

# PANORAMA



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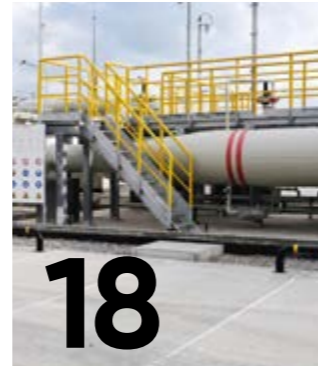
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**Dear colleagues and friends!**

**P**lease accept my sincere and heartfelt congratulations  
on the upcoming year 2026!

This past year, the Caspian Pipeline Consortium pumped and delivered its billionth ton of oil to world markets since the start of the operations. We've added another outstanding chapter to CPC's history!

The modernization of the pipeline system continues: caisson anchors for the new single point moorings at the Marine Terminal have been installed on schedule, and a major contract has been signed for the manufacture of main pump units with electric motor drives as part of the project to replace the gas turbine equipment at pump stations with these systems. Much has already been accomplished by our cohesive team as part of our production programs and current projects, and much remains to be done. This includes the replacement of two SPMs, the External Power Supply project, and much more.

It is worth noting that the Consortium is taking new steps in its development under special geopolitical conditions that affect the operations of all energy companies and the oil and gas industry as a whole. At the same time, we are witnessing how external circumstances are shaping a new stage in the development of science and industry, new technical solutions, safety methodologies and algorithms – and we are not just witnessing this, but creating and improving them! The challenges of our time are being successfully met by the responsible attitude toward work of all members of our team, all our field specialists who are accustomed to prioritizing production tasks, whose strength lies in spirit and tradition.

In 2025, we were united not only by shared challenges and achievements, but also by the memory of the Great Victory, which lives on in every family of CPC employees, in Russia and Kazakhstan. Under the banner of the 80th anniversary of Victory in the Great Patriotic War, we held our “CPC for Talented Children 2025. Wings of Victory” competition, which set another record for the number of participants, and the “Novorossiysk Chimes” festival, which this year received an expanded multi-day format. A number of materials dedicated to the Great Victory have also been prepared and published.

As this year passes the torch to the next, the Consortium will celebrate its 30th anniversary. I wish you to welcome the new year of 2026 surrounded by family and loved ones, in a festive mood, with new hopes, dreams and plans that will surely come true and be realized. I wish you all good health, good luck and happiness! Happy New Year!

**N. N. Gorban**  
General Director  
Caspian Pipeline Consortium



In the fall of 2025, the total volume of oil pumped through the CPC pipeline system over the company's operating history reached the billion-ton mark. Having loaded the billionth ton from one of the single point moorings at the Marine Terminal near Novorossiysk, the Caspian Pipeline Consortium continued its work, moving closer to another annual record with each passing day and each tanker filled

AUTHOR  
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# A billion tons

If a billion tons of oil were poured into railway tank cars, such a train would circle the Earth five times along the equator. The Consortium has been building up transportation and loading volumes consistently and steadily. Operation of the Tengiz – Novorossiysk pipeline system began at the end of 2001, and by mid-2004 CPC had already reached the full throughput capacity of the first development stage – 28.2 million tons per year. From 2005, the Consortium gradually increased transportation volumes, which reached 35 million tons per year in 2010.

At the meeting with the Western Region team



In 2011, the CPC Pipeline System Expansion Project was launched. Phased commissioning of new facilities made it possible to gradually increase oil transportation volumes through the pipeline. In 2014, more than 40 million tons were shipped through the CPC Marine Terminal.

In 2016, the Consortium shipped 44.3 million tons of oil to world markets. That year, the offshore Kashagan field was added to the major onshore fields in Kazakhstan – Tengiz and Karachaganak – as well as the Russian offshore Filanovsky and Korchagin fields.

With the increase in pumping volumes, the half-billionth ton of oil was loaded as early as August 2017. In 2019, the Debottlenecking Program was launched, and its successful implementation allowed the throughput capacity of the CPC pipeline to be increased to 72.5 million tons per year on the territory of the Republic of Kazakhstan and up to 82 million tons per year for the system as a whole by the end of 2022.

### Course for Acceleration

While it took 16 years to cover the distance from 0 to 500,000,000, the Consortium's team covered the second half of the journey



Awarded employees of the Marine Terminal

to the billionth ton in eight years. The global pandemic, increasingly frequent autumn-winter storms in recent years, and other challenges of our time certainly took their toll but did not have a critical impact on the stability of the CPC pipeline system's operation. Currently, the average monthly loading volume is 6 million tons. The stability, cost, and logistics of deliveries remain the clear choice for exporters.

In October 2025, meetings between the Consortium's management and employees were held at CPC production facilities, dedicated to crossing the billion-ton milestone in pumping and loading. On October 8, at the Eastern Region office in Atyrau, CPC General Director Nikolay Gorban presented departmental and corporate awards to the most distinguished employees: medals from the Ministry of Energy of the Republic of Kazakhstan "Mynai-gaz keshenin damytufa koskan ylesi yshin" ("For Contribution to the Development of the Oil and Gas Complex"), "Енбек ардагері" medals ("Labor Veteran"), and commemorative pins "Billionth Ton of Oil". The corporate commemorative pin "Billionth Ton of Oil", presented to employees of CPC-R JSC and CPC-K JSC, is made from fragments

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of the pipeline that pumped oil from Tengiz to Novorossiysk for decades and was then extracted from the ground as part of a scheduled replacement. For a pipeline worker, this cleaned and polished steel is worth more than gold. "Back in the 1990s, experts called our pipeline system a route into the 21st century, and now the Consortium's team has proven by their work that they were not wrong in their assessment of the project's role and scale. We will continue to implement all strategic objectives: CPC will continue to develop as a safe, efficient, and economically advantageous route for oil delivery to markets", noted CPC General Director Nikolay Gorban at the awards ceremony. On October 27 in Astrakhan, at a meeting with the Central Region team, the Consortium's head presented departmental and corporate awards to the most distinguished employees of the Central Region. The transportation of the billionth ton of oil through the CPC pipeline system was recognized by the Ministry of Energy of the Russian Federation, and in honor of this, a number of CPC-R JSC employees received letters of gratitude and certificates of honor from the ministry.



Meeting with the Central Region team

On October 28 in Krasnodar, letters of gratitude and certificates of honor from the Ministry of Energy of Russia, as well as the corporate commemorative pin "Billionth Ton of Oil", were awarded to the most distinguished employees of the CPC Western Region. Their colleagues in Novorossiysk received awards the following day, October 29. "The billionth ton of oil is a landmark achievement for the company and the fruit of our entire team's work", commented CPC General Director Nikolay Gorban on the award presentation. "We live and work in different regions and different countries, but our attitude toward work is unified: high professionalism, responsible attitude toward our duties, commitment to the values of Safe Work Culture".



## AUTHOR

Dmitry Konstantinov

# Building the Energy of the Future Together

The VIII International Russian Energy Week Forum took place in Moscow on October 15–17, 2025. CPC traditionally partnered in organizing the event

The year's flagship industry event showcased the development prospects for Russia's fuel and energy complex and the potential for international cooperation. Russian Energy Week (REW) adopted "Building the Energy of the Future Together" as its main theme. REW-2025 venues included the Manege Central Exhibition Hall, which hosted the business

program, and Gostiny Dvor, where the equipment and technology exhibition took place.

The REW business program annually addresses strategically important issues in global energy development and Russia's fuel and energy complex, bringing together government representatives, business leaders, and members of the scientific



Фото Кирилла Казачкова



and expert communities. This year's panel discussions explored energy's role in improving people's well-being and quality of life, ensuring technological sovereignty, developing human resources, overcoming geopolitical challenges, and building partnerships based on equality and mutual benefit.

"This kind of dialogue is especially important given the intensive, fundamental changes taking place in the global market – changes that energy and service companies, energy suppliers and consumers, and even entire nations are experiencing today" Russian Federation President Vladimir Putin emphasized at the plenary session on October 16.

That same day, as part of the Russian Energy Week business program, Nikolay Gorban, General Director of CPC-R JSC, and Dmitry Tumanov, General Director of Ural Dynamic Machines LLC (the managing organization of Russian Electric Motors JSC), signed a contract for manufacturing, supplying, supervising the installation, and commissioning main pump units with integrated oil systems.

This equipment forms part of CPC's program to replace gas turbine-driven MPUs with domestically produced electric motor-driven main pump units. Earlier, on March 12–13, 2025, a prototype manufactured by Russian Electric Motors JSC for CPC successfully completed testing.

The replacement program for gas turbine-driven main pump units on Russian territory will cover three stations: A-PS-4A, Komsomolskaya PS, and Kropotkinskaya PS. Like other Consortium stations, these pump stations will each receive four VFD block boxes and additional cable lines.

Under the program, CPC contractors will lay high-voltage overhead lines (110 kV) and build substations (110 kV) for A-PS-4A and Kropotkinskaya PS. The high-voltage line for A-PS-4A is expected to span 55 km, while the line for Kropotkinskaya PS will run 11 km. Rosseti PJSC will develop external power supply facilities for Komsomolskaya PS using CPC-R JSC funding.

More than 50 domestic and foreign companies – manufacturers, developers, and suppliers – participated in the fuel and energy complex equipment and technology exhibition held during Russian Energy Week. The advanced technological solutions, projects, and innovative products presented at exhibition stands, round tables, and seminars aimed to unite key industry players in developing the fuel and energy complex, enhancing its efficiency and reliability, and identifying priority areas for import substitution of critical equipment and technologies. The CPC delegation, comprising managers and employees from operations, construction project preparation and implementation, and other company divisions, toured the exhibition and took part in business program events.



## A Scientific Approach to Safety

On October 23, 2025, a scientific and technical conference of the Interdepartmental Expert Council on the Safety of Subsea Pipelines and Facilities took place in Moscow. In his welcoming remarks to the conference participants, Senator of the Russian Federation and Hero of Russia Yuri Nimchenko emphasized that protecting subsea pipelines from failures, accidents, and disasters is a matter of national security. Chairman of the Interdepartmental Expert Council, Corresponding Member of the Russian Academy of Sciences Nikolay Makhutov, and President of the Russian Oil and Gas Industrialists Union Gennady Shmal also took part in opening the conference program.

The conference focused particularly on the discussion of the draft Federal Law “On Marine Oil and Gas Facilities and Amendments to Certain Legislative Acts of the Russian Federation” and related current issues of safety of subsea pipelines and facilities under modern conditions. In total, 24 reports and presentations were heard and discussed in the sections “Regulatory Framework for the Safety of Marine Oil and Gas Facilities”, “Service Life, Integrity, and Safety of Subsea Pipelines and Facilities”, and “Underwater Robotics for Monitoring and Mitigating Anthropogenic Threats”.

Reports and presentations were made by heads and specialists from Rostekhnadzor, Russian Maritime Register of Shipping, Gubkin Russian State University of Oil and Gas (National Research University), Peter the Great St. Petersburg Polytechnic University, CPC-R JSC, Gazprom PJSC, Kurs Central Research Institute JSC, NGB-

Energodiagnostika LLC, Oceanos NPP JSC, as well as other organizations and agencies.

In the report by CPC General Director Nikolay Gorban “Developing Safety Systems for Marine Oil Terminals Based on the ‘Technogenic Security’ Concept” three levels of marine oil terminal safety assurance were examined, along with risk forecasting and accumulated damage assessment methodologies, modeling of physical processes using neural network technologies and regression analysis. The developed modular predictive monitoring system for the technical condition of marine oil terminals helps ensure stable and reliable operation by making timely management decisions on decommissioning, repair, maintenance, and diagnostics of various system components.

The presentation drew considerable interest among the conference audience. During the discussion, participants noted that, in particular, that the predictive monitoring system for technical condition is applicable not only to marine terminals but also to other hydrocarbon transportation facilities.

Based on the conference results, it was decided to prepare and submit proposals on key scientific and technical aspects required for implementing the Federal Law “On the Safety of Marine Oil and Gas Facilities and Amendments to Certain Legislative Acts of the Russian Federation” to the Federation Council, the Maritime Board, and the Ministry of Industry and Trade. The next session of the Interdepartmental Expert Council will take place in Moscow in October 2026.

### AUTHOR

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# Methods for Building a Safety System for Marine Oil Terminals Based on the Concept of “Technogenic Security”

This article presents the main provisions of the report of the same name, delivered at the scientific and practical conference of the Interdepartmental Expert Council on the Safety of Subsea Pipelines and Facilities

Marine transport has been playing a key role in the development of Russia’s hydrocarbon exports in recent years. The development of marine terminal infrastructure, including the construction and modernization of these facilities, is a priority task for the Russia’s oil industry in the Energy Strategy of the Russian Federation for the period up to 2050. Marine terminals in 2024 shipped about 195 million tons of oil and petroleum products,

accounting for 80% of the total export volume. In the same year, the Caspian Pipeline Consortium loaded 63.5 million tons of oil onto sea tankers from the single point moorings of the Marine Terminal near Novorossiysk.

The term “marine oil terminal” refers to the entire complex of technological facilities that ensure the transshipment of oil to tankers: feed pipelines and/or railway unloading racks, storage tanks, oil metering units, connecting technological pipelines, mooring facilities (shore berths, piers, single point moorings), underwater pipelines for connecting shore facilities with single point moorings, tanker loading systems, auxiliary vessel berths, auxiliary buildings and structures, supervisory control and data acquisition systems, communication systems, etc.

Over time, marine terminals are becoming increasingly technically complex. As transportation infrastructure facilities, they uniquely combine high potential accident damage with an extremely low accident rate. The reliability and safety of terminals, as well as their accident-free operation, are the top priority for operating organizations.



### Applicability of Traditional Approaches

State and international standards, as well as enterprise standards, rules, and regulations currently provide for three levels of safety assurance for technogenic facilities, which include marine oil terminals.

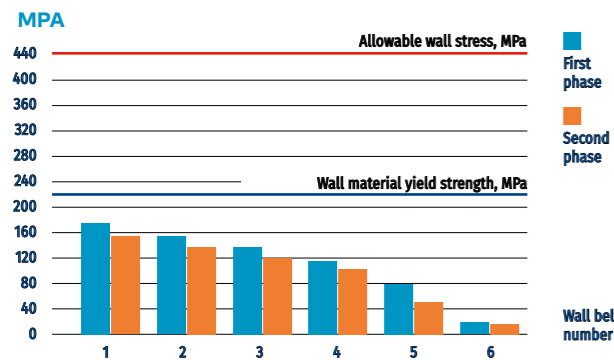
The first level involves the use of code-prescribed safety factors (reliability) for materials, loads, reliability, and structural responsibility in design calculations.

The application of this method for substantiating the safety of major construction projects remains the main tool in designing structures, buildings, and facilities of the oil and gas complex. The safety level at this stage is established through the application of reliability factors that ensure compliance with constraints in situations of uncertainty regarding the strength characteristics of materials and the loading level of structures. The criteria for substantiating reliability factors are allowable stresses, destructive loads, and limit states of structures.

A fundamental limitation in applying the first-level methodology is the impossibility of continuously increasing the reliability factor. A comparison of two different tanks of identical functional purpose and design shows that increasing wall thickness through the use of higher reliability factor values, beyond a certain level, does not lead to increased operational reliability. An example can be found in the tanks at the CPC-R JSC Marine Terminal from the first and second phases, which differ in design wall thickness.

It is obvious that the stresses in the wall of the second-phase tanks are lower (Chart 1) than the stresses in the wall of the first phase. However, for both the first and second phases, the actual stress values are within acceptable limits according to both GOST 31385-2023 and API 650. Increasing reliability factors at the design stage works within certain limits, after which it no longer has a significant impact on the reliability and safety level of structures but substantially increases their steel consumption content and capital costs.

CHART 1 ACTUAL MID-WALL EQUIVALENT STRESSES, MPA



The second level of technogenic facility safety assurance is based on reliability calculations that determine either safe residual life or probabilities of failure-free operation. As a rule, these calculations are performed within the framework of verification calculations for the most

critical facilities operating under conditions of high levels of loads and impacts, or when it is necessary to extend the design service life of a facility. The implementation of such an approach in reliability calculations is most effective when statistical data on failure rates is available for facilities that are homogeneous in terms of design solutions, technological modes, and operating conditions. For marine oil terminals, there is no reliable accident statistics, and consequently, it is impossible to build a statistically representative sample and obtain adequate probabilistic estimates of structural and equipment element failures.

It is also impossible for marine terminals to apply generalized statistical data, for example, on tank accident rates, which are presented in Rostekhnadzor's methodological recommendations, among other sources. Information on frequencies of accidental depressurization of typical hazardous production facility equipment for tanks of various designs was obtained by Rostekhnadzor by analyzing failure and accident statistics on tanks at pump stations and linear production dispatch stations of trunk pipelines with static loading mode. Marine oil terminal tanks operate under a different loading mode (cyclic), and data on average accident rates for trunk transport tanks cannot be applied to them.

