 in just three months. ●

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Darren J. Bradley/Shutterstock/FOTODOM

AUTHOR
DMITRY KONSTANTINOV

JOINING THE BEAUTIFUL

IN 2021, JUST LIKE LAST YEAR, THE "CPC FOR TALENTED CHILDREN" FESTIVAL-COMPETITION WAS HELD ONLINE DUE TO EPIDEMIOLOGICAL RESTRICTIONS. JUDGING BY THE NUMBER OF PARTICIPANTS GROWING YEAR BY YEAR, THIS SOLUTION HAS ITS ADVANTAGES: MORE COVERAGE OF REMOTE AREAS, LESS EMBARRASSMENT TO EXPRESS YOURSELF

This year the project started in March, on a new Internet platform, gathering over 15,000 participants at the first stage. According to the statistics of the executive organizer of the competition ANO "Academy of Cultural and Educational Innovations", this was a new record for 22 years of the festival. In total, 3778 applications were submitted from pupils of children's creative studios, music schools, art schools, gymnasiums and colleges – 1,160 of them in vocal, 1,275 in instrumental music, 554 in choreography, 789 in theater art.

"In just a few years, the competition has become a real bridge between the republics, territories and regions of our great country, contributing not only to the creative realization of young talents, but also to the expansion of cultural and human ties between the regions", Vladimir Medinsky, Aide to the President of the Russian Federation, assessed the festival.

At the second stage of the festival, in September and early October, virtual round tables with the participation of jury members and teachers of the competition were organized in the Astrakhan Oblast, Kalmykia, Stavropol, Krasnodar Krai. The numbers of the contestants that won at the first stage were reviewed, and methodological recommendations were given. A scientific and practical seminar was also broadcast for teachers and leaders of children's creative teams on topical topics in the field of pedagogy of additional education.

140 master classes conducted online by the best domestic masters of art and culture helped the young contestants improve their performance skills in the fight for reaching the final. Their teachers also received professional support: 45 videos from Russian innovative teachers were uploaded to the competition website.

"Children's Music School expresses its deep gratitude to "CPC for Talented Children" and Tatyana Pavlovna Sharova", such a review was left in the competitive Instagram community by teachers from the village of Divnoye, Apanasenkovsky District of Stavropol Krai. "Thank you for the excellent organization and master classes: informative for both children and teachers! The competition provides an opportunity for creative growth and professional development. We wish everyone a creative take-off!"

At the third and final stage of the festival, which takes place this year in correspondence format, 40 solo performers and creative teams reached the final. Among them are Ramil Bakhmutov, Anna Odintsova and the choreographic group "Variation" from the Astrakhan Oblast; David Badma-Khalgaev, Sergei Basaev and the "Bayr" orchestra from Kalmykia; Serafima Grinchuk, Kirill Kozlitin and the "Bagatitsa" Cossack Song Ensemble (Stavropol Krai); representing the Kuban Guram Asatiani, Anastasia Skidanchuk and the "Crush" dance group, Mark Vasyov, Miya Kim and the "Epatage" dance group from Novorossiysk, as well as other young talents.

"More than 20 years ago, it was in the Krasnodar Krai that the children's and youth creativity contest "CPC for Talented Children" was held for the first time. More than 30 thousand of our children during this time became its participants. The status of the competition and its geography is growing every year", said Anna Minkova, Deputy Head of the Administration of the Krasnodar Krai. "This year, almost a thousand applications from 109 children's and youth groups were sent to the "CPC for Talented Children" competition from the Krasnodar Krai – this is significantly more than last year".

The Gala concert of the winners was broadcast on December 19 on the YouTube channel and was supported by famous artists. Traditionally, it was preceded by the New Year's marathon on the Instagram platform @ktk-talant, which started on December 8th and ended on December 17th. The marathon included live broadcasts and master classes, where the stars of TV shows, movies and TV shows shared the secrets of mastery. Choreographer Yevgeny Gorenyatenko, singer and teacher Margarita Pozoyan, actor Kirill Grebenshchikov told about trends and nuances, the art of improvisation and overcoming "stage fright".

Organizers and teachers of the "CPC for Talented Children" contest note the increasing activity of its young participants from year to year. This is not surprising – thanks to the established long-term tradition and the established reputation of a significant event of the regional and republican scales, each new competition is eagerly awaited and prepared for it.

"At all times, taking care of children is the main indicator of the development of society", the singer Pelageya believes. "Traditionally, parents and the state are engaged in the upbringing of generations. In the modern world, successful companies with high social responsibility join this important task. The Caspian Pipeline Consortium takes care of the development of the younger generation by implementing creative projects for children and youth".

"Every year the international competition "CPC for Talented Children" grows and gains momentum", says actor Igor Vernik. "Every year the events become more ambitious, more significant. I am sure that the competition gives each young participant an invaluable and unforgettable experience, brings up taste and culture. I sincerely wish this really necessary project creative longevity, and inspiration, good luck and prosperity to its organizers and participants!"

