PANORAMA

CASPIAN PIPELINE CONSORTIUM

Каспийский Трубопроводный Консорциум
Caspian Pipeline Consortium
Каспий Құбыр Консорциумы

CORPORATE MAGAZINE
No 2 (29) May 2020

ISSUE'S FOCUS

RELIABILITY, EFFICIENCY, SUSTAINABLE DEVELOPMENT

CONTENT

DEAR COLLEAGUES!

Working as a solid team across all industrial facilities from Tengiz to Novorossiysk, Caspian Pipeline Consortium continues its operation and, as usual, displays excellence in responding to the challenges. All our divisions are working in a normal mode; we continue implementing our Debottlenecking Program and oil supplies are being delivered dynamically.

Considering the current epidemiological situation, most of our employees work remotely, using up-to-date communication technology and technical means at the company's disposal. The Consortium Security, Transportation, HR and IT Units and other divisions have managed to organize their work with regard to these new conditions without any performance losses within a matter of days, and I am grateful to them for such an immediate response to this unconventional situation. Having this issue in our minds, we have provided comfortable working conditions for all the employees who work continuously and on a rotational basis at our Marine Terminal and in all the Consortium's regions of operation.

The oil produced in Kazakhstan keeps flowing to our pipeline system without any interruption, just as usual. We can see how oil-producing companies of the Republic of Kazakhstan are reacting to the current economic situation and we endorse their optimism.

Thanks to our specialists' understanding, high orderliness, and strong sense of responsibility, we have been working just as planned. For example, we have a new shipment record: in March 2020, we shipped 6,450,676 tons of oil at our Marine Terminal. It is 495,682 tons more than in December 2018, when the Consortium set its previous shipped-in-a-month record. We loaded 61 oil tankers in March, which also showed how intensive and efficiently we worked.

Obviously, the upcoming months will be rather challenging for our multinational team. However, I am sure we can handle even the most difficult tasks. CPC's employees have been put to the test in terms of their professionalism, strength, readiness to mobilize their efforts, and ability to handle new challenges, and they have passed it with flying colors. I would like to wish you all to stay positive, maintain the team spirit and be ready to carry out the important tasks each of us is faced with today.

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ENGINEERING: FROM COMPLEX TO OPTIMAL

CASPIAN PIPELINE CONSORTIUM CONTINUES IMPLEMENTING ITS DEBOTTLENECKING PROGRAM (DBNP). TODAY, WE WILL TELL YOU ABOUT THE MODERNIZATION OF TENGIZ OIL PUMPING STATION (TENGIZ PS). THE ENGINEERING STAGE OF THE PROJECT IS ABOUT TO BE COMPLETED, SO THE IMPLEMENTATION IS GOING TO BE CARRIED OUT SOON. HOWEVER, IT IS ALREADY OBVIOUS THAT THE STATION WILL BE THE MOST TECHNICALLY SOPHISTICATED FACILITY BUILT AS A PART OF THE DBNP

Everybody knows where Caspian Pipeline Consortium starts from – from the main oil pumping station Tengiz located in the Atyrau Region of the Republic of Kazakhstan. It is one of the first and main oil pumping stations of the CPC's pipeline. Tengiz PS was built back in 1989 and became a part of the pipeline in 2001. It was modernized in the course of the Expansion Project and can now pump oil without any interruption ensuring the stable work of our system. Another equally important modernization of Tengiz PS is happening right now within the framework of the CPC's Pipeline Debottlenecking Program.

THE PROGRAM'S LARGEST FACILITY

One of the reasons for the technical upgrade of Tengiz PS is the increase in capacity of the namesake deposit. Besides, it is important to take into consideration the long operational life of the equipment and pipes that have been used there since 1989. Requirements for the system stability with regard to the DBNP's operating factor of no less than 0.95 also make the modernization of Tengiz PS relevant and important.

Based on the expert studies conducted together with JSC Giprovostokneft at the initial data collection stage, the following main solutions were developed for Tengiz PS. Existing pumps with impellers with a diameter of 475 mm will be replaced by similar pumps adapted to rotors with impellers with a diameter of 542 mm that will not change the operating scheme of the main pumping station. Oil custody metering station (LACT) and the safety valve assembly at the inlet of the pumping station will be also modernized. We will also mount a pressure control unit (PCU) at the LACT outlet. It is also planned to build a new booster pumping station, where units with a larger differential pressure will be installed.

The modernization of the Tengiz PS power supply system implies the construction of frequency converter block-boxes for high-voltage motors of back-up pumping units. Moreover, there will be a new electrical room, a 220/10 kV electrical substation, and two 220 kV overhead power lines.

The tank battery will be "strengthened" with two additional vertical steel tanks with floating roofs and necessary facilities.

It will be literally the most extensive project out of all the planned works for a single DBNP facility.

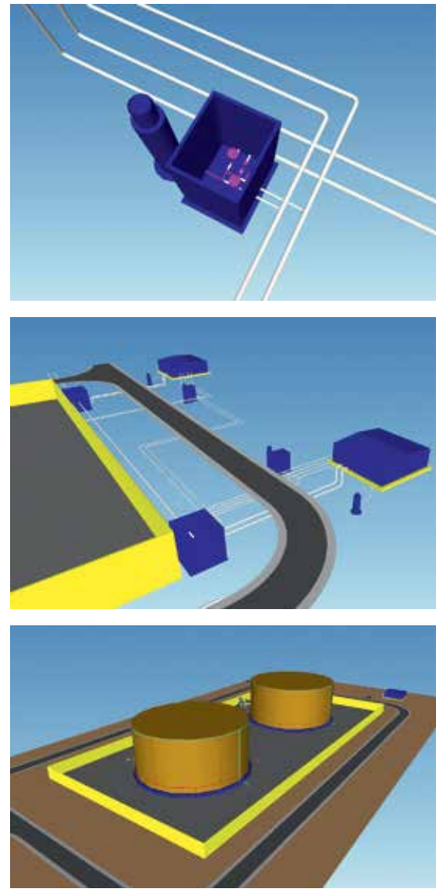
OPTIMIZATION OF PROJECT SOLUTIONS

Since the CPC's management team decided to focus on the improvement of quality of the solutions it adopts, the DBNP project team organized two additional field meetings at the construction site with the participation of specialists from the Operations Department from the Moscow office and the Eastern Region, as well as the Transportation and Commercial Departments. Thanks to extra engineering elaboration and joint discussions, it worked out to optimize and clarify the main technical solutions previously adopted during the pre-project examination of Tengiz PS.

Thus, for example, it worked out to optimize solutions for installation of 10 kV electrical equipment in the indoor switchgear and an integrated transformer substation without having to build an additional structure to the indoor switchgear building. Due to the installation of an additional 0.4 kV switchboards, as well as the use of existing remote I/O cabinets, the routing and number of the laid cable networks were optimized. A lot of attention was paid to the placement, design, piping and fire extinguishing system of two additional tanks. Since there are third-party engineering networks around Tengiz PS, it was proposed – in order to reduce the total area of the future facility – to surround the vertical steel tanks with floating roofs with steel-reinforced concrete dyke wall with an approximate height of 3 m, and even this solution required the relocation of the existing communication lines of Tengizshevroil LLP by agreement with the company. For that purpose, the additional land allocation was registered.

By the way, steel-reinforced concrete dyke wall for additional tanks, as well as frequency converters for high-voltage motors of back-up pumping units, will be used in the CPC's pipeline system for the first time.

It should be noted that during the field meetings, the project team managed to find a solution to one of the most difficult issues around the modernization of Tengiz PS: they found an optimal routing for new industrial pipelines from additional tanks to the future booster pumping station, considering that the existing collectors of the tank battery, which have been in operation since 1989, would be partly replaced. The difficulty of the task was supported by the lack of free space for laying two new collectors with a nominal diameter of 1,000 mm, the presence of a large number of existing engineering networks and communications, and the need for construction and installation work under the conditions of the operating enterprise.



DESIGN MODELING OF NEW UNITS OF TENGIZ PS

The implementation of the Tengiz PS technical upgrade project within the deadlines which have been agreed upon with the shareholders will undoubtedly become one of the biggest challenges both for the DBNP team and all CPC-K employees in general, because the launched processes will only be successful, if there is well-coordinated cooperation. In addition, this cooperation, as well as the working communications established at the engineering stage, characterized by a balanced, rational approach to the issues in question, brings good results.

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COMPREHENSIVE APPROACH TO DIAGNOSTICS

WHEN TRANSPORTED IN LARGE QUANTITIES OVER GREAT DISTANCES, CRUDE OIL IS AN ENVIRONMENTAL HAZARD, REQUIRING CLOSER ATTENTION TO THE INTEGRITY OF TRANSMISSION PIPELINES AND ACCIDENT PREVENTION

In-line inspection is a strategic area in safe operation of crude oil transmission pipelines. The CPC's efforts to this effect are discussed by Aleksandr Stepanov, Senior Engineer Pipeline Emergency Response.

KILOMETERS OF STEEL LINE

"To begin, a few words about the CPC's pipeline in general," says Aleksandr Stepanov. "The Tengiz-Novorossiysk pipeline transmission system is composed of 1,511 km of pipeline with a diameter of 1,000 mm. The section from Tengiz PS to Atyrau PS is made of pipes manufactured by Chelyabinskiy Truboprokatny Zavod and was put into service in 2012–2014 as part of the Expansion Project."

The next section downstream – from Atyrau PS to Komsomolskaya PS – has been in service since 1989. It was built using pipes of domestic and Japanese manufacture as part of the infrastructure of the Tengiz – Guryev – Astrakhan – Grozny oil pipeline.

In 2001, following the repairs and hydrostatic testing in order to check and set a rated pressure, this section of the steel artery joined the Tengiz – Novorossiysk oil pipeline.

"Works on improvement of reliability of the transmission line between Atyrau PS and Komsomolskaya PS were later continued," says Aleksandr Gennadyevich. "Thus, the findings of the in-line inspection in 2001–2006 were used to arrange the replacement of insulation and some repairs. Specifically, the period from 2002 to 2015 saw more than 6 thous. repair structures set up in the section."

The oil pipeline between Komsomolskaya PS and Kropotkinskaya PS is built using pipes made by Volzhskiy Trubny Zavod; the section ending at the Marine Terminal is built of the Italian pipes. Both were put into service in 2001.

It would not be amiss to add that the total length – 1,511 km – does not include the spur from the CPC pipeline to the pipeline system of KazTransOil. A little over a kilometer long and 700 mm in diameter, it was put into service in 1988 as part of the Tengiz – Guryev – Astrakhan – Grozny oil pipeline. Initially, that section of the oil pipeline was used to transmit crude oil from the Tengiz field to Atyrau PS of the KazTransOil system. In 2001, it was reconstructed and joined the Consortium's pipeline system as two sections: a section between Tengiz PS and Atyrau PS (CPC), 204 km long, which was replaced as part of the Expansion Project, and a spur from km 203 to Atyrau PS (KazTransOil), 1,178 m long, which is still in operation.

RELIABLE SERVICE PROVIDER

"Ever since it started operating its pipeline system, the Consortium has been giving a great deal of attention to monitoring its condition. And, sure enough, a key part of this effort is in-line inspection," emphasizes Aleksandr Stepanov.

The Tengiz – Atyrau section (which went on stream in 2012–2014) saw comprehensive survey using ultrasonic and magnetic pigs in 2016 and 2019. The crude oil pipeline section from Atyrau PS to Astrakhanskaya PS was surveyed using a variety of pigs in 2001, 2003, 2006, 2010, 2015 and 2019. The transmission line from Astrakhanskaya PS to Komsomolskaya PS was diagnosed using various pigs in 2003, 2009, 2010, 2014, 2015, 2016 and 2018; from Komsomolskaya PS to PS-4 – in 2002, 2003, 2008, 2012, 2014, 2016 and 2017; from PS-4 to Kropotkinskaya PS – in 2002, 2003, 2008, 2012, 2016 and 2017; and the section from Kropotkinskaya PS to Marine Terminal – in 2002, 2003, 2009, 2012 and 2017.

IN-LINE INSPECTION IS A STRATEGIC AREA IN SAFE OPERATION OF CRUDE OIL TRANSMISSION PIPELINES

Since 2015, in-line inspection on the Tengiz – Novorossiysk oil pipeline has been provided by Transneft's subsidiary – JSC Transneft-Diascan.

It is an undisputed leader in this type of services within the Russian Federation. The company was set up in 1991 in the city of Lukhovitsy, Moscow Region with its name being a conflation of "diagnostics" and "scanning". Diascan is a success in providing a full range of services: sourcing and assessing information about the technical condition of pipelines, identifying safe procedures for operating them, ascertaining the need for repairs, as well as handling methodological, regulatory, technical and technological matters.

Transneft-Diascan has an in-house design bureau, which develops defectoscopes, and an assembly shop, where the instruments are put together, repaired and maintained. Also in-house, the company manufactures all the necessary components and spare parts for defectoscopes and cleaning pigs, providing for a full cycle of their development and further repair.

The Diascanians need no help in developing electronic modules and software and make metal, polyurethane and other products. The company has a testing laboratory, where a special test bed is used to expose pipes to pulsating internal pressure and torque and to measure their time to failure.

"Transneft-Diascan is the best choice not only because of its serious research and development capabilities, but also because of the long history of close cooperation with this company and its human capital. Suffice it to say that in all, Transneft-Diascan, with the re-inspected sections factored in, has inspected more than 3 thous. km of pipelines for CPC," says Aleksandr Stepanov.

WITH RE-INSPECTED SECTIONS FACTORED IN, TRANSNEFT DIASCAN INSPECTED A TOTAL OF

3 THOUS. KM

OF OIL PIPELINES FOR CPC TO DATE

FIVE INSTRUMENTS

Transneft-Diascan has an extensive fleet of diagnostic pigs for pipelines of all diameters. The geometry pig detects geometric defects such as constraints and dents. The WM ultrasound pig measures the wall thickness, metal losses and lamination. The MFL magnetic pig monitors the condition of and checks for welded elements, pipeline housings and other structures.

Transneft-Diascan keeps improving the accuracy and functionality of its instruments. Before 2018, in-line inspection was conducted at CPC using three types of instruments: geometry, ultrasonic (WM) and magnetic (MFL) pigs. Since 2018, CPC has been doing comprehensive diagnostics using five types of pigs. The latest additions include instruments such as a TFI magnetic pig and a CD ultrasound pig. TFI improves the accuracy of detecting longitudinal defects, including weld defects, notches and welded elements. CD is better in diagnosing longitudinal irregularities in pipe wall metal, such as lamination notches and rill corrosion.

In 2019, CPC switched from the conventional geometry pig to an OPT pig, which additionally detects changes in the pipeline's spatial orientation, which enables the identification of stressed-strained sections. The instrument also enables more accurate detection of hot and cold bends and naturally and abnormally curved sections in the pipeline, which can also cause stress/strain.

The section from Astrakhanskaya PS to Komsomolskaya PS was the first to experience comprehensive five-instrument diagnostics in 2018. The OPT pig was first deployed for comprehensive diagnostics on the Tengiz PS – Atyrau PS section. It was not a random choice because the Atyrau PS – Astrakhanskaya PS section had been on stream for 30+ years, had once been taken off stream and required closer attention.

TOGETHER WITH SHAREHOLDERS

The improvements in the accuracy and functionality of pipeline inspection gauges made it possible to identify many more defects, which were described in diagnostics reports, including previously unidentified defects such as longitudinal weld defects and notches in dents. All of the above makes for a deeper survey with identification of defect trends and changes in the technical condition of the oil pipeline. The rising number of defects repaired every year is an evidence of better in-line inspection and improvements in instrument performance. The years 2017, 2018 and 2019 saw 81, 109 and 299 defects corrected respectively.

"Our relationship with Transneft-Diascan is mutually beneficial because we learn from each other. This is because CPC often gives Transneft-Diascan unconventional tasks based on the best practices and procedures of the CPC's corporate shareholders," Aleksandr Stepanov sums up.

The engineers of the Operations Department have developed and submitted for technical review a phased plan for replacing oil pipeline sections in 2022–2027 with a view to improving the reliability of the Tengiz – Novorossiysk oil pipeline infrastructure and boosting the oil transmission rates. The project used a comprehensive approach to troubleshooting and drew on the best practices of the major global oil and gas companies.

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ASPECTS OF PIPELINE REPAIR IN A MOUNTAINOUS AREA

CPC GIVES SPECIAL PRIORITY TO THE TECHNICAL CONDITION AND RELIABILITY OF THE OIL PIPELINE. REGULAR IN-LINE INSPECTION AND ELIMINATION OF DISCOVERED DEFECTS ARE ESSENTIAL

In accordance with CPC's Internal Regulatory Document VRD KTK 09-09.14* "Rules for Operation of the CPC Oil Pipeline System," an in-line inspection is conducted on a periodic basis, and its results are used as the basis for generating schedules for elimination of pipe wall defects on the Tengiz–Novorossiysk Mainline Pipeline (MLP). Defect repair methods are regulated by Internal Regulatory Document VRD KTK 32-12.13 "Regulation for Repair of Pipe Wall, Weld Joint, and Insulation Defects on the CPC Pipelines." As CPC's contractor, Starstroy LLC follows these documents in its operation.

THE NATURE OF DEFECTS

During operation, the diagnostics reveals external and internal defects in the metal of pipe spools and weld joints; these defects should be considered top-priority repair (TPR) defects and defects subject to repair (STR) according to the applicable standards.

The nature of defects can be different. The most common are the defects related to effects of corrosive environments, mechanical damages to pipes and weld joints, welding defects occurred during installation and welding works when the pipelines were constructed.

