PANORAMA

CASPIAN PIPELINE CONSORTIUM

CASPIAN
PIPELINE
CONSORTIUM

CORPORATE MAGAZINE
No 3 (50) SEPTEMBER 2025

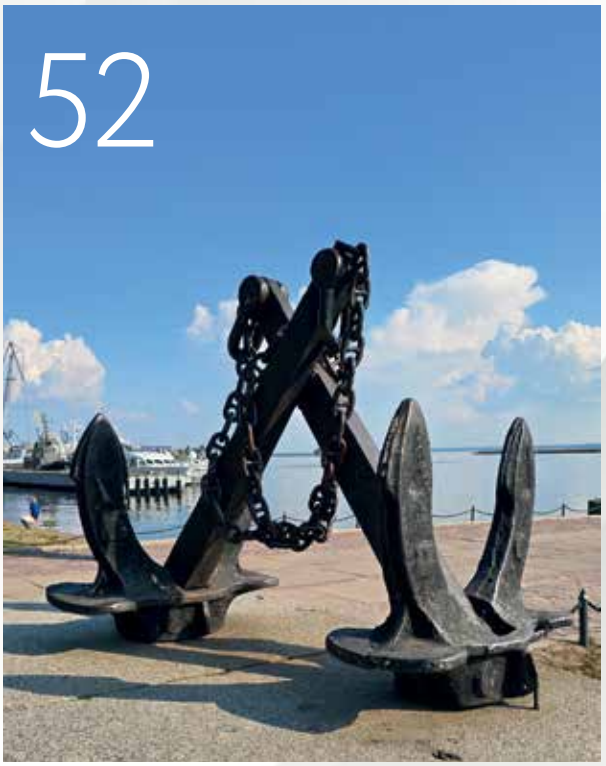
ISSUE'S FOCUS

THE FUTURE OF THE SYSTEM IS TO INCREASE ITS RELIABILITY

CONTENT

10

32



52

BK_graphic/Shutterstock/FOTODOM

DEAR COLLEAGUES AND FRIENDS!

Congratulations on Oil and Gas Industry Workers Day!

Currently, the Caspian Pipeline Consortium ships over six million tons of oil per month. This is an impressive figure for the global energy sector, but oil is not just cargo turnover, fuel, and materials that surround us in everyday life. Oil is national economic stability and energy security, taxes, social programs, and charitable projects. When pumping and shipping volumes grow, not only dividends grow, but there are more kindergartens, schools, clinics, and, accordingly, more healthy and happy people in Russia and Kazakhstan. And these volumes are growing, so in the first half of 2025, the amount of CPC blend oil shipped to world markets amounted to 36.3 million tons, which is 8.5% higher than the same figure for 2024.

Despite the challenges of our time, and the current year has not been an exception, the Consortium demonstrates stable sustainable development in the entire range of its work: from production activities to environmental social and educational projects. Along with the figures for shipment and pumping, the growth of indicators in the field of labor protection, industrial safety and environmental protection is important. The first half of 2025 is marked by 28.7 million man-hours without cases of industrial injuries and 64.1 million km traveled by the corporate vehicle fleet without accidents. This year, we combined the meeting of the leaders of the Safe Work Culture with the CPC Safety Day in Elista — this initiative is focused on mass participation and effectiveness in forming a conscious commitment to such company priorities as the life and health of employees.

We want to see our future — children and youth — as creatively gifted and deservedly in demand in art and culture, and we are pleased to note the annual growth of interest in our competition “CPC For Talented Children”. We also see the younger generation as a strategically important personnel reserve, consistently strengthening the educational base of such a leading industry university as Gubkin University.

This issue of the magazine is a jubilee, the fiftieth, and leafing through the entire collection makes it clear what a vast historical journey the Consortium has traveled over this time. Colleagues, you have created this history with your own hands, and on this most important day for all pipeline workers, I want to wish for those hands to remain just as strong and professionally precise. Health and happiness to you and your families, success in every endeavor, and a joyful holiday spirit!

N.N. Gorban
General Director
Caspian Pipeline Consortium

CPC WELCOMES GUESTS

ON JUNE 10, 2025, SOCHI HOSTED THE 25TH MEETING OF THE BOARD WITH THE AUTHORITY OF THE ASSEMBLY OF THE INTERNATIONAL ASSOCIATION OF OIL TRANSPORTERS (IAOT). FOR THE FIRST TIME SINCE ITS ADMISSION TO FULL MEMBERSHIP OF THE ORGANIZATION, THE CASPIAN PIPELINE CONSORTIUM ACTED AS THE HOST OF THE REPRESENTATIVE EVENT

In addition to CPC, the meeting in Sochi was attended by delegations from Transneft PJSC, Transnafta Pancevo JSC (Serbia), KazTransOil JSC, Gomeltransneft Druzhba OJSC (Belarus), MOL JSC (Hungary), and the China National Petroleum Corporation (CNPC), represented by its subsidiary Sino Pipeline International.

At the meeting chaired by the CPC General Director Nikolay Gorban, issues of the association's activities in 2024–25 were considered, and the financial and audit reports were approved. The participants of the event were presented with information on the activities of the Standing Expert Group "Efficient, Reliable and Safe Operation of Trunk Pipeline Systems" and on the results of the session of the IAOT Center for the Development of Professional Skills.

The Association members discussed the organization of the International Professional Skills Contest "Best in Profession" and supported the establishment of a fifth Standing Expert Group (SEG) on Energy Security and Risk Management. Let us recall

Photo: PJSC «Transneft»

that the Association already has existing SEGs on energy efficiency, supply, legal issues, as well as the SEG "Efficient, Reliable and Safe Operation of Trunk Pipeline Systems".

The elevation of CPC's status in April 2024 from observer to member of the IAOT has expanded working communications, qualitatively improved the exchange of experience and best practices, and created broad opportunities for organizing a comprehensive and productive technological dialogue.

The IAOT Board unanimously supported CPC's initiative to establish, within the Association, an industry-wide discussion platform for sharing experience and best practices in the field of HSE. Currently, the CPC has developed and continues to develop effective practices of the Safe Work Culture and its integral part – the Culture of Leadership in Labor Protection and Industrial Safety – CPC Life Saving Rules 12+1 and other measures to achieve zero injury rates are applied. These measures and practices also apply to the Consortium's contractors. The provisions of the HSE Strategic Plan for 2025–2027


Photo: PJSC «Transneft»

are consistently implemented. The effectiveness of this activity is evidenced by statistics: in the first quarter of this year, almost 3.5 million man-hours were worked in the CPC (including contractors) without injuries and incidents, while the mileage of vehicles without accidents amounted to about 8.2 million km.

"We are presenting the creation of a discussion platform for the development of the Safe Work Culture", noted CPC General Director Nikolay Gorban during the meeting. This is a long-term program in which we have reached a proactive level and are ready to share our experience with colleagues in the Association. Industrial safety is a significant asset for the company, which also brings financial benefits: the fewer incidents and accidents, the fewer losses. It is necessary to create a discussion platform within the Association in order to develop this topic further.


Photo: PJSC «Transneft»

FOR VALOR, COURAGE AND BRAVERY

WE CONTINUE THE SERIES OF PUBLICATIONS ABOUT THE COMPANY'S EMPLOYEES WHO WERE AWARDED DURING THEIR PARTICIPATION IN THE SPECIAL MILITARY OPERATION. MEDALS OF THE RUSSIAN FEDERATION, DEPARTMENTAL MEDALS OF THE MINISTRY OF DEFENSE OF THE RUSSIAN FEDERATION AND CERTIFICATES OF MILITARY UNITS WERE AWARDED TO SPECIALIST IN PHYSICAL SECURITY OF THE WESTERN REGION OF CPC-R ALEXEY STEPANOV AND PS OPERATOR OF THE CPC MARINE TERMINAL OLEG GOLOK

By the Decree of the President of the Russian Federation Vladimir Vladimirovich Putin dated December 4, 2024, Alexey Stepanov, Specialist in physical security of the Corporate Security Division of the CPC Western Region, was awarded the Russian Federation Medal "For Courage". Previously, he was also awarded the medals of the Ministry of Defense of the Russian Federation "For Military Valor" of the 1st degree and "Participant in the Special Military Operation".

The professional career of Alexey Vladimirovich in the oil and gas industry has been connected with the Caspian Pipeline Consortium for more than five years. From January 2019 to November 2020, he provided services on ensuring the security of CPC-R facilities under a civil law contract. In 2020, Alexey Stepanov was hired by CPC as a physical security specialist.

Elena Golovkova/Photobank Lori

In 2020–2022, Alexey Stepanov participated in ensuring the security of the facilities and the linear part of the Tengiz-Novorossiysk pipeline system, as well as the personnel of CPC Western Region. On a regular basis, he checked the provision of checkpoint and internal facility regime, supervised the work of the contractor providing physical protection of CPC-R facilities.

A professional approach to accomplishing assigned tasks allowed Alexey Vladimirovich to organize their implementation with the greatest efficiency, quality and completeness.

In order to prevent possible acts of illegal interference at the facilities of CPC-R located in the Krasnodar Krai, Alexey Stepanov carried out necessary coordination with law enforcement agencies, as a result of which it was possible to identify the leaders of an organized criminal group involved in committing several unauthorized taps into the CPC pipeline in 2019–2022. Subsequently, law enforcement officers detained the leaders of the organized criminal group.

FotograFF/Photobank Lori

In 2022, Alexey Vladimirovich took an active part in the work on categorizing, examining and updating the safety data sheets of the Western Region PSs, provided comprehensive assistance to members of interdepartmental commissions, including representatives of the Russian National Guard, the Ministry of Energy, the FSS, the Ministry of Fuel and Energy, EMERCOM and local administrations of the Krasnodar Krai. During the events, he paid increased attention to identifying critical elements of stations, their vulnerability, measures taken for physical protection and anti-terrorist security of facilities, followed by drawing up and signing relevant acts and safety data sheets.

In September 2022, Alexey Stepanov was called up for military service upon mobilization. He was awarded medals for taking enemy positions, preparing combat and rifle cells for defense, and combat training of personnel. Currently, Aleksey Vladimirovich continues to serve in the Special Military Operation zone.

A professional in every matter PS operator of the CPC Marine Terminal Oleg Golok was awarded the Russian Federation Medal "For Courage" by the decree of the President of the Russian Federation Vladimir Vladimirovich Putin dated February 25, 2025. A native of Novorossiysk, Oleg Aleksandrovich graduated from the Admiral F.F. Ushakov State Maritime University with a degree in "Operation of Port and Terminal Cargo-Handling Equipment". He has 16 years of experience in the oil and gas industry. Oleg Golok worked for about four years at STARSTROI LLC, and in November 2012 he joined the Caspian Pipeline Consortium as an operator of the process units of the Marine Terminal.

In September 2015, Oleg Aleksandrovich was appointed as the PS operator of the Marine Terminal. During the implementation of the Debottlenecking Program at the Marine Terminal in 2023–2024, he participated in the construction of new oil metering units and dismantling of old ones, installation of a new multi-purpose tank, modernization of the evacuation system, cutting in condensers into offshore pipelines leading to the single-point moorings, installation of valves of the Surge Relief System on the Tank Farm receiving chamber and other works.

Oleg Golok also developed process flow diagrams and adjusted new equipment.

Oleg Aleksandrovich's competence, experience and high professionalism made it possible to carry out dismantling and commissioning work within the framework of the Debottlenecking Program in the shortest possible time and subsequently contributed to ensuring the trouble-free operation of the process equipment of the Caspian Pipeline Consortium Marine Terminal.

Elena Golovkova/Photobank Lori

In September 2024, Oleg Golok signed a contract for voluntary assistance in the performance of tasks assigned to the Armed Forces of the Russian Federation, and is currently serving in the Special Military Operation. During the operation, he demonstrated courage, bravery, and heroism, and was awarded the Medal "For Courage" and the Certificate of Commendation of the military unit command for his great personal contribution to solving combat missions, high professionalism, and exemplary performance of his duties.

In 2025, Oleg Aleksandrovich's conscientious work and his contribution to the development of the fuel and energy complex were awarded the Certificate of Honor of the Ministry of Energy of the Russian Federation.

AUTHOR
PAVEL KRETOV

SHARED VALUES OF BUSINESS AND SOCIETY

THE XXVIII ST. PETERSBURG INTERNATIONAL ECONOMIC FORUM WAS HELD IN JUNE. SINCE 2017, THE CPC DELEGATION HAS REGULARLY PARTICIPATED IN ONE OF THE COUNTRY'S LARGEST ECONOMIC EVENTS

This year, SPIEF was attended by more than 24 thousand participants from 144 countries. The number of businessmen who came to St. Petersburg during these days, both Russian and foreign, was about 9 thousand.

The forum was held under the slogan "Shared Values: the Foundation of Growth in a Multipolar World". The participants of the event noted the importance of real sovereignty – political, economic, technological, as well as value-cultural. According to experts, it is these principles that allow countries to go through difficult periods of transformation with minimal costs. The total number of events – within the framework of the main business program and at industry and territorial sites – amounted to more than 370, with more than 1.3 thousand speakers and experts speaking at them.

The business program sessions were organized in five areas: "The Global Economy: A New Platform for Growth", "Russian Economy: New Quality of Growth", "The Individual in a New World". "Living Environment", and "Technology: Pursuit of Leadership".

The SPIEF agenda paid much attention to the growing role of the BRICS interstate association in the global economy. Today, BRICS is 45% of the world's population, 26% of the planet's territory and already 37% of global GDP at purchasing power parity, which means that the "Global South" is becoming a new point of support.

The plenary session was attended by the President of the Russian Federation Vladimir Putin, the President of the Republic of Indonesia Prabowo Subianto, representative of the King of Bahrain Sheikh Nasser bin Hamad Al Khalifa, Vice Premier of the State Council of China Ding Xuexiang and Vice President of South Africa Paul Mashatile.

Vladimir Putin named the most important tasks facing the Russian economy:

"The Russian economy must become more technologically advanced, and this is not a wish, this is an objective requirement of today and tomorrow, a challenge that must be met... We must fully deploy a new stage of technological development of the country. The key instrument here is called upon to be national projects to ensure technological leadership. They were launched this year, and my colleagues and I agreed that the activities of these national projects will be updated and expanded. By 2030, the combined expenditure of the state and business on research and development in Russia must grow to at least 2% of GDP".

As always, energy was a big topic at the forum. Today, the global energy landscape is changing under the influence of climate commitments, technological innovations and geopolitical changes. Despite the development of nuclear energy and renewable energy sources, traditional energy resources remain the foundation of global energy security.

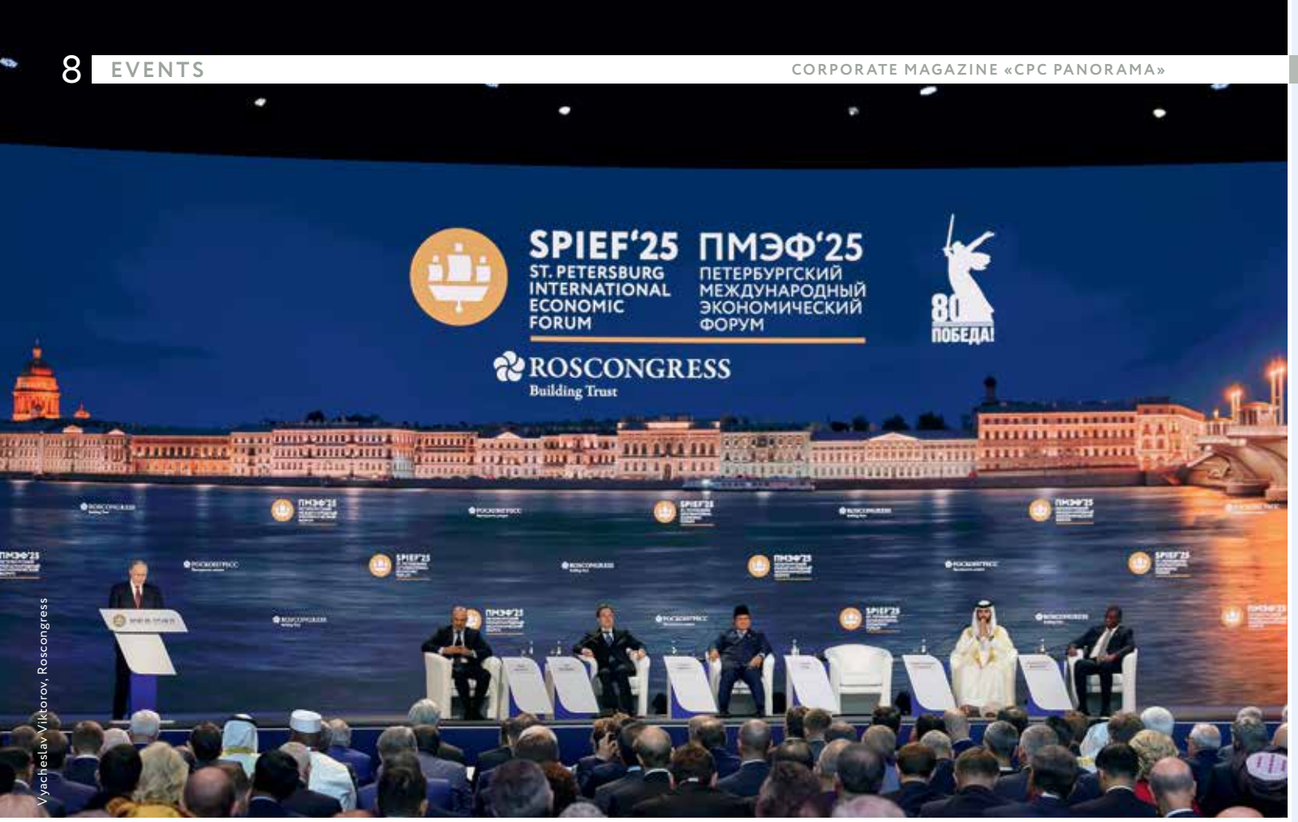
SPIEF-2025 WAS ATTENDED BY MORE THAN **24** THOUSAND PARTICIPANTS FROM 144 COUNTRIES

"Renewable energy sources should exist, and they will exist, but for now their share in the energy balance, in the global fuel and energy balance, is only 2.5%. Their share will grow, but renewables must take their place. In any case, it is impossible to ensure the fuel and energy balance without hydrocarbons", emphasized Deputy Chairman of the Government of the Russian Federation Alexander Novak.

In the energy sector, as well as in the chemical industry, mechanical engineering and digital solutions, international partnership plays a key role – this was discussed at the panel session "Russia – Kazakhstan". Russian investments in Kazakhstan have grown to a record $ 4 billion, demonstrating the success of joint projects and the strengthening of inter-industry contacts within the Eurasian Economic Union.

"The connections we are establishing today are not about immediate benefits, but about long-term mutual benefit. Kazakhstan and Russia are reliable partners", noted Ambassador Extraordinary and Plenipotentiary of the Republic of Kazakhstan to the Russian Federation Dauren Abayev. "The Caspian Pipeline Consortium project is undoubtedly an example of such successful cooperation".

Formation of a new approach to improving the quality of life in territorial entities became the topic of the session "Development of Russian regions: partnership of the state and business to achieve national goals". Today, big business



Vyacheslav Viktorov, Roscongress

and the state jointly implement projects of national importance, which contributes to economic growth and improvement of the quality of life. The introduction of flexible models of public-private partnership, including long-term social agreements, confirms the ability to scale up successful practices and strengthen the regional economy.

This year, 1,084 agreements were signed at the forum. Such documents regulate, among other things, the interaction of CPC with the administrations of the constituent entities of the Russian Federation, on whose territory the production facilities of the Tengiz-Novorossiysk oil pipeline are located. The current course of cooperation and long-term plans were discussed by CPC General Director Nikolay Gorban at the SPIEF with a number of heads of regions and municipal districts. Working meetings were held with the Governor of the Astrakhan oblast Igor Babushkin, the Head of the Republic of Kalmykia Batu Khasikov and the Head of the Municipal Formation of the City of Novorossiysk Andrey Kravchenko.

Cooperation between CPC and the Astrakhan oblast is carried out in all socially significant areas: healthcare, education, culture, children's sports, ecology, as well as the provision of targeted assistance to the most vulnerable groups of the population.

In 2024 alone, the volume of the social program of CPC-R JSC in the Astrakhan oblast amounted to more than 160 million rubles. Tax revenues from the Consortium to the consolidated budget of the Astrakhan oblast in 2024 exceeded 4.5 billion rubles. In the Republic of Kalmykia, these figures amounted to 157 million rubles and about 3.18 billion rubles, respectively. The heads of the company and the steppe region also discussed the organization of a major corporate event in Elista – CPC Safety Day, which is scheduled for August of this year.