AUTHOR
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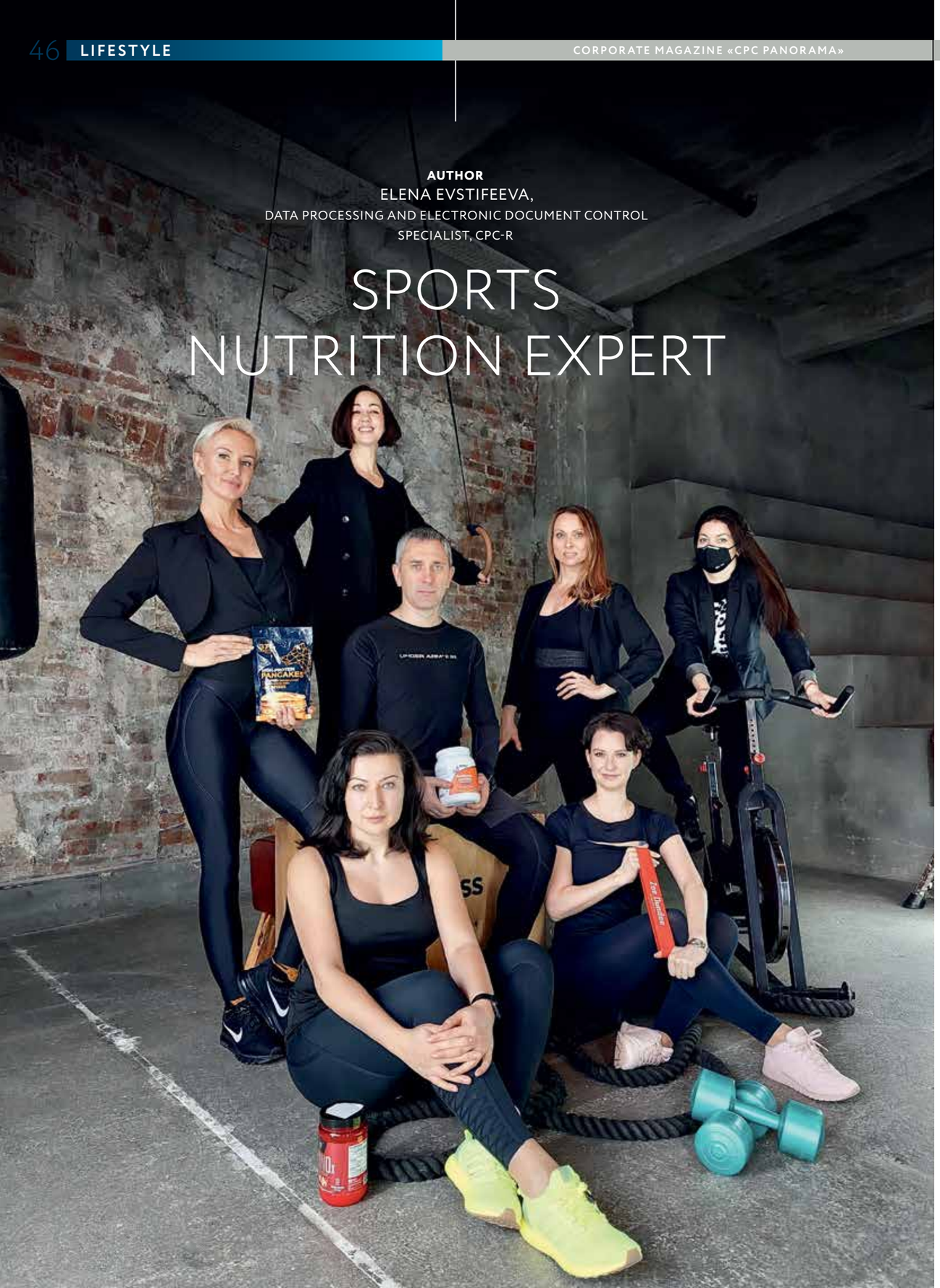
SPORTS NUTRITION EXPERT



THE EDITORS OF CPC PANORAMA RECEIVED A NUMBER OF REQUESTS FOLLOWING THE RESULTS OF THE DECEMBER PUBLICATION OF "GOOD HEALTH" AND INSTRUCTED ME, AS THE AUTHOR, TO THINK ABOUT THE CONTINUATION. BASICALLY, READERS WERE INTERESTED IN THE SO-CALLED SPORTS NUTRITION, AS A WAY TO MAINTAIN GOOD PHYSICAL SHAPE IN OFFICE AND SHIFT WORK. LET'S TRY TO SORT OUT THE PROS AND CONS OF SUCH SUPPORT

Habits formed over the years are hard to change. The speed of life in the modern world dictates a new principle: when you have time, then you eat. We do not hesitate to buy broilers grown on hormones, vegetables that creak with wax. The daily menu traces the entire periodic table: preservatives, dyes, flavors, thickeners, sweeteners. At the same time, the manufacturer claims that this is all made on a natural basis.

Have you ever wondered why there are so many medicines on the market lately? Why are we sick? It's simple: our food is "empty", it does not contain vitamins that the body needs. But there are "periodic elements" that our gastrointestinal tract cannot digest. First we buy cheaper food, then we buy vitamins and medicines more expensive. And how many food allergies lately?

What enters your body should benefit it. Therefore, today, when you come home, throw away all the food garbage and gradually introduce simple rules that work for everyone. There are not many of them, only nine.

First: a glass of water in the morning on an empty stomach to "start" digestion, replenish moisture after night dehydration and detoxification. Second: a hearty breakfast (preferably slow carbohydrates). The third rule says: drink one and a half to two liters of water daily.

Rule number four – your diet should be balanced. Fifth rule: do not eat two hours before bedtime and do not eat carbohydrates after 16.00. The sixth rule involves making up for the lack of vitamins, minerals, protein and fatty acids, using dietary supplements during active training.

According to rule number seven, it is important to exclude refined sugar, alcohol and unhealthy fats from the diet. The eighth rule teaches you to count CPFC (an indicator of the energy value of food, where C is calories, P is proteins, F is fats, C is carbohydrates) and observe calories. The eighth rule also calls for observing the diet and sleep. And rule number nine is to forget about fast food during the training process.

