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CASPIAN PIPELINE CONSORTIUM

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ISSUE'S FOCUS

HIGH-TECH OPERATION

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DEAR COLLEAGUES AND FRIENDS!

The year 2023 begins for all of us with a historically important event: ensuring the mechanical readiness of the CPC pipeline system to increase pumping volumes – 72.5 million tons through the territory of Kazakhstan and up to 81.5 million tons through the territory of Russia annually. This means that the peak of work on the Debottlenecking Program has been successfully passed, and although the implementation of the DBNP continues, we have already done the main thing.

I would like to note that the Consortium team coped with the tasks within the framework of DBNP and other projects of production activities in objectively difficult conditions, once again proving that our friendly team can handle any tasks, any challenges of the time.

A number of management, design, construction, industrial production and other technologies were tested for the first time and successfully during the DBNP. For example, we were the first in Russia to implement powerful, 8-megawatt frequency control units for electric drives of mainline pumps. Robotics, laser scanning, and the latest non-destructive testing technologies are used in the maintenance of our pipeline system facilities. CPC's production activities have always been knowledge-intensive - both during the development of the oil pipeline project, and during the Expansion Project, and as part of the implementation of the DBNP.

Not only the production programs of the Consortium are high-tech. For a year now, CPC, one of the largest taxpayers at the regional and federal levels, has been working according to the most progressive scheme of digital tax monitoring to date. Our charitable projects, which amounted to 553 million rubles in 2022, are the best medical equipment to date, modern comfortable transport, concert equipment that allows us to give the citizens new holidays and festivals. Our traditional festival-competition "CPC for Talented Children" is also held at a high professional and technical level, otherwise there would not have been another record of participants and a very beautiful gala concert in Moscow, remembered by everyone. And the project "Protect Nature of Our Native Land" was just as high-tech – environmental organizations in Stavropol, Kalmykia, Kuban were helped with modern equipment, which, in turn, helps in scientific research. As for the Astrakhan region, our environmental education project is also science-intensive there, since it has been developing for seven years in cooperation with the Volga-Caspian branch of the Russian Federal Research Institute of Fisheries and Oceanography.

When meeting people who live in cities and towns along the entire route from Atyrau to Novorossiysk, you often hear how important our work is for them. And the point here is not so much in pumping oil, taxes and jobs, although this is also important, but in convenient transport, spacious schools and kindergartens, hospitals and clinics equipped with the latest technology. It seems to me that this sense of necessity and demand wherever the CPC oil pipeline passes should give new strength to the work, which we have a lot ahead of us.

N.N. GORBAN,
GENERAL DIRECTOR
CASPIAN PIPELINE CONSORTIUM

AUTHOR
DMITRY KONSTANTINOV

MECHANICAL READINESS

THE YEAR 2022 ENDED WITH AN IMPORTANT EVENT FOR CPC: IN THE COURSE OF THE IMPLEMENTATION OF THE DBNP, A READINESS WAS REACHED TO TRANSPORT ABOUT 72.5 MTA FROM KAZAKHSTAN AND UP TO 81.5 MTA THROUGH THE RUSSIAN FEDERATION. IN HIS INTERVIEW, CPC TECHNICAL DIRECTOR – DBNP MANAGER IGOR LISIN REVEALS THE DETAILS OF THE TERM "MECHANICAL READINESS" AND TALKS ABOUT THE OBJECTIVES OF THE PROGRAM FOR 2023

Igor Yuryevich, in December 2022, as part of the Debottlenecking Program, the mechanical readiness of the CPC pipeline system for an increase in pumping volumes was ensured. To what percentage does this mean the completion of DBNP as a whole?

Indeed, on December 31, 2022, CPC shareholders were notified that, under the Debottlenecking Program, all facilities at the Tengiz and Astrakhanskaya PS were fully built and put into operation, which affect the ability of the CPC pipeline system to accept additional volumes of oil from the Tengiz field for transportation to The Republic of Kazakhstan. Currently, the Consortium's pipeline system, as envisaged by the Final Investment Decision (FID) is capable of transporting 72.5 MTA from Kazakhstan territory and, considering the operating factor, up to 81.5 MTA through the Russian Federation.

At the same time, the achievement of this important milestone does not mean the completion of the entire Program, which, in accordance with the current schedule, will continue until mid-2025, when the final scope of work will be completed to improve the reliability and refine the SCADA system after the changes made and the dismantling of old equipment. Based on the full scope of work, the readiness of the DBNP as a whole is currently estimated at 67%.

Are the mechanical readiness of the CPC pipeline system for an increase in transportation volumes and readiness for an increase in its pumping the same concepts, or is it necessary to complete a number of other works? If so, which ones?

In accordance with the DBNP schedule, CPC had to ensure mechanical readiness for an increase in transportation volumes – at two PSs Tengiz and Astrakhanskaya, to perform work that affects the ability of the CPC pipeline system to accept additional volumes of oil for transportation, complete commissioning, carry out comprehensive testing, make sure that the new equipment meets the required characteristics. Taking into account the tight deadlines for completing the work, it was assumed that certain issues related to documenting the commissioning of facilities could be resolved at the beginning of 2023. Nevertheless, the DBNP group did a great job and all issues related, including the documentation of the commissioning of facilities critical for pumping, were also completed in full in 2022. Permission was obtained to put new equipment into operation at Astrakhanskaya PS from the authorized state body of the Russian Federation – the Municipal Administration of Enotaevsky District of Astrakhan Oblast. Acts of commissioning new DBNP equipment at Tengiz PS were duly registered with the State Architectural and Construction Control Department, Republic of Kazakhstan. Thus, now we can proudly say that we have achieved not mechanical, but complete readiness of the CPC pipeline to increase the volume of transportation of additional volumes of oil.

What DBNP facilities will be put into operation in 2023, what other work needs to be completed? What is their role in debottlenecking the pipeline system?

As already noted, the key milestone of DBNP has been reached, but it is still premature to talk about the full completion of the Program. Increasing the capacity of a pipeline system must always go hand in hand with increasing its level of reliability. In this direction, DBNP will move in the coming years. So, in the middle of 2023, two new reservoirs of the Tengiz pumping station with a volume of 20 thousand m^3 each will be put into operation. They will provide a reserve of oil accumulation to eliminate temporary irregularities in supplies from the TCO shipper and will allow to begin a phased replacement of the station's existing tanks, the safe operation of which is coming to an end.

By the end of 2023, new external power supply facilities will be put into operation to increase the electric capacity available to the Tengiz PS. Also, by the end of 2023, three new LACT will be introduced at the MT Shore Facilities, which will increase the reliability of offshore operations, since a backup LACT will appear to be able to ship oil through all three available SPMs and at the same time it will be possible to bring any individual LACT line into service without damage current operation. I would like to note that even after an increase in the volume of transported oil, according to technological calculations, simultaneous loading by three SPMs is unlikely, this part of the DBNP is aimed at improving reliability and will allow us, if necessary, to quickly increase the accumulation of the Marine Terminal Tank Farm, as well as to consistently replace the existing SPM-1 and SPM-2 to new ones without prejudice to transportation volumes.

In addition, this year work will begin on the installation of VFD at PS-3, PS-4 and PS-5. Installation of this equipment will ensure stable operation of stations in conditions of unstable external power supply.

After the construction of new sub-objects, at Tengiz PS, Astrakhanskaya PS and the Marine Terminal, we will begin the next stage of DBNP – dismantling of old equipment. This stage of the project is no less responsible than the construction of new facilities. All work will be carried out at existing facilities. For example, electrical cables to be dismantled are located in the same place as those operated, which will require special attention and coordination of the construction contractor with the operational staff at the stations.

Let's not forget about a separate front of work – updating the SCADA system in connection with the introduction of new DBNP equipment. This long-term work will be carried out in stages until 2025, until the very last stage of the DBNP – "cleaning" the SCADA system after all changes and dismantling.

If we evaluate the implementation of the DBNP, starting from 2019, what volumes of work were ahead of schedule, which ones "fit in", and which ones did not? Why?

It should be noted that the conditions in which the construction took place – continuous pumping, construction in the midst of Covid-19, external sanctions factors – of course, had an impact on the course of the Program. However, many facilities were ahead of schedule, including Astrakhanskaya PS, Komsomolskaya PS, A-PS-4A, A-PS-5A. In many respects, this is the merit of a professional team of specialists and managers of DBNP, which offered and implemented solutions aimed at optimizing first design, and then construction and installation work. Moreover, all this happened at operating facilities, where the personnel of the Operations Department actively participated and helped in the prompt adoption and implementation of such decisions. Speaking about the supply of complex technological equipment, it is necessary to note the Procurement group of CPC, which was able not only to ensure timely delivery within its responsibility, but also helped in negotiations on the timing of equipment delivery by contractors. It is also impossible to deny the merit of the contractors VELESSTROY LLC and VELESSTROY LLP, who, even in a difficult epidemiological situation, were able to increase and maintain the number of personnel sufficient for the high pace of work, were able to catch up on the gaps, resolve issues with the logistics of equipment and materials delivery.

The most difficult object of the Program?

This question cannot be answered unequivocally, since any, even a technically simple project, due to a number of circumstances, can become quite difficult to implement. When implementing projects, we daily face difficulties of various levels and successfully solve them together. If we single out a specific project, then, in my opinion, the most difficult from the point of view of work is the implementation of the project for the construction of new LACT at the MT Shore Facilities of the due to the

severe limited space and the need for strictly consistent execution of all stages of work. So, already at the stage of elaboration of future design solutions, just for the possibility of placing the projected site of the LACT at the current location, it was additionally required to develop and coordinate special technical conditions (STC) in the Ministry of Construction, Housing and Utilities of the Russian Federation.

Let me remind you: the site of Marine Terminal Shore Facilities on both sides borders on the lands of the forest fund with rare plant species, on the third side it closely adjoins the fences of the residential village and is bounded by the Black Sea on the south side. Add here a complex mountainous terrain, where the height difference only in the projected area reaches 20 m, the need to excavate more than 138,000 m³ of rock exclusively by mechanical means without the possibility of drilling and blasting, the parallel construction of concrete retaining walls with a variable height from 0.5 to 10.5 m along the perimeter of the LACT site and the installation of large-sized technological equipment in conditions of, in fact, a closed space with one full-fledged race. And all this in the conditions of an operating enterprise with increased requirements for access control, since the Marine Terminal belongs to transport infrastructure facilities. Based on the above, you can get an idea of about half of the difficulties that the DBNP team has to face in their daily work.

Did you have to change anything in the project — supplementing or reducing the scope of work?

There were no major changes in the design solutions, except for their optimization at the design stage, compared to those approved by the shareholders of the FID of DBNP and the original design documentation. Implemented projects were adjusted to refine design solutions and, in the course of implementation, some design solutions were optimized for further ease of use of the constructed facilities in everyday operation. Since the end customer for us is the Operations Department, we try to take into account their comments wherever possible. In addition, due to the imposed external restrictions, during the implementation of the project, we had to literally "on the go" change manufacturers of technological, electrical equipment and instrumentation.

So, already at the implementation stage, the manufacturer of submersible pumps for drainage tanks of DBNP was replaced and a replacement was made for a domestic developer of a manufacturer of instrumentation. A striking example of competent optimization of design solutions at the design stage is the work carried out to reduce the total volume of rock excavation by mechanical means from 220,000 m³ to 138,000 m³ and to reduce the height of retaining walls from 17 m to a variable height of 0.5–10.5 m with construction of new LACT at MT SF. Also, thanks to a competent decision to organize an air technological transition from the side of the designed LACT through the existing on-site passage and the existing communications of the MT SF, it was possible to get away from the construction of a full-fledged serviced tunnel, which was discussed at the FID stage.

Whether research and development work (R&D) has been applied within the framework of the implementation of the DBNP? Is R&D applied to other CPC production processes (diagnostics, maintenance, repair, construction)? Is it possible to give examples?

In fact, DBNP is an upgrade of the current capacities of the oil pipeline system obtained through the implementation of the Expansion Project, therefore only well-proven technologies and equipment are used during the implementation of DBNP. Nevertheless, there were also innovations in the approach to work and the use of new technologies for the Company.

Thus, even at the stage of pre-project surveys, the DBNP team used the "deep immersion" method. Its essence was to conduct field production meetings directly at the sites of future construction with the participation of all interested services of the DBNP, the Operations Department and the Design Institute for an in-depth analysis of design issues and the development of basic technical solutions that satisfy all parties, before the start of the main design stage and joint analysis on site ready-made design solutions before the approval of the documentation "For the production of work". This approach made it possible to significantly optimize design solutions at the design stage.

Also, for such complex facilities in terms of implementation as MT SF and Tengiz PS, all design for the first time for CPC was carried out in 3D for the most detailed study. The use of 3D design made it possible to eliminate conflicts between different brands at the design stage, as well as to promtly make decisions, together with representatives of the Operations Department, to change design decisions directly during construction. This approach has fully justified itself, in the future we plan to use 3D design on capital projects implemented as part of our core business.

If we talk about new technologies for the Company, then within the framework of DBNP for the first time for our oil pipeline system, equipment for frequency control of the speed of electric motors of mainline pumping units (VFD) with a capacity of 6 and 8 MW was installed. And if VFD for 6 MW motors has been actively used

in our country for a long time, then the line of VFD equipment for 8 MW motors specially developed for CPC is experimental even for the manufacturer, VFD of such power, and even using only air cooling, is used for the first time in Russia and now, after more than six months of daily operation of the installed VFDs at PS-2, we can safely say: the developed solutions work stably and without accidents, they fulfill their task in full.

Also, I would like to note the "jewelry" operation carried out to replace three main pumps at the Tengiz PS with pumps of higher productivity. Jewelery lies in the fact that accurate calculations at the development stage and coordination of design and working documentation made it possible to place pumps of increased productivity on the old foundation in the same dimensions and with almost the same connections, and the replacement itself was carried out in a working station. As a result of the replacement, the throughput capacity of the main pumping station of Tengiz PS increased from 4,875 m^3/h to 6,800 m^3/h.

Now, looking back, even more respect for the work done is caused by the fact that, unlike the Expansion Project, where the work was organized by separately involved management companies, the management of the DBNP is carried out only at the expense of CPC's own specialists.

Did all the contractors endure the DBNP, did anyone have to be replaced?

As I have already noted, the construction of the DBNP facilities was to some extent a challenge for both the CPC team and the contractors. I think that both of them endured the challenge. The goals set for 2022 have been achieved. Contractors for the main types of work – VELESSTROY LLC in Russia, VELESSTROY LLP and Zaman Quantor LLP in Kazakhstan not only withstood the high pace of construction, but also increased their competence both in construction and in compliance with CPC requirements for the Safe Work Culture and to work at existing facilities, which undoubtedly was not easy for them and imposed certain restrictions. The same can be said about the contractors for specialized types of work – companies Sintec, Syncross, Aveva, performing work in the technological area. As for subcontractors, I cannot give any negative examples of their work. On the contrary, some local organizations, which initially claimed a small amount of work, performed well, stayed on the project and ended up doing much more than planned.

By what means did you manage to coordinate the work of CPC personnel and contractors, in particular, in HSE field?

The Debottlenecking Program was initiated from the very beginning not only to maintain the company's high standards in HSE field of during its implementation, but also to develop and improve the Safe Work Culture at the Consortium's facilities. This aspect was directly addressed in the Final Investment Decision approved in 2019 by the company's shareholders. The staffing structure of DBNP provides for the presence of labor protection specialists both in the Moscow office and in the regional divisions of DBNP, up to construction sites. Among other employees, it included work permit coordinators, who were tasked with coordinating the work of DBNP contractors in the conditions of ongoing maintenance work and capital projects being simultaneously performed at the stations. To ensure dual control over compliance with HSE requirements not only by CPC, but also by contractors, identical requirements were included in contracts for construction and installation works.

How were the tasks of supplying equipment and components under the sanctions conditions solved?

