

PANORAMA

CASPIAN PIPELINE CONSORTIUM



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OPERATION
NO SOONER SAID
THAN DONE

SAFETY&SECURITY
PRACTICE-ORIENTED
APPROACH

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REDUCE FRICTION,
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DEAR COLLEAGUES AND FRIENDS!

The determining vector for the dynamic development of the Caspian Pipeline Consortium is increasing the level of interaction with related and other structures in all types of its activities – industrial, social, environmental – both quantitatively and qualitatively.

This spring, the 900 millionth ton of oil was shipped at the CPC Marine Terminal in Yuzhnaya Ozereyevka, which indicates a significant increase in the pace of transportation as a result of the commissioning of most facilities under the Debottlenecking Program.

In April, the Consortium's status in the International Association of Oil Transporters was upgraded from observer to full member. This expands the possibilities of interaction and cooperation, qualitatively improves the exchange of experience and best practices. The development of a constructive and effective dialogue with scientists from a number of universities and research institutes, as well as with public environmental organizations has become a relevant trend.

The participation of the Consortium in organizing and holding Energy Day within the framework of the Russia Expo was noted with gratitude from the Government of the Russian Federation. The Interregional Inspectorate of the Federal Tax Service of Russia assigned CPC-R JSC 11th place among the 100 largest taxpayer enterprises. The Consortium's contribution to the national project "Education" was the acquisition of mobile technology parks – "Quantoriums" for educational organizations in the Krasnodar Krai.

High production indicators, participation in federal projects, contribution to infrastructure and regional economic growth – step by step, our company is moving forward with confidence. Each specialist and manager of the Consortium solves the tasks assigned to him at a high professional level, and these achievements add up to the overall puzzle of the successful and dynamic development of CPC.



N.N. GORBÁN

GENERAL DIRECTOR
CASPIAN PIPELINE CONSORTIUM

AUTHOR
ANTON GLINYANOV,
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FAREWELL TO THE PAST AND A NEW LIFE

THE IMPLEMENTATION OF THE DEBOTTLENECKING PROGRAM INVOLVES NOT ONLY THE CONSTRUCTION OF NEW FACILITIES, BUT ALSO THE DISMANTLING OF DECOMMISSIONED STRUCTURES AND EQUIPMENT. LARGE-SCALE CHANGES AT SUCH KEY FACILITIES AS THE ASTRAKHANSKAYA PS AND THE MARINE TERMINAL ARE COMMENTED ON BY THE HEADS AND SPECIALISTS OF THE CONSTRUCTION HEADQUARTERS

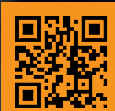
Dismantling of the main pumping station of initial construction and related structures at the Astrakhanskaya PS began in October 2023 and will last until the end of July 2024. The project provides for the dismantling of the MPS pumping units with piping, the MPS oil system, the cooling system, the MPS drainage tanks, the pressure control unit, the main mud strainers, the drainage tanks of accounted and unaccounted for oil, pipelines and block valves. Electrical equipment, devices of low-current systems, and cable lines are also dismantled. The block

modules of the chemical laboratory buildings and the arbitration sample storage warehouse are being moved to a new location. The project will also modernize the PLC program code for the fire and gas detection system.

At the Shore Facilities of the Marine Terminal, the third and fourth stages of the DBNP are under implementation. As part of the third stage, the project provides for the installation of jumpers between the inlet and outlet collectors of the decommissioned metering units 42-PK-A510 and 42-PK-A520, as well as the dismantling of these two

so-called "old LACT". The planned completion date of the stage is June 29, 2024.

The fourth stage includes the technical re-equipment of pressure control units and pressure dumping stations with the installation of a third PCU and a third PDS, similar to the existing ones. This technical solution makes it possible to send oil to load a tanker through any new LACT along any loading line. Also, simultaneous loading from three SPMs will be put into commercial operation if it is necessary to promptly pump oil from a full MT Tank Farm due



VIDEO REPORT FROM
THE PLACE OF WORK



to pauses in transshipment due to weather conditions or other reasons. The planned completion date of the project is July 16, 2025.

Two contractors were involved to implement dismantling and technical re-equipment projects. Specialists from IK Kvantor JSC work at the Astrakhanskaya PS – up to 90 people and 16 units

of equipment during peak periods. The implementation of the third and fourth stages of the DBNP at the Shore Facilities of the Marine Terminal involves the personnel of Spetsneftegazstroy LLC – up to 50 people and 9 units of equipment during peak periods. All dismantling work is carried out in cramped conditions, in a certain order and sequence, after completing the necessary preparatory measures. Dismantled structures are thoroughly inspected in advance – data is collected on the technical condition of structural elements of buildings and equipment to develop measures to ensure labor protection, industrial safety and environmental protection.

To ensure a comprehensive assessment of the external and internal impacts of dismantling work, construction contractors monitor settlements and deformations of nearby buildings and structures.

“Instrumental control is carried out using geodetic devices”, comments quality assurance lead engineer Evgeniy Pyshkin. “At the Astrakhanskaya PS, control is carried out at 113 points, at the Shore Facilities of the Marine Terminal – at 26 points”.

The statement “it’s easier to break than to make” in our case is questionable”, notes Denis Lipovtsev, leader of the Project Coordination Group. Currently, he is leading the implementation of the dismantling project; before that, he headed the project “Construction of the mainline pump and related structures”. “In addition to the cramped conditions and complexity of the preparatory activities, the contractor, like a surgeon, surrounded by existing technological systems, must carefully dismantle the equipment, clean it, preserve it, pack it and transfer it to the warehouse for reuse. But the main thing when working is the safety of their performance, which is achieved by strict compliance with the requirements of norms and rules, production discipline and personal responsibility of each employee”.

Preparation for dismantling, shutdown and decommissioning of process equipment, process pipelines and communications, block valves, etc., is carried out in the same way as their preparation for repair according to instructions and regulations for the operation of these structures, in compliance with the requirements of regulatory documents.

In order not to depend on the operating mode of the oil pipeline, the “former” main pumping station of the Astrakhanskaya PS was cut off during the planned shutdown.

The underground sections of pipelines under the mainline pump building are not dismantled, but are filled with a sand-cement mixture with a metal sheet welded along the cut. Dismantled equipment and pipelines are steamed and inspected, followed by preservation and packaging. Pipelines and metal structures are cut into pieces for removal from the work site. Lifting and moving large equipment is carried out simultaneously by two heavy-duty cranes. In addition to the dismantling of process equipment, two existing buildings – a laboratory and an arbitration sample storage facility – were relocated to a new site.

When asked whether it is sad to dismantle the equipment that served the CPC faithfully, Construction Office Manager, Yury Belov, answers negatively.

“The dismantling of the LACT was completed in four months”, explains Yury Nikolaevich. “Equipment, pipes, and metal structures were removed with a total weight of 300 tons. Constraints and the presence of operating equipment at the construction site affect the speed of work, but the professionalism of the builders and the support of all operating services allows to perform the work within the schedule. I would like to thank all participants in the implementation of the project, and especially for the work carried out during periods of shutdowns of the oil loading line, which were carried out in bad weather conditions in a shorter period of time than planned”.

Despite the high risks of dismantling work, no cases of injury were recorded at the facilities. This result is not only an increased responsibility of the personnel of contracting organizations, but also the coordinated work of labor protection and road safety



YURY BELOV

specialists, who, by their example of an active approach to work, essentially become mentors for colleagues in the Safe Work Culture. ●



DENIS LIPOVTSEV



AUTHOR
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NO SOONER SAID THAN DONE

CPC IS A CONTINUOUS CYCLE ENTERPRISE AND UNPLANNED SYSTEM SHUTDOWN AS A RESULT OF INTERRUPTION OF PROCESS CONTROL ALGORITHMS OR ERRONEOUS ACTIONS CAN HAVE SERIOUS NEGATIVE CONSEQUENCES. TODAY, CPC FACILITIES HAVE SUCCESSFULLY IMPLEMENTED AN INNOVATION PROPOSAL THAT PROTECTS PROGRAMMABLE LOGIC CONTROLLERS USED IN AUTOMATED CONTROL SYSTEMS FROM ERRONEOUS ACTIONS



DAMIR KHAKIMOV

execution”, “Programming mode”, “Enable remote program changes”.

Selecting the PLC operating mode is an infrequent, but important procedure, since one incorrect movement of the key can lead to activation of the “Programming Mode”. In this mode, the executive logic of the application software is stopped, all technological protections are activated on the object controlled from this PLC, and, as a result, this automation object is transferred to a safe state in order to reduce possible negative consequences for the technological mode. And the safe condition of such an object as, for example, a PS, means an unplanned stop of pumping with all the ensuing consequences for shippers. Thus, due to the design feature of the PLC mode

hardware blocker for switching PLC operating modes, which would be installed on the processor module of the controller. The proposal was based on the experience of observing work with controller equipment.

THE CREATIVITY AND DESIGN SKILLS OF ENGINEERS INCREASED THE RELIABILITY OF CONTROL SYSTEMS AT CPC FACILITIES

As is known, switching PLC operating modes is performed using a specialized key installed in the module, and can be used to select one of the operating modes: “Logic

switch device, this operation requires concentration and accuracy in actions.

The proposed external hardware blocker for the processor module

key would eliminate erroneous actions when choosing the PLC operating mode. All participants in the meeting of the Control Systems Service liked the idea, and the creativity of one of the division’s engineers helped to quickly implement the plan.

THE BENEFITS OF 3D PRINTING

Control systems engineer for the Central Region Damir Khakimov is not only responsible for technical support and programming of equipment such as PLCs, HMIs, flow and panel computers and more, but also develops the skills of a software engineer in his free time. Damir Fayazovich has experience in programming in languages of different levels. Among them are Java, an object-oriented programming language, and Python, a high-level programming language with dynamic typing and automatic control. At the same time, the engineer has a 3D printer at home, on which, having software modeling skills, he can bring any ideas to life.

Damir Khakimov has developed a PLC key lock model in three versions – for controller processor modules with different features of the front part. After this, test samples were printed on a home 3D printer over the next weekend.

The “pilot” blockers were tested by the engineering staff of the control systems service of the Central Region. Taking into account the comments and suggestions, the final version of the PLC key lock was approved “in series” by the entire team of the Control Systems Service. Blockers were manufactured and installed on all PLCs that are significant for the technological processes of the pipeline system.

Thus, the idea of one engineer and the initiative, creative thinking and design skills of another, as well as the teamwork of the Control Systems Service, made it possible to increase the reliability of control



PLC MODE SWITCHING MODULE IN ITS ORIGINAL FORM



PLC MODE SWITCHING MODULE WITH INSTALLED BLOCKER

systems at CPC facilities, in order to avoid unplanned shutdowns that could cause irreversible consequences for the production process, including disruption of work and even destruction

of technical facilities, since technological requirements for oil transportation do not allow immediately and simultaneously stopping the company’s production activities.

AUTHOR
PAVEL KRETOV

INCREASING INTERACTION

IN MARCH 2024, A MEETING WAS HELD IN STAVROPOL TO SUMMARIZE THE RESULTS OF CPC'S PRODUCTION AND ECONOMIC ACTIVITIES IN 2023. THE EVENT WAS ATTENDED BY THE HEADS OF REGIONAL OPERATING DIVISIONS, DEPARTMENTS AND KEY UNITS OF THE COMPANY



Opening the meeting, CPC General Director Nikolay Gorban proposed discussing all reports in a live discussion mode.

"Our services overlap with related ones in all areas. Everyone is interested in ensuring that all tasks are completed, and this requires close interaction between departments", he noted.

A block of reports by regional managers was opened by Alexey Pelipenko, Operations Regional Division Head (Regional Manager) of the Marine Terminal. Oil shipments in 2023 increased by 4.8 million tons compared to the previous period and reached a record 63.5 million tons in the history of the Company. In terms of the number of oil tankers,



OIL SHIPMENTS IN 2023 INCREASED BY 4.8 MILLION TONS COMPARED TO THE PREVIOUS PERIOD AND REACHED A RECORD

63,5

MILLION TONS IN THE HISTORY OF THE COMPANY

the increase was 51 tankers (578 in 2023 and 527 in 2022). Of these, almost half are of the more spacious Suezmax type, which saved mooring time and fuel for the Consortium's auxiliary fleet.

Despite the increase in shipments at the Marine Terminal, the amount of atmospheric emissions was reduced by 5.5% in 2023. The terminal staff also considers the traditional community clean-up days to clean the coastline of garbage to be important events on the environmental agenda.

Scheduled maintenance, current repairs and diagnostics of process equipment were carried out in full – more than 2.5 thousand work orders were issued. Among the tasks for 2024 is in-line diagnostics of the offshore underwater pipeline to SPM-1 (at SPM-2 and SPM-3 such work was carried out in 2021). Also, a total of 107 hoses will be replaced on three single-point moorings.

Operations Regional Division Head of the Western Region,



AFTER THE IMPLEMENTATION OF
THE DEBOTTLENECKING PROGRAM
IN 2023

59 HECTARES OF
LAND WERE
RECLAIMED

Sergey Potryasov, reported that in 2023 his division, including contractors, worked 2.9 million man-hours without incidents or injuries, and vehicle mileage without accidents amounted to 10.1 million km. In general, these figures since the beginning of recording have reached an impressive 34.8 million man-hours and 89.3 million km, respectively. The number of observation cards issued has doubled over the year, which is due to the active involvement of contractor representatives in this process.

In the area of responsibility of the Western region, the CPC pipeline has 1,284 intersections with networks of third-party organizations, gas and oil pipelines, railways and roads, as well as water bodies. As part of systematic work to improve the safety of such crossings, last year the intersection with the highway at the 1,400th

km of the pipeline was protected with a special case.

Among the team's tasks for 2024, Sergey Potryasov noted the overhaul of turbine units with the replacement of gas turbines at the Kropotkinskaya PS, the commissioning of VFD electric motors for main pumps and additional capacity of the pressure mitigating system at PS-4. Work will also continue on the installation of diesel power plants at the block valve station of the linear part. In 2023, 9 of them were installed, and 10 are planned for this year.

Konstantin Rybak, Operations Regional Division Head of the Central Region, noted that the unit's activities fully comply with international standards. In 2023, CR successfully passed the supervisory audit of the ISO 9001:2015 Quality Management System. More than 15 thousand permits were issued

for scheduled maintenance, current repairs and diagnostics of process equipment. At the same time, for hot work their number was reduced by 70%.

Environmental protection work was actively carried out. It is enough to note that after the implementation of the Debottlenecking Program, 59 hectares of land were reclaimed, 3 thousand bird protection devices were installed on power lines, and 36 thousand sturgeon fry were released into the Volga delta.

The list of production tasks for 2024 included work on the installation of VFD at PS-3. Dismantling of facilities decommissioned as part of the Debottlenecking Program will also continue.

The eastern region of CPC transported 56.6 million tons of oil in 2023, 4.6 million tons more than a year earlier. ER Regional Manager Mukhit Mazhenov announced this in his speech. Over 4 million man-hours were worked without injuries or incidents, and accident-free vehicle mileage exceeded 7 million km.

Significant results of 2023 were the commissioning of two SVFRT-20000 tanks at the Tengiz PS, repair and commissioning of the SVFRT-20000 tank at the Atyrau PS.

Also in the reporting year, the household water supply system was reconstructed and the fire and gas detection system at the Tengiz PS was re-equipped. The scheme of external power supply connection was changed at the Atyrau PS, and the system of household wastewater treatment was reconstructed. This year, the pumping units of the fire extinguishing system at the Tengiz and Atyrau PS will be replaced. At the latter PS, reconstruction of water supply networks of the fire ring will continue.

CPC Operations Division Head (General Manager) Alexey Dmitryukov presented reports on reliability assurance, the state of the linear part, projects in the field of communication infrastructure, and also summed up the results of the regions' production



activities for 2023. This assessment has been carried out since 2018 and takes into account such indicators as compliance with industrial, fire, environmental safety, labor protection, road safety, leadership in the development of a Safe Work Culture and others. CPC Western Region was recognized as the best,

4 points ahead of last year's winner – the Eastern Region.

