

CASPIAN PIPELINE CONSORTIUM:

A TIME-TESTED INTERNATIONAL PROJECT



PANORAMA

CASPIAN PIPELINE CONSORTIUM

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BY PREEMPTING THE RISKS

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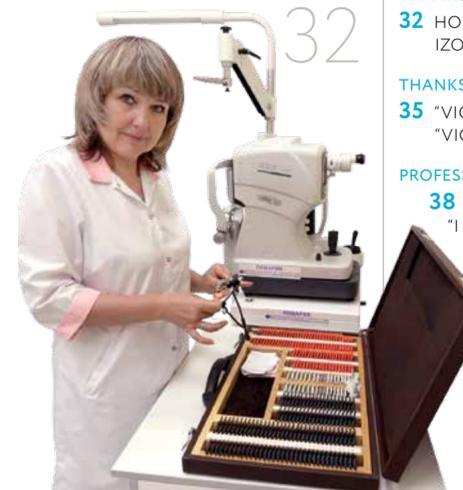
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NIKOLAY GORBAN: “CPC LAUNCHED DEBOTTLENECKING PROGRAMME”

FOR NEARLY TWO DECADES NOW, 11 SHAREHOLDERS FROM VARIOUS COUNTRIES HAVE BEEN OPERATING A 1.5-THOUSAND KILOMETRE PIPELINE SYSTEM THAT STRETCHES ACROSS RUSSIA AND KAZAKHSTAN AS AN EXAMPLE OF SUCCESSFUL INTERNATIONAL COOPERATION

The Expansion Project has put the Tengiz – Novorossiysk oil pipeline among the world’s largest. The implementation of this ambitious project in 2011–2017 has made it possible to set up a capacity reserve in advance of rising demand from shippers.

Life, however, does not stand still: the quantities of oil being delivered into the CPC pipeline have been growing fast. You will recall that 2017 exports totalled 55.1 MT, up 10.8 MT in 2016. In 2018 the Marine Terminal loaded over 61 MT of oil. CPC received in its pipeline system in 2018 the largest quantities of oil from the fields of Tengiz, Karachaganak and Kashagan – 28.7, 10.3 and 13.2 MT respectively. Kazakhstan is implementing a major project to ramp up production at the Tengiz field, which is expected to deliver a massive boost to the utilization of the Tengiz – Novorossiysk oil pipeline.



The oil producers' projected demand can exceed the current mechanical throughput capacity of the main pipeline as early as 2022. That is why the CPC's annual general meeting in Baku reviewed and accepted a Debottlenecking Programme (DBNP) 21 May 2019. It will increase the throughput capacity of the Tengiz – Novorossiysk system, allowing to transmit at least 72.5 MT of crude from Kazakhstan.

The Final Investment Decision (FID) document package has set a deadline for DBNP completion: December 2023. The bulk of building and installation work will be completed in 2022. Investments over the period of 2019 to 2023 will total USD 599.9 MM of which USD 156.4 MM and USD 443.5 MM to be made for CPC-K and CPC-R respectively.

I emphasize: the project covers all of the CPC's 15 oil pump stations and Marine Terminal. E.g., the DBNP will give the Astrakhanskaya PS a new main-line pump station and new indoor switchgear. Among the activities planned for the Atyrau PS is the construction of a new mainline pump unit with a gas turbine unit and the upgrading of a diesel pump station. The Tengiz PS will need two x 20,000 Vertical Floating Roof Tanks (VFRTs) installed, a LACT upgraded, three mainline pumps replaced, four booster pump packages installed and a substation built. But work will not be on such a scale everywhere; a number of stations will only need pump impellers replaced.

Essentially, the DBNP is an optimization project for the oil pipeline system capacity built by the Expansion

Project. The measures will add flexibility to the operation modes of pump stations and the option of accepting additional quantities of crude oil from Kazakhstan at the optimal quantity of DRA and higher oil pipeline on-stream factors.

As early as June 2019, the CPC team, working in close coordination with the Consortium's shareholders, sprang into action to implement the DBNP. On 10 June I signed the Resolution titled "On the arrangements for the implementation of the Debottlenecking Programme". A staffing list and balanced budgets are in place; engineering surveys are in progress; suppliers are being vetted; personnel is being hired. Early in July the CPC's top managers visited all DBNP target construction sites and held meetings with local technical staff.

In parallel with DBNP, the CPC team continues to implement their annual investment programmes as planned. The 2019 capital expenditure budget in place is about USD 50 MM (CPC-R and CPC-K – USD 32 MM and USD 18 MM respectively). The programme provides for the construction of a bridge over the river Kigach; replacement of fire detection systems at Komsomolskaya, Astrakhanskaya and Kropotkinskaya PS, at the Tank Farm and the Marine Terminal's Shore Facilities; construction of a rotation camp at the Astrakhanskaya PS; construction of an administration and amenity block at the Marine Terminal and other items.

The fast growth of the Consortium and higher quantities of crude oil pumped through the pipeline

THE THROUGHPUT CAPACITY OF THE TENGIZ – NOVOROSIYSK SYSTEM

WILL ALLOW TO TRANSPORT AT LEAST

72,5

MT OF CRUDE FROM KAZAKHSTAN



go a long way towards improving the CPC's financial situation. The company's consolidated earnings for 2018 totalled USD 2.19 Billion as per IFRS, after-tax income USD 322 MM. In 2018 CPC-R repaid some of its debt to its shareholders USD 1.45 Billion. In the 1st and 2nd quarters of 2019, CPC allocated USD 364 million and USD 261 million respectively for debt repayment; USD 1.423 Billion is to be paid in all in 2019. Such pace of debt repayment will enable the CPC to clear the debt by the end of 2020 and start assessing and paying dividends.

CPC project has thus provided an example of successful international cooperation in crude transmission. And the wealth of resources of the Caspian region ensures a stable outlook for the Consortium and its role for the member states, the largest of which are Russia and Kazakhstan, for many years to come.

N.N. GORBAN
GENERAL DIRECTOR
CASPIAN PIPELINE CONSORTIUM

AT THE PRESS CONFERENCE 3 JULY 2019, CPC GENERAL DIRECTOR, NIKOLAY GORBAN FIELDDED QUESTIONS FROM REPORTERS OF RUSSIAN AND FOREIGN MEDIA ABOUT CPC'S PERFORMANCE IN 2018 AND OUTLOOK FOR THE CURRENT YEAR. THE JOURNALISTS' INTEREST WAS PIQUED BY THE NEWS THAT THE CONSORTIUM HAD LAUNCHED ITS DEBOTTLENECKING PROGRAMME (DBNP) IN AN ATTEMPT TO FURTHER INCREASE THE THROUGHPUT OF THE TENGIZ – NOVOROSIYSK OIL PIPELINE



AUTHOR

PAVEL KRETOV

DBNP: STRATEGY OF THE PROGRAMME

IN JUNE 2019 CPC LAUNCHED DEBOTTLENECKING PROGRAMME (DBNP). EDITORS ASKED CHRISTOPHER SCOTT BOWEN, CPC PROJECTS AND ENGINEERING CONSULTANT, TO DESCRIBE THE PROGRAM

Mr. Bowen, what is the Debottlenecking Programme (DBNP) all about? What throughput increase will the CPC gain on its Tengiz – Novorossiysk oil pipeline downstream of Kazakhstan and in Novorossiysk?

DBNP is designed to optimize current capacity by making it available where the demand is. The incremental demand is at the eastern end of the pipeline, originating in Kazakhstan. There are many variables that determine ultimate capacity of the system, such as increased reliability, adding pumping capability, and optimized use of DRA, which are all elements of the Debottlenecking Program, and this is part of the reason why we call it a program instead of referring to it simply as one project. The answer to the capacity question is highly technical, but simply put, with the DBNP improvements, we will be able to accept nominations for Kazakhstan of 72.5 MMTA with optimized use of DRA, and up to 83 MTA from Kazakhstan with maximum DRA dosage. This year our accepted nominations are around 57 MMTA from Kazakhstan, and we have the physical capability to accept approximately 65 MMTA.

What is the programme's time frame? Will the DBNP be phased, as was the CPC Expansion Project?

The project is to be executed on the soonest possible timeline, in one stage, with completion of main construction works during the 2nd and 3rd quarters of 2022, and with final dismantling works of replaced facilities, etc. completed by the end of 2023. Objective is to be able to have capacity on line ahead of increased nominations, currently scheduled for July 1, 2022.

What is the scope of work to be completed under DBNP?

The projects critical to shifting available pipeline capacity to the eastern end of the pipeline mostly consist of adding pumps and their supply of power (new turbines and pumps at Atyrau, A-PS-4A, Komsomolskaya), adding electrical motor driven pumps at Astrakhan, installing new pumps and related boosters at Tengiz, and increasing rotor diameter on pumps at A-PS-3A, A-PS-4A, PS-5, A-PS-5A, PS-7, and PS-8.

Thus, I want to re-iterate the most important task in Russia will be construction of new mainline pump

house and new pumps installation at PS Astrakhanskaya. In Kazakhstan the most critical work scope is the installation of three new pumps with all ancillary systems at PS Tengiz.

We are also developing a more reliable system by installing variable frequency drives at several pump stations, installing recirculating lines at other, and significantly, installing a new three-meter LACT unit at the MT shore facility to better accommodate the demands of measuring crude loaded at the higher flow rate.

We will have some form of work taking place at every CPC pump station, plus the Marine terminal and in our offices in Moscow and the Regions. This is yet another reason why we call DBNP a program, not the project. Projects are implemented by individually assigned functions while a program requires cooperation across all functions and locations.

Hence a question: how will the DBNP be run? Will you use the same management structure as for the recent Expansion Project?

This will be a CPC managed program, which is a bit different than the way the Expansion Project was

managed. For DBNP we will use our resources rather than shareholder provided Project Management Companies, and we plan to hire in excess of 300 temporary staff during program execution. We will provide project management services from many locations, Moscow, the Region Offices, and at sites.

What challenges the DBNP managers are facing? What measures are being implemented?

Engineering surveys are nearing completion, and the design stage is about to begin; mobilization is in progress.

The staff of Procurement, E&P, and Operations Department have to analyze and optimize major equipment purchase proposals received. They are to be ready to place orders before the milestone date of October, 2019. E&P, Legal and Operations have to work jointly to develop finalized the contracting scheme and bid packages in time to go to tender by December 2019.

During the CPC Expansion Project implementation the Consortium's management and employees acquired wide practical experience. How was it taken into account for DBNP works planning, arrangement, management?

Our DBNP execution plan has taken into account lessons learned from the Expansion Project, as well as from our

many years of operating history. Our design solutions have history behind them as well, as we are not inventing anything new for DBNP, but rather using time tested proven solutions already in place wherever we can.

What latest technologies are planned to be used during DBNP construction or to be introduced following DBNP for the CPC pipeline system operation?

Since we are relying heavily on proven and tested applications, not many new technologies are being considered. One possible exception is the Variable Frequency Drives (VFD's) we plan to install. These will give a greater ability to regulate the pumps, and will be an advantage especially during shut downs and re-starts. This is not new technology, simply new to CPC. We plan extensive testing, training and simulations prior to putting the VFD's into operation.

The Expansion Project paid a lot of attention to safety culture and occupational safety and health policies. Do you plan to continue their promotion as part of the DBNP?

We have an excellent operation history in CPC,

especially in the past few years. This is for a combination of reasons, including our HSE Management system, regulations, and procedures. The current regulations are a product of lessons learned during many years of operating, plus our lessons from the Expansion Project. Our strategy for DBNP is to use our core foundation of existing regulations and procedures as the basis for our safety system. Due to the increased activity level at our facilities, we plan to add staff temporarily to ensure adequate site supervision, and we plan to require our contractors to supply sufficient supervisory and HSE resources at our construction sites. Uncompromised safety compliance and stringent observance of our job safety procedures is a requirement that must be met as we take on the goal of program timely completion. ●



AUTHOR
PAVEL KRETOV

FROM TENGIZ TO NOVOROSIYSK

IN JULY 2019 CPC MANAGEMENT HAD A WORKING TOUR
OF CPC'S FACILITIES IN RUSSIA AND KAZAKHSTAN



**NIKOLAY GORBAN,
CPC GENERAL DIRECTOR:**



THE RECENT EXPANSION OF THE CPC PIPELINE SYSTEM'S CAPACITY TOOK ALL PROJECT PARTICIPANTS THROUGH THEIR PACES. THE LARGE-SCALE CONSTRUCTION PROJECT SHOWED THAT THE CONSORTIUM HAS A STRONG TEAM, CAPABLE OF FULLY MEETING ALL OBJECTIVES SET BY THE SHAREHOLDERS. SO WE ARE IN NO DOUBT THAT THE DEBOTTLENECKING PROGRAMME WILL BE IMPLEMENTED PROFESSIONALLY, SAFELY AND TO THE HIGH GLOBAL QUALITY STANDARD

Nikolay Gorban, CPC General Director, Kenneth Yoss, First Deputy General Director, Operations and Vladimir Shmakov, General Manager, Operation visited Eastern, Central and Western Regions of the Consortium, as well as the Marine Terminal near Novorossiysk.

brought on stream in 2016 and 2017 respectively.