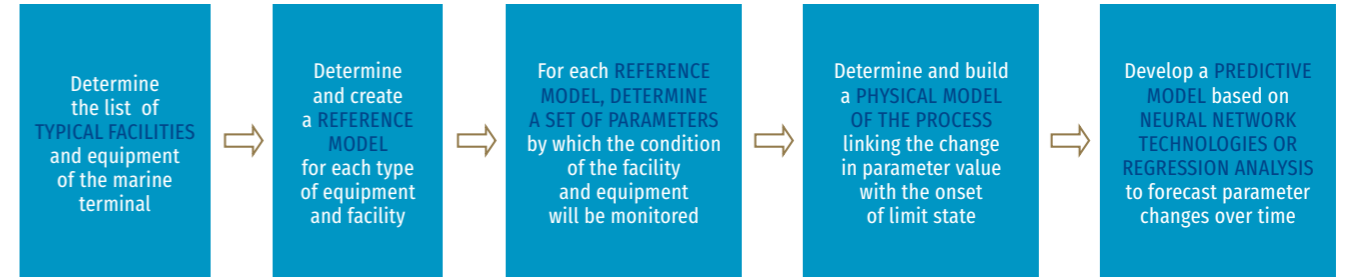
The third level of technogenic facility safety assurance is based on calculating risk value, which is an integral assessment of the probability of an accident scenario occurring and the scale of its consequences. The risk-based inspection method primarily requires identifying a specific mechanism or accident scenario by which failure will occur and whose probability of occurrence, accordingly, will be calculated.

When substantiating the necessary safety level using this method, two non-trivial tasks arise. The first involves determining the accident risk for a specific facility under given operating conditions. For unique and technically complex facilities such as marine terminals, applying risk-based methodology to manage their technical condition is not optimal, since estimates of the probability of an accident scenario occurring are formulated based on a precedent approach, which is impractical with limited or absent statistical failure data.

The second task is to determine the acceptable or tolerable risk level. For unique and technically complex facilities such as marine terminals, any low-probability accident event entails large-scale damage and is therefore unacceptable.

A technical diagnostics and repair system has been created and operates at all CPC facilities, with constant readiness of emergency response units maintained through conducting at least 10 major oil spill response and fire suppression drills per year. The presence of the above systems nevertheless does not completely exclude the possibility of an emergency situation. Should an accident occur at the Marine Terminal, even with extremely low probability and prompt response

DIAGRAM 1



to contain and eliminate its consequences, it would typically result in significant damage.

### Hazard Class and Security Concept

Retrospective studies of various technical condition management systems for hazardous production facilities show that the most promising methodological recommendations for marine oil terminals are those presented in scientific works by a team of authors led by Corresponding Member of the Russian Academy of Sciences Nikolay Andreevich Makhutov: "Current Problems of Safety of Critical and Strategically Critical Facilities" (2018) and "Ensuring Safety - A Priority Direction in Fundamental and Applied Research" (2013).

The classification of facilities by hazard classes proposed in these works formed the basis for the classification of emergencies adopted in the Russian Federation in RF Government Decree No. 304 of May 21, 2007 "On the Classification of Natural and Technogenic Emergency Situations". According to this approach, a marine oil terminal is clearly classified as a strategic hazard class facility based on the potential damage level in case of an accident.

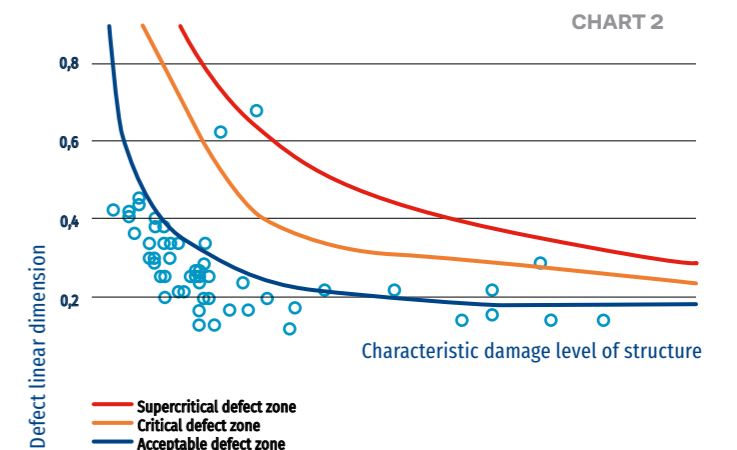
For facilities belonging to critical and strategic hazard classes, the most preferable of all options is building a safety system based on the concept of protection from technogenic catastrophes. When building a technical condition management system based on the concept of protection from technogenic catastrophes, the approach assumes that damage accumulates in the facility during operation. To ensure safe operation of such structures, any deviation of the facility from design parameters (cracks, deformations, metal loss, reduction in material characteristics, etc.), including acceptable deviations, must be monitored and controlled, not just critical damage corresponding to reaching limit states.

To date, no specific implementation algorithms have been developed for strategic and critical hazard class facilities. This article proposes implementing the concept of protection from technogenic catastrophes (Diagram 1) based on building a digital twin of a strategic and critical hazard class facility, which is based on a predictive monitoring system for accumulated defects. This system tracks the condition of main equipment and structures of marine oil terminals, identifies the emergence and development of negative processes at early stages, and predicts defect development based on analysis of current data received in real time.

To implement the concept of protection from technogenic catastrophes when developing an effective system for monitoring and assessing the technical condition of marine oil terminals, we propose introducing into practice the concept of "facility degradation", understood as a measure characterizing the deviation of the facility's condition from the design state taking into account all accumulated damage. Damage is understood as any deviation of the facility from design parameters (cracks, deformations, metal loss, reduction in material characteristics, etc.), including acceptable deviations.

To quantify facility degradation, the concept of "accumulated damage" is introduced, representing a function built on the basis of neural network technologies or regression analysis and depending on the forecast time period, actual values of accumulated damage, and the dynamics of accumulated damage development in previous time periods.

Predictive analysis of structural degradation serves a function similar to the defect detection function in the risk-based approach. However, if the basic element of the risk-based approach is assessing the probability of critical defect failure, then the technogenic security concept uses the accumulated damage indicator for all detected structural defects. This methodology based on the damage accumulation mechanism takes into account all detected defects and assesses their contribution to the integral parameter of accumulated structural damage. The damage accumulation process can be represented as a trajectory determined by facility operation parameters: number of cycles, stress level, defectiveness, geometry changes, wall thinning, etc. (Chart 2).



**Methodology**

An example of a damage accumulation mechanism is the accumulated fatigue assessment methodology for predicting the technical condition of Marine Terminal tanks according to the low-cycle fatigue criterion. The level of accumulated damage according to the Palmgren-Miner criterion for the i-th defect is determined by the formula.

$$D_i = \sum_{i=1}^j \frac{N_i}{N_{i,kp}}$$

The damage accumulation curve is constructed from the results of periodic or continuous measurements of the parameter under study. The horizontal axis shows the facility's life cycle divided into n diagnostic periods, while the vertical axis shows the damage accumulation scale on which various levels are marked.

The CPC Marine Terminal Tank Farm is one of Russia's largest oil storage facilities with a total capacity of 1 million tons. Ten SVFRT-100000 tanks equipped with an automatic fire suppression system are located in robust containment dikes capable of containing 120% of each tank's contents. To prevent oil vapors from entering the atmosphere, the tanks are equipped with floating roofs with a high-density rigid secondary seal.

Due to the elevation difference between the Tank Farm (TF) and Shore Facilities (SF) of the Marine Terminal, oil from TF tanks flows by gravity through an inter-site pipeline to SF and then through underwater pipelines to single point moorings (SPMs), where it is then loaded into tanker vessels through two floating loading hoses. Maximum loading capacity reaches 12,700 m<sup>3</sup>/h.

When designing an oil and petroleum products terminal, according to SP 350.1326000.2018, measures are provided to prevent oil cargo spills and water area pollution. The terminal's moorings are equipped with devices preventing oil and petroleum products from entering the water; spill response kits for containing and cleaning up oil and petroleum product spills; blocking devices that automatically stop oil transfer in case of connection rupture or other emergency situations.

Devices for collecting and removing spilled cargo and oil-contaminated water are provided in combination with the overall complex of measures to prevent water area pollution designed for this port (emergency pressure relief system, boom barriers, floating craft, etc.), in compliance with current environmental protection norms and rules and requirements of the International MARPOL Convention. Technological solutions for ensuring explosion and fire safety at the terminal are aimed at preventing exceedance of acceptable fire risk values established by Federal Law No. 123-FZ of July 22, 2008, and preventing harm to terminal personnel and

tanker crews as a result of explosion or fire. Risk-based inspection is implemented in accordance with API 580 and API 581 standards, as well as ASME PCC-3.

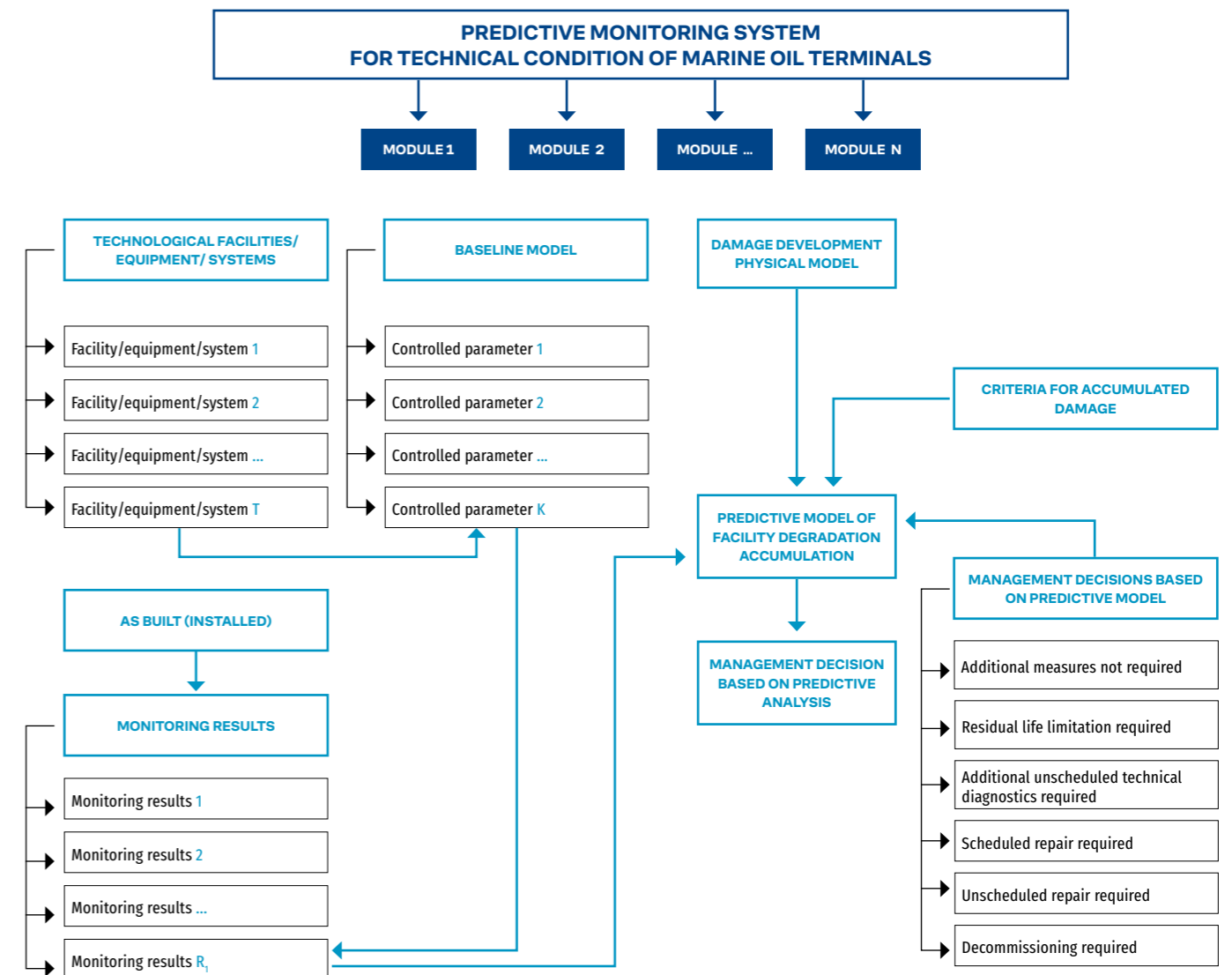
Implementation of the technogenic security methodology will require ranking hazardous production facilities within the CPC pipeline system and identifying those of the appropriate hazard class whose technical devices, buildings, and structures need to be protected using this methodology. It should be kept in mind that at strategic hazard class facilities, it will be necessary to formalize the list of buildings, structures, and devices requiring implementation of the technogenic security methodology. The remaining equipment and devices will be operated as before, either based on the limit states methodology for those facilities whose failure does not cause accidents or incidents, or based on risk management methodology for facilities whose failure definitely leads to an accident or incident, but the scale of such an accident does not meet the strategic hazard class criterion.

**Predictive Monitoring System**

To implement the technogenic security methodology, we propose supplementing the industrial safety management system for marine oil terminals existing in operating organizations with a new structural element for monitoring the technical condition of facilities, structures, and equipment – a predictive monitoring system for technical condition. The proposed system (Diagram 2) functions simultaneously and in conjunction with the maintenance and repair system currently used by operating organizations, which operates in accordance with government regulations and technical standards of the operating organization. Within this system, technological facilities/equipment/systems are considered and assessed which, upon reaching limit state, may cause emergency situations at the marine oil terminal. The list of technological facilities/equipment/systems considered by the predictive monitoring system for technical condition is determined by the potentially high cost of implementing such a system and the economic efficiency of its operation.

A group of submodules of the proposed system is designed to accumulate and systematize diagnostic information about the facility's condition and link this information to a specific unit of equipment, building, or structure. Using the "Technological Facilities" submodule, among all equipment, buildings, structures, and systems of the Marine Terminal, only those facilities will be identified whose failure will directly result in consequences of strategic significance. Each such piece of equipment will be described in a baseline model consisting of a defined set of monitored parameters obtained based on analysis of design, regulatory, and technical documents and requirements. The "As Built" and "Monitoring Results" submodules are designed to accumulate and systematize diagnostic data and specific values of measured damage.

DIAGRAM 2



The "Damage Development Physical Model" submodule will enable assessment of the degree of influence of each detected damage on the facility's condition, since it establishes a connection between the numerical value of each controlled parameter and the facility's technical condition. Key to assessing technical condition is the "Predictive Model of Accumulated Damage" module, which is designed to establish a relationship between the numerical value of accumulated damage for equipment and the forecast of changes in its technical condition over time.

This module is expected to be created based on either regression models or neural network technologies. The obtained values of actual "accumulated damage" must be evaluated against "Criteria for Accumulated Damage" and it is to be determined whether management action is required.

This system is an additional element of the industrial safety management systems in place at operating organizations and will help prevent emergency situations at marine oil terminals throughout their entire operating period.

# Underwater Procedures

From late September to mid-October 2025, work was carried out in Novorossiysk to install caisson anchors for the future new single point moorings at the CPC Marine Terminal. The mooring devices were built at a shipyard in the UAE in the Persian Gulf and delivered through the Indian Ocean, the Red and Mediterranean Seas to the Hero City of Novorossiysk. The transportation of 12 caisson anchors was carried out in three batches on the identical Russian river-sea class cargo vessels Pola Varvara, Pola Marina, and Pola Alexia, built in 2020 in Nizhny Novgorod

The journey from the coast of the Arabian Peninsula to Novorossiysk took about a month. Each vessel carried four anchors – two in the hold and two on deck. This cargo configuration required particular vigilance from the crews: the tall caissons blocked the view from the bridge, and navigation was carried out using instruments – electronic chart and radar. The passage through the Indian Ocean proved difficult due to weather conditions, but the vessels confidently made it safely through a Force 6 storm.

“Our project vessels have good seaworthiness and are equipped with precise navigation equipment, which allows us to navigate even without visual control. We overcame all difficulties and delivered

the cargo safe and sound. The crew is 11 people, all experienced sailors», Anton Luzhin, senior assistant to the captain of the cargo vessel Pola Alexia, told CPC Panorama correspondents.

By way of background, offshore mooring devices – that is, located in sea waters – for cargo operations with oil tankers have been in use since the mid-20th century. The most common structural types of SPM (Single Point Mooring) are CALM (Catenary Anchor Leg Mooring, a buoy with multi-point chain mooring) and SALM (Single Anchor Leg Mooring, a buoy with single-point mooring). According to Science Direct, there are currently 150 CALM-type SPMs and 50 SALM-type SPMs in use worldwide.

While a SALM requires one anchor, the CALM variant has six or eight. Evenly distributed in a circle on the seabed, they are connected to the SPM by anchor chains (bridles), not taut, but with enough slack, so that about 300 m lie on the ground. This chain configuration stabilizes the position of the SPM in stormy conditions, evenly distributing the load on the anchors.

Suction caissons are the most common type of anchor for deepwater mooring facilities today. Their first application for SPM installation took place in the Danish sector of the North Sea in 1981 at the Gorm field. The caissons holding the SPM were submerged on sandy soil 40 m below the water surface. In the 1990s, this technology was no longer unique. It was already being used on various soils, most often on compacted clay.