Specialists give a preference to one repair technique or another primarily based on technical specifications of a repair structure as well as simplicity, efficiency, and flexibility of repair. The optimal repair technique is chosen in each particular case.

Repair techniques involving the installation of repair structures are very important; the most basic ones include welded compression couplings, fillet couplings, split tees, pipes with reinforcement plates, and plugs. Repair structures are to be used when other technology is ineffective. Repair works conducted in mountainous areas of the CPC oil pipeline system call for special approaches.

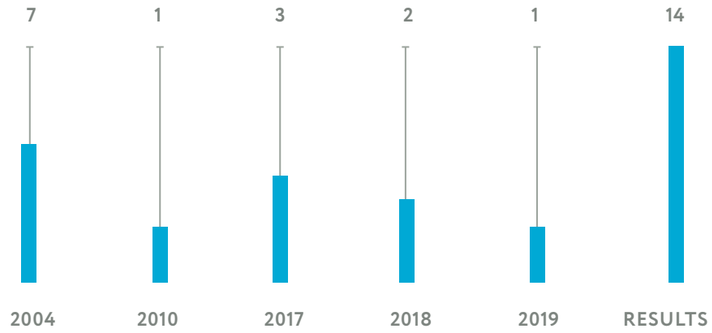

FIG. 1. QUANTITY OF THE LINE SECTION'S DEFECTS REPAIRED IN THE MOUNTAINOUS AREA OF THE CPC MLP IN 2004–2019

IN MOUNTAINOUS CONDITIONS

The total length of the CPC main oil pipeline is over 1,500 kilometres; the pipeline starts at the Tengiz oilfield in Kazakhstan and ends in the vicinity of Novorossiysk, Russia. The mountainous section under responsibility of CPC's Western Region is over 40 kilometres long, starting practically at Pump Station PS-8 (1,459th kilometre) and ending with the Marine Terminal Shore Facilities (1,505th kilometre).

Oil pipeline repair in mountainous regions and in a highly broken country is significantly more difficult as compared to plains and mild terrains; it often requires a special engineering solution, which is to be described in a Work Execution Plan. Such solutions are developed, coordinated, and approved together with the line section maintenance specialists of Starstroy and CPC-R in the Western Region, who possess great competence and vast experience in the oil and oil products transportation structures. It is also worth noting that the smooth-running and well-coordinated collaboration emerged over the years of working together (practically 20 years).

PRIOR TO THE COMMENCEMENT OF WORKS

Mountainous terrain requires working on steep ascents and descents. Often the slopes are so steep that it is impossible for machines to operate. Mountain roads are difficult due to their sudden ascents and turns, which means significant complications in cargo transportation. That's why the preparation before the commencement of repair works in mountainous areas is of particular importance, and the works themselves are very different from those performed under normal conditions.

Prior to the commencement of works, the specialists of CPC's Western Region and Starstroy thoroughly examine the specifics of the route within every section to be repaired. The visual inspection establishes the condition of soils and that of the route: finding landslide areas, mudflow beds, streams (including dry ones), ravines, and ditches; identifying the terrain steepness in the repair area and adjacent areas in order to determine whether it is possible to move the equipment; examining the vegetation coverage of soils; and looking into the possibility of arranging vehicle parking lots, a camp, and a storage site for materials and removed soil.

One of the tasks before the Starstroy employees at the work preparation stage is to minimize the expenses

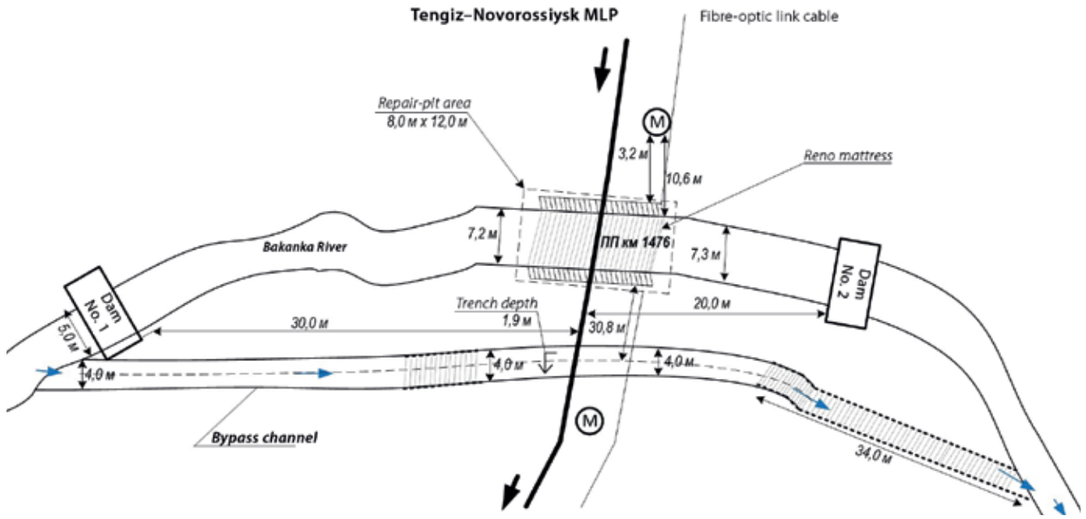

FIG. 2. SCHEME OF ORGANIZATION AND PRODUCTION OF WORKS AT UNDERWATER CROSSING OF THE MAIN OIL PIPELINE ACROSS THE BAKANKA RIVER

of CPC-R while preserving the quality performance of all pipeline repair procedures and following the health, safety, and environment regulations.

According to the in-line inspection results, over 14 repair jobs were performed from 2004 through 2019 in the mountainous area of the MLP line section, mostly involving the installation of P1 repair structures with composite-coupling technology (CCT). Broken down by years, this data looks as follows (Fig. 1).

NEW EXPERIENCE GAINED

In our opinion, the most difficult defects were those eliminated via the installation of CCT composite couplings at the 1,473rd and 1,476th kilometres on the Tengiz–Novorossiysk MLP in 2017 and 2018, respectively.

The works at the 1,473rd kilometre were complicated by several circumstances. Due to the confined conditions, the oil pipeline burial deeper than 7 m, and a pipe inclination angle over 10°, a significant scope of preparation works was necessary. Prior to forming a shelf to station the excavation equipment later, a single-track driveway with a smaller inclination angle was formed, which allowed access of the equipment without anchoring it. The total volume of the soil of different categories transported to temporary storage sites and back was about 2,000 m³.

A particularly significant aspect that required solving during the excavation and creation of a repair pit was the constant flooding of the pit site by springs and rain water. On top of it all, the oil pipeline in the area of the discovered defect rested on solid rock. Constant saturation of the pit walls with ground waters would have resulted in their inevitable collapse. To solve this problem, the incoming water was being drained 24/7 by motor pumps.

The solid rock under the pipeline was removed with both manual equipment and a hydraulic hammer. After the pit was ready and its walls were reinforced, the defective area was repaired with the P1 repair structure. To control the further behaviour of the pipeline in the mountainous conditions, a remote marker beacon was mounted on it to observe any potential horizontal or vertical displacement of this pipe section twice a year.

UNDERWATER CROSSING

Repair works at the 1,476th kilometre of the oil pipeline, where it crosses the Bakanka River, were unique in the defect location. It was under the main bed of the mountain river, which could be either affluent and turbulent or practically dry depending on the season and weather conditions. In order to eliminate the influence of these factors on the work schedule and to ensure safety of the employees, all works were scheduled for May and June. Also, a decision was made to form and develop a bypass channel for the river. Waterproof screens were additionally installed to minimize the water inflow into the repair pit at the point where the bypass channel intersected the pipeline.

In the course of further operations, the positive effect of these preparatory activities became evident. However, numerous underground springs and ground waters continued to flood the pit, which required a 24/7 draining by motor pumps both from the repair pit and from the intercepting sumps that were prepared beforehand.

The assembly and welding of the composite repair structure is a critical and effort-consuming process, but preservation of the repair structure against the aggressive corrosion impact is no less important. Modern insulation coatings of both domestic and foreign origin were used for corrosion protection of the oil pipeline repair structure.

Due to the fact that manufacturers of anticorrosion materials are constantly improving their production and releasing newer, higher-quality, and more dependable modern materials, the repair staff of Starstroy for the first time encountered a new anticorrosion coating application technology at this facility. To ensure the strict adherence to this application procedure, a joint decision was made by CPC-R and Starstroy to train the Starstroy staff in application of these anticorrosion coatings. As a result, the works were performed in compliance with all process requirements and under supervision of the insulation material manufacturers' representatives.

THE TOTAL VOLUME OF SOIL OF DIFFERENT CATEGORIES TRANSPORTED TO TEMPORARY STORAGE SITES AND BACK WAS ABOUT

2000 M³

Upon completion of the works, the mountain river was returned to its natural bed. To reinforce the bottom in the pipeline area in order to better protect the oil pipeline, flexible concrete mats PB-ZGU-405 were laid after the pit was backfilled (Fig. 2).

In the course of two years since the repair of the described defects of the oil pipeline, instrument-based examinations for damages to the new insulation coating were conducted. No signs of negative processes were found at the places where the repair structures had been installed.

Active involvement, an affirmative approach, and mutual understanding of the Consortium's and Starstroy's specialists—like CPC's Leading Oil and Gas Pipelines Operation Engineer, Deputy Regional Production Manager, Head of the "Novorossiysk" Emergency Response Centre, and Deputy Head of the Administration/Regional Maintenance and Emergency Response Manager of CPC's Western Region—allowed all works to be performed on a high level of quality and within the established deadlines.

The fruitful collaboration of the customer's and the contractor's experts in the development of optimal solutions allows Starstroy LLC to hope for further partnership with CPC-R JSC. ●

AUTHOR
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THE RECONSTRUCTION IS A BEGINNING WITHOUT AN END

IT IS IN CPC'S WESTERN REGION WHERE THE VOLUME OF THE OIL FLOW IN THE PIPELINE REACHES ITS MAXIMUM. THE OPERATING PRESSURE IN THIS 543 KM OIL PIPELINE SECTION IS MAINTAINED BY FIVE OIL PUMPING STATIONS

In 2019, CPC's Western Region's management team underwent a generational change. Operation and Maintenance Manager Aleksey Fomenko, who contributed greatly to formation and further development of the division, was superseded by Aleksey Dmitryukov, a young and vigorous specialist. They both came to CPC from Transneft PJSC. Mr Fomenko had been working in this world's largest oil transportation company for 30 years.

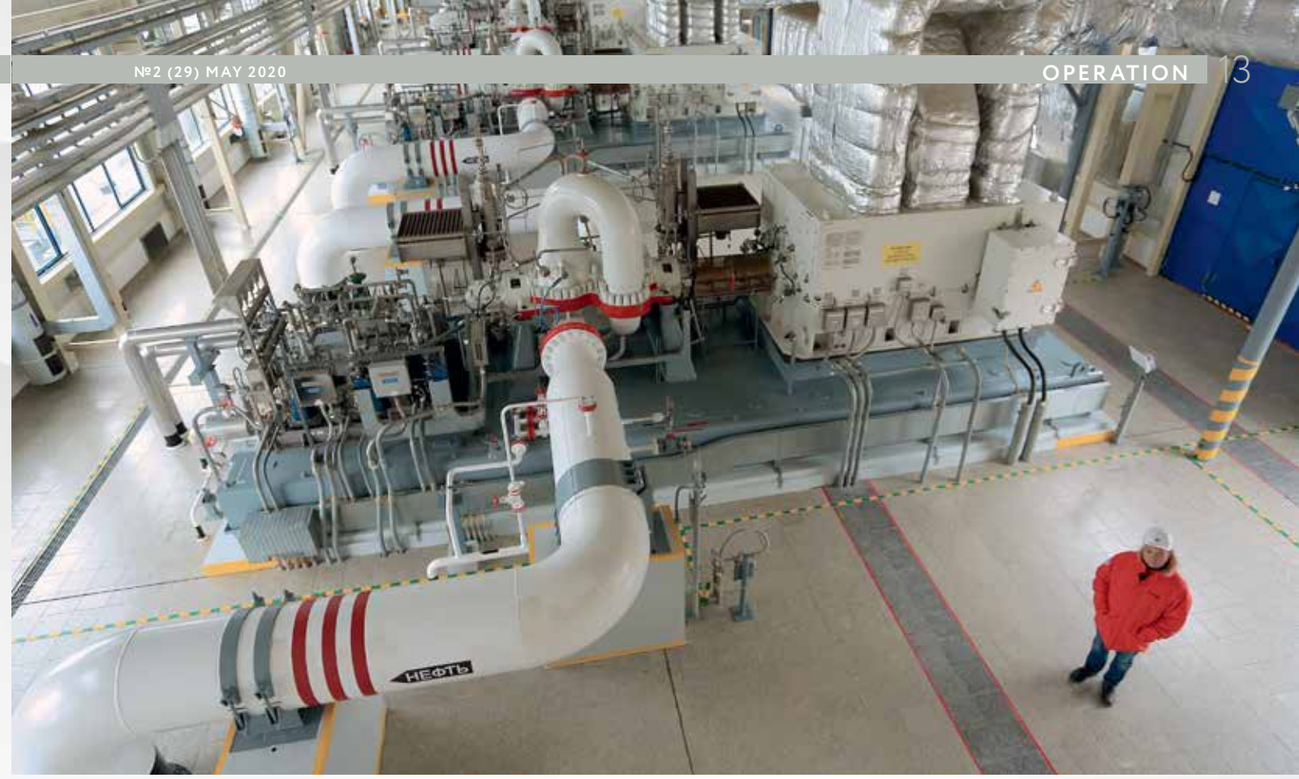
Aleksey Dmitryukov had worked in Transneft for 15 years, working his professional way up from a linear pipeliner to Deputy General Director of Chernomortransneft JSC, where he participated in the implementation of large-scale construction projects, such as construction of the Eastern Siberia–Pacific Ocean oil pipeline, reconstruction of a tank farm at the Grushovaya oil transfer terminal, construction of the Grushovaya–Sheskharis service tunnel crossing the Markotkh Range, and many others.

"CPC's Western Region annually performs a great amount of the facilities reconstruction work. So, the successful execution of the last year's program is greatly credited to my predecessor," emphasizes Aleksey Dmitryukov.

Operation and Maintenance Manager notices that although they probably don't have such large facilities under reconstruction in the Western Region as the ones their neighbours in the Central Region have, the scope of works remains significant because the facilities are scattered all along the pipeline.

In 2019, the team replaced uninterruptable power supplies at 34 shelters of the linear section. The experienced electricians and instrumentation and automation specialists did a superb job: they managed to carry out their tasks with surgical precision and avoided any failures of the equipment in operation and any SCADA false alarms. Moreover, a huge work was done equipping the automation wells (about 100 items) with flooding sensors. In the wells, their lids were insulated, and ventilation systems were installed to eliminate any possibility of condensation.

ALEKSEY DMITRYUKOV



2019 witnessed diagnostics of the main and supplementary equipment at the stations in full accordance with the schedule. Upon the examination results, gate valves were replaced with the new ones. Last year, the team replaced 8 items; it is planned to replace 10 items in 2020 and another 10 in 2021.

Extensive work in the Western Region is also connected with a predicted increase in the volumes of oil pumped through CPC's pipeline system. For example, cable links connecting electric motors of mainline pumps to indoor-switchgear cells are being replaced with those of larger cross-sections. Overall, 32 cable links will undergo this process.

"Last year, we replaced cable links at PS-7 and finished works on two other pumps at PS-5," explains Aleksey Dmitryukov. "Having finished with PS-5, we'll proceed with works at PS-8 and PS-4."

The Western Region implements this program in close cooperation with their colleagues from CPC's Transport and Commerce Department because such operations occasionally require shutdown of some pump stations.

Retrofitting of pig launchers/receivers is also planned in the Western Region. This is due not only to the fact that modern diagnostic devices have different dimensions, but also to the high speed of oil transfer through CPC's pipeline.

EXTENSIVE WORK IS ALSO CONNECTED WITH A PREDICTED INCREASE IN THE VOLUMES OF OIL PUMPED THROUGH THE PIPELINE

Answering our question on when the reconstruction pipeline transportation facilities within CPC's area of responsibility would be finished, Aleksey Dmitryukov said that the Consortium's pipeline system had entered the stage of its development where the reconstruction and both current repair and overhaul became ongoing.

"Some equipment is approaching the end of its estimated service life, and we replace all of it in due time. It's like that today, it'll be like that tomorrow and the day after tomorrow," says the Manager.

The management of CPC's Western Region pays special attention to the aesthetics of the production facilities. For instance, Kropotkinskaya PS has been built almost 15 years before any other station of this pipeline-system section. So, it is important to make every facility look equally modern, technologically advanced, and beautiful.

"It's important not only to comply with high international standards and strictly follow the Russian legislation, but also to have modern and comfortable facilities, 'cause this creates an appropriate mood for the personnel. Where there is a pleasant working environment, the great performance always follows," says Aleksey Dmitryukov.

AUTHOR
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AMPLE RESOURCE OF RELIABILITY

IN 2019, A NEW GAS HEATER WAS BUILT AT KROPOTKINSKAYA PS GAS DISTRIBUTION STATION. IT MADE POSSIBLE TO SIGNIFICANTLY IMPROVE THE RELIABILITY AND UPTIME OF THE MAIN EQUIPMENT OF THE LARGEST PS IN THE CPC WESTERN REGION

COST-EFFECTIVENESS AND LESS WEAR

«The new heater replaced the old installation that had been in operation since 2008,» explains Andrey Kozin, Western PS Maintenance Manager, «In 2020, we will dismantle the old heater and install another new one in its place, which will ensure mutual redundancy of this system.