In Novorossiysk last year, the volume of the social and charitable program of CPC-R amounted to about 198 million rubles. The largest project of this program today is the cultural and aesthetic center for children and youth being built in the village of Yuzhnaya Ozereyevka . The demand for this project was especially noted by Andrey Kravchenko. The parties discussed current issues of the construction of this facility, the work of the contractor for the construction, as well as the adjustment of the deadlines for the delivery of the facility.

During the meeting, the head of the Novorossiysk municipality highly appreciated the proactive work of the CPC in the field of environmental protection, in particular the development of a dialogue with the population and environmental activists of the city and coastal villages on issues of volatile organic compound emissions during the loading of oil onto tankers. Andrey Kravchenko emphasized that over 10 large industrial enterprises carry out production activities related to oil and oil products in the port of Novorossiysk, and the Consortium is a leader among them in terms of proactive environmental measures, such as reducing the speed of oil loading when adverse weather conditions occur, etc.

One of the main topics of SPIEF-2025 was the search for ways to solve the problem of personnel shortage. According to Deputy Minister of Science and Higher Education Dmitry Afanasyev, there is a need to strengthen the interaction between the Russian education system and business – and then in just a few years the supply of high-quality labor in the country will increase.

"Now it is important for the education system in Russia to build its work taking into account three main principles. The first is refocusing on the priority of technological development. The second is creating a unique system of interaction with industrial partners for each university. The third is planning educational programs in accordance with the needs of the labor market", Dmitry Afanasyev noted during the panel session "Cooperation of universities and industry to achieve the goals of technological leadership".

This year marks the 10th anniversary of the partnership between CPC and Gubkin University. Many of the university's graduates now work in the Consortium; the oil pipeline company widely uses the experience and research of one of the world's leading scientific schools in its production activities. During the meeting on the sidelines of the SPIEF, CPC General Director Nikolay Gorban and Gubkin University rector Viktor Martynov discussed new educational programs to improve the qualifications of the Caspian Pipeline Consortium's employees, as well as the university's facilities for which the oil pipeline company's charitable activities are most in demand.

PLENARY SESSION

Photo: Sergei Shinov

AUTHOR
ILYA ARKHIPOV

THE FUTURE OF THE SYSTEM IS TO INCREASE ITS RELIABILITY

INTERVIEW WITH CPC GENERAL DIRECTOR NIKOLAY GORBAN TO RUSSIAN AND FOREIGN MEDIA CORRESPONDENTS AT THE ST. PETERSBURG INTERNATIONAL ECONOMIC FORUM 2025

Nikolay Nikolaevich, Caspian Pipeline Consortium recently restored the Kropotkinskaya pump station, damaged in February by a Kyiv regime drone attack, to operation. What were the main difficulties in carrying out the repairs? Was it possible to quickly find all the necessary equipment?
The station was put into operation on May 23, 2025, and it operated in test mode after repairs from May 12. Restoration work at the Kropotkinskaya PS has been completed in full. The total time spent on restoration work was 2 months and 28 days (87 calendar days). In general, we quickly found all the necessary equipment including Russian-made equipment.

Did the foreign shareholders of the Consortium help with the repair of Kropotkinskaya and the supply of spare parts?
All shareholders provided us with advisory assistance. The very next day after the drone attack, representatives of the Republic of Kazakhstan from among the shareholders were at the Kropotkinskaya PS, a preliminary assessment of the damage was carried out, and measures were developed with the participation of shareholders to restore the pipeline's functionality and prevent negative consequences for production activities and the environment.

Also this spring, the Kavkazskaya pump station, which was supplying oil into the CPC system, was also attacked. Do you have any information about the timeframe for its restoration and the resumption of receiving oil from it into the system?
As you know, the Kavkazskaya station is not part of the CPC pipeline facilities. We received about 300 thousand tons from it monthly. There is information about the resumption of deliveries in the foreseeable future, but for exact timelines it is best to consult the station's owner.

What is the estimated amount of damage caused to CPC by the attacks on the system's facilities?
The preliminary damage estimate at the Kropotkinskaya PS is estimated at about 2.7 billion rubles. We still have work to do with the insurance company. Damage in terms of oil transportation can be discussed in connection with the increased costs of using the drag reducing agent, since we actively used it, and all the volumes that the shippers delivered to us were pumped to the Marine Terminal, except for those lost from the Kavkazskaya station.

Are there any plans to take measures to protect CPC facilities from similar attacks in the future, or does the Consortium's international status prevent this?
It is better to talk about such measures after the end of the Special Military Operation. We are interacting with the security forces of the Russian Federation on this issue.

It was previously reported that Kazakh diplomats were interacting with their Ukrainian counterparts on the issue of ensuring the security of the CPC system. Did you receive any security guarantees as a result of these meetings?
You heard the response from the Ministry of Foreign Affairs of the Republic of Kazakhstan: no reply has yet been received from the Ukrainian side. What guarantees can we talk about here? At the meetings of the Board of Directors, all shareholders expressed concern and noted the inadmissibility of terrorist attacks on civilian facilities. Let me remind you that the combat part of the drones was filled with striking elements. In addition to damaging the facility, it was apparently planned to destroy the personnel. Here, our services worked harmoniously and prevented the death of CPC workers.

Is there already an estimate of how much oil pumping has dropped during the station's repairs? Is there an understanding of how this will affect volumes by the end of the year?
As I said, we accepted and transported all volumes that shippers delivered to us. We have a deviation of 6% from the planned volumes in the first quarter, but this is largely due to decisions by shippers in the Republic of Kazakhstan, for example, at Tengiz. The decrease in planned revenue was about 5%. The consortium under-received more than $35 million.

Last year, shippers did not fulfill all preliminary requests for pumping, which reduced the volume of oil transportation. Will the situation repeat itself this year? Do you still expect an increase in deliveries from Tengiz in 2025?
We are not receiving additional volumes from Tengiz yet. In January 2025, repair work was carried out at Tengiz, which also affected shipments.

The year has started off tough for CPC — UAV attacks, suspension of the SPM class by the Maritime Register. However, according to the disclosed data, the Consortium has increased oil shipments by more than 5%, while carrying out scheduled maintenance in full. Are we right in understanding that the CPC oil transportation plan for this year does not need to be adjusted? What is it at the moment?
Let's be precise in our wording. It was not the Consortium that increased, but the shippers that delivered more compared to other periods. In the budget, based on preliminary applications, we had 76 million tons. Now we see a deviation of more than 1.8 million tons and this is due to various factors: the impact of repairs at the fields, and OPEC, and the UAV attack, and Kazakhstan's use of other routes.

How much oil was shipped in the full five months?
In the first five months of the year, 30 million tons of oil were shipped. 253 tankers were handled.

Is an increase in the tariff for transporting oil through the system being considered?
The tariff is set by the shareholders' agreement and remains unchanged for now.

Last year, it was reported that CPC was applying the pump-or-pay principle to shippers whose shipments were smaller than those indicated in their pumping requests. How often is this principle applied and how do you assess the effect of this measure?
The "pump-or-pay" principle has been and continues to be applied. Accounting is conducted and payment is made when the corresponding conditions occur.

IN THE FIRST FIVE MONTHS OF THE YEAR

30

MILLION TONS OF OIL WERE SHIPPED. 253 TANKERS WERE HANDLED.

In the spring, Rostransnadzor identified violations at two SPMs and suspended their operation. What were these violations, and are the single-point moorings now operating in the normal mode? How is the process of restoring their class status progressing?
SPM-1 operates in the normal mode, SPM-2 remains decommissioned and is being prepared for scheduled maintenance, and its class has not yet been restored. SPM-3 operates in the normal mode. The violations identified concerned both some documentary aspects and purely technical ones.

Are you confident that a similar situation with the withdrawal of SPM classes will not happen again in the future?
This summer we are beginning the installation of caisson anchors to replace two SPMs that have been in operation since 2001. In the spring of 2026, we will be installing new buoys for the single-point moorings. We hope that this will guarantee the exclusion of such situations in the future. The technical project has been developed and agreed upon with the Russian Maritime Register of Shipping.

In December 2024, you signed an agreement with Transneft-Service JSC for SPM maintenance. Did this company participate in helping to eliminate the violations?
Transneft-Service has been our main contractor for servicing the CPC's surface and underwater infrastructure at the Marine Terminal since 2021. The company is involved in all work.

CPC has gained the ability to load oil from the terminal simultaneously through all three SPMs. How often is this option used?
This option has been tested and is not used yet. Let me remind you that it would be needed after periods of storms, leading to a break in loading and accumulation of oil in the tanks. When the weather improves, we can catch up with the schedule, berthing vessels at all three single-point moorings simultaneously.

In 2026, the company planned to replace two of the three SPMs with a Russian analogue. When will you start receiving equipment from the manufacturer and do you plan to replace the berths?
The contract with the Russian manufacturer has been suspended for now – this is a decision by the shareholders. But the developments have been preserved and may be used in the future. Another contractor continues to work on the production of the SPM. The caisson anchors and bearings have already been manufactured. The installation of the first in the waters near Novorossiysk will begin in the second half of summer 2025. The production of buoys and underwater manifolds continues. These devices will start being delivered to us in the spring of 2026. We will not disclose the total cost of production of the two SPMs for now.

The replacement of the SPM is planned for September 2026. When are the units expected to be delivered? Who will be the contractor for the installation of the SPM? How much will these works and units cost the Consortium?
For offshore operations, we chose Alliance LLC. This company has the necessary experience in performing work, its own technical resources and qualified personnel. In 2022, it was this domestic company that replaced the buoyancy tanks on two CPC SPMs.

Will all the difficulties of the first half of the year affect the company's financial performance and dividend payments for 2025?
At the moment, the forecast deviation for dividends is about 80 million US dollars. We budgeted 1 billion 450 million US dollars for the year. The payout figures for the second half of the year will still be adjusted, taking into account throughput volumes and other influencing factors.

How much have your capital expenditures increased in 2025 due to all the repairs? What is the volume of capital expenditures planned for 2025? What are the main items?
The budget for capital expenditures in 2025 is about 400 million US dollars. However, in the first quarter our spending even decreased, the execution of the planned amounted to 86%. We completed some projects last year, the project "Construction of the northern berth wall" at MT was cancelled.

The main articles are: replacement of the SPM, programs for replacement mainline pumps with GTU, replacement of the SCADA OAZIS with the Dispatch control and management system, reconstruction of LP, replacement of UPS that have reached the end of their service life, replacement of marine hoses, replacement of tanks at the Tengiz PS.

What is the actual volume of capital expenditures by the end of 2024 (almost $200 million was planned)?
The planned capital expenditure volume for 2024 of $200 million was almost fully realized – at 99%. We have fulfilled the set tasks.

This year, CPC has planned a program to electrify its PS. When will you start and how long will it take? You wanted to replace the gas turbine with an electric motor unit at the Kropotkinskaya PS, was this done immediately during the repair?
Of course not. We are steadily implementing the project, and have successfully tested a prototype at the manufacturing plant. Installation of new equipment at the Kropotkinskaya PS, Komsomolskaya PS and A-PS-4A is scheduled for 2028. In addition, the GTU in question at Kropotkinskaya is not the GTU that directly provides pumping. This device is used to provide the station with electricity.

CPC previously announced the start of the program for the transition to domestic mainline pumps with electric motors. It was assumed that in late May – early June you would sign a contract for the supply of pump and electric motor kits. Has the contract been signed yet? Have you started implementing the program?
Design work is being carried out ahead of schedule for the Kropotkinskaya PS (project documentation has been developed, examination and development of working documentation is underway), Komsomolskaya PS (examination of design documentation and engineering survey results is being completed, working documentation has been developed – verification is underway). For A-PS-4A, approval has been received from Gazprom Dobycha Astrakhan LLC for the placement of A-PS-4A external power supply facilities on the territory of the Astrakhan gas condensate field. Engineering surveys and development of design documentation are underway.

Manufacturing and testing of an electric pump unit has been completed, comprehensive tests at the manufacturer's plant were successfully completed on March 12–13, 2025 (in a configuration combining MPU+EM+VFD+EM purging and cooling system). The signing of the contract for the supply of MPU, EM, VFD, switchgear for the full scope of work is planned for the near future, after receiving the necessary approvals, including from shareholders.

Contracting – currently, an agreement has been signed for the execution of design work under the Program for the construction of WPS facilities and the replacement of mainline pumps with gas turbines with MPU with electric motors at A PS-4A, Komsomolskaya PS and Kropotkinskaya PS, as well as an agreement has been signed with Rosseti Yug PJSC for technological connection to the power grid to provide external power supply for the Komsomolskaya PS facilities.

The status of the construction and installation work is not started. The start of tender procedures for the volume of construction and installation work is planned for the second half of 2025.

CPC is gradually completing the Debottlenecking Program. What activities remain to be carried out under it, and how do you see the future development of the system?
To date, the DBNP budget has been fulfilled by 95%. Among the works planned for 2025 are the installation of a VFD for the MPU and additional capacity of the SRS at PS-3 and PS-5 (completed) and the installation of an additional PCU and PDS at the Marine Terminal.

I see the future of the system in enhancing its reliability, reconstructing some elements of the linear part, possibly building additional volumes of the tank farm along the linear part to increase its flexibility, in modernizing the software that ensures production processes. We are studying the possibilities of using artificial intelligence in some operations to ensure the daily activities of offices, using modern technologies in the field of environmental protection, achieving the goal of zero injuries and minimizing the number of violations in the field of labor protection and industrial safety.

Last year, the Caspian Pipeline Consortium and KazTransOil built and connected a connecting pipeline (jumper) between the companies' oil pipeline systems. How actively is it used, in what situations?
It actually existed before, but its condition was unfit for use. We put this jumper in order, though we use it rarely. It helps us with KTO in some modes to optimize the cargo flow.

Nikolay Nikolaevich, the year has started off difficult for the company. Already in December-January, CPC employees took part in the liquidation of the consequences of the oil spill in the Black Sea. Could you tell us how this work went near Anapa? What were its results?
We could not help but respond to this call for help. This is our country, our sea, our beaches, and we all want them to be clean. Immediately after the state of emergency was declared, CPC provided dump trucks, excavators, crew buses and dozens of specialists to the EMERCOM headquarters. The group was reinforced as needed. Our regular units also came out with the contractors. We worked side by side with volunteers, port workers, oil pipeline workers, helping each other with organizational issues and with equipment repairs carried out right on the beach, as well as with the delivery of personnel. At first, the operation participants covered half a kilometer a day, collecting an average of 130 tons, then the pace increased to 1 km.

This year the whole country celebrates the 80th anniversary of the Victory in the Great Patriotic War. Is CPC participating in the festive events?
Of course, we remember our veterans, our front-line relatives and home front workers, the heroes of that war, all those tragic events! We remember our Victory and the contribution of the people of the USSR to it.

We made a special issue of the magazine on this topic, filmed several memorable reports, including about the February landing of 1943 in Yuzhnaya Ozereyevka. We organized the improvement of the burial sites of Red Army soldiers and monuments in Novorossiysk and other regions.

This year, our traditional festival "CPC for Talented Children" has an additional name "Wings of Victory" and during regional gala concerts, works from the war years will be performed, and the scenarios of these events will also be dedicated to the patriotic agenda and the preservation of historical memory. In a word, we are not on the sidelines!

Next year marks 24 years since the first oil shipments from the CPC Marine Terminal began and the company's 30th anniversary. How do you assess the Consortium's contribution to the oil industry of Russia and Kazakhstan during this time?
Without the CPC pipeline, Kazakhstan's oil industry would be completely different. It was the Consortium's pipeline system that opened the wide road for large Kazakh oil to world markets. The creation of the route demonstrated the best sides of large companies from different countries, and this cooperation became an example for the successful implementation of other large projects for many, many years.

CULTURE NEWS

PANORAMA CPC PRESENTS THE LEADERS OF THE SAFE WORK CULTURE – EMPLOYEES OF THE CONSORTIUM AND CONTRACTORS – BASED ON THE RESULTS OF THE FIRST HALF OF 2025

ALEXANDER RODIONOV,
Operator of the Astrakhanskaya PS
He exercised the right to suspend the work of the contractor's team due to the violation of the CPC Life Saving Rule No. 5 "Work at heights", since the participants in the work did not use personal protective equipment against falls from a height.

ALEXANDER SIDOREVICH,
Electrician, electrical installations maintenance, Marine Terminal
Noticed that a worker from the contractor's team had started work without waiting for the permit documentation. He suspended the work and conducted a briefing on the rules for performing such tasks.

ALEXANDER RYABETS,
Instrumentation Technician, PS-5
Suspended work due to the unsafe movement of cargo a contractor's forklift-excavator.

ASKAR YESENGELDIN,
Instrumentation Technician, Kurmangazy PS
Detected the use of a tool not specified in the work permit. He suspended the work and reported the incident to the site manager.

NURBOLAT ESPULOV,
Responsible for the execution of works of KazTransOil JSC at the Atyrau PS
Recognized by CPC management for the safe execution of complex work to repair a malfunction in the charging and rectifying unit.

ALEXEY KARPENKO,
Site foreman of MasterService LLC at PS-4
Recognized by the CPC HSE Group for delivering the best pre-job safety briefing.

AUTHORS
ALEXEY MIKHAILOV, TEAM LEADER, PS AND MARINE TERMINAL OPERATIONS
DMITRY BENDEROV, SERVICE HEAD, PS, TANK FARMS AND SHORE FACILITIES OPERATIONS
DMITRY ZAVALINICH, CHIEF WELDER

OVERCOMING THE STATE OF UNSTABLE EQUILIBRIUM

APPLICATION OF A SIMPLE MATHEMATICAL MODEL FOR SYSTEMATIZATION OF MAINTENANCE AND REPAIR PROCESSES AT HAZARDOUS PRODUCTION FACILITIES OF THE PIPELINE TRANSPORT SYSTEM

What is the law of unstable equilibrium in physics? It is a state in which the center of gravity of a body is above its fulcrum. Equilibrium can be lost when an insignificant external force is applied to the body. Since physics is the science of the nature of things and its laws apply to everything around us, the law of unstable equilibrium is fully applicable to the production sphere.

Compliance with industrial safety (IS) requirements during operation, timely and high-quality maintenance and repair (MR) of process equipment at hazardous production facilities (HPF), along with unconditional fulfillment of oil transportation plans is the task around which all production activities of CPC are built. At the same time, the solution to the problem should be approached not only from the point of view of ensuring the safe operation of equipment during its life cycle, but also as regulation of an entire area that takes into account aspects of rational MR planning, optimization of financial costs, and the legal side when interacting with government supervisory authorities. That is why the strategic goal of the company is to form a single system of sustainable balance for all structural divisions of CPC on all issues of IS during the implementation of the MR system.

At first glance, it may seem that this is a trivial goal, since the main oil pipeline has been operating for decades, but in fact, the creation of a single structure for industrial safety, maintenance and repair turned out to be a long and very difficult matter. The formation of the system has already taken years of painstaking and persistent work by specialists from the Operations Department of the Moscow office and regions. The work continues and much more needs to be done to complete it.

What preceded this work, how did it begin, what formed the basis of this new structure? As is known, nature strives for endless optimization in everything, and evolution is the optimization method applied by nature, described by mathematical models. Therefore, there was no need to invent anything new, it was enough to simply spy on, borrow nature's methods. Even the ancient Greek philosopher and mathematician Pythagoras, studying the nature of things, came to the conclusion that everything that exists is a number. In other words, the new structure had to be based on a simple and understandable mathematical model.

The foundation was laid in 2020 by Nikolay Gorban, General Director of CPC: a group of specialists from the Operations Department was tasked with bringing the above-described processes to a unified approach across regions, streamlining and optimizing them. Given the scale of the implementation, it was decided to build a new IS and MO structure in stages.

STAGE ONE. CREATION OF THE STANDARD

The development and implementation of the Corporate Standard (STP CPC 76.10.2022) concerning technical diagnostics, inspection, technical examination and industrial safety expertise (ISE)

of technical devices and structures operated at the CPC hazardous production facilities became the first step in the formation of the IS and MR. It should be noted that CPC had internal documents in this area before, but they did not cover the needs for all types of equipment in operation. It was necessary to start structural changes from this stage also because the operating period of a number of CPC facilities was approaching 20 years, and, according to the legislation of the Russian Federation in the field of industrial safety, it was required (at that time) to extend the designated service life (in the absence of other terms established by the manufacturer).

The development of the Corporate Standard began with a deep analysis of all available basic documents, on the basis of which the activities of hazardous production facilities are assessed by the main state supervisory organization in the territory of the Russian Federation – the Federal Service for Environmental, Technological and Nuclear Supervision (Rostekhnadzor). The assessment of available information characterizing hazardous production facilities for each PS and Marine Terminal registered in the state register of hazardous production facilities, the study of the composition and content of current industrial safety expert assessments, as well as related operational documents, including process pipeline (facility) passports, unfortunately, showed the absence of a uniform approach to registration in the CPC.