CPC Technical Director /DBNP Manager Igor Lisin reported on the progress of CPC capital projects in Russia and Kazakhstan, as well as on the implementation of the goals and objectives of the Debottlenecking Program in 2023. In the area of responsibility of CPC-K, 46 capital projects were implemented, of which 11 were completed. CPC-R carried out 85 capital projects, 22 of which were completed.

Stability of personnel is also one of the secrets of the success of the international consortium. According to the Human Resources Division Head (HR Manager) Alexander Berezhanov, in 2023, more than 200 employees of CPC-R and CPC-K were honored with departmental, regional and corporate awards, and also received awards for service years.

Summarizing the results of the meeting, CPC General Director Nikolay Gorban emphasized the need to continue improving the level of interaction between the regions and services of the CPC. All proposals received from the meeting participants will be carefully and comprehensively considered by the heads of the areas, which will improve the production performance and efficiency of the Consortium team.



AUTHOR
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SERVICE HEAD, PROTECTION, CPC-R

PRACTICE-ORIENTED APPROACH

IN MID-MARCH, IN ELISTA, CPC CORPORATE SECURITY DIVISION HELD AN ANNUAL ON-SITE SEMINAR “MAIN ASPECTS OF ENSURING PHYSICAL SECURITY (ANTI-TERRORISM PROTECTION) OF FACILITIES OF THE FUEL AND ENERGY COMPLEX”

The seminar was attended by representatives of the regional teams of the Corporate Security Division of CPC-R and CPC-K,

the management of the private security organization Nachin LLC, as well as representatives of the Ministry of Energy of the Russian Federation, the National

Guard and the Russian Academy of Railways.

Opening the event, Grigory Senoyedov, Head of Physical Security Team of CPC Corporate



Security Division, noted the objective complication of the situation at fuel and energy complex facilities, announced statistics on the commission of acts of unlawful interference (AUI), emphasized the urgent importance of holding a seminar, which aims to increase the level of professional competencies of the company's employees, responsible for security, as well as improving the quality of security services.

The security service of CPC-R reported on the results of the work carried out in 2023 to ensure physical security, on the main threats to the safety of the operation of main oil pipeline facilities and the measures taken to prevent them. It was noted that the company and the security contractor are taking joint comprehensive measures to ensure the safety of oil pipeline facilities, which made it possible in 2023 to prevent incidents classified as terrorism, unauthorized taps (UT), as well as other AUI.

The head of the state control department of the Office of the National Guard for the Republic of Kalmykia made a report “Organization of interaction with control and supervisory authorities in the field of measures to protect

the fuel and energy complex in order to prevent (minimize) the risks of sanctions consequences in relation to the company when carrying out

The head of the Volgograd Center for Scientific and Technical Information, a branch of the Federal State Budgetary Institution Russian

THE PURPOSE OF THE SEMINAR WAS TO
INCREASE THE LEVEL OF COMPETENCIES OF
COMPANY EMPLOYEES RESPONSIBLE FOR SAFETY

activities, including taking into account the new requirements of the resolution Government of the Russian Federation dated May 12, 2023 No. 740, approving the Rules for the implementation of federal state control (supervision)».

Energy Agency (REA) of the Ministry of Energy of Russia (Volgograd), spoke about the features of the procedure for preparing and approving safety data passports for fuel and energy complex facilities.

The report of the head of the Training Center for the training of specialists in the field of transport security of Russian Academy of Railways Russian university of transport examined the organization, methodology and experience of advanced training of workers in specialties related to ensuring security (anti-terrorism protection) of fuel and energy complex and industrial transport facilities.

In addition to these reports, the agenda of the seminar included presentations by the heads of the structural subdivisions of the Corporate Security Division of CPC-R and CPC-K, as well as the contractor for the protection of facilities, PSO Nachin LLC.





LLC. The seminar also touched upon the issues of methodological support of the training process using the best practices of specialized institutions.

It is important to emphasize that the meeting in Elista had not only a corporate, but also an interdepartmental status: positions on the substance of the agenda of the seminar of the Ministry of Transport of the Russian Federation, the Ministry of Energy of the Russian Federation, the Federal Air Transport Agency and the Federal State Unitary Enterprise "State Air Traffic Management Corporation of the Russian Federation".

TEAMWORK

The second day of the seminar was devoted to practicing practical skills. The participants of the event visited the Educational and Training

Complex, where a tactical and special training was held with the participation of employees of the PSO Nachin LLC and specialists from the contracting organization STARSTROY LLC on the topic "Actions of personnel for the physical protection of a fuel and energy complex facility from threats of committing an act of illegal interference in the operation of the facility, including the use of unmanned aerial vehicles".

During the introductory visit of representatives of CPC Corporate Security Division, ministries and departments, the head of the ETC of PSO Nachin LLC, S. V. Sarmutkin, spoke about the organization of the educational process, the training programs being implemented and the skills acquired as a result of the classes. Seminar participants observed the development of such



skills by security staff in the training zones "Personnel and vehicle inspection zone", "Practical training in searching for taps", "Zone for modeling the linear part at the training ground", that is, in conditions as close as possible to real ones.

In the training class, the guests of the training center were presented with the technical means used by the security organization to ensure the physical protection of CPC facilities, including countering UAVs, as well as workplaces and training programs for operational duty officers and operators of the integrated security system.

During the practical part of the seminar, its participants were able to exchange existing experience in organizing and implementing measures to counter acts of illegal interference, including unauthorized taps into the linear part of the main oil pipeline. Ways to find solutions to problematic issues and improve the quality of security services were considered.

An important focus of the seminar was the discussion of the



INSTALLATION OF EXPLOSION LOCALIZER

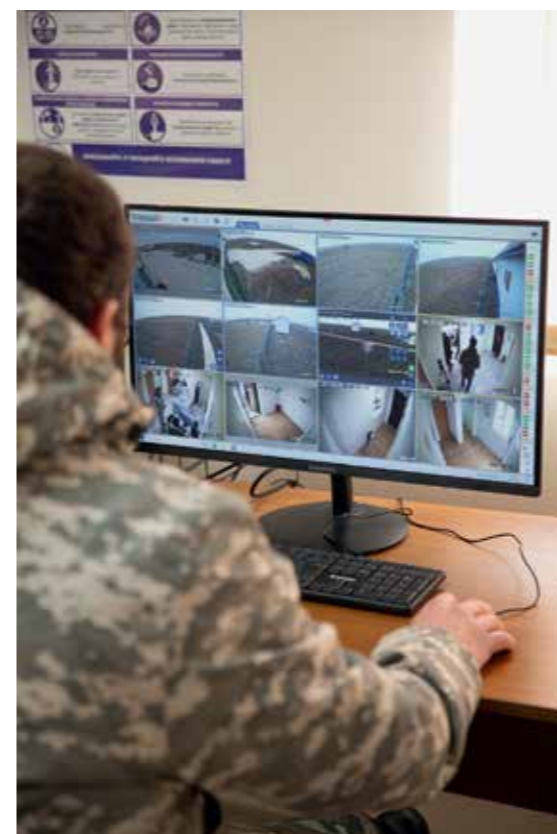
principle of a risk-based approach when organizing protective and security measures, as well as security issues not only of the company's property and facilities, but also of its personnel and other persons located at these facilities.

The meeting participants actively exchanged views, discussed the most important issues of ensuring anti-terrorist protection of CPC facilities, and considered proposals to improve protection both from representatives of government authorities and from Consortium employees. Responding to the challenges of the time, the seminar participants recognized the urgent need to improve measures to counter AUI using unmanned aerial vehicles, including those carried out by sabotage and reconnaissance groups. Special attention was paid to the issues of equipping the ETC with advanced equipment and software products, as well as more active use of modern information and organizational technologies and resources in the activities of the training center.

Based on the results of the practice-oriented event in Elista, the importance of improving the organization of interaction in security issues between the relevant CPC structures and government authorities,



cooperation at the interstate level with the competent departments of the Republic of Kazakhstan, increasing the role of educational processes in order to improve the qualifications of specialists and the quality of security services and, to achieve these goals, cooperation with industry educational institutions in the field of security and anti-terrorist protection.



AUTHOR
PAVEL KRETOV

REDUCE FRICTION, INCREASE POWER

TODAY, DRAG REDUCING AGENTS (DRA) ARE WIDELY USED IN OIL PIPELINE TRANSPORT. THE CASPIAN PIPELINE CONSORTIUM IS CAPABLE OF PUMPING ABOUT 83 MTA BASED ON THE RESULTS OF THE IMPLEMENTATION OF DEBOTTLENECKING PROGRAM AND TAKING INTO ACCOUNT THE USE OF DRA. CPC PANORAMA CORRESPONDENTS ASKED VICE-RECTOR OF GUBKIN UNIVERSITY NIKITA GOLUNOV TO TALK ABOUT THIS TECHNOLOGY

Nikita Nikolaevich, you defended your doctoral dissertation on the topic “Development of scientific and methodological foundations for the use of drag reducing agents for the transport of oil and petroleum products through main pipelines”. Let me congratulate you on your successful defense on behalf of CPC Panorama and ask a number of questions that interest readers. How long have scientists and industry been using DRA?

Thank you for your congratulations, but we need to wait for the official decision of the Higher Attestation Commission under the Ministry of Education and Science of Russia.

Issues of hydrostatic resistance of a liquid or gaseous medium began to occupy the minds of military engineers in the 20-30s of the 20th century – with the development of artillery and torpedo systems. Having increased the combat power of weapons, it was no less important to ensure their delivery over considerable distances. At the same time, it quickly became clear that such research in the field of hydraulics has even greater potential in the civil industry. For example, the engineer, scientist, and aeronautics specialist Theodor von Karman was deeply involved in similar issues.

In 1948, at a scientific congress in the Netherlands, the English chemist Brian Atkinson Toms announced the discovery of the effect of a sharp reduction (up to 50%) of hydrostatic resistance when adding a high molecular weight polymer in a low concentration (0.01%) to the pumped liquid flow. This was the first experience in using drag reducing agents, and the discovery became widely known as the “Toms effect”. Over the 70 years since then,

scientists have already written tens of thousands of works, but despite all their efforts, it must be admitted that there is still no complete theory in this area of hydraulics. A certain correction factor has been adopted, and all studies are rather experimental in nature.

That is, the Toms effect is still like a miracle: everyone knows that it works, but they don't fully know how?

Exactly. And this is how I usually start a conversation with students: imagine a large Soviet cast-iron bathtub. You add a few drops of polymer (at the rate of about 5 grams per ton), and the entire flow immediately changes the nature of movement, significantly reducing hydrostatic resistance.

However, the more this phenomenon was studied, the more questions they received. Thus, until the 70s of the 20th century, it seemed to scientists that they already had a comprehensive answer to what underlies the Toms effect: drag reducing agents consist of clumps of high-molecular compounds. When pumping liquid, they turn around and are pushed towards the walls of the flow, where they reduce friction. And since they act only in a narrow near-wall zone of the pipe, this explains such low concentrations.

But subsequent experiments began to contradict the theory: it turned out that, along with surface-acting additives, there are also bulk additives that are evenly distributed throughout the liquid. By the way, it was bulk additives that were first used in oil pipeline transport in the late 1970s – on the Trans-Alaska oil pipeline. But these days, almost all oil pipelines in the world, including Transneft PJSC, use surface-acting additives.

That is, by now scientists distinguish between two types of additives based on the types of action – surface and volumetric?

Absolutely right. Surface-acting DRA are produced, as a rule, on the basis of gel high-molecular polymers.



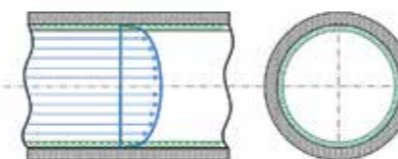
INSTALLATION FOR INTRODUCING DRA INTO THE CPC PIPELINE

They are the most effective because the main friction occurs in the near-wall region, but they also have a high degree of destruction: in the process of destruction of the polymer molecule, its molecular weight decreases and the ability to reduce hydraulic resistance decreases.

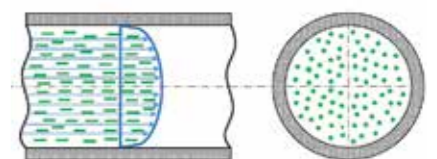
Volumetric DRA are surfactants, soap-like solutions of synthetic substances, fine suspensions, asbestos fibers, etc. They act at every point in the flow of the pumped liquid, but are subject to destruction to a lesser extent than the first type.

Why is the name “anti-friction additive” found along with anti-turbulence additive? Are we talking about the same substance in terms of properties? And there are also references to depressor additives...

ATA and AFA are the same thing. These are substances aimed at reducing the resistance between the transported liquids or gas and the pipe wall. Friction is the Latin word for “friction”. In the English-language literature, these additives are called DRA – Drag Reducing Agents. Another thing is depressor additives. The only thing they have in common with DRA is that they



MECHANISM OF ACTION OF SURFACE-ACTING DRA



MECHANISM OF ACTION OF VOLUMETRIC DRA



THEODOR VON KARMAN

are also used in low concentrations, but their task is different. They prevent the accumulation of paraffins on pipeline walls. The depressor additive envelops the paraffin particles and prevents them from sticking together. And this is also a very promising chemical solution to improve the efficiency of oil transportation through pipelines. For example, the use of a depressor additive on polar oil pipelines not only cleans the pipe, but also warms the oil for better transportability.

As already mentioned, the first DRA were used on the American Trans-Alaska oil pipeline. How did Soviet scientists and industry develop this same topic?

In the USA, additives were first added to an oil pipeline in 1979, and in the USSR – in 1986 on the Lisichansk-Tikhoretsk main oil pipeline. At the same time, in our country, research and development of drag reducing agents has been carried out since the mid-twentieth century. Two scientific schools dealt with the topic: academician Leonid Ivanovich Sedov and his students studied surface-acting DRA, and in Donetsk they specialized in volumetric DRA.

If we talk about American parity, it is important to understand that there was no need for DRA in Soviet pipeline transportation. After the discovery of the largest fields in Siberia, by

decision of the Council of Ministers and the State Planning Committee of the USSR, the construction of the most powerful long pipeline systems with a fixed maximum diameter began. For oil, the pipe diameter was 1200 mm and 1400 mm for gas. That is, everything was immediately built for the maximum possible pumping volumes, with the understanding that in the conditions of the Cold War there may not be enough funds to change the infrastructure.

After 30 years, it turned out that not all of Russia's "neighbors" are equally friendly, which required a prompt change in priority markets and transportation routes. This is where additives came in handy: they eliminated significant capital costs for the construction of branch lines, not to mention the time required. At first, the additives used in Russia were entirely imported; with the collapse of the USSR, many technological chains for the domestic industry were broken. But after 10–20 years, drag reducing agents began to be produced in Russia. Today they are comparable in quality to foreign

DOMESTIC DRAG REDUCING AGENTS ARE COMPARABLE IN QUALITY TO FOREIGN ONES AND EVEN SURPASS THEM

ones, and in some respects they even surpass them.

Since this is a polymer, is it possible to produce DRA from oil in associated production, for example at an oil refinery?

No, this is chemical production of a separate cycle, requiring a specially organized industrial enterprise.

Is it possible to say that for some types of hydrocarbons (oil with its different grades, diesel fuel, gasoline) surface-acting DRA are more suitable, for others – volumetric ones? Have any patterns been identified in the

choice of additive and its dosage, depending on the diameter of the pipeline, the temperature of the pumped product, etc.?

Too many factors influence the result, both individually and in combination, for such a calculation to be possible under current conditions. In what form is the additive itself – dispersive or gel-like, what is the chemical nature of the polymer, its molecular structure, resistance to degradation from external factors, geometric parameters of the pipeline and technological conditions, etc. Therefore, no laboratory tests will help make the right choice.

It is always necessary to conduct research on a real oil pipeline or its section where you plan to increase the volume of transportation or, for example, reduce energy consumption. The pipeline is pre-cleaned of paraffins, and the additive is added after each PS, if there are several of them, because the pumps completely neutralize the effect of the DRA each time.

You can try one additive, another and another. And, depending on the recipe, somewhere you will need 5 grams per ton, somewhere 100 grams.