In the CPC pipeline system, Kropotkinskaya PS, located in the Krasnodar Territory, is one of four stations, the main pumps of which power gas-turbine installations. The same pattern is implemented at Atyrau PS in Kazakhstan, at Komsomolskaya PS in Kalmykia, and at A-PS-4A in the Astrakhan region.

Stagers of the Consortium remember that initially the turbines of Kropotkinskaya PS, which have both gas and liquid fuel modules, were powered by diesel. But even with the operation of only two gas turbine engines (driving the main pumps) and one turbine generator (providing electricity to all other consumers on the territory of the PS), too much very expensive diesel fuel was required.

«Just imagine: while we were draining one 20-ton tank truck, the second one was already at the gate,» recalls Andrey Kozin.

An important factor was the fact that the diesel-driven equipment running in constant mode had increased wear, required frequent replacement of spare parts and constant attention to the quality characteristics of «gas oil», especially in winter.

Therefore, in 2009, Kropotkinskaya was switched to gas fuel. A gas distribution station (GDS) was built next to the PS, where gas is supplied via a branch from Alexandrovskoye – Leningradskoye main gas pipeline. Through the GDS, blue flame natural gas is fed through a 1.3 km pipeline to the gas distribution system of the station and to the inlets to the pump and generator turbines. The GDS provides for the necessary pressure and temperature parameters. Just for this purpose, it is equipped with a gas heater.

«The gas is heated up to 55 degrees at the GDS, so that it is not fed to the turbines colder than +35°C,» says Andrey Kozin, «This temperature ensures safe, reliable and stable operation of the equipment.»

START WITH RECYCLE

The designers have invested an ample resource of reliability in Kropotkinskaya PS, which was built in 2002 and put into permanent operation in 2003. After all, in the first years of oil transportation, there were only three oil pumping stations operating on the CPC main pipeline. Kropotkinskaya PS picked up the «black gold» flow, overcoming 500 km from Komsomolskaya PS, and, increasing productivity, pumped it for almost 300 km directly to the Marine Terminal near Novorossiysk. Therefore, to ensure flexibility of the equipment of Kropotkinskaya, the engineers provided a recycling line on it.

IN THE CPC PIPELINE SYSTEM, KROPOTKINSKAYA PS IS ONE OF FOUR STATIONS, THE MAIN PUMPS OF WHICH ARE POWERED BY THE GAS-TURBINE INSTALLATIONS

In the process of oil transportation through the main pipeline of the CPC Oil Pipeline System, sometimes there is a need for a short-term reduction in the pumping mode. This is due to the stopping of one or more PSs located upstream. In such cases, the designed recycling lines allow for a safe change in the pumping mode by means of changing-over the operation of turbines through the recirculating collector of Kropotkinskaya PS. After resuming the operation of the stopped PSs, the turbo-pump units operating along the recycling line are smoothly changed-over to on-load operation, which provides an increase in performance to the design parameters. In addition to providing a flexible pumping scheme through Kropotkinskaya PS, the recycling lines allow for checking the turbo-pump units brought into operation after maintenance or repairs, without affecting the operating modes of other pumps.

To recap, in 2014, three new turbo-pump units were installed at Kropotkinskaya PS as part of the Pipeline Capacity Expansion Project. At the same time, the old turbo-pump units were also modernized: their performance was brought to the capabilities of the new ones by increasing the turbine capacity, replacing the rotors of pumps with an increased diameters of the impellers. In turn, upgrade of the main equipment of the station imposed new requirements on its power supply systems, so the GDS compressors were also replaced with more powerful ones.

Today, Kropotkinskaya PS, the largest in the Tengiz – Novorossiysk pipeline system, has six main pumps and four back-up pumps. The station successfully fulfills its tasks and, in the context of the Debottlenecking Project, is ready for a further planned CPC pipeline system carrying capacity increase.

AUTHOR
PAVEL KRETOV

READY TO WORK IN LARGE SCALE!

IT HAS BEEN THREE YEARS SINCE PUMP STATION NO. 5 (PS-5) WAS PUT INTO OPERATION IN STAVROPOL KRAI. IT WAS ONE OF THE TWO STATIONS BUILT IN THE REGION UNDER THE EXPANSION PROJECT. KONSTANTIN GOFMAN, MANAGER OF PS-5, TOLD THE CPC PANORAMA CORRESPONDENT ABOUT IMMEDIATE CHALLENGES THE STATION PERSONNEL IS FACING TODAY

Konstantin is one of CPC's long-time employees. In 1999, after almost two decades of working at oil production enterprises of LUKOIL in Western Siberia, he came to work on the construction of the Tengiz–Novorossiysk oil pipeline. He was in charge of laying a 250 km mainline section from Kalmykia to Krasnodar Krai. Then, for almost 10 years, he acted as Deputy Manager of Starstroy's Western Region. In 2011, at the beginning of the Expansion Project implementation, Konstantin joined the Consortium to work on the Kropotkinskaya Pump Station modernization project. Then, he participated in the construction of PS-4 and PS-5. He has been Manager of Pump Station No. 5 (PS-5) since 2015. His work for CPC was marked by a gratitude letter and by the Certificate of Honour of the Ministry of Industry, Energy, Transport and Communications of Stavropol Krai.

"Now the station is preparing to increase the volumes transported through the pipeline system. We have replaced cable links connected to mainline pumps. Design solutions for implementation of the Debottlenecking Programme are under development," says Konstantin Gofman.

A lot of effort is being put in the territory improvement: lawns are being established, fruit trees are being planted, and pedestrian paths leading to the PS sites and equipment are being paved. To increase the comfort of the personnel, the interior of the station is also being improved. The station is replacing the doors with plastic ones (which are more wear-resistant), replacing linoleum with laminate flooring or tiles, and covering the walls with polyvinyl chloride wallpaper.

Talking about the safe and dependable operation of the PS, Konstantin Gofman puts emphasis on the high-level expertise possessed by the employees of both the station services and subcontractors.

"Representatives of Starstroy LLC carry out their tasks properly: thanks to the timely maintenance works they perform, we didn't record any equipment failures last year," he said. "Here at the station, we have the highly-trained and experienced firefighting personnel who used to work at fire departments of the Izobilnensky District. Our medical staff also demonstrates consistent excellence during our training sessions."

Konstantin is especially satisfied with the performance of the operational personnel:

"They are young guys who are always ready to demonstrate both their ultimate competence and their ability to perform even bigger tasks."

The author hereof met Rinat Valiyev, a PS-5 process section operator at CPC's Safety Day held in 2019 in the Republic of Kalmykia. The young specialist told us that he always enjoyed reading our corporate magazine CPC Panorama. During that business trip, he even happened to have with him a three-year-old issue of our magazine with an article on the start-up of the station he works at these days.

KONSTANTIN GOFMAN

Rinat came to PS-5 back in 2016, when it was still under construction. Together with his colleagues, he monitored the work progress and (what's the most important) the quality of the facilities being delivered by the contractor. The process section operator graduated from the Ufa State Petroleum Technological University, Faculty of Pipeline Transport.

"Since I was a child, I knew which university I was going to enter and what I would study there," says Rinat Valiyev. "It runs in my family: my grandfather devoted his whole life to the pipeline construction and operation in Kazakhstan. He retired as Deputy Head of the Aktyubinsk Oil Pipeline Management Department."

Rinat also started his career path in the Republic of Kazakhstan. He was an operator at the Kenkiyak Initial Pump Station belonging to KazTransOil JSC. This large station equipped with 15 mainline pumps, 10 tanks, and 3 metering units transports hydrocarbon raw materials in three directions at once—to Kumkol, towards the Kazakhstan–China oil pipeline, to Atyrau, Kazakhstan, and to Orsk, Russia. He worked at the Kenkiyak IPS for three years.

"I had a good mentor who taught me a lot—Vladimir Seliverstov, one of the operators," Rinat recalls. "He taught me to what I should pay extra attention while doing walk-around inspection of the station, how to monitor the main process equipment, and how to check the position of shut-off valves."

When working at KazTransOil, Rinat also participated in corporate events. There were no gatherings similar to CPC's Safety Day, but the contest called "The Best in Profession" and various sports competitions enjoyed great popularity among the personnel.

"I was happy to take part in CPC's Safety Day in Kalmykia," the young PS-5 process section operator shares his impressions. "We met specialists from other pump stations, exchanged some experience, boosted our team spirit, and received a lot of positive emotions."

AUTHOR
PAVEL KRETOV

BENCHMARK OIL PIPELINE

CASPIAN PIPELINE CONSORTIUM KEEPS THE LEADING POSITION IN ENERGY EFFICIENCY AMONG OIL TRANSPORTING COMPANIES, SHOWING THE PERFORMANCE OF THE MASTER PIPELINE SYSTEM MODELED BY TRANSNEFT R&D. WE DISCUSS WAYS AND MEANS OF REACHING SUCH A HIGH RESULT WITH ALEXEY IVANIN, LEADER OF PROCESS CALCULATION GROUP, CPC

THINK DIFFERENT

Aleksey Ivanin has been the Leader of CPC's Process Calculation Group since 2016. In 2007, he graduated from the National University of Oil and Gas "Gubkin University" with the "Engineering of Gas and Oil Pipelines and Storage Facilities" speciality. After the graduation, he worked for the design institute of Transneft PJSC—Giprotruboprovod JSC.

"Chief Technologist of the Institute Leonid Markovich Bekker introduced me to all the technology," Aleksey remembers. "But most importantly, he taught me how to think out of the box, to go beyond the regulations. This way of thinking has always helped me, both in my work and my personal life."

The Process Calculation Group Leader is demonstrating an automated plan/actual comparison system on the display screen to a CPC Panorama correspondent.

"The blue line is our plan. The red one is the actual performance of the oil pipeline. At the moment, they are coinciding, which means the operation is proceeding strictly as planned. Below are indices to be monitored on the hourly basis. Here is the percentage in the overall expenditure pattern to be spent on electricity, gas, and drag reducing agents (DRA). These figures are also consistent at the moment."

They are consistent now, but what is to be done if they aren't?

"Then we have to look into the reasons for the deviation," Aleksey Ivanin explains. "Let's take a look at the data for another date, where the plan and actual figures are different. For example, we proceeded as planned with electricity and gas, but overused DRA. But also I can see that the oil transportation volume in that period was above the plan, and our profit was higher. Eventually, the tariff revenue is the most important CPC performance indicator, so the overuse of DRA was absolutely reasonable."

TIME IS MONEY

Although it's really convenient to access all essential financial and operating information in two clicks in the SharePoint application, it wasn't always a possibility for the CPC employees. Only a year ago, while preparing reports and analytical summaries, they had to collect this data from different applications used by different departments, or even from different files. Consequently, the information had to be requested, received after some waiting period, uploaded from the SCADA system, processed, compiled, and visualized.

"But what's more important, too many employees were involved in this process," says Aleksey Ivanin. "Now that they don't have to do this, they can spend their time on dealing with more important and pressing matters".

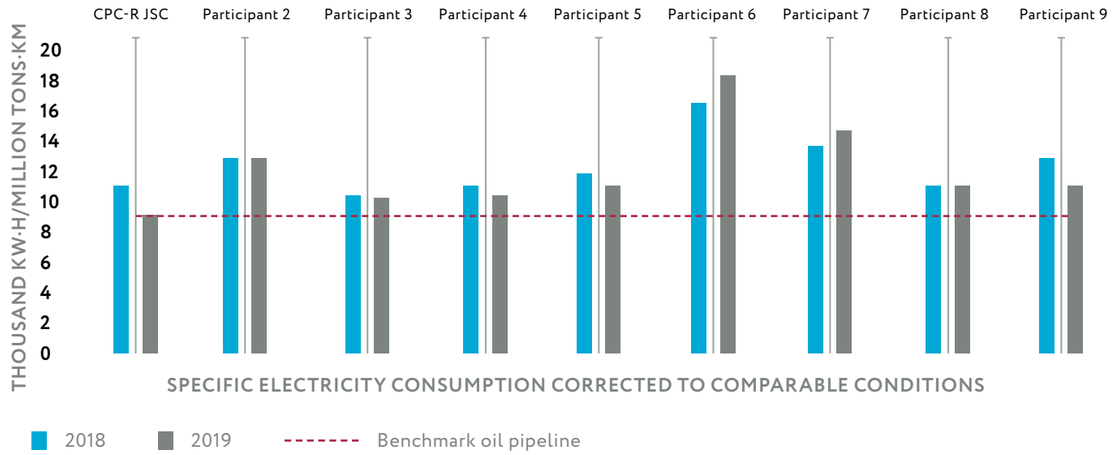
The experts of the Process Calculation Group started to develop the architecture of this system in 2018. They developed a database of the oil pipeline's main parameters, integrated its completion with the SCADA, and organized the teamwork and communications between the specialists engaged.

"2020 will be the pilot year for us to implement and test the analytical business system," continues Aleksey. "We are going to improve the interface, expand the functionalities, and increase the capabilities. The related business units at the CPC headquarters are already generating proposals to be implemented in cooperation with the representatives of the Consortium's IT Unit. Our final target is to digitalize all business intelligence processes of our company, so that all this data can be available for managers, shareholders, and employees both in the corporate network and from mobile applications.

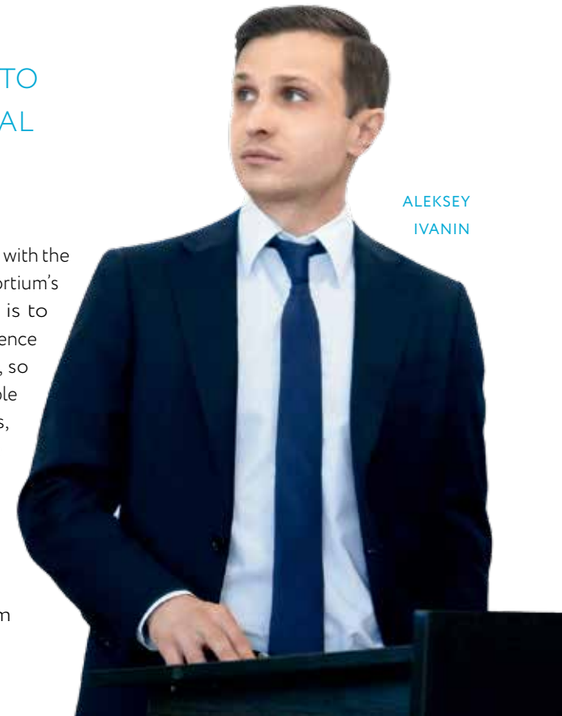
INSTRUMENT PANEL

As the new business intelligence system controls both natural and total value indicators, it significantly increased the efficiency of collaboration between the Process Calculation Group (planning the oil pipeline operating processes), the Chief Power Engineer Service (optimizing the electricity rates) and the Procurement Unit (purchasing gas and DRA). It must be said that this system also allowed the

COMPARATIVE RESULTS OF THE BENCHMARKING STUDIES FOR THE FIRST SIX MONTHS OF 2018 AND 2019



2020 WILL BE THE PILOT YEAR FOR US TO IMPLEMENT AND TEST THE ANALYTICAL BUSINESS SYSTEM



ALEKSEY IVANIN

CPC staff's involvement in the implementation of the energy efficiency policy to be developed. From now on, any employee with necessary competence is able to do their own analysis and to initiate the relevant proposals. Moreover, on the basis of the unified platform, information on the activities of other departments and business units can be added to this automated analytical system, as with building blocks, for instance, on KPI, warehousing, etc.

"The experience exchange showed that CPC keeps pace with their partners when it comes to the development of such databases," says Aleksey Ivanin. "We use the most cutting-edge software products on the market. For instance, Microsoft Power BI—a platform with various visual analytical panels, which was developed by MS specifically to ensure easy building of business intelligence displays. This platform is essentially a new branch of Excel-based diagrams and provides the sufficient ergonomics and interactivity level of the business intelligence presentation. A disadvantage of Excel was that the structuring of such a panel with several diagrams was complex. But Microsoft solved this issue by implementing separate desktop and server applications that make is possible to place several diagrams within the same sheet and link them to databases.

PROFITABILITY AND EFFICIENCY

CPC's efforts in energy efficiency improvement were greatly appreciated by their partners and colleagues in the industry. A special workgroup in the International Association of Oil Transporters (IAOT) rated the Consortium as number one out of eleven participants as of the first half of 2019.

"In fact, CPC demonstrated the performances on the level of the benchmark model oil pipeline developed by Transneft R&D Institute for the evaluation of the potential for an energy efficiency increase in the IAOT member companies," Aleksey Ivanin explains.

Such achievements of the Consortium in the field of energy efficiency were made possible thanks to proprietary, in-house developments created by the Process Calculation Group. One of those is a hydraulic stationary model of the CPC oil pipeline, which allows the quick and high-quality configuring of any scenarios of the oil pipeline operation under consideration, both current and prospective ones. The flexibility of these in-house applications makes it possible to promptly calibrate and increase the quality of calculations as well as to simulate "non-trivial" system scenarios and topologies that aren't always available for simulation in the standard software offered on the market. It is through this constantly improving hydraulic calculator and other applications that the planned transportation requests are processed after being issued by the Oil Transportation and Commerce Unit to Aleksey Ivanin's team. The machine designs the optimal process conditions based on the crucial criteria: a profitability ratio and an energy efficiency index. This technique was implemented for the first time in 2017 and has been constantly perfected since, gradually eliminating the divergences between the planned and actual values. The same computer hydraulic model was used to develop various scenarios for the Debottlenecking Programme (DBNP) at the investment feasibility study stage.