The current conditions could not but affect the course of procurement activities during the implementation of the Program. In general, before the geopolitical situation worsened, CPC managed to supply all the main equipment with a long lead time, which was the responsibility of the company. As for equipment for the supply of contractors, we had to help. The project team worked not only with contractors' logistics specialists, but also with CPC's core business logistics department to ensure timely delivery of the required equipment and materials. Some equipment, for which the delivery time was delayed, had to be taken from the CPC warehouses in agreement with the Operations Department and stock replenished as contractors delivered. By joint efforts, everything necessary for the start of commissioning was delivered on time.

DBNP best workers – who are they? How were these people encouraged?

In general, the entire DBNP Group proved to be professionals in their field. The management highly appreciates the merits of everyone who participated in achieving the ambitious goal of the Program – ensuring the readiness of the CPC pipeline system for an increase in pumping volumes. As for incentives, I am sure that appropriate personnel decisions will be made.

At the same time, I would like to note the role of not only the specialists and management of the DBNP project team, but also the top management of CPC. The maximum involvement and commitment of the company's management to the goals and objectives of DBNP, openness to initiatives and proposals for optimization, made it possible to effectively solve many emerging issues of the Program implementation. I believe that the contribution of CPC top management also deserves high appreciation from the company's shareholders.

How did the Consortium manage in 2022 to combine other planned production programs with the implementation of the DBNP – for technical re-equipment, diagnostics, maintenance, repair? After all, it cannot be said that the burden on them eased last year, rather, on the contrary, it increased taking into account the interdepartmental audit?

Even during the preparation of the Final Investment Decision in 2019, the Management of the Company, with the support of the Shareholders, determined a completely different approach to the implementation of DBNP projects compared to the previously implemented Expansion Project. It was decided to abandon the involvement of project management contractors, to do the DBNP on their own. For these purposes, a separate structure was formed, which, on the one hand, could implement the DBNP independently, without the participation of specialists in the core activities. But, on the other hand, this structure was created within the CPC and carried out work on DBNP projects in accordance with the procedures and practices of the main activity, although considering additional, more stringent requirements for DBNP. This approach made it possible not to divert resources from the implementation of current projects and to eliminate conflicts between core activity projects and DBNP projects.

EVEN AFTER AN INCREASE IN THE VOLUME OF TRANSPORTED OIL, ACCORDING TO TECHNOLOGICAL CALCULATIONS, THE SIMULTANEOUS ACTIVATION OF ALL THREE SPMS IS HIGHLY IMPROBABLE

As for the Expansion Project, we know that any large-scale CPC production program, and DBNP is no exception, implements interesting charitable projects. What will be done in this direction under the Debottlenecking Program?

Indeed, CPC has such a practice, which has become a good tradition – to reserve part of the funds of large investment projects for charitable purposes. The Debottlenecking Program was no exception.

As part of DBNP, the design and construction of cultural and aesthetic centers for children and youth in the village of Yuzhnaya Ozereevka (Novorossiysk) and in the village of Enotaevka (Astrakhan region) will be carried out on the territory of the Russian Federation. The construction of these facilities is aimed at improving the quality of life of children and youth in the regions where CPC operates. When determining the parameters of future cultural and aesthetic centers, CPC closely cooperated with local authorities in order to fully take into account the needs of local residents. At the moment, the design work has actually been completed, construction and installation work is expected to begin this year.

On the territory of the Republic of Kazakhstan in 2021, the House of Youth was built in the city of Atyrau. The project was created to assist in the social adaptation of children from children's villages and graduates of orphanages, boarding schools for orphans and children left without parental care. Today, teenagers aged 16 to 23 live in the Youth House. In addition, construction of a school in the Talgairan microdistrict began in 2022. Funds allocated for charity within the framework of DBNP will also be used to finance the construction work of this facility. The solemn ceremony of laying the first stone for the construction of a school designed for 900 students took place on September 15, 2022 with the participation of the CPC management and the Akimat of Atyrau Region.

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DMITRY KONSTANTINOV

KEY IN THE SYSTEM

IN EARLY DECEMBER 2022, REPRESENTATIVES OF THE COMPANIES-SHAREHOLDERS OF CASPIAN PIPELINE CONSORTIUM VISITED THE TENGIZ AND ASTRAKHANSKAYA PUMP STATIONS

The Tengiz PS and the Astrakhanskaya PS are key to increasing the capacity of the CPC oil pipeline system as part of the Debottlenecking Program (DBNP). The main purpose of the Shareholders' visit (a similar one was held a year earlier, see CPC Panorama No 1 (36) 2022) was to check the progress of work at the DBNP sites and assess their readiness for commissioning.

On December 6, representatives of Transneft PJSC, NC KazMunayGas, Chevron and ExxonMobil corporations, and Eni visited Tengiz PS. While walking around the station, they were shown the DBNP facilities that are at the stage of completed construction, including the platform for drainage tanks of relief spring safety valves (SSV), the oil quantity and quality measuring system (LACT) expanded due to the construction of new lines, a new pressure control unit (PCU).

Specialists of the CPC Companies-Shareholders got acquainted with the operation of the new booster pump station (BPS), which underwent a comprehensive testing process in November 2022. The main pump station (MPS) was also demonstrated, which in December passed the stage of phased replacement and comprehensive testing of new main pump units (MPU) in various modes. The guests assessed the degree of readiness of new tanks (VRFT-20000) that successfully passed hydraulic tests.

The results of the inspection were reviewed in the building of the administrative complex of Tengiz PS with the participation of the DBNP team and specialists from the CPC Operations Department. Shareholder representatives appreciated the high degree of readiness of the new facilities of the Debottlenecking Program. The management of the DBNP team confirmed its intention to notify the shareholders by the end of 2022 about ensuring the mechanical readiness of the CPC pipeline system for an increase in pumping volumes. Also, the shareholders were shown and discussed with them current and future work plans for all DBNP facilities in the Republic of Kazakhstan and the Russian Federation.

On December 8, representatives of Transneft PJSC, NC KazMunayGas and Chevron Corporation visited Astrakhanskaya PS. While walking around the station, they were shown fully prepared and tested DBNP facilities, including new buildings of indoor switchgear (ISG), complete transformer substation (CTS), drinking water treatment plant (DWTP). There were also presented a platform for mud strainers (MS), a platform for shut-off valves, frequency-controlled drives (VFD) in operation and a new main pump station.

The delegation of shareholders appreciated not only the new equipment, but also the high quality of the work performed and the improvement of the new section of Astrakhanskaya PS. Representatives of the CPC Operations Department noted the positive aspects of the introduction of VFD technology at pump stations: smooth start and stop of pump units, smooth transition from one pumping mode to another, resistance to voltage drops and energy savings.

THE MAIN PURPOSE OF THE SHAREHOLDERS' VISIT WAS TO CHECK THE PROGRESS OF WORK AT THE DBNP SITES AND ASSESS THEIR READINESS FOR COMMISSIONING

The results of the inspection of Astrakhanskaya PS were considered in the building of the administrative and household complex of the construction camp of VELESSTROY LLC with the participation of the DBNP team and representatives of the CPC Operations Department. Shareholders' representatives discussed the expected time frame for obtaining permission from government authorities to put new facilities into operation at Astrakhanskaya PS and expressed their gratitude to the CPC team for the work done to ensure the station's readiness to increase pumping volumes. The management of the DBNP team noted that the early and safe commissioning of the new section of Astrakhanskaya PS was ensured by the efforts of a specially organized working group, which contributed to prompt decision-making directly at the facility.

Within the framework of the meeting, which took place in the presence of representatives of Consortium Shareholders, the employees of CPC-R JSC and VELESSTROY LLC were awarded for their contribution to the development of a Safe Work Culture. The shareholders noted the high involvement of the CPC management in ensuring safe working conditions at the company's facilities.

SCIENCE AND TECHNOLOGY

THE PRODUCTION ACTIVITIES OF THE CASPIAN PIPELINE CONSORTIUM CAN REASONABLY BE CONSIDERED SCIENCE-INTENSIVE. RESEARCH AND DEVELOPMENT (R&D) IS APPLIED IN CONSTRUCTION, MAINTENANCE, REPAIR AND DIAGNOSTICS OF THE CPC PIPELINE SYSTEM

VARIABLE FREQUENCY CONVERTER (VFD) FOR 8 MW ELECTRIC DRIVE

R&D of EKRA Research and Production Enterprise (Russia). The frequency converter of the APP series for 8.3 MW electric motors is an advanced technical solution optimized in accordance with the requirements of CPC and used for electric drives of pumping units installed as part of the Debottlenecking Program. VFD with air cooling during the pilot operation at PS-2 did not cause any comments on its work.

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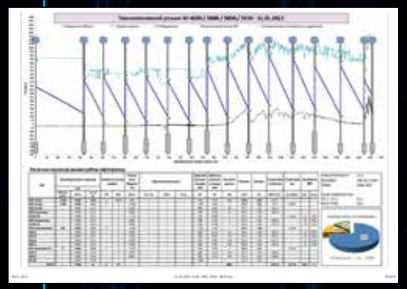
HYDRAULIC MODEL OF AN OIL PIPELINE



R&D of the CPC Process Calculations Group under the supervision of A.S. Ivanin and A.V. Andrushchenko. The calculated stationary hydraulic model of the CPC pipeline system of its own design allows you to quickly and efficiently set up any considered oil pipeline operation scenarios, both current and prospective ones with a variety of topology levels. The hydraulic model was used to optimize the costs of DBNP and select technical solutions, its current ongoing work is the development of optimal technological regimes and their planning to fulfill shippers' requests and carry out various works. Read more about the hydraulic model in the May 2020 issue of CPC Panorama.

SELF-PROPELLED ROBOT FOR IN-LINE DIAGNOSTICS

For in-line inspection of underwater pipelines leading from Marine Terminal Shore Facilities to the SPM, a remote-controlled robot is used. The device has the advantage over the traditional pig that it moves on its own, and not by increasing the hydraulic pressure in the pipeline. In this case, there is no need to use a tanker with its expensive lease for pumping underwater oil pipelines. In addition, flexible hoses in the sections of the manifold — SPM and SPM — tanker wear out less. A photo report about this technology is planned for publication in one of the following issues of the magazine.

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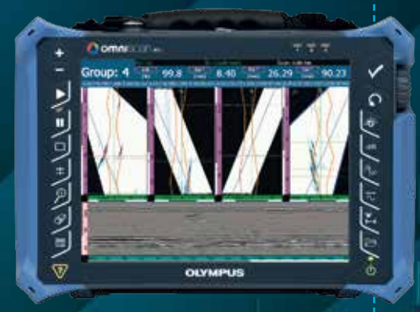
PHASED ARRAY ULTRASONIC FLAW DETECTOR

R&D was carried out by the NDT Laboratory of the general contractor of CPC for the maintenance of facilities in the Russian territory — STARSTROY LLC. The use of an ultrasonic phased array flaw detector is the most modern type of non-destructive ultrasonic testing and provides such advantages as the possibility of sectoral control, which provides greater visibility, and greater efficiency due to the replacement of longitudinal-transverse scanning with a linear one along the weld. Read more about the NDT Laboratory of STARSTROY in the article of this issue "See Through".



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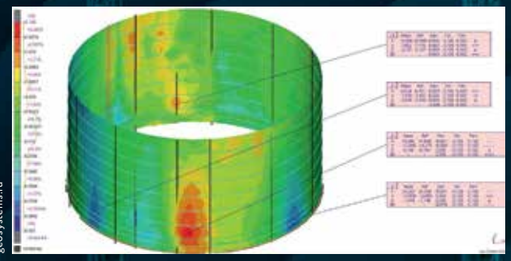

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TANK LASER SCANNING

R&D on the basis of Ph.D. thesis of N.N. Gorban "Development of a methodology for monitoring low-cycle fatigue in local geometric defects in the tank wall of offshore oil terminals" makes it possible to assess the condition of the tank metal and its residual resource. The implementation of the project is currently at the stage of concluding an agreement with a contractor — the Russian State University of Oil and Gas named after I.M. Gubkin. Working title: "Laser Scanning". The project is long-term, scanning will be carried out in two stages spaced apart in time with a comparison of the results to identify the dynamics of the occurrence of low-cycle fatigue in local geometric defects in the walls of the tanks. The laser scanner will have a special design, which makes it possible to carry out work without draining and drying the tanks. The results of the practical application will be published in the next issues of CPC Panorama.

PROTECTIVE CASE FOR PIPING

R&D of Safit Group of Companies (Russia). It was implemented by the CPC contractor Sevmortrans LLC at the 1400th kilometer of the CPC pipeline (Western Region) at the intersection with the federal highway A-289. A protective fiberglass case filled with a hydrophobic gel was installed on a 100m long section of the pipeline. The physical properties of the materials protect the pipeline from mechanical damage, dampen vibration loads from passing cars, and also prevent the formation of condensate and contact of the pipeline surface with groundwater. More details can be found in the article of this issue "Crossroad".

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EVGENY RADAEV,
CHIEF WELDER OF STARSTROY LLC

SEE THROUGH

SPECIALISTS OF THE NON-DESTRUCTIVE TESTING LABORATORY OF STARSTROY LLC GO TO THE TRACK EVERY DAY. THEIR COMPLEX SCIENCE-INTENSIVE WORK IS ONE OF THE IMPORTANT COMPONENTS OF THE RELIABILITY OF THE TENGIZ – NOVOROSSIYSK PIPELINE SYSTEM

Non-destructive testing (NDT) of products, structures and connections allows avoiding the risk of emergencies at hazardous production facilities (HPF) of CPC-R – storage facilities and pipelines transporting hydrocarbon raw materials.

The information obtained as a result of NDT makes it possible to detect latent defects at an early stage, the nature of their formation, size, quantity and location and take appropriate measures. Based on this technical information, a decision is made to repair or reject the product, to decommission the HPF.

At the facilities of CPC-R, the laboratory of STARSTROY conducts such types of non-destructive testing as visual and measuring (VMT), capillary (CT), ultrasonic (UT), radiation (RT) and electrical (ET).

During operation, external and internal defects are detected in the metal of pipe sections and welded joints according to the results of non-destructive testing, as well as in-pipe diagnostics. Specialists of the laboratory of STARSTROY receive an application for NDT from the operating engineers of the OGP CPC-R and daily go to the main oil pipeline.

CAPILLARY CONTROL OF THE BASE METAL AT THE WELDING POINTS OF THE CIRCUMFERENTIAL JOINTS OF THE REPAIR STRUCTURE P2

In the process of NDT, the flaw detector of the laboratory of STARSTROY conducts visual and measuring control. The specialist inspects the controlled object, reveals undercuts, burns, shells, fistulas with access to the surface, cracks, edge displacements. After detecting defects in a welded joint or in the base

WITH CAPILLARY CONTROL, A COLORED PENETRANT IS APPLIED TO THE SURFACE BLEACHED BY THE DEVELOPER

CAPILLARY CONTROL STEP BY STEP

metal of a pipe or other product, they are marked with a marker. At the end of this process, the welded joint (the base metal of the pipe/product) is repaired and the VMT is carried out again.

On July 15, 2022, at PS-4, during a scheduled inspection of pump 36-PU-C001 "C", an application was received from CPC-R for visual and measuring control of the pump shaft. Oleg Efremov, the flaw detection engineer of the laboratory of STARSTROY, carried out the VMT, as a result of which no defects were found, the relevant laboratory reports were sent to the customer.

To see surface and subsurface defects, the specialists of the laboratory of STARSTROY carry out capillary control. Its essence lies in coloring the surface of the product, bleached as a result of processing with a developer, with a colored penetrant. After application, the penetrant appears on the surface in places of discontinuities, cracks, non-fusion, folds. The defect zones contrast with the rest of the background and are easily distinguished. The photo shows what the capillary inspection of welds looks like when defects are detected and after they are eliminated. Flaw detectorists of STARSTROY use this method in accordance with the requirements of regulatory documentation, as well as on all "doubtful" areas of welded joints and the base metal – where VMT is not enough.