That is, at different concentrations you will achieve the same effect. At the same time, one additive that requires more consumption will be cheaper, while another, used in lower concentrations, will cost more.

Let's take the results of testing the products of one of the domestic companies. On an 82 km section of an oil field pipeline, the additive was added at a dosage of 50 grams per ton, reducing pressure by 33% and increasing throughput by 21%. And on a section of the main oil pipeline 173 km long, adding DRA at a concentration of 10 grams per ton, productivity increased by 28%.

On another 130 km oil pipeline with an additive of 16 grams per ton, the achieved efficiency was 54%.

This factor should not be overlooked: by changing the throughput in one area with additives, in a hydraulically connected system you automatically change the pressure in others. This means that you cannot add the same doses of the additive everywhere without calculations and experimental tests. Let's take, for example, another oil pipeline. Here at the head station they add 30 grams per ton, after 300 km – 1.5 grams per ton, after another 250 km – 3.5 grams per ton, and 300 km later – 12 grams per ton.

It will always be an important requirement that a chemically created additive should only physically affect the pumped product without changing its properties. There are many components in oil and how they interact with additive components, reagents added by oil producers, with anti-corrosion additives and additives that reduce metal wear, the formation of plaque on it in the case of petroleum products – this is also a very interesting scientific direction that continues to develop.

And if we talk about Russia in general, what prospects does the use of DRA have in domestic pipeline transport systems?

The use of DRA in Russia has enormous prospects. Now, in fact, a new logistics system is being formed in Central and Eastern Siberia, as well as in the Arctic. Let me remind you that earlier in the history of our country such a transport infrastructure was formed for oil supplies from Baku, then from Western Siberia. And now new territories and directions are being developed in deserted regions and harsh climates, where it is not easy to deliver large equipment, and even then for a limited time a year. Add to this the lack of energy sources, and you will understand why the use of additives in such places will be a significant factor in increasing the efficiency of pipeline operation for a long time.



THE CAPACITY OF THE CLASSROOMS OF THE CAMPUS OF ADDITIONAL PROFESSIONAL EDUCATION OF GUBKIN UNIVERSITY IS 300 SEATS, THE BANDWIDTH IS 10 THOUSAND PEOPLE PER YEAR

How does Gubkin University cooperate with CPC on DRA and other production issues?

CPC and the university have established close cooperation. It cannot be otherwise: the Consortium employs many of our graduates who do not lose touch with their alma mater. Now, for example, Associate Professor Mikhail Fedoseev and employees of the Department of Design and Operation of Gas and Oil Pipelines are developing a software package to automate hydraulic, technological and economic calculations when planning supplies through the CPC pipeline system. This will make it possible to build a map of modes for the coming periods of operation, minimize the costs of using DRA, reduce the load factor of oil pumping units drives and increase the economic efficiency of pumping processes.

Associate Professor Igor Leonovich and the team of the Department of Construction and Repair of Gas and Oil Pipelines and Storage Facilities are participating in laser scanning of the tanks of the CPC Marine Terminal to obtain their three-dimensional model, which will provide comprehensive information about the presence or absence of geometry defects.

Consortium specialists regularly improve their skills at the educational campus of Gubkin University. In

this direction, I, as Vice-Rector for Additional Education, would like to note the full-scale dispatch simulator created under the leadership of Associate Professor Vitaly Shvechkov (which allows one to practice the automaticity of actions in emergency situations and is already in use), as well as the constructive and effective cooperation with the CPC personnel training and development team under leadership of Alexandra Rabinovich.

Speaking about our interaction, we cannot help but thank the management and shareholders of CPC for their significant charitable contribution to the activities of the university. In particular, the company reconstructed and equipped the Large Academic Auditorium named after V.V. Vinogradov with modern equipment, restored and technically updated the Open Lecture Hall and the entrance group of the main building, and helped with the development of the educational campus. All of us, teachers and students, are very grateful to our partner for creating comfortable conditions for educational and research activities. Throughout the history of the fuel and energy complex (and from a global perspective), the domestic scientific school has always made and continues to make a significant and strategically important contribution to its development.

AUTHOR
ANASTASIA BELOVA,
SERVICE HEAD, PERSONNEL DEVELOPMENT, CPC-R

INTERNAL COACHES — WHO ARE THEY?

WHAT ASSOCIATION DO YOU HAVE WITH THE WORD “STUDYING”? A UNIVERSITY DEPARTMENT, A SPACIOUS CLASSROOM AT A TRAINING CENTER, OR A COMPUTER MONITOR WITH AN ONLINE COURSE?



For most of us, learning is associated with a university or training center, but is this form of learning always the most effective? After all, after completing the course, the teacher cannot answer participants' questions, and the schedule of the training centers does not always coincide with the busy schedule of the employees.

External training is not always effective — for example, when it comes to processes and procedures developed and adapted for our company.

The answer to all these questions is internal training —



INTERNAL TRAINERS ARE EMPLOYEES WITH UNIQUE EXPERIENCE WHO CAN TRANSFER KNOWLEDGE TO THEIR COLLEAGUES

courses that are developed and conducted by CPC employees. They, like no one else, know the specifics of equipment and processes.

The transfer of knowledge on the company's processes and procedures has been carried out at CPC for a long time — already in 2007, employees of the dispatch service introduced colleagues to the CPC Pipeline Operation Review program. Later, specialists from the Operations Department and Automated Process Control System Team conducted introductory training on Allen Bradley automation equipment, Siemens electric motors and other types of equipment.

In 2015, the internal training institute was introduced at the corporate level. At this time, intensive implementation of the Expansion Project was underway. Modernization and construction of new facilities required serious training of personnel to work with new

equipment and technologies. The Personnel Training and Development Team (then the Training Team), together with the management of the company's O&M Team, defined programs and trained internal trainers to provide training. Who are internal coaches? These are employees who have unique knowledge and experience in a certain field who can pass on knowledge to their colleagues and answer their questions. Over the years of the existence of the internal training process at CPC, 88 relevant training programs have been developed and adapted. In fact, as of December 2023, 92 CPC employees were listed as internal coaches.

In-house training programs primarily focus on the operation and maintenance of electric motors, pumps, fire and gas detection systems (FGDS) and other equipment.

CPC internal coaches are functional experts for whom

training colleagues is not their main production activity. To develop and conduct training, only functional knowledge is not enough — it is important to create a structured program, take into account the peculiarities of adult learning, develop clear and visual materials and tests that will help test the real level of acquired knowledge.

To assist internal coaches, The Personnel Training and Development Team developed a thematic section on the company's internal training portal. This section contains materials on preparing and conducting training and developing



tests. In 2023, the Personnel Training and Development Team developed a training program for internal coaches themselves. In November 2023, this program was implemented for internal trainers of the Central Region.

According to the participants' feedback, the bright, memorable program is full of practice and will significantly help in the further development and implementation of training. In 2024, the Personnel Training and Development Team plans to continue training internal coaches in teaching skills.

NOT JUST WEEKDAYS, BUT ALSO HOLIDAYS

In December 2023, a solemn event took place at the CPC regional offices – awarding the best internal coaches in the regions and selecting the best CPC coach. The best

coaches were selected in each region – the award criteria included feedback from training participants, the number of employees trained, and the programs developed.

The award ceremony was held in a solemn atmosphere by the leaders of the region – the winners were awarded souvenirs and prizes, and the best coaches who took first place were awarded certificates for full-time training in pedagogical skills.

The winner in the category “Best CPC Coach” was Alexander Nosov, Lead Dispatcher, Pipeline Control. Alexander Vladimirovich has been conducting training for CPC employees for more than 15 years, together with



MAY BE IT'S TIME TO TRY YOURSELF AS AN INTERNAL COACH?

DARIA
LAVRINOVA



colleagues from the Oil Transportation and Commerce Team, as well as Automated Process Control System Team, under the comprehensive programs “Initial training of shift supervisors” and “Safe management of CPC oil pipeline system equipment.” In 2023, together with Sergey Samsonov, Manager, Dispatching and Process Control, developed and conducted the course “Safe management of CPC oil pipeline system equipment for managers”. Alexander Nosov's experience and expert knowledge help him make every training productive.

The Personnel Training and Development Team

plans to further develop the area of internal coaching, because such experts can share knowledge not only in the field of operation of equipment and systems, but also in the field of the company's organizational processes and software. This is confirmed by the successful program “Skills for developing effective presentations using MS PowerPoint”, developed by Daria Lavrinova. During 2022–2023, 21 employees successfully completed this program, and Daria won the “Discovery of the Year” nomination.

Each of us is unique, talented and has knowledge that is in demand within the team. Maybe it's time to try yourself as an internal coach? ●

CPC PRESS SERVICE

CPC JOINED THE IAOT MEMBERSHIP

ON APRIL 3, 2024, IN BELGRADE (REPUBLIC OF SERBIA), THE XXI EXTRAORDINARY MEETING OF THE BOARD OF THE INTERNATIONAL ASSOCIATION OF OIL TRANSPORTERS (IAOT) WAS HELD IN PERSON, IN WHICH CPC GENERAL DIRECTOR NIKOLAY GORBAN TOOK PART. DURING THE EVENT, THE OFFICIAL PROCEDURE FOR ACCEPTING CPC-R AS A FULL PARTICIPANT OF IAOT TOOK PLACE

In observer status, CPC-R was a member of the International Association of Oil Transporters for eight years. Representatives of the Consortium took part in meetings of the Association Board and the Standing expert group (SEG) on energy efficiency. In January 2024, shareholders of CPC-R approved a corporate decision to increase the level of participation of the company in IAOT.

IAOT was established in 2013 as an international non-profit, non-governmental organization. The main objectives of the Association are to comprehensively assist in ensuring uninterrupted supplies of oil and petroleum products to international energy markets, as well as to develop relationships between members of the association at the national, regional and international level.

Four standing expert groups (SEG) have been created within the IAOT: a standing expert group on energy

efficiency, a standing expert group on legal issues, a standing expert group on supplies, a standing expert group on “Efficient, reliable and safe operation of main pipeline systems”.

Raising the status of the CPC in the IAOT from an observer to a participant of the Association will expand working communications, qualitatively improve the exchange of experience and best practices, and create ample opportunities for organizing a comprehensive technological dialogue. ●





AUTHOR
DMITRY KONSTANTINOV

RUSSIA EXPO

IN THE FIVE MONTHS SINCE ITS OPENING, THE RUSSIA EXPO HAS BEEN VISITED BY OVER 9 MILLION PEOPLE. CPC PANORAMA CORRESPONDENTS SHARED A COMMON INTEREST IN THE EVENT

From afar, even under the vault of the empire-style triumphal arch of the main entrance of VDNH, you understand that the site for holding an international exhibition-forum dedicated to almost all of Russia and everything that is happening in it today has been chosen

as well as possible. The Exhibition of Achievements of National Economy in the northern part of Moscow is the world's largest exhibition, museum and recreational complex, opened 85 years ago. On an area of 325 hectares there are dozens of pavilions, 49 of which are recognized as cultural heritage

sites, as well as cafes, fountains, sculptures, ponds and alleys. The exhibition and events within its framework are held in 20 permanent pavilions of the exhibition space and a number of other sites, including those specially built for the forum. The main exhibition is located in the largest pavilion

No. 75, built in 2008 using innovative column-free technology. On an area of 23,290 m², two exhibition halls housed expositions of Russian regions. All stands have individual design, and the unifying factor is the use of the latest media: interactive video screens, virtual reality helmets, artificial intelligence always ready to help visitors.

"The exhibition, where all regions of Russia are represented, is impressive and evokes a sense of pride for our great country", Natalya Gavrilenko, Deputy Minister of Health of the Stavropol Krai, assesses the event. "At our exposition, we tried to reflect in as much detail as possible the main qualities of the region as an all-Russian breadbasket and health resort. In terms of healthcare, the Caspian Pipeline Consortium, whose oil pipeline runs through four districts of Stavropol, helps us with medical equipment and special transport".

The exposition of the Krasnodar Krai shows a VR-film with footage of an overflight of the Utrish State Nature Reserve, which CPC has been supporting since 2022 as part of "Protect Nature of Our Native Land" project. The stand of the Republic of Kalmykia hosts non-stop master classes in dance, vocal and calligraphy, even archery classes.

"The exhibition presents the most important achievements of Russia in a very detailed and high-quality manner, and the international nature of the forum can be fully felt by the numerous visitors to our stand from different countries", says First Deputy Minister of Digital Development of the Republic of Kalmykia Bayir Mandzhieva. "In particular, in February our guests were Ambassador Extraordinary Plenipotentiary of the Kingdom of Thailand to the Russian Federation Sasivat Wongsinsawat, Honorary Consul General of the Russian Federation in the Republic of Korea Jeong Hong, General Director of Aviation Administration of Kazakhstan Katalin Radu, Chairman of the Advisory Board of the world's leading company in the field of cybersecurity Green Hills Software Juan Villalonga".

An interesting feature of the exhibition-forum is its flexible adjustment to virtually any age audience. Kids get stuck on the stands without any Smeshariki, young people gain their wits and listen to vacancies and grants announced

by the regions, older visitors broaden their horizons and master unfamiliar technologies. The atmosphere is such that here, at seminars and sessions of the business program, you can get information almost first-hand from the highest authorities, and this makes the exhibition-forum especially attractive to journalists.



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ЭНЕРГЕТИКА



АЛЕКСАНДР ВАЛЕНТИНОВИЧ НОВАК

ЗАМЕСТИТЕЛЬ ПРЕДСЕДАТЕЛЯ ПРАВИТЕЛЬСТВА
РОССИЙСКОЙ ФЕДЕРАЦИИ



ENERGY FOR EVERYONE

On February 20, 2024, Energy Day was held at the Russia Expo. During the day, meetings, speeches and events were held in 10 exhibition pavilions dedicated to new achievements and programs of the national Fuel and Energy Complex; CPC-R JSC was among the partners of the Energy Day.

Participants in the plenary session "Leadership and Sustainability of Russian Energy Sector" included Deputy Prime Minister Alexander Novak, who oversees fuel and energy issues, and the heads of the most important regions in the context of the industry. As part of the business program of the Forum of National Achievements, expert discussions "Sustainable energy: an environmentally friendly path for the development of the fuel and energy complex" and "The path to the profession: a conscious choice or an accident?" were also held. These events were attended by representatives of the Ministry of Energy of the Russian Federation,

industry-specific universities, and leading companies of the Russian fuel and energy complex.

"Today is an important event at the Russia Expo", Mikhail Grishankov, Deputy General Director, RF Government Relations, assessed the Energy Day and the exhibition as a whole. "I would like to note that Deputy Prime Minister of Russia Alexander Valentinovich Novak began his speech at the plenary session with the oil industry as the most significant in the energy sector today, and also emphasized the important role of pipeline transportation, which was created more than 100 years ago. The contribution of CPC as a pipeline project to the development of the oil transportation industry is colossal, and all representatives of our company who visited the exhibition today were both pleased and interested. The exhibition is unique, it provides an opportunity to see all of Russia in one location, and I invite all CPC employees to visit it and be sure to take their children with them: they will also find it interesting and educational".

The press conference of the Minister of Energy of the Russian Federation Nikolai Shulginov provided a rare opportunity for representatives of federal



and regional media to discuss topics of interest at the highest management level. The thematic Energy Day program also included a meeting of the commission of the State Council of the Russian Federation in the Energy sector.

"Thank you for your personal participation and contribution to the preparation and holding of the thematic energy day", noted Deputy Prime Minister of Russia Alexander Novak in a letter addressed to CPC General Director Nikolay Gorban. "Thanks to our joint efforts, the event was held at a high substantive and organizational level, and received high marks among representatives of the state, business and citizens".

THE ENERGY OF LIFE

The exposition of Pavilion I of the Rosneft company is logically built around a symbolic "drop" growing from the ceiling, which on its spherical surface represents the most important achievements and events in corporate life.

"Thanks to the Russia Expo, every resident of our country has the opportunity to get acquainted with the activities of all regions and all the most important enterprises for the country", says Olga Stashkova, a representative of the Press Service of Rosneft PJSC. "Our pavilion gives visitors the opportunity to get acquainted with the history of the company and the oil industry as a whole, its scientific developments and innovative projects, and this is greatly helped by events of such a scale as the Russia Expo.