"Due to the limited schedule imposed on the Consortium to prepare the DBNP feasibility study package, the Process Calculation Group had to actively engage in this work, since the involvement of a third-party contractor for the calculations at the time could significantly postpone the review of the Programme initiated by the shareholders," recalls the Process Calculation Group Leader. "That's why we embedded into the model the volumes to be transported through the Tengiz–Novorossiysk oil pipeline starting from 2023 and considered whether CPC would be able to provide them using the equipment currently in operation. This was followed by a long and interesting process of cost optimization, which resulted in decisions to reconstruct facilities and to install new and additional equipment. As you know, the final investment decision provides for more rotors of mainline units, upgrading of pumps at the Tengiz Pump Station, and construction of a new mainline pump house at the Astrakhanskaya Pump Station. These measures allowed the flow rate of drag reducing agents to be cut, and this is the most expensive of the three CPC resources (electricity, gas, DRA). The same reason is behind the necessity to install the fifth gas turbine unit at each PS: their power sinks during the summer heat period and must be compensated by additives.

> THE EFFORTS OF CPC TO INCREASE THE ENERGY EFFICIENCY WERE HIGHLY APPRECIATED BY THEIR PARTNERS AND COLLEAGUES IN THE INDUSTRY

SMOOTH RUNNING

A dynamic model of the CPC oil pipeline system, also developed by the Process Calculation Group based on the InFlow software, can help in incident investigation by simulating abnormal processes and emergency situations and by determining what negative factors could cause the equipment to malfunction. It is only reasonable to wonder how much this model contributed to CPC's new, higher level of equipment reliability with almost zero failures.

"The implementation of the hydraulic simulator is not the sole reason," remarks Aleksey Ivanin. "It was a large set of effective measures taken by all units of the CPC Operation Department: Line Section Service, I&A Service, and Chief Mechanic Service. Our joint efforts allowed us to develop ways to optimize the equipment operation."

Has the significant success of CPC in energy efficiency reached the limit? Are there other ways to improve the already impressive performance?

"Yes, there are such ways, and we continue developing them," says Aleksey Ivanin. "For example, while the monthly and yearly transportation is uniform, there are fluctuations in daily values. And since the oil pipeline operation modes are formed with the daily timeframe in mind, it significantly affects the resource consumption rates. The situation can be compared to how a car works: you'd spend less fuel while moving with a constant cruise speed than if you speed up and slow down all the time, even if covering the same distance in the same time. The same logic applies to the oil pipeline: the smaller the irregularity of pumping, the more uniform the distribution of energy resources and the closer the planned and actual values to each other. That's why our team is solving right now the task of irregularity optimization by more active utilization of the existing tank farms (TF), while alternating the periods of full-capacity modes (TF boost) with lower-capacity modes (TF fill-up). In this case we'll have complete control over the situation and won't depend on the regularity of the oil reception from shippers. Of course, before we switch to this system, there are many calculations to be made and statistical indicators in our database to be analyzed."

AUTHOR
DMITRY KONSTANTINOV

THE SAFE DRIVING ASSOCIATION HAS BEGAN ITS WORK

SINCE THE BEGINNING OF 2020, THE SAFE DRIVING ASSOCIATION HAS ALREADY HELD TWO MEETINGS WITH COMPANIES SUPPORTING THIS INITIATIVE, ONE OF WHICH WAS THE CASPIAN PIPELINE CONSORTIUM. THE ORGANIZATION, WHICH TODAY UNITES DOZENS OF ENTERPRISES, CONTINUES ESTABLISHING AND DEVELOPING THE CORPORATE CULTURE OF ROAD TRAFFIC SAFETY

Since its very invention a century and a half ago, motor transport has been significantly improving both the conditions of human lives and the ways of business organization. However, the number of risk factors has also increased: the larger the scale of the use of motor transportation, the more frequent the road accidents. Legislative and controlling authorities, scientists, and corporate structures for occupational health and safety are all making joint efforts to even out this negative correlation.

Thus, common road traffic regulations promote efficient optimization of the situation on the roads, making it organized instead of erratic. Scientists, technologists, designers, and engineers develop active and passive vehicle safety features and tools of remote vehicle monitoring and control that enable road accident statistics to be reduced. Every country and every vehicle fleet (federal, municipal, and corporate one) have their own characteristic achievements related to the road traffic safety culture and understand the importance of communication and experience exchange in this field.

Specialized unions and associations acting both locally and internationally become the best tools to establish the landscape for such cooperation. It is the business sector that is the driving force behind the implementation of best practices and advanced tools designed to minimize road accident rates. We probably should consider 2018 to have been an example and a trendsetting year, where 450 Russian companies supported an international zero harm project, Vision Zero.

"As an organization that actively supports Vision Zero, the Caspian Pipeline Consortium is ready to share its zero harm experience, including in the area of transportation," said Aleksey Bunaryov, CPC's Transportation Manager. "For example, in 2019, we reached the travelled distance of about 53 million kilometres without having a single registered road accident."

On a national scale, the significant step towards the integration of interests of transport companies was made in late 2019, when the Safe Driving Association (SDA) was established. This association unites Russian and international companies from various fields (fuel and energy, pharmaceuticals, retail, etc.) the activities of which are closely related to transportation.

The idea of establishing the SDA as a platform for exchange of experience in creating the corporate cultures of road traffic safety (as one of the key factors for implementation of the zero harm policy) emerged in September 2019. The Caspian Pipeline Consortium also became a member of the Association's Initiative Group. In November 2019, the second meeting of the Initiative Group was held in CPC's Moscow Office. And January 27, 2020, was the day when the Safety Driving Association was officially registered.

ALEKSEY BUNARYOV

CPC IS READY TO SHARE ITS ZERO HARM EXPERIENCE, INCLUDING IN THE AREA OF TRANSPORTATION

COOPERATION TOOLS

The first open meeting of the Association was held on February 5, 2020, and gathered together about 50 fleet managers, directors, and specialists for occupational safety and health and road traffic safety (RTS) from the companies belonging to various industries. These included the representatives of such companies as Gazprom Neft, Caspian Pipeline Consortium, Baltika, Kastor, Nestle, and others.

Anna Florinskaya, SDA Executive Director, and Tatyana Gavrilova, SDA Development Director, showed the guests the Association's work plan for 2020 and tools made by the SDA for development and cooperation between the member companies and external structures, such as state, specialized, and subcontracting organizations.

The Association plans to hold eight meetings and one final conference in 2020. The agenda is quite broad, covering topics from the implementation of mobile apps for driver control and electronic systems for pre-trip vehicle checks to changes in the road traffic safety legislation. The reporting conference will be held somewhere in November or December and will sum up the results of the Association's work throughout 2020.

"The Association has already become an efficient platform to share experience and information on," remarked Anna Florinskaya. "We have launched the organization's website where you can find an event calendar, a best practices catalogue, and project materials and where you can create an account for each of the members. In our nearest future, we plan to launch a series of regular workshops, meetings, competitions, and other events."

One of the key activities of the Association is due diligence review. The Association's lawyers monitor legal precedents, make inquiries to the Ministry of Transport and other government bodies for them to make clarifications on certain legal requirements, and develop suggestions on the elimination of controversies in laws and regulations. The Association also plans to organize and facilitate educational events (including videoconferences for distant learners) in cooperation with carmakers and government bodies for all categories of road users as well as professional competitions among drivers.

YURI VISNEVSKY

Exchange of Practices as the Main Value of the Union

The member companies of the Association will be able to use the forms of cooperation and experience exchange based on their best practices, which are designed specifically for them.

"We've started working on the catalogue of the best practices to increase the road traffic safety indices of vehicle fleets, which are implemented by the member companies," said Tatyana Gavrilova. "It's extremely important to perform benchmarking and share successful examples of measures reducing the accident rate. To encourage various companies to share the information, we are launching an annual award, The Best Projects Increasing the Road Traffic Safety."

To evaluate the companies' activities, the Association has offered to divide the best practices into six categories: RTS system management; infrastructure; safety levels of fleet vehicles; drivers' personal safety culture; personnel training levels in first aid and emergency response; and the company's social activities and RTS-related self-improvement. The Association allows that the categories might be expanded and new categories added as the practices are being collected—this is why a template form and application mechanics have been developed. The Association's best practices library or catalogue is understood as a systematized database with assignment of ID numbers and an optimized search engine.

Besides the best practices catalogue, the Association has also developed a system for evaluation of RTS improvements implemented by the companies. A Compliance Matrix evaluates the implementation of the relevant processes according to 11 different criteria: an RTS policy, RTS KPI, a driver incentive program, a penalty system, health monitoring, driver work-time tracking, a driver training system, investigation of road traffic accidents, risk assessment, and audit.

When discussing the best RTS practices, CPC's Transportation Manager Aleksey Bunaryov emphasized that it was also important to proclaim a common RTS Policy, from which certain Procedures and Standards would stem:

"The companies may operate in different fields, but they all have the same ultimate goal—to minimize the risks of road traffic accidents, which is an integral part of the zero harm policy."

INNOVATIVE TECHNOLOGY

In the course of the meeting held in February, the representatives of the member companies shared their experience in the implementation of innovative technology of traffic safety monitoring, including AI-based tools. Tatyana Romanova, Director of the HSE Division of Kastor, told the audience about neural networks–based video analytics tools used to reduce the accident rate.

Yuri Visnevsky, Commercial Director of SCOUT Corporate Solutions, presented the audience with a research in video analytics of unsafe actions taking place in a vehicle cabin. In particular, he was talking about an arsenal of modern video recording equipment, including online systems capable of warning and even waking up a driver who fell asleep at the wrong time.

Anton Gladilin, Head of the Paramedic School Training Centre, and Aleksey Malov, the Centre's head coach, facilitated a workshop dedicated to first aid treatment of road traffic accident victims, where they also talked about legal peculiarities of such actions.

THE OVERALL GOAL OF ALL THE MEMBER COMPANIES OF THE SAFE DRIVING ASSOCIATION IS TO MINIMIZE THE RISKS OF ROAD TRAFFIC ACCIDENTS

At the final discussion, the Association defined its basic priorities and noted that it operated not only in Russia, but also in the Republic of Kazakhstan and other neighbouring states where the member companies' drivers work. ●

AUTHOR
DMITRY KONSTANTINOV

ONLINE MODE

ON MARCH 18, THE SAFE DRIVING ASSOCIATION'S MEMBERS REPRESENTING MORE THAN 30 COMPANIES, SUCH AS LAFARGEHOLCIM, CPC, CASTROL BP, MIRATORG, VTORCHERMET NLMK, AND OTHERS, GATHERED ONLINE TO PARTICIPATE IN A REGULAR SCHEDULED MEETING

The Association's Development Director Tatyana Gavrilova was the moderator of the online conference. She presented a report on the Association's performance. For example, the already developed things include a detailed map of service and equipment suppliers. Cooperation with government bodies has also begun: a request has been sent to the Ministry of Labour and Social Protection of Russia to specify the application of legislation for one of the Association's members. The meeting attendees were also acquainted with legislative innovations in the transport sector, such as the introduction of electronic vehicle licenses, a new format for passing driver's license exams, and others.

Ildar Yamalov, Head of the Transport Safety Department of Lafarge-Holcim Russia, and Olesya Shumskaya, Head of the Occupational Health and Safety and Quality Management Department of Castrol BP, shared their corporate solutions for creation of mobile apps ensuring road traffic safety. These smartphone solutions implemented in the companies optimize RTS briefings, motivate the employees to improve the driving quality, facilitate calculation of trip risks, adjust routes, and contribute to the significant reduction of road traffic accident rates.

The agenda of the conference also included the discussion on processes for remote pre-trip medical examinations, which both ensure the traffic safety and reduce the time of vehicle release on the road. Aleksandr Balukhta, Deputy Director for Transport Safety of Highland Gold/Russdragmet, told the audience about the experience in the implementation of such systems in his company. During the conference, the Association's experts also listed criteria for selection of suppliers of remote pre-trip medical examination solutions.

"No external factors should interrupt the process of the experience and best practices exchange in the areas of road traffic safety and industrial safety," emphasized Tatyana Gavrilova. "Life goes on; vehicle fleets never stop operating; and there are still a lot of vehicles on the road, including corporate cars. Both drivers and pedestrians are still responsible for their and other people's lives and health. This is why the Association does its best to ensure stable cooperation between commercial companies in order to reduce the road traffic accident and injury rates." ●

CPC PRESS SERVICE

12 MOMENTS OF SAFETY

OUR FILM "CPC'S LIFE-SAVING RULES" WAS AWARDED FOR THE BEST VIDEO ON OCCUPATIONAL HEALTH AND SAFETY AWARD AT THE 9TH MOSCOW INTERNATIONAL FESTIVAL OF CORPORATE VIDEO (MMFKV)

The festival was organized by the Association of Communications and Corporate Media Directors of Russia (AKMR) and the Media-Business Publishing House. Over 100 large companies from different areas of economy and business took part in this year's edition of this festival. The winners were chosen by competent judges being the most experienced players of the media market. The awards ceremony was held in Skolkovo on March 17.

CPC Press Service and the Consortium's HSE (Health, Safety and Environment) Unit created the film in close cooperation with each other. The film is actually a series consisting of 13 episodes, where each episode is based on one of the CPC Life-Saving Rules. The story is narrated by a character named Kaska [Helmet], who explains us in detail and in a very unusual manner why we must strictly follow every rule and what are the negative consequences of breaking it. The correspondents of CPC Panorama asked Elena Bulatova, CPC's Deputy General Manager of the Health, Safety and Environment HSE Unit In Operation Department, to comment on the competition results.

EB: "Yes, we are happy with the results of our hard creative work. Today, the occupational health and safety requirements are a solid set of documents and regulations, which we had to process so that they could be represented in a succinct manner and without sounding protreptic. I think that our department, working

closely with the CPC Press Service, really managed to do it."

CPC Panorama: "What else does the HSE Unit do to promote the Incident and Injury Free Culture among the CPC employees and the contractors' representatives and to implement the world's best practices in the area of occupational health and industrial safety?"

EB: "Executing the task given to us by the CPC management to reach the zero incident and injury performance, we now are revising all our training and educational materials to find out what is still up-to-date and what works better on the audience. Besides the transition to electronic training and knowledge assessment systems, which make the educational process more interactive and hence more interesting, we are preparing a number of new video materials in cooperation with the Press Service. It will be an almost four-hour-long, multi-unit training course, which occupational safety engineers will be able to assemble like Lego blocks, depending on the required topics. It will enable them to efficiently teach and retrain the personnel of the production facilities." ●

LINK TO VIDEO "CPC'S LIFE-SAVING RULES"

AUTHOR
AINA ZHETPISBAYEVA

ZHAIYK, RIVER FOR SAKE

RECENT YEARS HAVE WITNESSED AN AGGRAVATION OF A PRESSING ISSUE OF NATIONAL AND GLOBAL NATURE CONNECTED WITH THE SHALLOWING OF ONE OF THE RICHEST IN TERMS OF FISH FAUNA DIVERSITY WATERBODIES – THE URAL (ZHAIYK) RIVER

The Kazakh people knew since the old times: who lives closest to the river shall never starve to death. Sadly, this saying is getting outdated nowadays considering the current disastrous condition of the Ural River. As the river slows down, everything around it turns to dust. It looks nothing like that mighty river that ran here only 5–10 years ago. What you see now only scares you and breaks your heart...

A LIFE-GIVING ARTERY

Experts deem the shallowing of the Ural River, which is the third biggest river in Europe and – without exaggeration – a life-giving artery for the West Kazakhstan Region, to be an environmental disaster. In Kazakhstan, they call this river Zhaiyk.

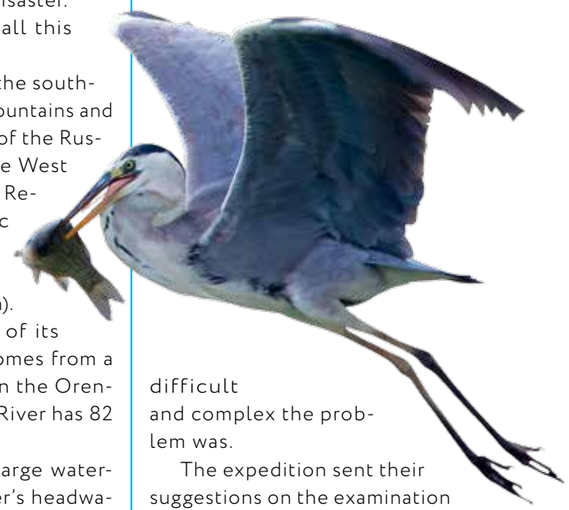
The river begins in the southern spurs of the Ural Mountains and crosses the territories of the Russian Federation and the West Kazakhstan and Atyrau Regions of the Republic of Kazakhstan. Its total length is 2,534 km (1,173 km in Kazakhstan). Fifty to sixty percent of its average annual flow comes from a large feeder Sakmara in the Orenburg Region. The Ural River has 82 feeders in total.

There are several large waterbodies in the Ural River's headwaters: Verkhne-Uralskoye, Magnitogorskoye, and Iriklinskoye. Moreover, in the Russian headwaters of the Ural River, there are 80 hydroelectric complexes and 3,200 illegal earthfill dams, which negatively affect the river's water content.

In 2019, the river's flood level was the lowest in the course of last 50 years and amounted to only 240 cm (the average semisecular flood level is 594 cm). The bed level of the Ural River, which was once navigable, has shallowed to the fording point that anyone can cross. The current situation contributes to adverse environmental conditions in southern regions having a negative impact on their development.

IN 2019, THE FLOOD LEVEL OF THE URAL RIVER WAS THE LOWEST IN THE COURSE OF THE LAST 50 YEARS AND AMOUNTED TO ONLY

240 CM



WITH THE SUPPORT OF CPC

To adequately evaluate the current condition of the Ural River, a famous international magazine National Geographic sent an expedition to the Atyrau Region. During that expedition, supported by CPC-K, experts clearly understood how difficult and complex the problem was.