Each caisson anchor is a steel structure measuring 30 x 10 x 5 m, kept buoyant by the air trapped inside. The structure is divided into four parts, each with pipelines leading to a central manifold with valves. The latter are distinguished by color. Using the green ones, air is bled from the caisson anchor to ensure the proper draft during concreting and before transportation. Red valves are used after the anchor is submerged to the bottom. Through them, forced air extraction is performed if the depth of the caisson's penetration into the ground under its own weight proves insufficient.

In addition to pipes and the manifold, the upper platform has ventilation hatches with protective membranes removed before submersion and cathodic protection systems. On top at the corners of the caissons are four lifting lugs for attachment by cables to a traverse suspended from a crane. The sides of the structure carry special draft markings, and side lugs are attached for towing across the water area.

A concrete slab 35 cm thick and about 100 m<sup>3</sup> in volume, poured from above into the structurally provided formwork with reinforcement, doubles the weight of the caisson from 200 to 400 tons. The possibility to concrete in the port nearest to the installation site significantly reduced logistics costs. Once the concrete had cured, the caissons were towed from the yard to the installation site and sunk by removing air through the built-in manifold.



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“Our company has extensive experience working with caisson anchors. For example, for floating gas storage facilities, we previously had to install not six but 48 such anchors», says Evgeny Lukanin, head of the marine engineering operations department at Alliance company.

First, 12 caisson anchors (six for each SPM) were delivered to berth No. 12 of Novorossiysk Ship Repair Yard JSC, where they were launched into the water. Concrete pouring on the deck was carried out evenly, in accordance with the recommended sequence and maintaining an even trim. According to the instructions, a heel angle of more than 3° had to be avoided. To achieve this, using

the manifold located in the upper part of the caisson, the volume of air in the compartments was reduced evenly during concrete pouring.

The project specified M400 (B30) concrete, used in facilities with special strength and durability requirements. After final hardening, this grade withstands a load of 390–400 kg/cm<sup>2</sup> and lasts about a century. Having high density and water impermeability, the material does not lose integrity under pressure even at 30 MPa, while at depths of 60 m, 7 MPa is sufficient. Concreting in volumes of over 100 m<sup>3</sup> per anchor was carried out from the berth using mixers and concrete pumps.

After the concrete hardened, the stage of towing the caissons from the ship repair yard to the installation site began. The distance of 12 nautical miles was covered by tugboats in four hours. Five different towing schemes were provided, but they decided to use one: two tugboats move with the caisson anchor tightly attached between them to the sides. During towing, the vessels displayed lights and signs notifying other participants in the water area of limited maneuvering capabilities.

Special attention was paid to weather conditions: wind speed – up to 11 m/s, current – up to 0.5 m/s, wave height should not exceed 0.75 m. Upon reaching the starting position, the anchor was moored to an installation barge with a crane installed on it with a lifting capacity of 1,350 tons and a boom height of 78 m. On the barge, 90 m long and 2,700 m<sup>2</sup> in area, in addition to the crane, they placed a diving station with a pressure chamber and other necessary structures.



Concreted caisson anchors

Remotely operated vehicle (ROV)




FIGURES

 **30 x 10 x 5 m**  
caisson dimensions

 **200 tons**  
caisson weight before concreting

 **400 tons**  
caisson weight after concreting

 **Up to 64 m**  
dive depth

 **5 m**  
penetration into the seabed

 **2700 m<sup>2</sup>**  
installation barge area

 **1350 tons**  
crane lifting capacity

 **78 m**  
crane boom height

 **50 trucks**  
installation equipment quantity

 **455 m**  
anchor chain length



Notably, outfitting the barge as a full-fledged crane vessel took about two months. To do this, a powerful shore crane was disassembled at the other end of the country – in Murmansk – and delivered to Novorossiysk on 50 trucks. The crane vessel was assembled at berth No. 1 of Novorossiysk Ship Repair Yard.

Before departure, the barge with the crane was ballasted. This is necessary to create the required seaworthiness of the converted vessel. Ballasting is the intake of water inside the barge to obtain the desired draft calculated on a computer in a special digital model of the vessel. Also, upon going to sea, the crane operators performed a test-lift – testing of the lifting mechanisms, and the divers tested their equipment by conducting a rescue dive – dives simulating an underwater rescue operation.

“Before starting work, it’s better to double-check everything many times. As the saying goes on international marine projects: two is one, one is none», noted Yuri Filipponenko, supervisor for caisson anchor installation.

A team of 14 divers was involved in the caisson anchor installation operation for round-the-clock work – seven people per shift. During dives, they used two LARS launch and recovery systems installed on the barge. In addition, they had a mobile containerized diving complex MKVK-60 with a pressure chamber.

Each diver underwater had communication with the vessel using three color-coded cables. The blue one supplied him with breathing mixture. The yellow one was connected to a pneumatic depth gauge installed on the diver – its readings were monitored on the vessel, as was the image

from the helmet camera: the signal from it to the dive control station came through the red cable.

Dives were carried out to depths of up to 64 m, so the issue of creating breathing mixtures was important. The greater the depth, the less oxygen and more helium should be in the mixture.

“Dynamic gas mixing takes place directly in the supply line, from where it goes further to the compressor. The gas composition can be changed at any moment. After dives, we always get feedback from the divers. Everyone says they feel good, their head is clear», says Sergey Drovtsov, Captain 2nd Rank (Reserve), specialist in preparing gas breathing mixtures.

To support diver fitness and recovery, in addition to observing the work and rest schedule, the vessel provides two-person cabins that effectively offer single occupancy since roommates work opposite shifts, four protein-rich meals a day, two gyms, and even a pool.

To lower the anchor with the crane, a traverse was used: they opened the air valves, removed the membranes from the ventilation hatches, and, transferring the load to the crane’s lifting device, proceeded with controlled submersion. When the top of the caisson anchor reached water level, tow lines were disconnected from it. Parallel to the submersion of the anchors, anchor chains were lowered. Each weighed 18 tons, so it was critically important to reduce their influence on the center of gravity of the caisson anchor during submersion.

The most critical stage of submersion is at a depth of 3–4 m from the surface. During this period, the structure with an area of about 300 m<sup>2</sup> is particularly susceptible to vertical motion caused by surface waves.

The support vessel Nefrit, equipped with a dynamic positioning system, was coupled to the barge. A complex of navigation and control equipment allows it to automatically and with high precision maintain a given position even in adverse weather conditions – without anchors, only through the vessel’s propellers. The vessel also deployed a remotely operated vehicle (ROV). The ROV is connected to monitor the progress of anchor submersion after passing the 20 m mark from the water surface.

The ROV is equipped with a lot of specialized equipment: satellite receivers, pitch sensors, pressure sensors for depth determination, course indicators, hydroacoustic positioning system, transponder beacons, video cameras, lighting devices, and, of course, manipulators with which the apparatus helped divers. It collected sensors and elements of cargo rigging in a special basket.

“Difficulties in our work? At these depths, we need to move quite far from the launch point of the apparatus, making sure that the control cable doesn’t get caught in propellers or tangled with the traverse”, explains Ivan Gorgoma, head of the hydrographic support party.

Installing anchors on the seabed is the most critical stage of the operation. If you make



a mistake with coordinates or in the orientation of the caisson, changing its position is practically impossible. Therefore, a high-precision underwater positioning system was used. Two transponder beacons were installed on the caisson anchors being installed in direct line of sight with the HiPAP transceiver antenna.

“We receive all information from above-water and underwater sensors and monitor to ensure the caisson anchor is positioned as precisely as possible in the design position at the specified coordinates on the seabed. Depending on hydrometeorological conditions and currents, lowering the structure takes from 40 minutes to several hours”, comments hydrographic engineer Nikolay Morozov.

All necessary navigation information in graphic and numerical form was broadcast in real time to the ROV control system. The actual position of vessels, ROV, and caisson anchors was displayed on the navigation display.

At around two meters above the seabed, the procedure of positioning the caisson anchor in the required position was performed until its “skirt” was submerged in the sand.

After completion of installation, divers with ROV support disconnected the traverse, which in difficult underwater conditions sometimes became one of the most labor-intensive and time-consuming parts of the operation.

Then the vessels participating in the operation moved to a new location to install the next caisson anchor.

“With the caisson anchors in place, the team has completed roughly half of all work on the SPM replacement project. The next part in 2026 will be somewhat simpler, a different fleet composition will be involved there, there will be no heavy lifting work dependent on natural conditions», summarizes Yuri Belov, Head of the Construction Headquarters for the SPM replacement project at CPC-R JSC.

“The Construction Headquarters of CPC-R JSC played an important role in implementing the caisson anchor installation project. Its specialists carried out planning and organization of work in difficult meteorological conditions, making timely decisions even under atypical conditions. Good coordination made it possible to carry out round-the-clock control at all stages, clearly assessing all risks: on the territory of Novorossiysk Ship Repair Yard, in the Marine Terminal water area, and during underwater operations», noted CPC Technical Director Igor Lisin.





# Third Unit: Installation Complete

In August 2025, CPC's Marine Terminal commissioned its third pressure control unit (PCU). With three metering units and three PCUs now in place under the Debottlenecking Program, simultaneous crude oil loading at all three single point moorings has become a reality.

The three PCUs at the Marine Terminal essentially complete the onshore section of the Tengiz–Novorossiysk pipeline system. Beyond them, pipelines run underwater to the single point moorings – a purely maritime domain. What does the new pressure control unit consist of, and what role does it play in crude oil transportation? CPC Panorama correspondents pose these questions in the office of Nikolay Pankov, Chief Engineer, Operations and Maintenance, Marine Terminal.



– The new PCU allows us to regulate crude oil flow during tanker loading, – the Chief Engineer explains. – Now each of our three cargo systems has its own pressure control unit. Schematically, it consists of inlet and outlet headers with a diameter of 1000 mm, to which three 600 mm control lines are connected. Each of these lines has regulators, inlet and outlet valves.

The construction headquarters, led by Yuri Belov, began implementing the third PCU construction project in 2023, when a new three-unit lease automatic custody transfer system (LACT) was commissioned at the Marine Terminal. Completing its construction made it possible to dismantle two previous LACT units, the switching unit, and prepare the vacated area for the third pressure control unit.



– The contractor selected to carry out the work was collaborating with CPC for the first time and needed some time to adapt to our requirements and procedures, – Yuri Belov says. – But this was more than compensated for by strong competencies in welding and installation work, allowing the facility to be delivered right on schedule.

The most challenging stage involved tie-ins to the active loading lines. These operations were performed during limited time windows of scheduled pipeline shutdowns. Issues with residual metal stress had to be addressed, and weather often hampered work with lifting equipment.

– Shore Facilities at the Marine Terminal always present special weather conditions – high humidity during winter, for example, – Yuri Belov explains. – We therefore ensured that paint coatings were applied only to completely dry pipelines.

Since conventional installation methods cannot be used at an operating production facility, construction was carried out at targeted points: on small work areas, with maximum safety precautions. Contractors prefabricated wooden mats and blocks to secure pipelines being cut – it was crucial to prevent deviations from design elevations due to stresses created during original construction or temperature fluctuations. And there were nearly two dozen such tie-ins!

Throughout all work, as always, the construction team worked closely with CPC's Operations Department and the Consortium's general contractor for facility operations and maintenance. A responsibility assignment matrix was jointly developed. For any complex operations, each participant had their assigned role, task, and timeframe.

Before focusing on construction at CPC, Yuri Belov spent several years working in the Marine Terminal Operations Service. His detailed understanding of pipeline system production processes helped him organize the workflow rationally and safely. It's worth noting that the entire PCU construction cycle was completed without injuries or incidents.

– In terms of conscious attitude toward occupational safety and embracing our Safe Work Culture, the PCU contractor at the start of work and at completion seemed like two different organizations, – Yuri Belov notes. – This company's personnel became one of the leaders in submitting observation cards among CPC contractors, actively participated in Safe Work Culture Committee meetings, and received numerous certificates of recognition. We're pleased that what was essentially a first collaboration led to quality execution of a fairly complex and critical task for the entire pipeline system.

## FIGURES



70 employees



20 pieces of equipment



3,000 m<sup>3</sup> earthworks



600 m<sup>3</sup> demolition of concrete foundation



1,500 tons steel structure reinstallation



5 km cable laying

# Cleaning According to the Map

The Marine Terminal Tank Farm completed a full inspection of SVFRT-100000 tanks No. 3 and 5 in the fall of 2025. The tanks were first cleaned of bottom sediments using a technology rarely seen in Russia – flushing with a dynamic jet of heated crude oil.

**W**e stand on the containment dike of the 100,000-cubic-meter tank with Shore Facilities and Tank Farm Manager Sergey Aksenov and observe another stage in the crude oil cleaning process for this steel giant. Last year, this procedure was carried out sequentially on three SVFRT-100000 tanks at the CPC Tank Farm. CPC Panorama correspondents have the opportunity to observe the process up close.



– Full inspection of tanks operating less than 20 years is conducted once every 10 years, – Sergey Valeryevich explains. – For vessels commissioned more than 20 years ago, this period is shorter: once every 8 years. Our tanks No. 3 and 5 have been in operation for more than 20 years, so they're due for full inspection.

The cleaning process for SVFRT-100000 tanks takes two to four months, depending on the quantity and characteristics of bottom sediments. The first stage includes jointly developing a work plan with CPC

SVFRT flushing



specialists and preparation. After completing it, contractors proceed to the main operations. As part of a three-tank group, the vessel is emptied. After coordinating with the Crude Oil Transportation and Commerce Team, it is taken out of operation.

Crude oil is drained to the 2.5 m mark. The contractor then receives the tank in this state and prepares a schematic map indicating the volume of paraffin-containing deposits in the vessel. Equipment is positioned outside the containment dike, in the bund area, and on the tank's floating roof.

Pumping equipment for supplying, extracting, and flushing crude oil is installed in the tank's bund area. On the floating roof, 30 or more flushing heads with rotating nozzles are mounted and connected by pipelines. According to the aforementioned map, these devices are installed in place of removed support columns. The flushing heads are connected to the crude oil supply pumping equipment operating



protection, enters the tank through a special hatch to assess the effectiveness of all the work performed earlier. Based on the inspection results, a new map is created and the flushing scheme is modified, with special attention paid to the most problematic zones of paraffin deposits.

At the final stage, specialists confirm that no bottom sediments remain. The flushing equipment is then dismantled and the support columns are returned to their standard positions. Degassing and ventilation are conducted using three air blowers, combining both natural and forced ventilation methods. This procedure usually takes three to four days.

Air quality is then tested and final cleaning of the tank interior can begin. The fully cleaned tank is handed over to another contractor to perform a full inspection. They check the condition of corrosion protection, welded joints, pipe connections, and the tank's overall condition. Based on the work performed, they issue a conclusion that this tank is suitable for continued operation for at least another eight years.

in the tank's bund area. Crude oil is heated using a shell-and-tube heat exchanger for effective flushing of paraffin-containing deposits. Flushing is conducted in a closed cycle: the contractor's pumping equipment extracts the product from the tank and supplies it to the flushing heads. Switching and control are carried out remotely via pneumatics.

After completing tank cleaning in the closed cycle, the tank is completely drained. At this stage, nitrogen is supplied into the vessel to reduce hydrocarbon vapor concentration. Flushing then continues using "fresh" crude oil extracted from another tank's technological pipeline.

– At the same time, the flushed product containing paraffins is pumped from the Tank Farm into the crude oil export pipeline for tanker loading, – Sergey Aksenov explains. – This tank cleaning technology doesn't require water or chemically active substances. As a result, the flushing products don't reduce the quality characteristics of commercial-grade crude oil when added in small quantities to the overall flow.

Tank cleaning is a rather labor-intensive process that can be quickly described, but actually this operation takes about two weeks to perform. As we watch, the third stage begins. A contractor representative in personal protective equipment, including respiratory

Sub-roof space of the cleaned tank



Tank cleaning hatch



# The Main Principle: Do No Harm

We spoke with Irina Matasova, Director of the Novorossiysk Educational and Research Marine Biological Center at Kuban State University and Candidate of Geological and Mineralogical Sciences, about the unique ecosystem of the Black Sea, how the ancient Pontus Euxinus differs from other bodies of water, and many other topics.

to graduate from it. The institute had an excellent faculty, and I'm proud that many of our graduates now work at various enterprises across the city, including the Caspian Pipeline Consortium.

► **You have authored over 100 scientific papers. What is your main area of research?**

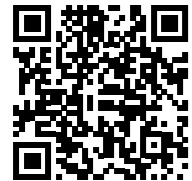
◄ In short, technosphere safety. This term, also a state educational standard, is actually very broad, encompassing environmental safety, fire safety, occupational health, and industrial safety. My focus is on environmental safety, particularly monitoring and management.