The LUKOIL company has completely reconstructed the 25th "Oil Industry" Pavilion, organizing an interactive center dedicated to the history of Russian oil and the development of domestic science and technology. It presents a number of interactive installations using advanced technologies such as virtual and augmented reality, holographic theater, as well as modern phygital

solutions at the intersection of the digital and physical worlds.

In the two-story Pavillion No. 46, a joint exposition of companies from the Russian Fuel and Energy Complex, "Energy of Life," is organized. The scenario involves a journey through five enfiladed halls with an immersion in the evolution of domestic energy. Transneft PJSC, Gazprom PJSC, JSC Zarubezhneft, SIBUR LLC, Inter RAO PJSC present their expositions here.

It is no coincidence that the interactive model of the oil transportation cycle of Transneft PJSC gathers the largest audience — it was made by the authors of the "Tsar Layout" that became famous throughout the country. The functionality of the station, tank farm, and marine oil terminal is presented in maximum detail. The main objects are kinetized: the tanker is moored, the booms are lowered for loading, the floating roofs and pontoons are raised when the tanks are filled with oil, the tugboat places booms, and a diagnostic tool passes through the pipe.

"This is one of the most successful technical solutions that we were able to see at the Russia Expo", Valery Yashin, Leader of Internal Audit, Controls and Compliance Team of CPC-R, evaluates the exposition of the "Energy of Life" Pavilion. "Thanks to the interior design, lighting and VR technologies,

you are completely immersed in the specifics of the objects that they want to show us. Everyone, including the whole family, should visit the exhibition. Children will be especially interested".



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QUESTION – ANSWER – SOLUTION

WHAT SHOULD BE DONE TO ENSURE THAT AN INCREASE IN OIL SHIPMENT VOLUMES IS NOT ACCOMPANIED BY AN INCREASE IN THE EMISSION OF VOLATILE ORGANIC COMPOUNDS? CAN SHIPBUILDERS BUILD A FLOATING RECUPERATOR FOR THE CPC? LAST YEAR, THE CONSORTIUM AND ENVIRONMENTAL ACTIVISTS FROM NOVOROSSIYSK CONTINUED A CONSTRUCTIVE DISCUSSION OF ALL THE MOST IMPORTANT AND PRESSING ENVIRONMENTAL PROTECTION ISSUES

The development of hydrocarbon pipeline transportation can be compared to the evolution of automobile construction or aviation in terms of complexity and richness of technical solutions. The development

of pipeline transport is an important component of national strategies in countries producing oil and gas, as well as processing them. Modern pipeline transport is inconceivable without improvement and rational use of existing capabilities.

Compared to other types of hydrocarbon delivery, modern pipeline transport is the most environmentally friendly, as it reduces the need for transshipment of the transported product along the entire route from the sender to the recipient by several times.

To ensure environmental safety, all pipeline transport companies, including CPC, have an environmental policy, monitor environmental conditions, rehabilitate soils and ensure biodiversity conservation in pipeline areas. Company specialists regularly hold public hearings to resolve various issues that arise during the operation of the pipeline.

Practice shows that dialogue with environmental activists is more productive than confrontation, and precedents have already been observed. Environmental activists of Novorossiysk note that of all the residents of the port city with hazardous production, CPC is the leader in terms of transparency and readiness for open communication. And the Consortium itself does not shrug off questions and suggestions, developing and implementing its own «seat belts» – barriers to prevent escalation of problems – as they arise, like a responsible automobile manufacturer.

IN THE AREA OF SPECIAL ATTENTION

The Caspian Pipeline Consortium completed 2023 with a record volume of oil shipped in history (63.5 million tons). The technical ability to increase transportation was ensured through advanced technical and technological solutions implemented as part of technical re-equipment programs at the Marine Terminal, taking into account compliance with the highest environmental standards. An inventory of stationary sources of pollutant emissions into the air carried out in 2023 showed that the company's activities comply with state sanitary and epidemiological rules and environmental standards, while the standards for permissible emissions into the air established and agreed upon by Rospotrebnadzor and Rosprirodnadzor. Also in 2023, the Consortium organized and held two public meetings with environmental activists

of Novorossiysk, which, according to participants' feedback, had an obvious impact.

The round table "Ecology in the conditions of a port city" on April 26 brought together representatives of the public, municipal administration, supervisory and control government bodies, science and medicine in the village of Glebovskoye. A number of studies were presented to the audience for discussion regarding the analysis of the chemical composition of CPC Blend oil, as well as the technical capabilities of oil vapor recovery when loading tankers on the high seas and regional medical statistics.

Vice-Rector for Science and Innovation of Vyatka State University, Candidate of Agricultural Sciences Sergey Litvinets introduced the round table participants to the results of the analysis of oil samples and their vapors. The research was carried out as part of an experiment simulating conditions at tanker loading points at the CPC Marine Terminal. Recall that loading points are three single-point moorings operating in the open sea five kilometers from the coast, that is, at a distance that ensures effective dispersion of pollutants from the transshipment of oil and petroleum products over the sea area.

"Having studied the composition of CPC Blend oil using HPLC-MS/MS (which is a hybrid and combines independent processes of liquid chromatographic separation and mass spectrometric analysis), we found that this grade differs from others in the presence of seven types of mercaptans (thiols)", Sergey Litvinets noted in his speech. "The human body has a very high sensitivity to mercaptans and will perceive their odor if the TLV is not exceeded".

An expert assessment of the air condition on the coast in the area of CPC production activities was given by the General Director of the ANO "Research Institute

of Human Ecology and GOS", Doctor of Biological Sciences Yury Karpenko:

"The recorded concentrations of pollutants in the atmospheric air in the area of the Marine Terminal do not pose a threat to the life and health of residents. The irritating effect of the smell of oil vapors is due to a genetically inherent sensitivity to mercaptans as markers of danger. However, in the concentrations recorded in vapors, mercaptans are not dangerous, which is confirmed by their use on an industrial scale for the odorization of natural gas. Speaking about oncology, it should be noted that in Novorossiysk the disease statistics are lower than in other settlements of the Krasnodar Krai".

Alexander Kanakin, Chief Doctor of Novorossiysk Outpatient Clinic No. 1, cited statistics on morbidity in the municipality: over the past three years, there has been no increase in the incidence of asthma. The growth in the number of cancer cases decreased over the same period. Mortality statistics have not changed. No cases of gas vapor poisoning were recorded. As stated, the data provided prove that there is no linear relationship between CPC production activities and the health of the local population, the environmental situation is stable.

COMPOUND SENTENCES

So, the smell of mercaptans, coming from the sea with a south wind (briefly and not everywhere, as confirmed by the eco-activists themselves), is, admittedly, unpleasant. We would like to do something with it, and all participants of the dialogue agree with this.

To solve the problem of unpleasant odors, at the request of CPC, leading scientific organizations carried out a set of research works, which resulted



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EXPERTISE
OF ALEXANDER POPOV,
JV BORMASH

in the development of organizational and technical measures. Control measurements of tank atmospheres using Dräger-Tubes gas measuring tubes for mercaptan and hydrogen sulfide were organized. If violations are detected, tankers are not allowed to load.

Control and recording of information on inadmissibility of ships for loading when unsatisfactory quality of tank atmosphere in terms of hydrogen sulphide and mercaptans content is detected. Vessels with the highest number of complaints during loading are identified and additional tank atmosphere quality control is carried out for such vessels.

During tanker loading, a gas mixture consisting of volatile organic compounds is displaced from the cargo tanks through mast risers – breathing valves. Tankers equipped with a volatile organic compound (VOC) emission control system in accordance with the requirements

of regulation 15 of Annex 6 of the International Convention MARPOL 73/78 are allowed for loading from the SPM. During cargo operations at the Marine Terminal SPM, the tanker must constantly adjust the degree of opening of the mast risers in such a way as to ensure uniform release of VOCs and avoid their concentrated emissions.

During the tanker loading process, CPC specialists monitor the implementation of the ship's VOC emission management plan, the pressure in the tanker's gas venting system and the percentage of valve opening on the mast riser.

Since it has been revealed that the volume of emissions increases depending on the loading productivity, from April 2023 the loading rate of oil onto tankers with south-east, south and south-west wind directions decreases from 12 to 9 thousand m³/h. At the time this publication went to press, there were 100 such reductions in transshipment speed.

Data from the stationary air quality monitoring post operating in Yuzhnaya Ozereyevka on the border of the SPZ with residential buildings since the beginning of 2023 are publicly available on the website of the corporate magazine CPC Panorama: www.cpc-online.ru in a special section "Ecoinform". The published data reflects the concentrations of volatile organic compounds (VOCs) recorded in the atmospheric air, such as hydrocarbons, benzene, toluene, xylene, and methyl mercaptans. Based on the measurement results, it can be seen that the threshold limit value (TLC) established at the federal level for any of the parameters were never exceeded during the year, and at times VOC concentrations were not recorded by gas analyzers at all.

During the meeting on April 26, 2023, eco-activists made two proposals to solve the mercaptan odor problem. In the first case, it was proposed to equip CPC single-point

moorings with gas mixture recovery units based on the model of the terminal in Sheskhari. The second proposal was to install pipelines through which the gas mixture would flow from each SPM ashore to a stationary recovery unit.

The technical complexity of equipping the SPM with VOC recuperators has been repeatedly declared by both manufacturers of single-point moorings and recuperator units. Nevertheless, in response to the wishes of Novorossiysk environmental activists, the Consortium invited Alexander Popov, executive director of JV BORMASH LLC, as an expert in analyzing the situation. A representative of a company that produces recovery units, among other things, explained that to absorb and process the volume of VOCs released into the atmosphere when a Suezmax tanker is loaded with oil, a device weighing 700 tons and an area of about 1 thousand m² will be required. Not a single SPM or tug will withstand such an installation, and to place it in the CPC oil loading area, an island will have to be built. In addition, recovery equipment is extremely sensitive to vibrations, and when using carbon adsorption technology, also to atmospheric humidity. Construction and full operation of pipelines for transporting VOCs to an onshore recovery plant is technically impossible.

In order to guarantee the possibility or impossibility of implementing the proposals of environmental activists based on the results of the first Round Table, on May 16, 2023, CPC announced an open public competition with a prize fund of 1 million rubles on the development of a system for monitoring the emission and recovery of volatile organic compounds (VOCs), integrated into the process of loading oil tankers through single-point moorings. Unfortunately, no proposals to avoid the technical difficulties mentioned above were submitted to the competition.



COUNTER MOVE

The next meeting was held at the CPC Novorossiysk office on December 13 and brought together representatives of the municipal administration, Consortium management and specialists, environmental activists, local residents and media correspondents. The results of monitoring VOCs in the atmospheric air in the water area of the CPC Marine Terminal, the results of scientific studies of the aquatic environment off the coast of the Abrau Peninsula and other topical environmental issues were discussed.

Director of the Novorossiysk educational and research marine biological center of Kuban State University, Candidate of Geological and Mineralogical Sciences Irina Matasova presented the results of studies of the Black Sea ecosystem in the area of the CPC Marine Terminal, carried out from September 2021 to March 2022, and the results of industrial environmental monitoring of sea water for 2022–2023. It was noted that the bottom flora and fauna of the study area is typical in its qualitative and quantitative composition for the studied depths and soil composition, and has characteristics typical for the corresponding seasons. Oil contamination of soils and bottom sediments at the research site does not exceed 50 mg/kg.

Head of the scientific direction of the Azov-Black Sea branch of the Russian Federal Research Institute of Fisheries and Oceanography,

Candidate of Biological Sciences Timofey Barabashin introduced the audience to the long-term dynamics of the state of seawater pollution with oil products and the state of bottom sediments of the shelf in the northeastern part of the Black Sea, and current methods for identifying oil pollution.

Eco-activists have proposed that a special VOC recovery vessel, a joint project of Vaholmen VOC Recovery, Wärtsilä Gas Solutions, Ulstein Design & Solutions and the American Bureau of Shipping, be considered for use in the CPC oil loading area. Wärtsilä Gas Solutions is responsible for VOC capture and processing equipment in this project.

Following negotiations with Wärtsilä Gas Solutions on the application of any of the company's VOC utilization technologies, the Consortium received clarifications: these solutions are not applicable to the conditions of oil transshipment at Yuzhnaya Ozereyevka Marine Terminal.

In the spring of 2024, the media of the Krasnodar Krai noted the transition of the relationship between the CPC and environmental activists from "direct confrontation" to "setting up crossings".

"The port of Novorossiysk is home to 17 industrial enterprises, the activities of which in one way or another have an impact on the state of the environment", environmental activist and local resident Anna Karpacheva told a Novorossiysk Notebook correspondent in March.

"We are in constant contact with the Consortium's specialists. Thanks to them for coming and taking measurements. We hope that continuous monitoring will allow us to improve the situation and minimize unpleasant odors".

Of course, CPC's environmental activities are not limited to the Marine Terminal. The principles and requirements of the enterprise's environmental policy apply at every facility and every kilometer of the Tengiz-Novorossiysk pipeline system. A typical example of such eco-friendly solutions are bird protection devices: self-supporting insulated wires, protective covers, caps that completely cover the insulator. Three thousand such devices in 2023 were installed on power lines of facilities in the Central Region of CPC, where the migration route of migratory birds passes. These and many other initiatives are implemented on an ongoing basis, strengthening CPC's position as a socially responsible enterprise focused on continuous development and improvement.

As this issue was going to press, another eco-agenda event was implemented in Novorossiysk. On April 16, 2024, a group of environmental activists and media representatives visited the Tank Farm of the CPC Marine Terminal. Consortium managers and specialists introduced the guests to the facilities of the Marine Terminal, and also spoke about modern and safe technologies used in the storage, transportation and transshipment of hydrocarbon raw materials at the oil loading port. The meeting was the next step in building a positive dialogue within the framework of the CPC's transparent policy in the field of environmental protection. ●



PROJECT VAHOLMEN



CPC SENIOR ENVIRONMENTAL ENGINEER DMITRY GAVRILOV CONDUCTS INSTRUMENTAL MONITORING OF AIR CONDITIONS UPON CALL FROM LOCAL RESIDENTS

AUTHOR
PAVEL KRETOV

GEOGRAPHICAL BIOGRAPHY

IN FEBRUARY, ALEXANDER VALERIANOVICH BEREZHANOV, HUMAN RESOURCES DIVISION HEAD (HR MANAGER), CELEBRATED HIS ANNIVERSARY. CPC PANORAMA EDITORIAL HAS LONG BEEN WAITING FOR AN OPPORTUNITY TO CONGRATULATE THE JUBILEE AS A PERSON WITH A UNIQUE LIFE EXPERIENCE

The founders of the Berezhanov family (the first mention of the surname was found in the 15th century) came from different regions of the Russian state, more precisely, provinces and volosts, as they were called then. Among them

are the Baltic Germans, the Don (highland) Cossacks, and builders of Peter the Great's fleet at the shipyards near Voronezh. When asked about his own place of birth, Alexander Valerianovich answers with a smile that he was born into a military family. It sounds

aphoristic, but it is understandable to anyone who is familiar with the realities of garrison life. His father, an Air Force officer, was transferred to Hungary in the second half of the 1950s, where Alexander and his brother Oleg were born.

The geography of Valerian Timofeevich Berezhanov's service further determined the places of Alexander and Oleg's childhood and youth – the Turkmen SSR, then the Polish People's Republic, and they graduated from high school in Belarus near Brest. Deciding on their life's work, both brothers also chose the military profession.

"Our grandfather fought in the Great Patriotic War, was captured near Kharkov in 1941, escaped from Nazi concentration camps three times, and conquered Berlin", recalls Alexander Valerianovich. "Our father's uncle headed the regimental

in Berlin, that became the Victory Banner.

"We were constantly kept "on our toes" by the forces of the 2nd British Rhine Army of the combined NATO forces stationed on the other side of the border", says Alexander Berezhanov. "That's why we didn't let up our attention: the units were undergoing constant intense combat training, including at the Magdeburg training ground, the largest in Eastern Europe".