The DBNP provides for PS Atyrau to be upgraded, including the construction of a new mainline pump unit. Consideration is being given to PS Tengiz having its LACT meter upgraded, three mainline

pumps replaced, several booster pump packages installed, two Vertical Floating Roof Steel Tanks (VFRTs) built, each for 20,000 m³, a substation and Overhead Power Lines (OHPL) built, Indoor Switch Gear (ISG) upgraded etc. A-PS-3A and A-PS-4 are expected to have the MLP impellers replaced.

As was reported earlier, in furtherance of the contract signed between CPC and KazTransOil (KTO) in May 2018, KTO's units started, effective as of 1 July 2018, to

CPC TOP MANAGERS STUDIED THE DBNP'S TARGET SITES

The top managers held meetings with key personnel and surprise readiness checks and inspected the equipment and the sites where the Debottlenecking Programme (DBNP) will be implemented.

In the Eastern Region, the CPC senior executives visited Tengiz PS, Atyrau PS, A-PS-3A and A-PS-4. The first two stations were upgraded as part of the CPC Expansion Project in 2015. A-PS-4 and A-PS-3A were

THE LOCATIONS VISITED BY
THE CPC MANAGEMENT WERE
INSPECTED FOR EMERGENCY
RESPONSE READINESS





IN THE EASTERN REGION, THE CPC'S SENIOR EXECUTIVES VISITED PS TENGIZ, PS ATYRAU, A-PS-3A AND A-PS-4

provide maintenance, repair and emergency response for CPC-K facilities in Kazakhstan.

Then the CPC's senior executives inspected the crude oil transportation facilities of the Consortium's Central and Western Regions located in Astrakhan Region, Republic of Kalmykia and Stavropol Krai.

They visited A-PS-4A, PS Astrakhanskaya, A-PS-5A, PS-3 in

the Central Region and PS-4 in the Western region. Following the inspection of the facilities, drills and meetings with experts, management team highlighted the reliable performance of equipment and CPC personnel expertise.

As part of CPC Pipeline Debottlenecking Programme in the Central Region, the inspected facilities, including A-PS-4A, are

expected to receive a new mainline pump unit with a gas turbine unit, as well as an upgrade to the diesel pump station. In store for the Astrakhanskaya PS is construction of a new mainline pump station, installation of new mainline pumps with variable-frequency drives (VFDs), installation of mud strainers, and the construction of a 10kV ISG. A-PS-4A and A-PS-5A

are expected to have the MLP impellers replaced.

The Western Region locations inspected by the CPC management will see their pressure surge relief systems upgraded as part of the DBNP.

The tour of CPC's top managers ended at the oil pipeline end point, the Marine Terminal near Novorossiysk. The senior executives inspected

**VLADIMIR SHMAKOV,
CPC GENERAL MANAGER,
OPERATIONS:**

THE TRIP SAW A CONSTRUCTIVE DIALOGUE WITH OUR REGIONAL PERSONNEL; WE SORTED OUT A LOT OF ISSUES. ON EACH BUSINESS TRIP TO THE CPC'S LOCATIONS I SATISFY MYSELF THAT A SINGLE TEAM OF PROFESSIONALS IS IN PLACE ALONG THE ENTIRE LENGTH OF THE TENGIZ - NOVOROSSIYSK OIL PIPELINE

the facilities of the Tank Farm and Marine Terminal Shore Facilities, conferred with technical staff on various aspects of MT operation and the Debottlenecking Programme for CPC oil pipeline system.

For the Marine Terminal, the DBNP program is expected to build three new LACTs and a new pressure control unit, upgrade the existing units, build an additional surge relief system (SRS) etc.

THE TOUR OF THE CPC'S TOP MANAGERS ENDED AT THE MARINE TERMINAL NEAR NOVOROSSIYSK

**KENNETH YOSS,
CPC FIRST DEPUTY GENERAL
DIRECTOR:**

TOURS OF THE CPC'S REGIONS ALWAYS MAKE A STRONG IMPRESSION ON ME. I SEE THAT THE LOCATIONS HAVE WORLD-CLASS EXPERTS, WHOSE ENERGY, COMPETENCE, RESPONSIBILITY AND EXPERTISE MAKE A STRONG CONTRIBUTION. OUR STAFF AT ALL LEVELS FULLY COMPLY WITH THE SAFE WORK RULES AND REGULATIONS, SHOW INITIATIVE AND ATTENTION TO EACH OTHER

THE DEBOTTLENECKING PROGRAMME (DBNP) WILL AFFECT ALL OIL PUMPING STATIONS OF THE TENGIZ - NOVOROSSIYSK PIPELINE SYSTEM, AS WELL AS THE CPC MARINE TERMINAL



AUTHOR
PAVEL KRETOV

SUSTAINABLE GROWTH AGENDA

IN JUNE 2019, THE NORTHERN CAPITAL OF RUSSIA HOSTED THE 23RD ST. PETERSBURG INTERNATIONAL ECONOMIC FORUM. IT WAS ATTENDED BY THE CPC DELEGATION FOR THE FOURTH TIME.

construction and operation of the oil pipeline infrastructure. And we are constantly seeking to improve our industrial and business processes. Our relationship with Sberbank-AST is definitely part of this important work. The agreement will enable CTC to use the tendering process for prompt, competent and secure procurement," said Nikolay Gorban before signing the document.

The business meeting between the Consortium's management and CPC's major shareholder, Chevron Corporation, discussed coordination in hydrocarbon transportation. Chevron's representatives were highly appreciative of CPC's performance and achievements in occupational safety and health. Chevron Vice President Jay Pryor emphasized that the successes had been enabled by strong teamwork of CPC's international management and high professionalism of the entire team.

The SPIEF hosted a trilateral meeting of CPC, Transneft and Chevron top executives.

The meeting was attended by Transneft President Nikolay Tokarev, CPC General Director Nikolay Gorban and Transneft Vice President Mikhail Margelov. Chevron was represented by Vice Presidents Jay Pryor and Bob Dastmalchi and Chairman of CPC-R Board

for tendering, ensuring its transparency, security and safety.

"CPC prioritizes state-of-the-art technologies and international standards for management, design,

This year the SPIEF's central theme was "Setting a sustainable growth agenda" and brought in more than 19 thou. people from 145 countries. The world has but 193 countries in all, which means this forum is not only international, but global. Its venues were used by 1,300 foreign and 2,500 Russian companies and saw 650 agreements signed, totaling over 3 trln rbl.

Also chock-full was CPC's top managers' personal agenda for the SPIEF. CPC General Director Nikolay Gorban and Sberbank-AST General Director Nikolay Andreyev inked a cooperation agreement. Designed for federal, state and municipal procurement, the Online Trading Platform (OTP) of CJSC Sberbank – AST is used by 600+ thou. suppliers. It supports all digitization, automation and administration solutions



of Directors, President of Chevron Neftegaz Inc. Andrew McGrahan. The parties discussed the outlook for the programmes to further upgrade the CPC oil pipeline system and international cooperation in the transportation of energy resources. A business meeting took place between CPC's top managers and Vagit Alekperov, Chief Executive Officer of the Consortium's another major shareholder, PJSC LUKOIL.

The forum also saw a meeting take place between CPC General Director and Germany's Siemens AG Group's delegation, headed by

CPC works in close coordination with the local authorities within its entire footprint. The Consortium's management regularly meets with the heads of the RF. The SPIEF venue was no exception either, hosting as it did a business meeting between CPC General Director Nikolay Gorban and Batu Khasikov, acting Head of the Republic of Kalmykia. The dialogue focused on progress under the 2017 Cooperation Agreement, the implementation of CPC's charity projects and programmes for 2019, and the outlook for joint efforts to improve the republic's so-

HELD SINCE 1997, THE SPIEF IS AN INTERNATIONAL VENUE FOR BUSINESS NETWORKING AND DISCUSSION OF KEY ECONOMIC ISSUES FACING RUSSIA, DEVELOPING ECONOMIES AND THE WORLD AT LARGE



CPC TOP MANAGERS' PERSONAL AGENDA FOR THE SPIEF WAS CHOCK-FULL AND PRODUCTIVE

CEO Joe Kaeser. Nikolay Gorban and Joe Kaeser exchanged opinions on cooperation between their companies and the areas of focus in their relationship. The parties discussed the use of cutting-edge technologies and innovative solutions in electrification, automation and energy-saving for pipeline transport infrastructure.

cial infrastructure in such areas of focus as public health service, education, culture, promotion of children's sports and the environment. Incidentally, the Consortium allocated over 800 million rbl. for the region's social needs between 1998 and 2018. In 2018 alone, the social programmes in the region were funded to the tune of 256.6 million rbl.,

including the construction of Children's Supplementary Education Centre in the township of Iki-Burul and a primary school building in the township of Artezian.

CPC has earmarked about 72 million rbl for 2019 social projects in Kalmykia as part of its charity programme.

Nikolay Gorban also informed Batu Khasikov that a major corporate event is planned for 2019 in the Republic – CPC Safety Day, which will be attended by representatives from all participants in the international project for networking on health, safety and environmental issues.

AUTHOR
PAVEL KRETOV

TOWARDS ZERO INJURY

IN 2018 CPC MANAGEMENT COMMITTED TO ACHIEVING ZERO-INJURY GOALS AS A STRATEGIC OBJECTIVE. THE FIRST MILESTONE TOWARDS THIS END IS CPC'S RANKING AMONG TOP 25 COMPANIES BY THE INTERNATIONAL ASSOCIATION OF OIL & GAS PRODUCERS (IOGP)

STATE-OF-THE-ART PRACTICES

At Russian Occupational Safety and Health Week (ROSHW), which took place in Sochi in April 2019, the Caspian Pipeline Consortium was awarded the Grand Prix of the "Health and Safety 2018" All-Russian Competition for its state-of-the-art practices and outstanding

achievements in workplace safety and security.

ROSHW has emerged as the largest health, safety and environment forum. The Consortium attends such events not only as a teacher but also as a diligent student, adopting the practices of global majors. When borrowed, such best practices are normally first tested at

regional subdivisions and, if proved a success, are extended to the rest of the company.

E.g., last year's ROSHW and local piloting resulted in CPC's taking on board a series of practices and successfully integrating them into the

Consortium's occupational health and safety management system. These include life-saving rules, a workplace observation-card-based monitoring programme, checklist-based facility auditing, and interactive staff training in occupational safety and health. Efforts were also made to bring the workwear and PPE used at CPC's facilities in line with the best market trends.

COMMITMENT

CPC's Safe Work Culture programme is predicated on each worker's awareness of and commitment to the prevention of accidents, workplace injuries and other incidents that may result in injuries or damage to the company.

The Consortium's facilities have introduced the Right to Suspend Work. Every worker knows that his/her refusal to work in unsafe conditions or exercise of the Right to Suspend Work will not expose him/her to disciplinary action; what is more, he or she will be commended for timely exercise of his Right.

CPC'S SAFETY DAYS

The Safe Work Culture programme has enlisted not only CPC's personnel, but

also the contractors' staff and site visitors in watching out for unsafe practices or unsafe work conditions. Everyone is entitled to voice their either positive or negative opinion of workers' behaviour, working conditions and technical condition of equipment and structures.

As part of its incentive scheme, CPC holds Safety Days on an annual basis. Their mission is to promote occupational safety and health and the idea of safety awareness. Held in CPC's host regions, Safety Days have emerged as a multinational, international forum.

CORE VALUES

The adoption of electronic systems for occupational safety and health training by CPC's production facilities makes it possible to improve the interactivity of

the process, which fuels employees' interest in safety matters.

The key aspects of the issue are covered in regular bulletins, which discuss safe practices and working conditions and offer recommendations based on safety requirements and first-hand experiences alike.

"In CPC, just as in all transnationals, human life and health are prioritized over performance indicators; no modern successful business can do otherwise. In this context, apart from providing a safe workplace for the staff, the employer must incentivize the personnel to work in a consciously safe manner and support the drive for zero injury," said CPC General Director Nikolay Gorban in an interview to journalists as part of ROSHW.

WHERE MANAGEMENT SETS PACE

International experience shows: any corporate occupational safety and health culture is spread by senior managers.

CPC PRIORITIZES HUMAN LIFE AND HEALTH OVER PERFORMANCE



It is they who make commitments and set policies, laying the groundwork for occupational safety and health culture, and continuously and at all times support its evolution.

"The management's active and personal involvement in promoting workplace safety in tandem with the workers creates a team drive for outstanding performance and constant improvement of Safe Work Culture," Kenneth Yoss, First Deputy CEO of CPC, said at the ROSHW roundtable called "Seven Golden Rules: simple and effective".

In 2019 a pilot project to promote leadership in Safe Work Culture will be taken through its paces at locations in CPC's Eastern Region. Specifically, this period is expected to see the region's experts examine all core processes of leadership drive and develop a leadership plan of action with key performance indicators. Those efforts are expected to culminate in a new CPC standard, "Leadership in Health, Safety and Environment".

IN PRACTICE

Whatever CPC's achievements, the Consortium will always seek to further improve all of its safety, health and environmental indicators.