► **You are a member of environmental councils under the administrations of Krasnodar Krai and Novorossiysk. What powers do these councils have, and what tangible benefits do they bring to nature and local residents?**

◄ These advisory bodies are important platforms for dialogue among government, business, scientists, and the public. We discuss various – sometimes controversial – issues and help find practical solutions. Enterprise representatives are invited, because any production activity inevitably affects the environment. As I tell my students: you can't even slice bread without leaving crumbs. It is crucial that residents hear the enterprises' perspective, enterprises hear residents' concerns, and both sides take each other's interests into account.

**H**ow did you come to choose Environmental Protection and the Rational Use of Natural Resources as your field of study?

◄ Chemistry and biology were my favorite subjects since childhood. I originally wanted to attend medical school, but that would have required studying in another city – something my family circumstances did not allow. So I enrolled at the Novorossiysk Polytechnic Institute of Kuban State Technological University. The Environmental Protection and Rational Use of Natural Resources program had just been launched, and my class was only the second



Interview  
on RuTube

► **The entire World Ocean to this day has been studied less than outer space**

► **You head the Novorossiysk Educational and Research Marine Biological Center (NUNIMBC). Could you tell us about its history, structure, area of responsibility, and main activities?**

◄ We celebrated the center's 105th anniversary this spring. The city archive preserves a Soviet government resolution establishing the Novorossiysk Biological Station, as the center was originally called. It was located near Cape Lyubvi, and its mission was to study resources needed for the national economy, including fish and algae. A key focus was combating cholera, which at the time affected not only the USSR but the world. The station conducted extensive research on water pollution from sewage to prevent outbreaks.

Initially independent, the biostation was later transferred first to Rostov State University and then to Kuban State University. Our center hosts practical training for biology students, who learn to collect and process samples. Throughout the year, students use our materials and library for coursework, bachelor's, and master's theses.

Our team is small – about 20 people – working in two areas. The first is our accredited chemical-analytical laboratory. The second involves various sections of marine biology, where specialist biologists work. Colleagues assist with sample collection, processing, and report preparation.

► **NUNIMBC has been collecting a database of hydrological, hydrochemical, and hydrobiological data on marine water pollution, bottom sediments, and marine life conditions for 90 years. What are the trends and forecasts for pollution in the coming years?**

◄ The aquatic environment is extremely dynamic, making predictions difficult. Even atmospheric forecasts are only reliable for three days, despite supercomputers. Water environments are even more complex. Nevertheless, state monitoring shows petroleum pollution has declined since the 1980s. In the 1990s, all the pebbles in Novorossiysk were coated in fuel oil – you couldn't return from the beach without getting smeared. Conditions have improved.

These aren't just our subjective observations – colleagues from the RAS Institute of Oceanology regularly publish satellite images. They show that current petroleum pollution follows busy shipping routes rather than shore-based or offshore moorings. Unauthorized ballast water discharge is likely the main cause.

Another trend is decreasing dissolved oxygen, a consequence of global warming: warmer water holds less oxygen, which makes marine life particularly vulnerable in summer.

Ecologists are also concerned about invasive species, including mollusks, zooplankton, and algae. These "aliens" arrive in ballast water or on ship hulls and can rapidly displace native species. Combatting invasive species is an international effort. Conventions on ballast water treatment require either integrated onboard treatment or discharge into port-based systems for rapid testing. Ships may also reballast offshore and submit local ballast for analysis upon entering port.





River conditions in coastal states present another challenge. Everything that enters a river eventually reaches the sea. Where freshwater meets seawater, geochemical barriers form: elements dissolved in rivers may precipitate near the sea, creating localized sediment contamination. Conversely, some suspended materials dissolve in seawater, forming potentially more hazardous colloidal particles. The chemical interactions at these junctions remain poorly studied.

► **Which Black Sea species are most at risk today? What threatens them?**

◄ A classic example is mussels, heavily impacted by rapa whelks, which have no natural competitors in our waters. After the outbreak peaked, some balance returned, and wild Black Sea oysters and scallops have begun returning to Tsemesskaya Bay.

Another threat is the ctenophore Mnemiopsis brought into our waters. These are very voracious organisms that earned the nickname “sea locust”. In a day they can consume biomass 10 times their own weight.

The situation was somewhat relieved by the arrival of another “invader” – the ctenophore Beroe, which began hunting Mnemiopsis.

Other threats to sea life come from human activity. Due to uncontrolled fishing, Black Sea turbot, anchovy, and others have become rare.

► **The Black Sea is a body of water unique in many parameters. How much more complex and how much more interesting is working here compared to other bodies of water? Has science already solved all the mysteries of Pontus Euxinus?**

◄ I’ll start with the second question. The entire World Ocean to this day has been studied less than outer space. We’ve never thoroughly explored the bottom and the objects on it. The Titanic sank in 1912, but the wreck site was only discovered in 1985. Despite advances in modern technology, bathyscaphe dives today remain quite complex and dangerous undertakings.

Any body of water would be interesting to study. Lake Baikal, for example – unique origin as a tectonic rift, unique ecosystem, depth, freshwater reserves.

► **How much could Turkey’s ongoing construction of a canal duplicating the Bosphorus affect the Black Sea’s ecological condition?**

◄ It will have an impact, because the salinity of the Mediterranean and Marmara seas differs from Black Sea salinity. It’s unknown what the new flow distribution will lead to. The main Black Sea current flows from Turkey’s shores past Georgia toward Russia. It’s difficult to predict how water with different density and salinity will mix. Much will depend on organisms’ ability to adapt to possible changes, because salt itself is such an important environmental component that strongly affects living organisms.



**Environmental protection rarely brings direct profit, but provides a delayed effect**

► **On captured German maps from the 1940s, the Black Sea connects with the Caspian via the Kerch–Manych Strait. According to official historiography, this strait dried up many centuries ago. But you can understand the German cartographers when you look out the plane window on the way to Elista: you constantly see the Manych River and lakes. Restoring this canal was planned in the 1950s; then they preferred the “Siberian rivers reversal” instead. Your opinion as a scientist – is such a project needed now and what would it give both seas?**

◄ Indeed, we’re talking about the Kuma–Manych Depression, which in the previous geological period was a strait connecting the Black and Caspian seas. Marine shells are still found in abundance there today. Artificially intervening and reuniting established ecosystems again seems too risky to me, in my view.

When you look at satellite images, among the virtually lifeless scorched steppe in Kalmykia you see small patches with lush green vegetation. They will be lost there: when creating canals between seas, saline groundwater will inevitably rise and even those rare productive soil patches existing in the region will be lost.

► **It’s common knowledge that clean water in the Black Sea exists at depths up to 100 meters, and beyond that lies a huge layer of hydrogen sulfide. I’ve read various theories about this layer’s origin, including that it was all produced by anaerobic sulfate-reducing bacteria. Which theory do you subscribe to?**

◄ It’s believed that once, on these territories that became the current Black Sea bottom, there was lush vegetation. Then the water level rose sharply, salinity

changed, and in oxygen-free conditions, organic matter decomposition began. When there’s no oxygen and sulfur acts as the oxidizer, the reaction product becomes hydrogen sulfide. This layer became home to specific bacteria that have no competitors for habitat in such conditions. You and I need oxygen to breathe, but they don’t need it for breathing. They live perfectly fine where it’s absent.

► **What is your attitude toward hypotheses according to which seismic activity in the region could eject the toxic hydrogen sulfide mass outward and millions of people would need to be evacuated?**

◄ I think that if such a severe seismic catastrophe ever occurs, hydrogen sulfide ejection will be the least of all our problems. Plus, hydrogen sulfide doesn’t exist in the sea as some kind of gas ball; it mixes with water, forming hydrogen sulfide acid and sulfides. According to one theory, it’s precisely because of the latter that the Black Sea got its name. After ships were moored there, sulfides covered anchors with black deposits. From my point of view, it’s precisely the uniform distribution of hydrogen sulfide in the sea that reduces the likelihood of its torch-like ejection during an earthquake.

► **There are ideas for using the hydrogen sulfide layer for humanity’s benefit: extracting such a valuable energy resource as hydrogen, building marine power plants, and using sulfur in road construction. How do you feel about such projects?**

◄ Everything that burns can theoretically be used as an energy resource. The question is economic feasibility and environmental impact assessment. When burning hydrogen sulfide we get not sulfur but its dioxide, which means the issue of exhaust gas treatment would need to be resolved – for example, building a sulfuric acid production plant nearby. Compensation payments for

damage to aquatic biological resources would also need to be provided. Water containing hydrogen sulfide would need to be delivered from great depths to gas extraction facilities. All this represents considerable expenses. Novorossiysk considered a project for hydrogen sulfide extraction and creating a local power plant, but due to cost and complexity it wasn't implemented.

► **Biologists from Moscow State University consider E. coli the main problem of Black Sea ecology, with plastic in second place. They obviously know better, but as an expert, what would you name as the most critical and leading types of pollution of the water area and coast?**

◄ Regarding plastic, I agree unequivocally. There's a lot of it; it doesn't decompose – nature simply doesn't know how to do this. It's also unclear exactly how microplastics behave inside our bodies. It's difficult for me to speak about E. coli because our center doesn't conduct such research. But if by biogens we mean untreated municipal utility discharges from resort areas lacking appropriate infrastructure, then the problem truly exists. Industrial enterprises have long been under serious control, which is sometimes not the case for urban territories.

► **In the Novorossiysk area, the northeast wind (nord-ost) is a serious problem for residents. I've heard the idea that this problem could be solved by creating a passage through the Markhot Ridge. What is your attitude toward such initiatives?**

◄ Negative. Such proposals contradict the "do no harm" principle. First, are we ready for winter

temperatures in Novorossiysk to drop? Second, the mountains are high-quality cement, and who decided we don't need it? Third, the nord-ost is regular natural self-cleaning system of the city air, 60% of that pollution consists of emissions from freight and passenger vehicle engines, reaching peak values during tourist season.

► **Lake Baikal's cleanliness is maintained by crustaceans – Baikal epischura. Perhaps someone similar could be introduced into the Black Sea?**

◄ We shouldn't introduce species, but remember that it's not clean where people sweep, but where people don't litter. Everything must come from human culture itself, from the family. When I walk with my children and they miss the trash bin with a candy wrapper, I make them go back and try again. Environmental education must begin as early as possible and be maintained throughout a person's life through unobtrusive forms.

► **Is that why last year you participated in events of the Regional Children's Environmental Festival?**

◄ Of course, this is very important. I tell my students in class: empowered people who make wrong decisions didn't fly to us from outer space. They grew up in the same environment where we live.

Environmental protection rarely brings direct profit, but provides a delayed effect. This effect is expressed not in monetary equivalent, but in the fact that we enjoy walking down a clean street, breathing clean air, swimming in a clean sea. In a healthy environment, people get sick less; their labor productivity increases. There's your effect for society.



Фото Виктории Захаровой

## AUTHOR

Zulfiya Iskalieva

# Leading the Way

On September 5, 2025, employees of the CPC Eastern Region were honored with state and departmental awards of the Republic of Kazakhstan. A number of colleagues received awards from the hands of the President of the Republic of Kazakhstan Kassym-Jomart Tokayev and the Prime Minister of the Republic of Kazakhstan Olzhas Bektenov



## Vladimir Abramchev

Operator at Kurmangazy PS awarded the Order of Labor Glory (Еңбек Даңқы) of III degree. Vladimir Pavlovich's total work experience in the oil and gas industry exceeds 40 years; he has been working at the Caspian Pipeline Consortium since 2002.

Vladimir Abramchev is one of those who was there from the beginning of the Atyrau and Kurmangazy pump stations. He started at Atyrau PS as a technical equipment operator, participated in the station's launch and equipment setup. Since 2016, he has been working at Kurmangazy PS, where he continues to contribute to the stable operation of the system.

"Receiving an award from the President is a great honor and excitement", says Vladimir Pavlovich. "Any undertaking requires effort, patience, and unity. The launch of Atyrau PS was a challenging time, but thanks to the coordinated work of the team, we handled all the tasks. I'm glad that through my work I was able to contribute to the establishment of CPC. Now our stations have reliable equipment and a strong team – that's the key to stable operation".

## Sergey Rozhkov

Operator at Atyrau PS awarded the Order of Labor Glory (Еңбек Даңқы) of III degree. The award was presented by the President of the Republic of Kazakhstan Kassym-Jomart Tokayev. Sergey Ivanovich's career began in 1984 – on the construction of the Yamburg-Yelets gas pipeline. Later he worked at KazTransOil company, and in 2002 he joined the friendly CPC-K team.

For 23 years now, Sergey Rozhkov has been working as an operator at Atyrau PS. It's demanding and complex work, but it's work he truly loves.

He managed to pass on his love for the profession to his son, who followed in his father's footsteps and today works at Tengiz PS.

"Our oil pumping volumes are huge, the equipment is modern and complex, everything needs to be monitored carefully and precisely, but over time it becomes part of you", notes Sergey Ivanovich. "When I learned about the award, I couldn't believe it at first: it seemed incredible until I found myself at Aq Orda residence. For me, this is a great honor and pride – to understand that our daily work is noticed and appreciated. This order is recognition of the entire team's work".



## Albek Akhmetov

Operator at Atyrau PS awarded the Order of Labor Glory (Еңбек Даңқы) of III degree. The award was presented by the Prime Minister of the Republic of Kazakhstan Olzhas Bektenov. Albek Akhymbayevich has been working in the oil and gas industry for 31 years. He began his professional career at Kulsary Oil Production Department, and in 2002 joined the CPC-K team, where he works to this day.

"Receiving an order is a high honor and recognition not only of my work but of the entire team's work", says Albek Akhmetov. "Work at a PS is teamwork, and I am grateful to my colleagues for their support and professionalism. At CPC-K, each of us feels responsibility for the common cause, and it is precisely this that unites us and helps us achieve results".



### Viktor Shirokikh

Operator at Atyrau PS awarded the honorary title and badge “Honored Worker of the Oil and Gas Industry” (Мұнай-газсаласының еңбек сіңірген қызметкері). Viktor Valerievich has been working in the oil and gas industry for 30 years, starting at KTO in 1995, at CPC-K since 2001. The position of operator at Atyrau PS carries great responsibility, because each pipeline station is not only pumping equipment but also another, quite complex structure that requires control, prompt response to possible emergency situations, and prevention of malfunctions. “I’m pleased that my work has been highly appreciated”, says Viktor Valerievich. “In our work, the most important things are safety and clear control over equipment, which we ensure with our colleagues”.

### Alexander Vodenikov

Electrical Engineer at Tengiz PS awarded the honorary title and badge “Honored Worker of the Oil and Gas Industry” (Мұнай-газсаласының еңбек сіңірген қызметкері). Alexander Valerievich began his career in 2006 at STARSTROY company as an electrician, then worked as a foreman and supervisor. He joined CPC in 2012. He started as a shift electrician for electrical equipment maintenance at Tengiz PS, and later his knowledge and skills allowed him to take the position of electrical engineer.

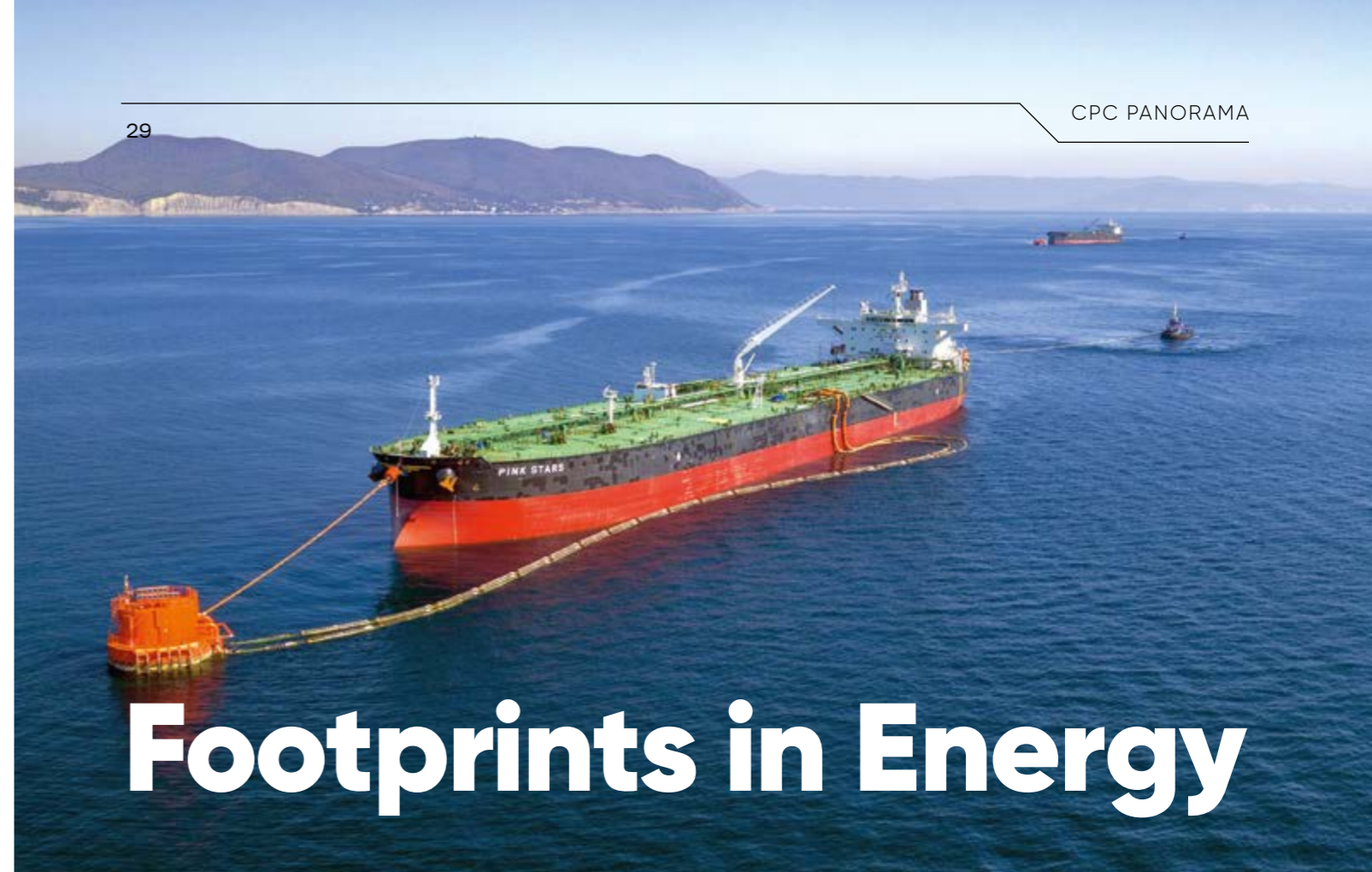
“Over the years, I have gained great experience and learned a lot from colleagues – from those who know production down to the smallest details”, says Alexander Vodenikov. “I underwent training and professional development in Moscow, Stavropol, Astana, but real knowledge comes from the people you work side by side with. This award came as a big surprise to me, because our team has many specialists worthy of such recognition. Therefore, I believe that this award is not mine alone. It is recognition of the collective work of the entire team”.