The fate of a military man is surprising – already working at CPC, many years later our interlocutor met in Atyrau almost a fellow

"SOMETIMES YOU COULD HEAR LANGUAGES YOU DIDN'T EVEN KNOW EXISTED"

committee of soldiers' deputies during the First World War, and in the late 1970s our father performed international military duty with his Cuban colleagues in Ethiopia".

His brother became a border guard, performed international duty in Afghanistan, and was wounded. And Alexander, after military service in the Far East, graduated from the Higher Red Banner School of the KGB of the USSR named after F. E. Dzerzhinsky, where he qualified as a lawyer with knowledge of English and special training. During his studies, he took part in ensuring the security of the 1980 Moscow Olympic Games. After graduation, he served in military counterintelligence agencies in the Group of Soviet Forces in Germany (GSFG).

That service began in a garrison located near the ancient Hanseatic town of Gardelegen in the land of Saxony-Anhalt, 17 km from the border with Germany. This border was covered by Soviet units that were previously part of the famous 150th Idriz Rifle Division. It was its flag, hoisted on May 1, 1945 on the roof of the Reichstag

soldier – a former tankman from the neighboring garrison of Staats Askar Shmanov, who today works as a representative for relations with the Government of the Republic of Kazakhstan of CPC-K JSC.

At the end of the 1980s, Alexander Valerianovich was transferred to Moscow, where he served in structures directly related to the activities of the National Nuclear Risk Reduction Center. He took part in inspections as part of the implementation of the Intermediate-Range Nuclear Forces Treaty (INF Treaty), the Treaty on Conventional Armed Forces in Europe (CFE), the Vienna Document, the Strategic Arms Reduction Treaty (START 1), signed in 1987 between the USSR and the USA. On these trips, he traveled to almost half of Western Europe: Germany, Belgium, the Netherlands, Luxembourg, Great Britain, Portugal, Poland.

"I've been to the USA several times, both in the western and eastern parts of the country", says Alexander Valerianovich. "To save foreign exchange resources, our inspectors then flew there not on special flights,



but on regular Aeroflot flights. Since one of the clauses of the Treaty required immediate departure from the country after the mission was declared completed, it was necessary to plan and carry out all necessary inspection actions between arrival and departure with virtually pinpoint precision. Sometimes it was necessary to have sharp discussions with representatives of the host country on issues related to the conditions for the implementation of the Treaties”.

In the late 1990s, Alexander Berezhnov served as a staff officer for the UN international force in the former Yugoslavia (UNTAES). Two other current CPC employees – Evgeny Malyshev, head of the Transport Security Service, and Sergey Solomakha, head of the Translation Service – were participants in this Mission at different times. In Eastern Slavonia, on the right bank of the Danube, peacekeepers from Russia, Belgium, Jordan and Pakistan stood on the demarcation line between Croats and Serbs. They were reinforced by an Argentine reconnaissance company and a Polish

counterterrorism unit. Air support was provided by Ukrainian helicopter pilots. Logistics support was provided by units from Indonesia, the Czech Republic and Slovakia. To this we must add the UN civilian police, which included representatives from 20

1.6 thousand military personnel from different countries. Their number, timely rotation, development of regulatory documentation, personnel reporting, postal support, legal support, living arrangements, organization of evacuation of the

“WE HAVE VERY COMPETENT HR SPECIALISTS WORKING FOR US – STRICT, PRINCIPLED, WITH AN ACTIVE LIFE POSITION”

other countries around the world. It was necessary to establish working interaction with everyone.

“Everyone used a common radio communication channel in English, but also had their own national radio frequencies”, Alexander Valerianovich smiles. “By switching to them, sometimes you could hear languages you didn’t even know existed. Such a little Babylon on the air”.

As the head of the G1 headquarters department, Alexander Berezhnov oversaw the entire international military contingent, which included

dead and wounded – all this was in the area of responsibility of his subordinates. The Russian contingent interacted with colleagues from the Airborne Troops Brigade, which was headquartered in the village of Ugljevik, Republika Srpska (part of Bosnia and Herzegovina).

There were some oddities too. One episode was particularly memorable. Every year, “in order to strengthen the spirit of international military cooperation”, the Russian brigade and its neighboring American parachute division from the KFOR forces organized sports competitions. Everyone was accustomed to the fact that in all disciplines, with the exception of the marathon, the Russians always excelled, but this particular meeting unexpectedly became an exception: ours not only lost, but lost with a humiliatingly crushing score.

The party that followed the competition significantly improved the linguistic abilities of some and loosened the tongues of others. And then suddenly the monotonous polyphony of the feast was cut through by an indignant shout in Russian: “Guys! We were deceived!”

It turned out that in order to beat their counterparts, the American command found it possible to enter into the competition not real military personnel, but members of the athletics team from a university in one of their states. The counterparts were



filled with emotions, and the sports festival spontaneously turned into fist “overtime.” The intervention of the military police was required, but there were no investigations or mutual presentation of claims.

After 20 years of service in the Armed Forces, Alexander Berezhnov moved to civilian structures. In the late nineties – the first half of the 2000s, with experience in supervising the security sector and organizing personnel work, he worked in such industries as pharmacology, international transport logistics, oil and gas production. In 2008, he was hired by AK Transneftproduct JSC, which was engaged in the transportation of all types of light petroleum products. This company was then at the stage of integration into the structures of Transneft PJSC.

“The merger of companies was not simple: TNP consisted of nine subsidiaries, plus 11 private security companies, the total number of personnel exceeded 16 thousand people, the length of the linear part of the main oil product pipelines was 15.4 thousand km”, explains Alexander Valerianovich. “The “head” of the enterprise began near Novosibirsk, and the “tails” ended at the Ukrainian-Hungarian border, in Belarus and at the port of Primorsk near Vyborg. The biggest problem then was numerous unauthorized taps, low salaries for workers and poor social package. Staff turnover

was off the charts. Therefore, integration into the Transneft system was a strategically correct decision: Transneftproduct divisions were thereby able to significantly expand their reconstruction and technical re-equipment programs, switch to new safety standards, conduct large-scale diagnostics, and improve the material well-being of employees”.

At Transneftproduct, Alexander Berezhnov first headed the newly formed internal security department, and three years later – the HR Department. Since 2016, he has been managing human resources at CPC.

“Our main task is to ensure the reliable functioning of, first of all, the three most important “combat” divisions of the Company”, says Alexander Berezhnov. “We are talking about the operation service, specialists in the field of commodity transport operations and construction workers engaged in repair, reconstruction and construction of production facilities. All other departments, including personnel, financiers, lawyers, translators, press service, etc., are also, undoubtedly, important. Without them, the Company will also not be able to work effectively, but their function is to provide “rear support” for our strikers.

The second important task of the HR Division is strict compliance with

the labor legislation of Russia and Kazakhstan and minimizing all types of risks for the company in this area. This, in particular, includes a full range of protection of personal data of employees. Regular training with the participation of leading consultants of the Russian Federation and Kazakhstan helps HR Division employees keep up with changes in legislation.

“We have very competent HR specialists working for us – strict, principled, loving their craft, in most cases with an active life position, rooting for their charges”, Alexander Valerianovich speaks with respect about his subordinates. “The leaders among them are deservedly Olga Kornienko, Anna Ustenko, Inessa Bazhina, Gulzada Kapakova, Nadezhda Krivoruchko, Yulia Borisova. Our labor and wages specialists, led by Yury Kirichenko, carefully carry out their work, which is invisible at first glance. A group headed by Alexander Avdokhin is responsible for the development and implementation of social programs. A separate topic is the relatively recently added unit to our team, which is engaged in training and development of personnel, which is led with inexhaustible energy by Alexandra Rabinovich. Taking this opportunity, I would like to express my deep gratitude to all of them for their highly professional and responsible approach to business!”





The work of HR divisions is associated with the daily processing of a huge array of documentary materials. Despite the gradual introduction of digital technologies, such basic documents as all types of orders (and there are 135 of them in CPC alone!), employment contracts, additional agreements to them, job descriptions, job evaluation cards, time sheets, etc. are initially prepared in paper form.

"I sign more than 250 documents every day, and every two weeks I have to change my pen", smiles the CPC HR Manager.

At the same time, it was the high digitalization of all processes in the company that made it possible to quickly transfer office staff to remote forms of work during the recent pandemic. This period was remembered by the chief HR specialist of CPC for the amazing ability of our employees to adapt in difficult conditions, strict self-discipline, and their strong corporate spirit. Thanks to this, even during the most difficult period of the pandemic, not a single production facility was shut down.

The pandemic is behind us, and practically so is DBNP... What is the focus of the Consortium's HR divisions today?

"Structural reorganization of a number of production divisions of the company. Reprocessing

of outdated regulatory documentation. Preparation for concluding a Collective Agreement with employees of CPC-K. Searching for specialists of high-demand specialties. Elimination of shareholder audit observations. There's never a dull moment", answers Alexander Berezhanov. "After including the Personnel Training and Development Team in the HR Division, we interact with specialized oil institutes to organize training and advanced training for our employees in Russia and Kazakhstan. We are developing a system of internal coaching by spheres — our individual shareholders are now interested in this experience".

The HR Division, according to its head, continues to improve social protection measures for the workforce. Last year, Regulations were introduced on the conditions and procedure for providing partial monetary compensation for the cost of renting residential premises to full-time employees of CPC-R and CPC-K. The procedures for obtaining compensation within the framework of the Regulations on partial reimbursement of expenses for sports, sanatorium and resort treatment, and the purchase of vouchers for organizing children's recreation and their health improvement are being

simplified. The amount of the shift bonus paid to workers at CPC-R shift PS has been increased. The same allowance was introduced for CPC-K shift workers, which allowed local managers to more effectively carry out rotational activities between stations, facilitating the exchange of experience and professional growth of specialists, and attracting the most worthy personnel. As a result, today CPC employs residents of almost all regions of Russia — from the Kaliningrad Oblast to the Far East.

"To be honest, I don't have much free time", the anniversarian answers the traditional question about hobbies. "In the evenings, I have to go through Telegram, at least to catch up on the main news. I am interested in literature on military-historical and political topics, especially memoirs of famous Russian figures from different eras and intelligence officers. If I manage to get out into nature, I love quiet (mushroom) hunting".

Recently, the Berezhanov family continued with the son of Alexander Valerianovich's eldest daughter, that is, his grandson. The daughter works in HR of one of the Moscow IT companies, one of the sons, having served in the army, is now a student at Moscow State Linguistic University, the second is studying at the Lyceum of the National Research University Higher School of Economics. ●



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FROM MOUTH TO BERTH

IN MID-FEBRUARY 2024, SERIKKALI KUZENBAEVICH MURINOV, GENERAL MANAGER, OIL TRANSPORTATION AND COMMERCE, CELEBRATED HIS 60TH BIRTHDAY. THE EDITORS OF CPC PANORAMA JOIN IN CONGRATULATING COLLEAGUES FROM DIFFERENT COUNTRIES



Serikkali Kuzenbaevich is a third generation oil pipeline worker. His grandfather in 1930 participated in the construction of the very first Kazakh oil pipeline Caspian — Orsk. This pipeline, laid for the needs of the industrialization of the USSR, acquired even greater importance with the beginning of the Great Patriotic War. In those years, his grandfather had the opportunity to work both as a lineman and as a driver of mainline pumping units.

His father worked all his life in the oil and gas production department. The family lived in the village of Kosshagyl (270 km southeast of Guryev, now Atyrau), where the development of the oil field of the same name, discovered in 1926, began. Here Murinov's father found a job in the mining industry. And in 1964, Serikkali was born in Kosshagyl. Early childhood was spent in the company of his grandmother, because his parents, as is usual with oil workers, went to develop the new Prorva field 170 km southeast of Atyrau.

"I came to my father and mother in the village of Sarykamys in 1970, when it was time to go to school", recalls Serikkali Kuzenbaevich. "About 6 thousand people lived in the settlement, built specifically for oil workers. You could say it was a republican outback, but not in terms of the level of school education. A very good school was built in Sarykamys and the best teachers were invited, who were provided with decent conditions and apartments".

In 1979, after finishing the eighth grade, Serikkali Murinov entered the oldest educational institution of the Kazakh SSR — the Guryev Polytechnic School (currently the Atyrau Polytechnic Higher College named after Salamat Mukashev). In 1984, with a year of work experience at Prorvaneft, the young oil worker entered the Moscow Institute of Petrochemical and Gas Industry (now Gubkin Russian State University of Oil and Gas).

"That same year, the Politburo of the CPSU Central Committee decided to cancel deferments in all

universities of the Soviet Union, and after my second year I joined the army", says Serikkali Murinov. "I served in Berdichev, in its own way it was also an important life experience".

In 1991, as a certified specialist, Murinov returned to Kazakhstan to the Prorva field, which was part of the Tengizneftegaz system. He started as a well operation operator and worked his way up to the head of the oil preparation and pumping workshop.

In turn, Serikkali Kuzenbaevich's experience as an oil pipeline operator began in 1995. He was invited to the Yuzhnefteprovod (now KazTransOil JSC), where such famous specialists as Taras Mazhitovich Kasymov and Ferdinat Abdrakhimovich Mamonov became mentors in the profession. Yuzhnefteprovod operated sections of the Kalamkas — Karazhanbas — Zhetybai — Uzen, Uzen — Atyrau — Samara oil pipelines, intended for transporting highly paraffinic oil. The raw materials froze already at + 32°C, so in addition to pumping stations, the main line was equipped with heating furnaces.



“First I worked at the Zhetybai LODS, then at the Aktau PS, whose main task was to ship oil through the port of the same name”, continues Serikkali Murinov. “The station received oil from the Tengiz, Kumkol, and Zhanazhol fields. For this purpose, in 1996, a railway discharge overpass was built and put into operation at the pump station, initially designed for 30 tank cars, later expanded to 84”.

In 1997, Serikkali Kuzenbaevich was transferred to the position of deputy head of the Balykshinsky oil pipeline department, where he became responsible for commodity transport operations. Afterwards, he did the same thing in the Mangistau department, until in 1999 he became deputy director of the Western branch of KazTransOil JSC, where he supervised the issues of oil and water transportation. Water supplied through specially laid pipelines from the Volga delta was required not only for technological processes of oil production, but also to supply populated areas of the Atyrau region.

The western branch of KazTransOil JSC, consisting of the Mangistau, Kulsarinsky, Atyrau, Aktobe and Ural oil

pipeline departments, was responsible for the operation of the Uzen – Atyrau – Samara, Kalamkas – Karazhanbas – Aktau, Kenkiyak – Atyrau oil pipelines, as well as the Astrakhan – Mangyshlak water pipeline.

“Our branch served the oilmen of the entire Western Kazakhstan region”, says Serikkali Murinov. “The mixing base was in Atyrau. Tengiz oil was transported through the port of Aktau and by rail from Atyrau all the way to Odessa, Feodosia and Finnish Porvoo. Together with Russian colleagues from Chernomortransneft, we were engaged in diagnostics of sections of the former Guryev-Grozny oil pipeline transferred to the CPC system.

When Serikkali Murinov was invited to the Caspian Pipeline Consortium in 2006, he not only had extensive experience in international cooperation, but was also intimately familiar with CPC production facilities.

SERIKKALI MURINOV CAN REPORT FOR EVERY KILOGRAM OF OIL – ITS LOSSES DURING TRANSPORTATION ARE CLOSE TO ZERO

“The first thing I would like to say about the company where I have been working for 18 years: no matter how situationally the interests of shareholders differ, we have always found and are finding a common ground when it comes to production safety and the efficiency of technological processes”, notes Serikkali Kuzenbaevich.

By implementing the Expansion Project and almost completing the Debottlenecking Program, CPC has prepared itself in time to increase oil supplies from its three largest fields. All of this will be required in the very near future.

“A significant increase in production volumes is expected at Tengiz as early as 2025”, says General Manager for Oil Transportation and Commerce. “Kashagan plans to reach half a million from the current 420 thousand barrels per day. We plan to maintain a high production

level at Karachaganak – 11–12 million tons of oil per year, at least until 2028, with a subsequent increase after the construction and launch of a gas processing plant”.