In conditions of constant lack of sleep, stress at work, chaotic nutrition and physical exertion, it is impossible to build a beautiful and healthy body because this requires "three pillars" of fitness: good sleep, healthy balanced food and training. If one of these elements is dropped, you are not progressing or progressing, but with a loss of health. Therefore, we often come to the need to use sports nutrition. Let's analyze in detail what's what.

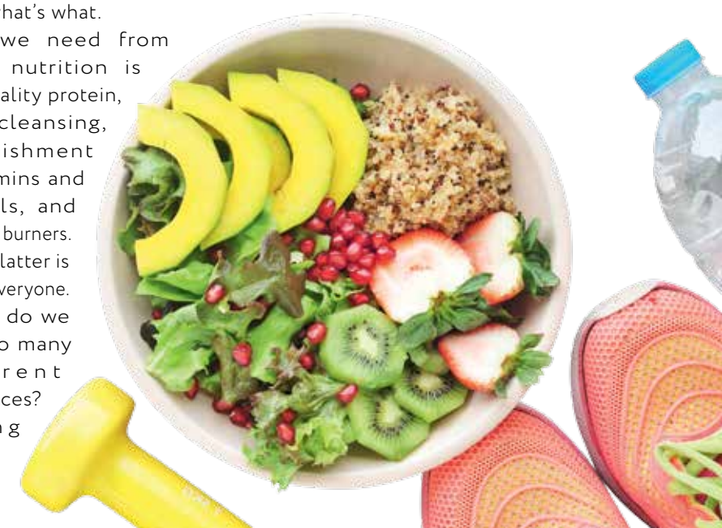
All we need from sports nutrition is high-quality protein, body cleansing, replenishment of vitamins and minerals, and some fat burners. But the latter is not for everyone.

Why do we need so many different substances? During physical exertion, the consumption of useful micro and macronutrients increases significantly, as a result of which many fitness beginners begin to experience a breakdown, weakness, or even get sick.

Muscles in the human body are a very energy-consuming material. The more they are developed, the higher the metabolism, the thinner the fat layer. You can even afford a little more junk food while still keeping your body in great shape. Muscular "corset" is the health of your internal organs and bones.

ABOUT "BUILDING MATERIALS"

All fitness goals can be conditionally divided into two directions - losing weight and gaining pure muscle mass. Understanding the role of proteins, amino acids (BCAA), fats, carbohydrates, vitamins, and minerals in the process of building muscle tissue is essential if you want to achieve the best results when building



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muscle mass. Let's take a quick look at each sports supplement and its role in the training process.

BCAAs are branched chain amino acids, the three essential acids L-leucine, isoleucine and valine, which provide and store energy in muscle tissue. The consumption of the daily norm of protein covers all the body's needs for amino acids, which are needed not only to build new muscle fibers, but also for the health of the skin, bones, nails, and hair. BCAAs are taken before the start of a workout, this increases the effectiveness of training and increases activity.

Protein. This word is of Greek origin and in translation means "the most important", "the first". So why is he in charge? Billions of new cells are born in our body every day. And what protein is synthesized from food in the body is the main building material for the walls of our cells.

Imagine a house that needs to be built, but the building materials have not been delivered. This happens when we are undernourished protein

George Rudy/Shutterstock/FOTODOM

IT IS VERY IMPORTANT TO MAKE SURE YOU HAVE ENOUGH PROTEIN IN YOUR DIET

- the body has nothing to build strong and healthy cells from, but it has to, because the body does not have a "pause" function. Then the cells are weak, fragile, defective, their walls are easily damaged by external aggressors. Imagine that these defective cells can become cells of any internal organs, cells of the skin, hair, brain, nerve cells, immune cells - in general, any.

Therefore, it is very important to ensure that you have enough protein in your diet. Add a source of protein to every meal. If you can't make up for it with protein foods (meat, fish, poultry, eggs, cottage cheese, seafood), use protein shakes. Protein shakes can be divided into whey, casein and multiprotein.

The whey cocktail contains all the necessary amino acids, including valuable BCAAs, are absorbed in two to three hours, so it is relevant both before and after physical exertion. Effective in losing weight and gaining lean muscle mass.

Casein protein is a slow-digesting protein that breaks down in the stomach for six to eight hours, does not cause a sharp jump in sugar, and provides long-term amino acid nutrition. Usually a casein shake is taken at night. It helps the muscles recover, and in the morning you will not feel overwhelmed. Effective in losing weight and gaining lean muscle mass.

A multi-protein shake consists of several types of protein. Since it is very nutritious, it can safely replace one meal. This protein helps to fill the deficiency of amino acids and neutralize catabolism (muscle breakdown), provides the body with nutrients for a long time, preventing it from starving. Therefore, a multiprotein is often recommended to be taken after an evening workout. Effective for keeping fit, but not suitable for losing weight and gaining pure muscle mass.

Gainer is a dietary supplement containing mainly carbohydrates (simple or complex) and protein. As a rule, gainers help to gain muscle mass in a relatively short time. People who are prone to fullness and quickly gaining weight are not recommended to use gainers frequently. It will be more difficult for them to avoid the increase in subcutaneous fat from unprocessed carbohydrates.

ABOUT VITAMINS

With regular physical activity, the metabolism is activated, which causes an increased depletion of the body's reserves, which means that its more intensive recovery is required. Ordinary vitamins do not take this into account. Many substances added to sports vitamins improve the functioning of the whole body.

What is not in vitamins? Let's list the main positions.