### Ermekkali Makhambetov

Driver at Kurmangazy PS awarded the Order of Labor Glory (Еңбек Даңқы) III degree. The award was presented by the Prime Minister of the Republic of Kazakhstan Olzhas Bektenov. Ermekkali Kalibekovich (Ermekkali Kalibekovich) has been working at CPC-K since 2001. For the past three years, he has been at Kurmangazy PS, where he is responsible for transporting operational personnel and delivering equipment. His work demands responsibility, punctuality, and attention to detail. Ermekkali Makhambetov knows every detail of the equipment, has an intuitive feel for the vehicle – performs preventive maintenance on time, preventing the need for repairs. He doesn’t like to talk about himself, but his work is always noticeable. He loves business trips, as it’s an opportunity to meet with colleagues, exchange experiences, and visit different CPC facilities.

“2025 has been declared the Year of Working Professions, and I am especially pleased that at CPC-K they value the work of everyone – regardless of position”, says Ermekkali Kalibekovich. “This award for me is confirmation that the contribution of each specialist is important for the common cause”.



# Footprints in Energy

The year 2025 marked a milestone for the Caspian Pipeline Consortium (CPC), with the billionth ton of crude oil pumped through the Tengiz – Novorossiysk pipeline system and shipped from the Marine Terminal in South Ozereevka. This achievement is clearly the result of the entire Consortium team’s efforts, with the top performers honored with prestigious titles and awards from the Ministry of Energy of the Russian Federation

### Alexey Pelipenko

For his significant personal contribution to the development of the fuel and energy sector and many years of dedicated service, Alexey Pelipenko, Head of the Regional Division (Regional Manager), Marine Terminal, was awarded the title of Honored Oil Worker.

Alexey Alexandrovich joined CPC in 2019, having previously accumulated extensive experience within the Transneft system. A graduate of Tyumen State Oil and Gas University, he began his career in 1987 with the Tyumen Main Oil Pipeline Administration as a mechanical engineer, first at an LODS, then at the Production Support Base. He subsequently led the Kniazhevo LODS and, in 2009, became Head of Tyumen Main Pumping Administration. Alexey Alexandrovich participated in the implementation of the ESPO and North-25 projects.

Under Alexey Pelipenko’s direct involvement, the Consortium implemented a key and technically complex facility of the Debottlenecking Program: the new “three-line” LACT system was constructed and commissioned in record time. The Sea Terminal team under his leadership initiated the professional skills competition Best Shift, which the Safe Work Culture Committee recommended for replication at other CPC production sites. The Marine Terminal Manager is well-known not only to colleagues but also to local residents and public organization activists.

“No matter how complex or time-consuming the operational tasks, we must stay connected to this shore, this city”, Alexey Pelipenko says.



“We all live here, relax after work, and raise our children. If necessary, the Sea Terminal will always support the people of Novorossiysk – and they know it”.

### Andrey Ilinykh

Team Leader, Mechanical and Process Equipment Operations, Andrey Ilinykh was awarded a Certificate of Honor by the Ministry of Energy of the Russian Federation for his significant personal contribution to the development of the fuel and energy sector and many years of dedicated service.

Andrey Nikolaevich has been working in the oil and gas industry since 1990, with 35 years of experience. He joined CPC in June 2020. As Chief Mechanic, he has been directly involved in major capital projects, the Debottlenecking Program, and the Program for Replacing Gas-Turbine-Driven MPUs with Electric-Driven MPUs (EPS Project).

“With each new pipeline modernization project, systems and equipment are upgraded”, Andrey Nikolaevich notes. “Certain types and models of equipment are being used in the industry for the first time – for example, VFDs for 8.3 MW motors. Processes and approaches are also evolving. In particular, we are witnessing and actively participating in the shift from reactive and planned preventive maintenance to condition-based maintenance”.



### Sergey Nosov

The title of Honored Oil Worker has been awarded to Sergey Nosov, Astrakhanskaya PS Manager, for his significant personal contribution

to the development of the fuel and energy sector and his many years of dedicated service.

Sergey Valeryevich has 25 years of work experience in the oil and gas industry, including 22 years with CPC. He joined Astrakhanskaya Pump Station in 2001, when he was hired by IK Quantor JSC as an operator responsible for the PS oil metering units. Since 2003, he has advanced from operator to Head of the PS. He played a direct role in bringing Astrakhanskaya PS to the throughput capacity of the first stage of CPC's pipeline system – 28.2 million tons per year. Sergey Valeryevich knows the station's equipment and systems inside out. Under his supervision, Astrakhanskaya PS underwent near-complete modernization during the Expansion Project (2010–2017) and the Debottlenecking Program (2019–2025). It should be noted that such complex and large-scale work – including the construction of the main pumping station, installation of variable frequency drives (VFDs) for the main pumping unit (MPU) motors, and construction of platforms for mud strainers equipment, among other tasks – was carried out on an operational facility without taking the pump station out of service.

“The modernization of Astrakhanskaya PS to cutting-edge technical standards enables our team to accomplish its tasks efficiently and effectively”, says Sergey Nosov. “Another contributing factor is that our station leads the Central Region in promoting Safe Work Culture”.

Throughout his career, Sergey Nosov has received state, departmental, and corporate awards. He was presented with the title and badge of Honored Oil Worker in October 2025, coinciding with the pumping of the billionth ton of oil through the CPC pipeline system – a milestone to which Head of Astrakhanskaya PS also contributed.

### Tatyana Myznikova

Tatyana Myznikova, Service Head, IFRS Accounting and Reporting, has been awarded a Certificate of Honor by the Ministry of Energy of the Russian Federation for her significant personal contribution to the development of the fuel and energy sector and her many years of dedicated service.

Tatyana Anatolyevna has been with the Caspian Pipeline Consortium since 2000. She is responsible for a critical area within the Finance Division – the company's reporting under International Financial Reporting Standards (IFRS).

“CPC-R and CPC-K are among the largest taxpayers in Russia and Kazakhstan, respectively”, Tatyana Myznikova says. “Our task is to prepare timely, highly accurate financial statements that fully comply with international standards and are clear and transparent for shareholders and regulatory authorities. This work is demanding – it requires precision, concentration, and deep expertise – and it plays an important role in the Consortium's overall operations, as our figures reflect the company's financial performance and support management decision-making”.



### Dmitry Medvedovsky

For his significant personal contribution to the development of the fuel and energy sector and many years of dedicated service, Dmitry Medvedovsky, Deputy Technical Director, Engineering, received a Letter of Appreciation from the Ministry of Energy of the Russian Federation.

Dmitry Vladimirovich has 17 years of work experience in the oil and gas industry, including 8 years at CPC. During his tenure as Deputy Design Manager in the Projects and Design Department and Deputy Technical Director for Design in the Construction Projects Implementation Department, significant company initiatives were implemented, such as the Debottlenecking Program (increasing the CPC pipeline throughput from 67 to 83 million tons per year) and the Program for Replacing Gas-Turbine-Driven MPUs with Electric-Driven MPUs (EPS Project).

“The key to successful implementation of the Debottlenecking Program, from preliminary surveys to commissioning strictly on schedule, is teamwork and attention to detail”, Dmitry Medvedovsky notes. “In particular, we took a very thorough approach during the pre-design stage and project solution presentations, conducting onsite meetings at facilities undergoing reconstruction with the participation of both design institute specialists and representatives of the Operations Division to develop optimal, mutually acceptable solutions. Additionally, as part of the DBNP, complex CPC facilities were, for the first time, designed in a 3D environment, which significantly minimized clashes during implementation. This experience is now applied wherever justified and appropriate”.

## AUTHOR

Pavel Kretov

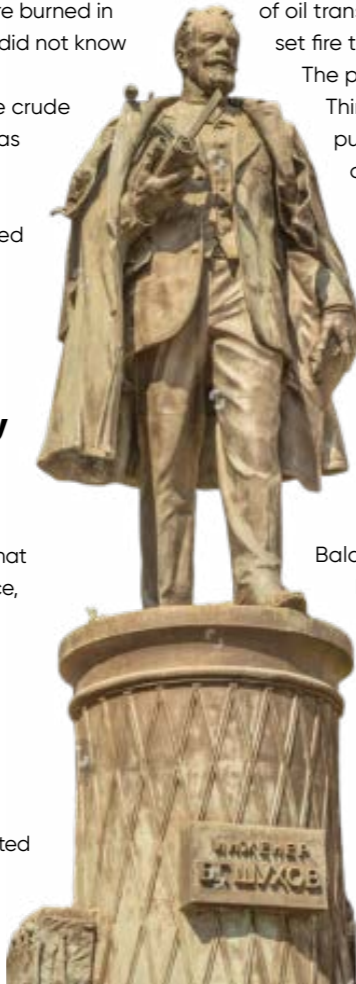
Vladimir Shukhov is rightfully considered one of the best Russian engineers. There are around two hundred Shukhov towers alone. In the oil industry, Vladimir Shukhov holds the priority for creating the world's first steel oil pipeline and cylindrical storage tank

The oil boom in the Baku region of the Russian Empire began in the mid-19th century. Thousands of people arrived here, eager to earn money from extracting and processing crude oil. By 1869, four oil refineries were operating in Baku and its surroundings, not counting numerous small facilities located in ordinary residential houses. The incredible mud and constant fires forced local authorities to move oil processing out of Baku into the so-called Black City. Oil extraction in the "pre-Shukhov" period looked like this: workers stood waist-deep in black liquid seeping from the ground and poured it by buckets into wooden barrels, which were transported by horses to the oil refinery. From three poods (≈48 kg) of oil, they obtained one pood (≈16 kg) of poor-quality kerosene, while the remaining fractions – fuel oil, gasoline, and so on – were burned in flares or simply poured out because people did not know how to use them.

More than 10,000 transporters carried the crude in barrels and leather sacks. This method was not only extremely inconvenient – in the summer months, there was no vegetation on the Absheron Peninsula to feed pack animals – but also very expensive. By comparison: one pood of oil (≈16 kg) at the production site cost 3 kopecks, while delivery to the Black City cost 20 kopecks.

### Stages of the Great Journey

In 1878, a 25-year-old Russian inventor, architect, and scientist, Vladimir Shukhov, arrived in Baku with a proposal to the industrialists to jointly build an oil pipeline. At that time, he worked at A. V. Bari Construction Office, which had gained fame thanks to the work of its chief engineer. Contemporaries called Vladimir Grigoryevich the "Russian Leonardo" and a "human factory". Shukhov had studied at the Imperial Moscow Technical School (now Bauman Moscow State Technical University), graduating with honors; he completed a one-year internship in the United



# Russian

States (and took with him the book by Russian scientist and encyclopedist Dmitry Mendeleev Oil Industry in the State of Pennsylvania in North America and in the Caucasus); and he had led the drafting bureau of the Warsaw–Vienna Railway, located in Saint Petersburg. It was there that U.S. citizen Alexander Bari offered him to head the Baku branch of the office.

Armed with figures, Vladimir Shukhov convincingly proved that laying a pipeline would be more economically efficient than building a coastal railway branch over the same distance, as was already happening in the United States. Indeed, what Dmitry Mendeleev had long spoken of – transporting oil via pipelines – "the Americans seemed to eavesdrop: they installed pipelines and established refineries not near wells, but where markets, sales, and trade routes were".

Shukhov's project envisaged a pipeline from Balakhany to the Black City, about 10 km long and 76 mm in diameter. Builders connected iron pipes with threaded ends using couplings, insulated them with oil-based coatings, and buried them two meters deep. To claim that constructing the first oil pipeline went smoothly would be untrue. The pipes, purchased in the United States, were of poor quality and often burst. Additional obstacles were created by competitors: owners of oil transport offices, barrel manufacturers, and teamsters set fire to warehouses, tore up and broke structures.

The problem was solved by organizing guard posts.

Thirty-five thousand poods (≈560 t) of oil were pumped through the pipeline per day. At a project cost of 100,000 rubles (≈25 million rubles in today's money), this allowed the construction to pay off within a year.

This was a huge success! A. V. Bari's office began receiving orders from other local industrialists for oil pumping via pipeline. Initially, they charged 5 kopecks per pood (≈16 kg) for this service, then the rate was reduced to 1.5 kopecks per pood. For comparison, transporting oil by railway at that time cost 3 kopecks per pood.

In 1879, two more pipelines were constructed: Balakhany – Black City and Balakhany – Surakhany Plant and Surakhany Plant – Zykhn Spit. Five years later, the total throughput of the pipelines operating at Balakhany fields reached 200,000 poods (≈3,200 t) per day.

### The Math Behind the Pipes

Alongside industrial projects, Shukhov developed a complete scientific basis for the construction and operation of pipelines.

# Leonardo



Bibi-Eibat settlement near Baku, where in 1846 a 21-meter exploration well marked the beginning of oil development



### The American Oversight

It turned out that Shukhov's inventions were closely followed by U.S. oil industrialists. His method of heating viscous oils and fuel oils during pipeline pumping was immediately adopted overseas; previously, Pennsylvania heavy oils were simply diluted with water for transport.

However, Shukhov could not benefit from American practical experience in pipeline construction. The pioneers of the U.S. oil transport business considered all calculations "salon chatter". They opposed scientific approaches with practical ones – trial and error. Jacob Jay Vandergrift, builder of the first U.S. pipelines, insisted: "You will not answer

In particular, he proposed a formula for determining the economically optimal diameter of a pipe to transport a given volume of oil and petroleum products over a specified distance. Shukhov recommended installing intermediate pump stations (PS) at points where the pressure dropped below the required level. The method he developed for placing such PSs is still in use today. Regarding the stations, Shukhov noted that they could be of two types: first, with tanks where oil would accumulate before being pumped further; second, without tanks, but this mode required a unified rhythm throughout the system, which meant that in the event of a stop at one section, automatic regulators and stop devices of various designs were necessary.

Shukhov also made a significant contribution to pump theory. Oil fields were often located on sandy terrain, which clogged the pumped liquid. He solved this problem with the world's first screw or capillary pumps. Their principle was to move liquid using an endless belt or cord that held droplets due to internal friction.



Section of the three-kilometer pipeline in Batumi, built to Shukhov's design, 1886. Photo from RAS archive





His calculations allowed designing tanks of any size. "The walls of the tank are formed by a series of rings riveted from sheet iron; the bottom ring is joined to the floor using an angle. The top ring also ends with an angle, serving as support for the roof trusses", wrote Shukhov in *Mechanical Structures in the Oil Industry*, 1883.

Full transition to riveted joints was also Shukhov's idea. Previously, industrial metal constructions mostly used bolted joints, which were more labor-intensive. Riveted joints were initially called "Shukhov seams". The engineer also refuted the prevailing belief that a massive foundation was necessary for a tank. Mathematical calculations and experiments showed that a flexible metal sheet on a sand bed was both cheaper and more reliable. Shukhov's research reduced costs and increased the speed of tank construction. In Russia, the permissible wall thickness was 4 mm, while in the U.S. it had to be at least 6.35 mm. Since the pressure on the tank walls varied – higher at the bottom, lower at the top – he proposed making the walls thicker at the bottom and thinner at the top, saving significant metal: domestic tanks were 30 % cheaper than those overseas.

