

PANORAMA



CASPIAN
PIPELINE
CONSORTIUM

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THE HEART OF THE STATION (10)

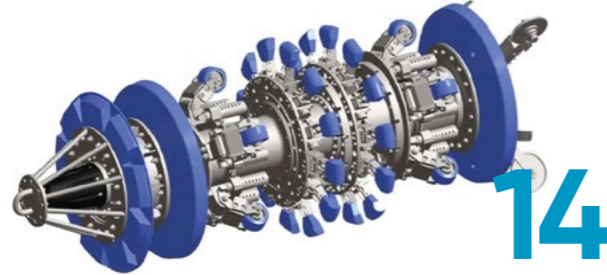
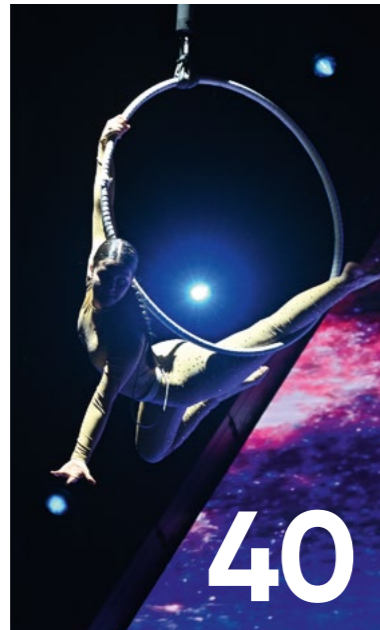
A MAJOR CHANGE (18)

WINGS OF MEMORY (40)

A NEW REALITY (52)



Major milestones in the project's history



IN THE FIRST PERSON

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Dear colleagues and friends!

2026 has been officially declared the Year of Unity of the Peoples of Russia. The Caspian Pipeline Consortium is a good example of such unity: for three decades now, a close-knit multinational team of pipeline professionals has been carrying out its tasks day in and day out at PSs, mainline facilities, tank farms, laboratories and offices. Astrakhan Oblast, the Republic of Kalmykia, Stavropol Krai and Kuban: each of the regions along the route of our main oil pipeline has its own rich traditions of folk art, its own history and symbols, and its own heroes. In the Republic of Kazakhstan, 2026 will be the Year of Digitalisation and Artificial Intelligence. For CPC, these are also not just words: digital technologies and neural networks are playing an increasingly important role in designing, diagnosing and managing pipeline system facilities and processes, and in improving the qualifications of our specialists.

As we approach our 30th anniversary (marked on 6 December, the day the Shareholders Agreement was signed in 1996 establishing CPC-R JSC and CPC-K JSC), the Consortium brings with it experience in tackling unprecedented challenges. In 2025, we not only shipped the one-billionth ton of crude oil since CPC began operations, but also recorded the largest annual shipment

volume in our history: more than 70.5 million tons. We faced terrorist attacks on our facilities, which resulted in injuries and required the rapid restoration of damaged and disabled equipment. I would like to particularly highlight the dedication and coordinated actions of the Consortium's workforce, which, in these near-combat conditions, can rightly be called heroic. The company is implementing new security measures, adjusting drill scenarios and revising the overall strategy for protecting production facilities. Our main task, transporting and shipping to global markets the crude oil contracted by our shippers, continues effectively and without interruption, despite stormy weather both at sea and in the world.

The Debottlenecking Programme was completed at the end of 2025. In 2026, new construction awaits us: at three PSs, gas-turbine-driven MPUs will be replaced with electrically driven MPUs. Testing of the first industrial prototype began in January at PS-7. Under a contract with Transneft PJSC's subsidiary UDM LLC, 11 such MPUs will be manufactured. To accommodate them, new main pump houses and related facilities will be built at the stations. CPC facilities will be upgraded not only onshore but also at sea: in 2026, two new SPMs will be installed at the Marine Terminal to replace the units that have been in service since 2001.

As you can see, the Consortium has many plans for 2026 aimed at improving the efficiency and safety of our operations. In addition, we continue to develop initiatives in environmental protection and support for healthcare, education, sport and culture in the regions where we operate. Our international festival-contest "CPC for Talented Children" is also a vivid example of the unity of folk traditions and cultures. Each and every employee and manager plays an important role in bringing the company's plans to life. I wish all of you a productive 2026 with good results, and I wish you the drive and determination to achieve everything we have set out to do.

N. N. Gorban
General Director
Caspian Pipeline Consortium



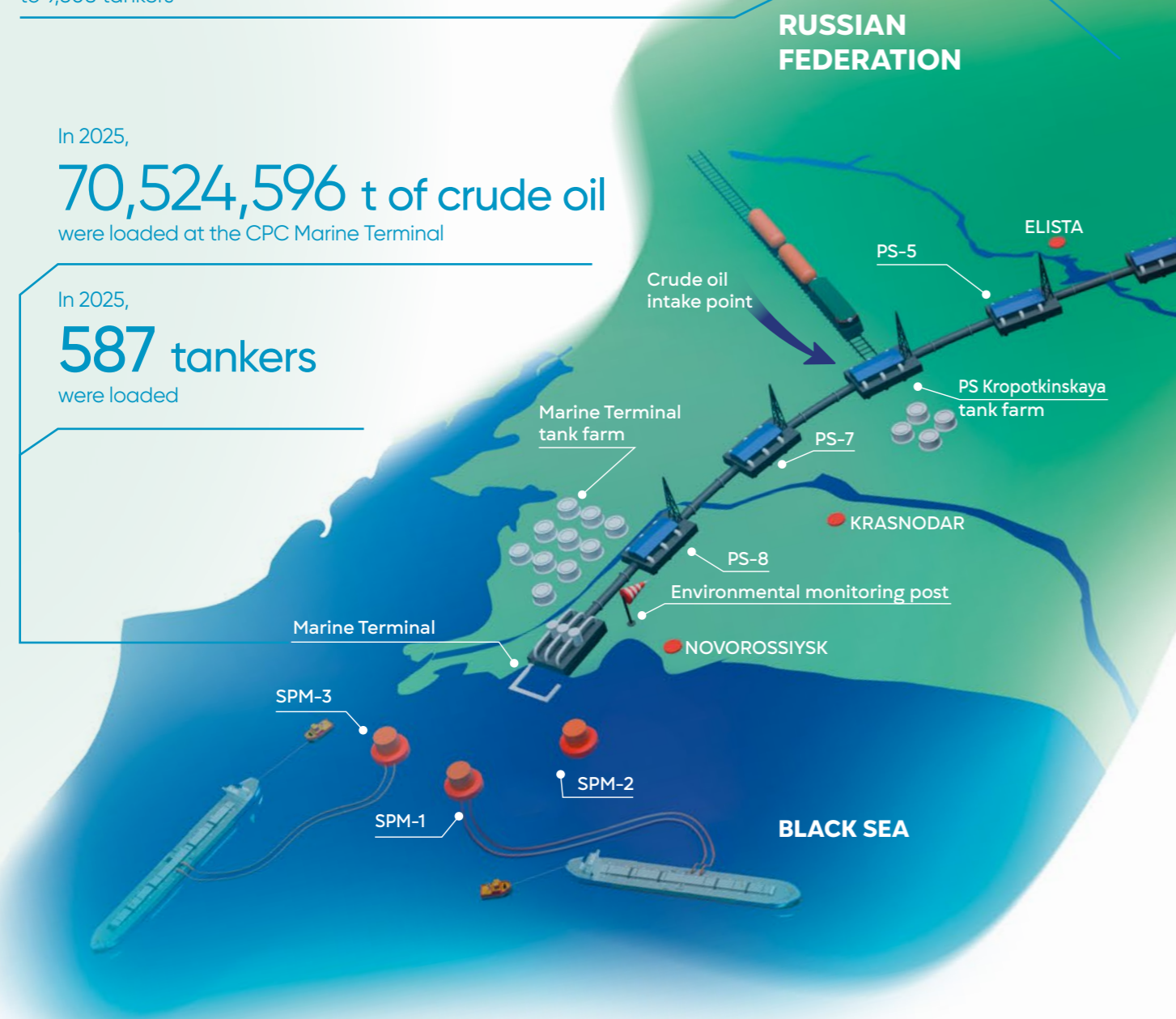
CPC: 2025 results

1,021,170,163 t of crude oil

delivered via the Tengiz – Novorossiysk pipeline system to global markets in 2001–2025, corresponding to 9,508 tankers

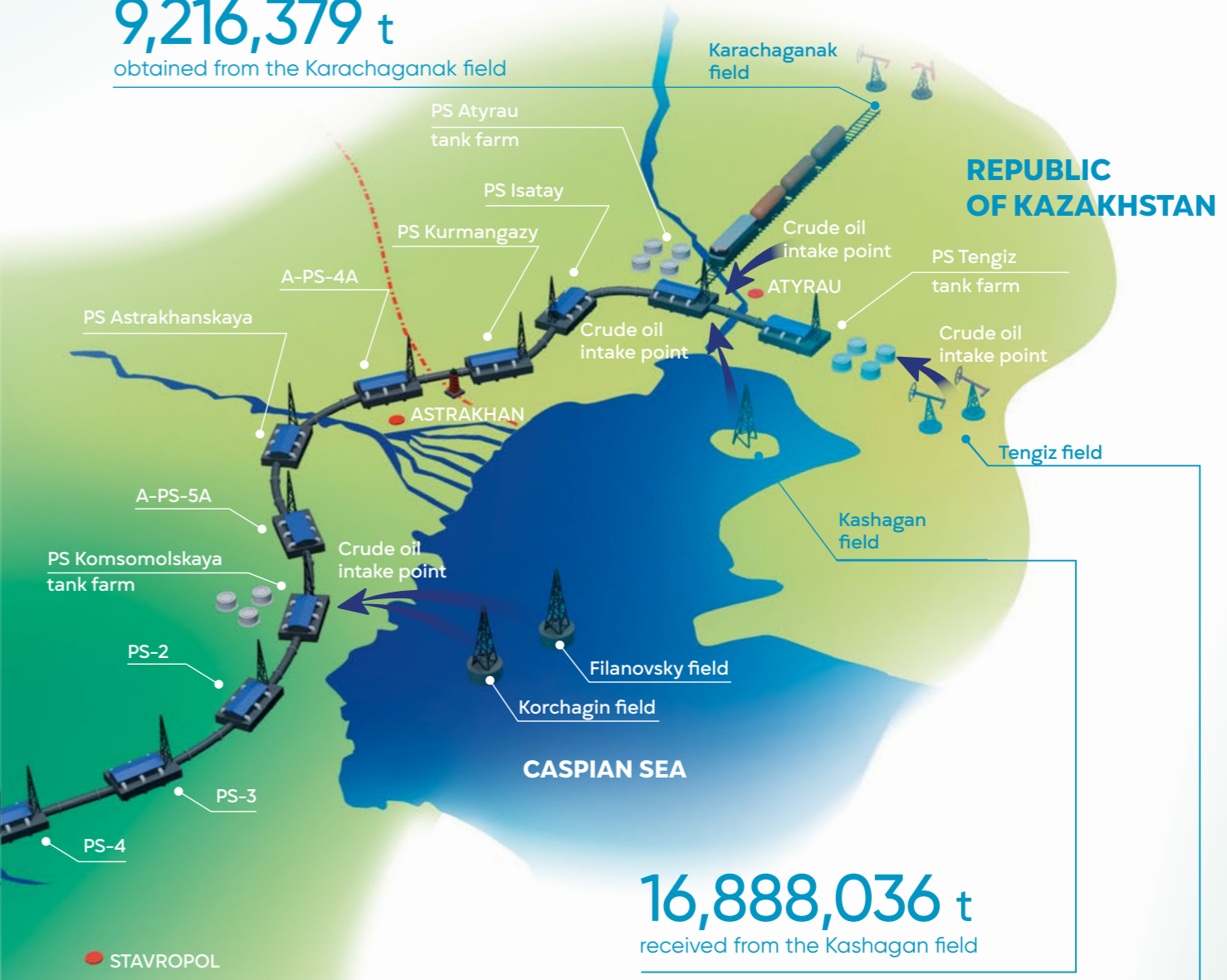
In 2025,
70,524,596 t of crude oil
were loaded at the CPC Marine Terminal

In 2025,
587 tankers
were loaded



9,216,379 t

obtained from the Karachaganak field



16,888,036 t

received from the Kashagan field

36,600,000 hours

worked without lost time injuries

36,571,429 t

received from the Tengiz field

81,200,000 km

driven by the corporate vehicle fleet without road accidents

About 660,000,000 tenge

total value of CPC charitable programs and projects in the Republic of Kazakhstan in 2025

821,500,000 roubles

total value of CPC charitable programs and projects in the Russian Federation in 2025

Awards from the President of Russia

Pursuant to Order of the President of the Russian Federation No. 468 rp dated 2 December 2025 “On Commendation”, the President’s Certificates of Honour were awarded to Pavel Moskatov, Chief Engineer for Operations and Maintenance in CPC’s Western Region, and Sergey Potryasov, Head of the Western Region Operations Division (Regional Manager), for their contribution to the development of the fuel and energy sector and for many years of diligent service.

The awards were presented on 19 December 2025 by CPC General Director Nikolay Gorban.

Pavel Moskatov has worked in the oil and gas industry for 31 years, including 24 years with the Caspian Pipeline Consortium. Before joining CPC, he built his career at Transneft, progressing from an Instrumentation and Automation Technician to Head of the Automated Process Control Systems (APCS) Service.

Before being appointed Chief Engineer for the Western Region, he worked at CPC as an I&C Technician, Shift Supervisor at PS Kropotkinskaya, Dispatcher at the Operation Control Centre, Deputy Manager of PS Kropotkinskaya, and Manager of PS 8.

Pavel Moskatov’s detailed knowledge of production processes along the 1,511 kilometre trunk pipeline from



Tengiz to Novorossiysk, his many years of experience ensuring the stable operation of oil transportation systems, and his hands on presence at critical station and line facilities contribute significantly to the reliability of CPC’s pipeline system.

Sergey Potryasov has 43 years of experience in the oil and gas industry and has worked for the Caspian Pipeline Consortium for 12 years.

Before taking charge of CPC’s key Western Region Operations Division, Sergey Aleksandrovich—a second generation oil worker from Tatarstan—worked as a Well Logging Supervisor, Senior Production Engineer, Oilfield Manager, Head of the Central Engineering and Technical Service, Chief Engineer of a production division, Production Director, and Chief Engineer / First Deputy General Director at a number of oil companies, including Komiyeft, LUKOIL Komi and RUSVIETPETRO. He also served as Deputy Minister of Industry and Energy of the Komi Republic.

His extensive leadership experience and ability to inspire teams by personal example enable Sergey Potryasov to tackle tasks of any complexity, while the operations team under his leadership has ranked among the top performers and set the benchmark for CPC’s structural units almost every year.



On 27 November 2025, a delegation of CPC shareholders, managers and specialists visited the Drydocks World Dubai shipyard in the UAE.

In January 2024, CPC signed a contract with the company for the fabrication of two single point moorings (SPMs).

The delegation toured the shipyard’s production facilities and the construction area where the SPMs are being built.

The manufacturer reported that fabrication is nearing completion: at the time of the visit, work was under way to route and seal cabling inside the buoy deckhouses and to fit and weld manhole covers.

Testing of piping on the end manifolds of the subsea pipeline system was at the final stage, and painting of these assemblies was in progress.

The two new SPMs will replace CPC 1 and CPC 2, which have been in operation since 2001. As part of the SPM replacement program, twelve caisson anchors were installed for the two new SPMs in September 2025. These holding structures were delivered to Novorossiysk from the UAE on three vessels and placed in their design positions on the seabed within the CPC Marine Terminal area.

Delivery and installation of the two new SPMs are scheduled for 2026.



CPC single point moorings set for upgrade



Cooperation agreement

On 9 December 2025, a cooperation agreement was signed between CPC K JSC and UKAZ JSC at the Government House of the Republic of Kazakhstan in Astana. In the presence of First Deputy Prime Minister of the Republic of Kazakhstan Roman Sklyar, the document was signed by Caspian Pipeline Consortium General Director Nikolay Gorban and Ust Kamenogorsk Valve Plant General Director Aleksandr Budris.

It was noted at the ceremony that cooperation between the two major industrial enterprises is of great importance for Kazakhstan: both are expanding their activities in the country in line with the strategic priorities set by President Kassym Jomart Tokayev and the Government of the Republic of Kazakhstan, as well as with the Law of the Republic of Kazakhstan “On Industrial Policy” and the 2023–2029 Development Concept for the Manufacturing Industry.

The agreement aims to expand cooperation in the context of import substitution for industrial equipment, the development of local manufacturing, the maintenance and upgrading of valves, pump units and electric motors, and the implementation of various R&D and technology programs.

The parties also agreed to strengthen collaboration on introducing advanced solutions into products manufactured by UKAZ JSC.

Signing the agreement lays the groundwork for increasing the share of Kazakhstan made equipment in trunk pipeline infrastructure, reducing the oil and gas sector’s dependence on imports, and creating new high tech jobs in Kazakhstan.

Ust Kamenogorsk Valve Plant is the largest producer of industrial pipeline valves in Kazakhstan and across the CIS.

Its products are supplied both to existing and to newly built oil and gas production facilities, as well as to crude oil and petroleum products transportation infrastructure.

Best Shift

On 18 December 2025, an awards ceremony for the Best Shift at the CPC Marine Terminal was held at the Kuban Cultural Centre in Novorossiysk. Initiated by the Marine Terminal Operations Division, the Best Shift contest was launched in 2023 and was held for the third time in 2025.

The 2025 Best Shift, led by Supervisor Andrey Brekhov, received the challenge banner and commemorative pennants. As part of the contest, performance was assessed against criteria such as the number of technical initiatives to improve ergonomics; the number of timely measures taken to eliminate non conformities in the areas of health, safety and environment (HSE); the number of HSE related improvement proposals submitted via the observation card system; the number of completed observation cards; and the number of implemented leadership practices.

The winning team included OPPS Operators Dmitry Dmitriyev and Aleksey Machulin, Process Installation Operators Anton Lyashko and Sergey Muravkin, Instrumentation Engineer Kirill Kharlamov, Instrumentation Technicians Pavel Mezentsev and Vyacheslav Terentyev, and Electrical Installations Maintenance Andrey Nevroda, Sergey Romanov and Aleksandr Sidorevich.



In the individual rankings, OPPS Operator Ibragim Osmanov won in the categories “Role Model: One for All” and “Inspirer: Motivator”. He shared the “Inspirer: Motivator” award with Electrical Installations Maintenance Konstantin Chernikov. Winners in the “Guide: Practical Approach” category were Process Installation Operator Anton Lyashko and Electrical Installations Maintenance Sergey Romanov.

In the “Driver: Idea Generator” category, the winners were OPPS Operator Andrey Babaevsky, Electrical Installations Maintenance Oleg Burkin and Process Installation Operator Ivan Sergeev.

“The strategic goal of the Best Shift contest is to identify and support leaders who will ultimately become a valuable human resource for CPC in promoting ideas and solutions to improve production safety management”, said Alexey Pelipenko, Head of Marine Terminal Operations Division, at the awards ceremony.

A New Dress Code for the Pipeline

Every industrial facility, like every person, needs reliable personal protective equipment. For a steel pipeline constantly exposed to moisture, sunlight and temperature swings, that PPE takes the form of a protective coating. In 2025, CPC completed a major project to repaint all process pipelines at its pump stations in the Western Region

“All of this is down to our southern climate”, explains Pavel Moskatov, Chief Engineer for Operation and Maintenance in CPC’s Western Region, at CPC’s Krasnodar office. “At the pipe entry into the ground, the protective sleeve formed a sort of ‘cup’. Because of the temperature difference between the crude inside and the humid air outside, condensate constantly accumulated there, and even with cathodic protection in place this led to pipeline corrosion”.