At the same time, based on Article 2 of the Federal Law N 116-FZ of July 21 "On Industrial Safety of Hazardous Production Facilities", HPFs are subject to registration in the state register in the established manner, while the head of the organization operating the HPF is responsible for the completeness and accuracy of the information provided for registration.

Thus, such discrepancies in the execution of basic documents even within the operational boundaries of one region led to inconsistent assessment, application of different standards for technical diagnostics, industrial safety, incorrect determination of volumes, frequency of maintenance and repair of equipment identical in its design, functional purpose and classification, operated at different facilities, not to mention the real risks of receiving orders and fines for both individuals and legal entities.

COMPARATIVE ANALYSIS

The primary document that defines the characteristics and hazard class, describes the composition of technical devices and facilities with

hazardous features, the type and quantity of hazardous substances, and other relevant parameters, is the information characterizing the HPF. The specified document is initially developed by the operating enterprise and must be periodically updated depending on changes in the condition and composition of HPF equipment. The document is agreed upon and registered with the territorial bodies of Rostekhnadzor and is fundamental during operation, as well as during inspections of HPFs in the field of industrial safety.

Thus, when preparing information characterizing the HPFs in 2019, specialists from the Marine Terminal and the Central Region were guided by the requirements of the federal "Industrial Safety Rules for Oil and Oil Product Warehouses" introduced by Rostekhnadzor on November 7, 2016. The specified document N 461 establishes requirements for classifying pipeline fittings as part of a process pipeline and applying industrial safety requirements to it as a single structure.

At the facilities of the Western Region, specialists were guided by other motives, as a result of which information characterizing the HPFs was submitted to Rostekhnadzor in a different form, based on the idea that each unit of pipeline fittings with a nominal diameter of 300 mm or more, regardless of its actual position (whether it is installed on a pipeline or is in warehouse storage), is a separate technical device. Consequently, each unit is subject to requirements for individual technical diagnostics and industrial safety expertise with an extension of the safe operating period.

The absence of a unified systemic approach to the issues of classification and methods of assessing the technical condition and the designated service life of technological equipment of the CPC facilities not only significantly complicates the process of interaction between the operating personnel of the PS and the territorial bodies of Rostekhnadzor (even within the boundaries of one region), but also creates conditions under which an excessive increase in unjustified costs and other resources associated with the technical examination of pipeline valves as separate technical devices isolated from the composition of structures (technological pipelines) may be allowed.

In case of classification of pipeline valves as separate technical devices, during diagnostics it will be necessary to perform a volume of works that will require their depressurization with the stop of technological operations in the diagnosed section. Considering the planned volumes of oil transportation, carrying out such activities would be extremely difficult, and in some cases, entirely impossible.

As a result of the analysis of the classification of HPF and the risks associated with it, under the supervision of specialists from the Operations Department, with the involvement of the expert organization Diaform LLC, a Corporate Standard was developed, which implements uniform standards for the classification of HPFs, the scope of work and assessment standards according to the requirements of regulatory and technical documentation (RTD) in accordance with the established classification. This updated approach does not contradict the requirements of the legislation of the Russian Federation in the field of industrial safety, but was applied for the first time in the domestic pipeline transport system.

LEGAL BASIS

Currently, along with other regulatory documents at the federal level, the "Industrial Safety Rules for Oil and Oil Product Warehouses" were put into effect by order No. 529 of December 15, 2020. The corresponding Rostekhnadzor order No. 529 came into effect on January 1, 2021 and is valid until January 1, 2027.

According to Clause No. 133 of the specified Federal Industrial Safety Rules (FNP) No. 529, process pipelines of hazardous production facilities are defined "Structures (facilities) consisting of pipes, parts and elements of a pipeline, including pipeline valves, bends, transitions, tees, flanges and elements of fastening, protection and compensation of a pipeline (supports, hangers, compensators, bolts, washers, gaskets), hermetically and firmly connected to each other (hereinafter – process pipelines), intended for the transfer of oil, oil products, waste oil products and ensuring the performance of process operations and the operation of equipment within hazardous production facilities of oil and oil product warehouses."

Further, based on Clause No. 243 of FNP No. 529, "The volume, frequency and procedure for organizing and carrying out maintenance and repair of equipment (including breathing and safety valves), tanks and process pipelines, engineering and technical support systems, taking into account specific operating conditions, are determined by regulatory and technical documents of the operating organization in accordance with the design documentation (documentation for technical re-equipment) and technical documentation of the organizations manufacturing the equipment and technical devices."

In addition, in terms of certification (passportization) of process pipelines, it is also necessary to pay attention to the following requirements of the Safety Rules for hazardous production facilities of main pipelines, introduced by Rostekhnadzor Order No. 517 of December 11, 2020 (FNP No. 517), as well as the Rules for the safe operation of process pipelines, introduced by Rostekhnadzor Order No. 444 of December 21, 2021 (FNP No. 444):

According to Clause No. 11 of FNP No. 444, "Passports shall be issued for all categories of process pipelines prior to their commissioning. The use of process pipelines without passports or with passports with partially filled sections at hazardous production facilities is not permitted...

...Restoration of passports in case of their loss or impossibility of further use due to wear and tear is carried out by the manufacturer or its successor. In case of objective impossibility of contacting the manufacturer (for example, due to liquidation of a legal entity), restoration of the passport is carried out by an organization specialized in this field of activity."

Based on clauses No. 127, 129, 130 of FNP No. 517 in the part concerning main pipelines:

The form (passport) for the main pipeline (MP) hazardous production facility must contain information about the section (section number) of the MP hazardous production

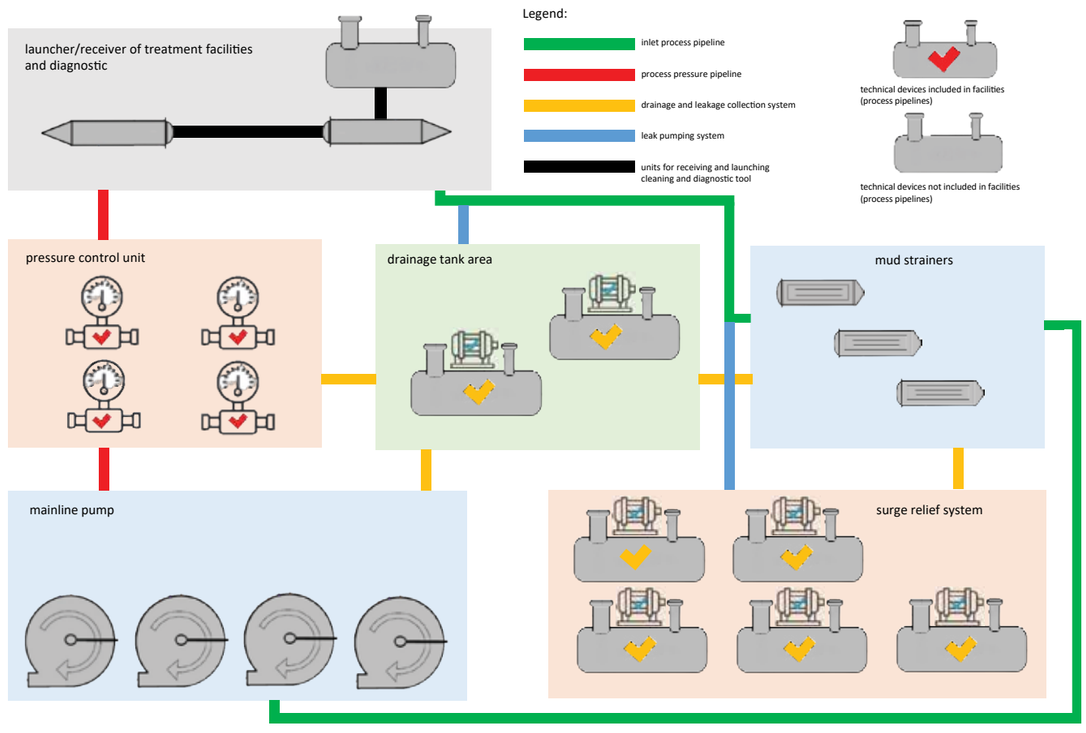


FIG. 1. THE STRUCTURE OF AN INTERMEDIATE PS, WITH TYPICAL BOUNDARIES OF TECHNICAL DEVICES AND STRUCTURES HIGHLIGHTED IN DIFFERENT COLORS

facility, the value of the permitted pressure, as well as the need to provide it with safety devices to limit the value of the (permissible) working pressure.

The operating organization is obliged to conduct periodic inspections of pipelines and equipment of the hazardous production facility MP throughout the entire life cycle of the hazardous production facility MP (until their liquidation).

The operating organization shall establish the frequency, completeness and procedure of inspection, methods and means of control taking into account:

- data on the construction of MT;
- technical condition;
- operating conditions (duration, technological mode);
- properties of the transported product;
- features of the location area (presence of security zones, the most hazardous areas).

Additionally, in terms of planning and implementing the maintenance and repair system, according to Clause No. 116 of FNP No. 517, "During technical maintenance of hazardous production facilities of main pipelines (MP), the volume and frequency of work performed must be determined by design documentation, technological regulations for the operation of hazardous production facilities of MP, regulatory and technical documents of manufacturers for pipes, materials and equipment, as well as the results of monitoring the technical condition."

Similar approaches to diagnosing process pipelines as single structures are described in the recently introduced Safety Guidelines "Recommendations for Technical Diagnostics of Main Oil Pipelines, Oil Product Pipelines and Their Components", approved by Rostekhnadzor Order No. 40 dated February 12, 2025 (RB No. 40).

FORM FACTORS

Thus, in accordance with the requirements of Federal legislation and subordinate acts, the following principles form the basis for the formation of the IS MR structure:

1. Technological pipelines of pumping stations, process areas, tank farms of the CPC, hermetically and firmlyconnected to pipeline fittings, are regarded as structures;
2. Shut-off and other pipeline valves used as part of process pipelines may not be considered as separate technical devices;
3. Responsibility for the safe operation, timely maintenance and repair of equipment rests with the operating enterprise;
4. The volume, frequency, procedure for organizing and conducting work on technical maintenance, repair, diagnostics and technical inspection of equipment are determined by the regulatory and technical documents of the operating enterprise, developed, among other things, taking into account the design documentation, technical documentation of the organizations manufacturing the equipment and not contradicting the requirements of Federal legislation in the field of industrial safety.

The flow chart (Fig. 1) shows the structure of a standard intermediate PS. The typical boundaries of technical devices and structures are highlighted in different colors.

Thus, over the last three years, the following has been accomplished in the first stage of the formation of a unified structure of the IS MR:

1. For HPFs located on the territory of the Russian Federation, the Corporate Standard STP CPC 76.10.2022 "Industrial safety expertise, technical diagnostics, inspection and technical certification at CPC-R HPFs" was developed and put into effect by the order of the General Director dated October 11, 2022.
2. A standard composition of structures and technical devices, as well as their specific standard boundaries for all PS, process sites, and tank farms of the CPC, have been developed and approved.
3. Standard industrial safety assessments of process pipelines (structures) were carried out for all pumping stations. The conclusions of the industrial safety assessments were registered with Rostekhnadzor.
4. The process of re-registration of standard information characterizing HPFs for all CPC PS is being completed.

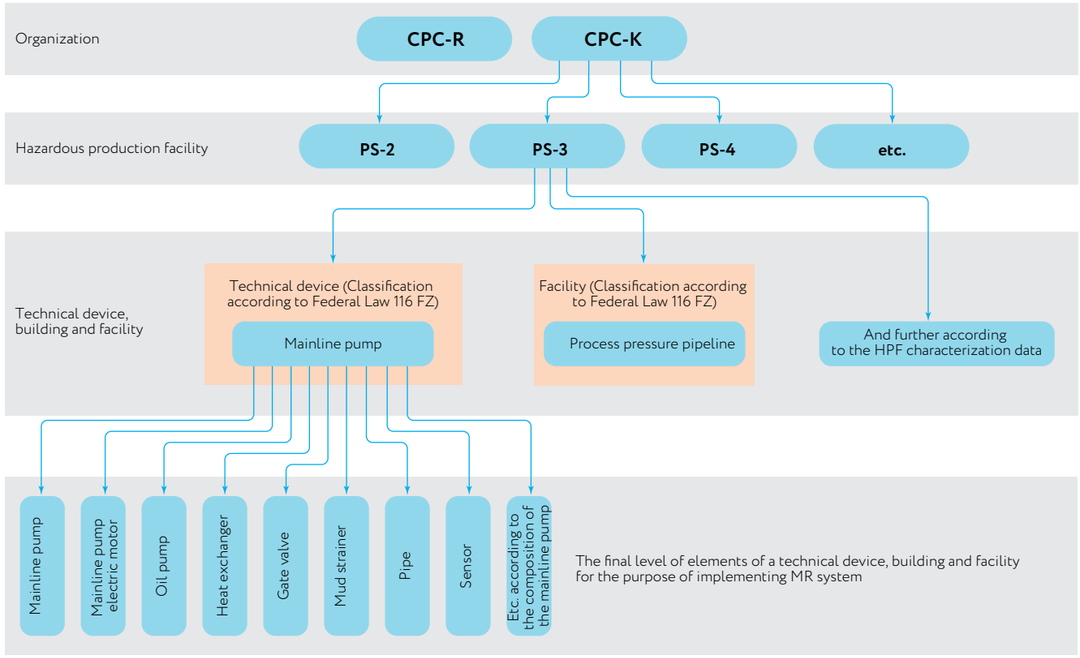


FIG. 2. MATHEMATICAL MODEL OF THE TYPICAL STRUCTURE OF THE IS MR OF TECHNICAL DEVICES, BUILDINGS AND STRUCTURES USING THE EXAMPLE OF A MAINLINE PUMP IN THE CLASSIFICATION OF THE FEDERAL LAW OF JULY 21, 1997 N 116-FZ

5. For the purposes of certification, a standard list of process pipelines has been developed and approved. Certification of process pipelines (structures) is planned for the current year with the involvement of a contracting expert organization.

STAGE TWO. NEW CONCEPT OF INTERNAL GUIDANCE DOCUMENTATION

Revision of related departmental documents on operation, maintenance and repair of process equipment, primarily VRD CPC 79.08.2024 "Guidance document on the maintenance of mechanical and power equipment, automation systems, and instrumentation of CPC facilities", transfer of a set of typical structures and technical devices within their specific typical boundaries, i.e. integration into the already formed framework of the structure – this is the second and final stage of work on CPC facilities on the territory of Russia.

Here it is necessary to emphasize once again that STP CPC 76.10.2022 and VRD CPC 79.08.2024 should be considered as two parts of one whole. Only under such conditions will we be able to fully implement the intended effective and transparent mathematical model of a unified IS MR system.

What economic effect will this ultimately bring? It is not difficult to predict. In simple terms, by combining technical devices and the elements that connect them into structures, we will be able to optimize the amount and composition of maintenance work, equalize the timing of the withdrawal of certain technical devices for repair as part of one structure, ensure simultaneous maintenance by involving specialists from related services, ensure uniform planning avoiding "distortions" from month to month in attracting available labor resources (ALR) of contractors performing maintenance on a contractual basis.

The mathematical model of a unified standard structure for IS MR of technical devices, buildings and facilities in the classification of the Federal Law of July 21, 1997 N 116-FZ is shown in Fig. 2.

After the implementation and testing of this structure in Russia, the next step should be its extension to objects located in the Republic of Kazakhstan (a member of the Customs Union). This issue currently has similar precedents in legal practice.

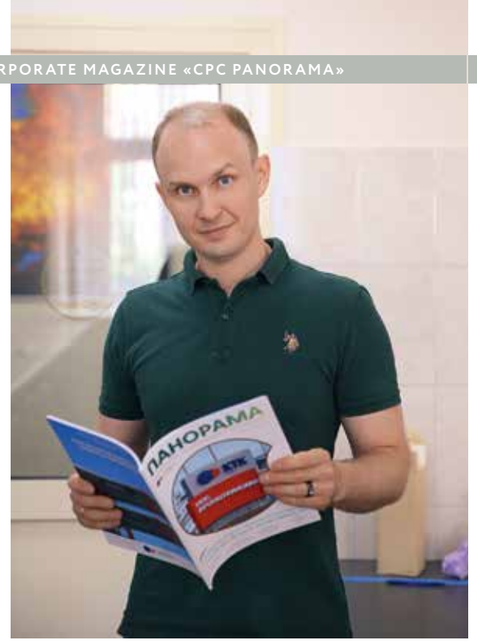
Whether this can be implemented – time will tell. Nothing is impossible with the correct application of the appropriate efforts of a team of qualified specialists.

The further progress of the project to create a unified system of IS MR will be reflected in future issues of the corporate publication.

AUTHOR
PAVEL KRETOV

CREATIVE INTERACTION

WE DISCUSS THE BENEFITS OF INTERDISCIPLINARITY FOR SCIENTIFIC COLLABORATION, THE MOMENTUM GAINED BY DOMESTIC TECHNOLOGIES IN THE CONTEXT OF IMPORT SUBSTITUTION, AND MUCH MORE WITH ASSOCIATE PROFESSOR OF THE DEPARTMENT OF METALLURGY AND NON-METALLIC MATERIALS AT GUBKIN UNIVERSITY, YURI DUBINOV



Yuri Sergeevich, you completed a master's degree in Technological Machines and Equipment, followed by a specialist degree in Information Management. How useful is such a multidisciplinary background in a researcher's work?

My first degree was obtained at the Department of Machinery and Equipment for Oil and Gas Fields in the field of Technological Machines and Equipment. Information Management is not as far removed from this specialization as it may initially seem. Today, digital twin technologies are becoming increasingly widespread – virtual replicas that allow us to first create digital copies of equipment and simulate various loads on them, and only then produce physical prototypes made of polymer or metallic materials. Even at the stage of designing a machine, we can calculate its entire life cycle, required maintenance, and therefore all operational costs.

So your second specialty is essentially a continuation of the first?

Exactly. In Soviet times, it was believed that an engineer should have a broad outlook, only then he would fully understand all processes. We shouldn't follow Europe and America with their narrowly focused education systems, because, for instance, a specialist in bolts and nuts might no longer be able to discuss pipes and welding due to a lack of competence in those areas. Information management develops the ability to make decisions based on data analysis, which, in fact, formed the basis of artificial intelligence, which today allows us to take on broad-based tasks, helps in finding information and taking into account factors that we might not have noticed before. Or, for example, a new foreign standard for equipment production has been released. Studying such a document in detail might take an engineer several months, but artificial intelligence can help grasp all the essential information much faster through extracted summaries.

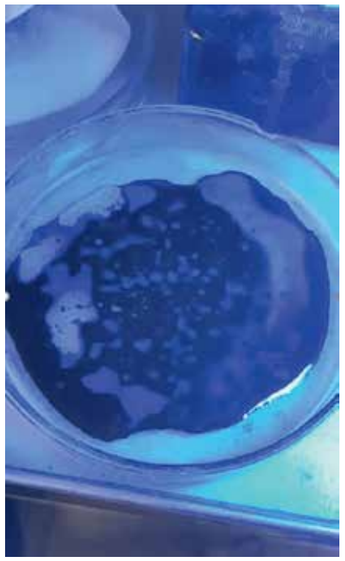
But what helps an established engineer and researcher might actually hinder a modern student. Doesn't the illusion of easy access to information lead to the temptation not to study, but rather to simulate learning?

Yes, we do sometimes encounter this problem. A student doesn't always interpret the information obtained through artificial intelligence correctly, as they may not be able to formulate a precise query. In such cases, the only proper response from the teacher is to urge a return to the textbook. It's best to turn to artificial intelligence when one already has a certain foundation of knowledge that allows for proper separation of the information provided and turning it to one's advantage. The primary task of a modern teacher is to get the student to put down the gadget and to cultivate interest not only in reading books, but also in hands-on work. We are trying to implement these ideas, including in our Interdepartmental Center for Engineering Development, student and school design bureaus.

Is interdepartmental interaction such a fertile ground for creative scientific research?

It was through precisely this kind of interdepartmental collaboration that a team of researchers from Gubkin University was recently recognized with the international environmental award Ecomir for an interesting discovery related to hogweed. One day, together with chemists and ecologists, we were driving to our training and production center "Zaluchye" in the Tver oblast. We saw Sosnowsky's hogweed on the side of the road and decided to think about how to use for good such a widespread and very dangerous weed, listed in the Black Book of Flora of Central Russia. In the laboratory of Gubkin University, we crushed the plant into various fractions and conducted research. It turned out that just 1 g of Sosnowsky's hogweed can absorb 16 g of spilled oil, which makes it a more effective organic sorbent compared to existing ones. Another advantage of hogweed was its selectivity: it absorbs only oil products, without water. And the third important discovery is the presence of light-sensitive substances from the furanocoumarin group, which cause severe burns on the skin when exposed to sunlight, having a bright fluorescent ability. This has already been described in the literature, but our team, having added the necessary solvent, suggested using it as a marker of oil when accounting for it. Where might this be needed? Imagine that at some stage of transportation, other organic compounds were unauthorizedly mixed with hydrocarbons. Thanks to the fluorescent indicator, this can be immediately detected.