Serikkali Murinov also notes that commodity transport work in the CPC has significant differences from any other pipeline systems in the region and this imposes its own characteristics on interaction with shippers. Thus, the Consortium does not have its own technological oil – all of it is formed at the expense of shareholders’ crude oil. Like any other property of CPC participants, it is carefully preserved – hydrocarbon losses during transportation are close to zero.

“We can report to all regulatory authorities, including customs, not just for a ton, but for every kilogram”, emphasizes Serikkali Kuzenbaevich. “At CPC, regulatory documents are strictly observed, punctuality and discipline are required not only from the Consortium personnel, but also from shippers – to deliver the declared volumes in a timely manner, pump, and deliver the tanker to the Marine Terminal”.

Rhythm is especially important during the autumn-winter period of storms. If a tanker is late, we have to fill the tanks of the Tank Farm. The weather has worsened, the storm has dragged on, and this very reservoir may not be enough for the uninterrupted operation of the entire pipeline system. And the number of stormy days on the Black Sea is growing year by year.

An important and stable trend in pipeline transport is the automation of all oil pumping processes. Thanks to this, only three dispatchers per shift manage the technological regimes on the linear part and the loading of tankers. These are unique specialists with



extensive experience in pipeline transportation. However, experience is experience, and the main control center dispatcher, before he is trusted to sit at the console, undergoes special training for at least a year. But even after this, study and retraining do not stop. Off-duty dispatchers continue to hone their skills in simulators, analyzing various situations that require a quick response in practice.

“I think it is important that despite all the uniqueness of CPC dispatchers, we managed to ensure continuity of generations in this specialty”, emphasizes Serikkali Murinov. “Now, together with honored veterans, we have quite young guys working and gaining authority”.

It is impossible not to mention another “bonus” of automation, thanks to which the division under the management of Serikkali Kuzenbaevich is well known and deservedly appreciated throughout the CPC pipeline system. Management and authorized specialists can obtain fresh operational data online:

how much oil was shipped per day, week, month, year. How many tankers are currently loading and what their tonnage is. How much oil entered the pipeline and where it came from. And other useful information.

If even this most important information in the operation of the CPC pipeline system was not enough, employees of the Operations Commerce Group are always in touch, 24x7, led by their supervisor.

“I don’t remember such periods when I completely “switched off” from work”, smiles the hero of the day. “Sometimes I reread classic literature at my leisure and wonder how my perception of it changes over the years. Probably because our attitude to life changes over time. Before I knew it, the children had already grown up and moved away: my son, Askhat, and two daughters, Aidana and Dina. My wife Gulsanym Baykhadonova, the keeper of our family hearth, devoted herself to their upbringing. Now we enjoy any opportunity to meet together on holidays”.

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«KUTUZOV» VS «CITADEL»

THE GREATEST TANK BATTLE IN HISTORY ON THE KURSK BULGE IS INTERESTING,
AMONG OTHER THINGS, ALSO FOR ITS FUEL SUPPLY ISSUES

The story about the Battle of Kursk should begin with an important event in Switzerland. It was in this neutral country that Soviet

intelligence officers received a top-secret document in April 1943 – Hitler's draft directive "On Operation Citadel". A unique case: the plan was endorsed by

all services of the Wehrmacht, all that was missing was the Führer's resolution, and it was already read in the Kremlin. By this stage of the war, the Soviet command could rely



Иван Шалун/РИА Новости

on a whole system of strategic, military, political intelligence, tactical intelligence operating at the front, air reconnaissance, radio intelligence, as well as information from partisans.

GERMAN VA-BANK

The decision to operate was not an easy one for Hitler. After the winter offensive of the Red Army and the German counteroffensive in eastern Ukraine, an arc was formed on the line Mtsensk – Maloarkhangelsk – Dmitrovsk – Sevsk – Rylsk – Sumy – Belgorod – Volchansk with a depth of up to 150 km and a width of up to 200 km. If the converging attacks on the base of the salient were successful, the defending Russian divisions could be surrounded and destroyed. However, there was no consensus among the German generals. After the defeat of the Germans at Stalingrad, many skeptics appeared there, who warned that in case of failure, the Wehrmacht would not be able to return even to its original lines. And yet Hitler signed the directive.

The opponents began to prepare for a new battle. Possessing accurate information about the German plans, Stalin's headquarters decided to first exhaust the enemy in defensive battles, bleed his strike forces, and then defeat them by carrying out counterattacks on the attackers at a critical moment. This plan also carried significant risks for the Red Army: at all previous stages of the war, it had never been able to stop the enemy's prepared offensive at the stage of breaking through its positions.

The defense of the Kursk ledge was entrusted to the troops of the Central and Voronezh fronts, numbering more than 1.3 million people, up to 20 thousand guns and mortars, over 3.3 thousand tanks and self-propelled guns, 2650 aircraft. In the rear, the Steppe Front was deployed, which was the strategic reserve of the Supreme Command Headquarters.



Галина Санько/РИА Новости

DURING THE COUNTEROFFENSIVE, ALMOST 100
THOUSAND TONS OF FUEL WERE SUPPLIED
TO THE FIVE FRONTS PARTICIPATING IN IT

In the zones of responsibility of the Central and Voronezh fronts alone, 9,240 kilometers of trenches were dug, more than 930,000 mines were installed, of which half a million were anti-tank.

FUEL OF WAR

The fuel services of the Red Army were also preparing for the largest confrontation in history involving tank formations. The State Defense Committee conducted an audit of fuel and lubricants accumulations in all fronts planned for future operations. Convinced that the available resources were not enough, the committee ordered to take the required amount from reserves in the Far East.

Taking into account previous war experience, the committee established a special priority schedule for the transportation of fuel and lubricants for the USSR People's Commissariat of Defense

via railways and waterways. And the corresponding rear units of the fronts had to immediately receive such transports. All trains were ordered to be unloaded only at night, which was supposed to take no more than four hours.

Until mid-summer, the supply of Soviet troops on the Kursk Bulge was carried out along the only railway route Kastornaya – Shchigry – Kursk. Since the second half of July, the newly built Sary Oskol – Rzhava branch also started operating.

Sometimes the Germans managed to disrupt the rhythm of fuel supplies. Thus, during the most intense period, German aviation managed to break through to the Saratov oil refinery, disable it and destroy a significant part of the reserves there. The situation was saved by a rapid increase in production at other plants (including the Guryev Oil Refinery) and a reduction in volumes for

the fronts not participating in the Battle of Kursk.

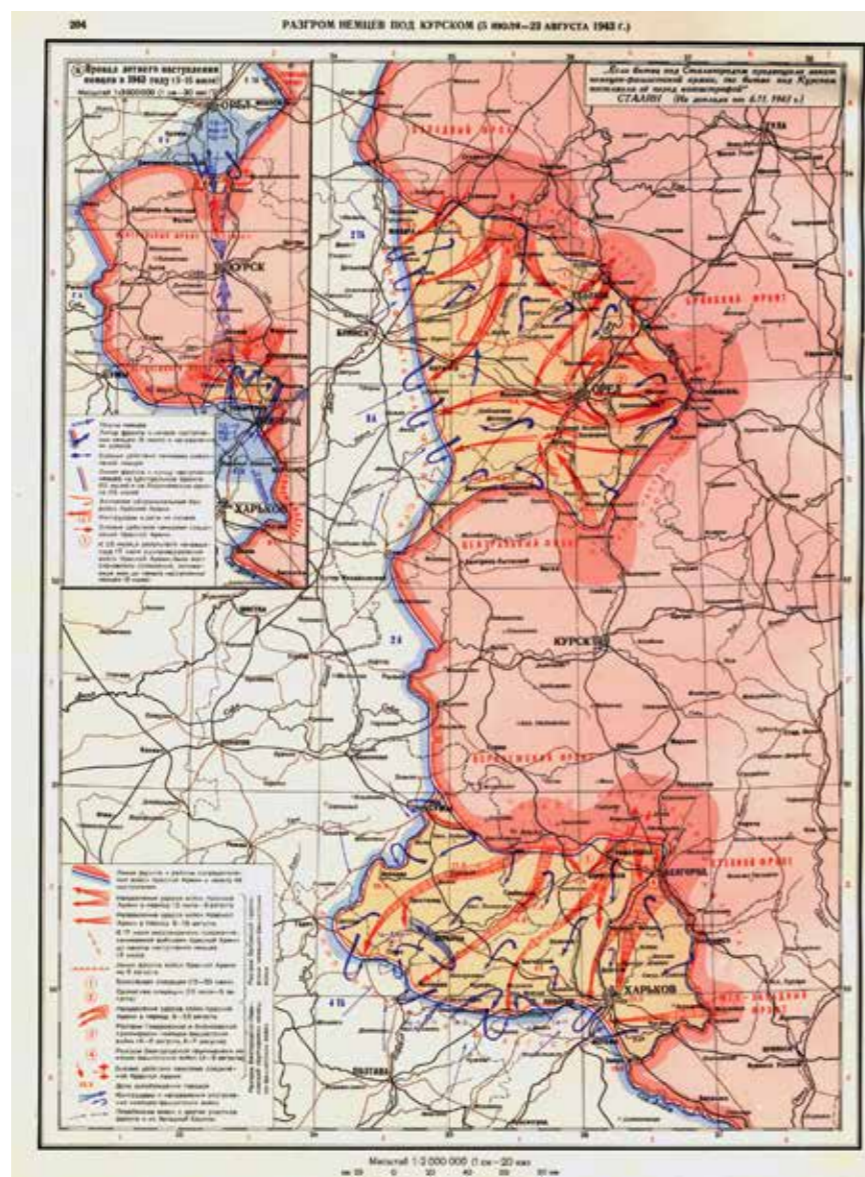
It is important to note: in accordance with the clearly defined tasks of the Red Army, methods for accumulating and storing fuel reserves on the Soviet fronts were also developed. That is, even at the defensive stage of the operation, more than half of the fuel was delivered directly to the regiments and divisions. As subsequent events confirmed, such placement of fuel not only increased the stability of the defense, but also made it possible to immediately go on the offensive without pause.

THE ENEMY HAS NOT PASSED

The German offensive began on July 5th. On the southern front of the arc, moving out from the Belgorod area, attacks were carried out by ten tank, one motorized and seven infantry divisions. At the same time, from the north, from the area west of Orel, seven tank, two motorized and nine infantry divisions went to break through the Soviet positions. Great hopes were placed on the massive use of the latest formidable Tiger and Panther tanks and Ferdinand self-propelled guns.

However, the northern group of Germans covered only 10 km in five days of battles, and, leaving up to two-thirds of their destroyed tanks on the battlefield, quickly lost their offensive potential. Behind the first defensive line, the Germans encountered densely mined fields, all passages in which were shot through by artillery.

The success of the Nazis was somewhat greater on the southern phase of the arc. Here the enemy created a significant superiority in manpower and equipment and managed to wedge 35 km into the defense. Then, faced with stubborn resistance from Soviet troops in the direction of Oboyan and Korocha, the enemy deployed tank columns to Prokhorovka, trying to approach Kursk through the Belgorod highway.



Igor Ljashkov/Фотобанк Лори

In turn, Soviet troops, reinforced by strategic reserves, launched a powerful counterattack against the wedged enemy group. On July 12, one of the largest tank battles in the history of war took place in the Prokhorovka area, in which up to 1.5 thousand tanks and self-propelled guns and large aviation forces took part on both sides. During the day of the battle, the enemy, having lost over 350 tanks, was forced to go on the defensive, and on July 16 – to begin withdrawal of its forces. Operation Citadel failed.

RADICAL CHANGE

On July 12, the Red Army with the forces of the Western and Bryansk fronts attacked the German positions.

The plan for the destruction of German troops in the Orel area received the code name "Kutuzov". On July 26, the enemy was forced to leave the Oryol bridgehead, and on August 5, Soviet troops liberated the city. On the southern front, the counteroffensive began on August 3: formations of the Voronezh and Steppe fronts went forward. On August 5, the Germans were driven out of Belgorod, and on August 23, from Kharkov. By the time the front stabilized, Soviet troops approached the starting lines for crossing the Dnieper.

During the summer days of 1943, the "fuelers" also worked hard. During the counteroffensive, almost 100 thousand tons of fuel



image/United Archives/TACC

were supplied to the five fronts participating in it. On average, each front received two trains with fuel every day. If during the defensive operation on the Kursk Bulge, Soviet troops spent about 1.4 thousand tons of fuel per day, then in the counteroffensive this figure increased more than twice. Moreover, the consumption of automobile fuel increased three times, and tank fuel – 2.7 times.

Thorough preparation of the fuel services for the counteroffensive made it possible to provide the armies with an impressive pace of attack. Difficulties with fuel delivery arose only when army communications stretched for 150–180 km. In the absence of paved

roads, motorized convoys with cargo moved at low speed, spending three to five days per trip.

The railway troops came to the rescue – they quickly restored the branch to Orel. Along this route, the tanks arrived at the stations closest to the troops, where fuel was supplied to military vehicles, bypassing army warehouses. More than 13 thousand railway tanks and about 1.5 thousand trucks were used to supply the troops participating in the counteroffensive.

Military historians note: the Battle of Kursk completed the very formation of the Red Army's fuel supply service. This service became capable of solving even more complex tasks of uninterrupted supply of troops,

which was especially important in conditions when the subsequent offensive unfolded on a wide front – from Nevel to the Sea of Azov.

In a global sense, the Battle of Kursk was the collapse of the Wehrmacht's offensive strategy. After the defeat at Kursk, the Red Army fully consolidated its strategic initiative; the German command went on the defensive along the entire line of the Soviet-German front. A radical turning point in the course of the Great Patriotic War was the final one. ●

Based on materials from the book: V.V. Nikitin. 30 years at the head of the fuel service (collection). – M.: Voentekhlit, 1999.

Общій видъ города и бухты.

Новоросіійскъ.

Сергей Елизарьев /
Фотобанк ЛориAUTHOR
PAVEL KRETOV

TWICE BORN

WE CONTINUE THE HISTORY OF THE DEVELOPMENT OF THE PORT CITY OF NOVOROSSIIYSK, BEGUN IN THE LAST ISSUE, WHICH HAS BEEN GOING ON FOR ALMOST TWO CENTURIES

Despite the fact that Novorossiysk acquired the status of a city in 1839, after the Crimean War, under the terms of the peace treaty, it had to be abolished. At first, a temporary fortification was erected on the site of the city, then a village. Novorossiysk officially became a port city again in 1866. And at the

same time it was declared the center of the Black Sea District, which was part of the Kuban region.

The issue of settling new territories in unusual climatic conditions and not always friendly surroundings was acute. As an incentive, the authorities offered volunteers free distribution of land and various financial benefits. Bourgeois, peasants, factory

workers, retired sailors and Azov Cossacks went to Tsemes Bay from the central regions of Russia. Thanks to permission for foreign nationals of Christian denominations to move to Novorossiysk, a large colony of Czechs quickly grew here: they sowed wheat, grew grapes and tobacco, and founded a fruit tree nursery.

Gradually, industrial enterprises began to appear in the city. The first signs in the late 60s of the 20th century were the oil refinery of the Russian Standard joint-stock company and cement production. Along with industrialists, electricity, telephone, telegraph, water supply and sewerage came to the city. The only thing missing was the railway.

THE LEGEND OF THE MINING ENGINEER

In 1875, a railway was built from Rostov-on-Don to Vladikavkaz, and in the cabinet of ministers of the Russian Empire they started talking about the need to build a new line through Ekaterinodar, to the Black Sea coast. Gelendzhik and Novorossiysk competed for the right to become a terminal for the railway. The latter won thanks to the presence of an already operating port.

Construction of the railway from Tikhoretsk to Novorossiysk began in 1885. Rails for the new highway were cast and rolled in St. Petersburg and Donetsk. Oak sleepers were harvested from local forests.

The port's capabilities were widely used to supply the materials needed by the railway builders. Five additional wooden piers were quickly installed here. Rail tracks with switches were laid directly on them – for shunting trains.