Leading specialists from ISR Transneft LLC were brought in to analyze the situation. They concluded that the protective structure was redundant: crude in the pipeline would not freeze even in winter, and without the sandwich it would be many times easier to monitor the condition of the steel. It is worth noting that even without any heating, friction in the pipeline raises the crude temperature by two to three degrees after each pump station.

Based on the study, a large scale project was developed and approved: to completely remove insulation from all above ground process pipelines at five pump stations in the region and switch to protection using modern paint coatings.

“This was a renovation in the full sense of the word”, says Pavel Moskatov. “We didn’t just need to repaint the pipelines, we had to provide a solid technical justification for removing the insulation. On top of that, we had to obtain all the necessary approvals and develop a new pipeline protection technology”.

The pilot site for the project in CPC’s Western Region was PS Kropotkinskaya, the largest CPC pump station in the Russian Federation. In 2023, contractor TsentTest, which already had experience working both with CPC and with CPC’s major state shareholder Transneft, began execution.

The task was a demanding one: to carry out the work on a live facility without



All work was carried out without shutting the pump stations down or interrupting pumping operations

disrupting operations or damaging any operating equipment. Where necessary, the contractor removed not only the insulation but also the concrete aprons in order to reach the “cup” section buried 50 cm below grade.

Initially, water jetting was considered as the method for cleaning the pipes. However, tests showed that despite its obvious convenience this approach led to flash rusting.

For many years, some of the process pipelines at CPC stations were fitted with thermal insulation in the form of a mineral wool “sandwich” covered by a metal jacket. Operating experience revealed a number of drawbacks with this design. The appearance of the jacket inevitably deteriorated after in line inspection and maintenance. More importantly, the inspections showed that on some pipeline sections this type of protection could actually create conditions for corrosion to develop.




The team therefore decided to use grit blasting. This traditional method has its own specifics. All sensitive equipment had to be thoroughly shielded from the abrasive stream: pressure gauges, instruments, valve stems, nameplates, and so on. Pressure in the sections of pipeline allocated for work was also closely monitored and was not allowed to exceed 2.5 MPa.

For grit blasting the contractor used heavy duty equipment: two compressors (main and standby) and professional blasting machines. Consumption of quartz sand was measured in tens of cubic metres. Demolition equipment was also required: jackhammers for concrete and dump trucks to haul away waste. The work was performed by contractor personnel in full PPE – from blasting suits to painters’ coveralls.



FIGURES

 **5 pump stations**

 Coating replaced on **8,100 m** of process pipelines

 **24 specialists** involved

 **12 units** of specialized equipment

 **350 m³** of quartz sand

 **4,400 l** of primer

 **8,600 l** of paint

Cleaned pipelines were painted using airless spraying. High pressure spray guns supplied from large volume paint containers were used. First a primer coat was applied, followed by a top coat; a two component polyurethane paint, Makspol, was selected for the finish. Whenever possible, work was scheduled for the warmer months in order to comply with the paint manufacturer’s requirements.

“The experience gained at Kropotkinskaya was invaluable for the entire project”, says Pavel Moskatov. “At the next stage, in 2024–2025, we moved on to the remaining Western Region stations – PS 4, PS 5, PS 7 and PS 8 – now with two crews instead of one and a clear understanding of the entire process. At each station, roughly one kilometre of pipelines were stripped to bare metal and repainted”.

At PS 7, the CPC Panorama team was welcomed by Pump Station Manager Vitaly Motrenko. Like the rest of the team, he takes pride in the station’s new, modern look. As elsewhere, painting at “number seven” was scheduled to fit around process operating modes and planned maintenance.

“For example, if the I&C team had work scheduled the following week on the drain tank area, we would ask the contractor to start there”, explains Vitaly Motrenko.



“Once that area was finished, they moved on. The contractor involved in the project had its own logistics priorities – choosing locations for compressors, storage areas for sand bags and containers of primer and paint. We always tried to accommodate them and avoid creating obstacles to their work”.

The familiar, slightly battered insulation has given way to neat white pipelines. Beyond the new aesthetics, PS operating personnel have gained a much better visual inspection capability. Now, during their rounds, specialists can immediately see the condition of the pipes, flanged joints and valves. The two component polyurethane paint, purchased in bulk specifically for this project, has a five year warranty, while the design service life of the protective coating is ten years. There is no need for seasonal repainting; at the same time, local touch ups are provided for after maintenance or modification work.

Pipeline heat tracing capability has been retained through the installation of quick release insulated covers

At critical locations – such as pressure transmitters and equipment protection enclosures where temperature control is important because of the risk of crude thickening – the project provides a special solution. Instead of the old insulation, quick release insulated covers with heating cables have been installed to ensure correct operation of these assemblies during the winter.

The successful upgrade of protective coatings on process pipelines at CPC’s Western Region pump stations is a clear example of a systematic approach to operating a trunk oil pipeline. The project not only solved a technical problem, but also delivered a long term economic benefit, enhanced safety and even changed the appearance of industrial facilities – demonstrating that on a modern site practicality and a tidy appearance can go hand in hand.



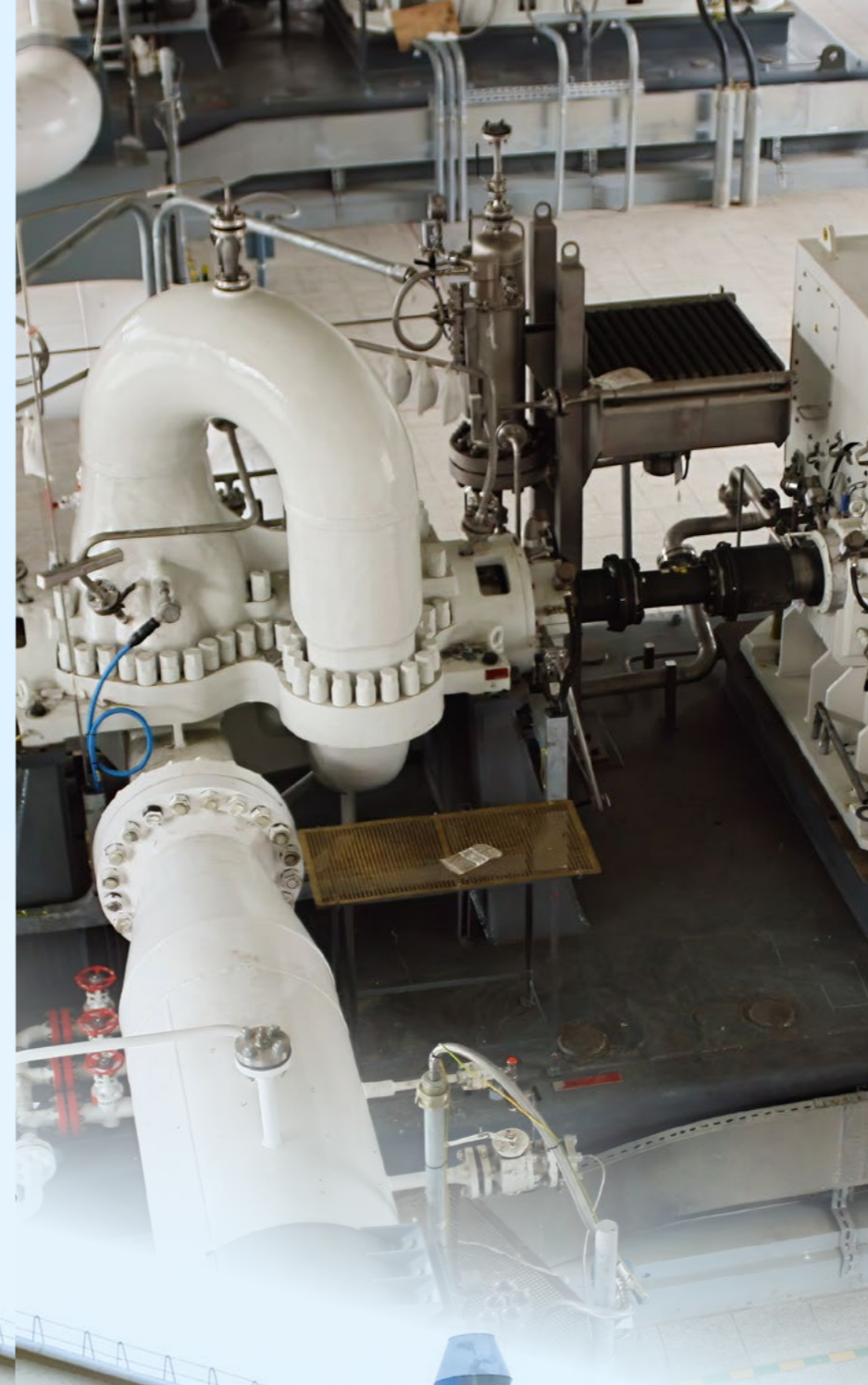
The Heart of the Station

At the end of 2025 and start of 2026, PS 8 underwent a scheduled medium overhaul of all four main pump units (MPUs) – a large scale operation that a more flamboyant journalist might be tempted to call “cardiological surgery”. In fact, the analogy is not quite accurate: it is closer to a regular health check up

line – the low pressure zone – and throws it outward from the center to the periphery with its blades. The resulting centrifugal force is great enough to overcome the hydraulic resistance of the entire pipeline section and push the fluid into the discharge line, where a high pressure zone is created. The volume of fluid pumped per unit of time is referred to by specialists as flow rate, or throughput.

In trunk pipeline operations, several MPUs at the same station can be connected in different ways. In a series configuration, the units are connected one after another, and each unit adds its own increment of pressure while handling the full flow – the total crude throughput mentioned above.

Main pump units are the most critical equipment at any pump station. An MPU consists of two interacting parts. The first is a powerful high voltage electric motor that delivers high speed, high torque rotation. The second is the pump, or centrifugal compressor, housed in a sealed casing that contains an impeller with specially contoured blades. The MPU operates on the principle of centrifugal force. Driven by the motor, the impeller draws crude oil in through the suction



This is the most common configuration on Russian trunk oil pipelines. At CPC, series connection of MPUs is used at the very first station in the system, the head pump station (PS) Tengiz.

With a parallel configuration, all main pump units operate independently, taking crude from a common header and discharging it onward. Each unit develops the full required pressure, but handles only its share of the total flow. This is the configuration used at all 14 CPC pump stations.

Repairs on schedule

Like all assets and equipment on the CPC pipeline, main pump units require regular maintenance and repairs. At CPC these activities follow a strict schedule: semi annual services (TM 6) and annual services (TM 12) are performed. During TM 12, for example, the sliding bearings of the motors are inspected and, if necessary, replaced, and the temperature sensors on the bearings are calibrated. These bearing assemblies are among the most heavily loaded and subject to friction.

Main pump – centrifugal pump (external view) with electric drive (right)



Centrifugal pump
disassembled

FIGURES

A medium overhaul of an MPU
is required after every

24,000
hours of operation

Any comparison with servicing a car disappears as soon as you move from MPU maintenance to MPU repairs. In the automotive world, repairs usually mean that something has already failed, whereas at a CPC pump station repairs are scheduled in advance.

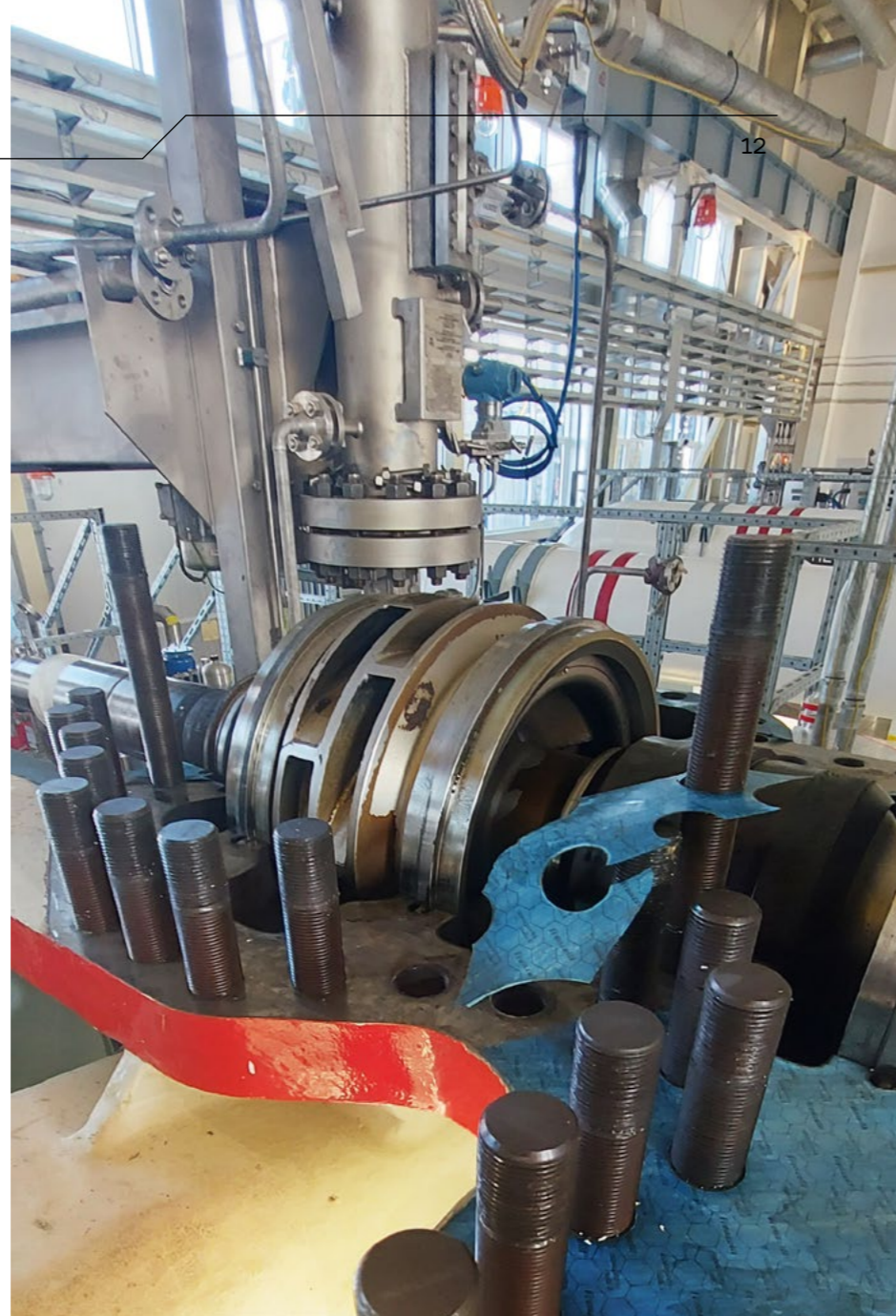
“An MPU requires a medium overhaul after every 24,000 hours of operation”, explains Andrey Kozin, Deputy Chief Engineer for Pump Station Maintenance in CPC’s Western Region. “With average annual operation of about 8,000 hours, this means a medium overhaul roughly every three years. The previous medium overhauls on the same MPUs at PS 8 were carried out in 2021”.

Preparing for a repair campaign takes meticulous planning. The unit shutdown has to be agreed with the Control Center so as not to disrupt the crude transportation schedule. At the end of 2025, for example, medium overhauls were carried out on two main pump units – C and D – at PS 8. Work on unit B had already been performed in January 2025 in order to ensure that the station could maintain the operating modes specified by dispatchers for crude throughput along the pipeline.

Repair planning starts several months in advance. Spare parts availability is checked, contractor readiness is confirmed, and the time window for the shutdown is calculated.

“We always try to minimize downtime so that dispatchers retain the option to

NDT inspectors performing
ultrasonic and dye penetrant
testing of the rotor



use a standby unit if needed”, stresses Andrey Kozin.

To use the shutdown time as efficiently as possible, additional worksopes are tied in with the MPU repairs. Electricians service cable lines, high voltage switchgear and the motors themselves. I&C specialists carry out maintenance and calibration of sensors. These are just examples; in practice there are more such associated activities.

“A medium overhaul means a full shutdown and isolation of the unit, complete disassembly, detailed defect inspection and replacement of worn components. That way we eliminate the risk of potential MPU failures in the future”, says Vitaly Vorobyev, Mechanical Engineer at PS 8.

The unit is taken out of operation, isolated from the mainline by block valves, and additionally fitted with blinds, effectively creating double isolation. Once the crude oil has been drained from the unit and instruments have been removed, and only after personnel have confirmed that all subsequent steps are safe, the contractor’s specialists – under the supervision of CPC’s operating personnel – begin dismantling the pumps.

“They open the casing and remove the rotor – the shaft with the impellers”, explains PS 8 Manager Sergey Moroz. “Then NDT inspectors use portable instruments to carry out ultrasonic and dye penetrant testing. The instrument processes the data and produces a report, which becomes the formal record of the inspection. This history of the work performed is needed to analyze statistics and equipment behavior. We assess the condition of bearings and seals, and replace assemblies where necessary”.

Repair quality is ensured by highly qualified specialists from contractor DS Controls, many of whom have hands on experience with the pump manufacturer, Flowserve. Safety is the absolute priority in this type of work.

“All work is carried out in coordination with the shift supervisor and station

manager, and is covered by a work permit”, notes PS 8 Shift Supervisor Ivan Andreyev. “Required interlocks are installed, a fire crew with a fire engine is on standby, and only intrinsically safe tools are used because these jobs are classified as gas hazardous. Day to day control includes evening reports from the contractor on work completed and weekly summary reports”.

Once repairs are finished, the unit is reassembled, blinds are removed, gas air mixture is displaced, and the system is refilled with crude oil. Before startup, all joints are checked for tightness.

The pump is then run in on line, while its parameters – vibration, bearing temperatures, pressure – are closely monitored using vibration monitoring systems and SCADA.

Planned maintenance of CPC’s main pumps is not just a box ticking exercise. It is a comprehensive system based on accurate diagnostics, the work of highly skilled specialists, rigorous adherence to safety requirements and continuous process improvement. This approach ensures the reliable, uninterrupted operation of the “heart” of the pipeline – the main pump units.

In addition to regular servicing and scheduled equipment repairs, CPC stations also focus on improving infrastructure. At PS 8, for example, 2025 saw a joint initiative by the Operations Service and contractors to upgrade the irrigation system: about 500 m of additional water lines were installed, enabling automated watering of the station’s third terrace.

“The station is located on a hillside and has five terraced levels. Right now we are watering three levels, and in the future we plan to cover all five”, says Sergey Moroz. “The total area of green spaces at the station is 7,300 m², including 90 trees and 150 coniferous shrubs”.

To further enhance personnel safety, PS employees are proactively implementing improvements: anti slip tape is installed on walkways, and additional guardrails are mounted. Every such proposal is logged in the observation card system and promptly implemented.



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Cross-Border Inspection

In 2025, Transneft Diaskan LLC conducted an in line inspection (ILI) of a 189 kilometre long section of the Tengiz – Novorossiysk pipeline spanning Russia and Kazakhstan. The results not only confirm the effectiveness of the current mainline operating strategy, but also demonstrate improved reliability indicators for the CPC pipeline system



The comprehensive inspection of 189 km of pipeline in the border zone between Kazakhstan and Russia was carried out from July to September 2025. On the first section, from PS Kurmangazy to the state border, 62 km of 1,020 mm diameter pipeline were inspected. Driven through the line by product flow, four in line inspection tools examined 195,671 m² of internal surface in sequence. The Operations Department noted a positive indicator of the pipeline's current condition: none of the identified defects require immediate remedial action. Based on strength and durability calculations (in accordance with regulatory document RD 23.040.00 KTN 011 16), 14 repairs are scheduled for 2025–2026, with the remaining 23 planned for 2027–2034.