APPEARANCE OF THE SORBENT OBTAINED FROM SOSNOWSKY'S HOGWEED



HEPTANE-BASED EXTRACT FLUORESCENCE IN ULTRAVIOLET LIGHT

IT TURNED OUT THAT JUST 1 G OF SOSNOWSKY'S HOGWEED CAN ABSORB

16

GRAMS OF SPILLED OIL

Speaking of hogweed, I recently read that this plant is five times more productive in producing bioethanol than sugar cane and beet. Could hogweed find its niche as a raw material for energy production?

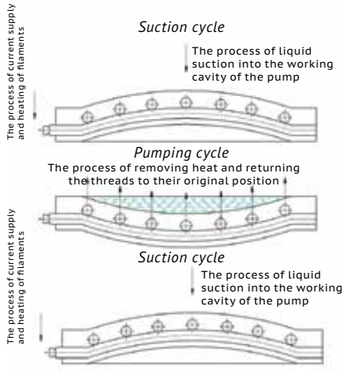
Absolutely not! Sosnowsky's hogweed is a dangerous, tenacious weed that causes significant harm to nature and the species diversity of the plant world. Out of 100 seeds, all 100 germinate, and they can wait for favorable conditions for growth for up to 10 years. The fight against hogweed is difficult and expensive, we certainly do not suggest cultivating it. On the contrary,

ETHYL-BASED EXTRACT FLUORESCENCE IN ULTRAVIOLET LIGHT

our projects are designed to help recoup the cost of eliminating the invasive weed and to interest representatives of various business sectors.

In one of your interviews, you spoke about your innovative development — a pump that does not require an electric drive. Please tell us more about it. Can such a device be used to transport hydrocarbons?

Yes, four years ago we patented the membrane pump technology. It has both a drive and a hydraulic part: a housing, a drive, a controller and a membrane. It is all about using a special intelligent material with a shape memory effect, which is set during production. This shape can then be changed as desired, but under certain conditions it will always return to the original one. This ensures variable up-and-down movements, which facilitate the pumping process. Such materials are already used in cosmonautics, medicine, and we want to start using it in the oil and gas industry. Anticipating your question, whether this technology can be used in the CPC or in mainline pipeline transport systems, I will say no. It is suitable for oil



THE WORKING PRINCIPLE OF A DIAPHRAGM PUMP

production — ideal for low-flow oil wells with volumes of up to 12 m^3 per day. Unfortunately, it cannot be used with the capacity of the main oil pipeline. As part of the competition of the St. Petersburg International Economic Forum, the development received an award from the Ministry of Energy of the Russian Federation for the creation of new generation equipment. A number of oil producing companies have already shown interest in it.

Have you had any interaction with CPC specialists on any issues? Have you personally visited the Consortium's facilities?

Unfortunately, I have not been to the facilities yet, but we have been closely cooperating with CPC specialists for a long time. We are talking in the premises of the international educational and scientific center Anticor at Gubkin University. Here, specialists of the Consortium regularly attend advanced training courses. If necessary, we consult on the topic of combating corrosion, help to choose inhibitors for various conditions. Universal inhibitors that behave equally well in any environment with any metal do not exist. Therefore, their effectiveness depends on the right choice, and at our base we can conduct comprehensive tests in order to further build a whole range of reliable anti-corrosion protection for oil and oil product transportation facilities.

What are the current problems of import substitution in the oil and gas sector? How do you assess the joint project of CPC and Transneft to develop a non-standard pump unit with an electric drive?

The development of the domestic machine-building industry can only be welcomed. This is certainly a positive trend. Now we have started producing many types of equipment. Recently I was at the Transneftemash plant in Velikiye Luki, which is part of the Transneft PJSC system. I saw a modern production base there, and well-trained specialists, engineers and workers. Here you can create anything you want. The main thing is to understand the technology.

The joint project between CPC and Transneft to replace pump units at mainline pumping stations with domestically produced equipment is of great interest. Both companies use variable frequency drive technologies for the electric drives of these

Audio und werbung/Shutterstock/FOTODOM

HYDROGEN STORAGE RECEIVERS MADE OF ALLOY STEEL 09G2S

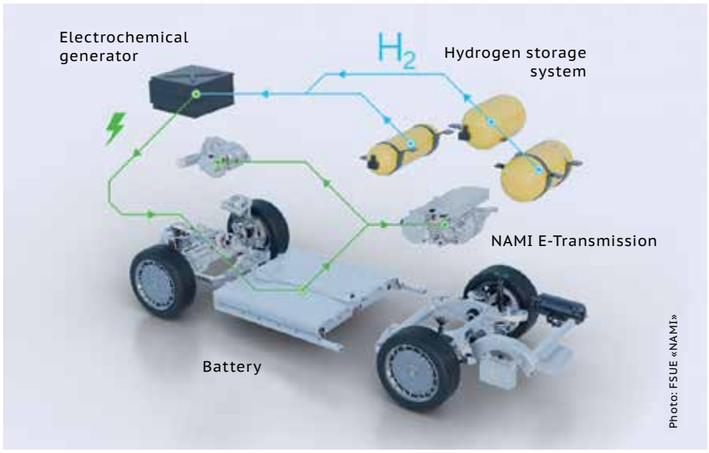
pump units. This is much more convenient, economical, and safer than using control valves. But in addition to reducing the risk of hydraulic shock and optimizing delivery schedules, they rarely talk about the possibility of indirect diagnostics of pumps. By analyzing the parameters of variable frequency drives, it is possible to create a virtual flow meter. Such research is currently being conducted at Gubkin University.

What are the current achievements of hydrogen energy? Are there any projects to create hydrogen drives for oil transportation? Would the use of such technologies help reduce the carbon footprint, the majority of which comes from electricity consumption, at oil pipeline transportation enterprises?

As a student, I prepared a term paper on hydrogen energy on the topic of "Using Hydrogen Engines to Drive Industrial Equipment". As a result of the analysis and research, certain conclusions were made. The idea with hydrogen is conceptually good and produces fewer emissions, provided that the gas is extracted from methane. However, there are no effective methods for collecting all the energy from hydrogen. Those with a high hydrogen yield produce high humidity, and drying is 20%. The main problem remains its storage: its atoms are small, so it leaks through most metals. Accordingly, the construction of hydrogen storage tanks requires the use of expensive steel grades.

What if, instead of storing hydrogen, we immediately convert it into energy and distribute it, for example, to batteries?

Such batteries objectively do not exist yet. Lead batteries do not hold large volumes and are and have a short lifespan. Gel and lithium batteries last longer, but



DESIGN OF THE HYDROGEN-POWERED VEHICLE Z-NAMI-5

do not like frequent discharge. Only graphene batteries can be considered promising. They are currently being tried in electric cars: full charge in seven minutes, the range without recharging is about 1000 km. But again, the issue of cost is acute. Such batteries are not a mass segment, they cost millions of rubles.

As the Chairman of the Council of Young Scientists of Gubkin University, please highlight the main key achievements of this organization in recent years.

It is both a trade union that protects the rights of young teachers and supports them in obtaining research grants. And a scientific community that holds over 50 events a year. We have already become a large collective expert force, and we are eagerly invited to other organizations. We interact with other universities on related work. At the beginning of our conversation, we touched on the important topic of interdisciplinarity. But without the Council of Young Scientists, you might not even know that colleagues from a neighboring faculty are working in the same field as you. And by getting together, you can carry out a truly large, high-quality collective project.

One of the areas of work of the Council of Young Scientists of Gubkin University is the School Scientific Society. What is it doing at the moment?

It is impossible to imagine a quality engineering education without a deep knowledge of physics. And we see from our applicants that this subject has become worse at school. To increase the interest of the children, we created a children's design bureau and do projects with them related to the oil industry. At the request of companies, we develop real conceptual models of equipment with schoolchildren. The university fully finances all the needs of the design bureau, purchases spare parts, sensors, controllers. We print parts on 3D printers. Because children are not yet constrained by conventional thinking, their imagination knows no bounds, and they come up with truly unexpected solutions. We also have our own goal in this project of the School Scientific Community: having studied the university from the inside, the children decide on a place of future study. They understand that the profession of an oilman is difficult, but creative and interesting, and they choose to apply to Gubkin University.

AUTHOR
PAVEL KRETOV

PRIORITY IS SAFETY

ON AUGUST 19, 2025, THE CITY OF ELISTA, THE CAPITAL OF THE REPUBLIC OF KALMYKIA, HOSTED THE 3RD SUMMIT ON LEADERSHIP IN THE DEVELOPMENT OF THE SAFE WORK CULTURE. THE MEETING BROUGHT TOGETHER THE TOP MANAGEMENT OF THE CONSORTIUM, THE MANAGEMENT AND SPECIALISTS OF ALL PRODUCTION FACILITIES OF THE COMPANY IN RUSSIA AND KAZAKHSTAN, REPRESENTATIVES OF CONTRACTORS

The key theme of the Summit was strengthening cooperation in occupational health, industrial safety, and environmental protection (HSE) among the employees of the companies implementing the CPC international project.

– Among the national goals outlined by the President of the Russian Federation Vladimir Vladimirovich Putin, the foremost is the preservation of the people. "The preservation of the individual as such, the working man, who with his daily work increases the power of the regions of our country", emphasized the Chairperson of the Government of the Republic of Kalmykia Gilana Boskhomdzhieva, welcoming the participants of the Summit.

The meeting in Elista once again demonstrated its role as a discussion platform on key issues of HSE, a venue for the "premiere" of new solutions and approaches, a place for exchanging experience equally accessible to managers and specialists of all production facilities of the oil pipeline system. It also serves as a checkpoint for aligning progress on the stages of implementing the HSE Strategic Plan, which CPC has been carrying out since 2022. The Plan is aimed at achieving zero-injury and accident-free performance indicators and was developed taking into account CPC's practical experience, that of its shareholder companies, and the global oil industry as a whole, as well as the results of independent assessments.

To ensure successful implementation of the HSE Strategic Plan, each of its eight goals is supervised by one of the company's top managers. The goal "Improving the level of the Safe Work Culture and Developing Leadership" is supervised by the General Director of CPC.

Last year, at the Summit in Elista, the results of the 2022–2024 Strategic Plan were discussed. The results and conclusions made it possible to thoroughly refine the key goals and objectives of the new Strategic Plan for 2025–2027.

The focus of the 2025 Summit was on the dynamics of the involvement of CPC personnel and contractors in the development of the Safe Work Culture, as well as the most effective tools for leadership practices.

110
THOUSAND HAZARDOUS SITUATIONS AT FACILITIES
CPC EMPLOYEES PREVENTED

"Thanks to a conscious approach to occupational safety, our people identified, minimized and prevented 110 thousand hazardous situations at facilities, essentially staying one step ahead", noted CPC General Director Nikolay Gorban in his speech.

One of the most important results of the meeting was the development of an action plan to reduce negative and develop positive beliefs in the field of safe production for all CPC employees and contractors. Effective mechanisms for eliminating communication barriers between managers at all levels were studied. The Summit participants made personal commitments and recommendations for a set of commitments in the field of safe production for all personnel. ●

AUTHOR
PAVEL KRETOV

EPIC OF THE GREAT STEPPE

ON AUGUST 20, 2025, THE 13TH CPC SAFETY DAY WAS HELD IN ELISTA. THE ANNUAL EVENT BROUGHT TOGETHER A RECORD NUMBER OF GUESTS AND PARTICIPANTS — 650 PEOPLE

Authenticity to the traditions of the host region has always been a guiding principle for the organizers of CPC Safety Day, and 2025 was no exception. The event's name — "Epic of the Great Steppe" — and its scenario fully corresponded to the style of the Kalmyk national epic "Jangar", even 28 teams of the Consortium divisions, contractors and partners were called "khaganates". The theme of the competitions was thought out in the same detail — here they threw lassos, shot from bows and demonstrated other heroic skills.

The organizers tried to immerse the contestants in the medieval epic — ensuring that participants would not encounter any modern objects or decorations along the route. Four teams came to each stage of the competition at the same time — they had a kind of micro-tournament among themselves.

The contestants, following the rules of ancient construction traditions, built portable national Kalmyk dwellings — kibitkas. They worked together to control huge ancient wagons. They saved humanity from evil demons, shulmuses, driving them into the center of a tangled labyrinth. Together with Khongor, Jangar's main assistant, they skillfully handled a bow and arrow, and having coped with this task, they took up a spear. Like real nomads and cattle breeders, they accurately threw a lasso from a "galloping horse".

No epic feats are possible without proper nutrition. A true hero of the Kalmyk steppe must be able to prepare food for himself. To bring to the table in the kibitka the traditional wheat flatbreads — bortsoki, symbolizing celebration and prosperity, the contestants had to fetch and filter water, thresh and grind grain.

All this, of course, required good physical fitness, quick reactions, and a will to win from the participants. At the same time, they were kept in good shape by the constant need to answer HSE questions at each competition. The spectators, however, had a rare opportunity to observe the entire competition field at once: in the central part, a high Jangar tower, was installed specially for them, and all the guests of the event visited it during the day.

In the final competition, all 28 "khaganates" met together for the first time on one site. Here, each team, with the direct participation of the head of their enterprise, made a kite in the shape of a sailboat, painted it in their corporate colors and launched it into the sunset evening sky.

"We thank you for the filigree historical thread in the name of the event — "Epic of the Great Steppe", noted in her welcoming speech the Chairperson of the Government of the Republic of Kalmykia, Gilyana Boskhomdzhieva. "2025 is also the year of a glorious anniversary, the 585th year of our cultural treasure, the national epic Jangar. It is very symbolic that we are talking about industrial safety, labor protection and a careful attitude towards human life. Today, the Caspian Pipeline Consortium is a conductor of the correct production ideology and a benchmark example of running a socially responsible business".

RECORD BREAKING **650** PEOPLE GATHERED THIS YEAR FOR THE CPC SAFETY DAY

Traditionally, the Safety Day was attended by representatives of the CPC shareholder

companies – Transneft PJSC and Chevron Caspian Pipeline Consortium Company.

"Excellent organization, friendly atmosphere, unforgettable emotions," noted in his speech Deputy Director of the Department of External Communications of Transneft PJSC Rustam Alparov. "Thank you for honoring your ancestors and folk traditions. On behalf of the government shareholder of the Russian Federation, I can say: we can be confident about industrial safety. We saw that the "zero" goal is not just words, but something that the entire CPC team truly believes in, and something that permeates the entire corporate culture. Thank you for the peace of mind that you give us. The Safe Work Culture is a two-way road. It involves not only the CPC team, but also a large number of contractors who were here today, competing, acting as one, and demonstrating real team spirit".

"I have been participating in the CPC Safety Days for 10 years now, I have met and become friends with many people, it is a great honor for me to be here", said Nikolay Avdulov, Commercial Manager of the Chevron Corporation. "I thought that there was little that could surprise me. However, from the first minutes in the hospitable Kalmyk steppe, I was given one of the most revered mantras of the Green Tara, which protects from troubles, risks, and dangers. We also have our own "mantras", one of which we repeat at every meeting of shareholders: partnership relations with the contractor. Another "mantra" is transparency of reporting, investigation and study of root causes. This is not necessary for punishment, but to find out what went wrong if an incident occurs. This is an important support point for the further growth of the Safe Work Culture".

To win, the "khaganates" of CPC employees and contractors needed knowledge of theory, the ability to investigate industrial accidents and identify their root causes, skills in preparing permits and identifying potential risks before starting work. Important topics of the competition program also included transport safety, actions in emergency situations, CPC Life Saving Rules, and the basics of environmental safety and health protection.

"Just as in the epic Jangar all dreams and thoughts are achievable, so in the field of labor protection we transform all ideas into specific measurable actual goals and consistently achieve them. All this can be seen in our competition program", – noted the technical director of CPC Igor Lisin.

The Western Region team won in the team standings of the CPC divisions. The Central Region team took second place, and the Marine Terminal "khaganate" was declared the bronze medalist. The Magistralny Vodovod team won first place among the contractors. The PromKhimSfera PKF team became the silver prize winner. The third place was shared by the KZF Service, MasterService and Kvantor EC teams. Traditionally, all participants of the Safety Day received memorable prizes and gifts.

The next Safety Day will be held in 2026 in the hero city of Novorossiysk.

"All those gathered here are leaders, the very people who carry our Safe Work Culture further into the team", noted CPC General Director Nikolay Gorban. "Every year we gather and confirm our conscious approach to safety issues and our commitment to it. It is symbolic that this time we have met again in the center of the CPC route in the middle of the Kalmykia steppe. The steppe and the sea are two boundless natural elements, which always set a certain mood, including a philosophical one. We have successfully conquered all the elements and continue to dynamically move forward, developing the competitive and educational concept of our Safety Day".

SAFETY DAY ON VK AND TELEGRAM

AUTHOR
PAVEL KRETOV

PROTECTED BY PIPELINE

IT IS TAKEN FOR GOOD THAT INDUSTRIAL FACILITIES HAVE A NEGATIVE IMPACT ON THE ENVIRONMENT. BUT IS THIS ALWAYS THE CASE? WE ARE DISCUSSING THIS TOPIC WITH COMPETENT INDEPENDENT EXPERTS IN THE CPC PIPELINE PROTECTED ZONE IN THE ASTRAKHAN OBLAST

Someone's overturned boat is drying on the sand, small waves are beating against the Volga bank, where a flock of ducks is cleaning their feathers. Only the signs "No Anchoring" and "Attention: Oil Pipeline! No vehicles allowed!" give away the steel artery's passage through the water barrier.

According to the legislation, at a distance of 100 m from the axes of the underwater pipeline, it is prohibited to carry out any activity that could interfere with the safe operation of the pipeline.

Trying not to make noise in the coastal forest, we slowly approach the nest of a handsome white-tailed eagle.

"That's a young one", comments nature photographer Alena Ryzhova on her observations. "But it is already a mature bird: it has a white tail and a yellow beak. The young have a dark beak and speckled plumage without white feathers".

The relatively modest nest also hints at the eagle's age. These birds from the hawk family nest in one place, each year adding to the structure of the dwelling. A large nest can reach 2 m in width.

Photo: Alena Ryzhova

Photo: Alena Ryzhova

The chicks are mostly supervised by their mother, but the father of the family also spends about 20% of the time in the nest, while the wife flies off to get some food. Here, by the Volga, the main diet of the birds of prey is fish, which the sun helps them hunt. When flying over the river, the eagle takes such a position relative to the light source that it can see the shine of its scales reflecting the sun's rays from afar.

Eagles are the largest birds of prey in Russia. In the 20th century, their numbers seriously declined and eagles were listed in the Red Book.

KIRILL LITVINOV

A SPECIAL REGIME AROUND AN EXTENDED PRODUCTION FACILITY CAN HAVE A POSITIVE EFFECT ON RARE SPECIES

Having taken several photos of the eagle in the nest and above the nest, we return to the SUV and drive along the highway towards the Astrakhanskaya PS. This dirt road is used for the protection, maintenance and repair of the linear part of the oil pipeline and is not intended for public use.

It should be noted that the onshore section of the pipeline has a security zone of 25 m on both sides of the main pipe. Strict compliance with this status is monitored by all relevant CPC services.

"A special regime created for an extended production facility can have a positive effect not only on the safety of equipment, but also on representatives of rare species of nature", notes Kirill Litvinov, Deputy Director for Research at the Astrakhan Biosphere Reserve and candidate of biological sciences. "Cattle are not grazed in such areas, pesticides are not used, fire safety is monitored, and the occurrence of spontaneous dumps is excluded. This topic really deserves special scientific research".

THE BIRD PATRIARCHY

Armed with binoculars and telephoto lenses, expedition experts

discovered a significant number of so-called park species at the Astrakhanskaya PS: sparrows, wagtails, tits, rooks, swallows, and finches. The orchard and vast lawns laid out on the station's territory form a unique biocenosis for the arid area, favorable for birds that usually live in cities and parks. Here, a greenfinch appeared among the spruce branches, although not long ago this bird, which prefers coniferous trees, was a rarity for Astrakhan. Now many such trees have been planted in city parks and squares, which has attracted greenfinches. The same thing happened with the Astrakhanskaya PS.

"This is also very important for nature: the basis of the biocenosis is made up of mass species", says Kirill Litvinov. "The steppe eagle, which is currently soaring over the station, does not care whether it claws a common greenfinch or a rarer lark. If we only care about rare species, we will not preserve a stable biocenosis".

Our last photo trophy near the Astrakhanskaya PS is a wheatear bird. These birds mainly live in the mountains, but are also found in other landscapes, preferring open rocky places and quarries, of which there are many in the Astrakhan region. Wheatears are one of the exceptions of the feathered world. They have significantly more females than males, and it is the latter who enjoy the privilege of choosing a partner, accepting or rejecting her courtship.