The expedition sent their suggestions on the examination of Zhaiyk's condition to the Society of Hunters and Fishermen of the Atyrau Region, the Territorial Inspectorate for Forestry and Wildlife of the Atyrau Region, Akzhaiyk the State Nature Reserve, the Meteorological Agency of the Republic of Kazakhstan (Kazgidromet) for the Atyrau Region, and a number of

non-governmental and non-profit organizations, and requested their assistance in the activity.

In the autumn of 2019, the expedition and the experts from the involved environmental organizations of the Atyrau Region examined and surveyed the condition of the part of the river flowing within the Atyrau Region, from the region's border with the West Kazakhstan Region to the place where the river runs into the Caspian Sea. According to local ecologists, if this problem is not solved soon, most animal and bird species living in the river will extinct.

ALL TOGETHER

Since the river is a transborder waterway, both RF and RK governments should reach a compromise on the problem to improve the current situation. There should be programs supporting rational water conservation which, in turn, wouldn't affect the overall flow of the river, from its source to its mouth.

During the expedition, the experts took samples of water and soil, measured the river's depth, monitored local flora and fauna, arranged meetings with the locals, and asked the old residents.

The expedition consisted of the best photographers and camera operators from Russian Federation, Kazakhstan Republic, China, and Thailand. The Society of Hunters and Fishermen of the Atyrau Region was represented by regionally-recognized biologist/game manager, ornithologist and zoologist Aleksandr Ivasenko, who coordinated the project. Specialists from the Inder and Makhambet divisions of the Territorial Inspectorate for Forestry and Wildlife of the Atyrau Region under the supervision of Daniyar Baymagambetov also gave a big hand. These divisions provided water-borne vehicle based on KS-10 which allowed to fully explore the Ural River bed. General organizational issues were managed by Asyltek Ispusinov, President of the Society of Hunters and Fishermen of the Atyrau Region.

PUBLIC RESPONSE

Following the results of activity, the expedition was found successful and efficient; the experts managed to collect very important materials. Thirty of the best photographs taken by the local and international photographers were featured in a photo exhibition, which was opened in the lead-up to New Year 2020. Upon the initiative of CPC-K, the photographs were displayed at one of the largest malls of Atyrau. Citizens and visitors had a unique chance to see it all — the tragic condition of the region's main water artery — with their own eyes.

Public response is an efficient way to enable the Government to make dramatic decisions that would save the Zhaiyk River. It has to be done, otherwise the Caspian Sea will suffer from water shortage, which will lead to a global environmental catastrophe. So we all hope that the Ural River's environmental health will be restored in the nearest future.

THE EXPEDITION CONSISTED OF THE BEST PHOTOGRAPHERS AND CAMERA OPERATORS FROM RUSSIAN FEDERATION, KAZAKHSTAN REPUBLIC, CHINA, AND THAILAND

AUTHOR
PAVEL KRETOV

THE CONSORTIUM'S SYSTEMATIC AID

COOPERATION BETWEEN CPC AND THE KRYMSKY DISTRICT OF THE REGION OF KUBAN DATES BACK OVER 20 YEARS. FOR THIS TIME, THE CONSORTIUM HAS IMPLEMENTED MANY IMPORTANT, LARGE-SCALE CHARITY PROJECTS IN THE DISTRICT

A BEAUTIFUL SCHOOL

"What makes CPC's charity work special is its systematic nature: if a hospital, a school, or an outpatient clinic receives assistance once, it actually becomes sponsored on a regular basis," says Vitaly Pershanov, Deputy Head of the Krymsky District. "The Consortium's representatives regularly visit sponsored facilities to monitor the equipment performance, to talk to the personnel, to offer holiday greetings, and so on."

Krymsky is the largest rural district in Kuban, with over 130,000 people living there, almost one in four of whom is underage. This is why CPC provides considerable assistance to the district's education system, working in cooperation with the district's administration.

In 2017, for instance, the Consortium built a new building for School No. 59 in the khutor [hamlet] of Shkolny, Krymsky District. CPC bought all the necessary things, such as multimedia equipment and furniture, and outfitted the gym and the up-to-date catering unit.

"We have a beautiful school, and all of us—teachers, students, and students' parents—love it and cherish it," says Natalia Lyakh, School Principal. "Children from nearby settlements—Fadeyevo, Svet, Varenikovskaya, and others—are gladly coming here to study, too. So, the number of students is constantly increasing. There were less than 100 of them in 2016, and 2019 saw as many as 122 students; we can teach up to 150 students in total."

CPC BUILT A NEW BUILDING FOR SCHOOL NO. 59 IN SHKOLNY KHUTOR OF THE KRYMSKY DISTRICT

In 2018, as a part of an outfitting program for two educational institutions in Kuban, CTC purchased equipment for the language laboratory of School No. 59. The set of equipment, intended for teaching 12 students at the same time, included a teacher's computer with all special-purpose software installed on it, headsets, work booths, and digital consoles for students.

"Thanks to the language lab equipment provided to us by the Caspian Pipeline Consortium, our school in terms of the English teaching level can now compete with urban schools," says Natalia Lyakh. "Our students perform greatly at the Unified State Exam. We receive positive feedback on the knowledge of our graduates from various universities."

ATTRACTION FACTORS

School No. 59 is one of the best schools in Kuban when it comes to teaching history, social sciences, Russian, and literature. For example, Polina Orlova, a student of grade 11A, prepares to take part in the Evrika academic workshop. She will present to the jury her research on the role of smileys and pictograms in modern-day Russian and in the history of writing.

Polina and her classmate Zakhar Shakun plan to enter the Kuban State Technological University and study oil and gas processing there. The students were greatly amazed by the recent tour of CPC's Pump Station No. 8.

"I suppose it was this trip that helped me decide what my future profession would be," Zakhar Shakun told CPC Panorama's reporter. "It was a tidy, gorgeous, up-to-date production facility. I also remembered highly-trained and perfectly equipped personnel of the station."

Nine out of 18 teachers of the school are its former students. Comfort and available technical resources are, indeed, important factors of the educational institution's attraction for young specialists. Polina Vinskovich, who is on her final year in this school, also plans to return to her alma mater after she graduates from a pedagogical university.

"This school is an integral part of my family's history: my grandfather, grandmother, father, and mother also studied here," she enumerated. Now Polina spends a lot of her time in the school library equipped with computers by the Consortium. Here she has access to the Internet and also prepares her presentations and projects.

HEALTHCARE IS THE PRIORITY

In 2019, CPC purchased equipment for the school's first aid room. Modern devices and software and hardware systems allow nurses to perform cardiac screening, determine a student's psychoemotional state, identify his or her proneness to unhealthy habits, divide students into different health groups, and promptly diagnose illnesses. It is also of no small importance that from now on students can be vaccinated right in the first aid room; earlier, they had to go to a hospital in the stanitsa [village] Varenikovskaya located 25 km from here in order to get such procedures.

Health care is one of the most important priorities of CPC's charity work. CPC provides considerable assistance to the Krymsky District Central Hospital (DCH).

"Out medical institution consists of two inpatient facilities providing both emergency and specialized medical care, a maternity unit, an intensive care unit, an internal medicine unit, a children's unit, a neurology unit, and many other units, 9 outpatient departments, 12 GP offices, and 24 rural medical stations", says Irina Kuznetsova, Deputy Chief Physician of the Krymsky DCH.

In 2018, CPC equipped the hospital with an up-to-date digital x-ray system ARgTs-RP. Using this system, the hospital's physicians are able to make accurate diagnoses for patients of the surgery and trauma units. The system operates day and night and performs 110 to 120 examinations per day.

"Unlike systems of the previous generation, ARgTs-RP doesn't require time-consuming film processing, certain lighting conditions, and reagent control. A radiologist can start working with a high-resolution digital 3D-image within minutes," explains Alla Arefyeva, Head of the Radiology Department of the Krymsky DCH.

Digital images are saved to a patient's electronic record, and he/she can log in to his/her account after many years to get the information about all the tests he/she underwent. It's impossible to lose such an image or to spill water on it.

CPC PROVIDES CONSIDERABLE ASSISTANCE TO THE KRYMSKY DISTRICT CENTRAL HOSPITAL

DIRECT AND INDIRECT EFFECT

In emergencies, patients who need high-tech medical care are delivered from the Krymsky District to regional hospitals in Krasnodar or to the Regional Vascular Centre in Novorossiysk. Transportation is performed by the Emergency Department of the Krymsky DCH, for which CPC purchased specialized vehicles.

"These cars are in really high demand: each of them travels for 100,000 km every half a year," remarks Aleksandr Arvanidi, Head of the Emergency Department of the Krymsky DCH. "They are reliable, comfortable, and perfectly equipped. Thanks to this equipment, the ambulance crew can take an electrocardiogram and make a diagnosis right in the car, which means they can quickly decide which hospital they should take the patient to."

Automated haematology and biochemistry analyzers purchased by CPC in 2018 enable the personnel of the Krymsky DCH to get prompt and highly precise results of blood tests of various difficulty levels.

"A MEK automated haematology analyzer can calculate a WBC differential for five populations at once, which significantly speeds up and facilitates the whole process," says Yekaterina Gorshkova, Head of the Clinical Diagnostic Laboratory of the hospital.

With a CA-270 automatic analyzer, the possibilities to conduct biochemical examination in the laboratory have increased several times. This device is capable of performing 900 rare tests per day.

"This new device is an open system: we put in it various reagents that are not necessarily manufactured by a certain company," continues Valentina Makeyeva, a medical laboratory scientist.

CPC's charity work not only gives a direct effect, but also an indirect one: it allows the region's administration to allocate saved money for the implementation of many other important social projects.

"For example, we managed to get rid of queues for places in our kindergartens. Now we try to solve the problem with our nurseries. There are 80 educational institutions in our district: 34 schools, 43 kindergartens, and 3 supplementary education institutions—this is the largest network in the whole region [Krasnodar Krai]," sums up Vitaly Pershanov, Deputy Head of the Krymsky District.

AUTHOR
PAVEL KRETOV

TO ALL THE PEOPLE OF THE REPUBLIC

I MET PYOTR LEONTYEV IN THE REPUBLICAN HOSPITAL OF WARSVETERANS IN ELISTA. THE BATTLE-FRONT VETERAN REGULARLY COMES HERE TO IMPROVE HIS HEALTH. HE ALSO REMARKED ON HOW MUCH THE ADMINISTRATION OF THE REPUBLIC CARES FOR THIS HEALTHCARE INSTITUTION

"We have wonderful and caring doctors and nurses. Every room has a TV and a fridge; catering services work perfectly," said Pyotr Leontyev, sharing his impression from the hospital.

Sure, comfortable conditions and the friendly staff are important, but the main purpose of the hospital is the treatment and improvement of veterans' health. What greatly expanded physicians' possibilities was 15,000,000 rubles worth of equipment donated to the hospital by the Caspian Pipeline Consortium at the beginning of 2020.

It was purchased as a result of the joint decision of CPC and the Republic of Kalmykia to provide additional support to the region's healthcare system, which also included the 75th annual celebration of the Great Victory.

"We are endlessly grateful to our veterans for their heroic deeds and the peaceful sky above our heads," Batu Khasikov, Head of the Republic of Kalmykia, emphasized at the medical equipment delivery ceremony.

The delivery included a Pentax endoscopy system with an endoscope reprocessor and a Logiq multifunctional mobile ultrasound system with pulsed wave, colour, and power Doppler functions. This state-of-the-art equipment incorporating the global best practice enables various diseases, especially oncological ones, to be promptly diagnosed in patients and all required medical care to be delivered.

When accepting the equipment, Liliya Sandzhiyeva, the hospital's director, said that the endoscopy system would allow physicians not only to perform tests, but also to take preventive measures since we're talking about the detection of extremely dangerous conditions, which might develop for years without causing any symptoms. Thus, these medical systems will save many lives.

Liliya Sandzhiyeva also added that the hospital signed an equipment sharing agreement with the republican hospital, so it would help not only patients of her hospital, but all the people who live in Kalmykia.

Over the many years of close cooperation between the Consortium and the region's authorities, the infrastructure of the Republic's healthcare institutions has greatly improved. This encompasses the purchase of high-tech equipment, furniture, and specialized vehicles. The fleet of healthcare institutions enlarged with dozens of new, fully and properly equipped ambulance cars.

Later that day, the Republican Children's Medical Centre named after V.D. Mandzhiyeva received five ambulance suvs. These vehicles would help little patients who live in distant, hard-to-reach areas with no hard-top roads to visit outpatient clinics and hospitals.

"Today, district paediatricians and nurses receive up to 900 calls per day, and most of the paediatric medical districts are located in remote areas of Elista and Tselynny District, with the 60 km radius of the service area," explained Yuri Kikenov, Healthcare Minister, talking about the relevance and importance of this charity project for the Republic.

Now, all five paediatric medical districts have Niva cars and are able to transport patients on stretchers, which is definitely of great help to the doctors.

Head of the region, Batu Khasikov, in his speech expressed great gratitude to the management of the Caspian Pipeline Consortium, which provides significant assistance in implementing extremely important social projects in the region.

"Today, another important contribution to our region has been made, which will significantly increase the performance of our medical services for the good of our little ones," remarked Head of the Republic, talking to the staff of the Republican Children's Medical Centre.

It remains to be added that to date CPC has provided the healthcare sector of the Republic alone with assistance worth over 200 million rubles.

AUTHOR

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THE DISCREET CHARM OF MOUNT ELBRUS

I CELEBRATED THE BEGINNING OF 2020 IN THE MOUNTAINS—MY FRIENDS AND I WENT SNOWBOARDING ON MOUNT ELBRUS. WE LIVED AT AN ALTITUDE OF 2,300 METRES AND WENT DOWN FROM 3,800 AND 4,100 METRES. IT WAS AN UNFORGETTABLE EXPERIENCE!

"BUT YOU CAN SEE MOUNT ELBRUS FROM AN AIRPLANE WINDOW..."

I first saw Mount Elbrus with my own eyes in 2015, when I went on a business trip from Moscow to Stavropol and then to Mineralnye Vody within The CPC Expansion Project. I could see the white double peak of the Greater Caucasus range from afar; it mesmerized and fascinated me.

IF YOU'RE VISITING ELBRUS FOR THE FIRST TIME, PREPARE TO LIVE LIKE A SPARTAN

The idea of climbing Elbrus specifically for skiing and snowboarding emerged later, and it wasn't mine. Here I should probably start with a history of this outdoor hobby of mine. I was introduced to snowboarding on the dry slopes around Moscow. I mastered my skill there, too. In January 2019, my friend and I decided that it was time to conquer real mountains, so we joined a company of 20 fellow mountain lovers. We went to a ski resort in Gudauri, Georgia. The emotions I experienced from this debut are a part of another story. To cut a long story short, after this trip I became unstoppable, and nothing could ever make me change my mind: "Nothing beats the mountains except the mountains themselves."

In April 2019, my friends and I went to the Khibiny Mountains (Murmansk Region). I found out that fans of snowy mountain slopes had always been among people I know; one of my friends even turned out to be a professional instructor and could literally teach a newbie to snowboard in a day. It was he who came up with this Elbrus idea, because he had already been there 15 times and knew all the pistes by heart, and he thought this mountain was the best one. We were so excited about this idea, and it really brought us together—all 36 of us. As the saying goes, having a group of friends is half the battle. We spent the rest of 2019 looking forward to the start of a new ski season.

WEATHER AND NATURE

Another reason to vote for Elbrus was that all I had to do is to buy an airplane ticket to Mineralnye Vody and pack my suitcase. The rest—transfer, accommodation, meals, ski passes, slope safety training, sightseeing, and all other kinds of entertainment—was on my friends, for some of them already had an experience with organization of such tours.

The first thing to catch my eye was an incredi-

ELBRUS IS A STRATOVOLCANO IN THE GREATER CAUCASUS RANGE AND THE HIGHEST POINT OF RUSSIA AND EUROPE. THE LAST ERUPTION OCCURRED ABOUT 5,120 YEARS AGO. THE EASTERN PEAK (5,621 M) AND THE WESTERN PEAK (5,642 M) ARE LOCATED AT A DISTANCE OF 1.5 KM FROM EACH OTHER. THE LOCAL (KABARDINO-BALKARIAN) NAME OF THE MOUNTAIN IS SHAT. THE AVERAGE SLOPE STEEPNESS IS 35°. MOUNT ELBRUS' GLACIERS NOURISH THE THREE LARGEST RIVERS OF THE CAUCASUS AND THE STAVROPOL REGION: BAKSAN, MALKA, AND KUBAN. THE FIRST ASCENT OF ELBRUS WAS MADE IN 1829; THE FIRST SKI DESCENT FROM ITS PEAK WAS MADE IN 1939. DURING WORLD WAR II, THE MOUNTAIN WITNESSED MANY FEROCIOUS BATTLES; THERE IS A MONUMENT (WHICH IS THE HIGHEST-ALTITUDE MONUMENT IN THE WORLD) SET UP IN HONOUR OF THE FALLEN SOVIET SOLDIERS AND OFFICERS, TO THE HEROES OF THE DEFENCE OF THE ELBRUS REGION (3,500 M, 219 NAMES OF THE DEAD WARRIORS). ELBRUS IS AN ICONIC PLACE FOR MOUNTAIN CLIMBERS, WHICH WAS OFTEN FOUND IN THE SONGS OF VLADIMIR VYSOTSKY, YURI VIZBOR, AND OTHER BARD SINGERS. STANISLAV GOVORUKHIN FILMED HIS VERTIKAL IN THE ELBRUS REGION IN 1966.

bly beautiful nature. Mountains, forests, waterfalls, the sun, the snow, the freshest air—it's unlikely you could find such a combination anywhere else in the world. We hiked to Mount Cheget, which was an hour and a half walk by a forest path in each direction. We went down the ravine of the Cherek River by a former motorway, which was now a footpath. There, in the depth of the ravine, laid a settlement, with a tunnel leading to it dug through a mountain. So, the old road was left there as a tourist attraction. But it was quite frightening to go down this road even on foot, so it was hard to imagine what it was like to drive down it in a van or any other vehicle. We also took a tour around the Chegem waterfalls—never in my life had I seen such huge icicles!