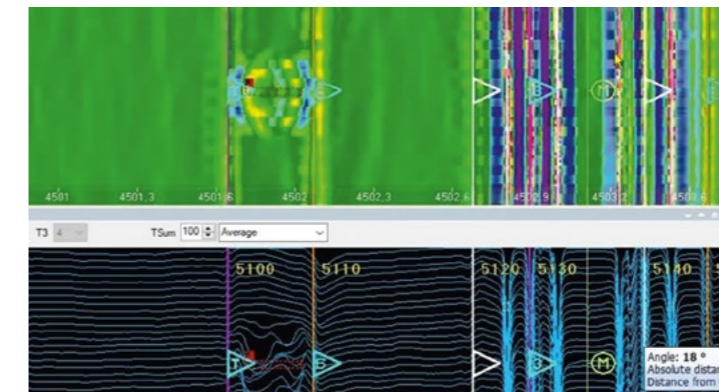
On the second, 127 kilometre section from the border to PS Astrakhanskaya, the inspection tools examined 400,150 m² of internal surface. No critical defects requiring immediate repair were found here either. According to the inspection report, 69 repairs are required in 2026, with a further 773 planned for 2027–2034. The pipeline section is in satisfactory condition and can continue to be operated safely, provided that scheduled repairs are carried out on time. Across both sections combined, the inspection tools examined 600,000 m² of internal surface. To put this in perspective: the area covered – to an accuracy of tenths of a millimetre – is equivalent to 148 football pitches. The ILI was carried out in accordance with a detailed plan developed by the Mainline Operations and Emergency Response Division, taking into account pipeline operating modes and coordination between

Pig receiver at PS Astrakhanskaya



the dispatch service in Novorossiysk, East Region specialists in Atyrau, Central Region specialists in Astrakhan, and mainline maintenance crews of contractor organizations KazTransOil JSC and STARSTROY LLC. The tools were launched after the pipeline section had been switched to the pumping mode required for ILI.

Above ground tracking of the tools was carried out by emergency response units, with tool passage through checkpoints recorded using low frequency locators and a dedicated marker system. Once a tool's approach to the cleaning and diagnostics pig receiver was confirmed, the pipeline operating mode was switched to ensure safe tool reception. The process was remotely monitored via SCADA sensor readings.



Magnetic flaw detection sensors



ILI is a set of activities using various types of specialised in line inspection tools that provide information on defects, weld condition, pipeline features and its routing. The main objectives of ILI are to detect defects in pipe metal and welds, pipeline geometry anomalies, identify defect types and determine their dimensions and locations, assess fitness for continued safe operation, and calculate the remaining service life of the mainline.

Strategic partner

Since the very beginning of CPC's pipeline system operations, close attention has been paid to monitoring the technical condition of the mainline. The Tengiz – Atyrau section (commissioned in 2012–2014) underwent comprehensive inspection using ultrasonic and magnetic tools in 2016, 2019 and 2023. The section from PS Atyrau to PS Astrakhanskaya was inspected using various types of tools in 2001, 2003, 2006, 2010, 2015, 2019 and 2023. The mainline from PS Astrakhanskaya to PS Komsomolskaya was inspected in 2003, 2009, 2010, 2014, 2015, 2016, 2018 and 2023; the section from PS Komsomolskaya to PS 4 in 2002, 2003, 2008, 2012, 2014, 2016, 2017 and 2022. The section from PS 4 to PS Kropotkinskaya underwent in line inspection in 2002, 2003, 2008, 2012, 2016, 2017 and 2022, and the section from PS Kropotkinskaya

Regulatory framework

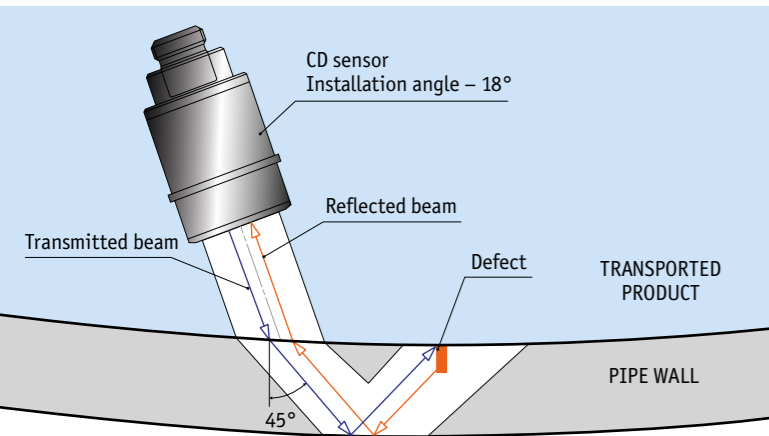
Periodic ILI is governed by industrial safety legislation. The CPC pipeline system is classified as a Hazardous Production Facility (HPF), Class 1, which demands maximum reliability and systematic monitoring. The requirement to carry out diagnostics within established timeframes is set out in Federal Law No. 116 FZ of 21 July 1997 "On the Industrial Safety of Hazardous Production Facilities".

The high reliability requirements for all elements of the pipeline system are driven in part by the design characteristics of the Tengiz – Novorossiysk pipeline: there are no loopings, no backup strings, and no alternative reliable and cost effective oil transportation corridors. At CPC, in line inspection is conducted at least once every four to five years, enabling a detailed assessment of the pipeline's technical condition, early detection of defects, repair planning, and completion of industrial safety expert review.

Diagnostic data visualisation in the QDR software

Transneft Diaskan JSC testing ground





Operating principle of the CD method (ultrasonic for crack detection)

to the Marine Terminal in 2002, 2003, 2009, 2012, 2017 and 2022.

Since 2015, in line inspection of the Tengiz – Novorossiysk pipeline has been carried out by Transneft Diaskan JSC, a subsidiary of Transneft PJSC. Founded in 1991 in Lukhovitsy, Moscow Oblast, the company holds a leading position in the ILI sector in Russia and successfully delivers the full range of tasks: gathering and evaluating information on pipeline technical condition, determining safe operating modes, issuing conclusions on the need for repairs, while providing methodological, regulatory and technical support. In 2025 alone, Transneft Diaskan JSC conducted in line inspection of more than 28,200 km of main oil pipelines across Russia.

CPC's strategic partnership with Transneft Diaskan JSC enables the Consortium not only to apply innovative inspection methods, but also to develop the competencies of its engineering and technical personnel in this area, use new repair technologies, and deploy new digital tools for data processing and interpretation. In 2026, training for specialists from CPC structural divisions is planned at the Transneft Diaskan JSC base in Lukhovitsy.

Evolution of inspection methods

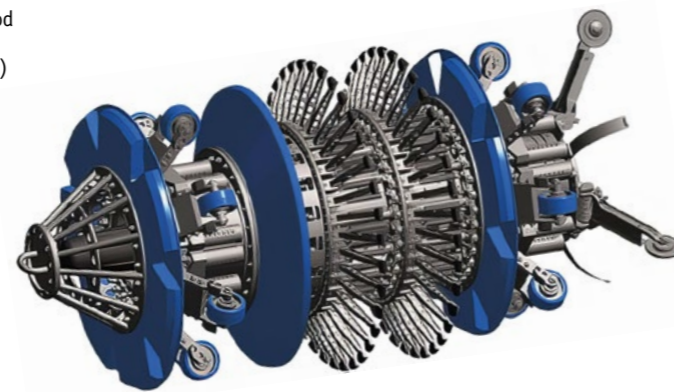
Today, the resolution of the diagnostic tools used at CPC facilities matches the highest level of global technology and allows defects as small as 0.1 mm to be detected. In wall defects are reliably identified even at relatively high tool travel speeds. Errors caused by variations in metal structure have been reduced to a minimum.

Prior to 2019, the inspection system comprised three main types of tools: a geometry tool for detecting geometric anomalies (dents, local bore reductions), an ultrasonic WM tool for measuring wall thickness and metal loss, and a magnetic MFL

tool for monitoring the condition of welded attachments and structures.

In 2019, the inspection tool suite was upgraded and now comprises four tools. The PRN geometry tool was replaced by the PRN02. Unlike its predecessor, the new tool not only records the pipeline's geometry but also tracks changes in its spatial position, identifying sections with elevated stress and strain. This information is critical for detecting sections where fatigue cracks may develop under high cycle loading.

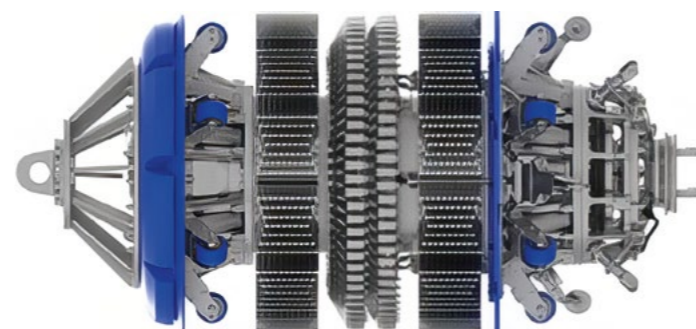
The MFL (magnetic flux leakage) tool identifies metal loss defects, defects and imperfections in girth and spiral welds, and



PRN02 geometry pig

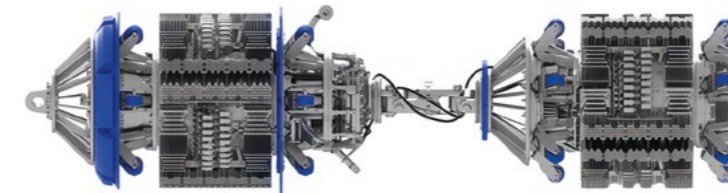
cross sectional deformations. The tool records design features of valves, bends, tees and other fittings and can also detect foreign metallic objects attached to the pipeline or located in its immediate vicinity.

The TFI (transverse field inspection) tool detects longitudinally oriented defects: fatigue cracks, manufacturing defects in longitudinal welds, and metal loss defects elongated along the pipe axis.



MFL magnetic flux detector

The DVU ultrasonic tool with radial and axial ultrasonic wave input has three times more sensors than the 2023 model. It is designed to detect wall defects oriented at any angle to the pipe axis. The first WM module measures



TFI magnetic flux detector

pipe wall thickness and detects metal loss on external and internal surfaces, laminations, inclusions, and cross sectional deformations. The second CD module with two ultrasonic beam angles identifies fatigue cracks and defects in longitudinal welds.

During the 2025 inspection, the DVU tools determined the shape and dimensions of detected defects and provided precise three dimensional coordinates relative to the pipeline axis and cross sectional circumference. Specialists then used dedicated software to process the data and calculate the defect growth rate based on analysis of previous inspections, recommending repair timelines taking into account loading in the defect zone.



DVU ultrasonic detector with WM and CD modules

It is important to note that the use of the DVU enabled the detection of defects that, with "traditional" tools such as MFL, TFI and WM, could have remained undetected due to complex geometry and location in weld zones.

Thus, CPC pipeline inspections today use four tools that together identify the full spectrum of possible defects – from major geometric anomalies to microcracks in weld joints.

Looking to the future

Comparison of the 2025 inspection data with previous results revealed a clear trend: a significant reduction in the number of newly identified corrosion defects and a slowdown in their growth rate. This indicates the effectiveness of measures to prevent and control corrosion on the mainline: the comprehensive protection system is delivering results.

It should be noted that the increase in the number of defects identified in 2025 compared to 2023 was attributable to the introduction of more advanced, high precision inspection tools, not to any deterioration in the pipeline's condition. This makes it possible to forecast pipeline condition and use less costly repair methods at an early stage of defect formation.

CPC will continue to maintain diagnostic monitoring at a level that ensures full coverage of all sections of the pipeline system, enabling continuous tracking of changes in the mainline's technical condition. In 2027, ILI of more than 1,200 km of the main oil pipeline is planned.



In 2026, two single point moorings (SPMs) at the CPC Marine Terminal will be replaced. This large-scale project will take out of operation the SPMs that have been used for crude oil loading since 2001



A Major Change

The CPC Marine Terminal operates three SPMs. Each unit is purpose-designed with due regard for seabed relief and is rated for the maximum storm conditions typical of the region. The SPMs are located 5 km offshore and are connected to the Marine Terminal's shore facilities by subsea pipelines.

According to specialists of CPC's Operations Department, the design documentation and fabrication of the new SPMs will certainly take into account the Consortium's operating experience with this type of equipment. The two new SPMs will have the same design as the third unit, which has been in service at the Marine Terminal since 2014.

Security of operations

To ensure safe operation, the new SPMs will feature an enclosed deckhouse on the buoy deck. This configuration allows all process equipment to be placed inside a protective envelope, shielding it from wind, seawater and icing. Ease of maintenance will be enhanced by upgraded lifting equipment, and the project provides for additional leak-detection and gas-detection sensors. In line with current industry standards and Russian legislation, structural elements will be reinforced and the autonomy of the electrical systems will be increased.

During project preparation, CPC experts evaluated the feasibility of equipping the SPMs with vapor recovery units, similar to those used on fixed shore berths at

marine terminals. These issues were reviewed in detail by CPC specialists and independent experts at the round-table discussion "Ecology in a Port City" held in Novorossiysk in April 2023. A vapor recovery unit sized for each SPM's throughput would have an extremely large weight and footprint. Its installation would require an offshore platform or a dedicated vessel, which is practically impossible for offshore loading operations far from shore.

Multi-stage quality control has been built into every phase of the project, from ordering materials from suppliers to integrated testing and final acceptance of the finished units from the manufacturer. What does multi stage mean in practice? In addition to the manufacturer's own QC, the equipment is inspected by an independent expert organization and by CPC's subject-

In detail:



matter specialists. The classification society also verifies compliance of the equipment with applicable standards and statutory requirements.

In the past, near shore sea areas have repeatedly become theaters of war. In addition, the seabed is naturally subject to shifting bottom sediments and water layers. For these reasons, the regulations of the Port of Novorossiysk and the Black Sea Fleet require that any work involving seabed contact be preceded by a mandatory program to survey and eliminate any residual mine threat. The same approach has been applied for the SPM replacement project. From October 2020 to August 2022, unexploded ordnance detection and disposal was carried out in the 628 hectare Marine Terminal area, defined by circles with a radius of 1,000 m centered on the locations of SPM 1 and SPM 2. The Black Sea Fleet Headquarters has issued a permit confirming that seabed-contact operations can proceed. Immediately before SPM replacement activities begin, an additional survey of the area is conducted to confirm there are no foreign objects in the work zones.

A specialized offshore contractor with sufficient experience will be engaged for the marine installation scope. The work will require transport barges, tugs, floating cranes, support vessels for diving operations, remotely operated vehicles (ROVs) and their support vessels.

The SPMs will be replaced sequentially, one unit at a time. Crude loading operations at the neighboring SPMs will not be suspended: all construction activities will take place outside their one kilometer marine security zones.

Masters of all vessels involved in the project will receive appropriate instructions. Vessels with dynamic positioning systems are planned to be used, eliminating uncontrolled movements. If necessary, following a risk assessment, additional standby tugs may be brought in to protect installation vessels against unintended drift.

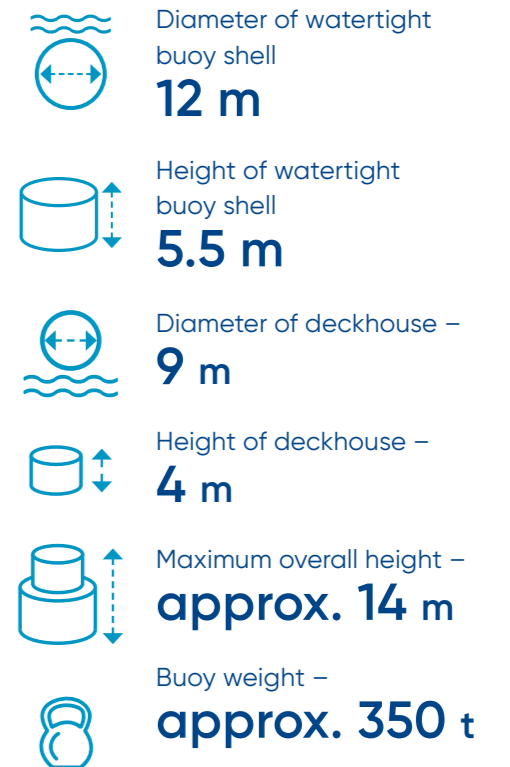
Design details

So what exactly are these SPMs whose replacement is so important for the CPC Marine Terminal? The special design of the units enables tankers under loading to weathervane freely around the buoy under the combined action of wind, currents and waves. This allows crude loading operations to continue in challenging weather conditions.

Each SPM consists of a floating buoy, an end manifold for the subsea pipelines, caisson anchors, anchor chains, and subsea and floating hoses. Position keeping of each SPM within its designated coordinates is provided by six anchors that were installed on the seabed in 2025 and are connected to the buoy by anchor chains. Each anchor weighs about 420 t, and the diameter of the high strength chain links is 92 mm.

A typical SPM comprises two main sections. The geostationary (fixed) section is secured to the seabed by six chains and caisson anchors. It is connected by flexible subsea hoses to the end manifold of the subsea pipeline

FIGURES



system, which consists of a piping network and block valves, measures approximately 14 by 12 m, weighs about 120 t and serves as the termination of the subsea pipeline (SP) running from shore. To control crude flow and ensure safe operation, the end manifold is equipped with a 42 inch ball valve at the tie in point with the subsea pipeline and two 24 inch ball valves at the tie in points with the subsea hoses.

The second, rotating section of the SPM allows the tanker to rotate around the buoy under adverse weather conditions and transfers crude oil to the tanker via floating hoses.

The subsea hoses on the new SPMs have an S shaped configuration with buoyancy elements attached along their length. This arrangement prevents hose damage due to buoy motions in storm conditions and reduces extreme wind and wave induced loads on the structural elements of the buoy and the end manifold.

Importantly, before each maintenance operation involving scheduled replacement of the floating hoses, the SPMs are thoroughly flushed to prevent any crude oil from entering the sea. To flush the SPM cargo system, CPC charters a tanker carrying about 2,000 m³ of seawater. The tanker moors to the SPM, connects via hoses, and uses its cargo pumps to transfer 2,000 m³ of water from one cargo tank through the SPM cargo system into another cargo tank. In this way the SPM is flushed and the crude in the SPM cargo system is displaced by seawater from the

tanker. Only after this procedure is completed can hose replacement work begin.

It is precisely the twin hose configuration—two subsea hoses, piping and then twin floating hoses starting from the end manifold—that enables the SPM cargo system to be looped for flushing. A system with a single hose, single pipeline and single floating hose would not allow such a flushing operation.

The buoy shell is a watertight welded steel structure of cylindrical shape. Structural strength is provided by external diagonal stiffeners. A protective “skirt” at the base of the shell prevents contact between the tanker hull and the SPM. Internally, the buoy is subdivided into watertight compartments to maintain buoyancy, including in a damaged condition. Depending on the design, the buoy may have six or nine such compartments. These watertight compartments also house special and auxiliary equipment used for SPM maintenance (winches with hooks and cables, spanners, an anchor chain angle indicator, lubrication pumps, etc.).

One of the key elements of the SPM is the dual path product swivel, which transfers crude oil from the fixed section to the rotating section. It consists of a piping system, a combined radial thrust bearing, and lubrication and sealing systems.