The territory where the objects and structures of the CPC oil pipeline system are located within the Astrakhan oblast is located in the northern desert zone and covers such unique natural objects as the left bank of the Volga and the western saline dune region. This region differs significantly from typical zonal deserts, as it developed mainly on the sandy deposits of the Khvalynsk Sea, as well as on clayey salt marshes in depressions and lake basins. Bumpy, ridged and dune sands formed here.

THE ANCESTOR OF ALL TULIPS

In places where fresh water accumulates, bushes of juzgun, oleaster, tamarisk and other plants are often found. In vast saline depressions, various types of salt marshes develop, covered with a variety of halophilic vegetation – from cereals to saltworts. The physical-geographical position and climatic features of a given area determine the specific species composition of animals, many of which are subject to protection.

Along the oil pipeline route, the expedition participants are accompanied by Andrey Saprykin, CPC Engineer of Oil and Gas Pipeline Operations. His area of responsibility is 500 km – from the state border with Kazakhstan to the administrative border between Kalmykia and Stavropol Krai.

Photo: Alena Ryzhova

"We often spot hares and foxes along the route", he says. "Closer to the Volga floodplain, the chances of encountering snakes increase. But in Kalmykia, near the CPC pump stations, you can often see saigas".

Our path lies precisely towards the steppe republic. We take photos directly from the car: the animals are ready to let the car get closer than a person sneaking across open terrain. We leave the SUV, noticing the red-listed Bieberstein

ALENA RYZHOVA

tulips. Baron Friedrich August Marshal von Bieberstein (aka Fyodor Kondratievich Bieberstein) was a German traveler, zoologist and botanist who was in Russian service at the turn of the 18th–19th centuries and devoted many years to exploring Southern Russia. His services to our country were highly appreciated by Emperors Paul I and Alexander I.

In April, looking at the fields of Bieberstein tulips covered with gold, it is hard to believe that these plants are endangered. And yet, this is a rare species, included in the Red Book.

Another botanical success for the expedition participants was the Schrenk tulip. Listed in the Red Book of Russia, the flower is considered one of the ancestors of all cultivated tulip varieties. A German born in the Kharkov province, Leopold Ivanovich von Schrenk left his mark in such fields of science as botany, zoology, mineralogy, linguistics and ethnography in the 19th century. The results of his research were given great importance, so the scientist was often accompanied by Siberian Cossacks on expeditions across the steppe.

"Both types of tulips are extremely sensitive to the state of the environment,» explains Kirill Litvinov. "The fact that we're finding them here, along the pipeline, indicates a healthy ecosystem".

PHOTOGRAPHER'S ETHICS

The further from the Volga, the more deserted the landscape becomes. In the hot climate with little water, most representatives of the animal world lead a twilight life here. But we were lucky to photograph a "little dragon" on a sand dune in broad daylight – a round-headed lizard with long ears. Shooting this reptile gave rise to a discussion about the professional ethics of nature photographers. The fact is that in photos of lizards we often see them with their mouths wide open.

"This pose is defensive and means that the animal was deliberately scared", explains Alena Ryzhova. "Yes, such photographs make an impression and win prizes at exhibitions, but every naturalist knows at what cost this was done".

What other taboos exist among wildlife photographers that could fundamentally violate the unwritten code of this professional community? The question is far from idle – the authors of photos published in CPC Panorama (and many of them work at the company's production facilities) often get flora and fauna in front of the lens, and it is important to know the relevant rules.

"Firstly, you should never use a flash when photographing birds, even if there is not enough light", answers Alena Ryzhova. "Birds have very sharp vision: a flash disorients them for a long time. With such a hindrance, that can lead to mid-air injuries or predation. Secondly, you should not use electronic decoys with the voices of birds that are being photographed. This makes the birds nervous, forcing them to leave their shelters to drive away their rivals. Scientists consider the use of drones to photograph saigas to be a serious violation of ethics: steppe antelopes are easily frightened, and then, while running away, large animals can get injured or trample the babies.

With the principle of "do no harm" everything is more or less clear. But what can a naturalist do during a photo hunt to increase the chances of a good shot?

"Birds' feet are better adapted to branches than to flat ground. Together with the necessary background and lighting, I create a "ditch": I put my branch and, if necessary, remove those that contradict my concept of the shoot. If you do everything right, you won't have to wait long for the "portraited ones", Alena Ryzhova shares her secrets of mastery.

After the sand dunes, the pipeline returns to the steppe zone. After

Photo: Alena Ryzhova

standing for a while among the cereal plants, we catch gophers with our telephoto lenses. The Latin name of the species translates as "seed lover". Outwardly, gophers resemble squirrels and marmots, with which they belong to the same family. But unlike squirrels, they do not live in nests and hollows, but in burrows. Some of these shelters reach 15–20 m in length. According to scientists, the large number of gophers near the pipeline route can be explained by the fact that warm oil flows through the pipe. In the conditions of often harsh winters in the steppe regions, "heating" in the burrow will clearly not hurt the endangered rodent.

Another curious specimen in our photo collection is the great grey shrike. A small, cute bird that makes a pleasant trill, it is in fact a cruel hunter. Its Latin name is lanius excubitor translates as "guard butcher" and is based on the habits of the bird. The shrike tears its victims – mice and large insects – and impales them on the thorns of a bush, storing them there as "canned food". The problem of coexistence in the same territory with large winged predators is

solved no less effectively: each time it warns other songbirds about their attack, and the unlucky competitors are forced to migrate to other areas.

FLIGHT OVER THE HIMALAYAS

Already at dusk, near A-PS-5A, the expedition's trained eye notices a pair of demoiselle cranes in the lowland. These rare birds fly from India to nest in Kalmykia and the Astrakhan oblast. Overcoming the Himalayas, the crane wedges rise to a height of 5 km, overcoming low temperatures, lack of oxygen and the hardships of a multi-hour flight. Demoiselle cranes are the only crane species in the world that has adapted to living in arid steppes. At the same time, they will never nest in areas with environmental problems. Scientists use their extreme fastidiousness as an indicator of the health of steppe ecosystems.

Of all the objects at A-PS-5A, the evaporation ponds attracted the greatest attention of the naturalist photographer and zoologist. Before approaching them closer, they spent a long time photographing the rare flower Adonis, also called "a coal in the fire", from all sides. The Latin name of the flower, Adonis, comes from an ancient Greek myth according to which the goddess Aphrodite turned her lover into a plant with red flowers after his death. In folk medicine, Adonis, which has antibacterial properties

and increases blood clotting, is used for kidney diseases. But if the dosage is exceeded, the medicine instantly becomes poison. For example, Adonis flowers that get into prepared hay can kill a horse.

Every year, workers at A-PS-5A observe many different species of migratory birds, including pelicans. In the wild, the latter build nests near shallow seas, shallow fresh and salt lakes, and the mouths of large rivers. Though clumsy on land, pelicans are powerful fliers and swimmers. It is interesting that in heraldry, the image of a pelican is a symbol of selfless service to a cause and selfless parental love.

In the artificial reservoir of the treatment facilities we are met by plovers from the group of waders. Clean birds with short beaks tidy up their plumage. By the way, the name "plovers" (in russian: "zuyok") goes back to the junior ranks of the crew on the Pomor boats. The Russian surname Zuyev has the same origin. Decorating the coat of arms and flag of the city of Orekhovo-Zuyevo, these birds get their food from the ground, quickly moving along its surface. For the convenience of running, their paws are missing a back toe.

"In arid areas, any body of water is of great value to the inhabitants and guests of the steppe. Forces often leave migratory birds behind during long flights, and such a pond turns out to be the only salvation. Near the oil pipeline, we counted about 40 species of birds and saw several species of mammals, but they are also more difficult to detect. We noticed a wolf's bed, photographed a fox, a hare, and gophers. Wildlife comfortably coexists with the linear and site facilities of oil pipeline workers", Kirill Litvinov sums up the expedition.

Remarkable fact, of course. It turns out that by protecting its infrastructure, CPC protects both the animal and plant world. For a complete picture, these areas should be observed in other seasons and over time, as well as look at the situation in dynamics, then the collected materials can become the basis for scientific research.

Photo: Alena Ryzhova

NOVOROSSIYSK CHIMES

THE 4TH CLASSICAL MUSIC FESTIVAL "NOVOROSSIYSK CHIMES" TOOK PLACE IN THE HERO CITY OF NOVOROSSIYSK FROM AUGUST 15 TO SEPTEMBER 6, 2025, WITH THE SUPPORT OF CPC

The audience was presented with 9 concerts at various venues across the city: in the Red Square shopping center, Frunze and Lenin Komsomol parks, the Sipyagin Palace of Children and Youth Creativity, and the City Theater.

For the first time in the history of the festival, the "Night of Ballet" took place – a parade of soloists and choreographic groups of ballet schools and dance studios. The "Golden French Horn of the World" Arkadiy Shilkloper showcased his instrumental virtuosity and caused a real sensation by playing such a rare instrument as the five-meter alpine horn. The harmony of the joint performance of the maestro with the Black Sea Symphony Orchestra and, most importantly, the young performers was achieved through numerous rehearsals.

Among the works of patriotic themes performed were Pyotr Tchaikovsky's "1812" Overture, the final song "Novorossiysk, Remember!" from Oskar Feltsman's operetta "Let the Guitar Play", and other works. Another premiere of the festival was the "Black Sea Symphonietta" performed by the children's symphony orchestra. The chamber ensemble "Era Cadenza" (L.A. Gergieva Children's Art School) presented the program "Music of the Starry Sky".

The musical theme "Novorossiysk Chimes" was created by composer Dmitry Shostakovich in 1960 and became the official anthem of the hero city. The first symphonic music festival of the same name was held with the support of the Caspian Pipeline Consortium on Forumnaya Square on September 10, 2022, gathered about 3.5 thousand spectators and was such a success that it was decided to make the event annual. Year after year, the number of performers and guests of the festival is growing, the festival "Novorossiysk Chimes – 2025" was visited by over 6 thousand people.

VIDEO REPORTS "FESTIVAL JOURNAL" ARE AVAILABLE ON RUTUBE AND VK

ittipon/Shutterstock/FOTODOM

AUTHOR
VICTORIA SMIRNOVA

THE YEAR OF WORKING PROFESSIONS

SEE YOU IN ELISTA

THE SERIES OF PUBLICATIONS ABOUT SPECIALISTS OF THE EASTERN REGION IN THE YEAR OF WORKING PROFESSIONS OF THE REPUBLIC OF KAZAKHSTAN CONTINUES WITH YOUNG EMPLOYEES – PARTICIPANTS OF THE CPC-2025 SAFETY DAY

Calling the close-knit team of CPC employees a big labor family would be no exaggeration. As in any family, there are traditions, values, interests and rules. All this forms a culture of conscious behavior at work, observing the rules of labor protection and industrial safety, personal and collective responsibility, and the principles of prioritizing the life and health of the enterprise's employees.

Since 2012, the Consortium has annually held the Safety Day – a large-scale congress-competition with the participation of teams from all structural divisions and contractors from the regions where CPC is present. It is worth noting that the CPC-K team has won prizes on numerous occasions. This year, Elista is hosting the Safety Day participants, and our heroes will not feel like newcomers there.

For Vladislav Kulikov, the Electrician for servicing electrical equipment at the Atyrau PS, this will be the fifth Safety Day. Vladislav has been working at the Consortium for seven years; he transferred to the Atyrau PS last year, and before that he serviced the 220/10 kV substation at the Kurmangazy PS.

"The high-voltage substation plays an important role in the life of the PS and the entire pipeline", says Vladislav Kulikov. "It supplies energy to the "heart" of the station, the main pumping unit platform, and sets the pulse for the pumping process".

Today, Vladislav Kulikov is responsible for seven main switchgear units and several auxiliary ones located across an area of 10.48 hectares. The workday of the duty electrician begins with the acceptance of the station from the previous shift, obtaining operational information on the state of the equipment, and monitoring the operation of the components of the power supply circuit.

"After inspecting the electrical installations, we check the operation of the systems, monitor the readings of electrical measuring instruments, the temperature of the bearings and windings", explains Vladislav.

The duties of the electrician, in addition to patrolling the PS area, include monitoring the condition of the equipment, preventive inspections, eliminating minor faults, and, if necessary, preparing for repairs by a contractor.

"Our task is to ensure uninterrupted power supply in the assigned area", the specialist continues. "At the end of the working day, we make a report and hand over the shift. Experience shows that it is better not to be lazy and double-check everything before handing over, as they say, "measure seven times". A mistake could result in shutting down all of the facility's equipment or cause harm to people's health and lives, and that is absolutely unacceptable".

Safety at the Consortium's facilities is not a matter of occasional one-off measures, but a daily, systematic work based on the involvement and responsibility of all employees. Knowledge of the CPC 12+1 Life Saving Rules is a mandatory condition for all operational personnel of the station and contractors involved in its work.

VLADISLAV KULIKOV

CALLING THE CLOSE-KNIT TEAM OF CPC EMPLOYEES A BIG LABOR FAMILY WOULD BE NO EXAGGERATION

"The Safe Work Culture is not an empty phrase for us", says Vladislav Kulikov. "We constantly improve our qualifications, pass tests on knowledge of safety engineering. Large banners with instructions are placed throughout the station, the rules of HSE are always in plain sight for everyone".

He considers his profession to be hereditary, passed down through a generation:

"My grandfather was also an electrician, I remember how we repaired kettles, irons, and disassembled flashlights together. I liked it, and after the ninth grade I decided to go to study at the Atyrau Polytechnic College majoring in "Power Supply".

College students completed their internship at Atyrau Heat Networks JSC, where the young man was noticed and, after graduation, invited to join the company. In 2012, the young specialist moved to STARSTROI LLC, an organization that then carried out technical maintenance of CPC production facilities, including in Kazakhstan. Vladislav serviced electrical equipment at the Tengiz PS, then, as part of the emergency response center (ERC), he was engaged in the electrical work of the linear section of the oil pipeline. In 2013, he got a job at the Atyrau Oil Refinery.

"I worked at the Atyrau Oil Refinery for five years, while keeping an eye on vacancies at CPC", says Vladislav Kulikov. "At the right moment, I sent my resume, passed the interview and was hired at the Kurmangazy PS as an electrician on duty. Later, I got the opportunity to transfer to the Atyrau PS, and I've been working here ever since".

The transfer to the Atyrau PS brought new experience: different equipment (including that installed during the implementation of the DBNP), and the station's territory is much larger than the previous one.

"Taking this opportunity, I would like to express my gratitude to my colleagues: Oleg Ivanovich Vakhmistrov and Igor Ilyich Zhukov", the specialist says. "They taught me everything, shared their experience. They continue to do this to this day, for which I am very grateful. And thanks to the entire enterprise for the strong social support. I have two small children who go to kindergarten, and the company partially compensates for the payment of the preschool institution, which is a significant help for my family".

Vladislav is a good family man, a loving husband and a caring father. He spends his free time with his family and enjoys traveling by car. He has been fond of football since his youth, and in recent months he has been paying increased attention to training in order to worthily represent his team at the CPC Safety Day.

ALWAYS IN SHAPE

Lead Instrumentation Engineer Aslan Bertleu is not new to the spotlight of the press. In April 2021, Aslan and his wife Zhadyra got married on a national holiday,

ASLAN BERTLEU

Valentine's Day, as reported by the regional newspaper Prikaspiyskaya Kommuna. And this is not his first Safety Day, but his second.

"I took part in the 2018 competitions that took place in Krasnodar", explains Aslan Turzhanuly. "By the way, that year our team took second place. The competition tasks tested physical fitness, ingenuity, technical knowledge, and the ability to provide first aid. The main goal was to test knowledge of labor protection rules and the ability to apply them in practice.

Over 15 years of work at CPC-K, Aslan has risen from an instrumentation trainee technician at the Atyrau PS to the position of Lead Engineer at the regional

ASLAN AND ZHADYRA BERTLEU

office. He has experience working as a technician for servicing instrumentation at the Tengiz PS and the Atyrau PS, then as an engineer at the Tengiz PS, and as a senior engineer in the CPC regional office in Atyrau. In 2021, having received the position of lead engineer, he headed the instrumentation service of CPC-K. With each step of the career ladder, the area of responsibility expanded.

"Currently, I supervise the work of the entire Instrumentation service of CPC-K", says Aslan Bertleu. I directly manage 27 people, these are senior engineers, engineers and instrumentation technicians, and the corresponding specialists of contractors. We must ensure the efficient and reliable operation of the instrumentation equipment of the oil pipeline system. Our task includes monitoring the operability of the instrumentation equipment, checking the correct operation of devices within the service's area of responsibility, monitoring the timely and high-quality performance of technical maintenance, interaction with contractors in this profile, and much more.

A hereditary oilman, after finishing 11th grade he entered the Almaty Institute of Energy and Communications to study Automation and Control. After graduating from the university, he returned to Atyrau, where in 2010 he continued his studies in the master's program at the Safi Utebayev Technical University of Oil and Gas. In the same year, Aslan Bertleu was hired by CPC as an intern. Consistently mastering the stages of the profession, he became a leading specialist in his field.

"I love my job", Aslan admits. "It doesn't let me stand still, it requires constant development, it always keeps me in shape. Every day I have to solve various problems, which is exciting, motivates me to self-development, acquiring new knowledge and skills. In addition, the scale of the Caspian Pipeline Consortium is impressive, and I am proud to contribute to the success of such a significant international project".

Aslan Bertleu believes that working with people is more difficult than with automation, and it's hard to disagree with that.

"There are no trifles in our business. Taking into account and preventing all possible risks, and by no means allowing any unforeseen situations, especially at new facilities is our top priority", says the Lead Engineer.

As mentioned earlier, Aslan and Zhadyra got married in 2021, and now the family has two daughters. One of the family traditions is pilaf and rassolnik soup, which dad periodically cooks, having recently added a passion for alpine skiing to his culinary hobby. Both the daughters and the mother, who works in the same office in Atyrau, are happy with the treat. Instrumentation is undoubtedly important, but HR issues will not resolve themselves. It is interesting that the union of the instrumentation specialist and the HR specialist was facilitated by... English courses.

"When we had to split into pairs in class to build dialogues, we chose each other", Aslan smiles. "And that's how we've been building our dialogue ever since".

SECRETS OF EXTENDED SUMMER

PRESERVING FRUITS AND VEGETABLES FOR THE WINTER AND MAKING JAM IS A LONG-STANDING STRONG TRADITION THAT UNITES ALL THE TERRITORIES THROUGH WHICH THE CPC OIL PIPELINE PASSES. COLLEAGUES FROM NOVOROSSIYSK AND ASTRAKHAN SHARE THEIR MOST EXOTIC RECIPES

RED PEPPER JAM WITH POPPY SEEDS AND WALNUTS

Anna_Pustynnikova/Shutterstock/FOTODOM

Administrative Support Specialist Anna Sklyanova (Novorossiysk) recommends this bright sweet and spicy jam with tea, bruschetta, hard and soft cheeses, and poultry dishes.

Use gloves when handling the pepper. Cut the pepper into rings. Place it in a saucepan. Add sugar and stir. Leave for three hours so that the pepper releases juice. Put the saucepan on low or medium heat. When the contents begin to boil, pour in finely chopped nuts and poppy seeds, stir. Pour in lemon juice and cook the jam for 20-30 minutes at a constant low boil. Let the jam cool to room temperature. Place in sterilized jars and close with lids. Store in the refrigerator.

INGREDIENTS:
pepper Caramel F1 – 500 g
sugar – 500 g
walnuts – 50 g
poppy seeds – 1–2 tbsp.
lemon juice – 1 tbsp.

QUINCE JAM WITH LEMON AND WALNUTS

Sapronova Marina/Shutterstock/FOTODOM

Senior Accountant Evgeniya Kravchenko (Novorossiysk) recommends this tart aromatic jam not only for tea, but also for duck pate as an interesting alternative to lingonberry sauce.

Peel the fuzz off the quince, wash it thoroughly, cut it into four parts, remove the core with seeds and cut each quarter crosswise into pieces 0.5 cm thick. Place it in a saucepan, fill it with water so that the water covers the quince, bring to a boil and cook until soft, from time to time immersing the floating parts of the fruit.

In a jam pot, add 4 kg of sugar and 4.5 cups of the quince broth. Bring the syrup to a boil, remove the foam and cook until clear. Put the boiled quince into the syrup. Bring to a boil, immersing the floating parts in the syrup, leave for 6–7 hours.

Bring to a boil again and do this 5 times, taking breaks of at least 6 hours. Bring to a boil again, add 2 lemons, cut into small cubes (seeds removed) and 200 g of walnuts. Boil for 5 minutes, remove from heat and leave for 24 hours. Then place the jam again on the heat and cook until ready for 15–20 minutes (the fruit should become transparent). To check readiness, pour a little syrup onto a cold flat plate, let it cool, and run a spoon through, if the track holds, the jam is done.