THE PLAN OF NOVOROSSIIYSK IN 1913 FROM THE ILLUSTRATED PRACTICAL GUIDE TO THE CAUCASUS BY G. G. MOSKVICH

Wikimedia Commons

THE FIRST OIL PIPELINES TO THE CITY WERE LAID AT THE END OF THE 19TH CENTURY BY THE FAMOUS NOBEL BROTHERS

The section closest to Novorossiysk required the construction of small (390 m) and large (1400 m) tunnels in the mountains. They were tunneled from both sides using dynamite. To this day, in Novorossiysk you can hear the legend about the engineer responsible for the construction of the tunnel, who was waiting for

two teams to meet in the rock, and without waiting for them, he shot himself. The workers met the next day: the poor fellow made a mistake not in the direction of the tunnel, but only in its speed. However, such stories can be heard about several other tunnels in the Caucasus – it is not a fact that the real one happened near Novorossiysk.

FROM TRAIN TO SHIP

Construction of the railway was successfully completed in the summer of 1888. Minister of Railways Konstantin Posyet arrived at the opening of the station, and a few months later Emperor Alexander III himself visited Novorossiysk with his heir, the future Emperor Nicholas II.

The appearance of the railway artery turned Novorossiysk into the real southern gateway of Russia. A new route for the export of bread was opened, and industry in the city itself received a new impetus for



Старуха Луба / Фотобанк Лори



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Сергей Елизарев/Фотобанк Лори

development. Numerous trains with grain and oil went through Kuban to Novorossiysk, and in the opposite direction – with fish, cement, fruit, machine tools and machinery.

Transshipment of large volumes of grain at the port required the construction of a special elevator. The nine-story building was put into operation in 1894 – for a long time it was the tallest in Novorossiysk. The barns were connected by conveyor belts, which significantly simplified and accelerated the loading of export ships.

Soon Novorossiysk also became a major transshipment point for tourists: from St. Petersburg and Moscow they arrived in comfortable passenger trains and boarded on ships to Tuapse, Sochi and other resort cities. The rail tracks went

directly to the pier and the path from the express compartment to the ship's ramp was minimal.

A special mention should be made of Novorossiysk's development as a major export point for oil and petroleum products. The first pipelines to the city were laid at the end of the 19th century by the famous Nobel brothers. Their oil transshipment enterprise included a 95-kilometer main line with a diameter of 150 mm, a discharge rack for railway tanks, riveted tanks (one of which survived safely until 1988), pumping facilities and a sea pier for handling ships with a deadweight of up to 1.5 thousand tons.

TWO "STANDARDS"

In 1882, the first steamship left Novorossiysk with 1.3 thousand

tons of oil on board. By 1910, the Branobel company was producing 100 million pounds of oil per year, and its capital exceeded 60 million rubles. The company's shares could be purchased on the St. Petersburg, Amsterdam, Berlin and Frankfurt stock exchanges.

In 1918, all the Nobel brothers' property in Russia was sold to Rockefeller's Standard Oil. Soon after this, all storage facilities, wells and work camps were nationalized.

However, this mention of Standard Oil in the history of Novorossiysk was enough for local residents to sometimes mistakenly associate the origin of the Standard area with an American company. In fact, this once elite part of the city owes its name to the board of the Russian-French company Russian Standard. Here were also located such attractions as the "Garden on the Standard" and the Mont Plaisir cinema.

An oil export pier and the Russian Standard oil refinery appeared in Novorossiysk even before the construction of the railway. And with its construction, the company significantly expanded its infrastructure. Additionally, 23 tanks and three oil pipelines were built to load oil onto ships. Thus, at the turn of the 19th and 20th centuries, Novorossiysk became the largest trading center in the North Caucasus. ●



Сергей Елизарев/Фотобанк Лори

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TECHNOLOGY TO THE YOUTH

IN 2024, WITH THE SUPPORT OF CPC, THE NUMBER OF MOBILE QUANTORIUMS IN THE KRASNODAR KRAI INCREASED FROM FOUR TO NINE. THIS IS A SIGNIFICANT JOINT CONTRIBUTION OF THE OIL PIPELINE COMPANY AND THE REGIONAL MINISTRY OF EDUCATION, SCIENCE AND YOUTH POLICY TO THE NATIONAL PROJECT "EDUCATION"

The goals of the national "Education" project, launched in 2018, include modernizing the existing education system by increasing the level of pedagogical skills, as well as creating a full-scale digital educational environment. The talents of children and youth need to be helped to develop, and in this both the motivational component and technical support play equally important roles.

As part of the national project, Quantoriums – children's technology parks with modern equipment for mastering such promising areas as IT, biotechnology, robotics, design, construction, modeling, data analysis and others – have been opened in 76 regions of the country. In addition to stationary Quantoriums, mobile ones are also being created – minivans equipped with the necessary equipment that go to schools located in remote and hard-to-reach places. By the end

of 2023, there are 280 stationary and 85 mobile Quantoriums operating in the country.

"It is very important that we integrate this Quantorium project into the educational programs of schools, so that this is a natural element of children's education", said Prime Minister of Russia Mikhail Mishustin on February 11, 2020 in Nizhny Novgorod, where the first batch of mobile technoparks was assembled at the Gorky Automobile Plant.



In 2020, the Krasnodar Krai received four mobile Quantoriums. Throughout the school year, these technology parks on wheels travel from school to school, making a two-week stop at each one. In the summer, Quantoriums come to the Black Sea children's camps, where exciting competitions, shows and hackathons are held as part of the "Engineering Vacations" program. According to statistics, at the beginning of February 2024, mobile Quantoriums visited 96 schools, and 18.4 thousand children attended classes at their base.

"Advanced science is becoming even closer to schoolchildren", says Elena Vorobyova, Minister of Education, Science and Youth Policy of the Krasnodar Krai. "In such technology parks, children get acquainted with promising areas of engineering, conduct research, study programming, 3D modeling, artificial intelligence, unmanned aviation".

With the beginning of 2024, there are already nine mobile technology parks in the Krasnodar Krai: four existing ones have been joined by five more, built on the basis of Sollers-Atlant vans with funding from the Caspian Pipeline Consortium under the Cooperation Agreement with the Krasnodar Krai, which has been in effect since 2022. Rural organizations of additional education received one car each: the Center for Creativity of the Dinsky District, the House of Artistic Creativity of the Korenovsky District, the Center for the Development of Creativity of Children and Youth of the City of Krymsk, the Center for Aesthetic Education of Children "Theater of Young Spectators" of the Tbilisi District and the House of Children's Creativity of the Kavkazskaya Village.

"Thanks to CPC's support, the number of mobile technoparks in the region increased from four to nine. They are extremely in demand", Vice-Governor of the Krasnodar Krai Anna Minkova noted



at the ceremony of handing over the special transport. "Now even more children will be able to get involved in science and receive additional education in the most remote villages and small towns – the new Quantoriums will cover about 5 thousand schoolchildren in a year".

New mobile technoparks are equipped with 3D printers, milling machines, laser multifunctional devices and high-performance laptops for teaching schoolchildren in four areas: "Industrial Robotics / Industrial Design", "Geoinformation Technologies / Aerotechnologies",

18,4
THOUSAND CHILDREN

"Virtual and Augmented Reality / Information Technologies", "High-tech".

"Thanks to the "Education" national project, scientific and technical creativity has now become available to every schoolchild", says First Deputy Minister of Education, Science and Youth Policy of the Krasnodar Krai Sergey Pronko. "Mobile children's technoparks

are visiting rural schools; children from small towns and villages can study programming, robotics, drone operation, 3D technologies, virtual and augmented reality with experienced teachers".

In the Korenovsky district, the project of mobile Quantoriums started on February 1, 2024. The target audience is pupils of grades 5-8, about 800 people in total. By the end of the school year, with a 36-hour Hi-Tech program, it is planned to go around school No. 4 in the village of Razdolnaya and schools No. 5 and No. 25 in the village of Platnirovskaya. These schools

IN 96 SCHOOLS WERE
TRAINED ON THE
BASIS OF MOBILE
QUANTORIUMS IN THE
KRASNODAR KRAI

recruited two groups of children of different ages (12 students each). Training takes place in session format outside of school hours (two weeks, from Monday to Friday from 14:30 to 17:40).

In the new 2024/25 academic year, the course program is planned to be expanded to 72 hours while maintaining two different age groups in each educational institution.



MOBILE TECHNOPARKS ARE EQUIPPED WITH 3D PRINTERS, MILLING MACHINES, LASER MULTIFUNCTIONAL DEVICES AND LAPTOPS

The planned coverage will increase to ten rural schools in the region with weekly visits throughout the school year.

"In our opinion, this project creates students' interest in engineering professions, helps to identify and develop talented children in the field of technical creativity", says Alexander Mishchenko, director of the Municipal autonomous non-profit institution of additional education "House of artistic creativity" of the Korenovsky

district. "In turn, the development of creative abilities leads to the expansion of students' horizons, which helps in their professional orientation".

In March 2024, a report on the visit of the mobile Quantorium to school No. 36 of the Armyansky village, Krymsky district, Krasnodar Territory, was published by a number of media outlets.

"Quantorium comes to our school on a regular basis twice a week", notes Nadezhda Romanova, acting

director of Secondary School No. 36. "During classes, students become familiar with the principles of website construction, computer game development, and the process of creating a three-dimensional model of an object. Classes conducted by mentors provide an opportunity not only for children, but also for school teachers to get acquainted with innovative technologies and high-tech equipment, as well as modern approaches to organizing the educational process".

"Programming, 3D modeling – they don't teach all this in school, but it's so interesting!", Feodosia Kushchidi, a fifth-grader from school No. 36, shares her impressions. "We look forward to each visit of Quantorium as if it were a holiday and we go out to greet it with the whole school. Everyone in our group understands that the classes are not only interesting, but also useful, as they help us to learn in-demand professions".

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SPRING MARATHON

IT'S STILL SPRING, BUT THE OPENING OF THE SWIMMING SEASON IS JUST AROUND THE CORNER. IT'S TIME FOR SWIMMERS TO MAKE PLANS WITH THE OFFICIAL SWIM SCHEDULE IN MIND

My path to cyclic sports began in 2016 with a colleague's story about his climb to Elbrus. I was extremely impressed by him then, and I realized that I also wanted to try to climb the highest point in Europe. At the first opportunity, I shared my thoughts with my friends, and we decided that we would go.

A year was spent purchasing equipment, watching hundreds of videos online, planning and sports training, which seemed sufficient to us. In June 2017, my friends and I tried to climb Elbrus from the north side (this is a less crowded and more difficult option), but bad weather and insufficient preparation did not allow us to do this. Mountains are a great examiner! They showed us in a very accessible way, openly and impartially, what we are capable of.

Upon returning from the Caucasus, the goal for the next season was set — Mount Kazbek. I took a few running workouts and a month later I ran my first five kilometers. The whole year was entirely devoted to independent running training. As a result, in June 2018 we climbed Kazbek without much incident, and in September I ran my first marathon (42.2 km).

After running for two more years and running my second marathon, I was faced with a problem that can be described in three words: "What's

next?" I didn't want to run "for health"; the goal of improving my marathon time didn't inspire me, and training for ultramarathons (50 km or more) required much more time than I was willing to devote.

After some thought, I decided to try swimming. The experience of climbing and running on my own showed the importance of having a Mentor and a Goal, so I went to a swim school and bought several slots for the 2021 summer swims. But now we are not talking about them, but about 2023. It turned out to be a busy race, and then I decided to master the five-kilometer distance. To do this, I bought slots for four summer swims at once, and then for another one in October.

LAKE PLESHCHEYEVO, JUNE 25

The famous almost circular reservoir, on the banks of which the city of Pereslavl-Zalessky appeared, is located 140 km from Moscow. There was no 5 km distance on this lake, but there was a 7 km distance. When choosing a swim, I read reviews about the camps that are held on Lake Pleshcheyevo before the swim. They praised this location for its shallow depth and the ability to always stand up and catch your breath. I decided that 7 km at a pace of 20 min/km (total 2 hours 20 min) with the opportunity to rest is an

excellent option to try out a long distance, so that in the future I can swim 5 km distances without fear.

My friends and I found out about my misconception at the start. The organizer told us that the lake is shallow only for the first 100 meters, until the middle of the reservoir a counter wave awaits us, and the water temperature in the places where the springs emerge will drop to 16–18 degrees. I swam half the distance in freestyle and the other half in breaststroke. The result was 3:20 (28.5 min/km), exactly an hour more than planned. For me, the swim was comfortable, thanks to two gels and the switch to breaststroke.

When I ran into the finish arch, my friend Vitaliy came out to meet me (he swam with a result of 2:52) and congratulated me on completing the swim. I was quite surprised that my second friend Pasha had not yet arrived. And when I picked up the phone, I saw hundreds of messages from his wife Lena, to whom he promised that we would handle it in two to two and a half hours. As a result, Pavel finished exactly half an hour after me. His watch showed that he had swam 11 km. We are still at a loss to guess where he found them. Pasha pretty much scared us all and himself with his result, I even remembered the epic that Lake Pleshcheyevo is unswimmable.

SELIGER, JULY 1

The dream of swimming across Lake Seliger attracted me for a long time, the only thing stopping me was the long road. But last year I got the hang of navigating the M4 highway, going twice to the sea and back, so the distance of more than 300 km was no longer so scary.

The swim through Seliger has its own unique atmosphere. Hundreds of people with tents come to the lake for several days, sing songs around the fire with a guitar, play the drums, and cook on primus stoves. How do you like the fact that two ships were sent for us to take us to the start to the walls of the monastery of the Stolobny Island? My "inner child" squealed with delight.

On Seliger the weather turned out to be better, although there were still waves. This time I swam the crawl, but refused to eat. In the second half, I had difficulty raising my arms and eventually swam with a result of 2 hours 37 minutes (31.4 min/km). I was glad that I didn't switch to breaststroke, but I was absolutely unhappy with the time. I even began to worry that I was swimming 5 km distances at 25–30 min/km and that I would not be able to move to longer distances.

VOLGA, JULY 23

The competition with about two thousand participants took place in Nizhny Novgorod, 400 km from Moscow. The 5 km swim is interesting because first you swim across the Volga from the right orographic bank to the



left, there you swim through the arch and then swim together with the participants for three kilometers across the place where the Oka flows into the Volga, actually across two rivers to the walls of the Nizhny Novgorod Kremlin with the finish on the pontoon at the boat «Hero» under the Chkalov staircase. The current in the Volga and Oka is quite strong, so you need to choose the right landmarks on the opposite bank so as not to run aground and miss the finish line.

This was my second swim across the Volga (in 2022 I swam 3 km), so, based on my experience, I optimized the route in the second half of the journey and happily swam the distance without unnecessary deviations from the optimal path. During the swim,

I found a booklet with Desnogorsk in the starter pack. At first I threw it out, but when I returned to Moscow and read a little about the swim, I couldn't resist and bought a slot for the 5 km distance.

PESTOVSKOE RESERVOIR, AUGUST 13

It was the last swim of last summer, perhaps the closest location among those mentioned — only 25 km from MKAD. Keeping Seliger in mind, I took two gels for the swim. The weather was kind to us, and the swim took place in a lagoon, closed on three sides from waves and wind. As a result, I swam in a record time of 1 hour 47 minutes (21.4 min/km). I was extremely pleased with this result and how the swim went. Everything went smoothly and clearly. I realized that I need to eat gels and everything will be fine.

DESNOGORSK. X WATERS NUCLEAR 2023, OCTOBER 7

And then October came, it's time for Desnogorsk. From Moscow to this city in the Smolensk region is 330 km. The Desnogorsk Reservoir is known for the discharge of water that cools the reactors of the Smolensk Nuclear Power Plant into it, due to which the water temperature in the reservoir in October





I could not adjust my wetsuit before entering the water and I think that this was the reason for the “heaviness” of my hands during the first 2 km. This was a little frustrating, but I reassured myself that the distance was long and I would still have time to “warm up.” The start took place in unexpectedly warm water (it felt like 28 degrees), after the cold outside, swimming in it was bliss.