"Despite the fact that many businesses are still thinking of Safe Work Culture in abstract terms with no clear-cut definition or regulatory framework, we offer ourselves as a case study in how work culture can and should be promoted and concrete



results achieved," emphasized Erica Vela Toussaint, CPC's safety, health and environmental consultant, at the ceremony of presentation to the Consortium of the Grand Prix of the

"Health and Safety 2018" All-Russian Competition.

CPC has already developed a package of programmes that enable contractors' occupational health and safety

CPC WINS GRAND PRIX OF "HEALTH AND SAFETY 2018 ALL-RUSSIAN COMPETITION 2018"



INTERNATIONAL EXPERIENCE SHOWS: OCCUPATIONAL SAFETY AND HEALTH CULTURE IS SPREAD BY SENIOR MANAGERS

management systems to be reliably reviewed and be brought into compliance with the requirements of the Consortium's standards as well as CPC's own personnel and contractor's staff to be involved in dealing with unsafe practices and working conditions, including by suspending work to prevent accidents.

CPC's Central Region will develop new tools to enforce safe work practices with contractors. The plan provides for a dedicated database to be set up for

prompt verification of personnel competency and equipment conformity, and for training in safe work practices with competence assessment of contractors' designated persons before allowing them site access. The best practices developed as part of the pilot project are also expected to lead to a draft standard HSE Plan for contractors.

The CPC enforces safe work practices and implements cutting-edge solutions in conjunction with best global health,

CPC HOLDS SAFETY DAY EVERY YEAR

safety and environmental practices. In a bid to improve performance indicators in this area, the team of CPC's Western Region will do in 2019 a pilot project to develop tools to identify the root causes of non-conformities discovered at locations and implement a package of measures to prevent repeat violations. Specifically, the plan provides for a high-performance algorithm to be developed to identify the root causes and train personnel in using the new procedure.

The personnel of the CPC Marine Terminal will translate risk registers into bow tie diagrams* as a pilot project this year.

* BOW TIE ANALYSIS IS A SCHEMATIC METHOD OF DESCRIBING AND ASSESSING RISK SCENARIOS. THE METHOD COMBINES AN INVESTIGATION OF THE CAUSES OF AN EVENT USING FAULT TREE ANALYSIS AND REVIEW OF CONSEQUENCES USING EVENT TREE ANALYSIS. THE FOCUS OF BOW TIE ANALYSIS, HOWEVER, IS ON THE BARRIERS BETWEEN CAUSES AND THREATS AND THREATS AND CONSEQUENCES. BOW TIE DIAGRAMS CAN BE BASED ON IDENTIFIED MALFUNCTIONS AND EVENT TREES, BUT THEY ARE MOSTLY BUILT IN THE COURSE OF BRAINSTORMING SESSIONS.





AUTHORS

GRIGORIY SENOEDOV,
DEPUTY SECURITY HEAD, CPC



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PROTECTING THE FACILITIES BY PREEMPTING THE RISKS

FROM JUNE 17 TO 21, CPC SECURITY DEPARTMENT HELD A MAJOR EVENT IN ELISTA – THE ALIGNMENT MEETING ON PHYSICAL SECURITY



Department – “Terrorism” and “Illegal tapping” (IT).

Within the framework of discussing “Terrorism” risk the representative of Ministry of Energy of the RF has noticed the high results of the CPC Security employees’ activities in the field of protection against terrorism. Further, the main tendencies and trends in legal enforcement of the legislative and regulatory frameworks in the area of fuel and energy complex security have been highlighted and

While discussing the matters regarding “Illegal tapping” risk, the general provisions on searching, kinds of penetration, signs of preparation for IT and order of activities in cases of revealing tappings have been envisaged. Some statistical data were given on illegal tappings into mainline pipelines

of various companies in the Russian Federation and, in particular, in the regions where the CPC’s facilities are located. The participants in the alignment meeting actively discussed the matters related to the ITs revealed at the CPC’s mainline pipeline from 2017 to 2019.

Additionally, within the scope of this topic the participants in the alignment meeting were familiarized with the general methodology of revealing an illegal tapping and leak, a possible equipment set of criminals, the existing methods of pipeline

The participants in this event were Ilya Borisenko Head of Security, his deputy, regional security managers, managers and professionals in physical security, security of personnel of the Moscow office, regions and Marine Terminal, as well as representatives of the security contractor. The special guest was the representative of Ministry of Energy of the Russian Federation.

The core theme of the alignment meeting was improvement of security guard activities results and providing a strong foundation for initiatives

aimed at sustainable development. Within the framework of the meeting the participants were familiarized with the risk-oriented strategy of CPC, as well as have analyzed and discussed the corporate risks within the competence of the Security

THE PARTICIPANTS IN THE ALIGNMENT MEETING WERE FAMILIARIZED WITH THE RISK-ORIENTED STRATEGY OF CPC

some practical recommendations have been given on arrangement of rating, passportization and updating of safety certificates for CPC’s facilities. Substantial attention has been paid to the legal conflicts in this area.



ILYA BORISENKO,
HEAD OF CPC SECURITY DEPARTMENT:

« NOWADAYS THREATS OF TERRORIST ACTS AND ACTS OF UNLAWFUL INTERFERENCE AT THE OBJECTS OF FUEL AND ENERGY COMPLEX IN RUSSIA AND KAZAKHSTAN ARE A VERY ACTUAL PROBLEM. UNAUTHORIZED ACTIONS OF PHYSICAL PERSONS ARE ESPECIALLY DANGEROUS FOR FUEL AND ENERGY COMPLEX (FEC) FACILITIES. POSSIBLE RESULTS OF SUCH ACTIONS ARE UNPREDICTABLE: FROM STEALING OF PROPERTY TO CREATION OF AN EMERGENCY SITUATION AT AN OBJECT (UNAUTHORIZED TAMPERING INTO OPERATIONS, FIRE ACCIDENT, DESTRUCTION, FLOODING, BREAKDOWN, VIOLENT UNREST, ETC).

ONE OF THE EFFECTIVE PREVENTIVE MEASURES TO ENSURE SAFETY AT IMPORTANT INDUSTRIAL OBJECTS IS CREATION OF A RELIABLE PROTECTION SYSTEM AGAINST UNAUTHORIZED INTRUSION OF PHYSICAL PERSONS, I.E. A PHYSICAL PROTECTION SYSTEM. THIS COMPLEX TASK OF PRIME IMPORTANCE IS SOLVED BY CPC SECURITY DEPARTMENT A 24/7 BASIS



VADIM BELOUSOV,
SENIOR PHYSICAL SECURITY OFFICER, CPC MOSCOW
OFFICE:

« ALIGNMENT MEETINGS SIMILAR TO ONE THAT WAS HELD IN ELISTA ALLOW THE STAFF MEMBERS OF THE CPC SECURITY WHO ARE DISPERSED OVER THE PIPELINE SYSTEM FROM TENGIZ TO NOVOROSSIYSK TO GATHER TOGETHER AND PRODUCTIVELY DISCUSS THE SECURITY DEPARTMENT'S AIMS AND OBJECTIVES WHICH ARE DETERMINED BY THE CHALLENGING CRIME SITUATION IN THE SOUTHERN REGIONS OF THE RF, AS WELL AS BY DIVERSIONARY AND TERRORIST THREATS RELATING TO OBJECTS OF FUEL AND ENERGY COMPLEX AND TRANSPORT

integrity monitoring, as well as the most commonly used methods and algorithms of actions for preventing IT consequences.

During the subsequent days of the alignment meeting, some practical trainings were held at 896–941 km of the CPC linear pipeline section and at PS-2 the main goal of which was elaboration of unified approaches to arrangement of safeguarding the oil pipeline and CPC's facilities. Moreover, the practical aspects of arranging the activities of roving patrols, foot patrols, mobile raid patrols, static and additional posts were worked out to the last detail. Particular attention was paid to arrangement of a rapid response service; and an optimal algorithm for recording and timely supplying of incident

information, control of actions at guard posts and emergency response order was discussed.

A separate subject for discussion was execution of the essential rules accepted at CPC and the requirements

In addition to the existing methods of safeguarding an oil pipeline, some additional practices based on innovative and technically challenging solutions using lie detectors, site surveillance and control of actions by quadcopters

THE EMPLOYEES OF THE SECURITY DEPARTMENT HAVE HIGHLY APPRECIATED THE EVENT

for occupational safety and health, industrial safety and environmental safety (HSE). Head of the Security Department has organized and conducted the workshop on this matter with attending contractor representatives responsible for safekeeping in the CPC Central region.

and GLONASS tracking equipment have been envisaged within the framework of the alignment meeting.

Summarizing the event, the employees of the Security Department were solid in their feelings: they have highly appreciated the event and noticed the necessity of regular carrying out similar meetings.



ALEXEY SENCHENKO,
PHYSICAL SECURITY MANAGER, CPC:

« AT PRESENT, THE ROLE OF FEC COMPANIES' SECURITY DEPARTMENTS AND SECURITY STRUCTURES IN THE STRUGGLE AGAINST TERRORIST THREATS REASONABLY INCREASES, AND THEIR ACTIVE PARTICIPATION IN MAINTENANCE OF PUBLIC SECURITY UPON LAWFUL AND LEGALLY SOUND PRINCIPLES IS AN ESSENTIAL ELEMENT OF IMPLEMENTING THE SYSTEM OF GOVERNMENT MEASURES AIMED AT COUNTERTERRORISM, NON-ADMISSION OF UNLAWFUL INTERFERENCE ACTS AND PREVENTION OF ILLEGAL TAPPING INTO MAINLINE PIPELINES OF THE RF

CPC PRESS SERVICE

OFFSHORE AND ONSHORE

THE CONSORTIUM ANNUALLY CONDUCTS NO FEWER THAN 10 LARGE-SCALE OIL SPILL RESPONSE AND FIRE-FIGHTING DRILLS TO ENSURE READINESS FOR PROMPT REMEDIAL ACTION IN ANY ES (EMERGENCY SITUATION).

E. g., 21 May 2019 saw comprehensive drills conducted offshore around the CPC Marine Terminal. Their purpose was to practise coordination between the teams and facilities of CPC and contractors in dealing with the largest oil spills envisioned.

The drills involved over 150 responders, 19 craft, 1.2 km of marine

containment booms, 450 m of coastal containment booms, 15 oil-skimming systems with a total capacity of 635 m³/hour, as well as different types of oil spill response (OSR) equipment.

A sitrep at 10:07 identified a drill oil slick off SPM (Single Point Mooring)-2. Tanker loading was suspended for drill purposes. The auxiliary ship harbour of the CPC Marine Terminal and the port

of Novorossiysk immediately sent out ships with OSR equipment. The ships promptly set up six oil-gathering units. The search and rescue personnel deployed offshore and coastal booms, oil-skimming systems and containers for collected oil. And as early as at 13:12 the drill participants completed the measures to contain and clean up the offshore oil spill.



THE DRILLS INVOLVED MORE THAN

150
RESPONDERS

SOURCE: PRESS SERVICE OF LLC STARSTROY

20 YEARS OF SUCCESSFUL PARTNERSHIP WITH CPC

2019 IS AN ANNIVERSARY YEAR FOR LLC STARSTROY, ONE OF THE KEY CONTRACTORS OF THE CASPIAN PIPELINE CONSORTIUM. BORIS ZABULDIN, THE COMPANY'S GENERAL DIRECTOR, TALKS ABOUT ITS HISTORY AND PRESENT DAY

On 15 March 1999 JSC Globalstroy Engineering (Moscow, Russia) and Bouygues Offshore (Paris, France) set up an international joint venture in a bid to pool the expertise of Russian and foreign partners in construction, service and maintenance of oil and gas facilities in Russia and elsewhere. LLC STARSTROY is a brainchild of Serik Rakhmetov, Chairman of the Board of Directors of JSC GSI (Globalstroy Engineering), Jean-Pierre Vurpillot, Head of the Russian Branch of Bouygues Offshore, and Feliks

Mukhamedov, the first General Director of the Company. The venture was a timely one because in the late 90s there were no contractors in the post-Soviet space capable of building facilities to international specifications and standards for foreign project owners.

For over two decades the company has implemented



a plethora of construction, including global, international projects. Its first and flagship project was to build facilities for the oil pipeline system of the Caspian Pipeline Consortium within the Russian Federation. The construction projects, such as the Tengiz–Novorossiysk oil pipeline, pumping stations and the Marine Terminal of CPC were completed in a short space of time and with excellent workmanship.

This was made possible thanks to the concerted effort of professionals in design, construction and operation of crude-oil pipeline transport facilities.

LLC STARSTROY's milestones are marked by its contributions to the Blue Stream projects and the Sakhalin-2 international project, as well as to mechanical installation works for the refurbishment and overhaul of petrochemical plants and oil refineries of national champions,

SINCE 2001 STARSTROY HAS BEEN CPC-R'S MAIN MAINTENANCE

such as Rosneft Oil Company, PJSC LUKOIL, PJSC Bashneft, etc. Wherever our experts and personnel were deployed, the customers praised their process safety awareness, safe practices and workmanship.

The company was set up and operates as a maintenance service provider for oil and gas facilities. Since 2001 STARSTROY has been CPC-R's main maintenance, repair and emergency response contractor for the Russian section of the Tengiz–Novorossiysk oil pipeline, and until 2018 we also successfully served in that capacity on the Kazakhstan section of the oil pipeline.