Standardization of tank components and equipment – hatches, ladders, level gauges, safety valves, etc. – was another major step. It was no longer necessary to design them for each individual project.

Progressive construction methods and favorable prices attracted many oilmen to A. V. Bari's office. In 1883, it built 130 tanks; the next year 200; a year later almost 300. The average tank volume also increased: in 1882 the largest was 90,000 poods; in 1885 – 160,000 poods; four years later, 200,000 poods.

In the last quarter of the 19th century, Shukhov's tanks were transforming the appearance of cities along the Volga. "Anyone who saw Sormovo last year would not recognize it this year. It has become an entire town of oil tanks and other structures..." wrote Russian Shipping magazine in 1888.

### Birth of Cracking

While creating and improving the scientific theory of pipeline construction and operation, Shukhov freely shared his knowledge and discoveries with oilmen. In July 1884, his article *Oil Pipelines* was published in *Industry Bulletin*.

abstruse questions until you build a pipeline yourself. And you will not build it without real men with crowbars, wrenches, clamps, dynamite, and a supply of courage. That alone must be taken into account".

Nothing else was considered by American practitioners at the time. As a result, one of the first pipelines in Pennsylvania was laid in the heat, without accounting for iron's expansion at high temperatures and contraction at low ones. When it got cold, the joints burst, and oil spilled onto the ground. Conversely, the pipeline through the Allegan Mountains was built in freezing conditions. With the arrival of summer, thick-walled iron pipes, assembled without allowances and not buried, rose from the ditch, blocked the road, and knocked down telegraph poles.

### Revolution in Storage Tanks

The next major task Shukhov solved for oilmen was the development of new types of storage tanks for crude. He was the first to introduce steel cylindrical tanks in Baku.

Tank Farm Construction Designed by V. G. Shukhov, Konstantinovka, 1881



V. G. Shukhov's thermal cracking unit, 1931



be formed. This gave rise to the Shukhov nozzle, the ancestor of the modern nozzle used in contemporary engines.

Before him, inventor Alexander Shpakovsky worked on nozzles, but his design had a major flaw: the steam jet expanded, losing a significant part of its energy.

During 15 years of A. V. Bari Construction Office operations (1880–1895), 3,200 tanks and many other structures were built according to Shukhov's designs. Shukhov worked with Alexander Bari for almost half a century. Reflecting on this period, he said: "People say A. V. Bari exploited me. That is true. Legally, I remained an employee of the office. My work was modestly paid compared to the income the office received from my work. But I also exploited him, forcing him to implement even my boldest proposals!" In the early years of their collaboration, Shukhov's salary was 200 rubles per month (≈500,000 rubles today) plus 5 % of the value of each completed project contract. Far from insignificant!

### For the Benefit of the Motherland

Shukhov did not accept either of the 1917 revolutions, but he refused offers to emigrate to the United States. He was confident that his engineering knowledge would be in demand in Soviet Russia. "Towers, boilers, and trusses are needed, and we will be needed. We must work and work regardless of politics", he said. In 1928, the Grozny – Tuapse trunk pipeline, over 600 km long, was launched, where Shukhov's pipeline loops were used for the first time to increase capacity. Many enterprises across the country were built with his participation. In 1934, nearly 80-year-old Shukhov returned to Baku to launch the "Soviet Cracking" refinery, based on his invention.

Who knows how much more useful he could have designed for the country. But his life tragically ended in 1939. At home, the experienced engineer lost vigilance and violated safety procedures while handling flammable substances. Near an open flame (a candle), he rubbed his hands with cologne. A few drops fell on his linen nightshirt, which instantly ignited. A cruel twist of fate!

Yes, even at home, for ourselves and our loved ones, we must maintain focus – and, of course, remember the CPC Life Saving Rules, which apply both at work and in everyday life.



Ten years later, he systematized his ideas in the book *Pipelines and Their Application in the Oil Industry*.

In 1893, Shukhov contributed to the design of the first trunk kerosene pipeline Baku – Batumi. His version was submitted to the Ministry of State Property. The final project, completed in 1897, was created by Nikolai Shchukin, under whose supervision the pipeline was built and commissioned in 1906.

Even more than pipelines, A. V. Bari's office profited from another Shukhov invention – the development of the cracking process, i.e., the separation of petroleum fractions. In the early 1890s, Vladimir Shukhov designed and patented the world's first industrial continuous thermal oil cracking unit. Cracking allowed obtaining not only kerosene but also gasoline, diesel, and motor oils. With the widespread adoption of gasoline-powered vehicles, Shukhov's invention became universally used.

Earlier, Shukhov had also solved the problem of fuel oil being considered useless waste. Due to slow combustion with almost no heat release, it was discarded. The engineer discovered that by mixing thick fuel oil with hot steam and turning it into fine droplets, a combustible suspension could

### DETAILS

#### Shukhov's Hyperboloid

Vladimir Shukhov was the first in the world to develop hyperboloid structures and metal lattice shells for construction. He built his first lattice tower in 1896 in Nizhny Novgorod for the All-Russian Industrial and Art Exhibition. That tower has survived to this day and now stands in the Lipetsk Oblast,

where it was relocated to the Polibino estate by the factory owner Yuri Nechaev-Maltsov, who purchased the remarkable structure. Shukhov's designs were also used for lighthouses, water towers, power lines, and even ship masts. However, Shukhov's most famous "hyperboloid" is the tower

for the Shabolovka radio station in Moscow, constructed between 1919 and 1922. It is a telescopic structure, 160 meters tall, composed of six steel sections. The tower still stands today on a street named in honor of its creator – Shukhov Street.



## AUTHOR

Pavel Kretov

# A Split Second Ahead of Everyone Else

Supporting children's sports is one of the key areas of the Caspian Pipeline Consortium's charitable activities in regions where it operates. New sports facilities are not only built but also fully equipped, and the best way to understand their importance for the city and young people is from the young athletes themselves and their coaches

In 1954, the Nadezhda sports school opened in Novorossiysk. For many years, the training bases for its students were the Palace of Pioneers and the gymnasium of the Technical and Economic Lyceum. Even in such cramped conditions, coaches continued to set – and achieve – ambitious goals: over the years, Nadezhda has trained nearly 50 Candidates for the title of Master of Sport and almost 25 Masters of Sport. The sports school began a new life in 2019, when a modern athletic and recreation center was built using a project created with CPC's charitable funds. The Consortium also purchased specialized sports equipment worth 18 million rubles.

"We used to train in a cramped and airless gym that always smelled damp, but then we got a spacious building with a medical office, locker rooms, and showers", says Elena Nurmekhamitova, director of the Nadezhda sports school. "Today our sports school meets all requirements for holding major competitions. In 2024, the All-Russian Sports Acrobatics Championships were held at Nadezhda".

The sports school has two specialized halls for sports acrobatics, with certified equipment installed: beams, trampolines, pommel horses, horizontal bars, a gymnastics pit, and special gymnastics mats. The spacious building has allowed us to increase the number of participants by a third. Since 2019, more than 2,000 athletes with mass sport categories, 80 candidates for Master of Sport, and 24 Masters of Sport have been trained at the new sports school.

The Nadezhda sports school offers six sports programs: artistic gymnastics, sports acrobatics, volleyball, shooting, competitive ballroom dancing, and trampoline jumping. One of the school's students, Ekaterina Pungina, was selected for the Krasnodar Krai team. The team made it into the top 10 at the Russian Artistic Gymnastics Championships, which was recognized as a great success.

Nadezhda athletes annually become prize winners at the Southern Federal



District Championships. A unique case: in 2025, the entire quartet representing the Krasnodar Krai team in men's group acrobatics were all Nadezhda students – Daniil Romantsov, Konstantin Khristostomov, Vladimir Fatsaev, and Ivan Zagorulko. To outperform their competitors, the boys learned to perfectly execute the most difficult elements: a triple somersault and the highest pyramid in sports acrobatics.

While sports like volleyball attract teenagers, the training of a gymnast and acrobat begins at an early age.

**Coaching is very rewarding work, that's why I love my job. I'd probably spend all my time here if I could, but my family is waiting at home.**

**Inna Mitrofanova,**  
Artistic gymnastics coach,  
Honorary Education Worker  
of Russia



**Today our sports school meets all requirements for holding major competitions. In 2024, the All-Russian Sports Acrobatics Championships were held at Nadezhda.**

**Elena Nurmekhamitova,**  
Director of the Nadezhda Sports School

"If you came to see us in the evening, you would find many four-year-olds", continues Elena Nurmekhamitova. "It's important to engage them through games, with prizes – notebooks, stickers. At first, not all children can even do an ordinary somersault, not all can land properly".

Sport begins with interest. However, victory and real results require fighting with yourself every day, overcoming fear, mastering new elements. There are five apparatus in women's gymnastics, six in men's. The sport is becoming increasingly complex, and not everyone can walk the challenging path to truly high achievements. That's why, in addition to trust in their coach, comfortable training conditions are so important for young gymnasts and acrobats – conditions that could not have been created without CPC's charitable support for children.

"Coaching is very rewarding work, that's why I love my job", smiles artistic gymnastics coach Inna Mitrofanova. "I'd probably spend all my time here if I could, but my family is waiting at home".



AUTHOR

Pavel Kretov

# From the First Days of Life

Novorossiysk city authorities have always paid serious attention to healthcare. This good tradition continues, with CPC supporting the municipal administration in this effort



CDC Chief Physician Grant Aboyan

One of the largest clinics in the USSR, serving a population of about 100,000, was built in Novorossiysk in the 1970s. This Clinic No. 5 later became part of the Second City Hospital structure. Today, highly qualified specialists work here, and the institution is fully equipped with modern medical equipment. However, Novorossiysk is developing, growing with new territories, including rural areas, where there is high demand for highly specialized medical care and quality diagnostics.

In 2007, on the initiative of Vladimir Sinyagovsky, then Mayor of the Hero City of Novorossiysk, a Clinical Diagnostic Center (CDC) was created, and staffed with all necessary specialists.

“This raised the level of medical care for the population to a new level”, says Grant Aboyan, chief physician of the CDC. “We began serving all those who previously had to travel to Krasnodar and even Rostov-on-Don for medical examinations. The core of the CDC was formed by ultrasound diagnostics doctors from the ‘Mother, Child, Family’ center under the leadership of our first chief physician Oleg Safonov”.



Ultrasound Diagnostics Doctor Svetlana Nefedova

Today, the CDC includes an outpatient department, a clinical diagnostic laboratory, and a day hospital. About 7,000 people visit the center monthly, examined by three dozen specialized physicians, many of whom hold PhDs. Ultrasound diagnostic imaging remains one of the CDC’s strongest areas. Of the five ultrasound machines available, three were received through the Caspian Pipeline Consortium’s charitable program.

“State-of-the-art expert-class equipment from the world’s best manufacturers allows us to conduct examinations of various organs, including elastography: by tissue changes, without biopsy, to distinguish malignant tumors from benign ones, to determine cirrhosis, cardiovascular diseases, thyroid diseases and others at early stages using minimally invasive methods”, explains Grant Iosifovich.

For four years now, Dr. Svetlana Nefedova has been examining patients using the ultrasound machine with elastometry function donated by CPC. She previously underwent the necessary training, enabling her to utilize all of the equipment’s capabilities.

“The machine is equipped with a set of sensors and provides excellent visualization. It enables specialists

FIGURES

The center delivers about 3,000 babies annually, with up to **20 deliveries per day**



Acting Chief Physician of the Perinatal Center Ivan Sobolekov and his deputy Dmitry Tretyakov

to obtain all the information needed to determine patient treatment tactics”, says Svetlana Nefedova.

In early 2025, the Consortium purchased a MEDSTAR UE-3000 Aseptic PRO ENT workstation for the CDC. This device enables modern diagnostics that eliminates the risk of nosocomial infection spread. The workstation creates images with high detail, which increases research accuracy. The painless types of endoscopy it employs make it indispensable in pediatrics, and the use of ENT organ irrigation equipment included in the delivery set combined with laser radiation provides maximum therapeutic effect.

“Such a device, in terms of novelty, variety of options and diagnostic capabilities, is unique in the city. The flexible endoscope with a diameter of only 4.5 mm causes almost no discomfort to children and allows examining infants from day one”, emphasizes the CDC chief physician.

Additional capabilities are given to the ENT workstation by the built-in sterility maintenance system using UV rays. This equipment processes and heats medical instruments to a temperature comfortable for patients.

CPC Panorama correspondents also visited the Novorossiysk Interterritorial Perinatal Center located next to the CDC. The term “interterritorial” means that the center provides medical care to pregnant

women, women in labor, postpartum women, and newborns not only from Novorossiysk but also from Gelendzhik, Anapa, and Krymsk. The Perinatal Center consists of three obstetric and pediatric departments, adult and pediatric intensive care units, as well as a gynecological department. The center delivers about 3,000 babies annually, with up to 20 deliveries per day.

“We differ from an ordinary maternity hospital by having a pediatric intensive care unit, where we provide care for children with pathologies and premature babies”, says Ivan Sobolekov, acting chief physician of the Perinatal Center. “In the gynecological department, we perform highly specialized operations – laparoscopic, endoscopic, sling procedures, and others”.

The Caspian Pipeline Consortium provides substantial support to the institution. High-frequency ventilators for replacing and supporting respiratory function help Perinatal Center specialists save the lives of newborns with extremely low body weight.

“For children with meconium aspiration syndrome, a regular ventilator cannot effectively help”, notes Sobolekov. “Our previous ‘high-frequency’ unit constantly broke down, it was difficult to quickly find a replacement, and then CPC purchased for us not an equivalent device but a different one with better characteristics”.

The Consortium is also appreciated at the Perinatal Center for ultrasound diagnostic equipment, including portable units, and for shock-resistant infusion pumps. It was once said that the pipeline company pays a lot of attention to the younger generation. Based on the results of our visit to the Perinatal Center in Novorossiysk, we can confidently add: including the very arrival of this generation into the world.



Carestation-620 anesthesia-respiratory system at the Perinatal Center

## AUTHOR

Pavel Kretov

# From Community Theatre to Professional Stage

The partnership between Novorossiysk City Theater and CPC has lasted for exactly 10 years. The institution's own history goes back much further. The theater was built here before the Russian Revolution, with a semicircular auditorium seating one thousand and a general's box. A church stood nearby, which gave the square its name – Church Square. The two buildings stood side by side until the early 1930s. The Orthodox church was torn down by a decision of the city council. The temple of Melpomene was destroyed in a 1942 air raid.

**T**he damage inflicted on the city is best illustrated by this fact: Novorossiysk's prewar population was 95,000 residents, and after liberation Soviet soldiers found only a family of three – hiding in a basement marked "Typhus". Therefore, although reconstruction of the city began immediately in 1943, the issue of restoring the theater surfaced only in the 1950s. Novorossiysk residents

built it with their own hands, in their spare time after their main jobs, as a summer style, using stones and bricks salvaged from other ruined buildings.

– Behind the scenes, you can still see the variety of materials used in the walls: stones, red and white bricks, and assorted blocks", explains theater director Oleg Beredin. "On the portico, as was customary, bas-reliefs of Lenin and Stalin were installed. They are still there, hidden from the audience: when the summer theater was converted into a winter theater in 1961, the attic concealed the leaders.

Construction of the winter theater was entrusted to specialists from the Novorossiysk Ship Repair Plant, who approached the task with great responsibility. Moreover, their ship-repair expertise proved invaluable during the reconstruction. Anticipating that the old walls could not support the new stage machinery, the builders welded a robust metal framework. Another testament to the ship repairers' exceptional craftsmanship was a chandelier made specifically for the theater, which continues to impress visitors with its elegance today.



Another relic of the theater is a Blüthner piano, purchased specifically for Dmitry Shostakovich's visit. It was on this instrument that the patriarch of Soviet music performed for the people of Novorossiysk the city anthem he composed – "Novorossiysk Chimes".

For many years, Novorossiysk City Theater was a people's theater. Typically, such a title evokes the words of Yevgeny Yevstigneyev's character in the film "Beware of the Car": "Who haven't we played in our collectives! Better not to remember. Isn't it time, friends, for us to take on William, you know, our Shakespeare?" However, this quote certainly does not apply to Novorossiysk Theater.

Director of Novorossiysk City Theater Oleg Beredin against the backdrop of the building's "historical masonry"

**We underwent a five-year transition period. The entire troupe graduated from the Institute of Culture, and the director upgraded his qualifications. A completely new chapter in our lives then began**

The level of directing and acting at the theater was such from the start that productions like "Between Downpours" and "The Man with a Gun" were even staged at the Kremlin Palace of Congresses in Moscow. As is well known, not every professional theater in those years was permitted to stage plays about V.I. Lenin, in order to avoid caricaturing the leader's image. A special commission carefully selected actors for these productions. In 1965, Novorossiysk Theater, with its production of "The Man with a Gun", won the All-Russian Review, surpassing 200 other people's theaters of the RSFSR. The troupe proudly received the jury's assessment: "It is no coincidence that Novorossiysk People's Theater performs the functions of a city theater".