The ground root of the Butcher's Broom has anti-varicose, vascular-strengthening effects. The synthetic polymer Ostivone improves calcium absorption and the development of healthy bone cells. Grape seed extract is much stronger than vitamins E and C. It restores the walls of blood vessels, reduces pressure.

Grated odorous garlic is an anti-inflammatory, antimicrobial, anthelmintic, diuretic. Citrus bioflavonoids improve the condition of the liver, strengthen blood vessels, lower cholesterol and have many more beneficial properties. Soy isoflavones help women during menopause, reduce hot flashes and cholesterol levels, and prevent the formation of cancer cells. Lutein and zeaxanthin are essential for the eyes to protect against UV and computer radiation.

ABOUT FAT BURNERS

Depending on the composition and method of exposure, four main types of fat burners can be distinguished.

Thermogenics are one of the most effective and popular fat burners in the world. As a rule, after taking it, the body temperature rises, the heartbeat and metabolism accelerate, the activity of the central nervous system is activated, and appetite is suppressed. In total, all this translates our body into a special mode in which calorie consumption increases. Thermogenics are contraindicated in people with heart problems.

Carbohydrate and fat blockers are nutritional supplements that block certain enzymes that break down carbohydrates or fats. As a result, fats and carbohydrates are not absorbed by the body and are excreted undigested. Accordingly, the body receives fewer calories from the food eaten.

Anorectics are food supplements that suppress appetite. They purposefully affect the areas that are responsible for saturation, thereby making the body "think" that it is full. Anorectics are not directly involved in fat burning, but, due to appetite suppression, help reduce the amount of food intake.

L-carnitine is the safest fat burner with no side effects and can be recommended for children. It transports "long-chain" fatty acids into the mitochondria through the inner membrane and thus activates fat metabolism. To get the maximum effect, you need to combine it with other fat-burners (perfectly combined with thermogenics), as well as with diet and intense training.

Provided that the correct regime is followed, these additives can speed up the fat burning process by one and a half to two times. But, if the diet and training regime is violated, then the purchase of fat burners is a waste of money.

Is sports nutrition dangerous for health? Of course not! But in everything you need to know the measure and select the components correctly. And, of course, it is better to consult a doctor. ●

Svetlana Lukienko/Shutterstock/FOTODOM

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ON THE SAME WAVELENGTH

THE FIRST TIME I HEARD THE PHRASE "SHORT WAVES" FROM MY FATHER. I WAS THEN SEVEN OR SIX YEARS OLD, OR MAYBE NINE. EVERY YEAR, THE WHOLE FAMILY WENT TO REST ON THE BLACK SEA COAST FOR A WHOLE MONTH – FROM DZHUBGA TO SOCHI. WE LIVED IN A TENT, COOKED ON A PRIMUS STOVE. FROM MEDIA ENTERTAINMENT, WE HAD A VEF-202 RECEIVER, AS MY PARENTS SAID – A WINDOW TO THE WORLD

During the day, the all-Union radio stations "Mayak" and "Youth" were received. At nightfall, Middle Eastern and Western voices could be heard through the crackle of atmospheric static and the noise of "mufflers". It was not appropriate for a Soviet schoolboy to listen to it, but this made it especially interesting.

From the age of eleven, I already got into the habit of learning about the most important events in the country and in the world from shortwave radio. After all, there are no state borders for SW, and it is impossible to drown them out completely. By the way, about jamming – empirically it turned out that if you sit down with a receiver under a steep high bank, then the interference noticeably weakens, and you can listen to the "Sevaoborot" of the BBC radio station in acceptable quality.

I was little interested in politics, but the events of cultural life, music, literature, stories about the life of my contemporaries in other parts of the world - all this was important information for a teenager. By the way, radio amateurs from England and North America confessed to me when they met in nostalgia for the days of broadcasting the International Moscow Radio with the famous jingle "Moscow Nights". It turns out that our Soviet broadcasting was once very popular in the world.