The most commonly used method of non-destructive testing CPC-R facilities is ultrasonic. It is based on the analysis of the parameters of elastic waves excited and (or) arising in a controlled object. This non-destructive testing method is suitable for testing various metal products. The laboratory of STARSTROY is equipped with the most modern equipment for ultrasonic testing: an ultrasonic phased array flaw detector

COMPLETE SET OF X-RAY MACHINE ICM SITE-X C1802

RADIOGRAPHIC INSPECTION OF A WELDED JOINT ON THE BASIS OF KROPOTKIN ERC

RADIOGRAPHIC INSPECTION AT CPC FACILITIES IS USED TO CHECK WELDED JOINTS OF PIPES AND TANKS

CHECKING THE QUALITY OF THE INSULATING COATING AT KM 1216 OF THE TENGIZ – NOVOROSSIYSK OIL PIPELINE

Единая система оценки соответствия в области промышленной, экологической безопасности, безопасности в энергетике и строительстве

СИСТЕМА СНК

СВИДЕТЕЛЬСТВО ОБ АТТЕСТАЦИИ

УДОСТОВЕРЯЕТ:

Общество с ограниченной ответственностью «СТАРСТРОЙ»

(ООО «СТАРСТРОЙ»)

Лаборатория неразрушающего контроля

УДОВЛЕТВОРЯЕТ

Руководитель Независимого органа

OmniScan MX2, an ultrasonic flaw detector Olympus EPOCH LTC, as well as ultrasonic thickness gauges – Panametrics-NDT 26MG and Konstanta-K5.

Another type of NDT, for which the specialists of the laboratory of STARSTROY are certified, is radiographic testing. On the Tengiz – Novorossiysk oil pipeline, it is used to detect internal defects in welded joints of pipes with a working diameter of 20 to 1420 mm, on vertical cylindrical tanks and other structures. This is the most effective method of non-destructive testing used at the facilities of CPC-R. The radiation of a radioactive source passes through the object under study and affects the photographic layer of a special radiographic film. After processing the film and deciphering the obtained technical information, defective spots in the welds and the base material become clearly distinguishable.

During the planned shutdown of the Tengiz – Novorossiysk oil pipeline on October 4–7, 2022, five welded joints with parameters 1067x11.8 were subjected to radiographic inspection. After processing the radiographic film and deciphering the images, no unacceptable defects were found.

THE TECHNOPARK OF THE NON-DESTRUCTIVE TESTING LABORATORY OF STARSTROY IS BEING STEADILY MODERNIZED, SPECIALISTS ARE BEING TRAINED AND RETRAINED

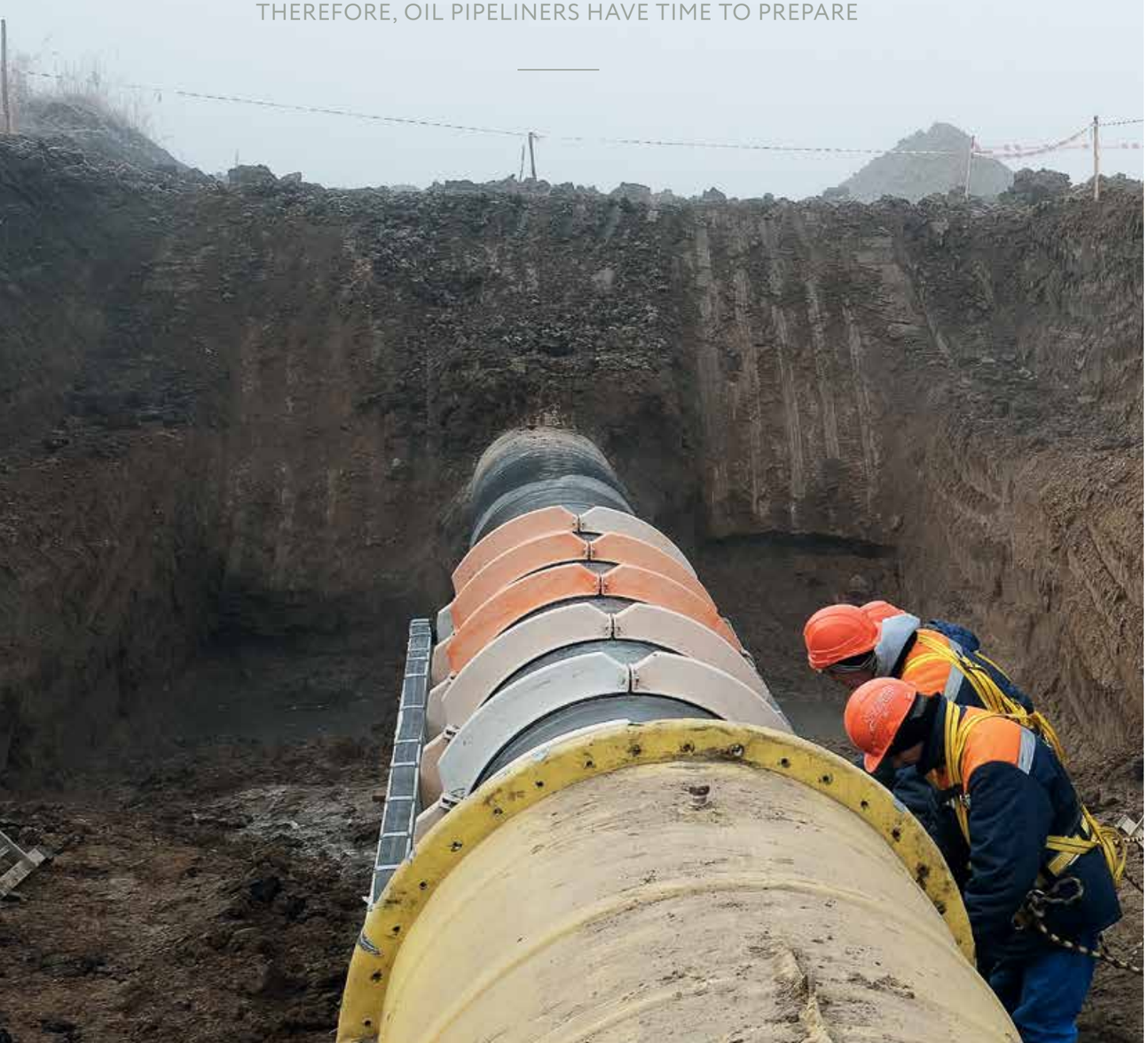
When all types of control are completed and the defective sections are repaired, an insulating coating is applied to the pipe. But even this stage of work, cannot be done without specialists from the NDT laboratory of STARSTROY. When the pipe body is insulated, electrical control is carried out. The method is based on fixing an electrical breakdown of a defect in a dielectric coating with a flaw detector by high voltage applied between an electrode located on the coating and a conductive base.

The technopark of the non-destructive testing laboratory of STARSTROY is being steadily modernized, specialists are being trained and retrained. Every year the laboratory is certified by the independent bodies of the Russian Society for Non-Destructive Testing and Technical Diagnostics (RSNTTD). Efficient interaction between the specialists of CPC-R and STARSTROY in the field of non-destructive testing of products, joints and structures contributes to the efficient and safe operation of the facilities of the Tengiz – Novorossiysk pipeline system.

AUTHOR
PAVEL KRETOV

CROSSROAD

USING A UNIQUE TECHNOLOGY NOT APPLIED BEFORE AT CPC FACILITIES, THE CONSTRUCTION OF THE OIL PIPELINE CROSSING THROUGH THE FEDERAL HIGHWAY IN THE KRASNODAR REGION IS UNDER CONSTRUCTION. THIS ROAD LINE IS STILL UNDER CONSTRUCTION NEXT TO A 1400 KM OPERATING OIL ARTERY, THEREFORE, OIL PIPELINERS HAVE TIME TO PREPARE



The weather in the Kuban is unpredictable in winter. Daytime air temperature last week reached +16 °C, this week it dropped to -5 ºC. The soil, warmed by the recent warmth, met the cold with a dense fog.

"The fog does not interfere at all", Andrei Khvatov, foreman of Sevmortrans LLC, answers the question. "But the clay soils here are really heavy".

13 people work under his leadership. Three units of equipment are involved in the operations. Since the oil pipeline is operational, in order to ensure its safety, it is impossible to work mechanically closer than 20 cm from the pipe. And these last centimeters, which have to be developed manually, are especially difficult for contractors.

So what are they doing on the Tengiz-Novorossiysk main oil pipeline? At a rate of 12m per week, contractors are installing a 100m-long special protective case, after which the interior space between the case and the pipeline will be filled with a special synthetic hydrophobic gel. Someone will say that this is not fast at all, but they will be wrong.

"After the opening of each new section, the contractors of STARSTROY LLC conduct a study of its height marks for the absence of pipe subsidence", explains Vladimir Makarovsky, Senior Engineer, Oil and Gas Operation, Western Region. "Then additional flaw detection control of the pipe and joints is performed, the integrity of the pipe body insulation is checked, the insulation at the pipe joints is replaced to exclude the occurrence of unrepaired defects under the casing. Only after that Sevmortrans LLC receives permission to continue the installation of the case.

VLADIMIR MAKAROVSKY

The case helps to protect the main oil pipeline from external loads and damage at the intersection with the highway, and the gel prevents the formation of condensate in the inter-tube space and ingress of groundwater into the case. No less important is the fact that the structure is almost three times longer than the width of the highway, which makes it possible to significantly soften and evenly distribute vibration loads that will be created by passing cars.

THE CASE HELPS TO PROTECT THE MAIN OIL PIPELINE FROM EXTERNAL LOADS AND DAMAGE AT THE INTERSECTION WITH THE HIGHWAY

The prefabricated protective case consists of 17 sections 6 m long and one section 4 m long. They are interconnected by means of flanges using a special rubber sealing gasket. Each section consists of an upper and lower casing. The protective case itself is installed on the centralizers, which are pre-mounted on the oil pipe over the insulating coating to ensure straightness and all strength characteristics. Under the case and around it, a 200 mm layer of sand is added. All types of soil are compacted in layers with vibration rammers, and on the sides of the main oil pipeline — additionally with a vibratory roller. At the same time, the degree of soil compaction at all stages is controlled by a specialized laboratory. Laboratory technicians test compacted soil on site, and also take samples for analysis in stationary conditions to more accurately determine the compaction coefficient, which should be at least 0.95.

At the ends of the extreme sections of the case, plugs are mounted to prevent the gel from flowing out. With the help of an industrial steam generator, the gel is heated to a temperature of 80 °C and poured into the case through fittings with a special pump. After cooling, the gel takes a firm-elastic shape, completely filling the case.

"In the process of crossing operations, specialists from the CPC Western Region constantly monitor compliance with all technologies and requirements for safe work performance", adds Oleg Skomsky, Lead Engineer, Oil and Gas Operation, Western Region. "After the completion of the crossing project, the CPC head office will receive the executive documentation, which will be reviewed and, after approval, sent to GIS specialists for drawing a new communication on the Tengiz — Novorossiysk oil pipeline plan-profile.

The authors of the technology guarantee that the case, the installation of which will be completed in February 2023, will reliably serve for at least 40 years.

AUTHOR
PAVEL KRETOV

ON THE NEW PLAN

AT THE END OF NOVEMBER 2022, THE LARGEST OIL SPILL RESPONSE DRILLS IN THE CONSORTIUM'S HISTORY WAS HELD AT THE CPC MARINE TERMINAL. FOR THE FIRST TIME THEIR PARTICIPANTS WORKED INTERACTION DURING THE LOCALIZATION OF THE LARGEST POSSIBLE EMERGENCY NOT ON THE OIL PIPE INFRASTRUCTURE, BUT ON THE VESSEL

The basis for conducting such exercises were amendments to the provisions of Federal Law No 155-FZ dated July 31, 1998 "On Inland Sea Waters, the Territorial Sea and the Contiguous Zone of the Russian Federation", as well as comments issued by CPC-R based on the results of an audit of the Federal service for supervision in the field of transport (South UGMRN Rostransnadzor) and other supervisory authorities. The event was required to be completed before the approval of the Oil and Oil Products Spill Prevention and Response Plan (OSRP) at the Marine Terminal of Caspian Pipeline Consortium-R JSC.

"To put the document into effect, it was necessary to conduct a training exercise, in which the forces and means of Transneft-Service LLC, waste disposal contractors and STARSTROY LLC were involved to ensure the pumping of the collected oil-water mixture from the multi-purpose tank to the Tank Farm", commented CPC Marine Terminal Manager Alexey Pelipenko.

About 200 people took part in the training exercises, including 155 rescue units from Fire and Emergency Service (FES) and Transneft-Service. To localize a simulated oil spill, emergency response ships and floating craft, equipment for protecting and cleaning the coastline, sea and coastal booms, oil gathering systems, transport floating tanks, sorbents, light towers, high pressure washers and other equipment were used.

In order for the CPC fleet to take part in the exercises in full force, the Oil Transportation and Commercial Division of the Consortium provided for the departure of the last oil tanker from the tanker one hour before the start of the exercises.

According to legend, at 11 a.m., the mooring master sounded an alarm on the first single-point mooring. The dispatcher of the OCC in emergency mode conditionally stopped the loading of the tanker, with the help of a siren notified the terminal staff about the emergency situation and activated the automated warning system. The information was sent in the form of voice notifications, SMS alerts and emails to two dozen departments and organizations.

"We put into operation an automated warning system for state regulatory and supervisory authorities, as well as interacting structures and organizations in 2022", said Vitaly Tkachenko, Senior Engineer, Civill Defence, Emergency Response and Oil Spill Response. "It has already proven its effectiveness: you do not have to waste time on calls, distracting from other urgent matters in an emergency".

During the exercises, the participants worked out the localization and elimination of the consequences of an oil spill as a result of conditional damage to two adjacent tanks of the ship. This conditional volume significantly exceeded the maximum possible quantitative oil yield from the least probable, but the most severe accident in terms

THE COURSE OF THE EXERCISES WAS MONITORED BY A COMMISSION CONSISTING OF REPRESENTATIVES OF SUPERVISORY AND REGULATORY AUTHORITIES

of consequences — the "guillotine" destruction of an underwater pipeline when loading a tanker at the single-point mooring (SPM).

On November 22, 2022, the CPC attracted and demonstrated to the members of the state commission more forces and means than the oil spill response plan required. In the direction of the drift of the conditional oil slick, the boundaries of the booms delivered by the emergency response vessels were promptly set.

Small size vessels "Bystry", "Skory", "Rezvy", "Stremitelny", justifying their names, promptly delivered transport floating containers with a volume of 50 m^3 to the booms. Later, they also deployed traps perpendicular to the booms on the coastal strip.

To collect the oil-water emulsion, floating containers delivered from the harbor of the Marine Terminal's auxiliary vessels were used. At various boundaries, a conditional collection of spilled oil was carried out by oil-gathering systems lowered from the ships. Skimmers and vacuum installations were used near the shore.

Gas analysis of the air environment and monitoring of the movement of oil pollution with the standard equipment of the vessels involved were carried out in a constant mode in the area of the oil slick.

The double task was carried out by the large auxiliary multi-purpose vessel "Arktik". It not only delivered a floating tank with a volume of 250 m^3 to the booms, but also became a kind of second headquarters of the exercises for representatives of the state commission.

"The commission was able to make sure that the deployment of forces and means was ahead of the established standards", Vitaly Tkachenko emphasized. "We even repeated some elements of the exercises several times if it turned out that representatives of the supervisory authorities did not have time to consider something. At the request of the members of the commission, we used all the equipment both at sea and on shore, and there was not a single case that something did not start".

The course of the exercises was monitored by a commission consisting of representatives of supervisory and regulatory authorities: EMERCOM of Russia, Rosprirodnadzor, the administration of the municipality "City of Novorossiysk", FSBI "Administration of Seaports of the Black Sea", Rostransnadzor and others.

On December 2, 2022, the Federal Agency for Marine and River Transport (Rosmorrechflot) issued a positive conclusion on conducting training exercises before approving the Oil and Oil Products Spill Prevention and Response Plan at the Marine Terminal of CPC-R JSC.

CPC is constantly improving its arsenal of emergency response tools. So, in 2020, new oil-gathering systems were "put into service" to protect the coast. In mid-2023, sea booms will be replaced with more durable ones, which will allow efficient use in the most adverse weather conditions, and by the end of next year, the entire auxiliary fleet will be updated.