Our personnel involved in providing maintenance service for the CPC's facilities have the greatest

THE COMPANY HAS DELIVERED A WHOLE RAFT OF CONSTRUCTION PROJECTS IN TWO DECADES



expertise, a proven track record and all the necessary tools and equipment. All along the oil pipeline are

and mechanical – that provide the requisite diagnostic measurements and equipment checks. The labora-

THE COMPANY PLAYED A MAJOR ROLE IN CPC'S EXPANSION PROJECT

field service depots, which house, apart from service functions, the equipment and vehicles needed for prompt response to any accident and for oil spill containment and clean-up both offshore and onshore. The exercises and drills regularly held by CPC-R all along the oil pipeline demonstrate the high preparedness level of the personnel and well-oiled teamwork of units.

In each of its footprint regions, CPC has set up dedicated laboratories – metrological, electrical

tories have cutting-edge measurement and test instruments, as well as vehicles.

STARSTROY has construction units, which take part in construction and refurbishment of oil pipeline infrastructure. The company has been taking an active part in expanding CPC-R's facilities since 2015. Specifically, this means modernization of pump packages of the Atyrau PS and the Komsomolskaya PS in an attempt to increase throughput. The work was performed on the equipment in operation, with the

PS remaining on stream, together with the equipment manufacturing companies – Siemens, Flowserve and Schneider Electric. Also, STARSTROY personnel was tasked with connecting all the new-builds to the existing utilities as well as with start-up and commissioning of the new PSs. All CPC's facilities that came on stream as part of the Expansion Project were accepted by us into maintenance service.

The wealth of experience gained by the team of LLC STARSTROY over the last 20 years, and specifically in its relationship with CPC, allows the company to be optimistic of the future and to conquer new heights. I hope that our team's expertise will be sought after for years to come. ●

BORIS ZABULDIN,
GENERAL DIRECTOR,
LLC STARSTROY

NIKOLAY GORBAN, CPC GENERAL DIRECTOR:

IT IS NOTEWORTHY THAT THE CASPIAN PIPELINE CONSORTIUM WAS AMONG THE FIRST CUSTOMERS OF LLC STARSTROY, INCORPORATED IN 1999 TO IMPLEMENT DESIGN, CONSTRUCTION AND MAINTENANCE SOLUTIONS FOR OIL AND GAS FACILITIES. HAVING COMPLETED ALL TURNKEY CONSTRUCTION PROJECTS FOR CPC'S OIL PIPELINE SYSTEM, THE COMPANY UNDERTOOK TO PROVIDE MAINTENANCE, REPAIR AND EMERGENCY RESPONSE SERVICES FOR THEM.

SINCE 2013 THE STARSTROY TEAM HAS BEEN PLAYING A MAJOR ROLE IN IMPLEMENTING THE TENGIZ-NOVOROSSIYSK EXPANSION PROJECT, MAKING A STRONG CONTRIBUTION TO ITS SUCCESS AS PART OF ITS INTERNATIONAL TEAM.

STARSTROY TODAY IS A RELIABLE SERVICE PROVIDER WITH A PROVEN RECORD AS A GENERAL MAINTENANCE CONTRACTOR FOR CPC'S OIL PIPELINE, AND THIS RELATIONSHIP HAS WITHSTOOD THE TEST OF TIME. ADDRESSING ALL PRODUCTION ISSUES AS A TEAM, WE ARE CONFIDENT THAT IN ANY SITUATION WE CAN RELY ON THE PROFESSIONALISM, VAST EXPERIENCE AND CONSCIENTIOUSNESS OF OUR COLLEAGUES, AND THAT MEANS A LOT.

THE COMPANY'S PROFESSIONAL REPUTATION IN THE INDUSTRY IS SHAPED BY A MULTITUDE OF FACTORS, AND ALL OF THEM ARE COVERED BY STARSTROY, WHICH ADHERES TO GLOBAL QUALITY STANDARDS.

I CONGRATULATE THE COMPANY'S MANAGEMENT AND STAFF ON ITS 20TH ANNIVERSARY. MAY YOU KEEP YOUR MOMENTUM AND GO FROM STRENGTH TO STRENGTH!



SAVE AND PRESERVE

CPC PRESS SERVICE

AT THE END OF MAY 2019 ASTRAKHAN OBLAST HOSTED POST-IMPLEMENTATION REVIEW OF "SAVE THE HOMELAND'S ENVIRONMENT" TRADITIONAL ENVIRONMENTAL EDUCATION PROJECT

CPC has been running the project for a fourth year now in the region with support from the Caspian Fisheries Research Institute (CaspNIRKh).

The festivities to mark the project's completion were attended by representatives from CPC and CaspNIRKh, the government of Astrakhan Oblast and Rosrybolovstvo Russian Federal Agency for Fisheries, and, last but not least, the winners of children's creativity competition, educators and parents. Traditionally, the event kicked off with a ceremony of releasing young Russian

sturgeons from the mooring berth of CaspNIRKh's base – every child could accomplish a pleasant mission by releasing their "own" baby sturgeon into the environment by hand. That was followed by a competition award presentation and a gala concert.

Apart from the practical objective of increasing the population of rare sturgeon fish, the Save the Homeland's Environment project has an important educational mission, teaching the younger generation to take care of wildlife and instilling environmental awareness in children. This year the project's educational component was staged in the Kharabalinsky, Yenotayevsky, Limansky, Narimanovsky and Krasnoyarsky Districts of Astrakhan Oblast, which accommodate CPC's

production facilities. The children were offered 30 demo classes at 10 schools on the theme: "The sturgeon is an ancient fish, dating back to the age of dinosaurs. Let us save it for posterity".

The children were able to express their creativity in the competition for the best environmental promotion content in the following categories "Promotion Team", "Picture (poster, leaflet)" and "Functional Art". 27 entries were declared winners, and their authors received valuable gifts from CPC.

The following day CaspNIRKh's research ship set out for a deltaic area where 1,700 young Russian sturgeons with an average weight of about 500 g were released in their habitat as part of CPC's charity programme. ●



AUTHOR
PAVEL KRETOV

IN ASTRAKHAN LAND

ON 8 JULY 2019 CPC GENERAL DIRECTOR NIKOLAY GORBAN AND IGOR BABUSHKIN, ACTING GOVERNOR OF ASTRAKHAN OBLAST, OPENED CPC'S NEW OFFICE IN ASTRAKHAN

The inauguration ceremony was attended by the heads of relevant ministries and representatives from oil and gas companies of Astrakhan Oblast. The office with a total floor area of 3.6 thou. m² is now home to 113 employees of the Consortium. CPC's business units in the Central Region used to be housed separately in two old buildings.

The renovations at the new office space were completed on a tight schedule, starting in December 2018 and ending in May 2019. Here, everything has been done according to modern international and Russian workplace safety standards.

"This is the office we've long been waiting for!" said CPC General Director Nikolay Gorban at the unveiling

ceremony. "I hope our team will be happy with the spacious building, cosy rooms, good air conditioning and the comfortable work environment."

The newly moved-in occupants were warmly congratulated by Igor Babushkin, Acting Governor of Astrakhan Oblast. It is noteworthy that it was the new office that hosted the first work meeting between the head of the

region and the CPC management. The parties discussed aspects of the company's current operations and the implementation of an extensive social programme in 2019.

"CPC is a reliable community-focused partner of Astrakhan Oblast. We find important all your projects – to preserve the environment, promote and improve medicine and culture, support young people... We are grateful to you for that and looking forward to a long relationship!" said Governor of the Region Igor Babushkin.

The relationship between the international Consortium and Astrakhan Oblast dates back more than 20 years, during which CPC, apart from ensuring the effective and safe operation of its industrial facilities, has been sponsoring the region's social development. In the period from 1998 to 2018 the Consortium donated some 900 million rbl in total for various charity projects and programmes in Astrakhan Oblast. And this relationship is still very much alive now.

ASTRAKHAN OBLAST IS CROSSED BY MORE THAN 200 KM OF THE TENGIZ-NOVOROSSIYSK OIL PIPELINE; THE REGION IS HOME TO CPC'S THREE PUMP STATIONS: ASTRAKHANSKAYA, A-PS-4A AND A-PS-5A



RELATIONSHIP CONTINUES

ON 3 JULY 2019 CPC'S MOSCOW OFFICE WAS USED TO SIGN A CONTRACT FOR MAINTENANCE OF GAS TURBINE PLANTS AND SUPPLY OF SPARE PARTS BETWEEN CPC AND SIEMENS



Signatures to the document were affixed by CPC General Director Nikolay Gorban, President of Siemens in Russia Aleksandr Liberov and president of Siemens in Kazakhstan Audris Bartsyavichyus. The contract covers 5 years.

The German group and the international Consortium partnered as early as at the turn of the century, at the start of the Tengiz–Novorossiysk pipeline system construction project. Their relationship continued in the context of the CPC Expansion Project in 2010–2017.

The Siemens equipment supplied under the contracts in place for the construction of CPC's system and implementation of the Expansion Project is being used by CPC's crude oil transportation facilities in Astrakhan Oblast, in the Republic of Kalmykia and in Krasnodar Krai, as well as in Kazakhstan.

The Siemens Group operates in 190+ countries all over the world in a wide spectrum of fields: electrical engineering, consumer electronics, power equipment, transport, medical equipment and lighting technology, as well as rendering of specialized services.



CPC PRESS SERVICE

CORROSION CONTROL: INTERNATIONAL EXPERIENCE

IN MAY 2019, THE INTERNATIONAL CONFERENCE "CORROSION IN OIL AND GAS INDUSTRY" WAS HELD IN SAINT PETERSBURG. THE EVENT WAS ORGANIZED BY PETER THE GREAT SAINT PETERSBURG STATE POLYTECHNICAL UNIVERSITY



For the first time in Russia, NACE International (National Association of Corrosion Engineers) and EFC (European Federation of Corrosion) acted as co-organizers of the conference. Gazprom, Transneft, and Lukoil became the sponsors and participants.

the conference, and we asked him to share his impressions.

"Within the last 5 years, our operating service began to detect damages of epoxy insulation on the Stavropol Territory pipeline section," Oleg Andreev started telling. "Such places are identified by the

GazpromVNIIGAZ's report "Influence of cathodic polarization over the properties of epoxy powder coatings at point impact loads with various intensity" is of practical interest. The report describes the tests of an epoxy insulation coating under the influence of various external

pipeline) the process of insulation peeling may develop in course of time, if pipe wall temperature is higher than 40°C. If this temperature is lower, peeling does not appear. Therefore, the experimental data of our workfellows answered the question about the reasons of

GETTING TO THE TRUTH

CPC was represented at the conference by Oleg Andreev, Senior Electrochemical Protection Engineer of the Western region. He gave the talk called "The cathodic protection system over the Tengiz – Novorossiysk pipeline section. Experience, problems, solutions" that arose a keen interest among our workfellows from LLC GazpromVNIIGAZ, Salyk Petroleum, and De Nora. For his part, our colleague has picked up some useful experience of other companies at

special instruments when regular examining the earth's surface above a pipeline. After each uncovering the ground, a local swelling-up of insulation and its peeling were revealed on the pipeline. In this context, the information from LLC

factors, such as temperature, series of mechanical actions, and cathodic polarization. On the results of the experiments an important conclusion was drawn that in places with shallow impact damages of insulation (which could occur while constructing a

PETER THE GREAT SAINT PETERSBURG STATE POLYTECHNICAL UNIVERSITY ACTED AS THE ORGANIZER

THE REPORT OF THE CPC REPRESENTATIVE AROSE A KEEN INTEREST AMONG THE AUDIENCE



epoxy insulation damages in sections of our oil pipeline as well.

FROM THEORY TO PRACTICE

LLC GazpromVNIIGAZ's report "The laboratory and bench tests of anodic earth electrodes. The features of the tests on the basis of electrode materials" the methods of testing the above electrodes are described. Using these methods allows checking the quality of anode materials from different manufacturers which is considered when choosing a supplier of materials.

In the report of our Far-Eastern workfellows from Marine State University named after Admiral G.I. Nevelskiy it is proposed to utilize solar panels with a controlled voltage converter instead of the well-known protection circuits using protectors or cathodic protection stations. The feature of this protection method is based on the property of forming saline cathode deposits from calcium carbonate $CaCO_3$ and magnesium hydroxide $Mg(OH)_2$ on a steel surface in sea water. These salts have good protection properties and are able to obstruct the process of corrosion attack.

CORROSION AND BUSINESS

There were the 10 parallel-working sections and 3 alignment meetings at the conference, and the problems of corrosion in oil processing, pipeline transportation, oil and gas recovery, and maritime industry were considered. Some reports on corrosion protection, as well as theoretical and scientific insights on the mechanisms of this phenomenon have been presented.