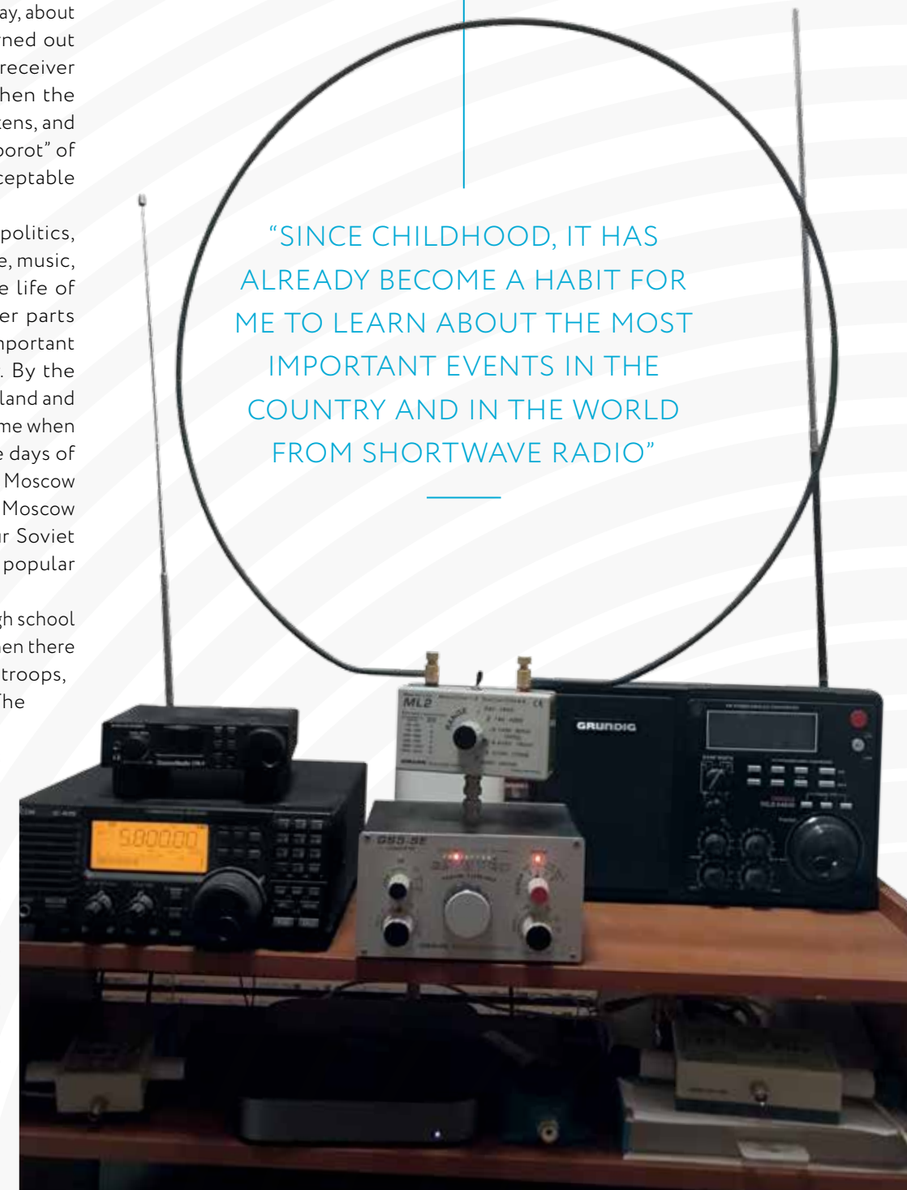
In 1984 I graduated from high school and entered the university. Then there was a service in the border troops, then I returned to studies. The break in radio reception lasted for five years – until 1989. This year I bought myself some kind second-hand small radio, but I listened mainly to "perestroika" programs – broadcasts of the First Congress of People's Deputies, for example. I rarely thought about shortwave broadcast then, although it was great to turn the knob of the encoder away from civilization, from its noise and radio interference.

In the mid-1990s, I purchased a portable Chinese SW receiver from some noname company. There is such a thing as a hobby killer. This was my case. There was no antenna input on the receiver, almost nothing could be received on the small built-in telescopic antenna...

My first high-quality receiver was the Grundig Yacht Boy-80.

Then the cult Degen 1103 (which is inexpensive) and Sony 7600GR, bought in Sony's branded salon on Nikolskaya Street for a considerable $400. It is still my favorite of the entire collection. Fearing that the Japanese would discontinue this model, I bought a second one from the rural Radio Shack in California for only $149.

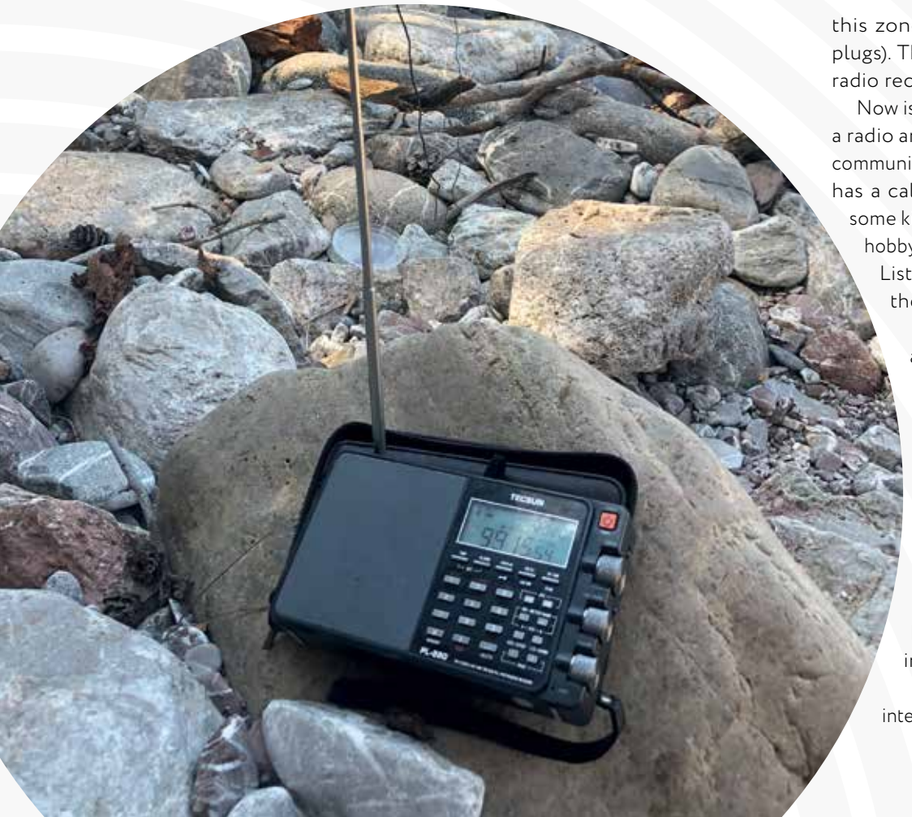
"SINCE CHILDHOOD, IT HAS ALREADY BECOME A HABIT FOR ME TO LEARN ABOUT THE MOST IMPORTANT EVENTS IN THE COUNTRY AND IN THE WORLD FROM SHORTWAVE RADIO"



Now I have about 15 different portable radios and two desktop radios. The most expensive and high-quality is the Japanese all-wave broadband ICOM R-75 desktop version. For everyday use during business trips or outings, I take the unpretentious Tecsun 660 with an air range.