AUTHOR
EVGENY FEDOROV,
SENIOR COORDINATOR, PERMIT TO WORK, CPC-R

PASSING BANNER

A PILOT PROJECT WAS LAUNCHED TO DEVELOP LEADERSHIP IN THE FIELD OF SAFE WORK CULTURE AMONG CPC CONTRACTORS

Last year was busy in terms of the volume of construction and installation work as part of the Debottlenecking Program. The construction sites, which almost all CPC facilities have become, have seen a significant increase in people and special equipment. In this regard, the issues of coordination of the company's personnel with employees of contractors in the HSE field have acquired particular importance.

These issues were raised at all levels, from leadership decisions to local initiatives. The pilot project "Passing Banner" is an example of such an initiative, which received the approval of the management. To date, the project can be called successfully implemented and its genesis can be traced.

In February 2022, the Consortium implemented the enterprise standard "Leadership in the Development of Safe Work Culture" CPC STP 62.01.2022. In April, Moscow hosted the first meeting of Safe Work Culture Committee, an organization joining CPC structural units and contractors. At the second, July meeting of the Committee, its Chairman, CPC General Director Nikolay Gorban, proposed to jointly develop measures to encourage the personnel of contractors to achieve leading positions in the HSE field.

"The architecture of Safe Work Culture Committee is built on the principles of a cascade hierarchy", noted Sergey Polovkov, Deputy General Manager of HSE. "Thanks to this, it is possible to replicate local initiative solutions horizontally: from the birthplace to other CPC facilities".

The Marine Terminal was the birthplace of the "Passing Banner" initiative. The concept of pilot project was announced and approved by regional Safe Work Culture Committee. During the fourth quarter of 2022, a commission consisting of specialists from the DBNP Group and contractors evaluated the work of VELESSTROY LLC, VELESSTROY SMU LLC, Artstroy LLC, Energostroy CJSC. HSE quality assessment included such criteria as the results of a scheduled audit by CPC, the quality of targeted briefing before starting work, organization of safe workplaces by teams, participation of management in Safe Work Culture trainings, leadership visits and leadership practices.

"The evaluation criteria will be finalized at the meeting of Marine Terminal Safe Work Culture Committee", comments Elena Bulatova, Labor and Industrial Safety Manager. "This will be covered in the next post".

On December 22, the winners were awarded. The main award – the passing banner - was received by the VELESSTROY SMU team. Also, 40 project participants were awarded in the "Breakthrough" and "Leadership" nominations.

The results of event were reviewed at a special meeting of the Regional Safe Work Culture Committee. The project aroused interest in CPC Operations Department, a proposal was made to replicate it to the company's structural divisions with the presentation of a passing banner to the best operators and PS shift supervisors.

CPC: RESULTS OF 2022

OPERATION

PIPELINE SYSTEM
58.7 million tons of oil transported through the Tengiz-Novorossiysk pipeline system in 2022

OIL TRANSSHIPMENT
CPC Marine Terminal Provides Oil Transshipment for 527 Tankers

FIELDS
The largest Kazakhstani fields delivered to CPC pipeline system:

- **58,7** million tons of oil
- **527** tankers
- **29** million tons of oil — Tengiz
- **12** million tons of oil — Kashagan
- **10** million tons of oil — Karachaganak

TAX PAYMENTS

RUSSIA

23,5 billion rubles

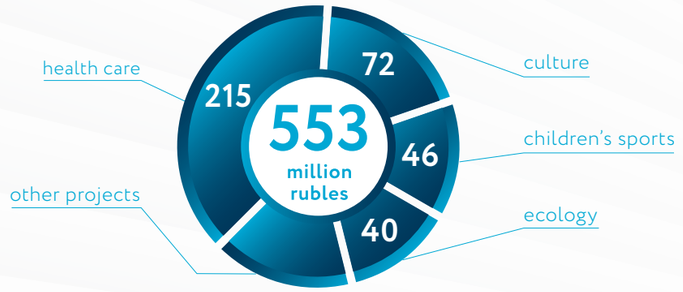
- **7** billion rubles — Federal budget
- **7,5** billion rubles — Krasnodar Krai
- **2,7** billion rubles — Astrakhan Oblast
- **2,3** billion rubles — Republic of Kalmykia
- **1,8** billion rubles — Stavropol Krai
- **2,2** billion rubles — Moscow budget

KAZAKHSTAN

37,5 billion tenge

MAJOR CPC CHARITABLE PROJECTS IN 2022

RUSSIA



KAZAKHSTAN

1,28 billion tenge

AUTHOR
DMITRY KONSTANTINOV

LUKOMORYE IN TSEMDOLINA

THE DUBRAVA ECOPARK, WHICH OPENED IN NOVOROSSIYSK IN MID-DECEMBER, IS NOT ONLY A RECREATIONAL SITE IN DEMAND BY CITIZENS, BUT ALSO AN INTERESTING ART OBJECT

Neat lawns, paths paved with yellow stone, semicircular cozy benches, an unusually shaped gazebo, lamps and a lot of greenery. Tulip tree, red-leaved maple, pedunculate oak, gingko, cherry, laurel, cypress, pine, juniper, euonymus, barberry, lavender and others – a total of 365 trees and shrubs were planted on 860 m^2 of park area.

"There are as many of them here as there are days in a year", Andrey Kravchenko, the head of the Novorossiysk municipality, noted at the opening ceremony of the ecopark. "I hope that the park will truly become the heart of the Primorsky district, a point of attraction".

In the village of Tsemdolina, the wasteland between secondary school No 28 and the Kuban House of Culture was occupied by spontaneous car parking for a long time, and people walked their dogs here.

Having restored the Palace of Culture building in 2018 and equipped it with modern stage equipment, the Caspian Pipeline Consortium did not stop there, but systematically began to optimize the landscape.

CPC charity projects are always focused on specific recipients, but in the case of the ecopark, the coincidence of interests was simply phenomenal. Residents of Tsemdolina, along with neighbors in the municipality, have repeatedly appealed to the administration of Novorossiysk with requests to preserve existing and create new green areas. In June last year, a meeting was held in the municipality with public activists, who designated the greening of the main industrial center of the Krasnodar Krai, the hero city and the port city as a priority of the eco-agenda. Since 2022, CPC has started implementing its environmental education project "Protect Nature of Our Native land" in the Kuban, responded to the needs of the city and actively joined in the creation of new recreational areas, the first of which was the Dubrava Ecopark.

"Environmental issues are one of the company's top priorities", said Mikhail Grishankov, Deputy General Director, RF Government Relations, CPC-R, when opening the park. "Our project "Protect Nature of Our Native land" is being implemented in all regions where the company operates, and now we are developing it in Novorossiysk and in the Krasnodar Krai in general. We preserve nature, educate and develop a careful attitude of others to the place where they live. We have big plans for the future".

The budget of the ecopark project amounted to about 24 million rubles, it included a dendrological study and the construction of an asphalt bypass road. Everything here has been done and continues to be done "according to science": soil preparation, arrangement of automatic irrigation and video surveillance systems, maintenance and cleaning, planting trees and shrubs at the right time of the year so that the seedlings properly take root in a new place. When they grow up, there will be much more greenery and oxygen in the park, and Dubrava will turn into a real oasis for recreation not only for schoolchildren, but also for residents of the neighborhood being built nearby, including people with limited mobility.

"Previously, we had nowhere to walk with a child here", admits young mother Zhanna Voloktina, who lives in the neighborhood. "We went to the embankment for this, but it is no that close, considering traffic jams. And now everything is just great. We live nearby, 10 minutes' walk".

"All of us – both adults and children – were looking forward to the opening of this park", Nina Nosova supports her fellow villager. "Here before there was a trampled dirty wasteland, and now it's just a fairy tale".

The "Pushkin" style did not arise by chance, but thanks to the sprawling oak growing here. It was he who formed the concept and name of the ecopark. The oak at the foot, in accordance with the lines of the classic, was decorated with a massive chain. Along with the acorn arbor envisaged by the project, the monumental "Collected Works, Volume I" appeared in the park (provided by the city Department of Culture on the opening day), and new artifacts may also appear. The creative impulse embraced all those involved, and the employees of the Marine Terminal did not stand aside.

"As soon as someone uttered the word "Lukomorye", the fantasy immediately started working", says MT Regional Manager Alexey Pelipenko. "We, in particular, brought here a fragment of the anchor chain from the SPM. Literally everyone wanted to participate in the creation of not just a park on the sponsored territory, but an art object in a theme beloved since childhood. If the project has united everyone so much, it means that it is necessary and correct".

AUTHOR
PAVEL KRETOV

LISTEN, DRAW, LEARN

ACCORDING TO RESEARCH, ONLY ONE-THIRD OF WORKERS IN THE WORLD CAN EASILY WITHSTAND EMOTIONAL STRESS. OVER 40% OF THE STAFF ADMIT THAT THEY EXPERIENCE DAILY STRESS. HOW TO REST AND AVOID BURNOUT AT WORK?

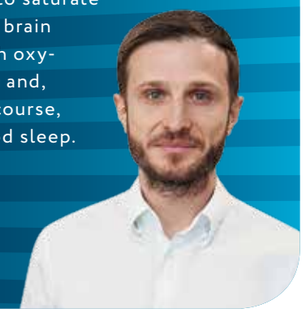
It would seem that the most effortless way is a soft sofa and a TV. But if you are an intellectual worker, then the latter is far from the best assistant: instead of relaxing, a person receives additional amounts of information, forcing the brain to perceive and process them.

In fact, proper recovery after work is a whole science. There are many professions that require high concentration, where mistakes can be costly or even fatal. In stressful conditions, physical and psychological preparation is the key to maintaining the necessary high productivity, so special techniques have been developed to prevent employee burnout. For example, pilots are scheduled to have recovery periods during and between flights in order to maintain an appropriate level of safety.

At the same time, experts have long noticed a feature: burnout does not occur in the workplace, where a person is immersed in the performance of his duties. Burnout is a consequence of the inability to distract from them after.

ALEXEY IVANIN,
HEAD OF INFORMATION AND ANALYTICAL SYSTEMS TEAM:

«I don't think I'll reveal any know-how to you by saying that you need to organize your working time so that you don't have to be late. Then you will come to work the next day fresh and full of energy. Sports help me to effectively switch from work. Of course, you should choose a sport or hobby that requires full concentration. For me, it's boxing. A good and universal tool for organizing personal effectiveness and balance is Kaizen philosophy, which I am currently actively studying and trying to put into practice. I would also advise colleagues to at least half an hour of walking in the fresh air to saturate the brain with oxygen and, of course, good sleep.



PROPER RECOVERY AFTER WORK IS A WHOLE SCIENCE

Therefore, it is important to learn how to switch immediately outside the office. On the way home from work (in a car or on public transport), the "unloading" playlist can become such a regular "switch". It can be both your favorite music and audiobooks. If you are driving, you can safely add aromatherapy. Lavender, eucalyptus and other essential oils have special anti-stress benefits.

By the way, the very way home and to work can also affect the level of stress. The optimal travel time is considered to be 30-60 minutes, longer trips are detrimental to the quality of everyday life, sleep and, as a result, general well-being.

Probably no one will be surprised to learn that one of the most effective ways to unwind is a walk in the park. By changing the working space to the natural environment, it is easier for us to leave aside all the worries of the office. The therapeutic effect will be noticeably enhanced by the company

IGOR MISHCHENKO,
HEAD DISPATCHER:

«The production activity of the oil pipeline is carried out around the clock, and I, by virtue of my official duties, am available 24x7 to communicate with colleagues who are on shift. As for rest, I believe that for a full-fledged work, it is important for an employee to get enough sleep first of all. Moreover, the time allotted for sleep is individual for everyone: someone needs more than eight hours, someone needs less. I will not dwell on the harmful role of bad habits, we are all adults, I will only note that for the quality performance of duties, the ability to leave household problems outside the office is also extremely important. At work, we must be focused only on work.

ANASTASIA NAUMOVA,
DOCUMENT CONTROL SPECIALIST:

«As a rather, I spend all holidays and vacations quite actively, I travel a lot. Regardless of the choice of route and activities, fitting back into the working schedule is quite difficult, but I can share a couple of "tricks". First, try to plan your vacation so that the return is a day or in the morning before the working week. As a rule, on rest days, our usual sleep pattern gets lost, we go to bed later and wake up later, so on this day, we need a little, the main thing is not to overdo it, physical activity in order to fall asleep faster, for example, to do something from the accumulated household business (this is not my option), go for a walk or play tennis (this is mine). You can also just do nothing, some are very tired of this. But getting up in the morning for work will still be difficult, so you need additional motivation in addition to the exciting journey to the subway and meeting with colleagues. And here it is, advice number 2: try to cook in advance or buy yourself something very tasty for breakfast — something that you love very much, but for some reason do not often allow yourself. The thought of a delicious breakfast will help you fall asleep faster and wake up faster.

of a four-legged pet. Yes, and at home, "our smaller brothers" significantly reduce anxiety, switching attention to yourself, whether it's a purring cat or watching aquarium fish that sets you up for a meditative state.

If we are talking about meditation, special lessons in this area are easy to find on the Internet. You should start with 5-10 minutes a day, each time increasing the time. Meditation is useful to combine with yoga. The latter gives sufficient physical activity, favorably affecting both health and mental state.

It is useful to fill free time with trips to theaters and concert halls. Listening to pleasant music, activating pleasure hormones (serotonin, dopamine, endorphins), improves well-being and reduces stress. Socialization is no less useful, when people exchange emotions and impressions with other listeners.

Perhaps someone will be surprised, but among the types of home creativity, experts recommend... coloring. Coloring pages are not only for children, and themes for the older generation are very diverse: cars, planes, animals, characters of favorite films and so on. This type of activity calms and helps to quickly relieve tension.

Photography is also mentioned in the top list of creative hobbies that help to fully unwind after work. It has been 200 years since the first photograph was taken, but the number of amateur photographers around the world is only increasing. Leisure time with a camera develops imagination and distracts from worries, helps to look even at familiar objects from the most unexpected angle. The therapeutic effect of photography was proven in the 40s of the twentieth century, later a whole direction of "phototherapy" was formed, which is now used both within the framework of medical complexes of psychotherapeutic techniques, and as an independent psychotechnics.

Another very productive idea is to study foreign languages at your leisure. This extremely exciting activity allows you to better understand how social contacts are built in another country, teaches you how to interact with people whose thinking and perception of the world is different from ours. Learning a language necessarily includes familiarity with the history, geography, art and traditions of another country. Researchers are sure that thanks to the study of a foreign language, we can better understand ourselves and gain the ability to make the right decisions with lightning speed.


Erbolat Shadrakhov

SERGEY NOSOV,
MANAGER OF ASTRAKHANSKAYA PS:

«I have a private house with a small garden, so my free time depends entirely on the season. During the summer, I take care of my fruit trees and vegetable crops. In winter, when I don't feel like going outside, I sometimes read. Particularly interested in the latest automotive industry, various electric vehicles. The study of technical literature, innovations in construction technologies of both civil and industrial facilities can also be listed among my hobbies.

MINGIYAN BATNASUNOV,
REPRESENTATIVE, GOVERNMENT RELATIONS:

«Three or four times a week after work I do Brazilian Jiu-Jitsu. This is our family tradition: my grandfather was fond of national wrestling, my father was freestyle wrestler. I recommend to everyone a wonderful way to improve overall well-being, good cardio loads, and develop flexibility. It is especially important for me that jiu-jitsu is a safe and non-impact martial art that does not reduce the intellectual activity of the brain. Each workout gives a charge of positive mood, because I work out in a circle of friends, like-minded people, supporters of a healthy lifestyle.

AUTHOR
AINA ZADABEK

MAN IS A LEGEND

IN 2023, THE FAMOUS OILMAN, CPC-K DEPUTY GENERAL DIRECTOR, REPUBLIC OF KAZAKHSTAN GOVERNMENT RELATIONS, KAIRGELDY MAKSUTOVICH KABYLDIN CELEBRATED HIS 70TH BIRTHDAY. THE HERO OF THE DAY, WHOSE NAME IS ASSOCIATED WITH THE LARGEST NATIONAL AND INTERNATIONAL PROJECTS, IS WELL KNOWN AND RESPECTED NOT ONLY IN KAZAKHSTAN, BUT ALSO OUTSIDE THE COUNTRY, IN FAR AND NEAR ABROAD

BK_graphic/Shutterstock/FOTODOM

Kairgeldy Kabyldin was born on January 1, 1953 in the city of Pavlodar in a large family. His father Maksut was a veteran of the Great Patriotic War and the bodies of the Ministry of Internal Affairs.