Our company stayed in one of the hotels in Polyana Azau, the highest inhabited settlement in the vicinity of Mount Elbrus. Its altitude of 2,300 m is almost the same as that of Rosa Peak, a view point at the famous ski resort in the city of Sochi. Its infrastructure, though, was far from being as good as Rosa Khutor's. Honestly, this was disappointing—everything on Elbrus was kind of half-finished and incomplete as if the ones who built the resort just left it like that and thought: "Well, that'll do." If you're visiting Elbrus for the first time, prepare to live like a Spartan.

All the hotels in Azau are owned by families: the mother cooks breakfast, the father makes kebabs, and other members of the family assist them. In the evening, they sit beside you and drink tea.

Modest interiors of hotels are partly compensated for by a big choice of places to go to. For example, not a lot of cafés in Gudauri were open till late. All in all, we found a lot of things to do at night, and our New Year party was quite decent. We rented a steambath a couple of times. We made it worth our while to play board games found there in abundance.

SPORTS

Unfortunately, we weren't too lucky because there was very little snow. For that reason, many pistes were closed. As it turned out, there were about a dozen of them. The Priyut-11 station (4,100 m) was connected to the Gara-Bashi station (3,800) by a blue piste. Approaching the Mir station (3,500 m), the piste changed its colour to red. Then it branched off, and there was a blue looping, but the second section was closed. A section from Mir to Krugozor was closed completely, so we could only go down by gondola lift or—that was risky—we could go off the piste and climb down the rocks. There was a green slope leading down from Krugozor to Polyana Azau. The rest of the pistes were black (there were about 5 of them) and mostly followed the ravines.

ELBRUS IS FAMOUS FOR ITS OFF-PISTE RIDING, BUT THIS IS QUITE DANGEROUS: THERE ARE LOTS OF STONES, ROCKS, CLIFFS, AND AVALANCHE-PRONE AREAS

Elbrus is famous for its off-piste riding, but this is quite dangerous: there are lots of stones, rocks, cliffs, and avalanche-prone areas. You have to be an outstanding professional rider to go for freeriding.

In Azau, we lived by the new gondola lift with cabins for eight people. The lift went from there to the Gara-Bashi station, with intermediate stops at Krugozor and Mir. There was also an old gondola lift that had been going to the Mir station since 1969. It had a huge red cabin for 25 people that looked like a tram. It's not available too often, but you have to take it at least once for an ultimate thrill. Everything is squeaking there, and it looks like it's about to fall apart—when you're up in the sky, it gives you a real adrenaline rush. The next portion of adrenaline is waiting for you at the Mir station, from which a lift consisting of a single chair hung up to the cable takes you up to Gara-Bashi. These old lifts are a special kind of attraction here on Elbrus.

As I've already said, the pistes below 3,500 m were closed due to the lack of snow. Perhaps that's why there were so many people in Gara-Bashi. Everyone, including those who came from Cheget (where absolutely all pistes were closed), tried to go down to Mir from there or to climb up to Priyut-11. It was possible to reach it on foot or by snow tanks (snowcats), and we chose the latter. We enjoyed the descent so much that we decided to do it again. So, we ended up riding down this piste—from 3,800 m to 3,500 m and from 4,100 m to 3,800 m—all week long. The weather changed eventually, and we were "lucky" enough to go down during both the blizzard and thick fog. But there wasn't anything extraordinary about that for me; it was just the same as it was in Gudauri.

There were a lot of people on Elbrus during the New Year holidays. There were not only freeriding pros, but also a lot of newbies. There were lots of children, local families, and people who just liked the view and gondola lifts.

I have two life hacks for those who are going to go to Elbrus for the first time: prepare for the utter austerity of your living conditions and make room for some extra expenses in your budget. As for me, my actual expenses were 1.5 times the estimated ones. I spent about 15,000 rubles on my tickets and 35,000 rubles on accommodation, transfers, tours, and meals. A ski pass for December 30 and 31 cost 1,500 rubles per day. They warned us the price would go up to 2,100 rubles per day since the beginning of 2020, and the lack of snow didn't stop them. As far as we found out, the ticket price for the old gondola lift and the new one differed. Other extra expenses were the steambath and kebabs.

I think it makes sense to go back to Elbrus as a freerider—this would kind of motivate you to upgrade your level. After all, this mountain is meant to be conquered by professionals. An amateur won't find here a variety of green, blue, and red pistes, but at the same time the mountain is huge and, if you have adequate sports skills, you can enjoy riding its slopes for weeks.

PISTE CLASSIFICATION (RUSSIA)

GREEN—SLOPE:
5–15 % (TANGENT OF AN ANGLE AS MULTIPLIED BY 100);
WIDTH: 15–40 M; THE SNOW SURFACE IS PREPARED (SMOOTHED WITH A SNOWCAT)

BLUE— SLOPE: 15–25 %;
WIDTH: 20–40 M; PREPARED

RED— SLOPE: 25–40 %;
WIDTH: 30–40 M; PREPARED

BLACK— SLOPE: > 40 %;
WIDTH: 35–40 M; MAY BE UNPREPARED

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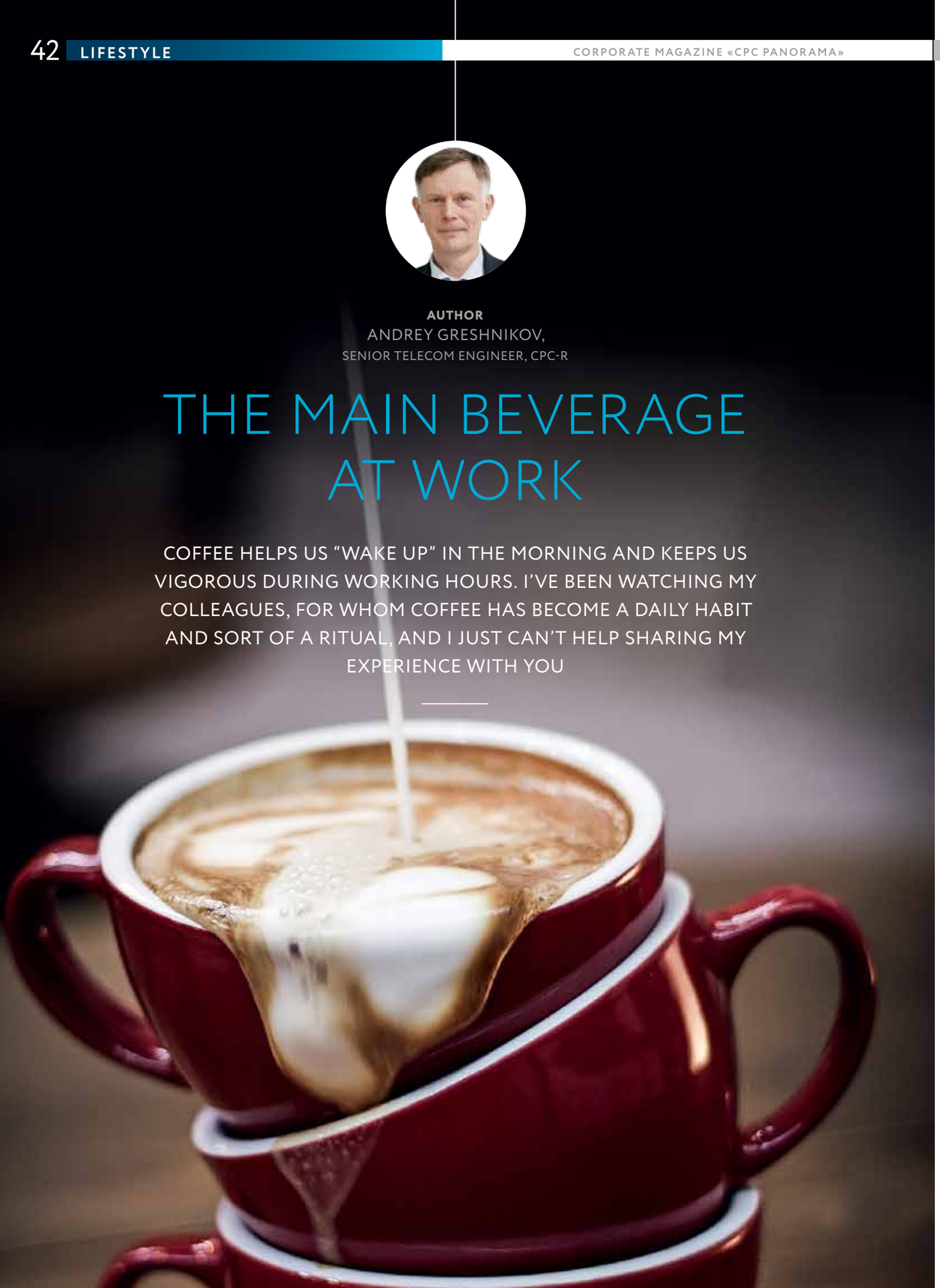
THE MAIN BEVERAGE AT WORK

COFFEE HELPS US “WAKE UP” IN THE MORNING AND KEEPS US VIGOROUS DURING WORKING HOURS. I’VE BEEN WATCHING MY COLLEAGUES, FOR WHOM COFFEE HAS BECOME A DAILY HABIT AND SORT OF A RITUAL, AND I JUST CAN’T HELP SHARING MY EXPERIENCE WITH YOU



CORNERSTONE

Of all the coffee-based beverages existing today, espresso still remains the main one. It is like the core of coffee culture and traditions, being the basis of most of the drinks.

The flavour of a coffee-based drink depends on many factors: the location and conditions in which coffee beans grew and matured, harvesting, transportation, roasting, storage, grinding, prewetting, dosage, and a brewing method. Let’s discuss each of them individually.

GROWING AND HARVESTING

The location where coffee beans are grown is of significant importance. It’s not only altitude above sea level that matters, but also the ecological condition of the soil, water, and air. Coffee producers should also pay attention to whether the weather was hot or cold during the year. It’s generally thought that the longer a coffee tree matures at slight temperature differences, the better the beans are. Experts call the composite of all the coffee tree maturing conditions terroir.

It is worth noting that coffee, as a plant, won’t grow just anywhere. It is not grown in Turkey, Armenia, Italy, or Russia, for example. Coffee trees only grow in Africa, Latin America, and the Asia-Pacific—and nowhere else.

The flavour of the future drink depends on how mature the coffee beans were during harvesting and how well the plants absorbed all micronutrients. What also affects the flavour is the conditions under which unroasted beans were harvested, stored, and transported.

COFFEE ROASTING

During further heat treatment, the beans release various oils. The coffee roasting process is divided into several types—from light roast (one coffee bean depicted on a package) to dark roast (five beans). Some coffee producers mark their coffee as light, medium, or dark roast. Depending on the degree of roast, coffee-based drinks vary in their flavour.

The roasting process is defined by the length and the depth of the so-called crack—a bean cracks open under action of the caramelization reaction. There are two types of cracks occurring during roasting: the first crack and the second crack. The first one happens at a temperature of about 200 °C due to high pressure resulting from moisture evaporation and release of carbon

COFFEE BEVERAGES:

ESPRESSO is one of the basic coffee drinks, which became the basis for dozens of other independent recipes. Espresso is strong black coffee with gold foam. One serving: 30 to 35 ml.

AMERICANO is espresso diluted with hot water in a ratio of 1:2 or 1:3. Hot water may also be served separately.

CAPPUCCINO is espresso with milk whipped into foam.

LATTE is espresso with milk (milk is poured into coffee) and thick milk foam on top.

LUNGO is espresso with much more water.

MACCHIATO is the opposite of latte. Espresso is poured into milk in such a way that layers appear. There’s milk foam on top (30 ml of espresso per 20 ml of milk).

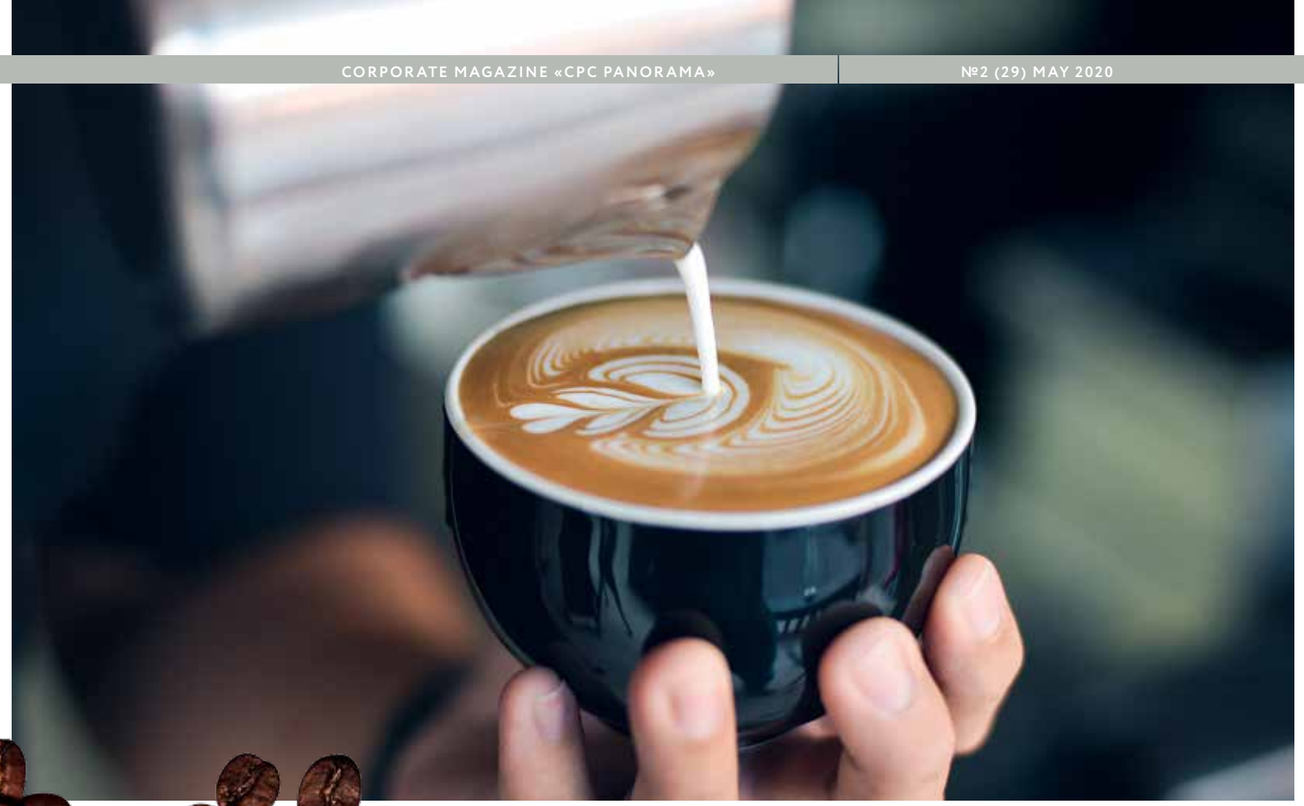
RISTRETTO is espresso without half the dosage of water (the dosage of ground coffee remains the same). It’s brewed two times faster than classic espresso..

MAROCCHINO is espresso mixed with cocoa powder and decorated with whipped milk and chocolate syrup.

MASALA is an Indian spiced coffee beverage brewed on the mix of milk and cream.

dioxide. The second crack occurs at a temperature above 220 °C, after sugars and cell walls start burning. If you keep roasting up until the second crack, the coffee will be very dark and way bitterer.

Roasted coffee can be stored in vacuum bags for up to 18 months. After the package is open, the coffee retains its properties for 30 days. The beans of good quality shouldn't look matte; they should have an oily gleam to them. It should be noted that if you only drink a cup of coffee or two a day at home, you should avoid buying packages of roasted coffee weighing a kilogram or more. Roasted coffee is prone to wear off its aroma and to easily absorb foreign odours and moisture, which changes its flavour.



POWDERING STAGE (GRINDING)

Espresso grind shouldn't be too coarse or too fine. The grinding degree should vary according to your taste preferences and the brewing method. If you make coffee in a cezve, the finer grind is preferred. If you use a coffeemaker, it's better to choose a medium grind. But this process always takes some adjustment and testing, because beans from different batches give different flavours to the drink.

The dosage of coffee doesn't usually depend on roast. Thus, to make one cup of espresso you would generally need 17 to 22 g of ground coffee.

Water is the second essential part of the drink. Its properties may significantly affect the quality of your espresso. Water used for brewing shouldn't contain any foreign odours or flavours. Its mineralization level should be about 120–130 ppm (mg/L); pH should be 7.0. If it is lower, coffee will have a sour aftertaste to it. Water hardness should be within 70 to 80 mg/L; total alkalinity should not exceed 50 mg/L. Chlorine in the water composition is totally unacceptable.

PREWETTING

To enable coffee to give most of its content to the water, a ground portion put in the capsule for further brewing should undergo prewetting. Not all coffeemakers can do that, and some baristas are just too lazy. The fresher the coffee is, the longer the prewetting process should take. It can be done at a temperature different from brewing conditions.

WAYS TO MAKE COFFEE

When hot water is poured over coffee, both soluble and insoluble elements are released. This process is called extraction. The soluble elements are salts, acids, sugars, and tannins. The insoluble ones are emulsion (oils), suspension (coffee particles), and aromatic compounds. Different groups of substances enter the drink at different stages of brewing.