In 1972, based on competition results, the theater was granted, for the third time, the honor of presenting its production on a Moscow stage. The Novorossiysk troupe brought the large-scale drama



"Cement" to the capital – large-scale in concept, in number of participants (120 people), and in scenery, with rotating kilns transported on two trucks and lit on stage. A model of the "Cement" scenery is still displayed in a place of honor at the Novorossiysk Cement Industry Museum today.

Chief director Vladimir Amerbekyan, whose name the theater now bears, closely followed developments in the country's theatrical life and pursued constant renewal and relevance of the repertoire. Among the notable productions of the 1970s were "Storm Year", "Yegor Bulychov" and Others, "Our Debts",

"Lines Cut Short by a Bullet", "Dacha Romance", "The Duel", and "Bride from Imereti". In the 1980s and 1990s – "Heart of a Dog", "Forget Herostratus", "The Trap", and others.

An important achievement of Vladimir Amerbekyan was that in the post-Soviet period he not only kept the theater going but also trained a new generation of young directors. By the beginning of the 21st century, the troupe unexpectedly had six professional directors, one of whom was the current theater director, Oleg Beredin.

– My entire working life has been connected with this theater, – recalls Oleg Gennadyevich. – I came here at 16 as a cultural organizer, and by 18 became head of the production department. I then enrolled in the Krasnodar Academy of Culture and received directorial training.

In the 2010s, it became clear that a people's theater – a unique mix of amateurs and professionals – could no longer remain in this status. At amateur festivals, the troupe was regularly told, "You're professionals; we can't evaluate



you". Conversely, at competitions among professional theaters, they were told, "Amateurs can only receive 'Participation' diplomas from us".

Thus, in 2012, Oleg Beredin and artistic director Yevgeny Kushpel set an ambitious goal for the company: "We are working toward obtaining professional status!"

– We underwent a five-year transition period. The entire troupe graduated from the Institute of Culture, and the director upgraded his qualifications. A completely new chapter in our lives then began, – recalls Oleg Beredin.

Substantial support for the theater, especially during its formative years, came from charitable assistance provided by the Caspian Pipeline Consortium. In 2015, CPC donated radio microphones and professional lighting equipment. In 2019, the theater received new sound and video systems. Standing in the auditorium,



The theater building's architecture is an example of 1950s Empire style

Ensemble performed here, and we have received only the most enthusiastic feedback regarding the sound quality.

At the end of 2023, Novorossiysk City Theater gained new touring opportunities thanks to another CPC donation – an intercity bus with seating for over 50 passengers. It was on this bus that the troupe transported the production "The Will to Live", based on Vasily Shukshin's work, to Moscow.

Today, under the roof of Novorossiysk City Theater, besides the main troupe, 15 additional diverse ensembles develop their creative skills, and active programs are conducted for talented children. Having achieved professional status, the troupe has not forgotten its origins.



one can appreciate the quality of these installations.

– Now we have true rider-grade Meyer Sound audio equipment, – notes Oleg Beredin. – See these speakers? There are eight in total, each special: the lowest produces the quietest sound, and each subsequent one is progressively louder. The topmost speaker is aimed at the last row and is also the loudest. This ensures that every audience member hears the same calibrated sound. Recently, the Valaam Monastery Choir and the Alexandrov

On the anniversary information stand – historical repertoire, outstanding artists, and the director who gave the theater its name



## AUTHOR

Dmitry Konstantinov



# The Fabric of Personality

Yulia Pestova is an expert and jury member of the "CPC for Talented Children" competition, as well as an actress and teacher. She is known for her roles in Gleb Panfilov's films *The Romanovs: A Crowned Family* and *In the First Circle*, as well as for her work in productions at the Moscow Gubernsky Theater and elsewhere.

The editorial team of CPC Panorama was eager to speak with a professional in theater and film, primarily to give our young contestants – who dream of pursuing careers in these fields – the chance to receive advice and insights directly "from the source."

Photo by Irina Volobueva

**Y**ulia Gennadyevna, thank you for inviting us to the press screening of "The Elder Son", in which you performed. After watching it, one gets the impression that this production has allowed the theater – perhaps only the Moscow Gubernsky Theater – to make a decisive step in competing with other forms of visual art. I might even compare its success to Meyerhold's breakthrough in the 1920s, although this production is executed more subtly and less "revolutionarily". How did you achieve this – I mean the entire theater collective, under the guidance of artistic director Sergei Bezrukov? After seeing the play, questions like "What does the future hold for theater as a genre in the age of media technologies?" and "Where are our new Shakespeares?" somehow immediately felt unnecessary.

◀ At a troupe meeting, Sergey Vitalyevich once said: "Yes, technologies are advancing, and new expressive means and forms of entertainment are emerging, but theater will never die".

I fully agree. Theater is the living word, a unique energy. It is communication and an exchange of energy with the audience – something that cannot be replaced. I am glad that in the play "The Elder Son", according to the director's vision, modern technologies – inevitable in today's theatrical world – do not overshadow the actors' performance.

▶ Yes, but there is also a projection on the curtain of an "atmospheric" film, edited from at least two Soviet black-and-white films of the 1960s, isn't there?

◀ I would not call the use of a film projector a cutting-edge technology, but it is also a technical device that

allows the audience to more fully immerse themselves in the atmosphere of the USSR during the years when Vampilov's play was written. In various productions at our theater, this technique is used quite frequently – sometimes with an even noticeable predominance of "cinematic" elements.

▶ And the "linear" stage machinery, as opposed to the classic turntable – that is also technology, isn't it? Yours changes the scenes quite interestingly.

◀ This is not technology – it is all manual labor by the stage crew dressed in black, so they remain invisible to the audience in the "gaps" of the scenery. Our stagehands pull and push the set pieces along rails in teams of three on each side, unrolling and rolling up dozens of meters of electrical lighting cables.

I have a small role in this production, but it is very enjoyable to play it because this is real live theater, where the actor's contact with the audience happens without any intermediaries.

▶ You mentioned the director – sometimes we forget that in theater this "intermediary" profession between actors and the playwright exists, yet it is so important...

◀ The director's profession is, in my opinion, still fundamental in theatrical art. The director is the creator of the performance.

For the production of "The Elder Son", a fairly well-known director was invited – Grigory Lifanov, artistic director of the Sevastopol Academic Russian Drama Theater named

after Lunacharsky. It was a great pleasure to work with him because he treats the nature of each artist with care and gives them the opportunity to improvise, independently creating their character's image. Grigory Alekseevich set the overall direction, adjusted certain things, and slightly limited the flight of our imagination where necessary to realize his concept, yet at the same time left the actors enormous space for creativity. And it is truly wonderful when a director doesn't "bend you over his knee", doesn't crush you with demands to hit the exact intonation or precise mise-en-scène – turn your head exactly 33 degrees, not 34. The actor can fully open up and begin to create.

This is exactly what we did during the entire two-plus months of staging the play. It was an extraordinary pleasure – a creative flight, an amazing unity of thought, and joy of communication. And, as the director himself says, the performance was created with love.

▶ We are pleased of speaking with an actress who has experience in both theater and film. What are your thoughts on the Stanislavsky system, which unites these two art forms? Is it still relevant, or are there other competing and more advanced methods?

◀ I believe the Stanislavsky system is timeless, and no other methodology can ever replace it. Konstantin Sergeevich discovered the key to human existence in this profession. Once someone enters it and masters the techniques of interacting with the audience – conveying thoughts, emotions, character, and energy – they truly become an actor.

Stanislavsky discovered, systematized, and refined all of this, and he deserves all honor and praise. He was a great man – one could even call him the founder of modern

**The Stanislavsky system is timeless, and no other methodology can ever replace it**

theatrical art, both in Russia and worldwide. I believe that to this day, no one has devised anything wiser than the Stanislavsky system.

▶ Is the acting profession profitable nowadays, or not very?

◀ People do not engage in creative work for money. For money, they go to work in banks, start businesses, and so on. People become actors, musicians, or painters when their soul calls for it, when they perceive the world differently, when they exist in this world so that everyone else – those in banks, business, or raising children – can live more easily. So that others may cry, laugh, rest, soar spiritually, experience catharsis – when they feel distressed, when they are crushed by circumstances or their own grief.

▶ There was a clear interest among young people in the Soviet era, which you presented and performed in such detail. Young viewers watched with fascination, recording videos...

◀ Yes, and this also influenced the choice of the play's style. We could have opted for a modern approach, with mobile phones and car sharing, but Soviet authenticity seemed more "appealing" to us. It intrigues today's youth and evokes nostalgia in those who lived in the USSR.

"The Romanovs: A Crowned Family"





## For classics, the choice of time and place of action is virtually irrelevant

In his time, Vysotsky played Hamlet at the Taganka Theater in clothing from the second half of the 20th century. Such a choice is entirely valid because, for the classics, the selection of time and place of action is practically irrelevant. Classics are about what will always “touch” people. That is precisely why the works of Shakespeare, Chekhov, and Vampilov are considered timeless.

When I studied at the Shchepkin School, a classmate performed an etude in which the protagonist was waiting for a bus. To our teacher Yury Solomin's question – why a bus and not, say, a girl who never came – the student answered: “Well, a girl – that's so banal, and I wanted it to be original”. To this, Yury Mefodyevich replied, in my opinion brilliantly: “Among the masterpieces of world art, there is nothing original. A plot where two people love each other but the parents are against it is banal, right? Yet Shakespeare created the tragedy “Romeo and Juliet” from this. Is it banal when she loves him but he doesn't love her? Yet Ostrovsky took it and wrote the drama “The Storm”. Remember: as long as people are born the same way they were born in Shakespeare's time, humanity's problems will remain the same”.

Similarly, in Chekhov's Three Sisters, Baron Tuzenbach says: “After us, people will fly in balloons, jackets will change, they may discover a sixth sense and develop it, but life will remain the same, life will be difficult, full of mysteries and happiness. And in a thousand years, man will sigh just the same: ‘Oh, life is hard!’ – and, at the same time, just as now, he will fear death and not want it”.

For hundreds and even thousands of years, nothing changes in human relationships, and no technological development can alter this. Therefore, the soulfulness of theatrical productions is no less important – and perhaps even more important – than their spectacle.

### ► When the trend for the USSR among modern youth changes, won't the classic fathers-and-sons conflict – noted by Turgenev – return again?

◄ The gap between fathers' perception of the world and children's worldview always exists. The question is different – how to perceive this and how to interact with it?

My eldest son is 13 years old. I look at him and his friends who come to visit, and I rejoice, unlike those who grumble that «youth today aren't what they used to be.» They seem very smart, interesting, and enthusiastic to me.

Yes, different clothing styles and people having gadgets – but essentially nothing changes. One generation doesn't radically differ from another. The same values and the same structure of society exist, with a certain percentage of geniuses, marginalized people, and «solid average performers.» In every generation there are happy people, lonely people, embittered people, selfless people. In any era, someone breaks the law, and someone sacrifices their life for others.

### ► How do you evaluate the participants of the 2025 «CPC for Talented Children» festival-competition – their abilities, creative potential?

◄ It's always gratifying to see people, especially children, who are burning with an idea, full of thirst for creativity, wanting to conquer some heights... In this sense, they're amazing kids with the richest creative potential! I'm very glad they invited me to this competition. Here, you understand how rich Russia is in talents, how important it is to give these talents timely development and help them realize their plans. I think a worthy replacement is growing for all of us – and this is very heartening.

### ► You have extensive experience working on juries of international competitions and film festivals. How does the «CPC for Talented Children» festival-competition look against their background – how does it differ from other creative competitions, what's missing, and what advantages do you see?

◄ My experience isn't that extensive. For three years, I was a jury member of two international film festivals in Kazan – «Winged Leopard» and «Zilant.» Then Diana Gurtskaya invited me to the jury of a music competition for children with disabilities. There, we evaluated performances together with Ekaterina Chernousova, an expert of the «CPC for Talented Children» competition. She introduced me to competition director Victoria Rille, and as a result, I was invited to the project.

### ► We talked about the demand for «paramusical» competitions – by analogy with the Paralympics – exactly a year ago in an interview with Nikolai Kozhin. In my opinion, it's very good and right that this direction is already being implemented today. What's your opinion?

◄ Communicating with these kids (some were literally carried onto the stage – they couldn't walk independently), I made an amazing discovery for myself. It's not that we're so wonderful because we socialize children with disabilities.

They are the chosen ones – bearing their cross so that others, through communication with them, realize all the fragility and vulnerability of existence, improve their souls through compassion and participation, rethink their lives, and grow spiritually, so the world becomes better. But this, of course, is a separate topic – I could talk about this for hours.

### ► You evaluated video applications in the «Theater. Artistic Word» nomination. What was successful in them and what wasn't?

◄ Against the background of fairly formal video clips – when, figuratively speaking, children stood on a stool and recited a poem – there were also creative solutions in their own way. There, apparently, teachers, parents, and the children themselves made efforts for a more accurate realization of concepts. They supplemented, for example, with ambiance – background, flag, military-patriotic symbolism, the entire setting. They added background music, thought through pose and gestures. It looked much better – more interesting – although all this didn't affect the evaluation criteria.

You couldn't raise the grade for someone reading poorly in a beautiful ambiance – or lower it for someone who read a poem well against a white wall. Not all those who read poorly were hopeless; sometimes it was enough to correct a couple of letters in the speech apparatus and work more with the teacher so the child understood what they were reading. Then they could record the application again.

## There's always a chance to get a children's role, even if you live in a remote village

### ► Are diction defects difficult to correct? And there are also specific accents in certain locations – what should be done with them?

◄ As a certified teacher of stage speech, I can say that pronunciation defects are corrected fairly easily and quickly – if they're not related to certain nervous system diseases. Such defects affect competition evaluation, but local dialects don't. The accent will have to be corrected later – when our contestant becomes a professional actor, not in their location, but in one of the Moscow theaters.

It's important to note that, besides evaluating the technical side, there is evaluation of artistic qualities. As I already said, this isn't about external design – it concerns proper selection of the work. First, it must match gender and age. A seven-year-old child can't read «I met you, and all the past came alive in an outlived heart.» A girl with bows can't read «Wait for me, and I'll return» – that's still a man's theme.

### ► There's also the opposite extreme – mentioned at the beginning of the year in your joint interview with Maria Evseeva and Alexander Koltsov. High school students – teenagers – shouldn't choose works that are too childish, such as Agnia Barto's poems about Tanya and the ball.

◄ This year, fortunately, such miscalculations weren't observed, and in general, the choice of themes was very good. In particular, Robert Rozhdestvensky's undeservedly forgotten «Ballad of Colors.»

There was something else related to military-patriotic themes. Again, a little girl with bows reading about war – how two sons were shot before their mother's eyes, and she mourns them. What can a child understand about maternal grief? At this age, a shot is a balloon popping – that's all. Did she choose this theme herself, or did her mentors see it this way? I really want to advise such teachers to change professions, so they don't ruin children's futures. It creates the impression that these people themselves haven't mastered either the art of reading literary works or pedagogical techniques – yet they try to teach. Very unfortunate.

### ► What would you recommend the youngest competition participants read about war?

◄ «Little Socks» by Musa Dzhalil, «Zinka» by Yulia Drunina. And such applications were there, by the way – small children read these works quite well. Against this background, performances were very upsetting when children looked aside and mumbled something without any interest or expression – clearly trying to finish quickly and run off to play with dolls.

In her time, Maya Plisetskaya found the courage to tell high-ranking officials who brought their children to her



"The Magic Drumstick"



for introduction to elite art: «My God, please, don't teach children ballet. It will be bad for both the children and ballet.» The same in our case – parents shouldn't try to realize their ambitions through children without certain aptitudes in their offspring. And children don't owe anyone anything at all. Feel it's uninteresting, not yours – don't lie to yourself, refuse.

► **And if it is «yours,» then any failure will only spur you on – inspire you to work more on yourself? That's what you said in that triple interview?**

◀ Yes, if something burns inside you, some motor is working – then you need to choose this road and walk it. Carlos Castaneda is an ambiguously perceived writer, but he has, from my point of view, the right thought: you'll recognize your path because you'll move along it easily, without effort. And if everything goes «against the grain» – it means it's not yours.

► **Suppose such a talent wins our competition, goes to Moscow, receives a prize, returns home. What's next – study in a theater studio, specialized university, employment? Can you break through via a «wormhole» and immediately get a children's role in theater or cinema?**

◀ Why not? There's always a chance to get a children's role, even if you live in a remote village. The nearest city surely has a theater, and acting agencies exist on the internet – including children's ones. You need to post your data there, photos, video business card, works – and wait. Of course, this doesn't mean a child doesn't have to study if he or she wants to grow as a professional.

In our theater, for example, Sergei Zhukov's new musical «You're My Only One» has just been staged, involving more than 20 children and teenagers aged 7 to 15. Even during rehearsals I was amazed by their energy – having studied at school in the morning, they come to the theater where they dance, sing, and perfect acting skills without any signs of fatigue or despondency. They show us professionals an example with their endurance and enthusiasm. You could even envy them!