The prospective trends in theory and practice of corrosion protection were addressed at the sections on corrosion monitoring, at the NACE alignment meetings on certification and training, and at



THE 10 SECTIONS AND 3 ALIGNMENT MEETINGS WERE CONDUCTED AT THE CONFERENCE

the NACE Technical Coordination Committee alignment meeting. In the reports of D.E. Greenfield, M. Diaz and A. Groysman the importance of developing a corrosion management international standard is emphasized by the International Organization for Standardization (ISO). Evolving the system designed to train experts on corrosion and the standardization of norms and regulations in the area of corrosion, NACE offers to use its own training programs and centers. The necessity of corrosion

management evolution at modern large enterprises is evident today, since, according to the specialists' research, the disbenefit of the states around the world from corrosion amounts to 2-4% of their aggregate national incomes. As one of the experts said at the conference, "If you don't manage corrosion, corrosion manages you." D.E. Greenfield, President of NACE International, held the presentation of Impact Plus software environment, from which it follows that introduction of a corrosion

monitoring system enables to decrease financial losses caused by corrosion attacks and increase the reliability of a business.

LUXURY OF COMMUNICATION

In the opinion of Oleg Andreev, professional growth is unthinkable without exchange of best practices with colleagues; it is possible only in an environment of experts.

"No constructive communication with participants in the conference would not have been possible without knowledge of English," Oleg Andreev emphasized in conclusion. "Since October last year, I was actively learning English according to a unique proprietary methodology by Alina Ramanchik via Skype and BK. With that, my teacher could be in London, Moscow or Klaipeda, while I could be in Krasnodar, Ipatov, Stavropol or Novorossiysk. The learning process was not discontinued, and already within the first three months the language barrier was dismantled and free communication skills were acquired. The second stage was immersion into the language structure, i.e. tenses, sentence formation, etc. Simultaneously I was working upon the articulation and pronunciation. As a result, I was able to communicate with my foreign workfellows freely and unhesitatingly at the conference, getting information straight from the source." ●



AUTHOR
OLEG ANDREEV,
SENIOR ECP ENGINEER OF THE CPC WESTERN REGION

THE CORNERSTONE IN RELIABLE OPERATION OF MLPS

THE MATTERS OF MATERIALS WORKING ABILITY ARE THE CORNERSTONE IN THE PROVISION OF RELIABLE OPERATION OF OIL-AND-GAS INFRASTRUCTURE OBJECTS

KoppCorrosion is one of the main causes of equipment reliability reduction. Here we will review in historical and practical contexts the measures that are taken at CPC to protect the equipment from impacts of aggressive environment through the example of the Western region.

OUR PROTECTION SYSTEM

The area of responsibility of the CPC Western region covers the 952-1,495 km oil pipeline section

that passes through the Stavropol and Krasnodar Territories and has five pump stations.

The cathodic protection system of the Western region comprises the following objects:

At the linear pipeline section:

- 20 cathodic protection units (CPU);
- 105 ground protection units (GPU) in walking tunnels under roads and railways;
- 42 ground protection units at block valve stations;

- 11 devices for protecting the pipeline against induced alternating current;
- 825 metering operation centers;
- solid-state polarized devices (PCR x 19, PCRH x 20) at block valve stations;
- 79 corrosion rate sensors.

At the five pump stations:

- 17 cathodic protection units;
- 15 ground protection units;
- 34 electrical insulating joints and flanges;
- 208 metering operation centers;
- 77 corrosion rate sensors.



A BLOCK VALVE STATION IN THE LINEAR PORTION



IMPROVING ECP

The initial stage of operating any oil pipeline involves elimination of revealed design and structural defects. And CPC is no exception in this regard. During examining the electrochemical protection (ECP) system in 2003, it was discovered that the 15 cathodic protection units commissioned a year earlier were not enough. The reason was that the tubes used in the pipeline section on the Stavropol Territory had a factory epoxy coating with insufficient insulation resistance. Therefore, in 2004, another 5 cathodic protection units were built. Meanwhile, from 2004 to 2007, the insulation itself was being repaired.

According to the project, all rectifiers of cathodic protection units were mounted in containers with electric equipment and located at block valve stations, and the point of cathodic cable connection to

the pipeline is inside the grounding contour of every block valve station. Such design solution has led to partial shielding of current distribution along the oil pipeline by protective grounding. This unwanted influence is strengthened due to the fact that during construction of grounding devices at our block valve stations and PSs copper was utilized. For example, at the 952-1,193 km section's block valve stations the portion of current passing through grounding amounted to 25-62% of the rectifier

output current. The root cause of such current distribution was the absence of a non-conductive element between the pipeline and the electric drive of gate valves. We have managed to increase the efficiency of the cathodic protection unit (CPU) by using the solid-state polarized devices, which allowed us to increase the potential in the sections of block valve stations by 50-150 mV at a little current

FURTHER STEPS

decrease; but this result did not satisfy the experts. For more effective CPU current distribution, a two-component polyurethane insulation coating was applied to the horizontal sections of underground earthing, which required uncovering a 30-35 m long earthing section. The earthing section selected for insulation was located at half a meter from the oil pipeline and underlaid parallel to it. Such solution enabled us to increase the potential at block valve stations by 100-200 mV whilst decreasing the rectifier output current by 25-50%. Applying the insulation to the buses did not influence much over the total resistance to earthing current spreading. The soil resistance in the pipeline section routed on the Stavropol Territory amounts to 8-35 Ω -m, and upon performing the works the resistance to earthing current spreading does not exceed 1.5 Ω . Another resulting plus point is a more uniform potential distribution along the oil pipeline. The difference between minimum and maximum potential values has decreased from 0.49 to 0.36 V.

Initially potential monitoring over the 543 km long MLP section according to SCADA system covered only 20 CPUs, but 21 additional monitoring

points were commissioned at the block valve stations in 2010. It was at the same time when 5 cathodic protection units were reconstructed with increasing the distance between the anode groundbed and the oil pipeline from 130 to 400-700 m. Accordingly, new anode beds were built. It allowed us to increase the length of protection areas for the units, as well as the uniformity of potential distribution.

CROSSINGS WITH OHPLS

As a result of evolving the electricity supply system in the Stavropol and Krasnodar Territories, 8 new crossings of the pipeline with 110-500 kV OHPLs have appeared within 13 years. The pressure of electrified transport duties has also been enhanced.

In 2013, a research was carried out with the aim of evaluating the influence of alternating current sources over the oil pipeline's rustproofing. Based on the research findings, groundings at 11 crossings with high-voltage lines with devices diverting alternating voltage from the oil pipeline were built. In 2016, the efficiency of the built devices was estimated and it was concluded that another 12 devices had to be built.

AT NEW PUMP STATIONS

In 2011, the works to increase capacities of the CPC system started.

In the Western region the works started from PS-6. Building of the two new tanks with capacity of 50,000 m³ each and the pipeline system has required to build two additional CPUs with the anode groundbeds of the expanded type made of an oil-petrol-resistant electrically conductive elastomer.

In 2012, we started building PS-7 and PS-4. There was only one CPU in the first draft of these stations. The absence of a standby unit was deemed inadmissible in terms of operation, and the second CPU was added to the project. The anode groundbeds were made of "MENDELEEVETS"-MKG sections on the outside of PS areas.

In 2013, we started building PS-5 and PS-8. There were already two CPUs in the projects of these PSs. However, during commissioning of PS-4 it was revealed that the power of two units was not enough for providing the designed potential. The reason lies in a low soil resistance and influence of a copper grounding over cathodic current distribution. For remediation of the situation the third CPU was mounted on PS-4 and PS-5. In order to deliver a cathodic current spread area, three additional 25 m deep anode earthing pits were fitted using eight "MENDELEEVETS"-MKG sections at all four new PSs.

The implementation of alterations made to the projects was checked

SOLID-STATE UNITS PCR AND PCRH AT A BLOCK VALVE STATION

upon completion of building the PSs, during due diligence of the ECP systems in 2016-17. According to the measurement results, safety of the underground process pipelines has been assured to the full extent.

UNDER THE RELIABLE PROTECTION

In 2018-2019, the condition of the ECP system and oil pipeline insulation coating was surveyed. The drawn conclusions confirmed the high quality of the polyethylene and epoxy factory coatings. However, even in the absence of insulation faults, the resistance of the oil pipeline insulation coating gradually decreases. For improving the quality of anticorrosive protection, it has been recommended that by 2022 in the CPC Western region responsibility area 5 new CPUs should be commissioned to assure overlapping of cathode current protective zones and redundancy of the protection system in emergency cases.

THE AREA OF RESPONSIBILITY OF THE CPC WESTERN REGION – COVERS THE OIL PIPELINE SECTION

952–
1,193 Km



THE DEVICE FOR PROTECTING THE OIL PIPELINE AGAINST INDUCED ALTERNATING CURRENT

AUTHOR
PAVEL KRETOV

HOUSE WARMING IN IZOBILNY

IN MID-MAY 2019 A NEW DISTRICT CHILDREN'S HEALTH CENTRE OPENED IN THE TOWN OF IZOBILNY, STAVROPOL KRAI. THAT BECAME A MILEPOST FOR A DISTRICT WITH A POPULATION OF 100 THOUSAND, ONE IN FIVE OF WHOM IS IN THE YOUNG BRACKET

WHEN YOU ARE TREATED IN COMFORT

For many a years, little patients in the town of Izobilny were treated in an old building, a former kindergarten repurposed as a medical facility.

"To be sure, the conditions were not ideal, but the team did

everything to prevent this from affecting the quality of medical services rendered," said Tatiana Khiryanova, Chief Physician at the Izobilny district hospital.

The new health centre, funded by CPC to the tune of 63+ million rbl., has delivered a whole new level of comfort for in-patients and working conditions for the medical personnel. The beautiful modern two-storey building with a total floor area of 1.5 thou. m² comfortably houses the sections of paediatrics, specialist medical care, restorative treatment, diagnostics and radiology, as well as a laboratory and the offices of neurologist, ENT specialist, orthopaedist, sur-

geon, ophthalmologist and psychiatrist, an ultrasound room etc.

The health centre is designed for 150-200 visits per day, which is enough to meet local demand.

"Every year we do a thorough annual physical examination of children, which enables us to identify the slightest developmental irregularities in children. And while in the old building it took us 10 days to complete the examination, in the new one, because the equipment and the laboratory are at the same location, it only takes us three," explained Yelena Shvetsova, Chief Paediatrician of the Izobilny district.

About the equipment, by the way. The state-of-the-art medical equipment for the Children's Health Centre in the Izobilny district cost 15.5 million rbl., 12.5 million of which was provided by the Caspian Pipeline Consortium.

"The equipment is great! We have been using it for three years now, and we are on cloud nine. CPC donated us two stationary and one portable ultrasound machines. We use the portable one for screening children in rural areas. The machines are an effective



tool for detecting pathologies even in those children who have no specific complaints," said Yelena Bliznyuk, an ultrasound diagnostician.

Outside the US room, the CPC Panorama correspondents talked to the health centre visitors – local resident Alla Paramonova and her granddaughter Nastya. That was

their first time at the new health centre, and they were happy to talk about their impressions.

"What our health centre is now is beyond all comparison with what we had before. It is a pleasant environment for grown-ups and children alike. What is also important is that our doctors have great tools. And we are very grateful

AT THE UNVEILING CEREMONY OF THE DISTRICT CHILDREN'S HEALTH CENTRE IN TOWN OF IZOBILNY, MIKHAIL GRISHANKOV, DEPUTY GENERAL DIRECTOR OF CPC, REMINDED THAT IN THE LAST FIVE YEARS ONLY THE INTERNATIONAL CONSORTIUM HAD PROVIDED 330 MILLION ROUBLES FOR THE PUBLIC HEALTH SERVICE SYSTEM OF STAVROPOL KRAI. THIS MUTUALLY BENEFICIAL RELATIONSHIP IS CERTAIN TO CONTINUE



for this to CPC, the territorial and district authorities," opined Alla Paramonova.

The health centre building houses a 25-bed day hospital. Little patients and their mummies are accommodated in large single- and two-bed rooms full of light and furnished with all necessities, such as convenient furniture, WC units, call-button panels, etc.





it. The CPC Panorama correspondents were shown the vehicles by the paramedics Inna Denisova and Yelena Frunze and by the driver Aleksandr Yeremenko.

"Like any ambulance station, we have a lot of work: 15-20 ambulance calls per day. Four crews are on duty during the day, and at night, when the health centre is closed, and there are more calls, the fifth one joins them," said Inna Denisova.

The crew praised the vehicle for its reliable engine, comfortable cabin and, naturally, a complete set of requisite equipment, singling out the design of the stretchers, which the paramedics find easier to carry, a user-friendly portable oxygen cylinder, and the heating system.

"A number of months ago we had to assist with a complicated delivery on board. It was winter, and the good heating system in the cabin was a key factor in the successful outcome," recalled Yelena Frunze.

"The ambulances travel up to 200 km per shift and have not let us down once. For our part, we also try to do our bit: provide maintenance on a regular basis and replace consumables time," said Aleksandr Yeremenko.

AUTHOR
PAVEL KRETOV

"VICTORIA" MEANS "VICTORY"

THE SPORTS SCHOOL OF HERO CITY NOVOROSIYSK HAS GRADUATED MORE THAN ONE GENERATION OF SPORTING LEGENDS



CPC ALLOCATED OVER
FOR ALL THE WORKS

51 MILLION RUBLES

To date, Pobeda (Victory) has an enrolment of more than 1.2 thou. children and teenagers in nine sports. Over the last six years the school has been headed by Vitaly Pakholkin, doubling as Chairman of the Novorossiysk Athletics Federation.