Immediately after the start we passed under the bridge. According to the organizers, the speed of the water underneath is 20–30 km per hour. I swam a few meters on my back to feel the moment. That was great. Then we passed the first orange buoy, the next one was not visible. I don’t know what the leaders were focusing on; personally, I just floated behind them, behind this string of orange dots moving forward, melting away in the fog. A buoy floated towards us, it appeared out of the fog, like a ghost ship from pirate films. At some point, the fog was replaced by rain and a wave in the back, strong as a sea surf. I had just adjusted to the wave when the rain intensified, and the waves came from all sides, some kind of trash began.

My pace slowed to a crawl as I paddled forward, wondering where the line between an emotionally charged life and inadequacy lay. Along the way, I tried to find the catamaran, near which it was previously planned to eat the gel. There was no catamaran, but there were some boats.

The rain and turbulence ended as suddenly as they began, and with them a warm patch of water was left behind. The temperature dropped to 16–17 degrees. My head began to freeze, as did my palms and feet. The algae added to the discomfort. I started to get upset. It was still +5°C outside. The thought came to me to get out of this mess, but I understood that if I stopped, I would freeze before the rescuers noticed me. Therefore, I decided not to give in to weakness and row forward. Somewhere ahead there was a catamaran, yachts, and behind them a turn to the right towards

the center of the current, in which, as I hoped, the temperature would be higher.

Finally, I saw a catamaran and swam onto it. Row, periodically looking forward for orientation. The catamaran was anchored very close to the shore, I rowed towards it and could not understand how I would swim there. At some point, I looked around and realized that about 150 meters from me to the right there was a boat and all the swimmers were going somewhere behind it. I was obviously swimming in the wrong direction! I followed them, a section of open water began, strong waves began to break on the right. I ate the gel and swam through the waves. On the right there was a view of the pipes of the Smolensk NPP. Gray sky, fog, nuclear plant – the landscapes were reminiscent of the game Stalker. I swam, I was constantly covered with waves and periodically with emotions.

Ahead, in the middle of the river, I saw a landmark yacht. Finally I realized where I was. It turned out that there was only a kilometer and a half left



rounded before the finish, are not, as usual, 30–50 meters from the shore, but three times further! And I urgently need to take it to the right. It’s good that I got a good lead over the guys who were sailing on the right course, so my “loops” didn’t affect my place in the standings. I made a final acceleration from the buoys and, satisfied, ran ashore. I saw my wife there and rushed into her arms, laughing and shouting: “I’m alive!»

took place in the struggle between these two emotions.

Another difference was the need to navigate in space. It took two years to learn to swim strictly straight and with a certain frequency to inhale not to the side, but forward, in order to determine the direction.

In the first and second years I swam no more than two nautical miles (3.7 km), so there was no need for nutrition during the swim. At a distance of 5 km, it already makes sense to add nutrition, which is an integral part of swims. It’s as important as training and recovery.

Within 1–2 hours (depending on the person’s preparedness), his body “eats” all the glycogen (energy reserve) that is in the muscles, resulting in weakness and dizziness. To prevent this, the athlete eats during the swim. Energy gels are excellent for distances up to 10 km – this is a gel-like liquid that consists of several types of sugars (regular sugar, glucose, fructose, maltodextrin, etc.), which allows the gel to gradually break down in the body, distributing additional energy over time. Since it is rarely possible to eat immediately before a swim, usually one gel is eaten at the start, then, after an hour of swimming, another one is eaten, and then one gel per half hour after that. In this mode, an athlete can swim for a very long time. ●

“THIS SWIM, TAKING INTO ACCOUNT THE WEATHER CONDITIONS, IS ELBRUS, AMONG ALL THE 5 KM DISTANCES IN WHICH I TOOK PART”

to the finish. I got to the yacht, ate the second gel and swam to the finish line. The water finally calmed down, my shoulders “released,” and I was able to overtake about seven swimmers who, apparently, were swimming without food. On the way to the finish line, a doubt crept in: why did all the other participants go to the right?

On my next breath, I looked around and saw another swimmer ahead. I decided that since I was not alone, then everything was right, that guy and I were geniuses, and the rest were simply unlucky. About 200 meters before the finish I realized that the situation was the opposite. It turned out that the finishing buoys, which had to be

GELS AND LIFE HACKS

What techniques help a swimmer get comfortable after swimming in the “field conditions” of a river, lake, or sea? My first swims were very emotional. On the one hand, when I ran into the water and began to swim in the midst of swimmers, an ancient and very strong feeling of harmony and unity with the team emerged from the depths of the subconscious. Perhaps this is how dolphins feel in a pack or horses in a herd. On the other hand, unlike a pool with clear water, the dark and muddy depths of the reservoirs near Moscow inspired horror. The entire swim usually

is 20–22°C. It sounds scary, but given the closed-cycle cooling technology, the water discharged into the reservoir does not interact directly with the reactor and is absolutely safe. This confirms the constant monitoring of radiation in the region, according to which the level of radiation in Desnogorsk is lower than in Moscow. Now, looking back, I can say with confidence that this swim, taking into account the weather conditions, is Elbrus, among all the 5 km distances in which I took part. The organizers – X Waters and Smolensk NPP – promised a golden autumn, but in fact we were met with a gray one.

The evening before the swim, the organizers posted a video in the chat in which they reported that due to weather conditions, all distances were moved from the Desnogorsk reservoir to the mouth of the Selchanka River. In the morning, when I arrived to pick up my starter pack, Desnogorsk

beach greeted me with rain, wind and a temperature of +5°C. A dense fog rose from the water throughout the reservoir, and my hands froze instantly while trying to capture it on camera. It was difficult to call it motivation, but the motto “don’t panic just swim” on the X Waters volunteers’ T-shirts added confidence, and I decided not to worry about circumstances that I can’t influence.

The swim itself was extremely varied. According to the briefing, the route looked like this: several buoys – a catamaran – two yachts (after the second turn) – we cross the river along wide water – we go around the third yacht and swim upstream to the hedgehog-shaped buoys – we swim between the hedgehogs and “cut” on finish.

Due to the fact that the organizers for some reason postponed the start by 20 minutes and the terrible cold,



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EVOLUTION OF TEASAURS

WE CONTINUE THE TOPIC STARTED IN THE LAST ISSUE AND VIRTUALLY INEXHAUSTIBLE. FROM TYPES OF TEA AND METHODS OF PREPARING IT – TO TEA TOURS AND “RELATED” DRINKS

The popularity of tea has led to the fact that this word began to be used not only to designate a drink from *Camellia chinensis*, but also other drinks made from herbs, plants and spices. Since ancient times, people have used infusions of various parts of plants. Gastrohistorian William Pokhlebkin points out that before

and during the spread of tea in Russia, peasants traditionally used infusions and decoctions based on ivan-tea (fireweed), leaves of fruit trees and bushes, bark and leaves of oak, birch, ash and others, including spices. Interesting fact: a police decree of 1840 prohibited the collection and sale of fireweed, the reason for this ban was the massive

counterfeiting of real tea with dried fireweed.

I love the taste and aroma of fireweed and enjoy using plain dried or fermented leaves to add variety to tea drinking. I definitely keep in stock aromatic herbs and inflorescences of chamomile, mint, lemon balm, oregano, Greek mountain tea, thyme and others. As well as raspberry, currant



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various delicacies; later this tradition transferred to tea drinking.

Another “relative” is Indian Masala tea, which has become widespread today thanks to the Russian winter cold along with the popularity of Indian fast food cafes. Masala is a warming



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leaves, rose hips, and viburnum. Most of these plants are grown in dachas or collected in meadows, and the culture of consuming drinks made from herbal tea and berries is familiar to us from childhood.

It is interesting that samovars were originally used to prepare another traditional national drink – sbiten, which was widespread before tea. It was prepared on the basis of honey, molasses, herbs and spices and was traditionally consumed with



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drink made from milk, loose leaf tea and a mixture of cardamom, cinnamon, ginger, fennel seeds, black pepper and cloves. The list of spices may vary, but the main ones are cardamom and cloves.

A VARIETY OF TEA DRINKS ENRICHES THE TEA EXPERIENCE AND AWAKENS INTEREST IN DIFFERENT CULTURAL TRADITIONS

Noteworthy is the tradition of drinking mate “tea,” which is prepared from Paraguayan holly, which grows in Latin America. The ritual of preparing and consuming mate involves a vessel made of dried pumpkin – a calabash – as well as a metal or wooden bombilla tube. This tea tradition helps to radically rethink the process of tea drinking, reducing the procedure to a minimum set of objects and actions, making it as fast and portable as possible. It turns out like a “tea party in reverse”: the tea leaves are placed in a calabash mug, and you drink the drink directly from there through a bombilla. A strainer is attached to it to filter out the tea leaves.

The variety of tea drinks and traditions enriches the individual tea experience and awakens interest in getting to know different cultural traditions and history. I would also like to mention the existence of a variety of tourist trips – tea tours to Japan, China, Vietnam, Sri Lanka, Turkey and other “tea countries”. In the process, you can not only enjoy the taste of fresh tea, take part in the ceremony, but admire the view of the tea plantations. And considering that tea most often grows in the mountains, you can combine the pleasure with full-fledged mountain hiking.



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BENJAMIN PATERSEN. «THE SALESMAN OF SBITNYA.»

AUTHOR
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LEGEND OR MYTH?

HAVING READ WITH INTEREST THE TEA
“EDUCATIONAL PROGRAM” OF THE LAST ISSUE
AND HAVING LEARNED A LOT OF USEFUL
THINGS FROM IT, THE EDITORS COULD NOT
HELP BUT PASS BY ONE INTERESTING VARIETY
OF TEA, ESPECIALLY POPULAR TODAY. LET’S
TALK ABOUT GABA TEA

The Land of the Rising Sun not only creatively rethought the tea ceremony of the Celestial Empire, but also discovered a new technology for the production of this ancient and popular drink. In 1987, Tojiro Tsushida, a professor at the National Research Institute of Tea (NARO), and his colleagues published the result of three years of research in a Japanese scientific agrochemical journal - an article on the technology for producing tea with a high content of gamma-aminobutyric acid. This acid, in English called GABA (Gamma AminoButyric Acid), is the most important inhibitory mediator of the human central nervous system, that is, a substance that protects the nervous system from overexcitation, ensuring homeostatic balance of the body with the environment.

The world scientific community considers GABA-acid to be practically a panacea for dementia and migraines, a means of effectively combating depression and insomnia. The same community recognizes that the absorption of GABA by

the “control center”, that is, the brain, impedes the blood-brain barrier, which all vertebrates are equipped with and thanks to which the brain is reliably protected from all viruses and toxins entering the blood. However, recent studies suggest that the effect of GABA on the intestinal microbiota stimulates the synthesis of the same acid by brain cells. Simply put, if the way to a man’s heart is through his stomach, then the secrets of his mental health are hidden somewhere in the same place.

Experimentally, Tsushida-san found out that if tea is fermented without access to oxygen, then all the glutamic acid present in the leaf is converted into gamma-aminobutyric acid. This happens within 6–10 hours in an anaerobic environment, where oxygen in the air is replaced by nitrogen. The resulting tea (as evidenced by both scientists

and volunteers) has a beneficial effect on the nervous system, mood, and mental activity.

Initially, the raw material for the production of gaba tea was green tea, but later the other varieties were technologically mastered. The center of production in the 1990s was Alishan Province in Taiwan. In China, at first there was an arrogant opinion that all the magical properties of gabaron (another name for GABA tea) were contained in white tea without any anaerobic processing. But with the change of centuries, gaba began to be produced in the Celestial Empire as well.

In accordance with the Chinese tradition of marking the depth of fermentation and the degree of roasting of tea with any of the precious stones, gaba is divided into opal, amber, ruby and diamond. The name also reflects the color, taste and value of the infusion. In Moscow, the “opal” price threshold is 600 rubles per 100 g, “ruby” - 2 thousand. All this is imported; with the abundance of Russian tea brands (“Akhmad”, “Richard” and

the like), no one has yet dared to develop GABA technology for tea itself. They do, but... from fireweed.

An experiment carried out with ruby gaba in a Moscow office by a group of volunteer enthusiasts (using technologies described in detail by a colleague in the last issue), unfortunately, did not reveal an exacerbation of mental abilities. But my sleep has clearly improved, and with it the homeostatic balance with the world. And of course, it’s delicious. In order not to arouse suspicion of bias and not to interrupt the emerging traditions of tea analytics, we will end with a proverb, this time from the Chinese “Tea and Chan (Zen) have the same taste”.





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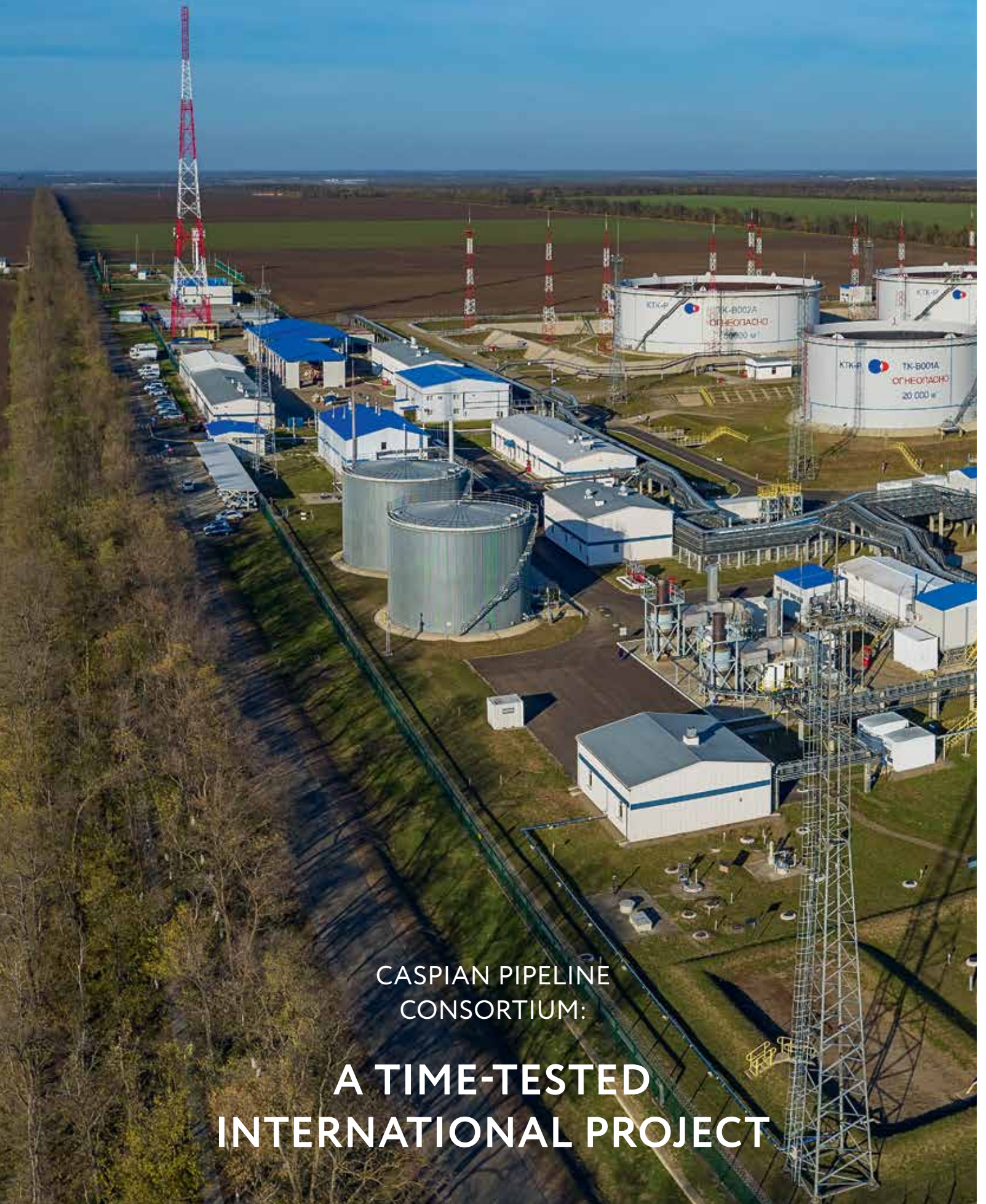
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