In 1975, after graduating from the Kazakh Polytechnic Institute named after V.I. Lenin, a young system engineer Kabyldin was drafted into the ranks of the Soviet army. He served in the radio engineering troops of the Baku Air Defense District, was demobilized in 1977 with the rank of senior lieutenant engineer.

Kairgeldy Maksutovich began his career in Omsk as a commissioning engineer at the Trans-Siberian Main Oil Pipelines Administration (TMOPA). Then he headed the Pavlodar PS, was the head of the department and deputy general director of the Production Association Main oil pipelines of Kazakhstan and Central Asia.

"I had a chance to take part in such Soviet-era construction projects as the Omsk –Pavlodar, Pavlodar – Shymkent, Shymkent–Chardzhou oil pipelines", recalls the hero of the day.

In 1993, Kairgeldy Kabyldin was invited to work at the Ministry of Energy and Fuel Resources of the Republic of Kazakhstan. He headed the Office for the Integrated Development of Oil and Gas Transportation.

"The main driving force behind the development of the economy of independent Kazakhstan has become the oil industry", notes Kairgeldy Maksutovich. "A strategic task was set to create a system of multi-vector export routes for oil transportation. Route No 1 was named Tengiz – Novorossiysk".

ROUTE NO 1 WAS NAMED TENGIZ – NOVOROSSIYSK

The work on this project in the Ministry of Energy of Kazakhstan was headed by Kairgeldy Kabyldin. In 1993, negotiations began between the participants and investors on the issues of financing, designing and building the CPC pipeline system. On December 6, 1996, a historic event took place in Moscow – the signing of the Shareholders' Agreement of the Caspian Pipeline Consortium.

From 1995 to 1997, Kairgeldy Maksutovich was developing a project to create a national oil transportation operator. The project was supported by the country's leadership, and in April 1997 KazTransOil CJSC began its work. In this company, Kairgeldy Kabyldin was appointed vice president for oil transportation. In the future, he becomes the first vice-president of National Company Oil and Gas Transport CJSC.

In 2002 NC KazMunayGas JSC was established. Kairgeldy Maksutovich is appointed Managing Director, then Vice President for Oil and Gas Transportation and Service Projects.

"The development of a multi-vector differentiated oil transportation system in the Republic of Kazakhstan continued", the hero of the day recalls. "The construction of a system of main oil pipelines Kazakhstan –China began. In 2003, a 400-kilometer Kenkiyak –Atyrau pipeline was built, and three years later, the Atasu – Alashankou pipeline (1,100 km) was built. In 2009, the 600-kilometer Kenkiyak-Kumkol oil pipeline was put into operation".

At the same time, Kairgeldy Maksutovich participated in the creation of the National Company Kaztransgas and the national shipping company Kazmortransflot. The construction of the first tankers of the Republic of Kazakhstan, such as Astana, Almaty, Aktau, Atyrau, Aral begins. In 2007, Kairgeldy Kabyldin was appointed Deputy Chairman of the Board of Kazakhstan Holding for State Assets Management Samruk JSC and headed the Board of Directors of NC KazMunayGas JSC. In 2008, he became the Chairman of the Board – President of NC KazMunayGas JSC.

LIEUTENANT ENGINEER K.M. KABYLDIN. 1976

At this time, the national company KazMunayGas begins to actively develop investment activities. In order to develop the Kazakh sector of the Caspian shelf, agreements are concluded with Total, Eni, Mubadala, Conoco-Phillips, KNOC, SOCAR.

HEAD OF PS PAVLODAR WITH COLLEAGUES. 1977

AT THE OPENING OF THE ATASU – ALASHANKOU OIL PIPELINE. 2006

SIGNING OF THE MEMORANDUM BETWEEN KMG AND CONOCO-PHILLIPS AND JSC «MUBADALA DEVELOPMENT COMPANY». 2008

AS PART OF THE CPC DELEGATION AT SPIEF 2021

In 2007, China and Kazakhstan conclude an intergovernmental agreement on the construction of the Turkmenistan– Uzbekistan – Kazakhstan – China main gas pipeline. Kairgeldy Maksutovich is actively involved in the project, developing the contractual framework between KMG and CNPC for the design, financing and construction of the gas pipeline. The first stage of the gas pipeline was put into operation in December 2009.

In October 2011, Kairgeldy Kabyldin was appointed General Director of KazTransOil JSC and headed the company's board. In 2012, KazTransOil was the first among the enterprises of Kazakhstan to take part in the "People's IPO" project and, as a result, received the Grand Prix of the republican competition "Paryz-2012".

In 2016, Kairgeldy Maksutovich became the Deputy General Director of the Caspian Pipeline Consortium for relations with the Government of the Republic of Kazakhstan.

"When I headed CPC in 2016, I did not expect that life would give me the opportunity to work side by side with Kabyldin himself", notes Nikolay Gorban, CPC General Director. "In the person of Kairgeldy Maksutovich, I found not only a deputy for a responsible direction in the Republic of Kazakhstan, but also a reliable support, and an older comrade, and a wonderful friend! Our close-knit work gives not only a lot of bright and unforgettable impressions, but also a huge layer of valuable professional knowledge and skills".

The career path of Kairgeldy Maksutovich is marked by state awards (Kurmet, Parasat, Barys orders, medals of the Republic of Kazakhstan) and honorary titles: honorary oilman of the Russian Federation, honorary citizen of the Pavlodar region, honorary professor of the Atyrau Institute of Oil and Gas, honorary professor of the Eurasian club of scientists, academician of the International Academy of Engineering.

Relatives and colleagues of Kairgeldy Kabyldin speak with great respect for the generosity of his soul and kindness of heart. Wherever Kairgeldy Maksutovich works, he always considers social responsibility to be a priority part of the organization's activities.

Kairgeldy Kabyldin was one of those who supported the restoration of monuments to the heroes of the glorious history of the Kazakh people: the Tole-bey mausoleum in Tashkent, the Aiteke-bey mausoleum in Nurata, the Bokey Khan mausoleum in the Astrakhan region. In Pavlodar, with the assistance of Kairgeldy Maksutovich, monuments to academician Kanysh Satpayev and batyr Malay-Sary were erected, an ice hockey complex and a kindergarten were built. A sports complex was built in Zhanaozen, and a National Museum in Astana. This is just a small part of those social facilities that were built during the work of Kairgeldy Kabyldin in the national companies of the Republic of Kazakhstan.

HE CONSIDERS SOCIAL RESPONSIBILITY TO BE A PRIORITY PART OF THE ORGANIZATION'S ACTIVITIES

As part of CPC's charitable activities, Kairgeldy Maksutovich continues to create socially important facilities in the Atyrau region. Here, over the past five years, schools have been built in the village of Kurylys in Indersky district, in the village of Kyzyloba and in the village of Zhastaldap in Kurmangazy district. Kindergartens were opened in the village of Ganyushkin, Kurmangazy district, in the Samal microdistrict of the city of Atyrau and in the village of Akkistau, Isatai district. In 2020, the Children's Village and the Youth Home started working in Atyrau.

"We try to make the assistance of the Consortium as targeted as possible", says Kayrgeldy Maksutovich Kabyldin. "Thanks to the Children's Village and the Youth Home, children with a difficult fate now have a roof over their heads, there are comfortable conditions, thanks to which they can receive education and professions in demand. We pass on the baton of our affairs to the young, life goes on, and we still have a lot of tasks ahead of us".

AT THE START OF THE CONSTRUCTION OF A SCHOOL IN THE TALGAIRAN MICRODISTRICT. 2022

AUTHOR
PAVEL KRETOV

BY OIL ROUTES

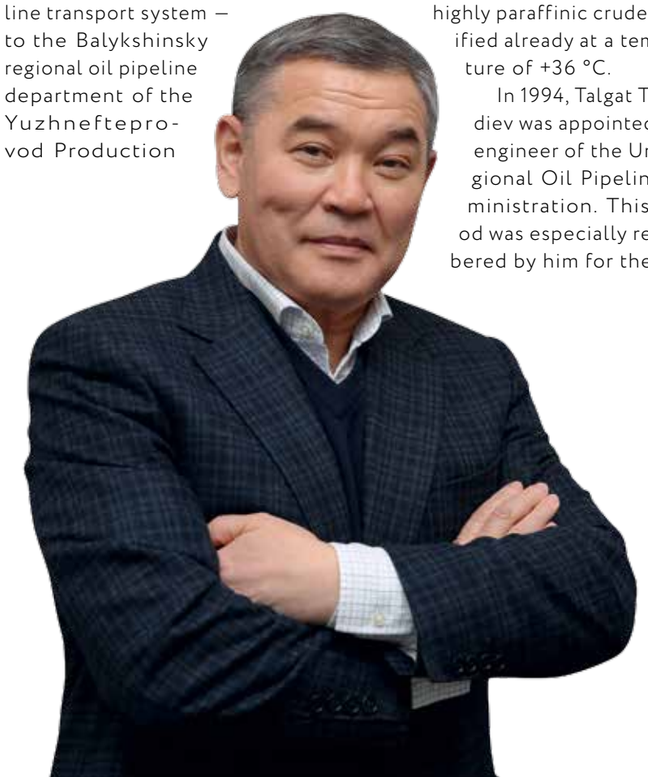
IN DECEMBER 2022, CPC DEPUTY GENERAL MANAGER FOR OPERATIONS TALGAT SATYBAYEVICH TAUBALDIEV CELEBRATED HIS 60TH BIRTHDAY. THE EDITORIAL OF THE CORPORATE MAGAZINE JOINS THE CONGRATULATIONS TO THE HERO OF THE DAY

Talgat's choice of the profession of an oilman determined the very place of residence. Not only was he born in the oil capital of Kazakhstan, the city of Atyrau (then Guryev), he also grew up in a microdistrict populated by oil pipeline workers.

"Our microdistrict Pervy Uchastok (First Site) was called so in honor of the construction of the main oil pipeline Caspian – Orsk", says Talgat Satybayevich. "Many years have passed since then (the pipeline was put into operation in 1936), so only dedicated people knew that the first PS and the production service base were once located here".

Of course, all the local children dreamed of becoming oil workers, and after school, Talgat entered the Moscow Institute of Oil and Gas named after I.M. Gubkin at the Faculty of Oil and Gas Fields Development. After graduating from the university, in 1991, he worked on an expedition, where he participated in the discovery of the Imashevskoye and Zaburunskoye deposits, as well as the Oryskazgan and Sazankurak deposits in Western Kazakhstan.

"Oil and gas exploration expeditions were directly related to the structures of the USSR Ministry of Geology", explains Talgat Taubaldiev. "With the collapse of the socialist state, funding stopped, and I moved to the pipeline transport system – to the Balykshinsky regional oil pipeline department of the Yuzhnefteprovod Production Association" (today it is a division of KazTransOil JSC).



In 1993, he headed the operation department of Regional Oil Pipeline Administration, which ensured the operability of the Uzen – Atyrau – Samara oil pipeline section. It was not an easy task, given both the age of the steel artery and the lack of funding characteristic of the 90s. In-line diagnostics helped out: it allowed to rank defects according to the degree of urgency and to carry out repairs in a timely manner.

"We did not identify individual places for repairs, but entire sections with a length of sometimes several tens of kilometers", recalls Talgat Satybaevich. "Gathering emergency recovery teams from all ROPA – hundreds of people and dozens of pieces of equipment – they changed coils at once 10, 20, or even 30 m long".

All this had to be organized in a timely manner, to provide the involved specialists with the necessary materials and food. Oil heating furnaces also required great attention. Without this equipment, highly paraffinic crude solidified already at a temperature of +36 °C.

In 1994, Talgat Taubaldiev was appointed chief engineer of the Ural Regional Oil Pipeline Administration. This period was especially remembered by him for the need to quickly build a chemical-analytical laboratory at the intermediate PS "Bolshoi Chagan".

FIRST SITE SCHOOLCHILDREN

TALGAT WITH CLASSMATES

"This station was the last in the course of oil before the Russian section of the Guryev-Kuibyshev oil pipeline", Talgat Taubaldiev explains. "At that time, Transneft had questions about the quality of crude coming from Kazakhstan, and we needed to quickly find out which supplier could not withstand the indicators".

> "IT IS EASY TO WORK WITH PEOPLE WHO KNOW AND LOVE THEIR JOB, THERE ARE NO OTHERS IN THE CONSORTIUM"

The problem was quickly solved: a laboratory was built, staff was recruited and trained. An additional difficulty was created by the need to flush the walls of the pipeline from salts.

In 1998, Talgat Taubaldiev was invited to Tengizchevroil as a Special Projects Manager in the Marketing and Logistics Department. Here he studied the issues of re-profiling for the transportation of oil from Tengiz the first line of the Uzen – Guryev oil pipeline, built in 1969. Diagnostics showed that the restoration of the steel artery would be unreasonably expensive, and then Talgat concentrated on organizing alternative supply routes. Through the pipeline, Tengiz oil, mixed with Uzen oil, was pumped to Samara. With the help of special ferries, designed for 48 railway tanks, crude were transported by sea from Aktau to Baku and then delivered to Batumi. Other recipients of Tengiz oil by rail were sea terminals in Feodosia, Odessa and even in Finnish Porvoo.

In 1999, Talgat Taubaldiev returned to KazTransOil, taking the position of chief engineer of the western branch. One of the important tasks of those years was the reconstruction of the Mangistau Regional Oil Pipeline Administration. The department was responsible for a total of 700 km of main oil pipelines: the arteries that went from the Buzachi peninsula and the section of the Uzen-Atyrau pipeline to the Opornoye heating point.

"The turn of the 1990–2000s was already more favorable for the industry due to the increase in world oil prices", Talgat Satybaevich notes. "Therefore, we were able not only to focus on strengthening the reliability of the pipeline system, but also to begin to eliminate the consequences of oil pollution that remained in emergency barns from Soviet times".

In the mid-2000s, Talgat Taubaldiev moved to work in the central office of KazTransOil in Astana. As the first deputy general director of the company, in particular, he was involved in the development of projects for the transportation of oil from the fields of Western Kazakhstan to China. During this period, with the participation of Chinese colleagues, the Kenkiyak – Atyrau, Kenkiyak – Kumkol oil pipelines were built, the Kumkol station was significantly rebuilt with the addition of a tank farm.

In 2016, as Deputy General Manager for Operations, Talgat Taubaldiev joined the friendly CPC team.

"It is easy to work with people who know and love their job. There are no others in the Consortium: everyone went through a great school of pipeline transport", says Talgat Satybayevich.

As Deputy General Manager for Operations, Talgat Taubaldiev is responsible for the Kazakhstan section of the CPC oil pipeline. Now his focus is on bringing the facilities commissioned under the Debottlenecking Program to full operational readiness, in-pipe diagnostics of the linear sections built in 1991, timely scheduled replacement of equipment and other important tasks.

AUTHOR
OLGA SIMASHKINA,
TESTING LABORATORY HEAD, KOMSOMOLSKAYA PS

BEHIND THE FLAGS

AT THE WORD "FREERIDE", MOST PEOPLE SEE UNTOUCHED SNOW-WHITE FLUFFY FIELDS, ALONG WHICH A LONE SKIER RUSHES DOWN. IN REALITY, EVERYTHING IS SOMEWHAT DIFFERENT

Freeride is a descent from a mountain outside of prepared tracks, where the rider chooses his own line, depending on the physical and psychological state. Each descent is unique, it is a kind of small journey that gives incredible impressions and emotions. It is riding on untouched snow that fully reveals all the possibilities of snowboarding – you can endlessly progress and find new places.

But it is important to always remember that this magical journey can turn into a struggle for survival at any moment. The mountains are beautiful, but they hide many dangers associated with orientation in unfamiliar terrain, avalanches, trees, streams. Therefore, having decided to go beyond the marked route, it is important to soberly assess your strengths and not neglect the company of proven guides.