"In the last 30-plus years our city has not seen construction from scratch of major sports facilities, such as Children's Tennis Centre and the Pobeda Archery Centre, which

were built and donated to the sports school by CPC in 2018," says Vitaly Pakholkin.

The Children's Tennis Centre and Pobeda centre construction projects were started in late December 2017.

CPC allocated 51+ million rbl for the construction projects, including design.

OUR ARCHERS ARE THE BEST!
The archery centre is training 214 archers. This is the only facility

THE HEALTH CENTRE BUILDING HOUSES

"In compliance with all sanitation and hygiene standards, we have done our best to make the health centre as comfortable as one's home," said Lyudmila Gamayunova, Head of the Children's Health Centre. "A mother staying here with her child can feed and bathe it at any time. There is a lift, and she needn't carry her child up and down the stairs. It is also convenient that the outpatient department is downstairs and the hospital upstairs: there's no need to go out; if need be, any equipment can be moved upstairs as necessary and carry out all medical procedures."

MOBILE AMBULANCE

Next door to the Children's Health Centre is the ambulance department, which services

A
25
-BED HOSPITAL

both adults and children of the district. Two years ago the CPC donated new ambulance cars to



of this nature in the European part of the country. It would not be much of an exaggeration to say that nowhere is Russia is anything like that yet: there is an archery range in the village of Tashir in Buryatia, but it can hardly be called a centre – Buryat archers train indoors and outdoors at different locations. The news of the Pobeda centre's opening has spread throughout sporting Russia, with enquiries now coming from the remotest corners of the country about holding archery meets in Novorossiysk.

"Our archers are the best in Krasnodar Krai. The Pobeda sports school is used by 8 international Masters of Sports and 17 Candidate Masters," says Tatiana Butunova, Meritorious Coach of the Russian Federation and a member of the coaching staff of the RF Paralympic Team. Among her trainees are many Paralympic athletes, world and European champions. If all goes well, Tatiana Butunova will take Yevgeny Khudaiberdiyev to the next Paralympic Games. In the Russian championship, hosted by the town of Aleksin, Tula Oblast, in March 2019, the 17-year-old won bronze, qualified as Master of Sports of Russia and made the national team, which started training for the European Championship. In April 2019 Yevgeny won the Russian championship that took place in Alushta and got a ticket to the World Cup in Holland. It is where the battle for national quotas for the 2020 Paralympic Games will unfold.

"I train every day at the indoor archery range. It is a great facility; you can shoot (here) 18 m farther than at the range we used before. Next to it is an outdoor range," says Yevgeny.

There, shooting arrow after arrow and hitting the bull's eye every time, Victoria Gradinar, Candidate Master of Sports, trains. It is chilly and drizzly outside (the CPC Panorama correspondents visited the centre in mid-February), but

AT THE CHILDREN'S TENNIS CENTRE, THE YOUNG PLAYERS RECEIVED TWO OUTDOOR AND TWO INDOOR TENNIS COURTS FROM CPC

it looks like nothing can distract the girl from her training. Not far off, wearing a heavy parka and watching his trainee in action is Yevgeny Gogunov, Master of Sports, coach and sports psychologist.

"Archery is not a kind sport," he explains. "Neither snow, nor rain, nor wind is a reason to cancel competitions; they are only postponed if wind gusts knock down targets. A good archer must be ready for anything!"

Victoria, whose name, incidentally, means "victory", is a good archer. She's been shooting for a mere three years, but has already medalled at major Russian and international competitions.

"I know many Russian and foreign sportspersons, but I have no idols in sports: I'd like to become an idol myself for somebody!" Victoria says smiling.



"I THANK MY FORTUNE AND THE CONSORTIUM"

At the Children's Tennis Centre, the young tennis players received from CPC two outdoor and two indoor hardcourts, built to the current requirements and standards. The centre can accommodate up to 30 tennis players training at the same time, with up to 125 children using it on a daily basis.

"For 20 years I've dreamt that one day I would train in such a great facility. We have an excellent low-maintenance surface, and great lighting: you can easily see the ball. Every day when I enter this space, I see the CPC flag and I thank my fortune and the Consortium," admits tennis coach Sergey Kargalov.

OUR ARCHERS ARE THE BEST IN KRASNODAR KRAI

The tennis centre was designed in compliance with all European standards and requirements. The locker rooms have hot and cold water and disabled access.

In wintertime, children from all over Krasnodar Krai come to Novorossiysk for training. Experts believe that the new-build sports facility is likely to put Novorossiysk second to only Sochi's tennis centre in Kuban.

The Pobeda centre and the Children's Tennis Centre sit in the most densely populated areas of Novorossiysk, home to some 70 thou. people. And this is instrumental in making sports available for all.

"I was brought to the tennis centre last year by my mum," says 10-year-old Sonia Shavelnikova, taking a few seconds off her training. "I haven't bested anybody yet, but I can already use my racket real good!"

ON HOME TURF AND ELSEWHERE

CPC Panorama correspondents were also asked by representatives from the golf section of the Pobeda Sports School to pass on their thanks to the team and shareholders of the international Consortium. The crude transmission professionals donated to the school two Toyota Hiace people carriers, which the young players use for comfortable travel to the golf club, some 25 km from the town, and to competition venues.

"We train 50 children aged 10 and older. The Pobeda sports school is the only one in the territory that has its own golf section, so our trainees are the backbone of

the state golf team," emphasizes Sergey Tikhonov, Vice-Principal of the Pobeda Sports School for Sports Activities.

Kuban players have already made a name for themselves at the national level in Russia. In 2018 the team won fourth place at the National Games of Russia. The team has been consistently ranked in the top five, competing against titled rivals from Moscow. ●

AUTHOR
AINA ZHETPISBAYEVA

VIKTOR SUTYAGIN: "I AM HAPPY THAT CPC WANTS MY CONTRIBUTION"

CPC IS A REPUTED MULTINATIONAL. THE CREDIT UNDOUBTEDLY GOES TO THOSE WHO HAVE BEEN WITH THE PIPELINE GIANT SINCE ITS INFANCY AND INSTRUMENTAL IN ITS CURRENT SUCCESSES. AMONG THEM IS VIKTOR SUTYAGIN



Viktor Sutyagin is a veteran of the oil transmission industry, with 18+ years in the CPC system and high awards from the Republic of Kazakhstan, such as the Orders of Kurmet and Dostyk, as well as the badge of Honoured Oil and Gas Industry Worker. For many years Viktor Sutyagin worked as Operations and Maintenance (O&M) Manager for CPC's Eastern Region. This is the current area of responsibility of our aksakal, who is now an independent service provider. It was interesting to talk to him about his professional life, his attitude

now NGDU ZhayikMunayGas, where I rose through the ranks from well workover foreman to shift supervisor of the Process Engineering Service. In 1976, by order of Embanef't's General Director, I was transferred to the Oil Pipeline Directorate (subsequently the Western-Kazakhstan Oil Pipeline Directorate of Glavtransneft). It was the event that started my career in crude oil pipeline transport.

And how did you end up with CPC?

In December 2000 reorganization was in progress at PO (Industrial Group) Yuznefteprovod, and I was invited to transfer to the central

Maintenance Manager, and Boris Viktorovich Sviridov, Chief Operating Officer of the company, invited me to come back to Atyrau. At that time, I still had no place of my own in Astrakhan and was happy to return to my homeland. My colleagues joked that the ancestral land had not given me leave to depart. Since then I've been working in CPC's Eastern Region.

You are a member of a dynasty of petroleum workers. Please tell us about your family background.

Granddad was a driver for the oil pipeline. Dad is an oilman, with over 40 years on Embanef't's system in the city of Guryev (now Atyrau). My elder brother Valery was a geologist; he is now retired and, lives in Russia. My sister, Vera, works for the Western Services Directorate of the contractor KazTransOil. My wife graduated from the Grozny Oil Institute just like me. Having pooled our expertise (she is a geologist, I am a developer), we came here as young professionals. We have two children. My son, Sergey, is also an oilman; he graduated from the Gubkin [Oil Institute]; he now works at the design institute in the city of Samara, where he deals with oil production and oil pipelines. My daughter, Natasha, is with Gazprom. I've got grandchildren, but I don't spend enough time with them as

VIKTOR SUTYAGIN HAS BEEN WITH CPC FOR 18+ YEARS

to his work and colleagues and much more.

How did you begin your career?

In 1972, having graduated from the Grozny Oil Institute, I was assigned to the Embanef't industrial group and sent to Dossorneft NGDU [oil and gas producer], he recalls. — There I ended up at a new field, Martyshy,

office of JSC KazTransOil in the city of Astana, but I opted for a job with CPC, which was looking for a maintenance manager for the Central Region. That is how I joined CPC's Astrakhan team. Construction and pre-commissioning activities were then in progress at the facilities of the Tengiz—Novorossiysk oil pipeline.

In September 2001 CPC's Eastern Region needed an Operations and

a grandfather because of my work schedule, though I try and talk to my family whenever I can.

And what are you like as a team player?

Our jobs demand that we do what's expected of us, no more, no less. We don't have the luxury of making mistakes, so in the work context I've always demanded from myself and colleagues full compliance with workplace discipline and the rules and regulations applicable to our profession. Be that as it may, however, people are not machines. I've understood one thing in my professional life: you can't keep taking your subordinates to task. If they have made a mistake somewhere, it is necessary to try and remedy the problem by joining forces. Still, I probably serve as a peacekeeper on the team. I find it difficult to punish an employee – I feel bad for them, probably even more so than they do for themselves...

What have you got to show for your nearly two decades with CPC?

CPC is a Western-style enterprise. Working for the Consortium has taught me new things, expanded my horizons in dealing with work-related issues. CPC has a well-coordinated and competent team; the people are aware of their joint global responsibility. I am happy that destiny has brought me to this rather than any other company, that my expertise is at a premium here, and, though past retirement age, I'm still in the saddle.

Young people are part of the team. Have you ever found yourself in the role of a mentor, training, helping, advising?..

We have an ongoing process of knowledge transfer. Whatever the issue, teamwork is the answer. We hold meetings and situation analyses, take action ... And the young people who come to replace us are always in the loop. We do our best to help them get into their stride. If we hit

a new snag that has not been in the documentation before, we develop a new step-by-step protocol for the staff to respond to such a situation. If necessary, revisions are made to the design. This is an ongoing effort. Everybody needs to learn. Should a worker retreat into himself and limit himself to his current expertise, he'll fall behind, overtaken by life and industrial processes, which are constantly improving.

What are the challenges of a pipeline operator?

You have a lot of responsibilities: some during construction and commissioning, to be sure, but even more during scheduled shutdowns when the equipment is depressurized, when you may need to work in fummy environments and you are responsible for safety. After all, nothing is more valuable than the health and life of CPC's personnel and contractors. This is where, even though we repeat many things year after year, my attitude is the same: we start from scratch – each and every time! Before commencing this or that operation, we do the same thing: check, double check and worry... We are also under pressure to complete on schedule: we are only given 48 or 72 hours per shutdown based on the maintenance plan, and not a minute more! We need to meet the schedule without compromising occupational safety, without incidents.

Years fly by... Don't you have regrets that, try as you might, you'll have to retire for good one of these days?