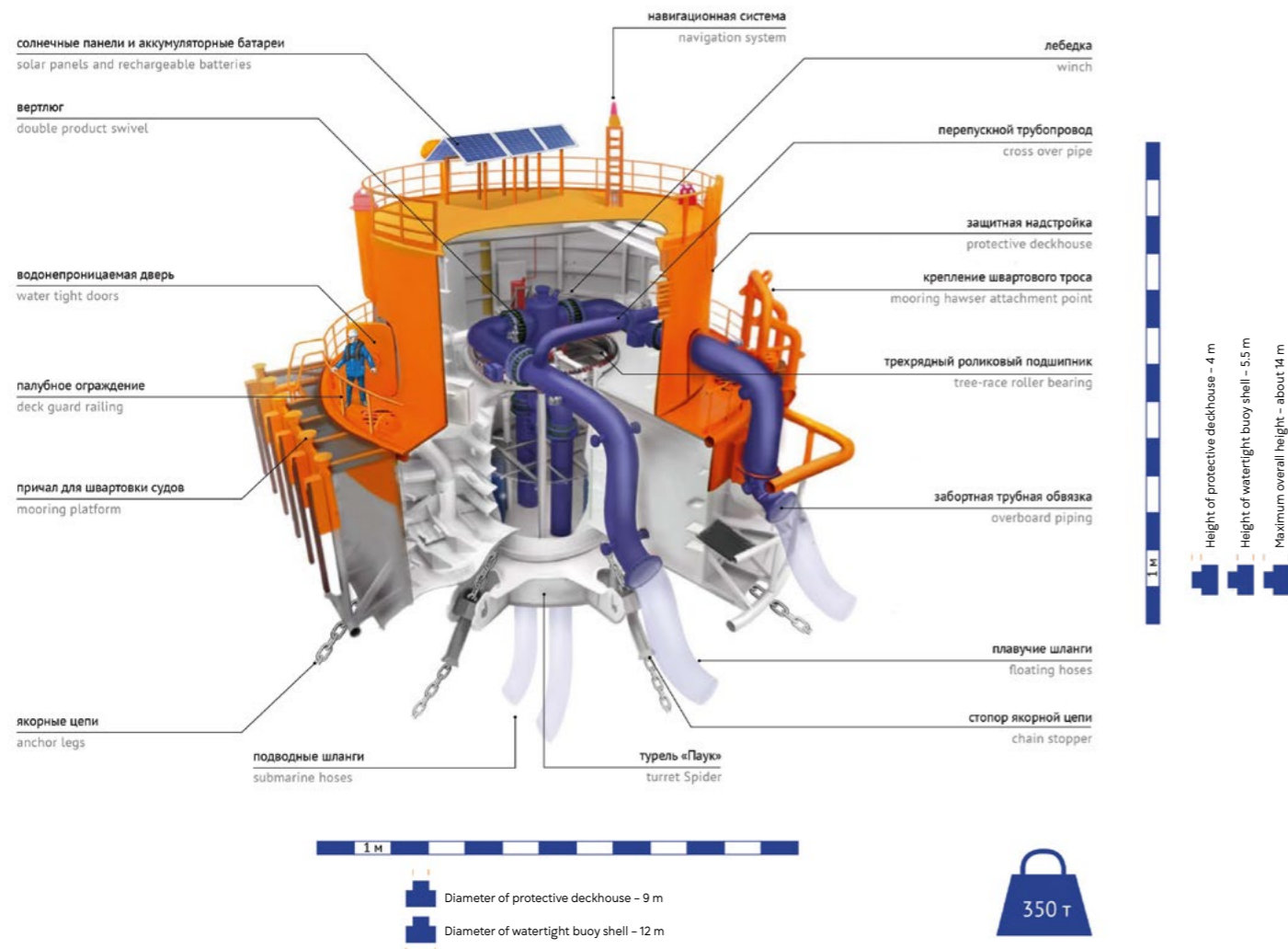
Corrosion protection of the SPM is provided by a three coat paint system and by cathodic protection. The latter consists of sacrificial anodes made from aluminum and zinc based alloys installed in the submerged zone.

Operating principle

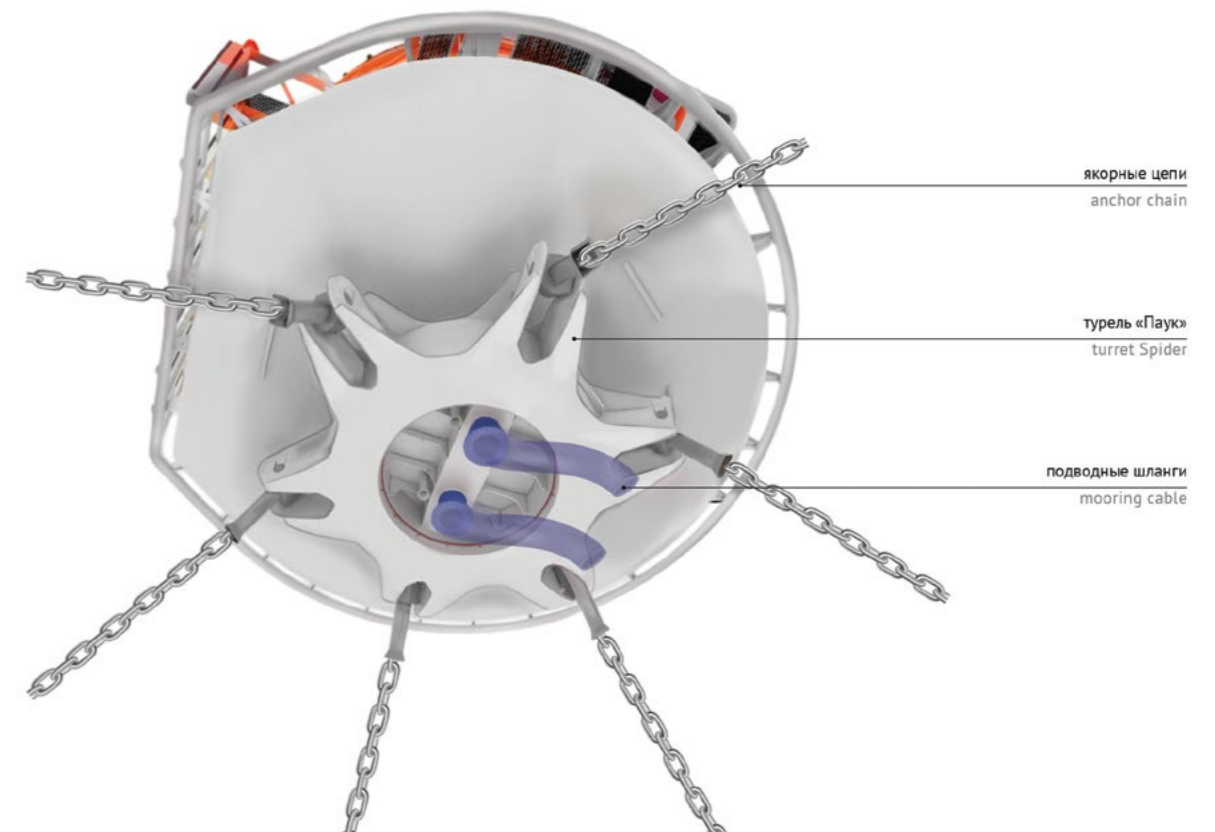
The fixed shell of the SPM buoy is connected to the rotating section by the main bearing. To provide berthing for workboats and service craft, six steel mooring bits are welded around the edge of the buoy deck.

The rotating section of the buoy is a welded steel structure that also carries process equipment. The upper deck of the rotating platform supports auxiliary systems such as navigation aids and wireless data transmission equipment that must rotate together with the moored

DESIGN OF A MODERN TURRET TYPE SPM



LOWER SECTION OF THE SPM WITH SUBSEA HOSES



tanker. Large mooring brackets, to which the mooring gear is attached, transmit mooring loads directly into the buoy structure. The deck also supports the mooring platform for support craft.

The main bearing has an overall diameter of 4.3 m and a weight of 4 t. It is protected from the aggressive marine environment by two watertight seals. The bearing is equipped with a lubrication system; the rollers are fully immersed in lubricant, which is periodically replenished via grease nipples spaced around the circumference.

The main bearing is a most important component of the SPM. A three row radial thrust roller bearing is used; it allows the rotating section of the buoy to turn freely relative to the fixed section and at the same time carries vertical loads and overturning moments.

Two flexible connectors (expansion joints) are installed between the product swivel and the buoy's piping. They compensate for any misalignment between the swivel and the rotating section piping and relieve possible stresses in the pipework caused by misalignment and thermal expansion.

The mooring platform for support vessels is designed to provide safe access to the rotating section of the buoy while preventing service craft from making contact with the buoy's protective skirt. A diver's platform is installed

where the buoy pipework connects to the floating hoses, making it easier for specialists to inspect and repair the floating hoses.

The SPM buoy is equipped with a 10 tonne cargo winch system used to tension the anchor chains to the required angle. The same winch is used when installing and replacing subsea hoses. The buoy is fitted with the standard set of navigation equipment for marine installations: an octagonal passive radar reflector and white navigation lights with a range of five nautical miles. Electrical systems on the buoy are powered by 12 volt batteries housed in dedicated compartments and charged from solar panels.

In conditions of reduced visibility, sound signals are provided by a foghorn controlled by a fog detector via the telemetry system; signals are transmitted over a range of up to half a nautical mile. The navigation lights and foghorn are powered by batteries, while the communications and telemetry systems are supplied from solar panels.

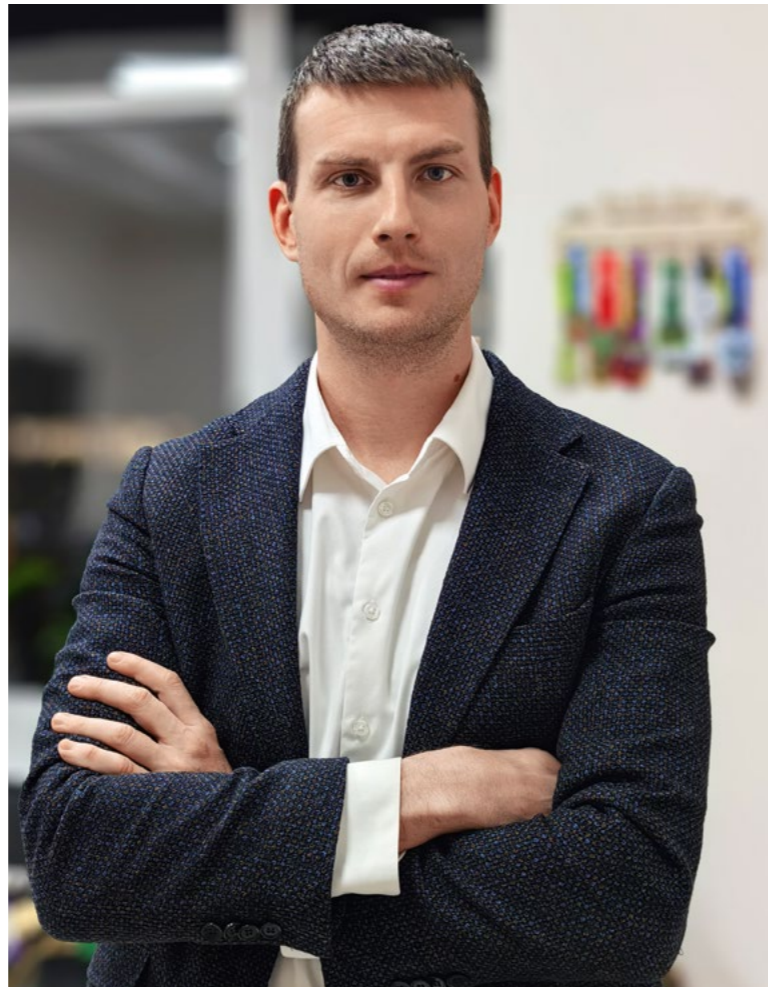
The new SPMs are scheduled to be commissioned within the next few months. With a more advanced design than the existing units, these single point moorings will enable CPC to continue fulfilling its core mission: reliable, uninterrupted delivery of crude from Caspian oil fields to global markets.

AUTHOR

Pavel Kretov

From Production to Refining

Pavel Kalashnikov, Candidate of Technical Sciences and Vice-Rector for Research at the Gubkin Russian State University of Oil and Gas, tells CPC Panorama about new trends in science and education, virtual plants and Caspian ice ridges



Pavel Kirillovich, as the person responsible for the research sector, how much research does the country's leading oil and gas university currently carry out? How do you measure this volume?

◀ In broad terms, the easiest way is to measure it in money. We recently passed the “psychological threshold” of one billion roubles, adding 20% to the figure over two years. The university earns this revenue from contract research and government-funded fundamental science. We undertake design work, engineering surveys, laboratory calculations and so on. Gubkin University is an industry-focused university, so it is not surprising that 80% of our income comes from production companies.

Another way to gauge our research output is by the number of successful applications to the Russian Science Foundation, which awards government-funded grants. Over the past five years, 260 applications out of 16,000 in the oil and gas field have been approved, nine of which are ours. By this measure we are in the top third of participating organisations, but we have room to grow.

Regular government funding is provided through youth laboratories. We currently have three, and we plan to double that number.

Among Gubkin University's recent achievements is winning the Government of the Russian Federation Prize in Science and Technology. All eight of our university's academic journals, which publish the main results of research by our own and industry specialists, have been included in the Unified State Register of Scientific Publications – the “White List”.

We see further opportunities to improve our research performance through consolidating the potential of different departments in our strongest areas, in order to meet all national needs.

▶ **Gubkin University is one of the participants in the Priority-2030 academic leadership programme. As part of this programme, the university prepares recommendations for developing a network of testing centres and industrial testing grounds for oil and gas equipment, instruments and materials, and also has built a project portfolio covering design, scientific and technical support, technical diagnostics and industrial safety assessments, including using the HAZOP methodology. To what extent is this activity focused on oil pipeline transportation?**

◀ We participated in the core part of the Priority-2030 academic leadership programme until 2023. In 2024, we were included in the list of 38 universities that train engineers and develop technologies to support technological leadership. Today the country graduates



Gubkin Russian State University of Oil and Gas, Internet, Information Resources Department

systems for quite some time. Have these tools reached their limits, or are there breakthrough technologies ahead?

◀ In-line inspection tools have come a long way. Geometry tools, ultrasonic and magnetic flaw detectors have become more effective. Combined tools have appeared, bringing together several types of inspection in a single body. Developers have made strong progress on size, power supply, and sensor configurations. As computing power in the devices grows, we need to move towards integrating AI. With AI, as the tool moves along a pipeline section, it will make its own decisions, and instead of recording everything

We need to move towards integrating artificial intelligence.

three times fewer engineers than people with humanities degrees, and this trend needs to be corrected. As part of the university programme developed through to 2036, we are working both on developing engineering education and on involving young people in research. As for the areas you mentioned – HAZOP, scientific and technical support, technical diagnostics, industrial safety assessment – we have never stopped working on these. This is our day-to-day work and one of our core competencies. All of this is used in pipeline operations. We have our closest ties with Gazprom PJSC.

▶ **You are a qualified engineer in the design, construction and operation of oil and gas pipelines and storage facilities. Your early research focused on cleaning devices and mathematical modelling of the movement of in-line inspection tools through pipes. Yet your current field of scientific activity is offshore field development technologies. How interconnected are these areas?**

◀ The connection is straightforward. I graduated from the department of design and operation of oil and gas storage facilities and pipelines. I then continued my PhD research at the Faculty of Engineering Mechanics, in the department of computer-aided design of oil and gas industry structures. In both places I was dealing with design issues. As for diagnostic tools, their use in mainline and offshore pipelines is fundamentally the same: in both cases, the tools operate inside the pipeline and are largely shielded from the external environment.

▶ **Both in-line inspection tools and, even more so, cleaning devices have been used in pipeline transportation**



Gubkin Russian State University of Oil and Gas, Internet, Information Resources Department

The strategic goals of Gubkin University are developing engineering education and involving young people in research



Gubkin Russian State University of Oil and Gas, Internet, Information Resources Department



Gubkin Russian State University of Oil and Gas, Internet Information Resources Department

indiscriminately at the same quality, it will analyse data in real time and independently select the set of sensors most effective for that particular case and the degree of detail required.

► **One of your works examines the use of renewable energy sources for operating offshore platforms. How effective are renewables for offshore oil terminals, particularly in the Black Sea?**

◄ In 2013–2014, together with colleagues from the National Research Moscow State University of Civil Engineering, I studied the use of renewable energy sources for offshore platforms, single point moorings and so on. I looked at wind, solar and wave energy. I came to the conclusion that all of this is still uneconomical. When discussing the effectiveness of renewables, one must allow for the current level of technology development, periods of peak demand, the unpredictability and instability of natural factors, and the high cost of batteries containing rare-earth metals. And it does seem odd – given all these difficulties – to install renewable energy equipment on an offshore platform while flaring associated petroleum gas or reinjecting it back into the reservoir. That said, research must of course continue: what seems unsolvable today may well become feasible tomorrow.

► **Looking at the map, you can see that the CPC pipeline skirts the northern part of the Caspian Sea. Would it have been possible to “cut straight across”, laying the pipeline system along the seabed – then or now? There has long been talk of the Kuryk – Dyubendi oil pipeline project from Kazakhstan to Azerbaijan. Is its implementation possible? Could a pump station be installed on platforms in the middle of the Caspian Sea?**

What seems unsolvable today may well become feasible tomorrow.

◄ The problem with the Caspian Sea is the combination of shallow depths with ice formations that cause seabed scouring. In other words, ice ridges plough through the ground. Laying a pipeline in such conditions requires good burial depth, below the scouring level. There are examples of such projects. From the Yuri Korchagin offshore field, a 50-kilometre pipeline runs along the Caspian seabed to a single point mooring, from which crude is loaded onto tankers. Beyond that, everything comes down to economics. Building an underwater pipeline will cost at least three times more per kilometre than a land pipeline. And we are not talking about 50 km, but about 500. Add to this that no one builds pump stations in the middle of the sea.

► **You have participated in creating simulators and are a co-author of several computer programs. Please tell us about this work.**

◄ I have been involved in developing various simulators, which can broadly be divided into four types. Sometimes at the concept level, sometimes as a co-author and developer. The first, simplest type of simulator is designed for laboratory work. Previously these were mobile applications; now they are most often web-based interfaces. The programs simulate processes in physics, chemistry, theoretical mechanics and strength of materials.

The second type is VR simulators. For example, we created a virtual small-scale liquefied natural gas plant, an

offshore platform with various operational scenarios and training tasks, and other facilities.

The third type is an integrated hardware-and-software suite. In particular, we created one for learning to operate an ROV – a remotely operated underwater vehicle. In the oil industry, such vehicles are used, for instance, at coastal terminals to detect corrosion in underwater structures and to replace cathodic protection elements. Our simulator has everything needed to control an ROV: control panel, joystick, instruments and monitoring screens.

The fourth type is high-precision mathematical modelling systems. They make it possible to work through various tasks at very different stages, from production to refining.

► **In connection with advances in artificial intelligence, there is often discussion about the future of professions. Which ones in the oil and gas sector, especially oil pipeline transportation systems, will AI soon replace? To what extent is “synthetic intelligence” applicable in this field?**

◄ Preparing for this interview, I asked AI itself this question. I must say that I generally agree with its conclusions. Automation will reduce the need for process operators. It will not replace them completely, because the final decision will remain with a human being, but the number of workers in this profession in the industry will decrease. The same will happen with flaw-detection specialists: machines will take over basic analytical processes. And at the next stage, deeper interpretation of analytical data can also be automated.

The work of repair specialists will also be transformed. There will be more condition-based maintenance following monitoring results. On the other hand,



Gubkin University uses four types of simulators, including VR simulators



A VR simulator of an oil and gas facility enables personnel to practise actions in emergency situations, identify and eliminate industrial safety violations

the need for cybersecurity specialists will only increase. Protection of information channels will become critically important for ensuring technological processes.

► **The generation of students and the generation of teachers – how do they differ? What unites and what separates them in their attitude to life, mentality, ambitions and diligence in study?**

◄ Each year is different, and the conclusions can be quite contradictory. The general trend is this:

a decline in the basic preparation level of recent school graduates. I do not think the school alone is to blame; it is more a general decline in attitudes to work. When the time comes for students to decide on the field in which to apply their professional skills, we observe the same picture: they demand high pay immediately and are not prepared for monotonous work.