INGREDIENTS:
quince – 3 kg
sugar – 4 kg
lemon – 2 pcs.
walnuts – 200 g
the broth in which the quince was cooked – 4.5 cups

eNjoy Style/Shutterstock/FOTODOM

WATERMELON RIND JAM

Naturally, the aromatic, magnesium and iron-rich watermelon jam, was, of course, invented in Astrakhan. In the Central Region of CPC, many people, including executives, know the recipe, in two versions – from rinds and pulp. Thanks to this, watermelon jam is included in the menu of PS canteens.

INGREDIENTS:
watermelon rinds – 250 g
water – 2 liters
soda – 1 tbsp
sugar – 300 g

PS-2 Manager Alexander Pashko recommends the recipe from Olga Kokoz, PS canteen chef -to make jam from watermelon rinds. The outer green part is cut off the rinds, the rest is cut into small cubes and boiled for 10 minutes in a deep container with water and soda. Then the solution is drained, the pan is filled again with water with sugar, and the watermelon cubes are boiled until transparent. After this, lemon juice is squeezed into the mixture. When cooled, the jam resembles candied fruit, such "canned summer" is stored for a long time, provided that the jars are sterilized.

The recipe for watermelon rind jam from the Deputy Manager of the Astrakhanskaya PS Viktor Antsupov is different in that soda is not added during the cooking process. Instead, cut cubes with a side of 1 cm are covered with sugar and kept in this form for 12 hours. After that, the cubes are boiled for 3-4 cycles for 15 minutes, in the last cycle, 5 minutes before readiness, lemon slices are added to the mixture.

natashamam/Shutterstock/FOTODOM

cooled, after which it is boiled for another 15 minutes and cooled once again. These cycles can be repeated until the desired consistency is achieved. At the final stage (5 minutes before readiness), it is important not only to squeeze out the lemon juice, but also to add the grated zest. There is also a version with the addition of pieces of fresh fruit to the watermelon syrup – for example, pears or nectarines. The preparation process is almost the same, only after infusing the watermelon pulp with sugar, it is rubbed through a sieve.

WATERMELON JAM

To resist the temptation of eating all the watermelon flesh at once requires willpower, and those who have it can make jam not only from the rinds, but also from the pulp, following the recipe of the PS-2 canteen chef Olga Kokoz. The watermelon pulp separated from the rind is covered with sugar and infused for 2 hours until juice is formed. Then it is boiled for 30 minutes on low heat, completely cooled and boiled for another 30 minutes, after which the juice of half a lemon is added. Jam from watermelon pulp resembles honey or jelly in consistency, and the taste is the charm of the past summer. It is stored in glass jars in the refrigerator and is especially pleasing on winter evenings.

INGREDIENTS:
watermelon pulp – 1.5 kg
sugar – 1 kg
lemon – 0.5 pcs.

In his recipe for watermelon pulp jam, Viktor Antsupov, Deputy Manager of the Astrakhanskaya PS, recommends removing the seeds and specifies the size of the cubes as 2 cm along the edge. 2 kg of such cubes should be covered with sugar (750 g) and left for 2 hours. The released juice is poured into a saucepan with the addition of sugar (750 g) and brought to a boil. Watermelon cubes are added to the hot syrup and boiled for 15 minutes, skimming off the foam. Then the jam is completely dissolved. After this, the mixture is brought to a boil and cooked for 25-30 minutes, skimming off the foam. After complete cooling, the jam must be brought to a boil again and cooked for 15 minutes. Vanillin is added 5 minutes before readiness.

MELON JAM

Melon jam is considered a five-minute recipe, but preparation, according to Viktor Antsupov's method, takes several hours. Melon pulp, without peel and seeds, is cut into cubes with a side of 1.5 cm, covered with sugar and infused until juice is released, in which the sugar is completely

INGREDIENTS:
melon – 1.5 kg
sugar – 800 g
vanillin – 10 g

ROSE PETAL JAM

The most glamorous jam was invented in France in the 15th century, but Novorossiysk has its own original recipe – without boiling. Rose petals are laid out in an enamel bowl, covered with sugar and poured with lemon juice. The mixture is infused for 6-8 hours with periodic stirring, then whipped with a blender until smooth. "Paradise jam", rich in many elements of the periodic table, should be stored in sterilized jars in the refrigerator – recommends the newspaper "Novorossiysky worker" (2024),

INGREDIENTS:
rose petals – 100 g
sugar – 500 g
lemon – 1 pcs.

Julia-Bogdanova/Shutterstock/FOTODOM

FIG JAM WITH HAZELNUTS

In the Glebovsky rural district, they know the secret of a tonic jam rich in potassium and iron.

Lyudmila Mikhailovskaya/Shutterstock/FOTODOM

Figs are sprinkled with sugar and left overnight, the released juice should cover the fruit completely. Add 0.5 liters of water, put the mixture on the stove, bring to a boil and completely dissolve the sugar. After boiling, cook for 15 minutes, then add peeled hazelnuts. Cook for another 15 minutes on low heat, then cool for 5-6 hours. After this, repeat the boiling cycle, then add sliced lemon without seeds and zest to avoid bitterness. With the addition of lemon, cook for another 20 minutes until ready, then pour into sterilized jars and roll up the lids – recommends Anziv Levonyan, resident of Yantar gardening cooperative.

INGREDIENTS:
figs – 5 kg
sugar – 5 kg
hazelnuts – 1 kg
water – 0.5 liters
lemon – 1 pcs.

WALNUT JAM

Green walnuts are rich in iodine and vitamins, preparing this jam is not easy, but the result is worth the effort, says Karina Kocharyan from the Yantar gardening cooperative. Peeled nuts are soaked in cold water for 4 days, changing it in the morning and evening. On the fourth day, the water should become lighter. The extracted nuts are placed in a lime solution (1 liter), previously strained through a sieve, for 3-4 hours. The nuts, hardened in this way, are washed with cold water and pierced with a needle. They are then left in cold water for another 2 hours. To prepare the syrup, 2 kg of sugar and 2 liters of water are brought to a boil in a saucepan over maximum heat, after which the nuts are immersed in the solution. The mixture is cooked over medium heat for 5-6 hours, after which citric acid, cardamom, cinnamon and cloves are added. Cooking continues for another 1 hour, then the jam is completely cooled and then cooked for 1.5 hours, after which it is placed in sterilized jars and sealed with lids.

INGREDIENTS:
green walnuts – 100 pcs.
water – 3 liters
sugar – 2 kg
citric acid – 0.5 tbsp.
ground cardamom – 2 tbsp.
ground cinnamon – 2 tbsp.
cloves – 10 pcs.
slaked lime – 2 tbsp.

KarinaKlachuk/Shutterstock/FOTODOM

AUTHOR **DMITRY KONSTANTINOV**

SUBSEA FLIGHT

2022. “LADY, LADY, WHAT’S DOWN THERE?!” — INTRIGUED TOURISTS ASK FROM THE DECK. “NOTHING. JUST PHOTOGRAPHERS”, COMES THE DRY, DISAPPOINTED REPLY... THIS IS HOW A NEW CHAPTER BEGAN IN THE LIFE OF THE LEAD SPECIALIST, ACCOUNTS PAYABLE, FINANCE, CPC-R. BY THE 2025 SEASON, YULIA LAVROVA HAD PADI ADVANCED, DEEP DIVER AND RESCUE DIVING CERTIFICATES. IF WE ALREADY KNOW EVERYTHING OR ALMOST EVERYTHING ABOUT MOUNTAINEERING, THANKS TO THE ENTHUSIASM OF OUR COLLEAGUES, THEN DIVING AS THE ANTITHESIS OF CONQUERING MOUNTAIN PEAKS HAS NOT YET BEEN STUDIED MUCH BY THE EDITORS. TAKING THIS OPPORTUNITY, WE WILL TRY TO FILL IN THE GAPS

Yulia, congratulations on reaching new depths in your mastery! Please tell us how you came to this hobby.

Thanks to my trips to Egypt. Before my first trip in 2005, I hadn’t done any diving at all.

Was there some kind of phobia?

No, I just never had the opportunity. I don’t like fresh water: it often has a lot of murk, small algae. In the sea, it’s a completely different matter. And it was in Egypt that I discovered diving, first at the snorkeling level (mask, snorkel, fins), then tourist trips with scuba gear, and then it came to certification.

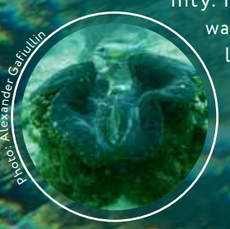


Photo: Alexander Gafiullin

What are the differences between the certification levels in diving?

KA classic tourist dive takes place at a depth of 8-10 m. You are taken on an excursion to the open sea, immersed in the company of an instructor and a photographer, and instead of the opportunity to enjoy the wonders of the marine world, you are asked to pose for the photographer for the allotted 10 minutes.

The final disappointment came in 2022 during yet another underwater excursion, when the instructor asked, “Why don’t you have a certificate?” and that question became the spark for a new goal. Underwater, at the tourist level, I feel quite confident, but for greater depths I decided that as an “honest person” I should somehow “legitimize” my further dives. By the next vacation, I tried to complete training and pass the exam for an entry-level certificate. But I never thought I would go deeper and deeper! The first level in amateur diving is Open Water, which allows diving to a depth of 18 m. The next step is Advanced Open Water, which allows diving to a depth of 30 m. To dive to a depth of 40 m, you can get the Deep Diver level. Even deeper is already considered technical diving. In addition to the above, I received a Rescue certificate.

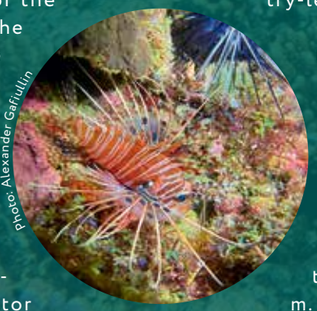


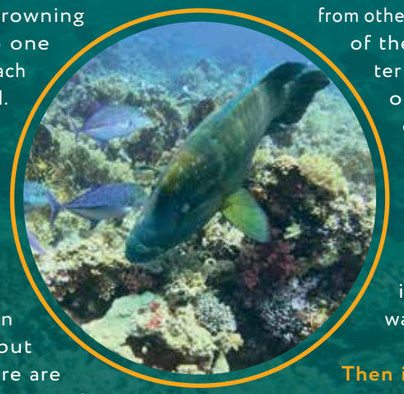
Photo: Alexander Gafiullin

Can this be called an additional profession?

Yes, if you get a Divemaster certificate. But I don’t have that goal for now. The current level already provides a very useful skill. By the way, our Red Cross training program for preparing employees to provide first aid is very much in tune with the Rescue level in practice: real training at sea to save a so-called panicked diver.

In our first aid classes, we were told that if you feel someone is more likely to drown you than let you pull them out, you shouldn’t provide such assistance. Do rescue divers have the same rules?

When I was going through this level, I remembered a drowning person, whom no one around me on the beach or in the sea noticed. It was a few years ago in the Baltic during a storm. At that moment I realized that no one would help except me. I really love the waves, swimming in them, jumping, but unfortunately, there are people who do not assess the risks and swim far enough for their level of training. Swimming up to this drowning girl, trying to take her “in tow” underwater, I realized that the risk of drowning together was very high. But everything worked out. I hope she remembers this experience!



When I was completing the Rescue level, I realized what the main mistakes are when rescuing drowning people. The Red Cross training that is held at CPC also allows you to assess where you have failed. But the Rescue certificate also has its differences, for example, the topic of burns from sea creatures and recommendations on how to deal with them.

A jellyfish sting isn’t that immediately a second-degree burn with blisters, or can it somehow be prevented, for example, with cold water?

It’s more complicated: there are different types of jellyfish, and a sting can even be fatal. The severity of the body’s reaction is what matters. If this happened in the Black Sea, it’s one thing, but if it happened on the Australian coast, it’s a completely different matter. In addition, it’s not just a jellyfish sting — it can also be a sting from other inhabitants of the underwater world. One of the recommendations: jellyfish stings are washed with their own habitat — sea water.

Then it is logical to move on to methods of protecting a diver from underwater dangers. In the movies they show knives with a foot mount, but are there any other special means to, for example, protect yourself from sharks?

The so-called underwater knife is a mandatory equipment item. Do you think it will save you from sharks? That’s only in the movies. The basis of underwater safety, according to diving rules, is to not touch anything or anyone, not to feed anyone, and to avoid situations that could lead to injury. Even minor damage to the skin underwater can have dangerous consequences: blood attracts predators. First of all, study the diving area — this is already a step towards safety.

Have you had any sharks or dangerous situations in your practice?

A year ago I encountered a 10-meter whale shark, but it poses no danger to humans. This year I managed to see a whitetip shark in person. There was also an incident when I didn’t feel the current, turned around and was hit by a reef. The suit protected me, but I still got injured, albeit minor, but it required long-term treatment.

What is the main danger for a diver in the water: equipment failure, predators, currents or

Photo: Alexander Gafiullin

human error, i.e. behavioral errors?
I believe it's currents. They appear suddenly and can drag you down, prevent you from surfacing, or hit you on reefs. Divers are provided with maps of currents in dive sites, where areas are marked where it is strictly forbidden to be present.

Photos from your underwater swims. How are they taken?
With GoPro cameras, Series 10 and 13. These are used in the mountains on skis, and on bike rides, and underwater. For underwater shooting, a special protective box is needed. In addition, I use a selfie stick.

What pressure is this box designed for?
In my experience, it can withstand up to 40 m.

Recently a video appeared where a phone in a waterproof bag falls into the water from a SUP and records a crab at a depth of 10 meters. Have you also tried filming various shorts and reels with your phone while diving and then sending them to your friends and subscribers?

Unfortunately, I am not a "social media" person. But theoretically it is possible. You can take photos and videos with your phone even deeper, but 10 m is definitely the limit for sending a signal.

When did you get your first aqualung?
Now in Egypt security measures have been tightened and the rule "one instructor – one diver" is in effect, but it used to be a little different. So, in 2005, we were taken out as tourists on a boat to the open sea, they gave me an aqualung and said: "You will be the first".

Without any preparation?
Without any. Immediately, an image from a school textbook came to mind: the water's surface above, and beneath it an entire encyclopedia! And when I dove, the impressions were boundless. Euphoria from the feeling of lightness, freedom, I wanted to swim forward, up, down, right, left, and all at once! And there was so much interesting around! I saw a huge Napoleon fish very close and wanted to hug it with joy.

Did you hug?
No, my intuition told me it was better not to do this.

Let's get back to the certificates. Was it difficult? Who issues the certificates?
Diving certificates are issued by several associations. The most popular is PADI. To obtain such a certificate, you need to study and pass the theory on the PADI website, as well as undergo practical training in a certified center. There are such centers in Moscow, you undergo practical training in the pool. Personally, I passed the theoretical exam on the website and received certificates already at the place of my vacation in Egypt, combining the pleasant with the useful. In addition, I was lucky: I had good instructors who know all the features of the local underwater world, recommend places and guides for diving, and in some cases even persistently do not advise, evaluating my experience.

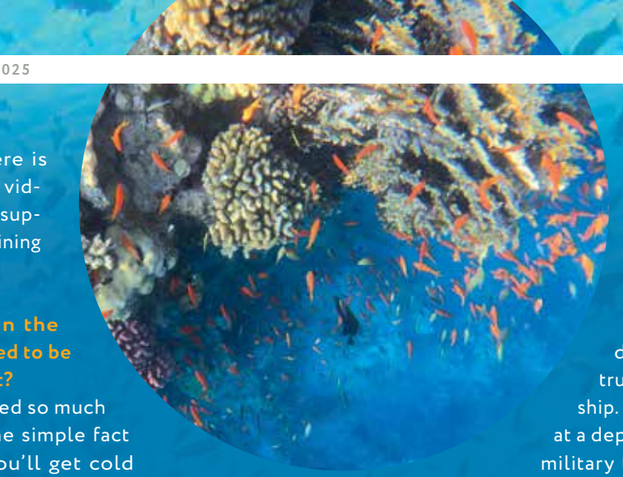
photo: Alexander Gafiullin

What are the basics of the theory?
First of all, you need to learn the basics of underwater communication. Imagine the following picture: your eyes and nose are completely covered by a mask, you can only breathe through a regulator in your mouth, and you need to tell your buddy that there is a dangerous current somewhere here, or you are low on air and it is time to go back, or there is a shark nearby. There is a generally accepted system of signs and gestures. They are given both by the instructor, showing (for example, that you need to surface or "attention, danger"), and by the divers themselves, using gestures to indicate the problem that has arisen (a leg is cramped, ears are blocked, etc.). You also need to learn how to put on and take off equipment correctly, including underwater, use scuba gear in order to breathe and

swim correctly. There is special literature and video courses. All this is supported by practical training in the pool.

Is a suit required in the Red Sea? It's supposed to be tropical there, isn't it?
A wetsuit isn't required so much by the rules as by the simple fact that without one you'll get cold underwater even in Egypt. Heat loss occurs underwater. The colder the water, the thicker the wetsuit. For the tropics, this is a "wet" suit with a neoprene shell thickness of 3-5 mm. If these are northern, cold seas or winter diving, then a dry wetsuit is needed.

Are there any health contraindications to diving?
At the very least, it is not advisable to dive with a cold. As you dive, you need to periodically equalize the pressure, and a stuffy nose or ears will not allow you to do this.



Do you prefer to dive only in the Red Sea or are you considering other locations in the future?
I periodically monitor other locations, ask fellow divers, watch specialized channels on the Internet to understand the global picture and use all this when planning my next vacation. But I have not changed my beliefs yet: diving in the Red Sea has no worthy alternative. This is a unique concentrate of bright colors, spectacle, comfortable conditions and opportunities. Here are the coral reefs near Tiran Island, and sunken ships in Sharm el-Sheikh, and the Ras Mohammed Nature Reserve, and the vertical karst cave Blue Hall in Dahab.

Did you manage to visit the Blue Halll?
In 2020, the film "One Breath" was released about Natalia Molchanova, who dived into the Blue Hall in 2005 and swam past the underwater arch at a depth of 52 m. The idea to dive in the famous "cemetery of divers" arose at the certification stage. Another dream also recently came true – to descend to a sunken ship. It was the Thistlegorm, lying at a depth of 35 meters – a British military transport sunk by German bombers in October 1941, three miles from the coast near Sharm el-Sheikh. Until recently, diving in the Thistlegorm was prohibited, but now the ship has finally been cleared of mines and divers from all over the world are actively exploring it.

Do you have any records or life hacks developed through experience?
There is some improvement in buoyancy skills, underwater breathing, and body control. All this together reduces air consumption, so you can watch the underwater world longer. There is also a life hack for beginners: to prevent the mask from fogging, it is enough to treat the glass with a soap solution or warm it up with a lighter.

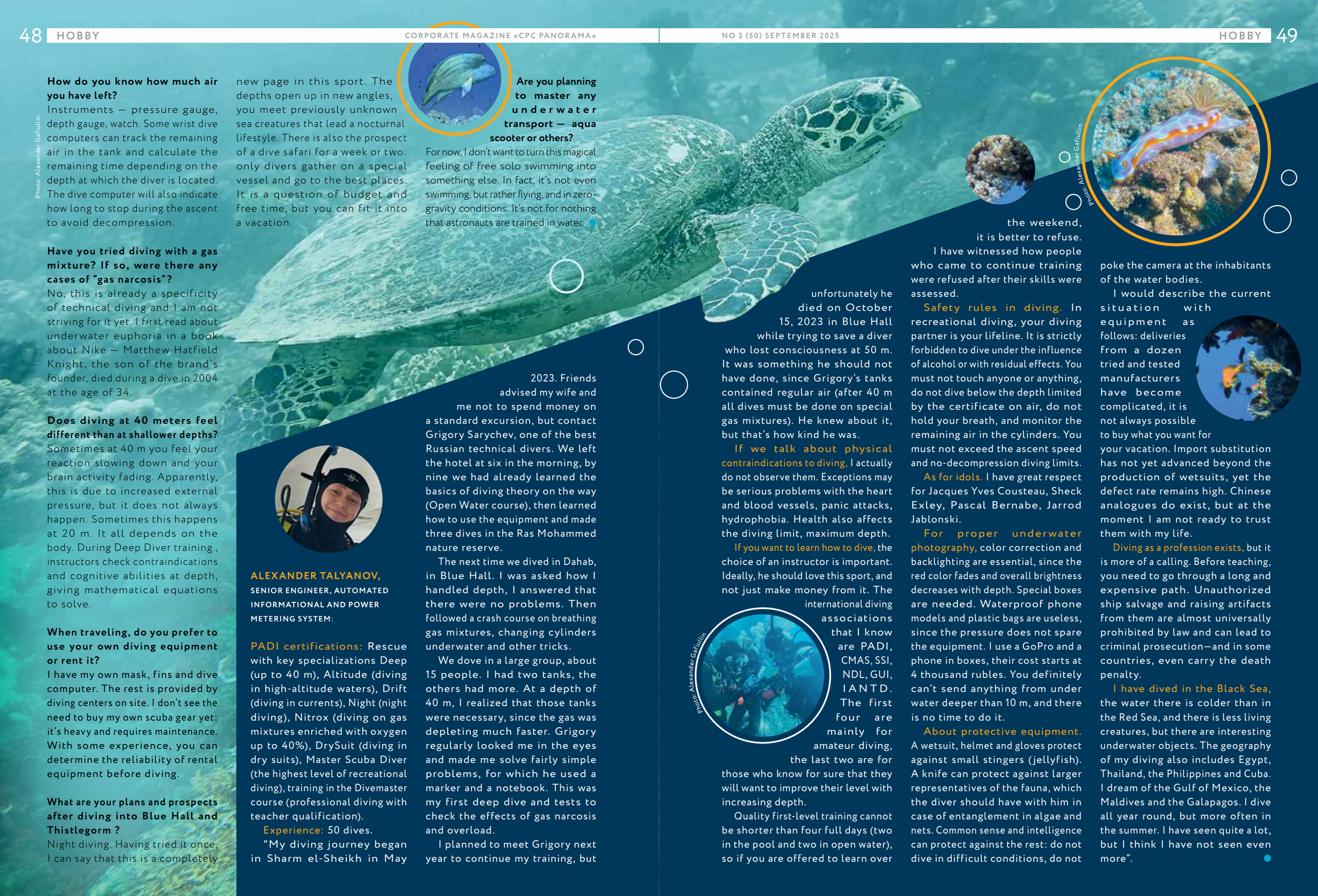


Photo: Alexander Gafiullin

How do you know how much air you have left?