Antennas are a separate conversation. For me, this is usually a regular telescopic radio antenna, sometimes a long wire, from 3 m or more, stretched above the ground. More complex solutions – various dipole options, multi-element designs, active frame magnetic antennas, etc. In the north of Finland, cottages are rented that have the ability to connect to huge stationary antennas – radio amateurs come there with their receivers and use the antenna infrastructure for a fee.

Another example is that in the US, in the state of West Virginia, there is a huge area around a complex of radio telescopes for studying deep space. In addition to the absence of stationary electromagnetic sources, only diesel vehicles are allowed in this zone (they do not have spark plugs). That's where the expanse for radio reception!



Now is the time to say that I am not a radio amateur. RA is someone who communicates on amateur radio bands, has a call sign, perhaps belongs to some kind of club or association. My hobby is called SWLing (Short Wave Listening) – literally, listening to the shortwave range.

What can be heard on the air now? The situation with broadcasting on SW in general and in Russian in particular is very sad. Conventionally, since 2010, every year, lovers of loss have lost such monsters as RFI, RCI, BBC. And this is only a small part ... But the broadcasting of China's International Radio has increased many times – in many languages.

What am I listening to? I am interested in remote radio stations that are difficult to distinguish and receive in normal urban conditions – this is called DXing. I receive "passing", I go away from industrial and domestic electromagnetic interference – for example, during a vacation in Finland I sailed to distant islands and turned the antenna there, using a slingshot, launching a long wire with a weight on a tall tree.

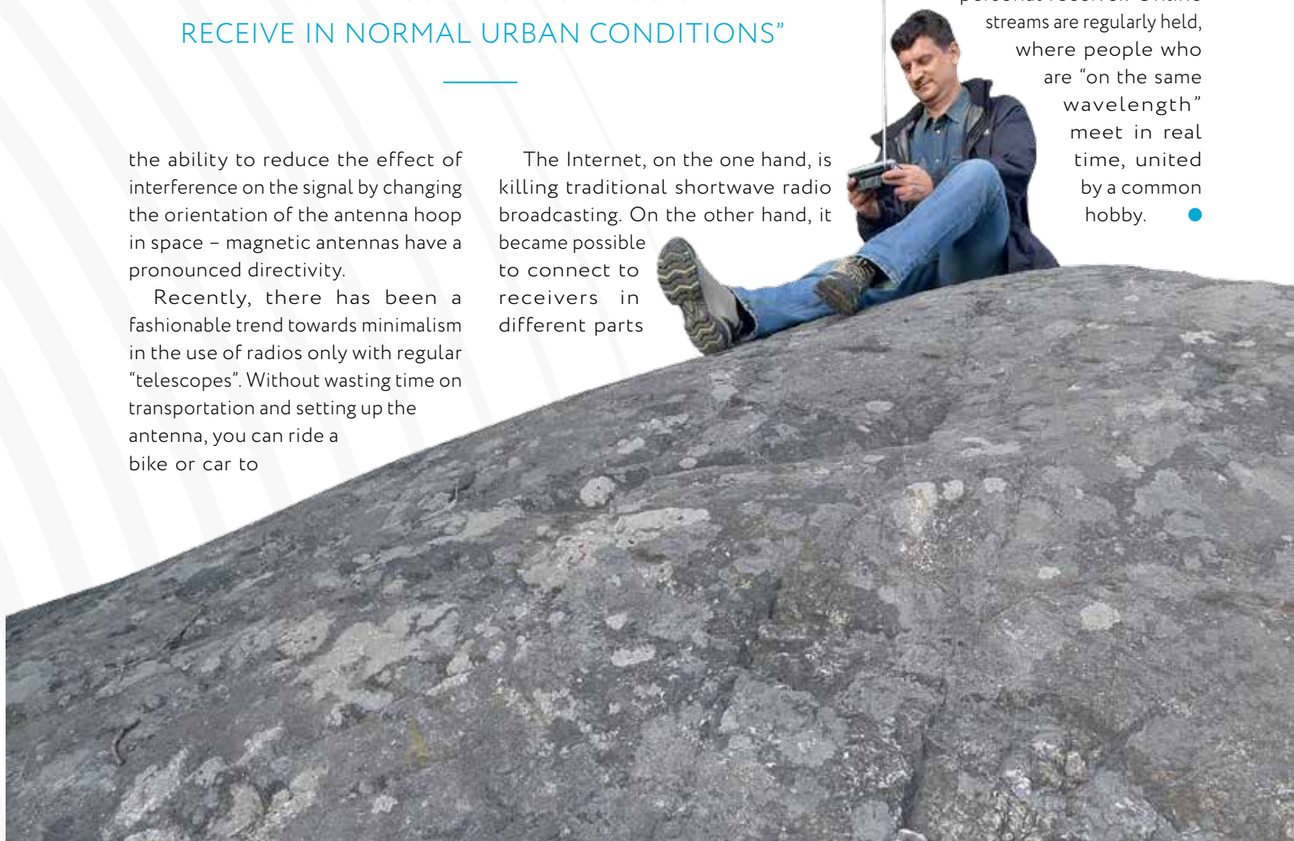
Or a recent week-long vacation in the skerries of Ladoga – where my son and I lived in a house without electricity, the nearest power socket was 5 km from us. There I was able to catch Latin America and Japanese radio amateurs...