Snowboarding has fascinated me since I was in college. Within the boundaries of Krasnoyarsk there is a small ski slope, where it all began. I thought about freeride much later. This sport requires a certain level of technique and general physical fitness. Only when you feel confident on prepared slopes of any complexity, you begin to enjoy the descent beyond the green, blue, red and black slopes.

Outwardly, the freeride looks very impressive, but in fact you understand that the surface of the descent is far from uniform. Outside the tracks, in most cases, you ride on snow porridge, crust, bushes scraped to the ground and other delights. Often it takes a long time to climb to the starting point or already at the finish line to get out of the forest waist-deep in snow. But all this is compensated by the mountains – the best place on earth.

There are many interesting places for freeriding in the world: Japan with its fantastic snow, Chile in summer or descents from volcanoes to the Pacific coast in Kamchatka.

THE MOUNTAINS ARE BEAUTIFUL, BUT THEY HIDE MANY DANGERS

Sheregesh is consistently good at the beginning of the season, in November-December. This resort in the Kemerovo region is suitable for any level of skiing, as well as for meeting old friends.

Going to the village of Priiskovoe in Khakassia makes sense if you want to combine the meeting of the new year and off-piste skiing. Here you will not see the queue for the lift, because there are no lifts, only snowcats (equipped with a passenger cabin). The place is exclusively for freeriders.

If you want to extend the season, you need to go to Kirovsk, Murmansk region. Here in May, the quality of snow is excellent, and the variety of terrain adds adrenaline to the blood

The dream of any freerider is heli-skiing, when you are delivered to the top by helicopter. There are such programs in Russia in Kamchatka – descents from volcanoes to the Pacific Ocean. It is expensive, but the algorithm is quite simple: you fill out an application for participation, pay money, buy a plane ticket, pack your equipment and fly. Skills of confident skiing on and off the slopes, possession of avalanche equipment are required. When planning such a trip, you need to be honest with yourself, assess your strengths. If the level of skiing is insufficient, there is a possibility that they will not take you on board.

NUANCES OF EQUIPMENT

Boots are the most important piece of snowboarding equipment. They should be comfortable and fit well on the leg, not press or dangle. To begin with, you should not choose very hard boots, it is advisable to try on several pairs of different manufacturers before buying.

If you have never snowboarded, then you need the most ordinary board for beginners. Don't think that if I want to freeride, I need a freeride board. No, first you need a board for a beginner. After all, a beginner board and a freeride board are two completely different boards.

The main thing when choosing a snowboard is to focus on size and stiffness. It is desirable that the board be soft enough to "forgive" all the mistakes of a beginner. A freeride board is wider and longer than a regular board – a large area allows it to "float" in deep snow. Stiffness is also selected for specific conditions: for those who ride more often in the forest, it is better to take a soft board that will be nimble and easy to control. If you are going to ride in high mountains, you need to take a rigid board that will hold the arc at high speeds and inflated slope.

Clothing is an important factor in successful snowboarding. It should be comfortable, not restrict movement. It should not be hot and the body should be dry. When dressing for skiing, it is important to follow the rule of layering.

The first layer is thermal underwear. Its task is to remove moisture from the surface of the skin. The second layer is insulating. It can be fleece, fluff. These materials will retain the heat that our body loses and ensure the removal of moisture from the surface of thermal underwear. The choice of insulation layer depends on the place of skiing and individual thermoregulation.

The third, top layer of clothing performs three functions: it protects from the wind, removes evaporation, and shelters from rain and snow. At the same time, it is important to pay attention to the membrane: the more humid the climate, the higher its water resistance should be. It is the membrane that will keep your body dry and will not spoil the riding experience.

Freeriding is dangerous without protective equipment, including a helmet and other attributes. This is important for beginners to understand, as the risks outside of the equipped trails increase many times over. When riding outside marked trails, the rider will need both a set of avalanche equipment (beeper, probe, shovel) and the skills of using it.

A novice rider should practice more and hone his descent technique on equipped slopes. Do not be afraid of difficulties in finding instructors, guides and like-minded people. You can always enroll in a school where there is a company suitable for skating.

AUTHOR
DMITRY KONSTANTINOV

ROAD TO FUTURE

THE INTERNATIONAL FESTIVAL "CPC FOR TALENTED CHILDREN" IN 2022 HAS REGAINED ITS IN-PERSON FORMAT AFTER TWO YEARS THAT HAVE PASSED ONLINE DUE TO EPIDEMIOLOGICAL RESTRICTIONS. THE RESULT EXCEEDED THE WILDEST EXPECTATIONS: A RECORD NUMBER OF PARTICIPANTS, AN OBJECTIVELY HIGH QUALITY OF PERFORMANCES

The competition, which the Caspian Pipeline Consortium has been holding for more than two decades in the Astrakhan Oblast, Republic of Kalmykia, Stavropol Krai and Krasnodar Krai, gives a chance for creatively gifted children and adolescents aged 6 to 18 to express themselves at the main concert venues of the country, to receive training from the best teachers and famous artists, to meet and make friends with like-minded people, to learn a lot of new and interesting things. Since 2019, a similar competition Jas tolquin has been held in the Republic of Kazakhstan, in which talented children from Atyrau, Aktobe, Mangistau and West Kazakhstan regions participate. Laureates of Russian and Kazakh competitions perform together at a gala concert in Moscow.

"The CPC for Talented Children Festival occupies a special place among the charitable projects that we implement in the regions of our presence", said Nikolay Gorban, CPC General Director, in his greeting to the 2023 laureates. "By lighting new stars every year, we make an important investment in the future that belongs to our children. The festival plays an important role in the process of formation and development of the younger generation, the preservation of ethnic cultural traditions of the regions of Russia and Kazakhstan".

The acceptance of applications for participation in the 2022 contest started on March 10 and lasted exactly a month. The organizers recorded the largest number of participants in the history of the festival – more than 18 thousand people and almost 5 thousand applications. Information support and prompt feedback were provided by three network resources: the festival website, as well as communities in social networks VK and Telegram.

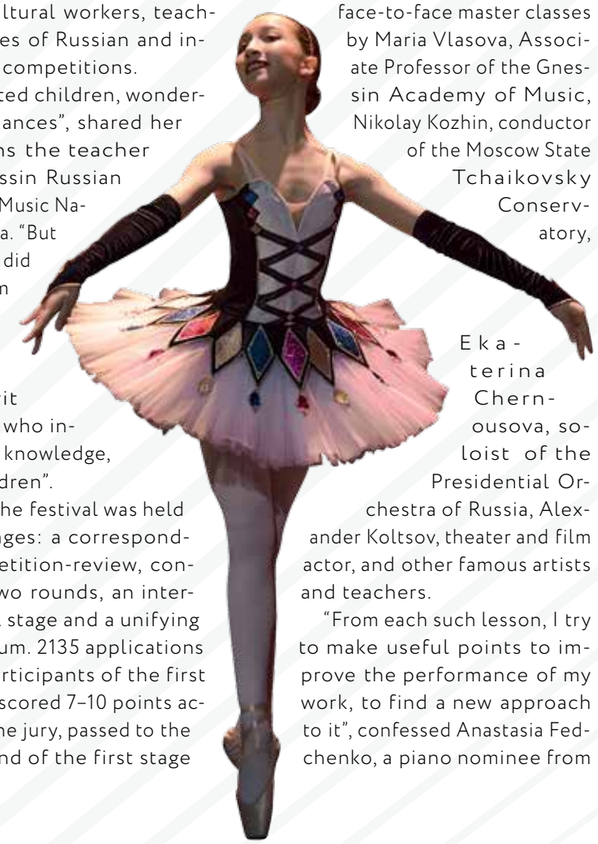
Each of the seven competitive nominations (vocal, instrumental music, scenography, choreography, and others), in turn, contained several directions. Participants could present works for piano, string, wind or percussion instruments, instrumental ensemble, orchestra; choose between pop, academic or folk performance. The performances were evaluated by an authoritative jury, which included famous artists, honored cultural workers, teachers, laureates of Russian and international competitions.

"Very gifted children, wonderful performances", shared her impressions the teacher of the Gnessin Russian Academy of Music Natalya Mukhina. "But such a result did not fall from the sky, this is primarily the merit of teachers who invested skill, knowledge, soul in children".

In 2022, the festival was held in three stages: a correspondence competition-review, consisting of two rounds, an internal regional stage and a unifying cultural forum. 2135 applications from the participants of the first round, who scored 7–10 points according to the jury, passed to the second round of the first stage of the competition. The second round, which ended on July 1, determined the participants of the full-time regional stages of the competition, which started in September.

The children who made it to the regional stages were given face-to-face master classes by Maria Vlasova, Associate Professor of the Gnessin Academy of Music, Nikolay Kozhin, conductor of the Moscow State Tchaikovsky Conservatory, Ekaterina Chernousova, soloist of the Presidential Orchestra of Russia, Alexander Koltsov, theater and film actor, and other famous artists and teachers.

"From each such lesson, I try to make useful points to improve the performance of my work, to find a new approach to it", confessed Anastasia Fedchenko, a piano nominee from



Stavropol, who submitted Anatoly Lyadov to the Barcarolle competition. "All professionals in any field need to constantly improve their skills".

"I plan to enroll in VGIK or GITIS to become a director", said 17-year-old Nikita Polyakov from Krasnodar. "A master class in acting is of particular value to me, because it allows me to look into this specific world from the inside, to immerse myself in its atmosphere".

Regional gala concerts with the participation of winners and laureates of the second round were held in October in Astrakhan, Elista, Stavropol, Krasnodar and Novorossiysk.

"The wonderful project "CPC for Talented Children" has become a traditional cultural event that young Stavropol residents are looking forward to", Galina Pavlova, First Deputy Minister of Culture of the Stavropol Krai, emphasized at the opening of the concert. "We are grateful to the Caspian Pipeline Consortium for supporting young people, for their willingness to invest charitable funds in the future of children, in the future of the country".

The third stage of the CPC for Talented Children 2022 competition, a unifying cultural forum, was held from 25 to 29 November in Moscow. On the eve of the gala concert on November 26–27, the winners of the regional stages of the competition, together with their mentors, took part in master classes organized by teachers from leading Moscow universities, artists from Moscow theaters, and famous musicians. All participants of the third stage also went on interesting excursions, visited Moscow museums, exhibitions, concerts and other attractions.

"The participants came to Moscow with an interesting and diverse program", Nikolay Kozhin, conductor of the Moscow State Tchaikovsky Conservatory, assessed the preparation of the laureates.

On November 28, 2022, a gala concert and awards ceremony took place at the Et Cetera Theater in Moscow. The gala concert was united by a common storyline: "time travel for a dream". The main travelers – Alisa Selezneva and the robot Werter – were borrowed by the author of the script from a 1984 science fiction film. This kind of nostalgic quotation appealed to adults, but the children perceived the plot as something new and exciting.

Successive historical epochs – Peter's, Catherine's, Pushkin's, Russian industrial, early and late Soviet – immersed the audience in musical and dance performances authentic to their time, performed with high skill by the contestants. Bright, tastefully chosen costumes, energetic, temperamental performance of folk and modern works – all this caused delight to the full half-thousand hall and a well-deserved ovation.

The two-act historical-fiction action organically ended with the award ceremony of 49 laureates of the festival, among whom were soloists and creative teams. The stage was filled with 260 well-deserved winners. They were welcomed by CPC General Director Nikolay Gorban. The award ceremony was attended by Mikhail Grishankov, CPC Deputy General Director for RF Government Relations, Kairgeldy Kabyldin, CPC Deputy General Director for RK Government Relations, Oleg Knyazev, Chairman of the Government of Astrakhan Oblast, Andrey Kravchenko, Head of the Novorossiysk Municipality.

"The festival occupies a special place in the Consortium's charitable projects", said Mikhail Grishankov, CPC Deputy General Director, RF Government Relations. "Our main task is to give children the opportunity to learn performing skills and show their talents to the maximum. We hope that this opportunity will give them new strength, open the way to the future".

"There are no losers in this contest", emphasized Kairgeldy Kabyldin, CPC Deputy General Director, RK Government Relations. "The competition allows us, adults, to make sure that children have a dream, and whoever dreams is happy. Today, new stars of music, theater, variety art, and art are born on this site".

The planes were still in the air, and the trains were halfway when the festival social networks began to fill up with impressions of those returning from the Moscow concert. Young, but already certified artists, their parents and teachers were all equally emotional, impressed and enthusiastic.

"Many thanks to the organizers of the competition for giving our children the opportunity to show their talents and learn from wonderful mentors", Marina Pereboeva emphasized in her review. "This is very valuable for children and for us, leaders of clubs and studios."

"Two days have already passed since we returned home, but emotions still overwhelm us and our children", Olga David shared her impressions. "Many thanks to everyone for this holiday, which will remain in memory for many years!"

Members of the jury, experts and just the audience agreed on the high overall level of performance of the musical and stage performances of the gala concert. At the same time, it was impossible not to notice that over the years the festival has already formed its own leaders and "ambassadors". Improving their skills with each master class, they already take world-class octaves and chords, delight the eye with magnificent stage costumes, and periodically appear on federal television channels. This is more of an incentive than a reason to give up for those who did not make it to the 2022 finals, and for those who have just learned about the festival and are going to make their debut in it. In the spring of 2023, applications for the new season of the CPC for Talented Children festival will open. Everyone has a chance, and luck – as the songwriters taught – is the reward for courage.

AUTHOR
PAVEL KRETOV

TRADITION – TO HELP

CPC NOT ONLY DOES BUSINESS, BUT ALSO CONSIDERS IT ITS DUTY TO PROMOTE THE DEVELOPMENT OF SOCIAL INFRASTRUCTURE IN THE REGIONS. MANY INSTITUTIONS INTERACTION WITH WHICH STARTED DECADES AGO CONTINUE TO RECEIVE EFFECTIVE AND REGULAR SUPPORT OF THE OIL TRANSPORTATION COMPANY

It is middle of a day. Yard of school number 31 in the village of Glebovsky. Accompanied by teachers, schoolchildren get on buses. They approach in groups, quickly, but in an organized manner, and now the transport is ready to hit the road.

LILIA SHALAGINA

"The Caspian Pipeline Consortium donated three modern buses to our school. They are of great importance for ensuring the educational process: more than 500 students come and return home on this transport", says the director of the school, Lilia Shalagina. CPC not only donated, but also replaces old cars with new ones as needed. Now children are transported by comfortable IVECO Neman-420438-511 with soft seats equipped with point seat belts and folding armrests. There are even compartments for school bags. Salons are equipped with air conditioners, tinted windows and are adapted for transportation in the suburbs of Novorossiysk.

The buses are equipped with the GLONASS navigation system, speed limiters, external loudspeakers, digital tachographs, in-vehicle emergency call devices and other equipment to ensure passenger safety.

"Good, reliable and safe buses, ideal for transporting children. About 215 km are covered per day", says Vladimir Kirilyuk, a driver with 35 years of experience. Previously, he had even driven the world's largest BelAZ mining dump trucks.

By eight in the morning, Vladimir brings children of the first shift. At noon, the guys go home and immediately after that the bus cabin is filled with schoolchildren of the second shift. At seven o'clock in the evening they also leave the school. The route covers the Southern and Northern Ozereevka, Prokhorovka, Borisovka, Tsemdolina and other settlements.

The Krasnodar Krai is traditionally attractive for the resettlement of residents from the northern and central territories of the country, besides, there is a high birth rate. Therefore, the number of children in the school is dynamically increasing: if in 2020 there were 696 children studying here, now there are already 928.

"A lot of large families come", Lilia Shalagina continues. "Every such time, replenishment comes to several classes at once".

The school currently operates on a nine-year program, but plans to become an 11-year program after the construction of an additional extension for 400 places, where it is supposed to transfer junior grades. In the meantime, graduates enter the senior classes of school No 30 in the neighboring village of Abrau-Durso and in secondary vocational education institutions. The Novorossiysk socio-pedagogical college, the college of construction and economics, the maritime and transport colleges are the most popular among the Glebovsky youth.

CPC NOT ONLY DONATED, BUT ALSO REPLACES OLD CARS WITH NEW ONES AS NEEDED

"Our graduates come to school in the form of their educational institutions, as part of career guidance programs they talk about their future specialties, and this impresses the children", says Lilia Shalagina.