Instruments — pressure gauge, depth gauge, watch. Some wrist dive computers can track the remaining air in the tank and calculate the remaining time depending on the depth at which the diver is located. The dive computer will also indicate how long to stop during the ascent to avoid decompression.

Have you tried diving with a gas mixture? If so, were there any cases of "gas narcosis"?

No, this is already a specificity of technical diving and I am not striving for it yet. I first read about underwater euphoria in a book about Nike — Matthew Hatfield Knight, the son of the brand's founder, died during a dive in 2004 at the age of 34.

Does diving at 40 meters feel different than at shallower depths?

Sometimes at 40 m you feel your reaction slowing down and your brain activity fading. Apparently, this is due to increased external pressure, but it does not always happen. Sometimes this happens at 20 m. It all depends on the body. During Deep Diver training , instructors check contraindications and cognitive abilities at depth, giving mathematical equations to solve.

When traveling, do you prefer to use your own diving equipment or rent it?

I have my own mask, fins and dive computer. The rest is provided by diving centers on site. I don't see the need to buy my own scuba gear yet: it's heavy and requires maintenance. With some experience, you can determine the reliability of rental equipment before diving.

What are your plans and prospects after diving into Blue Hall and Thistlegorm ?

Night diving. Having tried it once, I can say that this is a completely new page in this sport. The depths open up in new angles, you meet previously unknown sea creatures that lead a nocturnal lifestyle. There is also the prospect of a dive safari for a week or two: only divers gather on a special vessel and go to the best places. It is a question of budget and free time, but you can fit it into a vacation.

Are you planning to master any underwater transport — aqua scooter or others?

For now, I don't want to turn this magical feeling of free solo swimming into something else. In fact, it's not even swimming, but rather flying, and in zero-gravity conditions. It's not for nothing that astronauts are trained in water.

ALEXANDER TALYANOV,
SENIOR ENGINEER, AUTOMATED INFORMATIONAL AND POWER METERING SYSTEM:

PADI certifications: Rescue with key specializations Deep (up to 40 m), Altitude (diving in high-altitude waters), Drift (diving in currents), Night (night diving), Nitrox (diving on gas mixtures enriched with oxygen up to 40%), DrySuit (diving in dry suits), Master Scuba Diver (the highest level of recreational diving), training in the Divemaster course (professional diving with teacher qualification).

Experience: 50 dives.

"My diving journey began in Sharm el-Sheikh in May 2023. Friends advised my wife and me not to spend money on a standard excursion, but contact Grigory Sarychev, one of the best Russian technical divers. We left the hotel at six in the morning, by nine we had already learned the basics of diving theory on the way (Open Water course), then learned how to use the equipment and made three dives in the Ras Mohammed nature reserve.

The next time we dived in Dahab, in Blue Hall. I was asked how I handled depth, I answered that there were no problems. Then followed a crash course on breathing gas mixtures, changing cylinders underwater and other tricks.

We dove in a large group, about 15 people. I had two tanks, the others had more. At a depth of 40 m, I realized that those tanks were necessary, since the gas was depleting much faster. Grigory regularly looked me in the eyes and made me solve fairly simple problems, for which he used a marker and a notebook. This was my first deep dive and tests to check the effects of gas narcosis and overload.

I planned to meet Grigory next year to continue my training, but unfortunately he died on October 15, 2023 in Blue Hall while trying to save a diver who lost consciousness at 50 m. It was something he should not have done, since Grigory's tanks contained regular air (after 40 m all dives must be done on special gas mixtures). He knew about it, but that's how kind he was.

If we talk about physical contraindications to diving, I actually do not observe them. Exceptions may be serious problems with the heart and blood vessels, panic attacks, hydrophobia. Health also affects the diving limit, maximum depth.

If you want to learn how to dive, the choice of an instructor is important. Ideally, he should love this sport, and not just make money from it. The international diving associations that I know are PADI, CMAS, SSI, NDL, GUI, IANTD. The first four are mainly for amateur diving, the last two are for those who know for sure that they will want to improve their level with increasing depth.

Photo: Alexander Gafiullin

Quality first-level training cannot be shorter than four full days (two in the pool and two in open water), so if you are offered to learn over the weekend, it is better to refuse.

I have witnessed how people who came to continue training were refused after their skills were assessed.

Safety rules in diving. In recreational diving, your diving partner is your lifeline. It is strictly forbidden to dive under the influence of alcohol or with residual effects. You must not touch anyone or anything, do not dive below the depth limited by the certificate on air, do not hold your breath, and monitor the remaining air in the cylinders. You must not exceed the ascent speed and no-decompression diving limits.

As for idols. I have great respect for Jacques Yves Cousteau, Sheck Exley, Pascal Bernabe, Jarrod Jablonski.

For proper underwater photography, color correction and backlighting are essential, since the red color fades and overall brightness decreases with depth. Special boxes are needed. Waterproof phone models and plastic bags are useless, since the pressure does not spare the equipment. I use a GoPro and a phone in boxes, their cost starts at 4 thousand rubles. You definitely can't send anything from under water deeper than 10 m, and there is no time to do it.

About protective equipment. A wetsuit, helmet and gloves protect against small stingers (jellyfish). A knife can protect against larger representatives of the fauna, which the diver should have with him in case of entanglement in algae and nets. Common sense and intelligence can protect against the rest: do not dive in difficult conditions, do not poke the camera at the inhabitants of the water bodies.

Photo: Alexander Gafiullin

I would describe the current situation with equipment as follows: deliveries from a dozen tried and tested manufacturers have become complicated, it is not always possible to buy what you want for your vacation. Import substitution has not yet advanced beyond the production of wetsuits, yet the defect rate remains high. Chinese analogues do exist, but at the moment I am not ready to trust them with my life.

Diving as a profession exists, but it is more of a calling. Before teaching, you need to go through a long and expensive path. Unauthorized ship salvage and raising artifacts from them are almost universally prohibited by law and can lead to criminal prosecution—and in some countries, even carry the death penalty.

I have dived in the Black Sea, the water there is colder than in the Red Sea, and there is less living creatures, but there are interesting underwater objects. The geography of my diving also includes Egypt, Thailand, the Philippines and Cuba. I dream of the Gulf of Mexico, the Maldives and the Galapagos. I dive all year round, but more often in the summer. I have seen quite a lot, but I think I have not seen even more".

TIME TESTED


ОБРАТНАЯ СВЯЗЬ

КТК-К

Работая над выпуском этого издания, мы обратились к вам, его будущим читателям, с вопросом: «Какого бы вы хотели видеть корпоративный журнал?» Ответы — самые разные. Но главное пожелание мы хотим сделать общим: ИНТЕРЕСНО! Это же, будем стараться...

Акмарал Айтуарова, Жанна Жаналиева и Алмагуль Кемелова, г. Атырау:

Дмитрий Богданов, Москва:

Александр Барков, Москва:

Анна Варенцева, Москва:

Аишат Текеева, Москва:

май 2013 Панорама КТК | 21

www.cpc.ru

IN MAY 2013, THE FIRST ISSUE OF CPC PANORAMA MAGAZINE WAS PUBLISHED. IN IT, THE COMPANY'S EMPLOYEES, AMONG OTHER THINGS, SHARED THEIR "STARTING WISHES" FOR THE PUBLICATION. TWELVE YEARS LATER, AS THE EDITORIAL TEAM PREPARED THE 50TH ISSUE, THEY SOUGHT TO LEARN FROM THOSE SAME COLLEAGUES HOW FAR THEIR EXPECTATIONS HAD BEEN MET

AKMARAL AITUAROVA, LEAD TAX SPECIALIST, CPC-K:

Yes, time flies, but I am glad that I can refresh my memory of events by leafing through the issues of CPC Panorama. It is good that special issues are published dedicated to such important historical milestones as the 80th anniversary of the Victory and the Expansion Project. I do not know if a special issue dedicated to the DBNP is planned, but I would be interested to read it.

ZHANNA ZHANALYEVA, SPECIALIST, FINANCE REPORTING AND ANALYSIS, CPC-K:

The expectation of learning more about colleagues from different regions along the pipeline route has been fully met. What interesting people work at CPC, how many talents, hobbies, valuable experience! It is a pity that printed issues are not delivered to Kazakhstan in the required volume, but I hope that the situation will improve.

ALMAGUL KEMALOVA, CHIEF TAX SPECIALIST, CPC-K:

We must give credit to the editors, they are noticeably trying to expand both the range of topics and the geographical coverage of the magazine. I would like this trend to continue, that colleagues from all regions of the Consortium's presence more actively share production achievements, ideas, rationalization proposals, creativity. It is important to always remember that this is a corporate magazine of the entire Consortium. And it is also important to maintain the "effect of presence" — photo reports from production and charity sites, lively dialogue with specialists and local residents. Only in this way will the magazine be interesting and in demand.

New Africa/Shutterstock/FOTODOM

DMITRY BOGDANOV, SENIOR TRANSLATOR, CPC-R:

All these years, I have always read our corporate magazine with interest. I can especially note the publications dedicated to our employees, their hobbies, and travels. You learn a lot of interesting things about people you know. I also like the information about the history of the creation and development of pipeline transport and the most interesting projects in this area implemented in our country and in the world. I cannot help but mention the special issue of the magazine dedicated to the 80th anniversary of the Victory in the Great Patriotic War. I read all the articles with interest and particularly enjoyed the wartime photographs.

ALEXANDER BARKOV, SPECIALIST LABOR MANAGEMENT AND PAYROLL, CPC-R:

It is hard to describe the evolution of the magazine in a few words over these 50 issues: the path taken by its creative collective is enormous! And that is encouraging: the magazine lives in the general rhythm of the entire CPC, evolves, responds to the challenges of the time. It is gratifying that each issue contains several pages for personal topics: the creativity of the employees, travels, something unusual. But my favorite section of the magazine is "Through the lens of history".

The special issue for the 80th anniversary of the Victory turned out to be very interesting. I would like to see more materials in the Science section on the pages of future issues. Our Consortium was and remains an advanced enterprise, searching for and implementing the most modern technologies in its activities. And coverage of this area of work seems interesting and important to me. And yet, CPC still has no anthem.

ANNA VARENTSEVA, LEAD ENGINEER, SOURCE AND PERMITTING DOCUMENTATION, CPC-R:

I have been working in the company for 15 years — this is a long period during which a young specialist goes from a beginner to an experienced employee, acquiring a wealth of useful knowledge, becoming an expert in his field. The corporate magazine CPC Panorama has gone through a similar path: I have witnessed its birth and the evolution of its development. The articles in the magazine have always been interesting, but over the years its content has become more diverse, the disclosure is deeper.

In the first issue of the corporate publication #1/2013, among the wishes of colleagues, I noted that it would be interesting to learn more about the development of pipeline transport, about the history of the places where the CPC route passes. I am grateful that this proposal was accepted and each issue of CPC Panorama contains articles dedicated to history.

Of all the issues, I would especially like to note the Special Issue for the 80th Anniversary of Victory. There will never be enough information about the Great Patriotic War: each event from the 1418 days of the war is worthy of detailed coverage and memory. The Special Issue contains interesting archival facts, photographs, and recollections. I was especially interested in the articles "Operation Children" about the partisan movement and saving children and "On the Threshold of Victory" about the laying of the first military main pipeline right during military operations. This Special Issue has taken a worthy place among the carefully kept books in my home library.

Also, in each issue, in addition to current information about the life of CPC, it is very pleasant to read about the hobbies and sports interests of employees, notes from travels, articles about family traditions, including the creation of new families among our colleagues.

CPC Panorama is not just pages and letters, it is a living chronicle of our company, a reliable bridge between all employees. I wish the magazine to remain as interesting, popular, modern and bright! And to the editorial team — creative ideas and lots and lots of inspiration!

AISHAT TEKEYEVA:

CPC Panorama is my window into the work I love. Several times a year, my colleagues pass along to me, while I am on maternity leave, the issues of the magazine that have accumulated, and I read them with great pleasure. It is very pleasant to read about both the production successes of colleagues and their hobbies, travels, achievements and dreams that came true. And I, as a reader, am pleased with our magazine, but I hope that the most interesting publications are yet to come! ●

AUTHOR
DMITRY KONSTANTINOV

ORIGIN OF ANCHORS

NOBEL LAUREATE AND ROMANTIC MARINE ENTHUSIAST JOSEPH RUDYARD KIPLING BELIEVED THAT THE BIBLICAL NOAH (BORN 2970 BC) WAS THE INVENTOR OF THE FIRST PONTOON. NEW REMNANTS OF NOAH'S ARK ARE DISCOVERED ALMOST ANNUALLY, AND ALWAYS WITH AN ANCHOR. IT SEEMS HUMANKIND DEVISED THIS BRAKING AND HOLDING MECHANISM FOR RAFTS, DUGOUTS, AND EVENTUALLY SHIPS MUCH EARLIER – RIGHT WHEN THEY FIRST VENTURED ONTO RIVERS AND SEAS IN SEARCH OF FOOD AND, ACCORDING TO KIPLING ONCE MORE, TO EXPAND THE MAP OF THEIR DOMINIONS

Read the full version of the article on the CPC Panorama website:

Today, there are enough types of anchors to choose one for any specific task: stock and dead anchors, Spek anchors, clip anchors, pool anchors, admiralty anchors, caisson anchors, and many others.

According to science, the first anchors appeared around 6,000 years ago – long before the wheel was invented. Single stones, or stones in baskets or sacks, were lowered to the bottom using ropes made of vines or ox sinew, slowing or stabilizing the vessel.

Documented evidence of anchor use in Ancient Egypt dates back to around 2500 BC. The bas-reliefs of the pyramid of Pharaoh Sahure of the Old Kingdom depict ships that made the first voyage to the land of Punt (the territory of modern Somalia). These sailboats clearly show anchor stones at the bow with holes for ropes. Archaeologists have also discovered stone anchors used by Phoenician sailors on their first voyage around Africa (600 BC). For reliability, they had two holes.

In 1929, Soviet archaeologist A.Ya. Bryusov found an anchor stone with a hole during excavations at the lower reaches of the Suna River in Karelia. As later radiocarbon analysis showed, the anchor was made in 2000 BC.

On February 4, 2020, Haifa veterinarian Rafi Bahalul discovered a flat stone with Egyptian hieroglyphs carved into it while swimming in the Mediterranean Sea in the morning. The Israel Antiquities Authority determined the object to be a 3,500 years old, a trapezoidal anchor carved from an older temple slab depicting Seshat, the Egyptian goddess of literature, writing, arithmetic, and fate.

"Having secured the shaky ship with rigging and anchor,

They went out; Telemachus, following Athena, also

He came out. Turning to him, the goddess Athena said:

"Son of Odysseus, you must not be shy now," – as told in Homer's "Odyssey" (translated by V.A. Zhukovsky). The ancient Greek poet also mentions the use of anchors during the siege of Troy (1194–1184 BC) and the voyage of the Argonauts (1250 BC).

WOOD AND IRON

As Lev Skryagin writes in his "Book of Anchors" (1973), the first to use metal in anchor construction were, once again, the ancient Phoenicians. One of their routes led to the Isles of Scilly, off the southwestern tip of England. There were mines of tin there, a metal that was in great demand at that time for the production of bronze. On their ships, the Phoenicians used not anchor stones but logs of Lebanese cedar into which tin ingots were inserted like bullets into a clip. This partially solved not only the problem of anchoring, but also of braking and maneuvering ships in various currents and wind conditions. A weak current means "loading" less tin into the log, a strong one – more.

The tin logs held vessels well on sticky, silty bottoms but slipped on hard surfaces. Thus, Phoenician sailors returned to the "stone" concept with a series of improvements. Anchor stones were drilled with two holes at the top for the rope, and three more at the bottom. Wooden stakes, sharpened on both ends, were inserted into the lower holes. These anchors clung to the seabed with the protruding ends of the stakes like a cat with its claws into a roof wet from the rain.

For several centuries, sailors experimented with anchor models in which stakes were arranged crosswise, or with a single plow-like fluke that required a diver to set it, but eventually they returned to a two-sided design with flukes (below) and a stem (above), according to which the so-called Admiralty anchor used in the navy to this day is built.

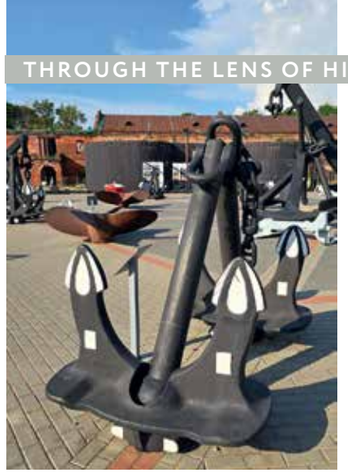
ADMIRALTY ANCHOR, 1852

In 1955, the inventor of scuba gear Jacques-Yves Cousteau disproved the previously held theory that the flukes (horns) of ancient Roman trireme anchors were cast from lead, while the rest (the shank and stock) were made of dense, water-sinking wood. The mistake lay in the fact that, instead of modern heavy anchor chains, the Romans, like all ethnic groups before them and for a long time after them, used ropes of plant origin. Therefore, it was the lead stock that ensured optimal sinking trajectory and seabed grip for the flat ancient anchors.

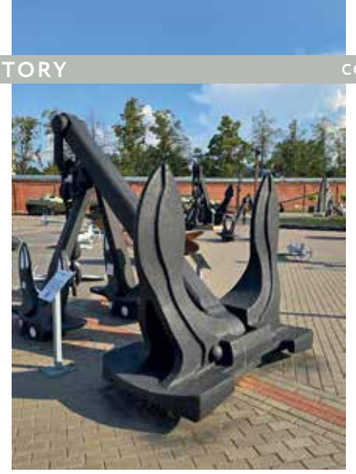
THE FIRST ANCHORS APPEARED AROUND 6,000 YEARS AGO – LONG BEFORE THE WHEEL WAS INVENTED

CLASSICS AND AVANT-GARDE

Paradoxically, all the Great Geographical Discoveries were made by sailors using a single type of anchor invented back in Ancient Rome. It was a metal anchor with a



SYKES ANCHOR, 1898



SPEK ANCHOR, 1950

GRUSON ANCHOR, 1920

wooden stock, created in the 7th century BC, with the stock rotated 90° relative to the flukes. This configuration gave the Roman anchor the most effective seabed grip.

"The anchor's design did not fundamentally change for 14 centuries", notes Lev Skryagin. The reason lay in the general state of metallurgy, which only made a significant leap in the last third of the 18th century with the onset of the First Industrial Revolution and the advent of the first steam engines.

Curiously, even in pre-Petrine times, Russian anchors forged from "swamp iron" were preferred in Europe and actively imported. The secret of swamp iron lay in the deposits of spongy brown iron ore (limonite) formed by the bacteria Gallionella ferruginea on the roots of lake and marsh vegetation. Blacksmiths of the Russian North collected this ore and smelted it in charcoal furnaces, producing iron of exceptional ductility. Even at low forging temperatures, parts fused into a solid mass, akin to gas-electric welding. The Novgorod swamp iron industries existed since the 13th century. In Karelia, with a large number of lakes and swamps, the Olonetsky factories began to be created in the 1680s, which Peter I used as a base for the production of artillery for the Northern War.