Inside buildings, I use active frame antennas for reception. Imagine a hula hoop - from 30 to 100 cm in diameter. Unlike wired antennas, the magnetic component of radio waves is used here to pick up the signal. One of the advantages is compactness and the ability to reduce the effect of interference on the signal by changing the orientation of the antenna hoop in space – magnetic antennas have a pronounced directivity.

Recently, there has been a fashionable trend towards minimalism in the use of radios only with regular "telescopes". Without wasting time on transportation and setting up the antenna, you can ride a bike or car to a remote corner where there is no industrial interference and immediately start enjoying listening to the air.

> "I AM INTERESTED IN REMOTE RADIO STATIONS THAT ARE DIFFICULT TO DISTINGUISH AND RECEIVE IN NORMAL URBAN CONDITIONS"

The Internet, on the one hand, is killing traditional shortwave radio broadcasting. On the other hand, it became possible to connect to receivers in different parts of the world, which, through WEB SDR, give access to hundreds of radio listeners at the same time – I can listen to real receivers installed in South America, Europe, Japan or Australia. And, if desired, try to catch the weak signal on your personal receiver. Online streams are regularly held, where people who are "on the same wavelength" meet in real time, united by a common hobby. ●



AUTHOR
PAVEL KRETOV

WITH THE ARMED EYE

IGOR POVALYAEV, INSRRUMENTATION TECHNICIAN OF THE PS-5, CPC WESTERN REGION, HAS BEEN FOND OF ASTRONOMY SINCE CHILDHOOD. HE READ BOOKS WITH PLEASURE, WATCHED POPULAR SCIENCE FILMS ABOUT SPACE EXPLORATION, COMMUNICATED WITH THE SAME AMATEURS ON THE INTERNET ON SPECIAL FORUMS

A few years ago, Igor himself decided to look at the sky of Stavropol with an armed eye. To do this, he purchased astronomical binoculars with a 15x magnification and a lens diameter of 70 mm.

"Of course, it cannot be compared with a telescope, but even with binoculars I can see not only the Moon and Jupiter with satellites, but also many deep space objects, scattered and globular star clusters, nebulae, galaxies. Finding them is a very exciting task", says Igor Povalyaev.

However, even the human eye, armed with optics, is not very adapted for observing such a gigantic space as the Universe is. We don't see space objects the way they really look. The thing is that our organ of vision does not distinguish colors well in the dark and cannot accumulate light. Therefore, most of the observed objects appear to us in the form of gray foggy spots with poorly distinguishable details.

Another thing is a digital camera. Its sensor can accumulate light, so long exposure photography is successfully used for astrophotography.

"I prepare for shooting each object in advance: I find it in the planetarium computer program, find out when it appears in the sky, how much it will be visible, what field of the frame will be at the focal length that I use, and so on", explains the instrumentation technician.

Then Igor goes to the shooting point, where he deploys the equipment. Usually, a geodesic tripod is used, which is highly stable and does not tremble from the wind, a SLR camera and the Soviet Jupiter-37A lens with a focal length of 135 mm and an astrotracker. The last one is worth mentioning in more detail. An astrotracker is a special device that rotates the camera at the same angular speed as the stars move across the sky and allows you to take pictures with long exposures without "blurring".

ANDROMEDA GALAXY. TO GET ON THE CAMERA MATRIX, THE LIGHT WENT TO THE EARTH FOR 2.5 MILLION YEARS. THE CLOSEST LARGE GALAXY TO THE MILKY WAY CONTAINS ABOUT 1 TRILLION STARS.

PHOTO BY IGOR POVALYAEV. SHOOTING ON JUNE 11, 12 AND 18, 2021, THE CITY OF IZOBILNY, STAVROPOL KRAI. TOTAL 440 FRAMES, TOTAL TIME 2 HOURS 27 MINUTES.

"My Canon 550D camera allows you to set the desired series of frames, which depends on specific conditions, with the required shutter speed - usually 20 or 30 seconds", notes Igor Povalyaev.