► **Have you had a chance to visit CPC facilities, the production sites of shareholder companies, or to work with Consortium specialists? What do you think of the Large Academic Auditorium, refurbished by CPC in 2018?**

◄ I have not had occasion to visit CPC facilities, unlike Transneft PJSC. After my third year I spent a whole month on practical training at PS Kstovo in Nizhny Novgorod Oblast. I give lectures periodically in the Large Academic Auditorium; it has good capacity, it is bright, and the equipment is excellent. And it has become very comfortable to hold events of various formats in the Gubkin University Open Lecture Hall, which CPC refurbished in 2020 with its charitable funds.

AUTHORS

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Frozen drive

As temperatures drop, road surface conditions have an ever greater impact on vehicle handling – and, ultimately, on the driver's actions. Whether it is gravel or sand, concrete or asphalt under the wheels, each surface calls for specific skills and constant attention. On a cool day in November, Nachin Private Security Company's training complex in Elista hosted its first defensive driving master class for employees of the organisation providing security at CPC facilities in Russia

According to statistics, two people are killed in road traffic accidents in Russia every hour. In 95 out of 100 cases, these accidents could have been prevented by taking the necessary precautions. Defensive driving skills help drivers anticipate and avoid potentially hazardous situations caused by adverse conditions, an incorrect choice of speed or following distance, an unprepared vehicle, or mistakes made by other road users.

The defensive driving master class in Elista was organised by the Physical Security Team of CPC's Corporate Security Division together with the

Consortium's Transportation Team and the management of Nachin PSC. Engineering and technical personnel from the contractor responsible for the safe operation of vehicles used to protect CPC facilities in Russia completed a classroom-based theory course and then practised their new skills on the training ground.

"Total mileage driven by the corporate vehicle fleet without accidents is one of CPC's key HSE indicators, alongside the number of man-hours worked without lost-time injuries", notes Grigoriy Senoedov, Head of Physical Security Team, CPC-R. "In addition, accident-free



Practical training on the outdoor training ground

Classroom theory at the training complex

driving on public roads reduces costs and reputational risks for the company. We believe it is essential for drivers in all contractor organisations operating vehicles to have defensive driving skills. Within our area of responsibility, we help develop these skills among drivers of the organisation that safeguards the Consortium's pipeline system facilities in Russia".

As part of the theory course, CPC's Transportation Team presented training materials on Defensive Driving. The videos were accompanied by discussion and analysis, taking into account the specific nature of Nachin PSC's security operations. Among other things, participants reviewed common driver errors in assessing and responding to unexpected traffic situations. Particular attention was paid to maintaining focus, monitoring changing road conditions, recognising hazards, anticipating the actions of other road users, and planning one's own actions to prevent accidents, vehicle damage, and harm to the driver and passengers.

"Our specialists also briefed our colleagues from Nachin PSC on defensive-driving techniques", underlined Gennady Shmelkov, Transportation Team Leader, CPC-R. "These techniques help drivers reduce the risk of accidents and help the company avoid costs associated with vehicle repair or replacement. As a result, our colleagues were able to see the 'physics' of vehicle motion for themselves, learn about potential risks behind the wheel, and understand the need to anticipate how traffic situations may develop so they can foresee and prevent risks while driving".

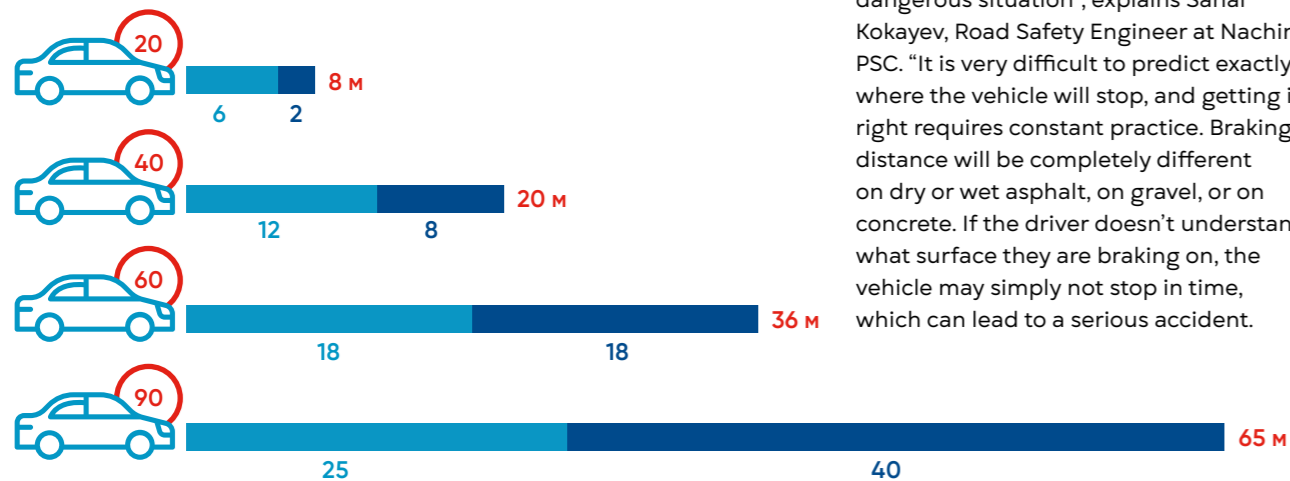
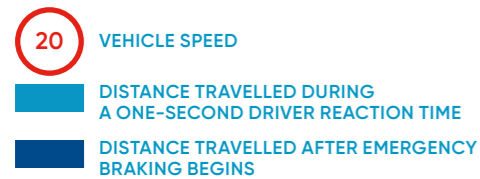
Beware of the car

Taking a vehicle out on the road when it is faulty or not properly prepared is risky and can lead to serious consequences, especially when providing security for the linear section of a trunk oil pipeline. With support from CPC Transportation Team specialists, drivers from Nachin PSC practised defensive driving in real-life scenarios, starting with a pre-trip vehicle inspection to assess its technical condition.

"Every trip must begin with a vehicle check: tyre and wheel condition; absence of leaks of technical fluids (fuel, oil, antifreeze, brake fluid); clean, undamaged windscreen and windows; clean, properly

adjusted rear-view mirrors; proper operation of wipers, rear-window defogger, headlights, brake lights, turn indicators and reversing lights”, says Pavel Buzyun, Traffic Safety Senior Engineer. CPC-R. “For every driver, inspection and trip preparation should become second nature, because taking an unprepared vehicle on the road can lead to a breakdown en route, an accident, or failure to complete work for CPC. If

STOPPING DISTANCE ON DRY ASPHALT



any faults are found, the driver must not start the trip until they are fixed”.

CPC specialists then demonstrated how to set up the driver’s position. The controls, driver’s seat, mirrors and seat belt were adjusted to suit each driver’s height and build. These seemingly simple actions can play a major role in preventing an accident or reducing its severity by ensuring better visibility and quicker reaction times. Proper seating helps reduce back strain, while correct hand position on the steering wheel allows a wider steering angle and more precise control. Once drivers and vehicles were ready, it was time for practical exercises.

“Emergency braking looks very cinematic, but it can easily create a dangerous situation”, explains Sanal Kokayev, Road Safety Engineer at Nachin PSC. “It is very difficult to predict exactly where the vehicle will stop, and getting it right requires constant practice. Braking distance will be completely different on dry or wet asphalt, on gravel, or on concrete. If the driver doesn’t understand what surface they are braking on, the vehicle may simply not stop in time, which can lead to a serious accident.



Driver attention and reaction speed directly depend on proper adjustment of the driver’s position

The master class gave participants the chance to practise defensive driving techniques in real-life scenarios

It’s extremely valuable that our CPC colleagues covered this topic in detail during the training”.

Participants practised emergency braking techniques on different types of road surface – asphalt, a gravel road and concrete – taking full advantage of the training ground conditions. Before each run, drivers were asked to estimate where the vehicle would come to a stop, with both the distance and the actual stopping point recorded. They then carried out braking runs at different speeds (20, 30 and 40 km/h), performing emergency braking at a designated point. On the first attempts, participants either failed to perform true emergency braking or stopped well beyond the planned stopping point. With each new run, their performance improved and errors decreased – but on a real road, a driver has only one attempt. This once again demonstrates that successfully executing any evasive manoeuvre to avoid an accident requires constant training.

No one starts their day expecting trouble or disaster. As a rule, drivers are confident in their skills and abilities – sometimes more confident than they should be. Many ignore traffic rules or engage in risky behaviour without fully realising that this can lead to an accident. Every driver is sure that they personally will be able to avoid



a crash. This is a classic illusion of control that people experience in many areas of life. Meanwhile, road conditions and the behaviour of other drivers can change dramatically in a matter of seconds.

Defensive-driving techniques help drivers build in extra time to make the right decision, take control of how a traffic situation develops, and prevent accidents from occurring in the first place.

“The value of the master class delivered by our CPC colleagues is obvious”, says Savr Badmayev, General Director of Nachin PSC. “Our drivers’ professional training, as well as their pre-trip checks, have always been carried out in coordination with CPC Physical Security and Transport Department specialists. The focus on defensive driving, practical exercises and theory gives us tremendous opportunities to exchange experience on this important topic and will undoubtedly help improve both the quality of our work and the safety of the Consortium’s pipeline system facilities as a whole”.

AUTHOR

Dmitry Konstantinov

In January 2026, Nikita Yevgenyevich Zosimov, Manager of PS Komsomolskaya, turns 50. A worthy successor to a dynasty of oil and gas engineers, he is responsible for transporting CPC Blend along the midpoint of the Tengiz – Novorossiysk route

Komsomol Commander

Nikita Zosimov was born on 4 January 1976 in Grozny, then one of the oil capitals of the USSR. He says many of his childhood memories are linked to the Zavodskoy district, where plant buildings and racks with pipelines stretched to the horizon.

“At the height of its operations, the Grozny refining complex processed 20 million tonnes of crude per year”, recalls Nikita Yevgenyevich. “My home city was steeped

in oil production; you’d see signs of it everywhere: pump jacks in the middle of the forest or on mountain slopes, wellhead pipes left on garden plots (dachas), old derricks that were a real adventure to climb with friends”.

The first generation of the Zosimov family moved to Grozny in the early 20th century. Nikita’s grandfather, Vasily Ivanovich Zosimov (born 1904), was the first engineer – the first “techie” – in the family. He rose from Design Technician at Groznetfazvedka to Chief Engineer of a repair and mechanical plant. He passed on his experience and passion for the profession to his younger son, Yevgeniy.

“That was my father. He worked at the Promavtomatika Scientific Production Association and also worked his way up from engineer to Head of the Design Bureau”, continues Nikita Zosimov. “In fact, my elder brother and I had a wide choice of other professions, but choosing a path different from my father’s and grandfather’s would have meant breaking family tradition”.

After finishing school, Nikita enrolled at the Grozny Petroleum Institute to study Chemical Technology of Organic Substances. In the early 1990s he had to leave his home city and continue his education at the North Caucasus State Technical University.

From 1996, Nikita Yevgenyevich worked at Astrakhan gas condensate field facilities, progressing from Instrumentation Technician to Process Engineer. Working within the Gazprom system was invaluable for his professional growth. Processing gas condensate containing up to 25% hydrogen sulphide required highly specialised, technically complex equipment and very high professional standards in its operation.

“In 2011 I decided it was time for a change”, says Nikita. “I was considering two offers: the Sakhalin 2 project and the Caspian Pipeline Consortium. I flew to Sakhalin, went through the interviews, and was then invited to CPC. After talking it over with my family, we chose the Consortium. That’s how I joined PS Komsomolskaya as an



Old production derricks in Grozny



1980, Nikita aged four



On skis, 1988

I&C Technician, and since then I’ve been with this station and with CPC”.

This was the start of the Expansion Project, and PS Komsomolskaya became the first facility to be implemented in the Central Region. It was also the training ground for personnel for other new pump stations. Today, people who started their careers at PS Komsomolskaya work at all Central Region stations and other CPC facilities.

“As the station’s first Manager, Vladimir Timofeyevich Pupyshev, used to say, the Komsomol team is a family, and belonging to this family is something to be proud of. Working here, surrounded by decent, highly qualified, remarkable people, is a great honour”, says Nikita. “I am grateful to the veteran specialists I was lucky enough

to work with and learn from: former PS Managers Gapur Salimovich Kuzhuyev (who retired in 2023) and Oleg Igorevich Dmitriyev, former Deputy PS Manager Boris Vladimirovich Filimonov (also retired in 2023), Electrician Pyotr Andreyevich Didenko, and many others”.

Komsomolskaya is known for its hospitality, warm atmosphere and excellent canteen. When you arrive, you find yourself in a close knit community of like minded professionals and true masters of their craft. First time visitors are often pleasantly surprised by the amount of greenery, the landscaping and the comfort of the site, especially against the backdrop of the surrounding steppe.

“The oasis concept was laid down from the very beginning by the people who first came here to develop the steppe, build and operate the pump station”, says Nikita Yevgenyevich. “It continues today, and I see it as my duty and calling to uphold it. The painstaking daily work of all links in the chain – CPC personnel and contractors – delivers the desired result. In the middle of the steppe we have an oasis – PS Komsomolskaya”.

In the 15 years that Nikita Zosimov has been with CPC, the company has completed the Expansion Project, implemented the Debottlenecking Programme (DBNP) and launched the External Power Supply (EPS)



Emergency drill at PS Komsomolskaya; Nikita Zosimov in the centre

project. There have also been difficult moments, such as the COVID 19 pandemic in 2020, when the operating routines of both station personnel and contractors had to be completely reconfigured. In a short time, measures were put in place to isolate PS staff from potential external threats.

“We must give credit to the people working at the station – they understood and accepted these measures”, notes Nikita Yevgenyevich.

The art of foresight

PS Komsomolskaya is the largest station in CPC's Central Region. Here, the main pump units (MPUs) are driven by gas turbines; power is supplied by the station's own turbogenerators; each of the three crude oil storage tanks has a capacity of 4,800 m³; and the custody transfer metering unit receives crude from LUKOIL. In the project documentation the station is designated as PS 1 or PS 24, but everyone simply calls it Komsomolskaya. It is named after the administrative centre of the Chernozemelsky District in the Republic of Kalmykia. PS Komsomolskaya is located almost exactly at the midpoint of the Tengiz – Novorossiysk trunk pipeline, at kilometre 756.

“Construction of the station began in 1988 as a junction pump station for



2017. V.N. Groshev and N.Ye. Zosimov at an awards ceremony



2024. N.G. Gvozdev and N.Ye. Zosimov. Safe Work Culture Leadership awards ceremony

the Tengiz–Grozny trunk oil pipeline project”, Nikita explains. “When the CPC project came, everything changed: the pipeline turned towards Novorossiysk, and Komsomolskaya became the turning point. It was from here that the new line was laid to the Marine Terminal in Yuzhnaya Ozereevka. To operate and maintain such sophisticated equipment you need competent, responsible professionals, and I can say with pride that our PS has exactly those people”.

Comparing the Consortium with other industry companies, Nikita notes CPC's leading position both in production and in social responsibility. When new young professionals arrive at the station, often without much prior experience at other organisations, he always tries to explain that working at CPC is something to be proud of, to value, and to live up to in terms of competence.

The rotational (shift) work pattern means that the same people work together on site for extended periods. They get used to each other, develop shared norms of behaviour, define personal boundaries, learn to cooperate and understand one another, and to look for solutions and compromises. Ideally, the team operates like a well tuned mechanism, without breakdowns, and any deviations from normal operation are quickly corrected without stopping the process.

“This approach is rational, and our company pays particular attention to ensuring that all work is carried out safely and with risk minimised”, says Nikita. “The Safe Work Culture programme plays a key role in this. In 2025 all personnel at PS Komsomolskaya signed individual Safe Work Culture



2013, PS Komsomolskaya



Anniversary with the family



On the mountain slopes with his son

commitments and have already reported on their fulfilment. My personal slogan in these commitments is: ‘Safety is not a lottery. We do not play games – we anticipate and comply!’”

The tools used most actively and effectively in planning and executing work are observation cards for operating personnel and leadership visits for managers. The non conformities identified through observation cards help to highlight where working conditions can be improved, where additional, previously unrecognised risks may exist, and how the number of hazards during work can be reduced. Staff can see that their feedback is acted upon: issues are not swept under the carpet, corrective measures are developed, and those who make a difference are recognised and rewarded.

“We regularly hold station committee meetings and involve contractor personnel in the programme”, says Nikita. “We look for leaders to drive the development of Safe Work Culture. A leader is not always just a manager; among the operating staff at PS Komsomolskaya there are many colleagues with strong leadership qualities who enthusiastically participate in Safe Work Culture practices. From my side, I believe it is essential to nurture such people, help them grow within the team and keep them motivated. They are the ones who make sure the station runs safely and efficiently”.

The benefits of electricity

In 2026, PS Komsomolskaya will launch a project to replace the gas turbine driven main pump units with electrically driven MPUs. The project will include a new main pump house and auxiliary facilities, connection of a 110 kV substation, and an upgrade to the main indoor switchgear.

“As a manager, I see this as a very interesting challenge”, says Nikita. “The Expansion Project and DBNP are behind us, but those efforts focused on increasing capacity based on gas turbine drivers. Now we are talking about replacing the heart of the station – the main pump house. It is encouraging that both the motors and the pumps will be manufactured in Russia: this will eliminate problems with spare parts supply and timely servicing, and it will give a new boost to our domestic industry”.

A gas turbine is technically more complex than an electric motor: there are more parameters to monitor, it takes longer to reach operating mode, and the fuel system is intricate – and the more complex the system, the higher the risk of failures. According to Nikita, before the introduction of variable frequency drives on electric motors, gas turbines were convenient precisely for fine tuning pumping modes by pressure and flow rate. Now, after implementing DBNP and installing VFDs at other CPC pump stations, electric motors as MPU drivers have a number of advantages over turbines.

“I am confident that after we switch to electrically driven MPUs, the pumping system will become even more reliable, safer and more efficient”, says Nikita Yevgenyevich. “For myself and for the team I see many new opportunities in this project. We will learn new equipment, build up our skills, level up, as the younger generation says, and get to know and work with new specialists. All of this is forward movement and development”.

If we think of work as the front line, then since 2017 Nikita's home front has been in Krasnodar. His family is waiting there: each of his three children needs his time, attention and care. In the mornings he takes the youngest, Maksim, to kindergarten. He tries to attend middle son Yelisey's football training sessions at FC Krasnodar's academy and then help with homework. With his eldest daughter Olesya, a university student, he discusses whatever is on her mind.

“From a young age I was passionate about alpine skiing and trekking and have done many routes in the Caucasus”, says Nikita. “Now I'm glad that Yelisey is also drawn to the mountains: he first got on skis at five, and at ten he already has solid technique and speed – his father can't keep up. Next year I'm planning to start training Maksim – four or five is just the right age to begin”.

Another of Nikita's hobbies is table tennis. There is a table in the PS Komsomolskaya gym, and shift workers enjoy this way of unwinding. Their boss is also a poet. Colleagues are very familiar with and fond of his greetings, odes and epigrams. In 2019 Nikita tried his hand at prose and won CPC Panorama's literary contest in the “Story about a Colleague” category.

“My story ‘The Roads We Choose’ was written for the 70th birthday of PS Komsomolskaya's first Manager, Vladimir Timofeyevich Pupyshev, a person who became very dear to me over our years of working together”, Nikita explains. “As for my own 50 years, I see them as just another stage – far too early to take stock. There are many plans and projects ahead. I have the strength, knowledge, motivation and confidence. I have colleagues, friends and family I can rely on – which means everything will work out”.