It's nearly time, and I believe that we must make way for the young. Still, no matter how much you love your job, you feel your age. It's

"ONCE I'M RETIRED, I PLAN TO SPEND AS MUCH TIME AS POSSIBLE WITH MY NEAR AND DEAR ONES"



CPC IS A WESTERN-STYLE ENTERPRISE



impossible to work "starting from scratch – each and every time"; the human nervous system needs a breather. I believe that every age brings its benefits. My children and grandchildren live in Moscow; when I go there on business, I sometimes can't find the time even to see them. I remember my oldest grandson, when was about 5, asked his dad, "Daddy, why can't you find granddad a job here? Why does he have to keep going back and forth?" Well, my younger grandchildren miss me

"I AM GRATEFUL TO MY DESTINY FOR BEING PART OF THE CPC TEAM"

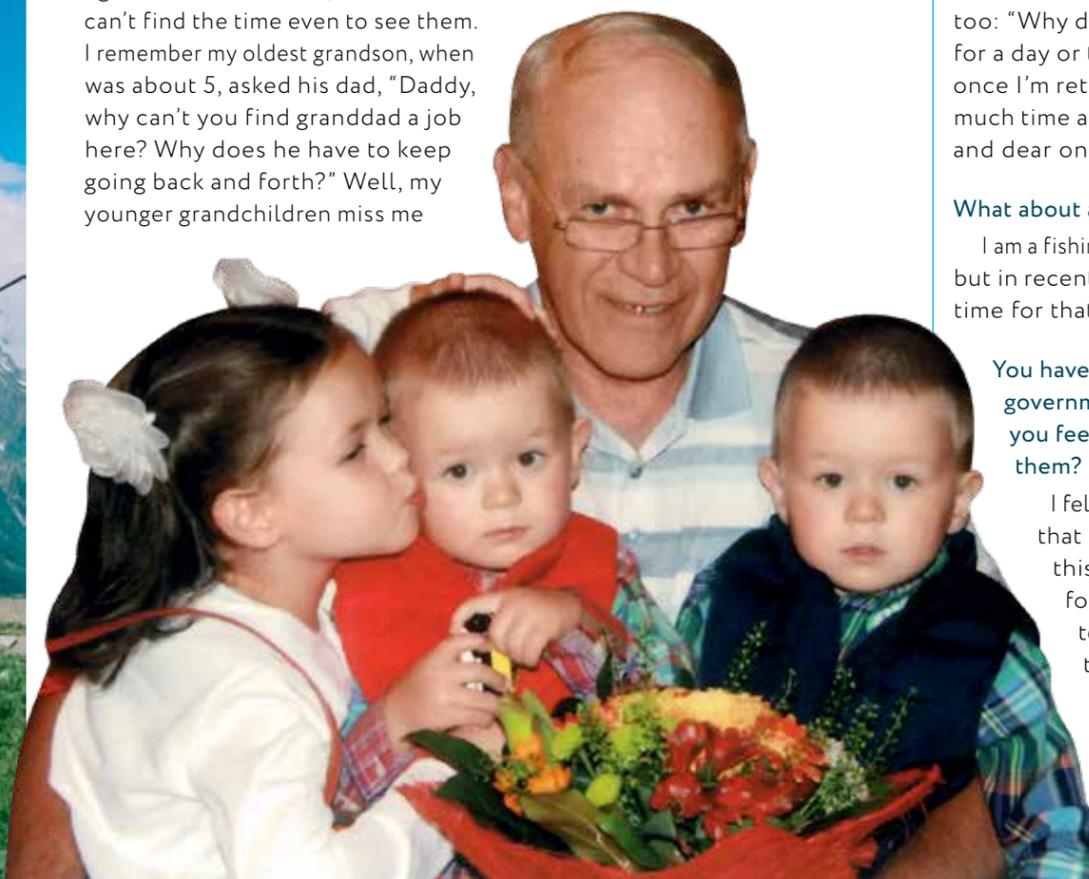
too: "Why do you, granddad, come for a day or two only?" That is why, once I'm retired, I plan to spend as much time as possible with my near and dear ones.

What about a hobby?

I am a fishing and hunting enthusiast, but in recent years I just don't have time for that. I hope to catch up!

You have a number of government awards. What did you feel when you received them?

I felt responsibility. I believe that an award conferred on this or that person is not for him, but for his entire team. And I am grateful to my destiny for making me part of CPC's highly skilled team!



AUTHOR
ROMAN IGNATENKO,
SHIFT SUPERVISOR, PS KROPOTKINSKAYA

PHILOSOPHY OF THE WORK YOU LOVE

IT IS EVENING SHIFT NOW. WITH A FAMILIAR MOVEMENT I ROLL MY CHAIR TO THE WORKSTATION WITH A BANK OF MONITORS

creation, not by a long chalk. White matter is NOT ENOUGH! In order to explain the unexplainable, smart scientists came up with the idea to call this shortfall «dark matter», and – voilà! – the equation is balanced! Let then my sensations and feelings too be the same unexplainable, hypothetical component – dark matter. This feeling is not unlike your awareness of a mighty river flowing somewhere nearby, one you cannot see, but you hear a distant noise, the rumble of its flow.

DRIVER OF PROGRESS

The energy of fluid, the energy of flow, the energy of oil... As everyone knows, energy is the universal measure of various forms of matter movement and interaction. Permeating pipelines and pumps, accumulating in tanks like in batteries that constantly feed the oil pipeline, it envelops me, electrifies me, giving me the sensation of frisson and anticipation. Thousands of tonnes per day, millions of tonnes of oil per year travel down the PS pipelines, shaking the equipment and foundations. Sped up by the pumps, the man-



SHIFT SUPERVISOR'S WORKSTATION IN PS-6'S CONTROL ROOM. ROMAN IGNATENKO WITH PS OPERATOR ALEXEY PETROV

high calorific value, several times that of coal's, has sped up and improved modern civilization severalfold. The world has changed beyond recognition! It has become faster, easier, newer!

INVALUABLE EXPERIENCE

It turned out to be my destiny to be involved in the construction of oil pipelines in Yakutia and in the Far East. That was an invaluable experience – to see how, notwithstanding the harsh environment (low temperatures, impenetrable swamps, steep mountains, lack of communications and normal accommodation), human will and commitment, coupled with discipline, conquer nature!

I will not go too deep into the construction challenges, but will emphasize that the work of each builder facing such terrible odds is nothing short of heroism. Welders, insulators, drivers... Blue-collar workers and E&T [engineers and technicians] did their bit every single day for the great cause.

FOR THE COMMON GOOD

Whenever I man the workstation and watch the numbers on the monitors, I see in my mind's eye the entire path travelled by the mighty flow of oil brought up from the bowels of the earth and carefully passed on from station to station, essentially from hand to hand! In such moments you grow aware of the true meaning of your profession and the reason for your excitement ... My duty is to safekeep the work of all those who invested part of their lives and souls in prospecting for, producing, storing and transmitting oil, and downstream in processing and converting it into various types of energy, into a multitude of useful things for the well-being of all of mankind!

I enter my passwords and see a visualization of PS operation appear in front of me: the equipment in operation changes its status; events are being logged; messages pop up and go away from time to time – it's business as usual at the station.

valving action are only reflected in the changing colours on the display, increasing or decreasing val-

THE OIL RIVER FLOWS FOR SOME 1,500 KM

made oil river continues its journey through the pipeline, moving its energy from station to station. It is carrying its waves over a distance of some 1,500 km, which is longer than the Rhine, Yenisei and Northern Dvina!

But even knowing all of that is not all that exciting. Any river normally originates in the mountains, upland. Expending its potential energy, the water eats through the soil, making a way for itself and seeking the path of least resistance to the seas and oceans.

ues. From where I sit, everything is clear, logical, predictable and explainable.

And yet you get an elusive feeling that there's more to it. There is a certain something unspoken, a feeling you can't name. The best explanation for my musings can probably be given by invoking the theory of white and dark matter. We know the mass of the Universe, but the components of white matter, which is constituted by the mass of stars, galaxies and planets, do not add up to the entirety of the

"DARK MATTER"

What does my job mean for me? How to understand it, how to measure? It's not easy to explain to a layman what it basically involves. You measure the importance and relevance of your job by its result or the process involved: a driver who carries people, a baker or a builder can describe their role in a word. What do I do? On the one hand, I am just an observer; on the other, an active participant and at the same time an indirect one. The filling and discharge of tanks, preparation of equipment for MTN [maintenance] and efficient



2011, ESPO-2 (EAST SIBERIA -PACIFIC OCEAN OIL PIPELINE), THE TRUNK CRUDE PIPELINE UNDERWATER CROSSING OVER THE RIVER BUREYA. A SOUVENIR PHOTO WITH SITE SUPERVISOR YEVGENY MELESHKO

Oil doesn't fall in your lap, doesn't fall down like manna from heaven free of charge, doesn't flow down the mountains, doesn't swell like oceans. Millennia had to pass, civilization had to experience several technological revolutions before this boon became available to man. Oil became one of the most important minerals of the 20th and 21st centuries. Oil and by-products became the driver of land, water and air transport (to say nothing of the chemical, food, pharmaceutical

and light industries), opened up new manufacturing and processing industries, including synthesis of polymers, plastics, rubbers and other valuable materials. Oil's

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KONSTANTIN LEMZIKOV,
 SENIOR ANALYST, NETWORK MONITORING AND SECURITY,
 MARINE TERMINAL

IF ONLY YOU HAD KNOWN HIM!..

ON 8 DECEMBER 2018 WE WERE BEREAVED OF LEAD ADMINISTRATOR
 ALEKSEY VIKTOROVICH ZOLOTARYOV, WHO WORKED AT THE CPC MARINE
 TERMINAL. HE DIED OF A MASSIVE STROKE SHORTLY AFTER SIGNING OFF LAST
 WEDNESDAY



It happened outside the office; Aleksey was promptly given first aid; an ambulance rushed him to the city hospital in Novorossiysk, and there was hope that he would survive... The following day his condition even improved, but on Saturday morning he passed away. Alexey is survived by a wife and three children.

I would like to tell everybody what an unusual person he was. For us, the IT crowd, he was Lyokha [a short form for Alexey]. Personally, I met him online, on the municipal forum of Novorossiysk. He was the forum's administrator, whose handle was 'awful', and because he was also number two in the forum's hierarchy and did not seek the limelight, he was also known as Cardinal. Yes, many saw him as Awful Cardinal, mysterious and all-powerful. And that was what Lyokha was in his server room.

I met Lyokha in the flesh when interviewing him for the position of technical support engineer. In came a heavyweight in large spectacles; I could see it at a glance: the shirt doesn't sit right on him, he looks smug, even insolent. He answers the questions competently, correctly, reasonably and at the same time as if looking down his nose: look here,



Incidentally, at the first interview Lyokha told a story that speaks volumes about his personality. His CV said that he had worked in Cyprus for a

response next door, and at the third place the proprietor told Lyokha: "We have a rush order here; we need to build nine PCs and connect them into a network, and, as luck would have it, all my staff are busy, can you help?" – "You bet!" By the close of business, the proprietor asked if at least one PC had been completed. "There they are – all nine of them, already online". Later the same day, the PCs were already in place at the customer's location, and the next day saw Lyokha employed in Cyprus. Illegally, to be sure, but in the '90s that was normal...

WE REALIZED THAT WE COULD NEVER FIND ANYBODY BETTER THAN HIM, AND WE NEVER LOOKED BACK

I'm not a push-over. We didn't hire him then: on the one hand, he was overqualified for the job; on the other, he would find it difficult to deal with users, and users with him. The next time, however, when we were looking for a server administrator, one more interview made us realize that we would never find anyone better than him. And we never looked back.

year and a half. How come? Well, he just went there for a holiday; a few days later, he got bored lying around on the beach...He went for a walk around Limassol, saw a computer shop, went in and looked the place over. He asked in pidgin English if they were hiring. No, we are not, enquire next door. It looked like all hardware vendors in Limassol were in the same street... He got the same

HE RAN THINGS

Lyokha ran everything – at home and work alike. In his server room, he knew everything inside out, always planned everything ahead and knew what's what and which server is better for what than those who used the server.



technicians about an issue. While the others are checking back and preparing their response, Lyokha has already a spreadsheet ready with different data categories highlighted in colour and final conclusions formulated. Nor was it unusual for Lyokha to write in response to an enquiry: "Is this regarding what I sent you last week? OK, I'll resend".

HE WAS WITTY

Lyokha was witty in every sense of the word. He liked and knew how to be funny, knew a lot of jokes and how to tell them. Ever so often he would come to the room on the first floor of the Marine Terminal's ABK1 block, which houses most of IT and ICT engineers, his one-litre mug in his hand. While he was filling

And at home ... He had his house built by telling the builders what to do and how though he was not a builder by training. And he usually did the bulk of the work himself, anyway, helped by his wife and son. He simply got to the bottom of everything as he always did. And he had ORDER everywhere. Primarily because he had got into the habit of doing everything right from the outset. Sometimes that got him in trouble with the management: told "just do it, right now", he would say, "no, let me chew it over a bit, and then I'll do it so that it doesn't have to be redone". It normally didn't take him long to figure things out.

About order, by the way. What does the room of a computer nerd usually look like? Wires, gutted computers, parts, cables, work surfaces all covered in haphazard piles of electronic bits and pieces. He had everything pigeonholed and labelled. Because "there must be order" – that was his motto.

HE WAS HOMO DOMESTICUS

Alexey's life centred on his work. But whatever time he had left after work he spent with his family. His first marriage failed, but when he met his second wife, Natasha, she became

the love of his life. Lyokha treated his sons harshly, believing that since they were not such hulks, the cruel world would hurt them without fail, and they needed to build character from childhood. Yet he doted on his younger daughter, Alyona. It was incredible to see such a big macho man showing so much tenderness...

HE WAS FAST

Lyokha always raced his second-hand right-hand drive Suzuki so that many people were afraid to let him drive. He practised no extreme sport, and even didn't think much of fitness – he was physically gifted by nature. His car was a means to express his love for speed and control, ability to make the right choices fast. He knew all Road Traffic Rules and never broke the rules, except perhaps the speed limit requirements.

Here's a typical workplace situation: the management makes an enquiry with various department

LYOKHA RAN EVERYTHING – AT HOME AND WORK ALIKE

it with tea, he would tell a joke. And when the laughter died out, he would say: "You know, the reason I came... remember we couldn't wrap our heads around some thing or another? I know how to do it". And he would propose a number of solutions to discuss. And more often than not, "I've clinched it, check it out" rather than "I know how to do it".

He was sharp-witted, quick to get to the bottom of an issue and propose a number of solutions off the cuff.

HE ALWAYS WENT THE DISTANCE

If an issue seemed intractable, it would still be sorted out eventually. "Who the hell, let's give it a google", Lyokha would say and have a go at it. His research could take quite a while, up to several months on and off. He would dig into reams of documentation, databases, forums, try various solutions, test, then come and say: "I've thrown together some

code, run it and see what happens." And it all worked.