The optimal temperature for coffee brewing is 92–96 °C, which depends on roast. Lighter roast requires a higher temperature. The coffee should be brewed for no less than 20 seconds to let all the substances get in the cup.

HOW TO DRINK IT

After the coffee is brewed, you should wait for a while before drinking it. Let it rest for some time, so that the rest of the coffee suspension settles down. The drink shouldn't be sour or bitter, flat- or thick-tasting. The quality of a coffee-based drink is estimated according to its aftertaste. The longer it lingers, the better the drink's quality is.

Everybody makes coffee (just as any other product, such as bread, meat, or wine) differently; everybody has their preferences and recipes. But if you tried a properly prepared drink or meal at least once, chances are you will raise your bar of preferences and experience more emotions after making a right or wrong choice.

I think (and so many experts do) the coffee consumption culture in our country still hasn't reached its peak. Many amateur coffee lovers can't distinguish a true quality drink from a mediocre one, with the latter being usually offered by most chain coffee shops. Not everybody has a decent quality coffeemaker and quality beans at home. At the same time, I should mention that there has been some progress in this area. For instance, Moscow has held several coffee conferences in the recent years, which were supported by the Moscow Government; a few competitions for baristas are held, qualifying them for the participation in the world espresso and cappuccino championships. One of the latest events took place in Melbourne on May 4–7, 2019. By the way, in the last year's coffee championship, the representative of the Russian Federation took the 7th place out of 54 participating countries.

Being an experienced amateur, I can assure you it's is quite possible to make coffee of decent quality at home. But you have to follow all the recommendations for brewing mentioned above, have properly roasted beans, filtered water, and a perfectly calibrated coffeemaker (if you use it). As for me, I use medium roast beans, a sorted blend of Brazil Fancy or Colombia El Bandido arabica beans. I like my espresso to be a little sour, to have a nice aftertaste, foam, and a delicious aroma. I noticed that the Columbian coffee makes you more awake, which means it contains more caffeine. ●

THE OPTIMAL TEMPERATURE FOR COFFEE BREWING IS

92–96 °C

RUSLAN DAKAYEV,
A COFFEE SHOP OWNER:

SO MANY MEN, SO MANY MINDS. IT WAS ONCE THOUGHT THAT IT'S BETTER TO DRINK YOUR ESPRESSO WITHIN THE FIRST 30 SECONDS AFTER IT WAS MADE; AFTER THAT, IT WOULD DIE. NOW THE OPINION CHANGED: THEY SAY YOU HAVE TO LET IT REST AND BREATHE. THEN IT WILL FULLY DEMONSTRATE ITS FLAVOUR, JUST LIKE WINE. FOR EXAMPLE, IN ITALY, THEY SERVE ESPRESSO AT THE BAR COUNTER ONLY. IT'S BECAUSE IT JUST WON'T BE ENOUGH TIME TO BRING ESPRESSO TO YOUR TABLE AS IT DIES. ITALIANS ALSO NEVER DRINK THEIR MORNING ESPRESSOS FROM AN UNHEATED COFFEEMAKER. THE RIGHT TIME TO DRINK COFFEE DEPENDS ON THE RECIPE. THERE'S NO RIGHT OR WRONG WAY TO DO IT.

"TO MAKE A QUALITY AND STABLE DRINK, YOU HAVE TO DO IT IN GRAMS—THAT IS, TO THOROUGHLY MEASURE A RATIO OF GROUND COFFEE TO THE READY DRINK. THE DOSAGE MAY VARY; THERE CAN BE 40 G OR EVEN 50 G OF THE READY DRINK.

"HERE'S ONE RECIPE: TAKE 18 G OF COFFEE TO GET 34 G OF A DRINK. IN ITALY, IT'S CONSIDERED TO BE A STANDARD WHEN YOU TAKE 7 G TO GET 30 ML, BUT IF WE MEASURE IN MILLILITRES, WE CAN'T BE SURE THE FLAVOUR IS STABLE, BECAUSE THE FOAM IS CHANGING. WE GET BACK TO THE RECIPE. IT ALL DEPENDS ON THE RECIPE WE TAKE FOR THE BASIS.

AUTHOR
PAVEL KRETOV

OIL AND GAS MILESTONES OF VICTORY

MAY MARKS THE 75TH ANNIVERSARY OF THE VICTORY OF THE SOVIET ARMY AND THE SOVIET PEOPLE IN THE GREAT PATRIOTIC WAR. THE WAY TO VICTORY IN THE ASPECT OF THE FUEL AND ENERGY SECTOR – WE DISCUSSED THIS ISSUE TOGETHER WITH THE COLLEAGUES FROM GUBKIN RUSSIAN STATE UNIVERSITY OF OIL AND GAS (NRU, NATIONAL RESEARCH UNIVERSITY) AND THE RUSSIAN MINISTRY OF ENERGY

CONTEMPORARY-STYLE PROLOGUE

At the beginning of 2020, Gubkin Russian State University of Oil and Gas (NRU) launched an «Open Lecture Hall». Renovation of the Lecture Hall was completed by the Caspian Pipeline Consortium. The country's leading oil and gas university received this gift from CPC in the year of its 90th anniversary and the 75th anniversary of victory in the Great Patriotic War.

The official launch ceremony of the joint project was attended by CPC General Director Nikolay Gorban, rector of Gubkin University Viktor Martynov, as well as the representatives of the international consortium shareholders.

In his speech, Nikolay Gorban reminded that the cooperation between CPC and the University is developing within the framework of the agreement signed in 2015. A few years ago, the Consortium completed the reconstruction and renovation of the Large Academic Hall named after Professor V. N. Vinogradov. As a result, the natural lighting of the Academic Hall was restored in accordance with the original plan of the Soviet architect Boris Iofan.

In turn, the «Open Lecture Hall» project is made in the contemporary style, which combines Scandinavian, Neo-classical, Art Deco, modern and country styles. General principles of the style intersect with the rules of minimalism – a lot of air, free space and no unnecessary details. The Lecture Hall is located behind the facade of the main building and has a separate entrance that allows for participating in educational events without registration of passes to the territory of Gubkin University. At the same time, a passage is provided from the Large Academic Hall to the Lecture Hall for using by the students.

NIKITA GOLUNOV

Rector of the University Viktor Martynov noted that the University successfully cooperates with the international consortium, and with all its shareholders that actively implement joint educational and scientific projects.

IMMEDIATELY AFTER THE OPENING OF THE NEW LECTURE HALL, A LECTURE ON «OIL AND GAS MILESTONES OF VICTORY» TOOK PLACE

«CPC employs a lot of graduates of our University. This is a very good example of cooperation, and we hope that our cooperation will continue, and we will continue to train highly qualified personnel for CPC,» he said.

THROUGH THE FUEL «FILTER»

Immediately after the opening of the Lecture Hall, the first TEDx lecture was held, which was prepared by Nikita Golunov, Vice-Rector for Continuing Professional Education, Head of the Department of Gas and Oil Pipelines Engineering and Operation. The topic of the lecture –»Oil and Gas Milestones of Victory» – was chosen by the University management not by chance. Lecturers and graduates of the University made a significant contribution to the defeat of the enemy on the front line, forged the victory

on the labor front, and even while being evacuated to Ufa during the war, the University continued to work fruitfully and develop. In 1945, for these achievements and especially for training highly qualified personnel for the Red Army fuel services, the educational institution was awarded the Order of the Red Banner of Labor.

Even today, 75 years after the Victory, the events of the Great Patriotic War continue to cause controversy among scientists and history lovers. Also, in certain political circles, attempts to revise the past in favor of short-term interests do not stop. However, revisionists often do not bother with referring to sources and historical documents. For example, one of the most controversial topics is the reasons for the failure of the Red Army in the initial period of the war. Nikita Golunov urged the audience to abstract from the assessment of the personalities of military leaders and movements of the fronts, and look at the course of hostilities only from the position of energy and supply of fuel and lubricants.

«Data from the archives show: before the attack against the USSR, Hitler's forces had a six-fold advantage in fuel reserves,» says Nikita Nikolayevich, «This suggests that the German army was more mechanized, mobile, maneuverable, and was able to travel long distances without a shortage of resources.»

ABOUT QUALITY AND QUANTITY

According to military archives, from 1941 to 1945, the Red Army spent 16.6 million tons of petroleum products (here and further N. N. Golunov refers to the data of the study of the Ministry of Energy of the Russian Federation, published in 2015 – ed. note). For comparison, Germany produced 20 million tons of synthetic fuel for military needs alone during the same period.

The quality characteristics of fuels and lubricants also played a significant role. In 1940, there were no plants in the Soviet Union with FCC units capable of producing high-octane gasoline. And while German aircraft flew on kerosene with an octane grade of up to 100, Soviet aircraft used fuel with an octane grade of 56 to 74. This meant that the Luftwaffe's fighters and bombers were faster, operated at higher altitudes, and had a wider operating range. Add to this such an indicator – the lack of fuel B-78 in flight schools of the USSR (less than 4 per cent of the required volume), graduates of which had only 12 hours of flight time as a result. This will give a comprehensive answer to the question why until the end of 1942, the German air force commanded the air.

And here it is time to note that in the face of Hitler's threat, the Soviet Union was not left alone with the enemy. The allies organized lend-lease deliveries of equipment, ammunition, food and fuel.

TRIPLE HERO OF THE SOVIET UNION ALEXANDER POKRYSHKIN STANDS AT THE COMBAT PLANE

«War veterans remember the American stew, the famous Soviet multiple rocket launchers Katyusha were mounted on three-axis American Studebakers, one of the most effective aces of the Red Army, Alexander Pokryshkin, flew on the American Airacobra,» lists Nikita Golunov.

From the United States, aircraft arrived on the Alaska - Siberia air bridge, where, already fueled by Soviet fuel, it took a course to the front. Promptly built and provided with the necessary cracking units refineries in Orsk, Guryev, Krasnovodsk and Kuibyshev began to keep it in high-octane gasoline together with the entire Red Army.

FOR THE FRONT AND THE REAR

The large-scale evacuation of industry and the construction of new plants during the war is sometimes rightly called the second industrialization. Until the end of 1941, more than 1.5 thousand large enterprises were transported to the East.

«Few people, except specialists, know that it was during the war years that the gas industry of the USSR was formed. Gas provided energy for plants that forged weapons for the Victory – produced rolled products, armors, planes, gunpowder, shells,» emphasizes Nikita Golunov.

From 1941 to 1945, natural gas production increased 12 times, 10 gas and 37 oil fields were discovered, and almost 2.5 thousand oil and gas pipelines were built. In 1942, the first main gas pipeline in the Soviet Union, Buguruslan – Kuibyshev, was built, and the Okha - Sofiysk main steel oil passage was laid to supply feedstock from the North of Sakhalin to the Komsomolsk-on-Amur refinery (both pipelines were put into commercial operation in 1943 – ed. note).

A special mention should be made of the oil product pipeline laid along the bottom of Lake Ladoga in 1942 to the blockaded Leningrad. The vital pipeline was completed in just 43 days with the highest quality of work: only one defect was found on 5.8 thousand welded joints. By the way, the chief engineer of the project was a Gubkin graduate with a degree in «Oil Transport and Storage», David Shinberg.

Today, there are about 50 oil and gas universities in Russia. And during the war, there were only three of them, and their specialists were in great demand, so it is not surprising that in 1943 the creation of the petro-mechanical faculty at Gubkin Institute of Petroleum was initiated by the State Defense Committee. The SDC resolution was issued on July 4, the faculty was established on July 22, and its first students sat down at their desks on September 1.

«It's an amazing thing! We call many periods of our history difficult, but during the war people had to do everything at once – transport enterprises, build new plants, develop fields, lay pipelines, open faculties, and no one complained,» says Nikita Golunov.

FROM 1941 TO 1945, THE RED ARMY SPENT

16,6

MLN TON

OF OIL PRODUCTS

BATTLE OF MACHINERY

But let's get back to the front. In 1942, the attack of the Nazis against the Caucasus and the Volga significantly complicated the supply of fuel to Stalingrad. If before the war, the Baku – Stalingrad transport leg was 1.2 thousand km, then at the time of the battle of Stalingrad it increased to 5 thousand km. From Baku, linked railway tanks with feedstock were towed along the Caspian Sea to Turkmenistan, from where they were transported through the territory of Uzbekistan and Kazakhstan to Saratov, where the black gold was processed and oil products were sent to the troops defending Stalingrad. The most dangerous were the last 380 km from

the Saratov oil refinery to Stalingrad, which were under targeted bombing by German aircraft.

From the point of view of the researcher, the structure of consumption of various types of fuel by the Red Army during the battle of Kursk in 1943 is interesting. We know it as the largest armored clash of the war, and most of the fuel and lubricants — 44 per cent — were used by cars, which were engaged in direct delivery of fuel and weapons to the troops. 30 per cent of the fuel in the confrontation on the Kursk Bulge fell to the share of Soviet aviation, which cleared the sky from the enemy and reinforced the attacks of armored troops with the actions of strike aircrafts from the air.

Analysis of fuel consumption from one major battle of the Great Patriotic War to another shows the dynamic mechanization of the Red Army. Both in the battle of Stalingrad, and in the «battle of machinery» on the Kursk Bulge, and during the Berlin offensive operation, the Soviet troops consumed approximately 150 thousand tons of fuel. But in the first case, this amount was spent in six months, in the second one — in 50 days, and in the third one — in 23 days.

Marshal of the Soviet Union A. M. Vasilevsky noted that in the most difficult conditions, specialists of fuel services always coped with all the tasks set, without disrupting a single operation. Officers and soldiers were highly appraised by Marshal of the Soviet Union K. K. Rokossovsky, who emphasized that they were inexhaustibly inventive. And, of course, we will add, the Gubkin school affected!

IL-2 AIRCRAFT ATTACKING AN ENEMY CONVOY THE KURSK BULGE. THE VORONEZH FRONT

DURING THE WAR, PEOPLE HAD TO DO EVERYTHING AT ONCE – TRANSPORT ENTERPRISES, BUILD NEW PLANTS, DEVELOP FIELDS, LAY PIPELINES, OPEN FACULTIES

AUTHOR
EKATERINA KRAPIVKO,
SENIOR SPECIALIST,
MEDIA RELATIONS, CPC-R

GREETINGS FROM THE BATTLEFRONT

EVERY YEAR, IN THE LEAD-UP TO THE GREAT VICTORY DAY, CPC PANORAMA REMEMBERS OUR BELOVED VETERANS. SOMETIMES, THIS MIGHT BECOME A WONDERFUL SURPRISE FOR A WAR VETERAN'S FAMILY

My grandfather Stepan Gavrilovich Kurilin was one of the heroes of CPC Panorama's issue dedicated to the 70th anniversary of the Great Victory. I couldn't even imagine what wonderful consequences that article would bring when I was telling my colleagues about my beloved veteran, who had passed away many years before, unfortunately.

When sharing my grandfather's story, I mentioned his brother Vladimir, who had died at the front line. However, it turned out there was also the third brother, Aleksandr. And my family only found out about him in 2018, when his granddaughter saw the article about Stepan Gavrilovich—she was looking for his relatives at the time—in CPC Panorama with my name on it. That issue also contained a story by my mom, "My Father's Dress Uniform". Olya found us thanks to this magazine.

My mother hadn't known anything about her uncle's life until that moment. She was moved to tears when she met Olya and listened to her story about how long it took for her to find us; she was touched by yellowish pictures taken back in 1943, one of which had a touching message on its reverse side left by her father for his younger brother: "A keepsake for my beloved brother Sasha. From Stepan. Take care, Sasha, for a pilot's life is short, although the profession itself is honourable. I love it. January 21, 1943. The town of Chkalov"...

It is impossible to describe how nervous I was ascending the escalator of the Saint Petersburg metro to meet Olya. On the one hand, I had never ever met her before. What would we even talk about? On the other hand, there was this growing desire for meeting my sister and the feeling of being even closer to my grandfather. All my doubts disappeared as soon as I saw Olya. We greeted each other with a hug, went to a nearby café, and... we ended up talking for four hours straight. We shared our memories of our grandfathers, grandmothers, mothers... It turned out we had so much in common! We looked alike, we had the same values, and we were the same family. And we would have talked even for longer if we hadn't had to part.

Was I walking back to my hotel? No, I was flying! It was peculiar, incomparable happiness that I wanted to share with the whole world. I was smiling all the time. I had one more sister! And she was amazing. We were the branches of the same tree. I also had that warm feeling that my grandfather, my dearest veteran, was somewhere nearby, and very happy, too.

AUTHOR
ASKAR SHMANOV,
REPUBLIC OF KAZAKHSTAN GOVERNMENT
RELATIONS REPRESENTATIVE, CPC-K

HEROES FROM ATYRAU

THERE ARE PROBABLY NO FAMILIES IN KAZAKHSTAN, LIKE IN ALL FORMER SOVIET REPUBLIC, THAT WERE NOT TOUCHED BY THE GREAT PATRIOTIC WAR. THE ATYRAU (FORMER GURYEV) REGION, WHERE THE CPC'S PIPELINE STARTS, IS NOT AN EXCEPTION. THERE WERE NO BATTLES ON THIS TERRITORY, BUT THE LOCALS DID CONTRIBUTE TO THE GREAT VICTORY

The geographic location of the region obliged it to become one of the strategically important rear areas. On July 7, 1941, a casualty clearing station was established in Guryev, through which 35,320 people from every part of the Soviet Union passed up until November 20, 1941. In the autumn of 1941, for example, it accommodated orphans and deaf children evacuated from Voronezh. Workers of a mechanical plant from the town of Nezhin of Chernihiv region also came here. The Machine Tool Plant named after G. I. Petrovsky was also fully evacuated from Donbass and transferred here. This plant later became the Guryev Machine-Building Plant (known today as AtyrauNefteMash). Each of these plants manufactured hardware for the battlefront non-stop.