AUTHOR

Pavel Kretov

Invincible Moscow

In 2026, it will be 85 years since the start of the Great Patriotic War. One of the most important battles of 1941 was the winter battle for Moscow, which put an end to the German blitzkrieg strategy. The editorial team of CPC Panorama has tried to add new, little known details to this page of history, which has been repeatedly portrayed in literature and cinema – about fuel supply for both sides, and more

On the 101st day of the «Russian campaign», as the Chief of the German Army General Staff Franz Halder pedantically noted in his diary, Hitler's forces launched Operation Typhoon to take Moscow. The Germans began implementing Typhoon several weeks later than planned, having lost momentum in the battles near Smolensk, Leningrad and in Ukraine. The Nazis made up for the forced delay with an unprecedented concentration of forces: about 75 divisions and three of the Reich's four panzer groups – whereas just one had been sufficient to crush all of France. Even von Kleist's panzer group, the only one formally not involved in the battle for Moscow, «donated» two panzer and two motorised divisions from the southern sector to the central one.

Soviet intelligence did not detect this sharp build up of Hitler's forces in the Moscow direction in time. It was believed that the Western, Reserve and Bryansk Fronts were well capable of meeting the threat.

On 30 September, the steel fist of Guderian's panzer group struck the left flank of the Bryansk Front – the beginning of the battle for Moscow. Two days later, with massive air support, the tanks of Hoepner and Hoth moved into action. «Russian resistance is weaker than expected,» Hoth reported on 2 October to Army Group Centre headquarters.

Once the front had been breached, Soviet front commanders failed to establish coordination, while simultaneously reporting to the State Defence Committee that, overall, the enemy had been repelled successfully. The first doubts in the Soviet High Command emerged on 3 October – after Hitler's live radio address from Berlin's Sportpalast. The Führer declared that an operation of unprecedented scale had been underway for 48 hours on the Eastern Front, and that Germany would use it to defeat Russia once and for all.

Even on 4 October, the Western Front was still doing nothing to defend Vyazma as a potential point where the German armoured pincers could link up. In an order to the 19th Army, several Wehrmacht panzer divisions rapidly advancing in the Soviet rear were described as «groups of hooligan submachine gunners».

On 4 October, Oryol fell; the next day, the Germans completed the encirclement of Soviet forces near Bryansk; and two days later they closed the Vyazma pocket. The result was catastrophic for the Red Army: four armies, 37 divisions, nine tank brigades and 31

artillery regiments – almost half of Moscow's defenders, and the most combat ready and well manned ones at that – were lost. Ivan Konev, Commander of the Western Front, almost shared the fate of General of the Army Pavlov, who had been executed along with his staff in July 1941. The argument, «you'll run out of commanders at that rate,» prevented the sentence – voiced by Konev's successor, Georgy Zhukov, urgently summoned from Leningrad. On 10 October, Zhukov took command of the front, with the Germans less than 200 km from Moscow.

Three defensive lines

It would be unfair to blame only Konev for the failure of the Vyazma defensive operation, just as it would be unfair to award all the laurels for Moscow's successful defence solely to Zhukov. The capital's shield had begun to be forged as early as the summer of 1941, with the formation of more than 150 new divisions. Of course, no one anticipated the catastrophe at the initial stage of Typhoon: the armed forces were to be reinforced to balance forces at the front and seize the strategic initiative. Thirty five newly formed divisions and almost the same number of rifle brigades replaced the lost front formations and also took up positions in the Moscow Defence Zone.

Georgy Zhukov began organising three defensive lines along the Volokolamsk–Mozhaysk–Maloyaroslavets line, the Naro Fominsk–Podolsk–Serpukhov line, and in the suburban districts of the capital. Debates about the impact of weather on the battle for Moscow continue to this day. Some believe that acknowledging it could diminish the valour of the capital's defenders: after all, the autumn mud season hindered everyone equally. But in reality, the waterlogged fields reduced the number of tank threat directions, allowing Zhukov, with limited

manpower, to concentrate on controlling key road junctions. All calculations showed that holding the Mozhaysk line required 25 divisions – Zhukov had four. In some sections, the defensive line existed only on paper. General Panfilov reported that his 316th division entered battle having, quite literally, «sat down on stakes» – pillboxes and bunkers had only been marked out; in reality, they did not exist.

Among the hastily prepared and poorly equipped formations, the cadet regiments stood out for the better. Encountering their stubborn resistance, the Germans singled them out immediately, and once they understood who they were facing, showered them with leaflets: «Red Junkers, surrender!» There is an opinion that the Podolsk cadets performed better than the Kremlin cadets, but such comparisons are incorrect: the latter, like Panfilov, were assigned unprepared lines. Under the blows of a superior enemy, the Kremlin regiment broke out of encirclement in an organised manner three times.

Behind the Lines: Fuel

The time Hitler's forces spent breaking through the Mozhaysk defensive line was not wasted in the Soviet rear. Extensive work was carried out to redeploy troops from the Far East and Siberia and to build up fuel stocks for all types of equipment.

Automotive, tank and tractor fuel for the fronts was supplied by refineries and oil depots in Saratov, Syzran, Ufa and Orsk. Aviation fuel came from the Caucasus and from central depots of the People's Commissariat of Defence.

Against all odds, the Moscow Oil Refinery continued to operate heroically. Cracking Plant No. 413 was built in 1938 on the Moskva River: Baku crude was delivered here by barge along this waterway. With the outbreak of war, German aircraft constantly tried to break through to the refinery, and a military ruse helped save it. Three kilometres from the real plant, an exact wooden replica was built. In aerial photographs it was indistinguishable from the original – the same tanks, the same rail spurs, the same planted trees. For several months, the Germans furiously bombed the decoy, and to ensure they did not lose interest too early, on duty sapper teams, on command, set fire to old barrels and plywood to give the impression of serious damage. Meanwhile, the real refinery continued operating at full capacity.

A striking fact: the enemy was at the gates of Moscow, yet the refinery increased output and produced more product types than before the war – diesel fuel, fuel oil, cracking gasoline, asphalt and petroleum semi-finished products. Plant workers continued building new units and devising ways to reduce equipment wear. In autumn 1941, military equipment was refuelled directly on the refinery premises. Only once did the plant come close to shutdown – due to disruptions in feedstock supply.

FIGURES

2.8 million tons

of crude were processed by the Moscow Oil Refinery during the Great Patriotic War (1941–1945)

294.4 thousand tons

of fuel were consumed by the Red Army over seven months of the battle for Moscow

But engineers quickly found a way to process feedstock of varying quality, maintaining the required production pace. In total, 2.8 million tonnes of crude were processed at the refinery during the war.

Automobile fuel battalions played an important role in delivering fuel to the troops, promptly supplying fuels and lubricants when the situation changed abruptly or became more difficult. Columns of 50–60 tank trucks each formed on Gorky Street between Pushkin Square and Mayakovskiy Square. On the way to the front, they often had to travel along dirt roads, as all major highways were jammed with Soviet military equipment.

Large volumes of fuel were also required for the evacuation of industrial enterprises from Moscow, announced on 10 October. Masses of trucks were used to move plant equipment to railway stations. Once this task was completed, fuel service personnel continued building up reserves.

Leading by example

Meanwhile, events at the front were taking a worrying turn. On 13 October, German tanks burst into Moscow Oblast. Even the traditional Sovinformburo bulletin stated: «The situation on the Western Front has worsened...» By late October, fighting was taking place 80–100 km from the Soviet capital.

Not until early November, after reaching the outskirts of Tula and Serpukhov and taking Naro Fominsk,

Volokolamsk and Kalinin, did the German formations pause for a time. But on 15 November, having received 10 fresh divisions and regrouped their forces, Hitler's troops launched a second decisive offensive on Moscow. They committed 51 divisions against the Soviet capital, including 13 panzer and four motorised divisions. The Supreme High Command also reinforced the defenders: the Western Front received 100,000 soldiers, 300 tanks and 2,000 guns.

The slogan of those days was «Not one step back!». Notably, the Soviet leadership held itself to the same standard. When Georgy Zhukov felt that the location of the Western Front headquarters in the village of Perkhushkovo on the Mozhaysk Highway was no longer safe, he asked Stalin for permission to move the headquarters to the Belorusskiy Railway Station in Moscow. The leader replied coldly: «If you fall back to Belorusskiy Station, I will take your place.»

Some time later, a member of the Western Front Military Council, Pavel Stepanov, also called Stalin. When he asked for permission to move the Air Force headquarters to the eastern outskirts of Moscow, the Supreme Commander in Chief advised the pilots to find shovels: «Dig yourselves mass graves! There will be no retreat! I am staying in Moscow!»

By late autumn, German troops began having fuel supply problems. On Russia's roadless terrain, tanks consumed much more fuel than usual; to support

Typhoon, 27–29 trainloads of fuel were required daily. For example, the German Pz.Kpfw IV (T IV) tank – the flagship model until the Tiger appeared in 1942 – consumed 318 litres of gasoline per 100 km on paved roads and about 500 litres cross country. On 13 November, Matthias Jakobi, a soldier in the security company of the 2nd Panzer Group, wrote in his diary: «We tried to start the vehicle, but it didn't work: the gasoline is dirty, and it's very cold.» Beyond fuel quantity and quality, the mechanised units were further hampered by the lack of winter track sets. Baron von Geyr, commander of the 24th Panzer Corps, noted that tanks were unable to climb icy slopes.

In a stubborn confrontation on 22 November, Soviet forces had to abandon Klin; two days later, Istra; and on 28 November, enemy advance units reached the Moscow–Volga Canal near Yakhroma, forced the Nara River and approached Kashira from the south.

Uniforms for a parade that never happened

In the last days of autumn, German soldiers could already observe Moscow through binoculars. On 30 November, German motorcyclists broke through to Khimki, leaving just 8 km to the Moscow city limits. According to one version, they were engaged by the city police.

On 2 December, editors of all German newspapers were ordered to leave blank spaces in their typeset pages to print the announcement of the capture of the Soviet capital. Dress uniforms were delivered to the 2nd German Panzer Division – for a triumphant march through Moscow's streets and across Red Square.

Front line Moscow was preparing for fighting already within the city itself. Twelve Moscow bridges, power stations and railway stations, and the Central Telegraph building were mined. Units of the Dzerzhinsky Division took up positions along the Garden Ring, where anti aircraft guns were also deployed. Mayakovskiy Square, Vosstaniya Square, Smolenskaya Square, Oktyabrskaya Square and Dobryninskaya Square were blocked with anti tank obstacles and sandbags. In central Moscow, columns were formed from servicemen arriving from the Far East, Central Asia and Siberia, who were immediately sent to the front.

Yet the enemy was already running out of steam. German losses were increasingly felt – by early December they had reached 750,000 men, with up to two thirds of the personnel of forward units lost.

In early December 1941, even before the Soviet counteroffensive, Army Group Centre commander Fedor von Bock set out grim thoughts about the situation near Moscow in his diary: «...Even if the impossible becomes possible and we manage at first to seize new territories around Moscow during our advance, I still will not have enough troops to encircle the city and seal it tightly from the south east, east and north east... Army Group Centre's forces are stretched

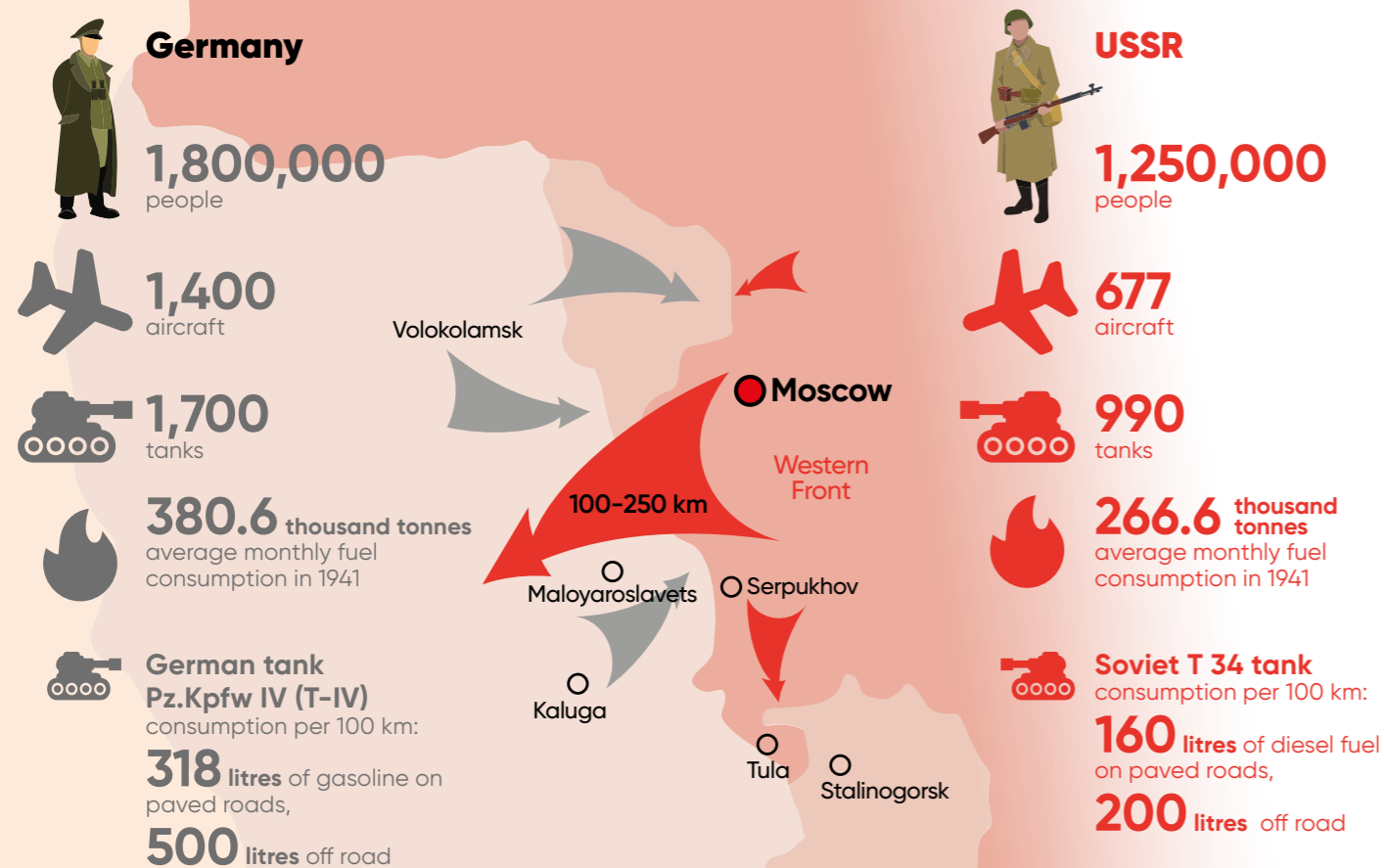
along a front of more than 1,000 kilometres, and behind the front line there is only a single division as reserve. If the group has to fight defensive battles in winter, with its current disposition this is possible only on the condition that major reserves are transferred to the front. These reserves must be sufficient to withstand powerful enemy attacks... This will require 12 divisions... Another essential condition for survival is putting the railways in order and establishing a clear schedule for train movements... If both of the above conditions cannot be fully met, suitable shortened defensive positions must be found in the rear for the eastern army as soon as possible.»

Commander of the 4th Army Günther von Kluge, nicknamed Clever Hans, held the same view. He advised the command to postpone the offensive until spring 1942. Even more radically, General Colonel Friedrich Fromm, commander of the Ersatzheer (Replacement Army), recommended immediately making the USSR a peace offer to avoid a two front war.

«Pursue the enemy!»

The German offensive near Moscow ended on 5 December with one last desperate attempt to break through to the outskirts of the city via Kryukovo, Krasnaya Polyana and Bely Rast. In the Naro Fominsk direction, the farthest point of the German advance was the village of Akulovo. And everywhere, in fierce, furious fighting, the enemy was stopped.

For the counteroffensive that began on 5 December, the High Command transferred three armies from its reserves to the Western Front. This made it possible to involve a total of 88 Soviet divisions in the operation. The fuel supply teams rose to the occasion. Fuel supplies were secured in advance from state reserve



FIGURES

350 thousand tons of automotive gasoline were approved for shipment to the fronts in November 1941 under the plan of the USSR Armed Forces Fuel Supply Directorate (USGKA)

32 thousand tons of fuel and oils were saved thanks to drivers' skill

depots, local oil depots of Glavneftesbyt and depots of the People's Commissariat of Defence located within the Western Front's area.

Aviation fuel was transported from the Caucasus via the Caspian Sea and the Volga. By early December, significant fuel stocks had also been built up in the fronts' positions. 25,000 tonnes were delivered to the troops by transport aircraft, and rail routes were used whenever possible.

The troops participating in the battle for Moscow consumed almost 300,000 tonnes of all types of fuel. In December 1941 alone, Western Front aircraft completed 22.6 full refuellings of aviation gasoline. In February 1942, aviation of the Kalinin Front exceeded this indicator – 27 refuellings.

To ensure rational use of fuel resources, limits were introduced in the Red Army. If a front was tasked with the main objective in an offensive operation, consumption norms were increased. For formations performing secondary tasks or troops fighting less intense defensive battles, limits were reduced. The use of trucks was strictly prohibited where supplies could be provided by horse drawn transport. For skilful driving and maintaining vehicles in exemplary condition, drivers received bonuses. It is believed that this measure alone saved about 32,000 tonnes of fuel and oils over the course of the war.

Rear services were ordered to equip 50% of freight transport with rigid tow devices, ensuring maximum use of towing, and to provide units with everything needed to adjust ignition systems.

The first phase of the Red Army's counteroffensive near Moscow began on 5–6 December 1941 without any operational pause and continued until early January 1942. The enemy was struck in the most

effective way: attacks were directed into the flank and rear of the panzer formations advancing on Moscow and Tula. Marshal Mikhail Katukov recalled: «The call 'Not one step back!' was replaced by the battle cry 'Forward! Pursue the enemy without respite, giving him no chance to entrench in populated areas!'»

On 8 December, 2nd Panzer Group commander Heinz Guderian – nicknamed Hurring Heinz and Heinz the Hurricane in the Wehrmacht – wrote to Germany: «We are confronted with the sad fact that our supreme command has drawn the bowstring too tight... and was taken by surprise by Russian frosts reaching minus 35 degrees. ...Because of the frost, losses in motor transport and artillery exceeded all calculations. We are making do, using peasant sledges, but they are, of course, of little use to us.»

The German Army Group Centre was pushed back 100–250 km from the Soviet capital. The Red Army liberated Moscow and Tula Regions, the cities of Kalinin and Kaluga, and a number of territories in other regions. The Germans managed to preserve the integrity of their front line only thanks to prompt action by transport aviation and the rapid transfer of fresh divisions from Western Europe. The war continued, and years of enormous hardship still lay ahead until Victory; but, in the view of many historians, the strategic outcome of the confrontation was decided precisely at the walls of the capital. German losses near Moscow in vehicles, tanks and horses were felt by them until the very end.

They could no longer, «as in '41», carry out large scale surprise transfers of masses of troops along the entire Soviet German front. In 1942, the Wehrmacht's priority direction changed – to the Caucasus and Stalingrad.

DETAILS

In 1941, petroleum products were intended not only for engines. On 7 July 1941, the State Defence Committee adopted a secret resolution «On anti tank incendiary grenades (bottles)», ordering the organisation of production of 120,000 bottles of incendiary mixture per day. In addition to bottles of gasoline, Red Army soldiers used mixtures «KS» (phosphorus and sulphur), «BGS» (benzene and solvent), «Mixture No. 1» (gasoline with the addition of aluminium powder

thickener), «Mixture No. 2» (wood resin, gasoline, turpentine), and «Mixture No. 3» (gasoline and diesel fuel).