Over the years of cooperation with CPC, School No. 31 has implemented many important charitable projects. A computer science room was equipped, dining room equipment, furniture, computers and interactive whiteboards were purchased, split-systems were installed in the classrooms, which is especially important for a region with a hot climate, windows were replaced with metal-plastic ones, and so on. A notable event for the entire district was the construction of a school mini-football field.

Now, few people will remember that schoolchildren used to play football on an asphalt playground, with a high risk of injury. They now compete year-round on UV-resistant, high-soft, 40 mm-high, tufted synthetic grass. The coating is made by a domestic company, has Russian certificates for medicine and fire safety, and in addition – the approval of the International Football Federation (FIFA).

Lilia Shalagina, herself a physical education teacher by profession, believes that CPC's donation to the school's facilities helps her students to constantly improve their sports performance:

"According to the results of basketball games at the municipal level, boys and girls of the fifth and sixth grades are in the lead in their subgroup. Seventh and eighth graders won volleyball competitions, their classmates became the third".

On the way back from the village of Glebovsky, on one of the city highways, a hydraulic lift with an onboard inscription "CPC – for the city of Novorossiysk" hit the lens. Using this technique, workers with chainsaws cut the branches of a tree that hung dangerously over a residential building.

"CPC donated two towers of this modification to the city. They are in great demand, they are daily engaged in tree trimming, restoration of power lines, replacement of light bulbs and others", Panorama CPC correspondents were told at the Center for Landscaping and Improvement.

AUTHOR
PAVEL KRETOV

ADDING SOUL

THE FIRST YEAR IS THE MOST VULNERABLE STAGE IN HUMAN LIFE. THE IMMUNE SYSTEM HAS NOT BEEN STRENGTHENED YET, AND ALREADY SHOULD RESPOND TO A NUMBER OF ADVERSE EXTERNAL FACTORS, INCLUDING THE EXPOSURE TO PATHOGENIC MICROFLORA. IN ADDITION TO THE MOTHER'S CARE, PROPER, BALANCED AND COMPLETE NUTRITION CAN HELP THE CHILD

Operating since 1965, the Novorossiysk baby food plant provides products to all large and low-income families of the municipality. Starting 60 years ago with modest volumes of 160 liters of kefir, the dairy kitchen reached 500 liters in 1979. In modern Russia, only three dairy kitchens have their own production, so Novorossiysk can be called unique. It produces live fermented milk products enriched with vitamins and minerals.

"Among our products are classic yogurt based on the culture of Lactobacillus bulgaricus (Bulgarian stick), bio-kefir with the addition of bifidobacteria, as well as a product based on mesophilic and thermophilic lactic bacteria, which is usually called yogurt", says Zoryana Kondrashova, head of the UIA "Baby Food Plant".

The plant produces cottage cheese with a 9% fat content, which is optimal for complete assimilation by the body. Products of the "Malyshok" series, which affect different parts of the stomach, are also useful for adults – to improve digestion and recover from illness. In spring and autumn, when people are acutely aware of the lack of vitamins, it will not be out of place to diversify the diet with pasteurized curd whey.

The company uses only a live product, without preservatives and food additives. Some types of products additionally saturate only with vitamins and minerals. Milk is supplied to the Baby Food Plant by a firm that exercises strict quality control. In addition, dry bacterial concentrates are purchased for the manufacture of first the "mother" and then the production starter for the preparation of the final product.

"Our products have a five-day shelf life, but we don't sell anything from yesterday", Zoryana Kondrashova continues. "Everything is sold daily".

In 2021, the Caspian Pipeline Consortium donated new equipment to the plant. The delivery set included about 30 items of various modern equipment worth more than 8.3 million rubles. In accordance with the requirements of the CPC, repairs were carried out in the premises on an area of 400 m^2 before the equipment was installed.

"Today, if necessary, we can produce about a ton of fermented milk products and almost 120 kg of cottage cheese", says the head of the baby food factory.

For comparison: 500 liters of milk could be poured into the old equipment for the production of fermented milk products, and 900 into the new one. The similar capacity of the previous cottage cheese production plants was 350 liters, and now it is 550.

For many years, the "bottleneck" in the production of dairy cuisine has been the packaging of finished products. Imagine that you need to fill 900 cups with exactly 35 grams of cottage cheese – how long will patience last? Now this monotonous painstaking work is given to high-tech equipment.

Filling machines disinfect cups with a special bactericidal lamp, pack the product, seal it with a lid.

"After the installation of new equipment, the Moscow certification laboratory, where we regularly send our products for testing, asked twice to repeat the tests", recalls Zoryana Kondrashova. "They were sure that there simply could not be such indicators close to aseptic ones, and some kind of mistake crept in".

The plant has two own laboratories – physico-chemical and sourdough production. By the way, the staff of the enterprise has only 18 people.

If automation is an obvious benefit in packaging, then in the production of a product, the more done by human hands, the higher the quality.

"CPC presented us with a wonderful self-pressing bath for cottage cheese, in which the whey is squeezed out of the curd clot faster", explains the head of the plant. "Due to this, the product is less warm, which significantly improves its quality. And in the production of fermented milk products by the reservoir method and pumping with the help of pumps, the clot would be destroyed".

The products of the Novorossiysk Baby Food Plant regularly receive awards and prizes in All-Russian competitions. So, at the competition "Dairy Products – 2017" in the city of Adler, the enterprise was awarded gold medals for the products "Malyshok-BIO" and whey. Silver awards were won by cottage cheese "For kids" and drinking yogurt. Representatives of the plant brought three more gold medals from the All-Russian competition "Dairy Products-2019" in Sochi.

"At the competition, we competed with the largest enterprises from dozens of regions of the country", recalls Zoryana Kondrashova. "Presenting the award, the members of the jury were interested in what secret ingredient we use to achieve this quality. I replied that in addition we only add our soul".

The plant's products are well known in Novorossiysk, and generations have been coming here for dairy products. Adults who have grown up on these products pass the tradition on to their children, who pass it on to their children.

AUTHOR
PAVEL KRETOV

KEROSENE AND A WONDERFUL LAMP

IN THE PREMISES OF THE RESTORED BY CPC OPEN LECTURE HALL OF THE GUBKIN RUSSIAN STATE UNIVERSITY OF OIL AND GAS (NRU) AN EXHIBITION "MAGIC LIGHT OF A KEROSENE LAMP" WAS ORGANIZED. THE PERMANENT EXHIBITION IS DEDICATED TO THE 90th ANNIVERSARY OF THE FOUNDING OF THE MOSCOW OIL INSTITUTE

Over six dozen kerosene lamps, many of which are of high artistic and antique value. Kuznetsov porcelain, Murano glass, Chopin's bronze foundry and other famous manufactories in the past. Russian, German, French, English and American models from the collection of the university, as well as from personal collections of employees. And not only lamps – at the exhibition you can also see exotic kerosene slide projector and kerosene radio.

"For many years, our university has had a somewhat ironic unofficial name – "Kerosinka", says the rector of the Russian State University of Oil and Gas (NRU) named after I.M. Gubkin Viktor Martynov. "This is due to the fact that in the 1920–1930s, when our university was founded, kerosene lamps illuminated the premises in Russian cities and in the countryside. And food was mainly cooked on kerosene stoves. Initially, such a nickname seemed somewhat offensive, but now that kerosene has become one of the most technologically advanced products of oil refining and is used in all the most modern aircraft and rockets, the name "Kerosinka" can be regarded as a compliment.

TABLE KEROSENE LAMP FROM THE COLLECTION OF V.G. MARTYNOV. GERMANY, 1890–1910, ECLECTIC. PORCELAIN, GLASS, 14-LINE BRASS BURNER "MATADOR"

Since primitive times, man has been inventing various ways of "portable fire" – torches, torches, candles... In ancient Greece and Rome, olive oil was poured into clay lamps with wicks. Over time, candles were invented, at first only wax, then tallow, later – from paraffin.

Over the centuries, engineers have continued to improve the design and materials for making lamps. Gradually clay was replaced by metal. At the end of the 18th century, the French chemist Joseph-Louis Proust separated the fuel tank from the burner with a horizontal tube, which achieved more uniform combustion.

In the 19th century, many scientists in different countries of the world were engaged in the search for more advanced combustible materials and the development of lamp designs for lighting streets and houses. Canadian geologist Abraham Gesner invented a method for obtaining a high-quality combustible substance from coal, which he called kerosene. Two years later, the Scottish chemist James Young, distilling oil from coal, was able to isolate light fractions, which he successfully tested on an oil lamp. In the middle of the 19th century, oilmen began to participate in the financing of developments to improve the kerosene lamp: they saw broad prospects for their business.

Austria-Hungary became the birthplace of the first mass-

TABLE KEROSENE LAMP FROM THE COLLECTION OF V.G. MARTYNOV. GERMANY, 1880–1900 , ECLECTIC. BRONZE, GLASS, 12-LINE BRASS BURNER "COSMOS"

On December 7, 2022, the grand opening of the renovated main entrance to the Russian State Oil and Gas named after I.M. Gubkin took place. Thanks to the renovation carried out with the charitable support of CPC, the renewed entrance group of the main building has once again become the University's hallmark. The stairs, the walls of the entire entrance group and the pass office are finished with granite from the Yuzhno-Sultaevsky deposit of the Chelyabinsk region. Modern entrance turnstiles are equipped with electromechanical locks and contactless magnetic card readers. Power supply networks were re-layed, automatic fire extinguishing and video surveillance systems were installed.

Active interaction between Gubkin University and CPC began in 2015, when the parties signed a cooperation agreement, under which a number of projects were implemented. In addition to the entrance group, the Consortium provided financial support for the renovation and equipping of the Big Academic Auditorium and the Open Lecture Hall.

"Many Gubkin University graduates work for our company", said Nikolay Gorban, CPC General Director, in his speech. "We highly appreciate the level of training that our specialists receive, and we are sincerely interested in the fact that the industry alma mater always looks majestic and monumental, as it was conceived by the architect Boris Mikhailovich Iofan, who designed the university building in 1951".

"If the theater begins with a hanger, then Gubkin University starts with the main entrance", emphasized the rector of Gubkin Russian State University of Oil and Gas Victor Martynov. "Now it is made to the highest standards — both technologically and beautifully".

produced kerosene lamp. In 1852, pharmacists from one of the pharmacies in Lvov, Ignacy Lukasiewicz and Jan Zech, with the participation of tinsmith Adam Bratkovsky, invented the first safe design. In December 1853, they received an Austrian patent for the distillation of kerosene with the purification of aromatic hydrocarbons, which rid the kerosene of an unpleasant odor. Since the very design of the lamp with a tin tank at the bottom and a part of mica on top was not patented by Lukasiewicz and Zech, its production was first mastered by the Vienna company of Karl Rudolf Ditmar, and then by factories throughout Europe.

IN RUSSIA, A GREAT CONTRIBUTION TO THE IMPROVEMENT OF THE DESIGN OF KEROSENE LAMPS WAS MADE BY D.I. MENDELEEV

In Russia, a great contribution to the development of kerosene production technology and the improvement of the design of kerosene lamps was made by the famous scientist Dmitry Mendeleev, who called himself an "oil business volunteer". He established a connection between the design of a kerosene lamp and the composition of the fuel. Thanks to the scientific research carried out in the Russian Empire, the lower limit of the flash point of kerosene (+ 27 °C) and the norms for the rejection of insufficiently purified fuel were legally established.

St. Petersburg was the first Russian city to switch to street lighting with kerosene. On August 1, 1863, six thousand lanterns with kerosene lamps were lit in the capital of the Russian Empire. On May 1, 1865, 2200 of the same street lamps were turned on in Moscow. Kerosene lamps gave light with the power of 10 candles. Each lamplighter was responsible for 50 lamps, which he had to sequentially light every evening for 40 minutes.

In addition to street lamps, in the second half of the 19th century, kerosene lamps were widely used in transport, industry, and everyday life. There were portable lamps — with a ring-shaped handle on top. Wall-mounted kerosene lamps had a mount for rigid fixation on the wall. Palaces, mansions and apartments were also lit by pendant, table and banquet kerosene lamps. They were made of metal, glass, crystal and porcelain, decorating in the appropriate interior style.

TABLE KEROSENE LAMP FROM THE COLLECTION OF V.G. MARTYNOV. GERMANY, 1880–1900. BRASS, GLASS, FABRIC, BEADS. 12-LINE BRASS BURNER «COSMOS»

KEROSENE SLIDE PROJECTOR. ERNST PLANCK, LATE 19TH CENTURY INSIDE IS A MINIATURE WICK KEROSENE LAMP 8 CM HIGH. AT THE TOP: CHIMNEY

KEROSENE RADIO. USSR, 1950–1960 PRODUCED FOR AREAS NOT COVERED BY ELECTRIFICATION. SUSPENDED THERMOELECTRIC GENERATOR TGK-3 WITH A KEROSENE LAMP POWER 3 W, VOLTAGE 2W

Kerosene lamps reached their greatest distribution in the years 1860–1920. Then they were increasingly replaced by gas and electricity, although for a long time they were used on the railway as signaling devices, and in rural conditions as either "spare" or the only sources of lighting. Lighting kerosene almost completely lost its importance in Europe and the USA after the Second World War, although almost a third of the world's population living in remote and hard-to-reach areas of India, China, Southeast Asia, and Africa still uses lighting based on it. In recent years, kerosene lamps have a new job — they are used to transport fire — blessed, Olympic, memorial.

HOUSEHOLD KEROSENE LAMPS GAVE LIGHT UP TO 15 WATTS

"Many examples of kerosene lamps, created by famous sculptors, ceramists, masters of art casting in almost all existing interior styles today, are outstanding works of art and are presented as unique exhibits in the best museums in the world," notes the rector of the Russian State University of Oil and Gas named after I.M. Gubkin Victor Martynov. "Now we have such a museum. The permanent exhibition fits perfectly into the interior of the lecture hall, zoning the space for especially important events". ●

AUTHOR
DMITRY KONSTANTINOV

THE GREAT MIRROR

A UNIQUE RESOURCE OF STURGEONS AND HYDROCARBONS, THE CASPIAN SEA IS NOW EXPERIENCING A NEW ROUND OF MEDIA POPULARITY. THERE ARE MANY INTERESTING AND UNUSUAL THINGS IN THE HISTORY OF THE WORLD'S GREATEST CLOSED SALT RESERVOIR

The ancient Greek poet Homer believed that the chariot of the god Helios starts its journey from the Caspian Sea every day. His countryman Plutarch in the I century reported how Alexander the Great, having gone ashore with an army, admired the oil fire and the low salinity of the waters. Astrophysicist Galileo Galilei believed that the Caspian Sea was the result of the impact of a giant celestial body. A wealthy guest from Novgorod (merchant of the 1st guild) Sadko "traveled with his ships along the Volkhov, walked along the Volga River, ran along the blue sea of Khvalynsky", that is, he developed an alternative route from the Varangians to the Greeks. In 1466, the Tver merchant Afanasy Nikitin reached India by this route.

In addition to Khvalynsky, the Caspian has about 70 more nicknames in different languages. In everyday life, the name is in honor of the tribe of the Caspians, horse breeders and shipbuilders who disappeared before the beginning of our era. The Great Mirror called the Caspian Sea, apparently visiting him in moments of calm, the poet Rasul Gamzatov. He obviously knew something about the concept of screens, industrially implemented here, the largest of which in the NATO classification is still called the Caspian monster.

In 1640, the merchant Guriy Nazaryev built a wooden fortress at the mouth of the Yaik River (renamed by Catherine II into the Urals after the Pugachev uprising) at the confluence with the Caspian Sea. Later, a city arose here, named Guryev in honor of the founder. On October 4, 1991, the city received a new name — Atyrau. Translated from the Kazakh "atyrau" means "estuary".