The Olonetsky factories produced anchors for the Azov flotilla and the Bering–Chirikov expeditions (1725–1742). The anchors were transported in parts by reindeer from Karelia to Kamchatka. At the final point of the route, a basic forge was set up, and the flukes were "welded" to the shank by hand hammering, with the metal preheated until it sparked.

It is believed that the strength of British anchors suffered due to the use of fuels like coal and coke in forges. The sulfur and phosphorus in these fuels made the metal less malleable and more brittle, especially at the joints. Such enthusiasts as Richard Pering (in 1813, he proposed forging anchors not from bars, but from a set of thin plates with a T-shaped fork at the junction of the horns and the spindle), William Parker (in 1840, he patented an anchor with a tenon joint between the spindle and horns), William Roger (a hollow tetrahedral spindle, small flukes, an iron stock, 1844) fought against this as best they could.

By the mid-19th century, ships flying the Union Jack were using various anchor modifications produced by dozens of manufacturers, and they sank with troubling regularity. Lloyd's insurance agency grew tired of paying out numerous claims and lobbied the Lords of the Admiralty to issue a single standard in 1852, which henceforth prescribed anchors for the Royal Navy. These anchors were forged from strips using a steam hammer that fused the mortise joints into a solid mass, the stock could be either steel or oak. The Admiralty anchor saw wide global use. In May 1959, the Soviet research vessel Vityaz set a world record for deep-sea anchoring (9600 m) using two Admiralty anchors.

Hawseholes (openings in the ship's side for the anchor) were first used by the Normans in the early Middle Ages. This was primarily because a heavy anchor swung overboard could easily smash the deck. As for the Admiralty anchor, it would not fit through any hawse hole and was tied to the side in a horizontal position, which required considerable effort, time, and special equipment.

The Second Industrial Revolution and the first open-hearth furnaces once again raised the level of world metallurgy, giving engineers the opportunity to further optimize anchor designs. In the 19th–20th centuries, development followed two main paths: eliminating the stock so that at least the shank could be retracted into the hawsehole, and creating a transformer-like anchor—flat on deck, deployable on the seabed.

The successive improvements in the hinged connection between shank and flukes by inventors Porter, Trotman, Hawkins, Martin, David, Charpentier, Smith, and others culminated in the 1888 patent issued to Sheffield native John Francis Hall.

The Hall anchor featured a bolted hinge between flukes and shank similar to that of Martin and others, but the joint was encased in a cast box, forming a single unit with the flukes. This protected the hinge from the corrosive effects of saltwater, ensuring it would not fail at a critical moment. Its manufacturing simplicity and reliability led to its rapid adoption worldwide, and it is still in use today with minor modifications, such as a pintle or ball joint instead of a bolt.

One of the few drawbacks of the Hall anchor is that it is only effective at weights over half a ton. For small vessels, that's too much, so they typically use the so-called clip anchor, invented by British engineer Griffin.

The second drawback of the Hall anchor is that sometimes its flukes don't fold when entering the hawsehole. In such cases, the anchor must be let down again until it touches the water, after which it is etched with the hinge already triggered. This problem was solved in 1950 by Dutch engineer Speksneijder. He changed the Hall anchor's center of gravity so that the flukes would always align correctly. This anchor became known as the Spek anchor.

From the time of the Hall anchor to the present day, the design of stockless retractable anchors has not fundamentally changed. The third drawback of the Hall anchor was considered to be a relatively small holding force — only 4 kg per 1 kg of its own weight. Anchors by Heine, Danforth, Matrosov, and other designers improved this to varying degrees by changing the shape of the flukes and the hinge box. For example, the Dutch "Poolanker" anchor had pyramidal, hollow flukes.

Lev Skryagin notes that, based on his observations, the most statistically dominant anchors in the global fleet are Byers anchors, manufactured since 1887 to this day. Their demand is driven by their high holding power and the reinforcing ribs along the edges of the flukes.

ROCKETS AND CAISSONS

To an impressionable and well-read person, the term "dead anchor" might evoke images of a creaky wooden pirate leg and the jingle of doubloons. In reality, this term refers to an anchor designed to hold a marine object in place for months, years, or even decades. A concrete pyramid, a steel "mushroom" buried in the sand, or the so-called "Mitchell screw" can be used for this purpose, for which the inventor received a huge sum of 2,500 pounds from the British Admiralty in 1848. Such anchors were used to secure roadstead and channel buoys, later underwater mines and floating lighthouses, and with the beginning of the development of offshore hydrocarbon deposits, "dead anchors" acquired a new task — holding production platforms.

"In 1966, a unique device was patented in the United States, dubbed by its inventors a "deepwater anchor", writes L.N. Skryagin in The Book of Anchors. "It operates on the principle of suction to the seabed and has enormous holding power despite its relatively low weight. In fact, it is not an anchor in the traditional sense but a hollow metal cylinder with a sharp bottom edge. It is covered with a heavy concrete lid on top. In addition to the anchor chain, a hose from the vessel is connected to the cylinder to pump water in and out. As the anchor lies on the seabed, water enters through its open bottom. As water is pumped out, the cylinder is pulled downward into the soil. This anchor holds as they say, dead still. To break the suction grip, water is pumped back in via the hose using compressed air or a pump".

Mass production of self-suctioning caisson-type anchors for offshore oil platforms was established in the Great Britain and Norway, countries that were actively developing North Sea oil and gas fields in the second half of the 20th century. Piles were difficult to drive deeply there due to layers of coarse gravel, so alternative solutions were needed. Research and design of such systems were conducted by the Norwegian Geotechnical Institute (NGI) and financed by 15 of the world's largest oil companies. The result was both vertical "three-cylinder" self-suctioning anchor units (in which no concrete was used) and horizontal platform-anchors with concrete tops and steel caisson-like skirts underneath.

As for the first type of installation, science has long proven that a three-legged structure is the most stable. The production of such caisson anchors is similar to pipe rolling. For example, at a factory in Sheffield, England, 30-meter-long and 6.5-meter-diameter cylinders are welded using a 33 kW electric arc, with each unit consuming 100 tons of high-carbon steel. These three-cylinder structures, joined by a central core (with anchor chain and pump hose fixtures), are transported by special vessels and lowered into the sea by floating cranes.

Since the mid-1970s, reinforced concrete slabs have been used as foundations for offshore platforms in the North Sea. The installation

HALL ANCHORS ON THE AURORA, 1900

MITCHELL ANCHOR, 1848

MATROSOV ANCHOR, 1946

MARTIN ANCHOR, 1852

time for these structures called gravity-based platforms (GBP) was significantly shorter than for pile-based ones, and their cost was lower than commissioning and transporting three-cylinder caisson anchors. The first GBP was installed at the Ekofisk field, its size corresponds to a football field. The largest gravity-based platform to date is the Troll A production complex.

It would not be entirely accurate to claim that flat, concrete-encased caisson anchors are hybrids of three-cylinder self-suctioning anchors and gravity platforms. First, the 1966 American patent already included concrete in its design. Second, the ability of a "dead anchor" to generate suction due to a void at the base was observed as early as the 19th century, if not earlier. At the turn of the 19th and 20th centuries in Russia, so-called "frog anchors" appeared, cast from concrete with a semicircular hollow, and cast-iron "segment" anchors shaped like hemispheres. In 1907, hydraulic engineer N. Sakhansky improved the segment anchor by welding a wide steel ring to the original hemisphere, increasing the anchor's "power".

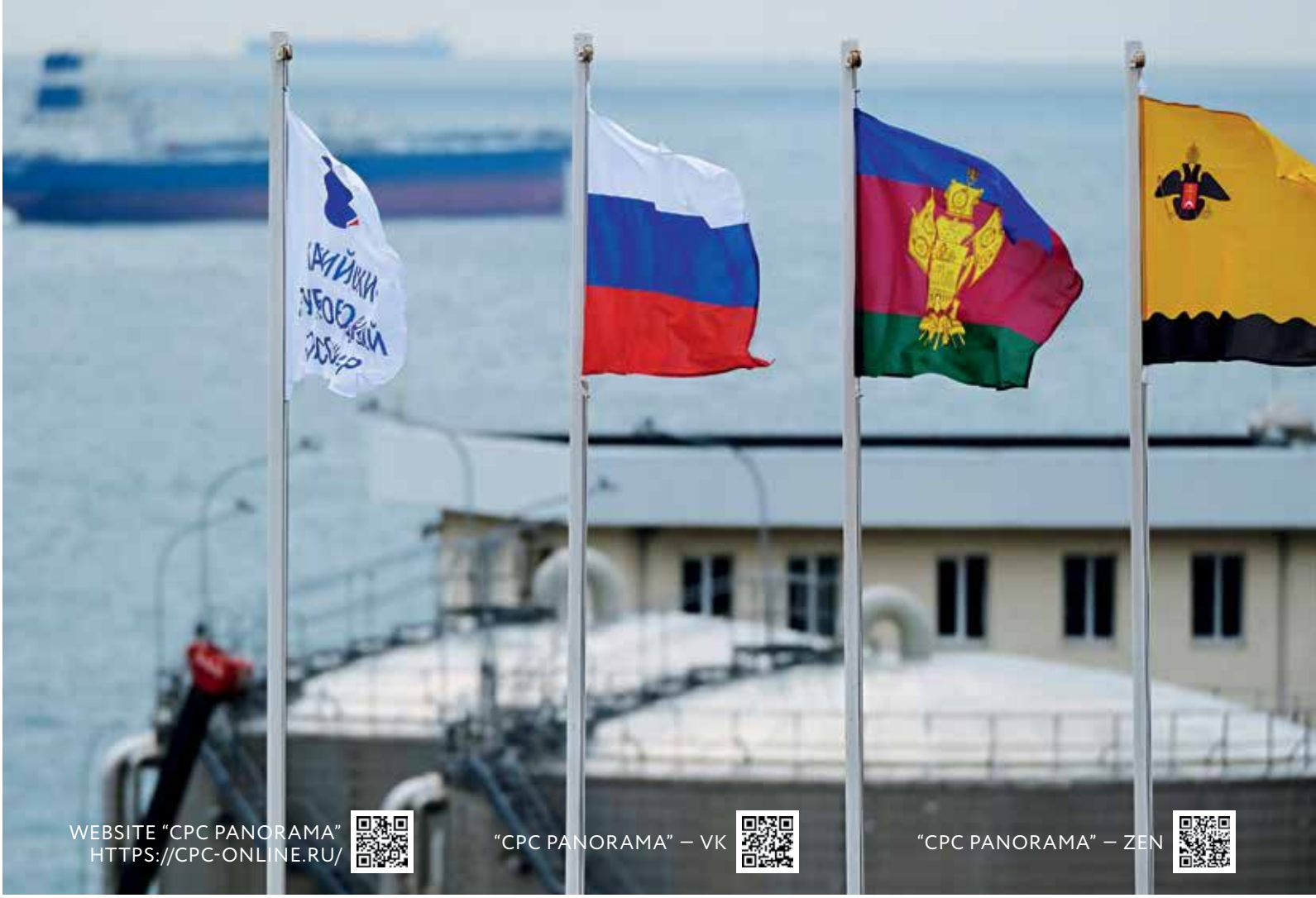
From his vantage point in 1973, Lev Skryagin also informs his descendants about another vector of development of anchor science:

"One of the most recent advancements in anchor technology is the invention of rocket anchors powered by solid fuel. Their appearance several years ago was caysed by the need to provide supertankers with a reliable mooring device in case of main engine failure near shore. The first experiments in this direction were successfully conducted in the 1960s by the US Army Corps of Engineers. A prototype rocket anchor weighing 102 kg demonstrated a holding power of more than 22 tons during testing. The rocket, built into the anchor body, would activate upon ground contact. Under this thrust, the anchor embedded itself 10 meters deep into firm soil. A second model, weighing 6.8 tons, showed a holding power of 135 tons in solid ground, that is, the same as a conventional anchor weighing 19 tons. Both rocket anchors were designed for single use: it is almost impossible to pull them out of the ground. By pressing a button, the ship's commander detonates a cartridge that separates the anchor and the anchor chain. If gigantomania continues in global tanker shipbuilding, such anchors may enter mass production and replace familiar designs".

As practice has shown, gigantomania subsided, and the rocket anchor program was discontinued. Launched in 1976, the world's largest supertanker—the 458-meter Norwegian Knock Nevis with a deadweight of 564,763 tons was too large to pass through the Panama Canal and was scrapped in 2010.

In 2002, there were 485 caisson anchors installed worldwide, at depths of up to 2 km. Twelve of them (of reinforced concrete-metal hybrid design, six caisson anchors for each of two SPMs) were used in the Black Sea by the Caspian Pipeline Consortium, which had launched operations a year earlier. These two CPC SPMs are soon to be replaced. The first stage of this process will be the installation of new caisson anchors for SPM 1 and SPM 2 in 2025. This is a labor-intensive, expensive and complex operation. We will cover the progress of its implementation in a separate report.

Even having learned all the specific marine slang – Dutch, Russian and English, having studied all of Skryagin, Guyer, Taylor and other marine experts, it will not be possible to clearly and distinctly formulate which anchor is the best in its field and why. One thing is clear: in this branch of shipbuilding, a lot has always been done and is being done so that, to quote another romantic mariner Robert Louis Stevenson, that "home is the sailor, home from sea."



CPC-R, MOSCOW OFF ICE
Bldg. 1, 7 Pavlovskaya Str.,
Moscow, 115093, Russian Federation
tel.: +7 (495) 966-50-00
fax: +7 (495) 966-52-22
e-mail: Moscow.reception@cpcpipe.ru

CPC-R, WESTERN REGION
Budennogo Str., 117/2, Krasnodar,
350000, Russian Federation
tel.: +7 (861) 216-60-00
fax: +7 (861) 216-60-90
e-mail: Krasnodar.reception@cpcpipe.ru

CPC-R, REPUB LIC OF KALMYKIYA
Suite 608, V.I. Lenina Str., 255a, Elista,
358000, Russian Federation
tel.: +7 (8512) 27-13-89
e-mail: Elista.reception@cpcpipe.ru

CPC-R, NOVOROSSIYSK
Isaeva Str., 1a, Novorossiysk,
Krasnodar Krai, 353900, Russian Federation
tel.: +7 (8617) 29-43-00
fax: +7 (8617) 29-40-09
e-mail: Novorossiysk.reception@cpcpipe.ru

CPC-R, STAVROPOL KRAI
Suite 208, Ryleeva Str., 7, Stavropol,
355000, Russian Federation
tel.: +7 (861) 216-60-00
e-mail: Krasnodar.reception@cpcpipe.ru

CPC-K, EASTERN REGION
Business center «Grand Asia»,
Abilkhair Khan Ave., 92b, Atyrau, 060097,
Kazakhstan
tel.:+7 (7122) 76-15-00, 76-15-99
e-mail: Atyrau.reception@cpcpipe.ru

CPC-R MARINE TERMINAL
Marine Terminal Primorsky District Territory,
Novorossiysk, Krasnodar Krai, 353900, Russian
Federation
tel.: +7 (8617) 29-40-00
fax: +7 (8617) 29-40-09
e-mail: MarineTerminal.reception@cpcpipe.ru

CPC-R, CENTRAL REGION
Kuibyshev Str., 62, Astrakhan,
414040, Russian Federation
tel: +7 (8512) 31-14-00, 31-14-99
fax: + 7 (8512) 31-14-91
e-mail: Astrakhan.reception@cpcpipe.ru

CPC-K, ASTANA
10th floor, Kunayev Str., 2, Astana,
010000, Kazakhstan
tel.: +7 (7172) 79-17-00
fax: +7 (7122) 76-15-91
e-mail: Astana.reception@cpcpipe.ru

PANORAMA
CASPIAN PIPELINE CONSORTIUM

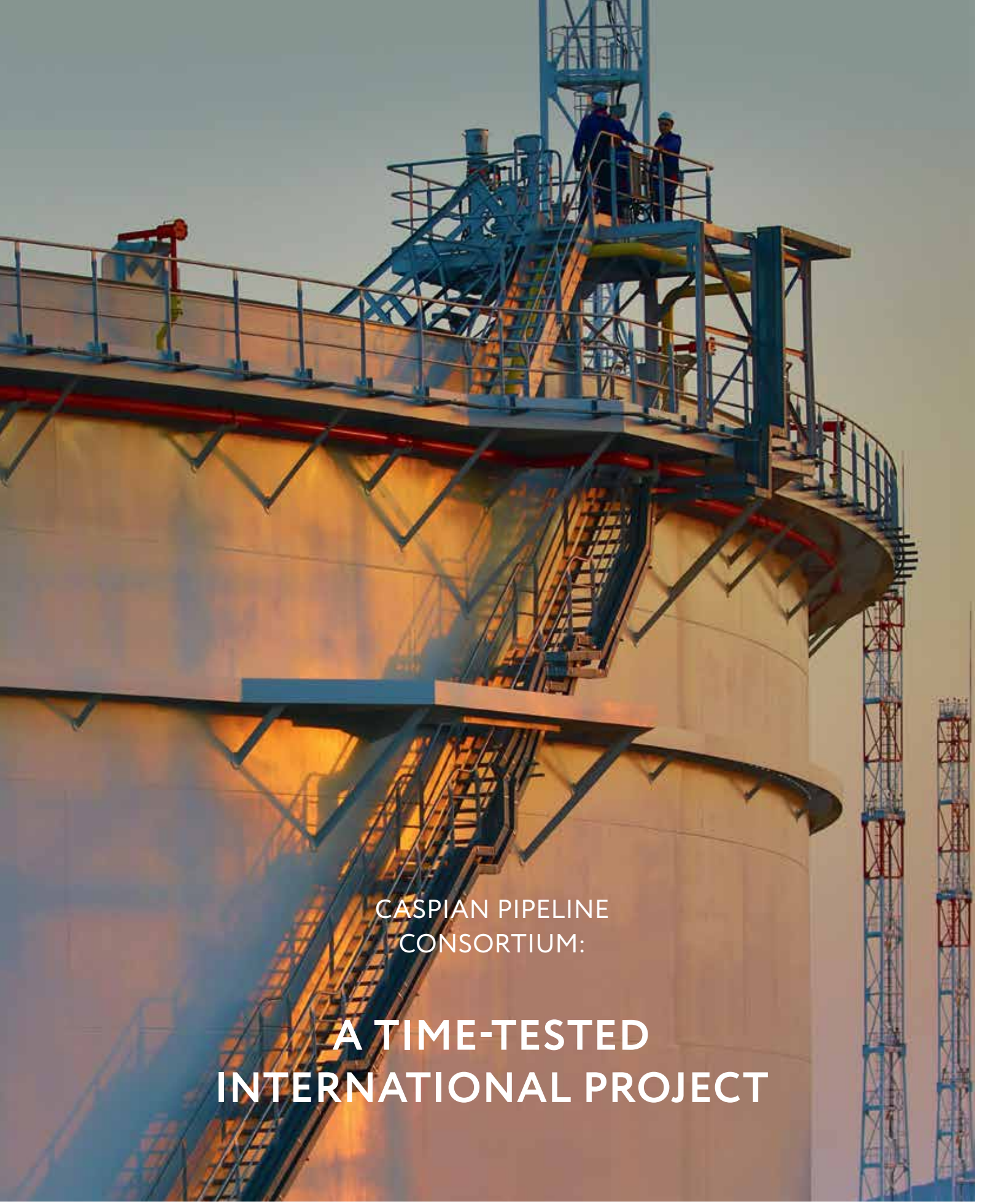
CPC PANORAMA Corporate Magazine. No 3 (50) SEPTEMBER 2025. The issue is prepared by the CPC Press Service.
Editor: Dmitry Konstantinov. E-mail: Dmitriy.Konstantinov@cpcpipe.ru; Pavel.Kretov@cpcpipe.ru.
Tel.: +7 (495) 966 50 00 (ext. 5323 and 5220); www.cpc-online.ru

Publisher: LL C Media Service. 111024, Moscow, ext. ter. Lefortovo municipal district, Aviamotornaya str., 50, p. 2, room. 29/2.
www.vashagazeta.com. Tel.: +7 (495) 988 18 06. E-mail: ask@vashagazeta.com. General Director: Vladimir Zmeyushchenko.
Managing Editor: Julia Kuznetsova. Editor: Larisa Solodovnikova. Art Editor: Juliya Osintseva. Designer: Gulnara Aglyamutdinova.
Translator: Ildar Nasyrov.

людиpeople*

Photos: CPC Press Service, Shutterstock/FOTODOM, Photobank Lori.

Printed in the «A2Press»: 2d Yuzhnoportovy pr., 26a, building 12, 115088, Moscow.



CASPIAN PIPELINE
CONSORTIUM:

A TIME-TESTED INTERNATIONAL PROJECT

CASPIAN
PIPELINE
CONSORTIUM