The first batches of bottles with incendiary mixture had a fuse that was lit by hand before throwing. Later, production of ampoule fuses was established; they ignited the mixture when the thrown bottle shattered against armour. During the Great Patriotic War, about 110 million bottles of incendiary mixture of various types were produced.



Georgy Zelima / RIA Novosti

Forward to the Past

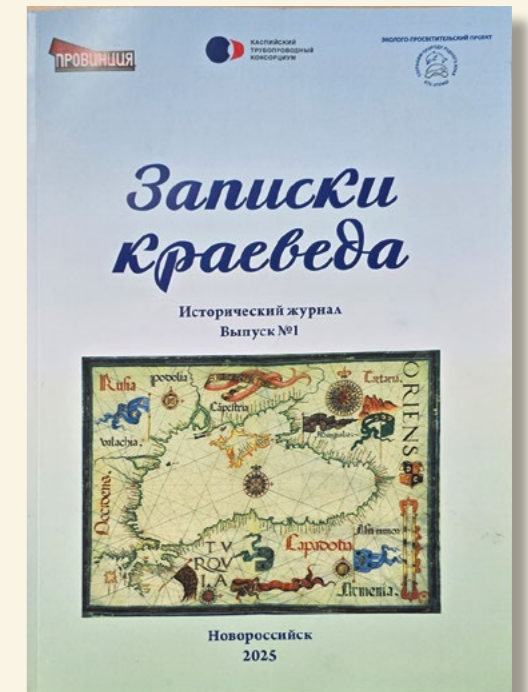
CPC PRESS SERVICE

At the end of 2025, the first issue of a new local history journal, Notes of a Local Historian, was published in Novorossiysk. This popular science journal was launched with the support of the Caspian Pipeline Consortium as part of the environmental and educational project "Protect Nature of Our Native Land. CPC – Utrish"

The history of every city is interesting in its own way, especially when a city emerges at the crossroads of eras, borders and trade routes. Novorossiysk is no exception: this port and Hero City dates back to the ancient polis of Bata, founded in the 1st century AD and destroyed by the Goths three centuries later. In the 15th century, the site was home to a Genoese trading post; in the 18th century – to the Ottoman fortress of Sudzhuk-Kale. For many years, the scholarly community had been considering the idea of a periodical that would cover the different stages of Novorossiysk's history to a high professional standard – similar journals in other cities have clearly proved their value and relevance in practice.

The idea took practical shape with the launch in Novorossiysk of the environmental and educational project "Protect Nature of Our Native Land. CPC – Utrish". The project already included annual publication of books for children and young people, but in 2025 a decision was taken to expand the audience by creating a historical and scientific journal. A team of 16 authors – local historians, historians, academics and researchers – spent six months working on the first issue, gathering archival materials and taking a deep look at little-known topics and major historical events.

Cable cars, parks, skating rinks and cinemas in Novorossiysk that once rivalled those in the capital in terms of technical sophistication. The role of the Cossacks in developing the Black Sea region, the evolution of



medical infrastructure, the unique photographic chronicle of the Borisov brothers, memoirs of cultural figures, and much more – all richly illustrated with archival maps and daguerreotypes. And this is far from everything in the history of the Hero City – more is yet to come.

"From the outset, the goal was a popular science approach – solid professional research, presented in language accessible to a wide readership", says Candidate of Pedagogical Sciences Anna Karpacheva, Coordinator of the "Protect Nature of Our Native Land. CPC – Utrish" project. "The scope is not limited to Novorossiysk alone. We also cover Gelendzhik, Abkhazia and the Crimea – because the history of the coastline is closely interconnected, and you cannot fully understand individual events without a systemic picture of the processes that took place in the region at different points in its history".

AUTHOR

Dmitry Konstantinov

Wings of Memory

The gala concert of the "CPC for Talented Children 2025. Wings of Victory" festival-contest took place on 1 December in Moscow, on the stage of the Gorbunov Palace of Culture. The editorial team of CPC Panorama looks at the ripple effect of the 27th season of the international festival from two angles: by comparing the quantitative and qualitative indicators of different years and by speaking with laureates, experts and guests of the event, including leaders of the regions where the festival was held

Video



In the year marking the 80th anniversary of Victory in the Great Patriotic War, neither the organisers nor the participants of CPC's international creative contest stood aside from an event that matters to everyone. The festival theme, and the contest entries submitted, focused on the feat of the Soviet people who freed the world from Nazism. As is well known, the soldiers of the Red Army and the workers of the home front included representatives of more than a hundred nationalities and ethnic groups of the USSR. It is symbolic that the Moscow gala concert brought together winners and laureates from Astrakhan Oblast, the Republic of Kalmykia, Stavropol Krai, Kuban, Novorossiysk and four regions of the Republic of Kazakhstan. In these regions, as in both countries as a whole, the Great Patriotic War left its mark on virtually every family.

Five years ago, the "CPC for Talented Children" festival-contest was seriously affected by the COVID-19 pandemic. By adapting in time to medical restrictions and bans on public events, contestants and the jury successfully moved to a remote format and mastered the required media tools. Some of these remote-communication solutions proved so effective that they became part of the first two stages of subsequent seasons, even after the pandemic had receded.

In 2025, the organisers and participants faced another set of challenges, including the blocking in Russia of a popular video platform and



restrictions on internet access in a number of regions for security reasons. They managed this as well: in particular, video submissions began to be uploaded to the "cloud" storage of email service providers. As a result, 2025 – a technically more demanding year for contestants – became another record year in the festival's history: more than 25,000 participants and more than 7,000 submissions in the second round.

In terms of quality emerging from quantity, the 27th season produced some interesting outcomes. For example, the Moscow concert of the Jas Tolqyn festival at the Kazakhstan Pavilion at VDNKh was hosted by Ruslan Yelmesov from Atyrau. A winner of the CPC contest in 2023, he is currently honing his acting skills at the Zerkalo miniature theatre of the Vershina cultural and leisure centre. In June 2025, Ruslan and other young artists took part in the 9th Regional Literary and Music Festival "I Was Coming to See You" in Uralsk, where he recited Alexander Pushkin's poems in the translation by Abai Kunanbayev. The talented young artist has been nominated for a Rossotrudnichestvo grant, and the Chair of the CPC for Talented Children expert panel, GITIS lecturer Aleksandr Koltsov, recommended that Ruslan continue his education at a theatre university.

"One of our most important tasks as experts is to stay in touch with the contestants' teachers", says Aleksandr Nikolayevich. "That way, I believe, we will be able to avoid one of the issues of the 27th season in the future: a decline in the quality of video submissions at the second stage. Unfortunately, the second round sometimes

receives submissions recorded at the beginning of the year rather than after the first stage and based on the jury's recommendations".

Winners and participants of the CPC festival-contest continue to refine their skills at Moscow universities. The 2019 first-place laureate in the "Pop Vocal. Solo" category, Stavropol native Martin Mirzoyan, entered GITIS on a state-funded place in summer 2025 and is training as an actor in the studio of Ivan Popovski, Galina Tyunina and Kirill Pirogov. Nikita Polyakov, a student of Polina Zinovyeva – a teacher from the Krasnodar theatre studio Novye Vorota who took part in the 2025 gala concert – is now in his second year at the Boris Shchukin Theatre Institute. As for the "I Remember" gala concert itself, it was staged on the basis of a video of the same name by eight-year-old debutant Lea Polina from Novoaleksandrovsk, Stavropol Krai, who submitted her work in 2025 in a new category, "Media Creativity".





"I told the story of my great-grandfather, who went to the front in 1941", says Lea Polina. "In our family, this story is passed down from generation to generation".

Around 300 Grand Prix winners and laureates met in Moscow

New Wave

Following tradition, the Moscow gala concert combined performances by winners and laureates of the third stage from Russia's regions with acts by finalists of the Jas Tolqyn ("New Wave") contest, held annually in the Atyrau, West Kazakhstan, Aktobe and Mangystau regions of the Republic of Kazakhstan. This year, the contest brought together more than 350 participants, and around fifty winners travelled to Moscow.

The Shashu family ensemble from Aktobe, which performed on the Gorbunov Palace of Culture stage, won the Jas Tolqyn Grand Prix. The founders, spouses Umirkhan and Amangul Yeshpanov, are raising 11 sons and 18 daughters. Four children are biological; the others were adopted at different times, but the word "adopted" is not used in the family. Seven children came to Moscow with their mother and performed the folk piece Arnau ("Dedication") at the gala concert.

"In these very days of 1941, the Panfilov Division stopped German tanks near Volokolamsk, and during the Great Patriotic War as a whole, more than 1.2 million people from Kazakhstan were drafted to the front, and only half returned", noted Kairgeldy Kabyldin, CPC Deputy General Director for Relations with the Government of the Republic of Kazakhstan, in his greeting to the participants of the "I Remember" gala concert. "The festival 'CPC for Talented Children 2025. Wings of Victory' is our shared celebration in the same way as that Great Victory was shared by all".

High-tech for the Young

Designed in 1929 by Yakov Kornfeld, the Palace of Culture – named in 1933 after aircraft plant director



Sergey Gorbunov – proved to be an unconventional venue for the final gala concert. The constructivist interior, in the best traditions of Le Corbusier, prioritised function over form, so young contestants and their teachers had no shortage of space for rehearsals and rest.

When some complained about the lack of velvet seats in the auditorium and marble counters in the cloakroom, longtime Muscovites patiently explained that the "Gorbushka" historically served as a rock-concert venue, and therefore traditional theatrical luxury would be out of place here.

Fans of both classics and grunge were finally won over by a giant 100-m² "tablet" installed at a 45-degree angle in 2024 for the Anti-Gravity show. Actors walked down and up the sloped surface, aerialists launched their flights from it, vivid visuals on the screen gave way to video scenes and letters from the front – all of this added a new, almost magical dimension to the stage action.

"In the year of the Great Victory, the 'CPC for Talented Children' contest acquired special significance and special meaning", emphasised Gilyana Boskhomdjiyeva, Prime Minister of the Republic of Kalmykia. "Children remember the feat of the Soviet soldier and glorify it in poems and songs. Year by year, the contest is gaining ever greater popularity in Kalmykia".

In the Republic of Kalmykia, 1,515 people took part in the "CPC for Talented Children 2025. Wings of Victory" contest. Four of them received the Grand Prix, and 227 became laureates of the third in-person regional stage, "Voices of Victory".

"One of the tenets of our ideological opponents goes: 'If you want to defeat a people, raise their children'", noted Vladimir Babolya, Deputy Prime Minister of Astrakhan Region and Plenipotentiary Representative of the Governor of Astrakhan Oblast. "Children are the flowers of life, and CPC, like an experienced gardener, has been caring for their healthy development for many years, preventing harmful influences".

In Astrakhan Oblast, 2,762 young talents took part in the contest. Fifteen people received the Grand Prix, and 539 were declared laureates of the third in-person regional stage, "Threads of Victory". In Stavropol Krai, the gala concert concluding the regional tour was called "The Living Book of Victory". 4,251 people from the Krai took part in the contest; 10 received the Grand Prix, and 719 became laureates.

"For our Hero City, the 'CPC for Talented Children 2025. Wings of Victory' contest has special significance", said Natalya Mayorova, Deputy Head of the Municipality of Novorossiysk. "Winning this contest is not the most important thing; the most important thing is the creative development of young people and the growing professionalism of teachers".

In Novorossiysk, 2,774 young talents took part in the 2025 contest. Ten of them received the Grand Prix, and 474 became laureates of the regional tour, "Roads of Memory". In Krasnodar Krai, 4,362 people took part in the contest. Twenty-five people received the Grand Prix. 847 laureates were announced following the third in-person regional stage, "Spring of Victory".

On 28 November 2025, more than 240 of the best contestants from four regions of Russia arrived for the "Moscow Welcomes Friends" cultural forum. In the capital they were treated to excursions (including to the Victory Museum on Poklonnaya Hill), master classes by teachers from leading music and theatre universities, and creative meetings with well-known artists. The final "I Remember" gala concert on the stage of the Gorbunov Palace of Culture included 27 performances by contest winners and laureates. In a production unified by a common storyline, the history of the war years of 1941-1945 was interpreted



through the eyes of modern teenagers. The vibrant theatrical show featured both finalists and contest experts – professional artists and musicians.

"Probably there is not a single family in Russia or Kazakhstan that was not touched by the Great Patriotic War", noted CPC General Director Nikolay Gorban. "I am very grateful to our young contestants and their teachers for the great work they have done, for their vibrant performances, for their creative approach to a theme that is important and unforgettable for all of us – the Great Victory. For our part, we will continue to provide comprehensive support for patriotic education and the creative development of the younger generation".



AUTHOR
Pavel Kretov

The Only One in the City

The L.A. Gergieva Children's School of Arts has reached its 60th anniversary milestone. The school opened in Novorossiysk in 1964 as a music school with three departments, and 20 years later, with growing enrolment and new areas of study, it was transformed into a children's school of arts

In 2014, the school was named after People's Artist of Russia Larisa Gergieva. Larisa Abisalovna is Artistic Director of the Mariinsky Theatre's Academy of Young Singers in St. Petersburg, a member of the International Association of Vocal Experts, and the founder and General Director of the N.A. Rimsky Korsakov Young Opera Singers Competition. She has visited Novorossiysk and brought her students to the school. To mark the school's new status, CPC made a set of major gifts: sound amplification equipment for the assembly hall, a SAMICK baby grand piano, and a professional multi timbre Jupiter bayan (button accordion). Today, more than 650 children aged 4 to 17 study here. The school has 10 departments: piano, strings, wind instruments, folk instruments, choir, musical folklore, choreography, visual arts, theatre and a preparatory department.

"Our school is the only one in the city that offers the full range of pre professional departments in the arts", notes School Director Elena Poturoyeva, a graduate of the Rostov State Conservatory. "It is also convenient for children and their parents that, unlike narrowly specialised music and art schools, a child can change their area of study here. If the violin or choreography doesn't work out, that's fine – they can, for example, try their creative talents in visual arts or in the theatre department".

With a pre professional diploma, graduates of the school have the opportunity to apply to specialised secondary and higher education institutions. An interesting fact: over the past three years, 33% of the school's graduates have been admitted to arts universities. In 2019, the school launched the city's only Theatre Arts programme, which currently has about 60 students. This young department is already showing strong results: one recent graduate, having



"This is a wonderful project. When children see distinguished teachers and groups from other cities and regions, they get a powerful incentive for self development".

Elena Poturoyeva,
School Director, graduate of the Rostov State Conservatory

competed against 160 applicants for a single spot, became a student at Oleg Tabakov's Theatre School in Moscow.

From its earliest days, the Theatre Arts department established a creative group, Artmosfera, led by Lina Zanozina, a graduate of the Boris Shchukin Theatre Institute. Her students immediately became laureates of a regional theatre arts competition.

Overall, the school employs about 40 teachers and accompanists. Five of them hold the title "Honoured Worker of Culture of Krasnodar Krai" and have



received certificates of merit and letters of appreciation from the regional Ministry of Culture and the administration of the Hero City of Novorossiysk. Teachers take pride in their students' many achievements at international, national and regional competitions. The best students receive scholarships from the Governor of Krasnodar Krai and the Mayor of Novorossiysk. The school's students have also repeatedly achieved notable success at the CPC for Talented Children festival contest.

"This is a wonderful project", says Elena Poturoyeva. "When children see distinguished teachers and groups from other cities and regions, they get a powerful incentive for self development. Of course, there is also the Sirius centre for talented children, but it is difficult to get in. In that sense, the CPC for Talented Children contest is both more accessible and broader in scope".

Students of the L.A. Gergieva School of Arts also enthusiastically take part in other projects supported by CPC. For example, in 2023 the school's soloists and choreography ensembles, Sea Pearl and Through the Looking Glass, performed for the first time at the Novorossiysk Chimes festival, and this has now become an annual tradition for the school.

That same year, student Leonid Ustin took part – at the invitation of the Minister of Culture of Krasnodar Krai – in the music festival "Denis Matsuev Presents: Dialogue of Generations". The renowned virtuoso pianist spoke with Leonid personally and offered words of encouragement for his future success.

By nurturing creative potential while carefully preserving tradition, the L.A. Gergieva Children's School of Arts continues its important contribution to the city's cultural life and develops new plans and ideas. Renovation of the historic building's façade – an architectural landmark that once housed Cossack barracks in the late 19th century – is almost complete. The team also hopes to open branches in other districts of the city.



Teachers take pride in their students' many achievements at international, national and regional competitions



AUTHOR

Pavel Kretov

Investing in the Future

Sixty-five years ago, the Kuban Palace of Culture became a focal point for residents of Tsem dolina and the entire Hero City of Novorossiysk. It also became a second home for creatively gifted young people and dedicated, enthusiastic teachers

This year marks another anniversary: in 2016, the Kuban Palace of Culture began working with the Caspian Pipeline Consortium. Major reconstruction funded by CPC enabled the building to be enlarged,

new rooms to be equipped for children's creative activities, a new stage to be built, vandal-proof seats to be installed, and furniture, equipment and musical instruments to be purchased. In 2018, the Russian Ministry of Culture awarded the Caspian Pipeline Consortium the Patron of the Year prize for this project.

"Today no one even remembers that ten years ago the Palace of Culture was closed due to its poor condition", notes Director of the Kuban Palace of Culture Vasily Kiselev. "The building had no heating, no toilets, no rooms for creative activities".

After the renovation was completed in 2018, the Kuban Palace of Culture significantly expanded its role. Today, more than thirty creative and sports groups operate here, with over 400 participants.

Each year, the Palace of Culture hosts more than 380 events: festive programmes, concerts, and educational and entertainment programmes.

Great attention is paid to preserving the distinctive cultures of the district's multi-ethnic population.

In 2025, as part of the Consortium's charitable programme, new seats were installed in the auditorium.



These are proper, comfortable theatre seats where you can watch a performance for hours without getting tired. The number of seats has also increased to 174.

The team and guests of the Kuban Palace of Culture are grateful to CPC for the LED screen and side screens that were purchased. Previously, if a performance required projected images, it was done the old-fashioned way – with a video projector onto a screen, directly over the faces of the performers.

Kuban
Palace of
Culture,
renovated
in 2018

"We installed special software that controls all three screens – the central one and the side screens", continues Vasily Kiselev. "This not only added depth to the stage and made it more contemporary, but also gave us far more



creative possibilities for staging events of all kinds – from concerts to lectures and quizzes”.

In recent years, new furniture has appeared in the classrooms, the foyer has been renovated, and display cases for trophies and awards have been updated. Kuban groups are winning more and more awards as they develop new creative and sports activities and expand the geography of their tours and performances.

Technology for Raevskaya

Another Palace of Culture with which CPC works is located in the village of Raevskaya and is part of the municipal Centralized Club System institution. Surrounded by a park,

Anna
Yusupova,
Director of the
Centralized
Club System



“We also have the Tandem theatre technology studio, the Bagira variety-circus group – the only one of its kind on the entire Russian Black Sea coast – and the Rosinka folk song ensemble and Armenian folk dance ensemble”.

The Palace of Culture regularly hosts concerts, exhibitions, contests, competitions, demonstration classes and open lessons, workshops and much more.

“We support a wide range of activities so that anyone, regardless of age, who comes to the Palace of Culture can find something they enjoy”, notes Artistic Director Yelena Yakimenko.

Until recently, technological support for festive events was a serious issue. But in September 2025, the Raevskaya Palace of Culture received a new LED screen from CPC, making it possible to make fuller use of the creative potential of clubs and amateur groups and to make cultural and public events more spectacular and engaging for young people.