In addition to the industrial facilities, there were five hospitals in the town. They were located in the Kuybyshev School, in a local youth center, in the building of the fishing industry school, in the recreational center for oil workers, and in the building of the polytechnic school. In these hospitals, more than 9,000 soldiers and commanders of the Red Army were cured.

THE KHIUAZ DOSPANOVA MEMORIAL AT THE ATYRAU AIRPORT

THE KAIYRGALI SMAGULOV MEMORIAL IN ATYRAU

In 1942, Guryev hosted an infantry school that prepared future troop and company commanders. One of the school's divisions was located in the Kuybyshev School (now – the office of KazTransGas Aimak), where 2,500 subalterns were trained in two years. Many of its students were born in Guryev. In the spring of 1942, Guryev seaport was opened on one of the Bolshiye Peshnye islands, which became a transshipment terminal for oil and other freight for military use.

The front was approaching Guryev. In the summer of 1942, the 471th Machine Gun Artillery Division came to the town to defend its oil depots and oil products. And that was a timely measure: when the Nazis approached the Volga River, Guryev appeared to be in the field of fire of enemy aircraft. On September 10, 1942, a Junkers Ju-88 crossed the town's skies. It dropped propaganda leaflets on the areas around the fish cannery and Zumysker settlement. Until the end of September, the enemy planes appeared above the town five times; they quickly retreated every time they noticed Russian fighters up in the sky. On October 4, 1942, another Junkers tried to make its run over oil storage tanks in Shirina settlement, but the attack was repulsed. There were no more attempts to bomb the town.

In May 1944, the Nazis landed their force of 14 diversionists who were the members of so-called Turkestan Legion, in the Zhylyoy District. Their main goal was to destroy oil fields across the Guryev Region. But thanks to the alertness of the locals, one part of the landing force was neutralized and the rest was captured.

When the war started, thousands of residents of the Atyrau Region stated their willingness to go to the front. A total of forty-two thousand citizens were called up for the army; more than 13,000 of them never came back home. Most of them were killed in battles, some are still deemed to have gone missing.

THEIR DESCENDANTS REMEMBER THEIR HEROIC DEEDS

The record of the Great Patriotic War has many examples of the excellent performance of military duty by our fellow countrymen and of their bravery and unselfish serving their motherland. Nine of them were given a title of the Hero of the Soviet Union: Kaiyrgali Smagulov, Boran Nysanbayev, Ivan Makhorin, Georgiy Kantsev, Filipp Mazurov, Aleksandr Afanasyev, Ivan Berezin, Mukat Musayev, and Musa Baymukhanov. Another four heroes returned from the front as Full Cavaliers of the Order of Glory (each of them got all three of the order's categories): Gizat Alipov, Shukir Yerikinov, Yevgeniy Polynin, and Gavriil Shamin.

Hero of the Soviet Union Kaiyrgali Smagulov was raised in the Uralsk Orphanage and worked at the fish cannery in Guryev. He was called up for the Red Army when he was 20. He participated in battles (near Rostov-on-Don and Ordzhonikidze settlement) since the very first days of the war. In September 1943, he was expelling the Nazis from Novorossiysk as a member of a landing party for four days. On November 17, 1943, he was awarded the title of the Hero of the Soviet Union for his bravery and courage that he had demonstrated in the battles on the "Malaya Zemlya". Gabit Musrepov dedicated his famous story "The Kazakh Batyr" to him. Later, the author made some additions and changes to the story and gave it the second name, "A Soldier From Kazakhstan". On May 6, 2010, there was the grand opening of the Hero's bust

on the boulevard named after Kaiyrgali Smagulov in Atyrau.

Full Cavalier of the Order of Glory Yevgeniy Mikhaylovich Polynin was called up by the recruiting station of the Guryev Region in July 1941. He participated in battles of the Rzhev–Vyazma operation. He received his first order — the Order of the Red Star — for his participation in the battles in the East of the Smolensk Region. Being a communications technician at first, he later replaced an injured artillery observer and took command of the artillery crew of an independent 76-mm divisional guns artillery battalion. This can be confirmed by the extract from his award sheet: "Comrade Polynin displayed great courage and heroism when fighting the Nazi invaders in the Skugorevo area on January 11, 1943. He replaced an injured artillery observer, destroyed two machine-gun positions and a mortar battery with his hardware, and demolished 40 Nazi soldiers." In August 1943, he received his second award — a medal "For Courage" — for the participation in a breakthrough battle near Shcheki village of the Smolensk Region. Later, he was awarded the Order of Glory of categories I and II and the Order of the Red Star.

The war did not end for him on Victory day. From August 9 to September 3, 1945, he was participating in battles with the Kwantung Army. He came back home in October 1945. Yevgeniy started working as a carpenter at an oil refinery and kept working there until his retirement. He also received dozens of gratitude letters and a letter of recognition from the Supreme Soviet of the Kazakh SSR for his hard work. Being a pensioner of national significance, he was engaged in major activities on military and patriotic education of the youth, often spoke to workers of various enterprises, and conducted bravery classes in schools and colleges. In 1984, Yevgeniy Polynin received the title of the Honorable Citizen of Guryev. Former Transportnaya street in Atyrau was eventually named after him. The house where he lived has a memorial tablet on it.

Khiuaz Dospanova was a navigator sniper with more than 300 flights on her account. Slim and small Katya — that's how her friends called her — was a brave pilot leaping into action despite all the injuries and traumas. A year before the war, she finished school with a gold medal, and thanks to the aeroclub classes she received her reserve pilot license along with her school certificate. Then she went to Moscow, where the committee of the Zhukovskiy Air Force Engineering Academy turned her down: they accepted men only. Khiuaz entered a medical university and finished her first year in the summer of 1941.

When Khiuaz found out about the establishment of a women's aviation regiment under the command of Marina Raskova, she immediately applied for it and soon went to Saratov to study at the aviation college with the other girls. In May 1942, the only women's light bomber regiment in the USSR was transferred to the command of Senior Lieutenant Yevdokiya Bershanskaya.

YEVGENIY POLYNIN

The Nazis called these creative and uncatchable pilots Nachthexen (The Night Witches). The breaks between the missions were 5 to 8 minutes long; sometimes there were 6 to 8 missions per night (and up to a dozen during long winter nights). The total flight time of the regiment was 28,676 hours, which is 1,191 days.

Khiuaz Dospanova was awarded the Order of the Red Star, the Category II Order of the Patriotic War, the Order of the Red Banner, and several medals, such as "For the Defense of the Caucasus", "For the Liberation of Warsaw", and "For the Victory over Germany". In 2004, according to the order by the President of the Republic of Kazakhstan, Khiuaz Dospanova received the Republic's highest award — the Gold Star Medal "Khalyk Kakharmany". In 2012, Embraer 190 of Air Astana received her name. In the lead-up to the 75th anniversary of the Great Victory, the Atyrau International Airport was also named after her.

Most of the Atyrau heroes went to the front when they were young. The war ruined all their plans. Our region is proud of our countrymen and their contribution to the Victory. Their descendants will always remember their heroic deeds expressing bravery and passionate love for their motherland.

THE MILITARY HALL OF FAME AT THE ATYRAU UNIVERSITY OF OIL AND GAS

CPC IMMORTAL SQUAD

ABROSIMOV, MIKHAIL ROMANOVICH

Natalia Gornykh, Senior Specialist, Commercial and Crude Movement Operations (Marine Terminal, Novorossiysk), about her great-uncle

Mikhail Abrosimov was born in Pokrovsky hamlet of Ivnyansky district of the Belgorod Region. He took the first fight in March 1943 in the Bryansk Region, where he was a wireman in a signal troop of the 297th Guards Anti-Aircraft Artillery Regiment. In the summer of 1944, he as a member of his division, a flak battery and an infantry company accepted a desperate battle with a group of Nazis made up of 1,500 soldiers, which escaped from encirclement. When all Russian commanders were killed, it was Corporal Abrosimov who assumed command of the company. The enemy was suppressed and turned to flight. But when surrendering, a Nazi officer discharged a handgun at Mikhail. M. R. Abrosimov was posthumously awarded a title of the Hero of the Soviet Union according to the Order of the Presidium of the Supreme Soviet of the USSR.

VINOGRADOV, IVAN YAKOVLEVICH

Igor Vinogradov, Regional Government Relations Representative (Marine Terminal, Novorossiysk), about his father

Ivan Vinogradov was called up for the Red Army in November 1934. He finished a regimental school in Leningrad in 1935, and in 1938 — already as a lieutenant — a tank school in Pavlovsk. In March 1940, during the Winter War, he received Medal "For Courage". He also was awarded the Order of the Red Banner for the evacuation of a disabled experimental heavy tank IS-1 with its crew inside from the forefront. From June 1941 until July 1942, he was a member of the 476th Infantry Regiment of the army and also fought near Stalingrad. He was awarded Medal "For Battle Merit". From 1943 until the end of the Great Patriotic War, Ivan Vinogradov was serving as assistant commandant of the regiment's service unit. In 1945, he was awarded Medal "For the Victory over Germany".

GERASIMENKO, VASILIY IVANOVICH

Aleksey Negryan, Operator Process Installation, PS-4 (Stavropolski Krai), about his grandfather

Vasiliy Gerasimenko was born in 1917 in Gospitalnaya Slobodka settlement (now Krasnokumskoye settlement, Stavropolski Krai). He was called up for the Red Army in 1941. He participated in battles on the Western, Bryansk and Belarusian fronts. As a driver of a mechanical transport company for airfield service, Vasiliy delivered a total of 2,317 tons of bombs and shells to the airfield. He always delivered shells for the 156th Fighter Aviation Regiment a day before the due date, which ensured the obvious advantage of the fighters up in the sky. When he was providing ammunition for airplanes of aviation regiments located at the Vosswinkel airfield (which was located on the territory of East Prussia taken by the Soviet troops), he managed to deliver 18 tons of bombs in two days. In 1945, he was awarded Medal "For Battle Merit".

GORNYKH, ANATOLIY YEFIMOVICH

Andrey Gornykh, Duty Officer Trunk Pipeline (Marine Terminal, Novorossiysk), about his great-uncle

Anatoliy Gornykh was born in 1925. He started participating in battle actions as a member of the Red Army in 1943. He was awarded the Category III Order of Glory for his act of bravery committed on April 2, 1944. That day, Anatoliy Gornykh, a student of a training unit of the 43th Daursk Regiment of the 106th Zabaikalsk–Dnepr Infantry Division, who led his squad, was the first to invade an enemy's trench and shot down three German soldiers. Junior Sergeant Gornykh was killed on July 13, 1944, in the Lviv–Sandomierz offensive in Western Ukraine. He was buried in a mass grave near Lokachi settlement in the Volyn Region of Ukraine.

IZMAYLOVA (TSYGANOVA), SARRA SULEYMANOVNA

Ekaterina Fedotova, Secretary Translator (Central Region, Astrakhan), about her grandmother

Sarra turned 16 in 1941. The war caught her in Astrakhan, where she was born. The atmosphere in the city became especially tense in the autumn of 1942. She and her friends had to dig positions, trenches, and anti-tank ditches in the course of construction of the Astrakhan line. Enervating heat in the summer, cold damp wind in the autumn, heavy physical work, hunger... She never told us about how hard it had been for her there. Always quiet and modest, she was a loving wife and a mother of three sons and a rear area and labor veteran.

LEYBENKO, PYOTR PETROVICH

Igor Kvashnev, Process Installation Operator (Central Region, Astrakhan), about his grandfather

Pyotr Leybenko was born on July 14, 1909, in Yandyki settlement of Limanskiy district of the Astrakhan Oblast. He was called up for the Red Army in January 1942. His battle history started with the 18th Kuban Cossacks' Cavalry Squadron. He fought for Rostov-on-Don and defended the Caucasus. On December 15, 1942, he secretly approached the enemy's fortifications and single-handedly destroyed its machine-gun crew. That led to him being awarded Medal "For Battle Merit". In August 1942, Pyotr Petrovich participated in the famous attack against superior enemy forces near Kushchevskaya settlement of the Krasnodar Region as a member of a mounted formation of the Cossacks' troops. An injury rendered him unable to continue fighting, so he was relocated to the Ural Tank-Building Plant. He returned to his home settlement after the war finished.

LYAKHIN, FYODOR NIKOLAYEVICH

Konstantin Lyakhin, Lead Engineer, Labour and Industrial Safety (Western Region, Krasnodar), about his grandfather

Fyodor Lyakhin was born in Novopetrovka village of the Bashkir ASSR. He was called up for the army on June 15, 1941. In August 1942, he participated in the defense of Krasnodar. In the spring of 1943, he ascended to an altitude of 121.4 km west of Krymsk, which was later called Sopka Geroyev (Hill of Heroes). On September 10, 1943, Pyotr participated in the liberation of Novorossiysk. On November 3, 1943, he took part in the Kerch–Eltigen landing operation. Together with his anti-tank crew, he destroyed 25 Nazis and a machine gun position at an altitude of 133.3 km near Bulganak settlement, for which he later was awarded the Category II Order of the Great Patriotic War. In January 1944, my grandfather participated in the Cape Tarkhan landing operation. His motorboat was pulled out to the Sea of Azov due to stormy weather. He was awarded the Order of the Red Star for his bravery and heroism displayed when saving his boat and men.

MUKHLAYEV, ULYUMDZHI KEKEYEVICH

Elveg Bembeyev, Senior IT Engineer (Central Region, Astrakhan), about his grandfather

Ulyumdzhi Mukhlayev was born on May 12, 1922, in Yasta settlement (Dolbanskiy district, Kalmyk ASSR). He was called up for the front in April 1942. He fought as a member of the South-East, Don, South, and the Fourth Ukrainian fronts. From July 1942 until November 1942, Sergeant Mukhlayev took command of a mortar crew of the 622nd Regiment of the 124th Infantry Division. In 1942, as a member of the 150th Guards Regiment of the 50th Guards Rifle Division if the 5th Attack Army, he participated in breakthrough battles against the Nazis in Stalingrad and its suburbs. He was involved in the liberation of the Rostov, Voroshilovgrad, Donetsk, and Zaporizhia Regions, which was happening from 1942 until 1943. He was injured and awarded the Category II Order of the Great Patriotic War.

ODINOKOV, VLADIMIR PAVLOVICH

Mariya Vasina, Administrative Assistant (General Director, CPC, Moscow), about her grandfather

Vladimir Odinokov was born in 1915. He attended school for working youth and at the same time was engaged in the activities at the Society for the Promotion of Aviation and Chemical Defense (Osoaviakhim). He learned light aircraft operation and jumped with a parachute. He was called up for the army in 1933 and served near Kyiv. He was not accepted to the flight school due to medical reasons. In 1941, he was called up to serve at the Leninabad airfield. He spent all the war serving in an air defense meteorological unit ensuring flights safety. He met the end of the war as an engineer mayor in Tukums (Latvia). My grandfather finished his military service as an engineer colonel of the air defense general staff. Fighting award: two Orders of the Red Star, medals: "For Battle Merit" and "For the Victory over Germany".

SOLOPIN, ANDREY PANTELEYMONOVICH

Igor Kushnarenkov, Electrician, Electrical Installation Maintenance (Central Region, Astrakhan), about his great-grandfather

Andrey Solopin was born in 1909 in Zelenga settlement of Volodarsky district of the Stalingrad Region. He was called up to the front on September 10, 1941. First he was a member of the 202nd Rifle Regiment of the 81st Rifle Division in the Krasnodar Region. He was captured in June 1942 (unofficial data obtained when aligning the events with orders), and was liberated at the beginning of 1943 by the soldiers of the 317th Rifle Division, where he eventually resumed serving. He fought throughout the whole war and managed to come back home. He died in 1971. Awarded the Medal "For the capture of Budapest". There are only photographs and letters from the front, in which he wrote: "Don't forget me. Remember me more often."

SUVOROV, SERGEY AVRAMIYEVICH

Pavel Nekrasov, Oil Products Operator, PS-5 (Stavropol Krai), about his grandfather

Sergey Suvorov was born in 1901. He got to the front in August 1941. He was a member of a separate infantry regiment up until July 1942. Then he was injured and stayed at the hospital until October of the same year. Then he went to the front again. He met the end of the war in Katowice, Poland. Sergey was awarded two medals: "For Battle Merit" and "For the Victory over Germany". ●

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PANORAMA
CASPIAN PIPELINE CONSORTIUM

CPC PANORAMA Corporate Publication. No. 2 (29) may 2020. The issue is prepared by the CPC Press Service.
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Publisher: LLC Media Service. 111116, Moscow, Energeticheskaya Str., 16. vashagazeta.com. Tel.: +7 (495) 988 18 06.
E-mail: ask@vashagazeta.com. General Director: Vladimir Zmeyushchenko. Editor-in-Chief: Vilorika Ivanova. Project Editor: Ksenia Piskareva. Art Editor: Tatiana Kalinina. Designers: Tatiana Kalinina, Gulnara Aglyamutdinova. Production Director: Oleg Merochkin. Photographs: CPC Press Service. Printed by PROPRINT: www.proprint.moscow, тел.: +7 (499) 490-44-62.
Circulation: 100. It is forbidden to use any content without the consent of the editorial office.

CASPIAN PIPELINE
CONSORTIUM:

A TIME-TESTED INTERNATIONAL PROJECT

Каспийский Трубопроводный Консорциум
Caspian Pipeline Consortium
Каспий Құбыр Консорциумы