► **What do you say about your traveling master class in Kalmykia and the regional gala concert in Elista? You**

**were praised in the Iki-Burul press. What's your opinion of the audience?**

◀ The master classes and concert were at the proper level, I think. It was easy and interesting for me to work. The kids and teachers participated very actively – with a high degree of involvement in the process. It was clear that this was all worthwhile, that each of them was learning something new, that they were very interested. And, accordingly, it was extraordinarily pleasant for me that I could give them something, teach them something, and maybe open the door for someone to a bright future in art.

► **Please comment on another thesis you expressed earlier: «If you weren't appreciated, think – maybe this opinion is subjective enough not to be considered truth.»**

◀ I think criticism can be useful if you treat it correctly. When a person takes note of some comments, considering them fair – that's very reasonable. If a person gets upset and starts thinking they're a mediocrity with no business in art, then such an approach to the matter is destructive.

You need to try to find the golden mean – understand where criticism is constructive and where the critic vented their unrealized ambitions on you, or maybe you just didn't coincide in your vision of the work, for example.

In general, I'm sure that in art, as in biology, there's natural selection. If talent is inherent by nature, it will break through the thorns. Circumstances will align, people capable of influencing further development of an acting career will be met, the right decisions will be made intuitively – you need to believe in this. But this also doesn't cancel study and work on yourself.

► **Parental ambitions are understandable. What if it's the opposite? When they say: «What theater?! You must continue the family dynasty of design engineers!»**

◀ My case. Peasant grandmothers moved to Moscow, mom and dad were born here and became engineers. When I was about three, mom took me to the theater, where I saw live artists – and from then on, I lived with the dream of an acting profession.

When I was unwise enough to voice my dream at home, I received a collective rebuff – mainly from my grandmothers: « Why would you go into acting – you've got neither the face nor the charm. Such actresses don't exist.»

► **Did you go against your family's will in the end?**

◀ Not quite. I studied poorly in school and, having finished it, decided I would never study again in my life. However, mom – with tears and pleas – begged me to go at least to medical school, which was located near home. What wouldn't you do for mom! But there I very quickly understood that studying, it turns out, is interesting. Grades improved, I fell in love with medicine, became completely absorbed by it, and forgot that I once dreamed of an acting path.

But fate, as they say, will find you even on the stove. A friend from a children's camp invited me to go to a theater studio with her, without warning me about this in advance. I was outraged by this circumstance and categorically

## The artist's path, though difficult and in some ways sacrificial in relation to commonly accepted values, is extremely fascinating and rewarding

refused to go there with her. How could I – I wasn't prepared: in old, unpolished boots, without manicure, without makeup, without hairstyle, hadn't even washed my hair! In short, we quarreled and went our separate ways.

But suddenly something inside me «clicked» – I ran back, caught up with my friend, and went with her to the studio. That's how my acting career began.

► **Did you enter theater school right away?**

◀ Yes. In fact, I got into two universities at once – GITIS and the Shchepkin Theater School. The director of that same theater studio said my nature was more suited to the Maly Theater, so I ended up choosing the second institution. I eventually graduated from it.

► **There's such a concept as «imprinting.» Often without realizing it, we behave like a favorite film character. We dress the same way, choose similar cars, similar home interiors, and so on. How about actors themselves?**

◀ It's hard to say. For us, playing these very «matrix» film characters, the idea of an «actor of one role» feels closer. For me, such a role was Grand Duchess Olga Nikolaevna in the film «The Romanovs: A Crowned Family». After school, I worked for a year at Mark Rozovsky's theater, and then film director Gleb Panfilov invited me to audition for his new film.

Working with him was an enormous pleasure. His professionalism, extraordinary talent, intelligence, spiritual subtlety, and ability to work with actors – all of this made that period of my life unforgettable. I can even say that communication with him had a huge influence on the formation of my personality and my development as an actress. Our joint creativity and interaction served as a kind of canvas on which all the subsequent

circumstances and events of my life were «embroidered.» We communicated with Gleb Anatolyevich until his passing, and the influence of this creative school, this unique atmosphere, still shapes my life.

For example, two years ago I started learning to play guitar and now perform for our soldiers in hospitals.

► **Like the grand duchesses of their time... Do you see your children as carriers of the creative legacy?**

◀ With the eldest – definitely not. He's technical, like his dad. He listens to the Strugatsky brothers with headphones, participates in the «Kurchatov» and «Phystech» olympiads. Recently, we were driving back from the dacha and the Internet ran out. So, not to waste time, he derived a formula himself in the car – and it turned out to be correct! When the Internet came back, he checked it and proudly told me he hadn't been wrong in his assumptions.

The youngest, who is now nine – that's another matter. He listens to Didyula with headphones, moves brilliantly, picks up the style of the music naturally... We enrolled him in dance – he quit. Still searching for himself. My nature. Passionate.

► **Our traditional question to competition experts: what is your personal recipe for victory?**

◀ There are no fixed recipes. The main thing is the desire to participate and understanding the importance of creating a quality video application. I'll reveal a secret: nowadays, even professional adult actors must do this to take part in screen tests. It's challenging, but inevitable. And then, as in the film «The Magicians»: see your goal, believe in yourself – and you'll get through any wall. The most important thing at the very beginning is to understand your true calling: not fame, not money, but this unique world behind the scenes, interaction with the audience, self-expression, and spiritual exploration.

You see, it's very dark backstage, which is why they use a special flashlight placed by the lighting technicians according to safety rules; its narrow beam shows the way to the stage. Walking along this beam throughout life – the path is difficult and, in some ways, sacrificial with respect to commonly accepted values, but it is extremely fascinating and rewarding.



# The Benefits of Book Therapy

In May 2023, a Russian publishing house published a book by Vitaly Shpilko, Senior Specialist for Maintenance and Repair Support in the CPC Western Region. Another of his books is now being prepared for publication, and during this pause we asked the author to share the secrets of creativity and the skills of book publishing without stepping away from his work in production

Summarizing the plot of a book is not quite the right thing to do and is commonly referred to as a spoiler. An experienced reviewer doesn't do that: first, he compares the thickness of the tome with the font size (234 pages in fairly small letters – not bad, not bad), and then opens the novel “Only One Dream Until Love” and immerses himself in reading.

The main character discovers in himself the gift of premonition, which involves him in a whirl of events, stories, and encounters, often requiring difficult and non-trivial decisions. The author calls the genre of his work romantic fantasy and admits that he used not only his own life experience and familiar images but also tried to construct a special world in which his characters live. Following the path once taken by John Ronald Reuel Tolkien and J.K. Rowling, our colleague feels as confident as an NHL hockey player on the ice at UBS Arena. But his favorite sport is different – it is fencing.

“Working with text requires a lot of time, and of course, as in any other endeavor, you need a structured plan”, shares Vitaly Valentinovich, revealing the secrets of his creativity. “Sports is partly a good helper in forming discipline and order in what appears on paper”.



## On Muses and Torments

The first literary experience of ninth-grader Vitaly Shpilko was a 20-page essay analyzing “The Tale of Igor’s Campaign”. The second was “An Unsent Letter”, also written at school. Then, as is customary in literary circles, he participated in writing “battles”, and his first real printed book came during his time working at CPC.

“Since childhood, I’ve liked history, literature, and research in these fields”, recalls Vitaly Valentinovich. “Besides that, I wanted to create something of my own. So when an interesting essay topic came up, I enthusiastically took on the task, read all the scholarly and critical works on ‘The Tale’ and ended up getting a C for ‘non-format.’ I later corrected it to a B by rewriting it ‘the way it should be’”.

To the main question we ask our creative colleagues: “Do emotional experiences improve a writer’s work?” Vitaly answers affirmatively.

“In school, I had unrequited love, then we were separated by thousands of kilometers. I moved to Tomsk, then to Perm, and then to Krasnodar, while she stayed in Kazakhstan. The feeling and pain didn’t go away, and I wrote her a letter in which I tried to express in maximum detail what was tormenting me. I never sent the letter, but over the years this text transformed into a story, then into a novel, written in snatches, by hand, and even with drawings in the margins. And when the draft was finished, you know, it let go. But this story would have remained in drafts if not for a future event”.

**You need to constantly stay in touch with your reader**

## More Than Reading

The magical-mystical properties of literature are being talked about again. Books are once again becoming the best gift, especially if it’s a grimoire in a leather binding. Vitaly Shpilko calls his own discovery of the special impact of a work on both readers and writers “book therapy”.

“In my youth, a classmate from the lyceum at North Kazakhstan State University and I tried writing competitively: who’s better”, the author continues. “It was interesting practice in its own way, but you couldn’t call it a serious breakthrough. But then, when I had already changed several places of residence and ‘reforged’ myself into a technical specialist, when I had a family and children, a new literary miracle happened.

Imagine an innate humanities person working at a large industrial enterprise. Experience and constant professional development naturally allow you to perform increasingly complex tasks more confidently and effectively over time, but routine accumulates, and the brain (initially versed in creativity) increasingly demands some kind of ‘outlet’.

“In early 2023, the LitRes website announced a ‘Love Between the Lines’ contest with results in May”, says Vitaly. “My wife suggested I participate, I remembered the draft of ‘An Unsent Letter,’ and in February-March I wrote a novel based on it, fundamentally rethinking the plot but keeping the main characters. I worked in the evenings after coming from the office. Based on the contest results, I didn’t make the top three, but I was fourth out of a thousand. But the main thing isn’t the podium, it’s that when I finally hit the ‘publish’ button on the LitRes website, I felt exactly that relief, that liberation from routine I was looking for, and I realized that I myself am first in line for book therapy”.



## Trade Secrets

The author admits that it was friends who encouraged him to print the novel that had debuted so successfully on the internet. Many of them wanted to receive as a gift not just a link in an email but a real tome with the smell of fresh printing ink. Vitaly began choosing publishers and ultimately settled on Ridero, a company that, among other things, provided editorial services.

“Now you can quickly get published at your own expense or at the publisher’s expense, which is less fast and not guaranteed”, Vitaly shares his experience. “I chose the first path, partly because a writer hoping to publish for free (through a publisher) is less protected in copyright. The manuscript is pushed onto the back burner, and then you look – all your ideas and plot lines have already come out in another author’s work”.

After receiving the print run from the printer, Vitaly did what any author would do and organized a book presentation, which went well overall. But not everyone was able to attend the event due to lack of information.

“Another practical tip for a beginning writer is to send personal invitations to those you’d like to see at the presentation”, Vitaly explains. “A general mailing list is ineffective; for some it goes to spam, and some are accustomed to printed invitations in envelopes. You need to constantly stay in touch with your reader”.

Many writers have used their dreams as plots: Mary Shelley, Robert Louis Stevenson, Ray Bradbury, Stephen King. Vitaly Shpilko doesn't reject this technique and believes that the main thing is not to let the "internal editor" wake up.

"Some believe our dreams connect us to the universe's information library – why not?" believes Vitaly Valentinovich. "Besides, during sleep a person undergoes a kind of deep cleaning of the brain, which is precisely why we sleep a third of our lives. And after this 'cleaning,' perception of reality is refreshed, we see, feel, and understand what we couldn't properly perceive before through 'dusty portholes'".

For a writer creating his works without leaving production, methods for transitioning into a creative state and tuning into creativity are especially important.

"For me, it's mainly music", admits Vitaly Shpilko. "Sometimes walks with meditative observation of nature, active sports, for example swimming, or just morning exercises in the fresh air. In such moments you stop tracking time, hours slip by like minutes, and suddenly – a flash, an epiphany, after which you need to remember or write everything down. That is, the main thing in tuning is to find a way to connect with your inner world".



### A Series or a New Experiment?

Vitaly Shpilko's second novel "Generation AI" has already been written and will participate in a detective novel contest on the LitRes platform at the end of 2025. According to the author, this is not a continuation of the first book but a new literary experiment.

"The concept of the book 'Only One Dream Until Love' was to create a one hundred percent positive, kind story", explains Vitaly Valentinovich. "With the overwhelming amount of negative information surrounding modern people, I wanted to make a kind of oasis book. Judging by readers' reviews, the experiment succeeded and book therapy had a healing effect not only on me but on others as well.

The second novel, which has a detective component, could not do without antagonist characters and bad deeds. Let it be so, I thought, but the book will become more lifelike, because in reality there is no energy without a negative charge, and no music without minor notes. By the way, the lyrical theme turned out so contrasting that my wife – my first reader and critic – approved my new experiment. But, as they say, good triumphs over evil, so the ending of the book will be special... And everything will come together into a series of uplifting books. My family is my inspiration and my support; I wouldn't get far without them".



### Ernest Hemingway advised writing only about what you know well

#### On Legacy

A book not only "heals" from the stress of everyday life, it can also raise the author's educational level.

"Ernest Hemingway advised writing only about what you know well", says Vitaly Shpilko. "Besides, you need to be competitive if only for the sake of winning another contest. So in the context

of the detective novel, I had to study materials on weapons, on Latin (I have codes in it), on programming (the main character is a hacker). In addition, I studied with great pleasure the evolution of the detective genre: from professional criminologists conducting investigations to enthusiast priests and Miss Marple. Also interesting are the reasons for the appearance of a partner – Watson, Hastings, and others. I'll have one too, a former employee of a certain law enforcement agency".

Vitaly Valentinovich also believes that literature should continue to influence civilization.

"The main thing that is passed from generation to generation, thanks to which people become better, evolve rather than degrade, is not material but spiritual and cultural values", says Vitaly Shpilko. "Creativity plays the most important role in this. Alexander Sergeyevich Pushkin, whom we remember by heart through the centuries – he not only composed, he carefully collected the cultural heritage of past generations, 'legends of deep antiquity,' to pass them on to descendants. And not only in this example do we see that literature and creativity in general play a creative role in human history. This process is continuous as long as humanity exists, and I'm glad to have embarked on this path".



# Culture Highlights

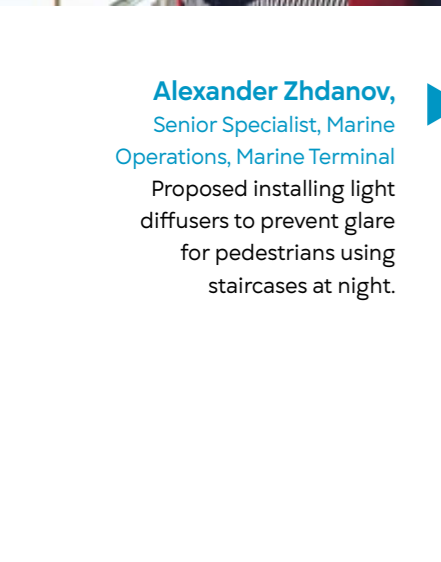
CPC Panorama recognizes the Leaders of Safe Work Culture for Q3 2025 – employees and contractors of the Consortium



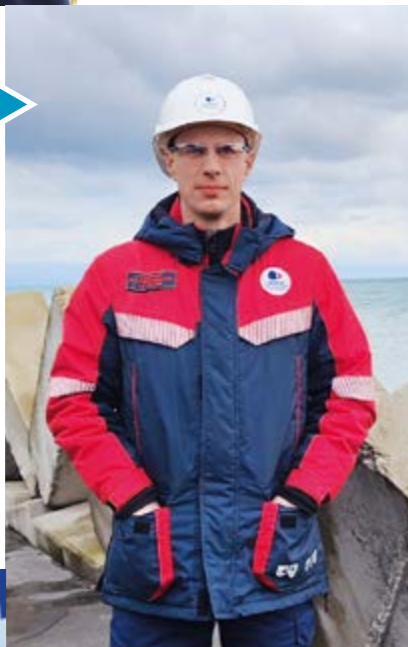
**Vladimir Kosukhin,**  
Operator, Oil Products  
Pump Station,  
Komsomolskaya PS  
Noted that two 6-meter-  
high flame arrester  
platforms lack guardrails  
on the entry side, creating  
risks during inspection or  
maintenance.



**Leonid  
Karatumanov,**  
Electrical Engineer,  
Electric Equipment  
Operations Service,  
Kurmangazy PS  
Suspended work  
until violations were  
addressed, as the  
diesel generator and  
concrete mixer in use  
lacked grounding  
systems.



**Alexander Zhdanov,**  
Senior Specialist, Marine  
Operations, Marine Terminal  
Proposed installing light  
diffusers to prevent glare  
for pedestrians using  
staircases at night.



**Leonid Egorov,**  
Foreman, Electrical  
Equipment  
Maintenance Team,  
STARSTROY LLC  
Identified missing  
mechanical protection  
on DG KU 1018 power  
cables in a timely  
manner, enabling  
prompt installation of  
protective measures.



**Igor Musenkov,**  
Senior Security Shift Officer,  
Nachin Security LLC,  
A-PS-5A  
Discovered improperly  
functioning gate leaves at the  
first water-lift station, which  
could have caused hand  
injuries during operation, and  
reported the issue to the NPS  
management.



**Vyacheslav  
Ovsyannikov**  
Operator, Process  
Installation, PS-5  
Halted unsafe operations  
when a truck operator  
remained in the cab while  
an excavator loaded soil  
into the truck bed.



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"CPC Panorama" – Zen



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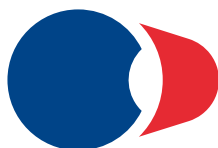
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