“Now each of our concert numbers has its own video accompaniment, complementing and enhancing the stage image of the creative group”, notes Anna Yusupova, Director of the Centralized Club System. “The new LED screen does not just complement traditional scenery – it virtually replaces it completely, allowing us to change context and setting instantly, create realistic 3D environments, interactive effects with full audience immersion, and save both time and money. Creativity and unconventional thinking are so important in contemporary art, and our teachers set the tone by teaching children to see beauty and create something new. New technologies provide more opportunities for creative development, and for the residents of Raevskaya, CPC has made those opportunities possible”.



New LED
screen on
the stage of
Raevskaya
Palace of
Culture



the building is buzzing with life. People rehearse here, sing and dance there, craft skilful handicrafts somewhere else – children and teachers are equally enthusiastic. The Raevskaya Palace of Culture is home to 46 amateur folk art groups: clubs in various genres and amateur interest associations, with around 1,400 participants.

“Our most distinguished group is the Razdolye folk choir, which tours extensively and has won Grand Prix at international competitions many times”, says Palace of Culture Manager Svetlana Popkova. “The group will celebrate its 40th anniversary in 2027”.

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Pavel Kretov

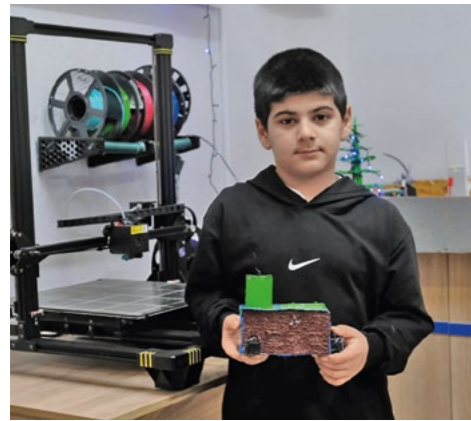


Technology on Wheels

Mobile units – both medical and educational – have long been a hallmark of the Caspian Pipeline Consortium’s charitable work. A trip to Kuban without checking how these vehicles operate would be a luxury CPC Panorama reporters simply could not afford

In early 2024, CPC delivered five Quantorium mobile technoparks to rural districts. This philanthropic initiative, aligned with the national education project, helps bridge the gap between district centres and remote villages in terms of access to high quality modern education.

The mobile Quantoriums are travelling laboratories equipped with powerful computers, 3D printers and other high tech equipment. They have been deployed to the Dinskoy, Kavkazsky, Korenovsky, Krymsky and Tbilissky districts to introduce children from remote communities to the professions of the future.



Future software developer Stepan Sarkisov

Director of the Creativity Centre. “For full immersion, they need to see the results of their work – for example, by making something themselves on a 3D printer”.

Familiarisation with the Quantorium equipment starts with teacher led workshops. There is no pre selection of children by ability or existing skills; the main criterion is desire. After several months of classes, the pupils reach a level that allows them to compete successfully in various tournaments and contests. In 2024, for example, students from Krymsk District took five prize places in a 3D modelling olympiad.



“The whole concept of the Quantorium is early career guidance”, says IT and Computer Science Teacher Yury Ivanov. “Some of the children later go on to study technical subjects and programming because they discovered they really enjoy it”.

Yury works with both senior and junior student groups. The children learn programming basics in their personal accounts on the RoboMind online platform, and they study 3D modelling using the specialist Tinkercad program.

The classrooms are lively and noisy. Students excitedly talk over one another about their projects: steam power plants, wind turbines, self made games and virtual worlds.

“I’ve been taking part for about two years, and I especially like programming”, says Stepan Sarkisov. “I’ve already created games – quests and car racing simulators. I want to become a programmer, because it’s a very in demand profession”.

His friend Dmitry Petrovichev sees his future in engineering and invention.

“I dream of creating robots that can help people”, the 10 year old student admits.

Although Yevgeniya Yakovenko has already completed 37 levels in RoboMind, she does not want to become a programmer. She sees her calling in teaching and wants to work as a primary school teacher.



Yevgeniya Yakovenko is going to become a teacher

At the heart of the project is not just showcasing modern equipment, but a structured, long term educational programme. Over six months, teachers manage to work in two rural schools, giving children the opportunity to immerse themselves deeply in the subject. For a time, the Quantorium’s advanced equipment supplements the schools’ existing resources.

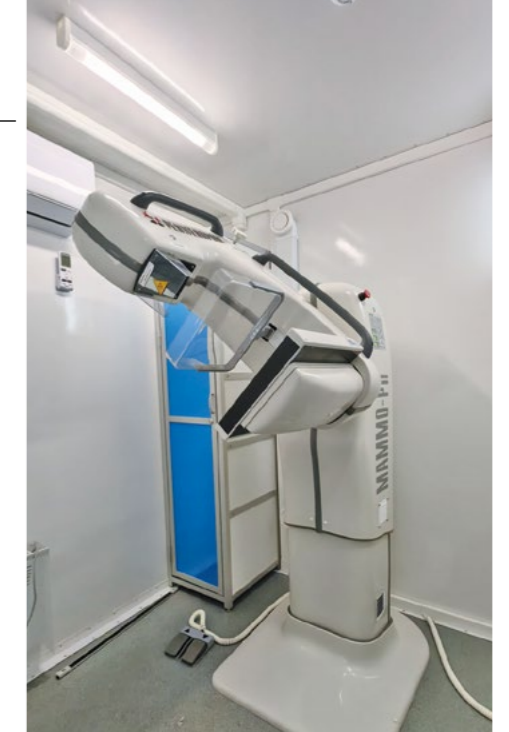
We see the first Quantorium in Krymsk, parked beside the town’s Creativity Centre. The six metre Atlant van is empty inside: all the laptops, printers and multifunction printers (MFPs) have been moved into classrooms, where the younger generation is enthusiastically mastering them.

“There is no point bringing a mobile unit for just two weeks – the children simply do not have time to get to grips with the new technology”, explains Galina Romanova,



Over two years behind the wheel of the Quantorium, driver Vladimir Ilyaev has clocked up about 8,000 km. In addition to schools in Krymsk District, he has taken the equipment to competitions in Krasnodar and Gelendzhik.

“It’s a very reliable vehicle; it holds the road perfectly”, Vladimir notes. “All the equipment inside is additionally secured so it doesn’t get shaken around”.



Protecting Health

In the medical sphere, CPC’s charitable support can be measured in kilometres travelled and in lives saved. Every working day, a white KAMAZ truck bearing medical markings and the Consortium’s logo sets off on a new route, bringing timely diagnosis and hope to remote corners of Kuban. In 2025, CPC made a unique donation to the Severskaya Central District Hospital: a mobile diagnostic unit. It is a fully fledged mobile medical room equipped with a modern digital fluorography unit and a digital mammography unit. It travels between villages and hamlets so that every resident can undergo vital screening without having to go to the district centre.

The significance of the project is evident from the figures provided by Severskaya CDH Deputy Chief Physician Tatyana Ishchenko. About 125,000 people live in the district, of whom 98,000 are adults. At the same time, the two stationary fluorography units and the single mammography unit are operating at over 100% of their nominal capacity.

The mobile unit is designed for 44 examinations per day. The new generation digital mammography unit can take images in several projections, which is critical for early diagnosis. Thanks to this capability, cancers are now more often detected at stages I and II, when treatment is most effective.

“Indicators for early detection have improved significantly. Treatment has become shorter, with a far better prognosis”, emphasises the Deputy Chief Physician.

Inside the spacious van, patients are seen one after another by Radiologist Tamara Savenko. She speaks warmly about her

The mobile unit is equipped with a fluorography unit and a mammography unit

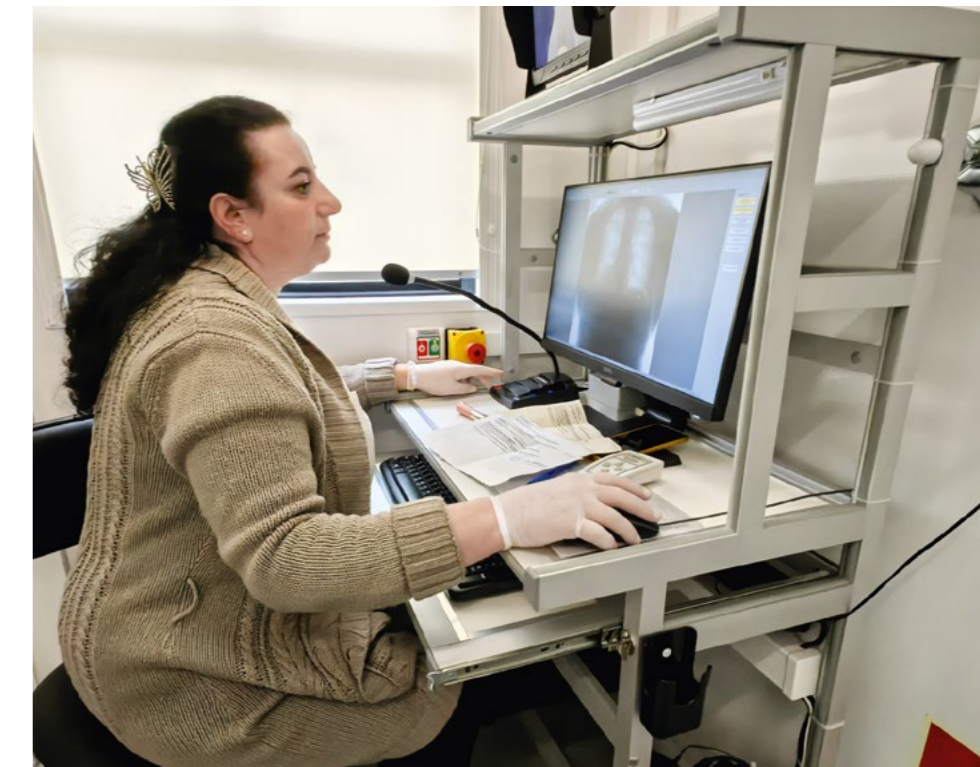
Patients are examined by Radiologist Tamara Savenko in the mobile diagnostic unit.

mobile consulting room: it has air conditioning, heating and even convenient coat racks for patients’ clothes. The equipment can be adjusted for each patient with a single movement.

Tamara pays particular attention to safety. During the procedure, she monitors the patient via a video camera. “People react differently to enclosed spaces, especially elderly patients. I am always in contact and keep a close eye on their condition”, she notes.

The unit has been a real lifeline for people with reduced mobility. Schoolchildren and their parents have also appreciated diagnostics on wheels: adolescent screening can now be done without interrupting the school day.

Just like the Quantoriums, mobile diagnostic units play an important social role: they make the most advanced technologies accessible to everyone, regardless of where they live.



A New Reality

Continuing the theme of colleagues' sporting interests, and paraphrasing a well-known entertainer, I can say with confidence: snowboarding is good, an alpenstock is good, but a via ferrata is better. At the editor's request, I am sharing my experience of tackling some routes that will appeal to anyone who enjoys an active holiday in southern Russia

Via ferrata (Italian for "iron path") is a mountain route equipped with cables and metal rungs that make it easier to move along sheer rock faces. The sport dates back to the First World War, when Italian and Austro-Hungarian mountain troops needed to create routes through the Alps for moving weapons, ammunition and supplies.

If you are brave, agile and properly equipped, you can climb, descend and traverse rocks horizontally, cross chasms Batman-style on a zip-line cable, and cross mountain rivers on a steel bridge like Indiana Jones. You do not need to go far: a 300-metre via ferrata sits at an altitude of 840 m at Guamka in Apsheronsky District, about 140 km from Tuapse.

The first time I visited Guamka, it was not for fun: I was trying to overcome acrophobia, or fear of heights. After a briefing, my husband, the other tourists and I were issued safety equipment: two special via ferrata lanyards with shock absorbers to cushion the impact of a fall, and a climbing helmet. It is important to understand that other types of helmets will not do – they are designed for different types of impacts. Gloves are also essential: they protect your palms from blisters and sharp burrs on the steel cable.

The instructor kept a close eye on the novices to make sure that, as we moved from rung to rung on the rock face, we clipped and unclipped the two lanyards in sequence. He did not just demonstrate the technique – he assessed participants' readiness and knew what to do in unexpected situations.

The critical moment came when my husband advised me not to look down. Naturally, I did exactly that. Panic seized me; my hands and legs began to shake convulsively. There was no option to go back down – there were ten of us on the rope. I had to overcome my phobias on my own and steel myself to continue the route.

I conquered my fear and reached the summit. It was probably the biggest adrenaline rush of my life. Immediately after the ascent, we had to cross from one ridge to another on a zip line over a gorge more than 200 m deep, but by then heights no longer frightened me.

Later I tackled via ferratas many times in the Caucasus and in Crimea, but the most emotional and memorable was that very first time. And now, whenever I face difficult situations in life that require willpower and intense concentration, I think back to that rock face: if I could do it then, I can handle this now.

Abseiling and caving

My next mountain activity was abseiling – or, in technical terms, the Dülfer rappel. What is it like? Everyone has seen rope-access technicians descending from building roofs and washing windows. It is the same thing, only in the mountains. The rope is secured to a reliable anchor at the top and threaded through a belay device attached to the main loop of the harness with a locking carabiner. By applying slight pressure with the lower hand on the rope below the device, you can ensure a safe and controlled descent. Some cliff tops have permanent abseil stations, especially coastal crags. In other situations – say, if the weather suddenly deteriorates or you have misjudged the difficulty of the route – abseiling may be the only way down to the base of the cliff.

I can confidently say that the most interesting abseil route in southern Russia, with fabulous scenery and

For novice cavers, I would strongly recommend going into caves only with people who know the route well. It is like travelling to another world with its own rules

incredible descents, is the Miskhor Grottoes in Crimea. We did this route accompanied by professional rescuers from the Ministry of Emergency Situations, who run training sessions for interested participants in their free time. We descended in several stages from an enormous height of 990 m. The first time, of course, it was terrifying to take that first step into the void, but by the second or third descent confidence came, and with it, enjoyment – both of the process itself and of the chance to see coastal landscapes inaccessible to ordinary tourists. Experiences like that are truly priceless.

As with belaying on an ascent, when abseiling there is an active, or “braking”, hand, which is placed on the rope below the descender and controls the descent, and a “guide” hand, which always remains above the abseiler’s torso.

Climbing and abseiling in the mountains taught me that, however much you trust your instructor, it is vital to understand clearly how all the equipment works yourself. To know how to clip and unclip carabiners efficiently so you are never left unprotected even for a second; to assess risks and be aware of the consequences.

While abseiling has been known and popular in Russia since the film *Kidnapping, Caucasian Style*, caving – that is, descending into vertical caves – is a relatively new sport. The thing is, apart from caves accessible on foot, there are also those you can only reach by abseiling. During one trip to Crimea, we met professional cavers who introduced us to this activity. Caves have always fascinated me; there is something mysterious and primeval about them, but the experience of visiting tourist caves does not compare in any way with exploring undeveloped ones.... We abseiled about 22 m down into Gugerdzhih Cave (roughly six storeys).

You cannot descend into cave shafts without first mastering the technique of ascending – jumaring. Under the guidance of an experienced instructor, we first practised on a tree. A jumar is a mechanical cam-type ascender. At the heart of the design is a special eccentric mechanism. When the jumar moves up the rope, the spiked cam slides freely. When pulled in the opposite direction, the spikes bite into the rope and press it

against the inner wall of the mechanism, locking it in place. This makes it possible to use the jumar for ascent.

For novice cavers, I would strongly recommend going into caves only with people who know the route well. It is like travelling to another world with its own rules. People with claustrophobia should not go: narrow passages, complete darkness and absolute silence are a serious test for the psyche. Choose sturdy, close-fitting clothing that does not restrict movement, but remember that caves are quite cool all year round. Never skip the helmet. A falling rock or a careless bump of the head against the ceiling can be fatal. Even for a short descent, take two

independent torches (a headlamp and a handheld) with triple the battery supply you think you will need.

With my abseiling experience, I found the descent into my first cave relatively easy. The ascent, naturally, was more difficult. Tourist caves may be more beautiful, with lighting and walkways, but nothing compares with the atmosphere of underground spaces visited only by professional cavers.

Safety rules

It is worth emphasizing: when preparing for a mountain trip, study the weather forecast carefully. Rain is dangerous; mountain rivers fill rapidly. If the weather

suddenly turns bad, if you are tired, or if something goes wrong, it is better to turn back.

Good trekking footwear is essential in any case. For via ferratas and caving, hiking boots with grip-giving tread that also support the ankle work equally well.

What else should you take on a mountain trip? My minimum kit includes water, a first-aid kit, a small but calorie-rich food supply, a rain jacket, and clothing that allows you to layer up in the off-season.

The question of personally notifying the emergency services (when, where, for how long) does not usually arise when you are part of an organized tourist group. But it makes sense to let relatives know, and if you are on a “wild” tour it is worth checking that the organizers have contact with the emergency services and radio communication, given that mobile phones generally do not work in the mountains.

As you pack your rucksack, remember: in the mountains and in caves, you can rely only on yourself. You must accurately assess your own capabilities. Respect the forces of nature, which do not forgive mistakes. Follow your instructor’s directions unquestioningly and observe safety rules. Then even “adrenaline” trips will not be a test of survival, but a wonderful break, a source of self-confidence and vivid memories.

Safe Work Culture News

CPC Panorama presents the Safe Work Culture Leaders for Q4 2025: employees of the Consortium and contractor organisations



Denis Shkarupa,
Instrumentation Technician,
PS-5

He noticed that scaffolding near the cable rack had been installed directly on the ground without a proper base, causing it to settle and creating a risk of collapse. Work was immediately stopped, he spoke with the contractor's responsible representative, and the structure was then reinforced with additional supports.



Roman Melnikov,
Foreman, STARSTROY
LLC, PS-7

Site management and operations personnel have repeatedly noted the high quality, level of detail and effectiveness of the briefings that Foreman Roman Melnikov delivers before work begins.



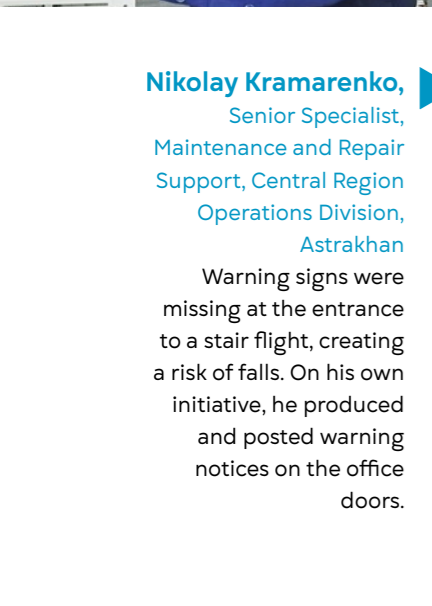
Website - CPC Panorama
<https://cpc-online.ru/>



"CPC Panorama" - VK



"CPC Panorama" - Zen



Nikolay Kramarenko,
Senior Specialist,
Maintenance and Repair
Support, Central Region
Operations Division,
Astrakhan

Warning signs were missing at the entrance to a stair flight, creating a risk of falls. On his own initiative, he produced and posted warning notices on the office doors.



Temirbek Jarylgasov,
Operator, PS Isatay

He carried out the highest number of Leadership Practices in CPC's East Region, demonstrating a conscious commitment to Safe Work Culture values.



Anton Lyashko,
Operator, Process
Installation,
Marine Terminal

He stopped unsafe actions by a truck driver, explaining that moving and manoeuvring oversized equipment without an escort by the person responsible for safe work is unacceptable.



Yury Vidus,
Lead Specialist, Mooring,
Transneft-Service LLC

He noticed that a tanker crew member was working at height without a safety harness. He identified the violation, stopped the work and spoke with the crew about the risks.



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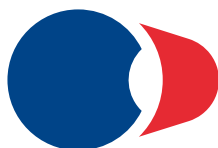
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