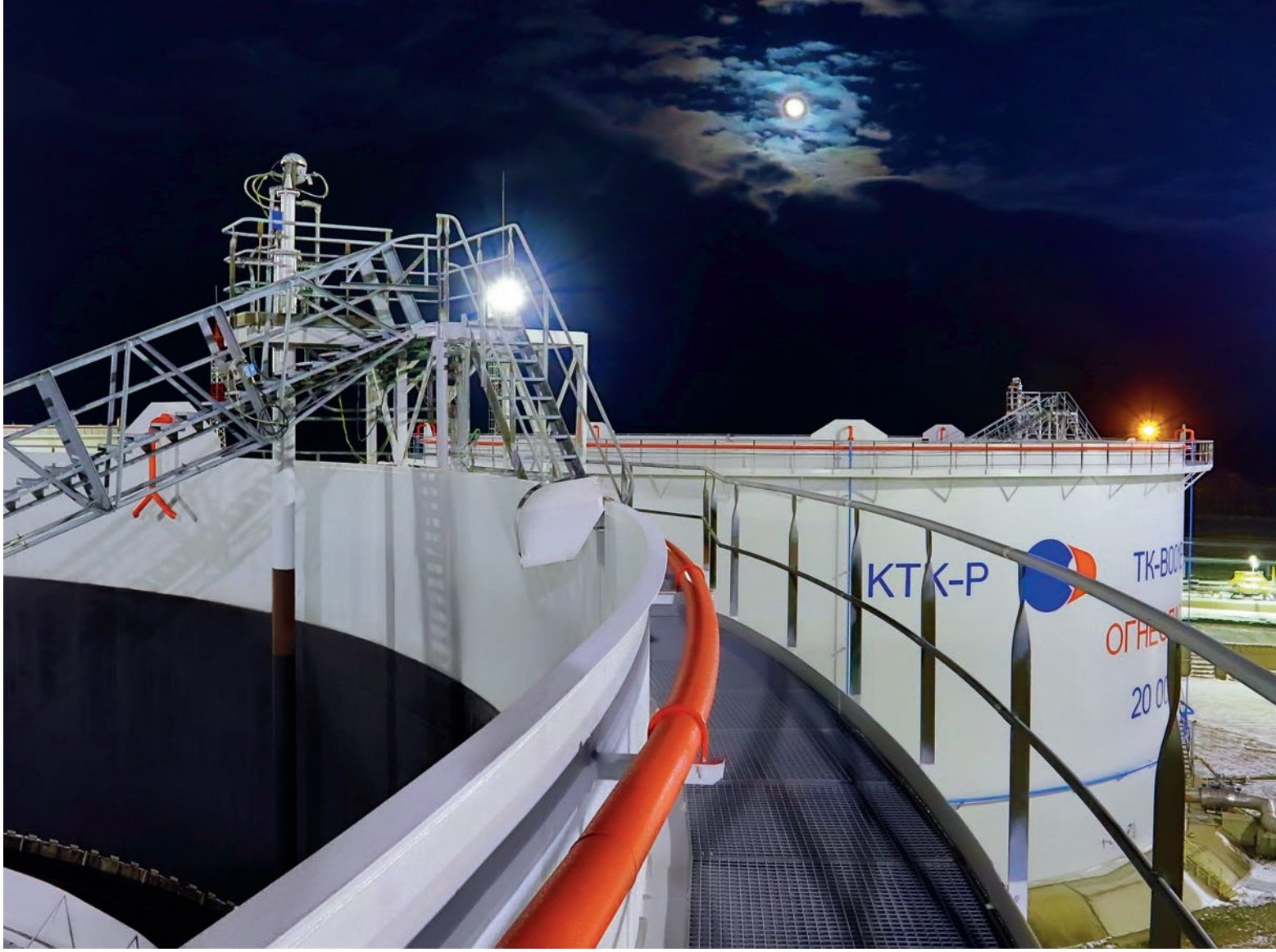
But it's not enough just to get the material. In order for the image from many files on a disk to turn into a real beautiful astrophoto, it must also be well processed. This enduring process can take anywhere from a few days to a few weeks! The work is performed at a home computer in specialized programs that allow you to fold and calibrate images. As a result, the picture becomes more detailed, color appears, noise decreases. Usually, amateurs use the DeepSkyStacker program for processing. After that, you can proceed to the final processing of the image, where the background is aligned, the color balance is corrected, etc. For this, programs such as FITStacker, FITSwork or Photoshop can be used.

Observations and shooting of space objects are best done in rural areas, away from urban illumination. The ideal place is the mountains.

"In summer, the clouds of the Milky Way are clearly visible in the Stavropol Krai – outside the city they can be seen even with the naked eye", Igor Povalyaev shares his experience. "For example, the center of our galaxy is visible in the constellation Sagittarius. Other summer objects for observation are the constellations of Cygnus, Lyra, Eagle, Scorpio. In the warm season, it is also good to observe the Andromeda galaxy. In winter, you should aim for the constellation of Orion and the next constellation Canis Major with the brightest star in the night sky, Sirius. During the same period, you can see an open cluster – the Pleiades, the brightest stars of which form a figure that looks like a small bucket. There are also constellations that are visible at any time of the year. The largest and easily recognizable are Ursa Major and Ursa Minor, the constellation Cassiopeia".

THE GREAT NEBULA OF ORION IS ONE OF THE MOST BEAUTIFUL AND BRIGHTEST NEBULAE IN THE NIGHT SKY. LOCATED IN THE CONSTELLATION OF ORION, VISIBLE WITH BINOCULARS OR A SMALL TELESCOPE. IT IS A HUGE CLOUD OF IONIZED HYDROGEN AND IS AN AREA OF ACTIVE STAR FORMATION. IT IS ABOUT 1.3 THOUSAND LIGHT YEARS AWAY FROM EARTH.

PHOTO BY IGOR POVALYAEV. SHOOTING – DECEMBER 2021, THE CITY OF IZOBILNY, STAVROPOL KRAI. TOTAL 360 FRAMES, TOTAL TIME 2 HOURS 00 MINUTES.



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ПАНОРАМА
КАСПИЙСКОГО ТРУБОПРОВОДНОГО КОНСОРЦИУМА

CPC PANORAMA Corporate Magazine. No 1 (36) February 2022. The issue is prepared by the CPC Press Service.
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Publisher: LLC Media Service. 111116, Moscow, Energeticheskaya Str., 16. www.vashagazeta.com. Tel.: +7 (495) 988 18 06.
E-mail: ask@vashagazeta.com.
General Director: Vladimir Zmeyushchenko. Editor-in-Chief: Vilorika Ivanova. Project Editor: Ksenia Piskareva.
Art Editor: Tatiana Kalinina. Designers: Tatiana Kalinina. Translator: Ildar Nasyrov. Production Director: Oleg Merochkin. Photos: CPC Press Service, Research Institute of Military History of the RF, Shutterstock/FOTODOM, akg-images/East News, TASS, RIA Novosti. Printed by "Printing Craftsman". Moscow, Aviamotornaya st., 12.

CASPIAN PIPELINE
CONSORTIUM:

A TIME-TESTED INTERNATIONAL PROJECT

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