Erbolat Shadrakhov

In the spring of 1668, the "sharp-breasted boats" of Stenka Razin entered the Caspian Sea. The warship Frederik, which by that time was part of the Russian Caspian flotilla, was not on the move, and Tsar Alexei Mikhailovich the Quietest diplomatically asked the Persians to deal with the "thieves' Cossacks". In the spring of 1669, in a battle near Pig Island (now Sengi-Mugan in the region of modern Baku), Stepan Timofeevich sank the entire squadron of Mamed Khan and captured his son and daughter. The ataman would subsequently present the young man to Prince Prozorovsky, and the girl would be sacrificed to Mother Volga. In September of the same year, Razin's Cossacks completed the Caspian campaign and moved to the Don.

The three-masted Frederik, by the way, was actually the first Russian warship. But it was built by the Holsteins in 1636, and the ship sailed under their flag for only a week, until it ran aground near Derbent in a storm in order to save cargo and crew. Fate is not too heroic, so official parity passed to the 22-guns frigate Eagle, launched in 1669. This ship, immortalized on the spire of the St. Petersburg Admiralty, was burned in Astrakhan in 1670 by the same S. Razin.

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The fate of the Persian princess and other events of that time was testified by the 30-year-old Dutchman Jan Jansen Streis, who enlisted in 1668 as a sailing master on the Eagle under construction, personally met with Razin and fled abroad when the Cossack rebellion gained national proportions. He was captivated by the Kaitag utsmian (modern Dagestan) Al-Sultan, tortured and sold into slavery, then ransomed in Persia. In 1675, Streis appears in Moscow, leaving a year later. Prior to this, the Dutch "super-agent" traveled to Africa, Siam and Japan, learned a lot of new things and died non-violently in 1694. His book "Three Journeys" was ordered by the Russian Emperor Peter I to be translated, but the translation was very late. In the XVII-XVIII centuries, Holland successfully competed with Britain in the colonial plan, and the issue of "Russian transit" along the route of Athanasius Nikitin was considered quite seriously.

In 1717, Emperor Peter I was admitted to the Paris Academy of Sciences for his exploration of the Caspian Sea and his own corrections to the Mer Caspienne map of Pierre du Vall. In 1709, the Vyshnevolotsk water system, created on the initiative of Peter I, was opened, linking the Neva with the Volga, and, consequently, with the Caspian. Later it was improved to the modern Volgobalt system.

Having quarreled with the British over Malta, Emperor Paul I planned a joint campaign against India with Consul Bonaparte. The idea was purely Napoleonic: forcing the allied armies of the Black and Caspian Seas, then a cavalry-infantry march to Kandahar. The Cossack chieftain Vasily Orlov, who was granted the powers of the viceroy of India by the highest rescript, brought 40 regiments of the Don Army to modern Aktobe without any problems. From there, the 20,000th army on March 31, 1801 was recalled back with a new rescript signed by Alexander I.

The prototype of the customs officer Vereshchagin from the film "White Sun of the Desert" was Mikhail Pospelov, staff captain, commander of the border detachment of the 30th Transcaspian brigade. Under his command, there were four cavalry patrols, the Sentinel guard and four border boats. In 1917, the soldiers and sailors of the 30th brigade dispersed to their homes, and the officers went to Denikin. Before the actual formation of Soviet power in the region in 1919, Pospelov guarded the Russian-Persian border on his own, recruiting a team of 20 Turkmen poor at his own expense and buying a couple of mortars for the needs of the fortified area. Then he headed the border detachment of the All-Russian Emergency Commission, taught at the command staff school, guarded the geological parties, was the head of the fire department in Tashkent, died in 1962.

HISTORY WITH GEOGRAPHY

10 million years ago, the Caspian was part of the Sarmatian Sea, splashing from Vienna to the Tien Shan, washing the islands of Crimea and the Caucasus. 6 million years ago, the rise of the Caucasus Range took place and the Caspian Sea separated from the Black Sea. After 3 million years, these seas were again connected by the shallow Manych-Kerch Strait, which functioned until the 17th century BC. After that, the Caspian Sea was finally isolated, turning into a huge salt lake. The bottom of the Caspian is made up of rocks of the ocean type, and the maximum depth — 1025 m — among the lakes of the world is second only to Baikal, Taganika and the Antarctic subglacial East. The northern part of the Caspian is shallow (on average 4 m) and is covered with ice for five months a year. The southern part is much deeper and is characterized by seismic activity, in particular by mud volcanoes that form gas hydrates. There are about 50 islands in the sea, the area of the largest is 55 km^2.

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MIKHAIL POSPELOV

Over the years, the now shallowing, then the arriving Caspian Sea is now inferior in area to the Black Sea, occupying about 390 thousand km^2. 130 rivers flow into the Caspian Sea: Volga, Terek, Ural, Emba, Kura, Atrek, Gorgan, Sefidrud and others. Rivers annually bring to the Caspian an average of 290 km^3 of fresh water, 75% of which is Volga water. The main evaporator is the Kara – Bogaz – Gol Bay. The name translates as "Black Mouth" – there is a legend that there is a hole at the bottom of the bay through which the Caspian water goes into the World Ocean. Bottom sediments of Kara – Bogaz – Gol include Glauber's salt (mirabilite), used in medicine and glass industry.

The water level in the Caspian Sea began to drop noticeably in the 1930s in connection with the construction of a hydroelectric power station on the Volga. Shallowed in this way by 2 meters, the reservoir again began to replenish in the last quarter of the 20th century. Having "won back" about a meter, by the mid-1990s the sea began to become shallow again. With the beginning of the new century, a surplus arose again, lasting about five years. From 2005 to 2021, the water level in the Caspian dropped by 120 cm. Despite periodic rises in water, it is becoming less and less in the Caspian Sea. The city of Atyrau, originally a coastal city, today "moved away" from the Caspian by 20 km.

SEALS AND BELUGAS

The Caspian seal is an endemic animal, that is, a purely local one. It has a spotted color, reaches a length of one and a half meters, weighs up to 60 kg.

It lives up to 50 years, dives to a depth of 80 m, feeds mainly on fish, preferring sprat.

Local seals are characterized by a herd and nomadic lifestyle. In winter, they usually migrate to the northern part of the Caspian Sea, where they procreate. Summer is spent on the South Caspian beaches, in autumn they go on 200-kilometer "cruises" along the Volga and the Urals.

In addition to sprat, Caspian seals prefer clean water. Industrial drains and poaching have significantly reduced their population – from a million at the beginning of the 20th century to 60,000 today. In 2020, in Mangistau, the interdepartmental commission on fisheries decided to include the Caspian seal in the Red Book of the Republic of Kazakhstan.

About 140 species of fish are found in the Caspian Sea, including roach, carp, pike perch, mullet, sprat, kutum, bream, salmon, perch. This is the last major sturgeon habitat in the world. Their fishing is currently stopped in accordance with the joint decision of the Caspian countries adopted in 2007: Kazakhstan, Iran, Turkmenistan, Russia and Azerbaijan.

CRADE OF THE INDUSTRY

The recoverable oil reserves of the Caspian shelf are estimated at 6 billion tons, hypothetically, there is much more hidden here. About 200 million tons of oil and 270 billion m^3 of natural gas are produced annually on the Caspian shelf.

In the 13th century, Marco Polo noted that "white" and "black" oil on the coast of modern Azerbaijan is mined in an open way and used for medical purposes, as well as for lighting. The Caspian fuel boom began in the 19th century, when chemists learned how to make kerosene from oil, replacing the previously used whale oil. Numerous private industries, including "sea wells", were taken under state control by the Russian Empire, distributing concessions among the most technologically advanced foreign companies at that time. In 1846, the first industrial well was drilled in the Baku fields, and in 1949, the world's first offshore oil production was carried out on the artificial island of Oil Rocks, near Absheron.

THE RECOVERABLE OIL RESERVES OF THE CASPIAN SHELF ARE ESTIMATED AT

6

BILLION TONS

The Caspian oilfields have become a kind of testing ground for testing and implementing the most advanced technologies. Here, in 1878, the first oil pipeline in Russia, Balakhany – Black City, was successfully laid, theoretically substantiated by Dmitry Mendeleev in the 1860s and built by engineer Vladimir Shukhov by order of the Nobel brothers. For them, the engineer Shukhov designed the world's first cylindrical tank. Astrakhan merchants Artemiev built the world's first tanker in 1873.

In 1942, the main forces of the Wehrmacht were sent south to seize the Caspian oil fields. It did not work, and this regrouping affected the outcome of the Great Patriotic War. Baku wells, on Stalin's orders, were neutralized in advance by Deputy People's Commissar Nikolay Baibakov, but they were quickly restored when the danger had passed. Fuel supply to the front at the expense of the Guriev-Atyrau refinery helped to decide the outcome of the Battle of Stalingrad. Tank breakthroughs of the Red Army and volleys of Katyushas largely depended on the Caspian oilmen, and they made their tangible contribution to the victory.

Erbolat Shadrakhov

Kashagan, discovered in 2000, is considered to be the largest field in the Caspian Sea. The oil and gas field, located in the sea, 80 km from Atyrau, was named after the famous Kazakh akyn, poet and singer Kashagan Kurzhimanuly. The recoverable oil resources lie at a depth of 4 km and are estimated by the NCOC operator at 2 billion tons. Commercial production began here in 2016, and Kashagan has also become a testing ground for technologies to protect offshore oil platforms from storm winds, waves and ice hummocks.

At Kashagan, this function is performed by artificial bulk islands. Production wells are located on five of them, and the largest one, Island D, also produces and simultaneously collects the extracted raw materials through underwater pipelines, performs primary processing (gas separation) and sends hydrocarbons through an underwater oil and gas pipeline to the onshore oil and gas complex treatment unit.

The shallowing of the Caspian Sea is also a problem for Kashagan, more precisely for ships serving the oil-producing archipelago. Since June 2021, the project operator has been dredging a 55-kilometer fairway using advanced Cooking Pot technology.

Offshore fields in the territorial waters of Kazakhstan are united in the North Caspian project, which, in addition to Kashagan, includes the Kalamkas-Sea field discovered in 2002 (284 million tons of oil), as well as the Aktoty field (156 million tons of condensate), Kairan (112 million tons oil) and South-West Kashagan (20 million tons of condensate), discovered in 2003.

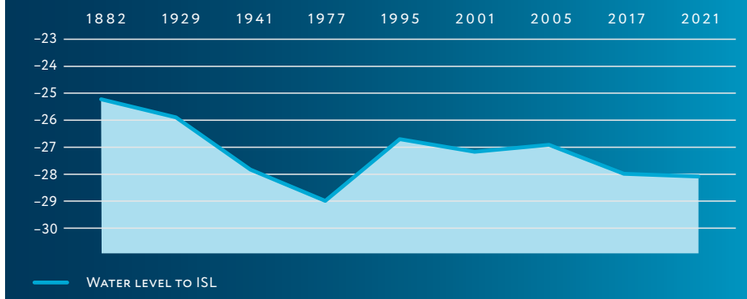
Nine large multilayer fields have been discovered in the Russian waters of the Caspian Sea (named after V. Filanovsky, named after Yu. Korchagin, named after V. Graifer, named after Yu. Kuvykin, Khvalynskoye, 170 km, Central, Zapadno-Rakushechnoye, Rybachye) and identified 10 promising structures with total reserves of 1.5 billion tons of reference fuel.

The first field to be put into operation in 2010 was the Yury Korchagin field, discovered in 2000 and located 180 km from Astrakhan. The initial recoverable oil reserves are 23.7 million tons, gas – 47.6 billion m^3. The LUKOIL operator uses offshore ice-resistant gravity-type platforms and underwater pipelines to transport raw materials to the shore.

On October 31, 2016, production began at the Vladimir Filanovsky field (discovered in 2005). Initial recoverable oil reserves are 129 million tons, gas – 41 billion m^3. A block conductor is involved here – an automated oil production platform that does not require the presence of people. The oil is brought to a marketable condition at sea, then it is sent via underwater pipelines to the onshore facilities of the LUKOIL company in Kalmykia.

On October 16, 2018, the groundbreaking ceremony for the facilities for the field, named after industry veteran Valery Graifer, took place. The deposit was discovered in 2001 and was previously called Rakushechnoye. LUKOIL plans to produce 1.2 million tons of oil per year here and, due to its

DYNAMICS OF WATER LEVEL CHANGES IN THE CASPIAN SEA OVER THE PAST 140 YEARS



proximity to the Filanovsky field, use the common infrastructure. The supporting blocks of the ice-resistant production platform were installed in 2020, the installation of the upper part is currently underway.

In the Azerbaijani (southern) sector of the Caspian Sea, oil is produced at the Oil Rocks, Azeri, Chirag, Gunashli and a number of other fields. The Gunashli field was discovered in 1981, Chirag — in 1985, Azeri — in 1987. Since 1994, the Azeri-Chirag-Gunashli project has been developed by an international consortium, which includes BP (operator), Equinor, ExxonMobil and other companies. Operator estimates Azeri Light oil reserves at 930 million tons.

Iran is developing the Sardar-Jangal offshore field discovered in the South Caspian in 2011 with proven oil reserves of 1.5 billion tons.

Owning a 2320-kilometer coastline of the Caspian Sea, the Republic of Kazakhstan today is both an oil exporter and the owner of its own tanker fleet. Established in 1998, the 100% subsidiary of NC KazMunayGas, Kazmortransflot (KMTF), has almost all types of vessels in its fleet: towing, service, dry cargo, barges, tankers. The latter are subdivided into diesel Caspianmax with a deadweight of 12,000 tons and black oil Aframax (115,000 tons). Kazakhstani aframaxes "Altai" and "Alatau" are loaded at the CPC Black Sea terminal, go to Romania and through the Bosphorus to the Mediterranean Sea. In 2021, KMTF tankers transported 537 thousand tons of oil across the Caspian Sea, 3.5 million tons across the Black Sea, and 5.7 million tons across the Mediterranean.

It is interesting that the Atyrau, Aktobe and Aral Caspian tanks purchased from KMTF in 2020 are expected to be transported by the buyer along the Volgobalt on their own, so that the ships start a new life in the northern seas already as chemical carriers. Kazmortransflot already has experience in overcoming Russian inland waterways. In November 2020, a three-year program for the delivery of equipment to the Tengiz field for the implementation of the Future Growth Project – Wellhead Pressure Management Project (FGP-WPMP) was completed with the mooring of a barge with a loading rack. Tengizchevroil's investments in this delivery exceeded 10 billion dollars, the port of Prorva was built in the Atyrau region, and a 71-kilometer canal was dug from it to the field. The total volume of cargo transportation amounted to 280 thousand tons. The equipment was brought not only from Italy and South Korea. Kazakhstani companies Ersai and KCOI in the Mangistau region produced 75 prefabricated modular racks and 10 remote control units for the project. Vessels of Kazmortransflot also participated in the creation of artificial islands of Kashagan and are now deepening the fairway there.

To date, the transport potential of the Caspian Sea is inferior to the mining one. Oil supplies via the Trans-Caspian route are carried out by KMTF tankers Astana, Almaty and TK Aktau. The maximum capacity of the Aktau port for shipping oil is 5.2 million tons per year. Theoretically, it is possible to transport more: in addition to KMTF tankers, Russian, Azerbaijani, Turkish and Dubai oil tankers operate in the Caspian Sea, the scheme of their "connection" is quite flexible, but the transshipment volume limits the technical condition of the infrastructure of the ports of Aktau and Batumi, as well as the oil transshipment terminals of Azerbaijan.

The laying of main pipelines along the bottom of the Caspian Sea is technically complicated by underwater ridges dividing the reservoir into northern, middle and southern parts. Put into operation in 2001 and actually connecting the Caspian Sea with the Black Sea, the CPC oil pipeline is the leader in terms of transportation volume, upgrading its throughput to 80 million tons per year. This overland route has been the shortest, fastest, cost-effective and most environmentally friendly route for more than 20 years – seals and sturgeons would say thank you if they could speak.

Even Mendeleev and the Nobels argued about the depletion of hydrocarbon deposits in the Caspian basin. So far, in industry circles, one can still pass for an analyst, by saying something weighty about the depletion of Azeri Light fields. But the contract for the development of the Azeri – Chirag – Gunashli project was recently extended until 2050, which means that the Baku – Tbilisi – Ceyhan oil pipeline still has a lot of time ahead to complete its main task, without attracting additional resources. And in general, the oil potential of the "Big Mirror" has rather long-term prospects for all the Caspian states.

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