HE WAS A WORKAHOLIC

Work took precedence in his life. Everything else was a distant second. He worked from morning till night, late into the night, in the wee hours, burning the candle at both ends. Ever so often one would get a message from him late at night: "Between midnight and 4 am, such and such server will be down at such and such URL; I'm doing something there; it

HE WAS SHARP-WITTED, QUICK TO GET TO THE BOTTOM OF AN ISSUE AND PROPOSE SOLUTIONS OFF THE CUFF

will be back online by morning." He would go about some tasks this way: "In the night I'll be getting the server up and running; while it's rebooting, I take a look at your problem."

He took care of so much that three people are now finding it difficult to keep all the servers up that he used to alone.

PARDON MY FRENCH...

Lyokha used choice words to emphasize his meaning, to pretty up his language with purple patches or for brevity, but never to insult. Lyokha had the gift of gab, and some of his coinages (not necessarily taboo, but packing a lot of punch) are the first thing that comes to mind in our team in certain situations.

HE SEEMED A SLOB

Lyokha put on a shirt and trousers only in the Moscow office; while at the Terminal, he wore jeans and a black T-shirt. In any

season. Can you imagine, December, snow is flying around, everyone is bundling up in jackets and fur coats, and here is Zolotaryov walking to work, with nothing but a T-shirt on. This not because he's showing off or because he goes in for winter swimming – no, it was just the way he liked it. To be sure, if a northeaster was blowing and the wind-chill factor made it feel like -20 C°, he put on a sweater or windcheater.

His relaxed manner, unadorned look, ostentatious rudeness – it could

all make him seem a slob. But he was actually a tidy, organized and prudent professional with unshakeable self-confidence backed by a top-notch skill set. He could throw something together, but never in a slapdash fashion.

SO WHAT WAS HE LIKE?

"He was like a rock," recalls Paul Wetterer, former manager, Technology Department.

"He was a true professional, the best admin I knew," says Ilya Starkov, IT manager and Alexey's line manager.

"He was like an ant in glasses – intelligent and very industrious," opines Pavel Nagayev, lead email administrator, for whom Lyokha set up and maintained servers.

"He was a consummate professional!" It is the consensus of regional IT engineers.

"He was tidy and prudent; he did his paperwork in full and on time," recalls Lyudmila Bogdantseva, document control specialist, Technology Department, Marine Terminal.

"He was a friend from God," says Dexter, administrator of the Novorossiysk city forum, a colleague of Zolotaryov at Shipping Company. ●



AUTHOR
PAVEL KRETOV

THROUGH THE "GREAT LAND"

45 YEARS AGO, CONSTRUCTION

ON THE FAMOUS TRANS-ALASKA PIPELINE BEGAN

The construction of the steel artery was associated with the discovery of new hydrocarbon deposits: in 1968, Atlantic-Richfield (ARCO) discovered one of the largest oil fields in the Arctic oil and gas province on the northern slope of Alaska, Prudhoe Bay, with 3.1 billion tons of oil reserves.

Today, the decision to build an oil pipeline from the northern coast of Alaska to the nearest continental non-freezing ports would seem obvious, but it wasn't so obvious to the leaders of the American oil industry in the late 1960s. None of the already proven and time-tested technologies for the construction of pipeline systems was suitable for the harsh natural conditions of the peninsula. For example, extensive permafrost zones excluded the possibility of underground installation: the temperature of the oil at the

outlet of the well was 50°C; at this heat the pipeline would inevitably melt the soil, turning it into a swamp, depriving the pipeline of support. Add to this winter temperatures down to minus 74°C, the lack of roads, three mountain ranges and three active geological faults, including one of the world's longest thrust faults, Denali.

And the more difficult the task of transporting Alaskan oil to foreign markets seemed, the more fantastic solutions were offered by engineers. Giant jet tankers, sea ice-breaker tankers, submarine tankers, suspended monorail – this is not even a complete list of bold ideas. However, when all this futuristic dust dissipated, the construction of the pipeline turned out to be the only truly real project.

The unprecedented construction of the 1,300-km-long oil pipeline from Prudhoe Bay to the port of

Valdez began. Construction through the "Great Land," as the word "Alaska" is translated from the Aleut language.

From May to September 1974, a road was built for the construction of the pipeline – the Dalton Highway, along which 29 construction camps and 14 temporary airfields were located. Why so many airfields? Aviation was actively used in the road and pipeline construction. There were times when up to 700 flights a day were made.

At the same time, 3 million tonnes of various construction materials were delivered to Alaska. Along with them, a unique 1,200 mm pipe was brought from Japan. The thickness of its wall ranged from 12 mm for lowland areas and up to 15 mm for mountainous areas. The pipe was made of extra-strong steel, was quite elastic and resilient, expanded under pressure, and after removal of the load returned to its original state, confidently enduring

deformation and not breaking off under tension.

The unique qualities of the pipe required the same unique skills from welders. Before being hired, they were required to weld several test joints. If a defect was found in at least one of them, the welder could no longer claim to participate in the construction of the Trans-Alaska oil pipeline.

Unique professional requirements led to unique wages for welders, which could easily reach \$3,000 a week. A letter from a welder which he sent to the editorial office of one of the leading financial magazines in the United States asking how best to handle such money is often recalled as an example. It turned out that an ordinary welder for a pipeline under construction earned more income in a year than a successful professional football player.

Japanese pipes were welded to 18-metre strings and delivered to the necessary spot in trenches. In total, welders collected about 100,000 joints.

The pipeline was constructed in the form of a zigzag line, providing the necessary tolerance for tensile and compression deformations during temperature changes. Underground sections of the pipeline were laid at a depth of 2.5 to 5 metres in conventional heat-insulated or cooled trenches, depending on the characteristics of the soil.

In the permafrost zone, approximately half the length of the pipeline – about 680 km – was laid above the ground on special six-metre

THE SALARY OF
WELDERS COULD
BE AS MUCH AS

\$3 THOUSANDS
A WEEK

supports. A total of 78,000 such supports were installed with compensators that heated the atmosphere, allowing the pipe to slide along special metal rails. In seismically dangerous places, the pipe was placed in rubber "clamps", allowing it to oscillate 3 metres on each

side horizontally and 160 cm vertically without rupturing.

In the area of Atigun Pass, where the route reached its highest point above sea level, 1,400 metres, the pipeline was laid inside the rock to protect it from avalanches. At the crossing of the Yukon,



the only time in the US, the oil pipeline was fixed on a 688-metre-long bridge, built in 1975.

The oil valves of the Prudhoe Bay oil pipeline were opened on 20 June 1977. At the ceremony of steel-artery commissioning, one of the pipe workers pointed out that launched once the pipeline is put in operation forever and specified that by "forever" he meant the North Alaska oil fields lifetime. Today, after all the upgrades, the pipeline's operator assumes that oil will be able to flow through the pipeline until at least 2075. ●



AUTHOR
EKATERINA KRAPIVKO

THE MANY FACES OF ITALY

BOTH SUNNY AND SHADY, CALM AND ACTIVE, PEDESTRIAN AND UNTRODDEN, AND ALSO FRAGRANT, DELICIOUS, MUSICAL... ITALY AS SEEN BY ME IN THE 10 DAYS OF MY VACATION

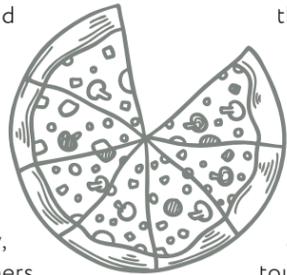
THE LACELIKE VENICE

We took a small motor vessel known as vaporetto (the most common local transport) to get to the hotel from the airport. Water is all around. Only the wooden piles, which seem to be hugging one another, are showing the right direction; they resemble islet towers, with vigilant seagulls sitting on their tops and watching us sail.

We stop at the small islands of the Venetian Lagoon on our way, Murano, Burano, and Lido. The tourists are in an excited hurry, some leaving the ship, others getting on board to join us to the next destination.

Before I got to see Venice, I imagined it as a very humid place with very little space, where people can only move about on a gondola (which even made me panic a little bit, as water is not my element at all).

But what we actually found was an incredibly beautiful city full of alluring pedestrian streets and sun-drenched squares, a city with



amazing buildings, fascinating roof terraces, and balconies all in bloom. This is where we felt like examining everything we saw, from aristocratic palazzos and old churches and to door handles of the residential buildings in the quiet streets. Terracotta and yellow buildings, dark green shutters and snow-white lions awaiting the tourists nearly at every turn (the winged lion being the patron of Venice)—everything is breathing elegance and beauty.

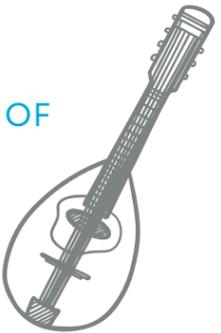
Indeed, the canals are plenty (and so are the tourists). They are mirroring the grandeur of the buildings and the beauty of the embankments, sometimes becoming a source of joy for one's hearing as well, as the famous "O Sole Mio" performed by local gondoliers deserves the best opera scenes. Maybe the sound reflecting from the walls of the buildings standing close around adds to the effect, or maybe it is all about the innate musicality of the Venetians; however, everything you



THE BEAUTIFUL LANDSCAPES
OFFER ROMANTIC WALKS



THE CANALS IN VENICE ARE MIRRORING THE GRANDEUR OF THE BUILDINGS



have seen and heard here leaves an indelible impression of the town and the desire to come back again.

TO TAKE OR NOT TO TAKE

There is a conventional image of small children being a serious burden for travellers. Families with kids have two options to choose from: either to leave them at their grandmother's, or to stay home until the children grow up. Let alone the pets!

As for Italy, this is where the whole family goes on vacation together, the youngest children in baby carriers, closer to mother's body, and happy dogs on a leash, closer to the master. And even though some pets struggle hard to climb the steep streets and suffer from local heat, still it feels much better than whining all alone in an empty apartment. Besides, a well-deserved

reward is awaiting them at the end of the promenade—a bowl of water, food, and a relieving shade under the cafe table. All the tourists are equal here, and exciting discoveries are available to everyone.

WELCOME TO PARADISE!

Anyone who has ever been to Lake Garda, will never forget it. The mirror surface framed by majestic mountains is amazingly beautiful. Sailing boats seem to be trembling on the water like colourful butterflies. Small towns such as Riva del Garda, Limone, and Nago-Torbole, lie here and there along the lake shore, enjoying the shade of leafy trees and enticing the tourists with their bright-coloured houses, steep streets, and appetizing savour from the pizzerias.



There are fascinating and diverse ways to spend your time on Lake Garda. This is where people of any age and fitness levels will find something to do to, whether going solo or travelling with friends or



EVERYTHING SPEAKS PEACE AND HARMONY AT GARDA



family. The beautiful landscapes offer romantic walks; the clear invigorating water invites to learn new sports, and the even strip of the waterfront is perfect for cycling and jogging. Those who love Italian cuisine will enjoy dining at local family cafes.

Tourists can stay at one of the countless hotels or at a holiday camp, which is a great choice if you have a van with room for bicycles, windsurfing boards, numerous family members, and pets. The passengers spend time on the shore together, cooking food in the cauldron and sharing their sailing experience and brand-new impressions with one another.

Everything speaks sunshine, peace, and harmony at Garda—the leisurely walking couples, the children frolicking in the grass, and the big curly coated dog stretching on the green lawn. The dog's mistress is

massaging its belly, kneading and pulling each paw gently. The dog is radiating absolute delight and bliss—and nothing can be more natural at this magical place.

WHEN IT TAKES SO MUCH MORE TO DESCEND THAN TO ASCEND

It all started with a sign that promised to bring us to Monte Baldo mountain a couple of kilometres away, where the town of Malcesine, with its famous sightseeing platform and lake views, lies. Once there, one could take the local funicular to get back down to the root of the mountain.

At first, my companion and I were slowly walking up the hairpin turns, enjoying the views of local vineyards and olive groves, and feasting on figs growing along the way. Two hours later, way exhausted by the scorching sun and the thirst (we had no water with us, as the hike was not planned), we

kept walking up when the paved road suddenly ended. No more road signs could be seen, and we realised that chances to get to Malcesine were scarce for us that day. A dense forest was lying ahead of us, and mountain ranges covered with coniferous forest were stretching out below. We decided to go back. My friend suggested that we took a different route.

At first we were relying on my companion's "inner compass", then we followed the blue marks on the trees left by the members of some hiking club. Then the marks turned orange...

We were happy when we discovered traces of civilization at some point, namely a road stand with old photos telling about World War I, and a bench providently installed next to it. It turned out that we entered the Malga Zures valley, the scene of a fierce battle between the Italians and the Austrians, which took place in December 1915.

The sunset was close. Massively tired now, we hurried to continue our way, hoping to find civilization before it got dark. When we saw a makeshift gate with a sign indicating a bike route to the city, we hastened to use it. We paid no attention to the sign prohibiting pedestrian traffic...

The doubtful wannabe-road ended soon, and our further way down was violently fast. Overcoming the steep slopes, sometimes flying down them and clinging to tree roots and grass in an attempt to slow down the "flight", I kept comforting myself with the thought that the descent could not last forever.

And it proved true. But there was yet another surprise awaiting us after the steep descent—several metal stairways nailed down to the mountain ridge protruding dangerously over the

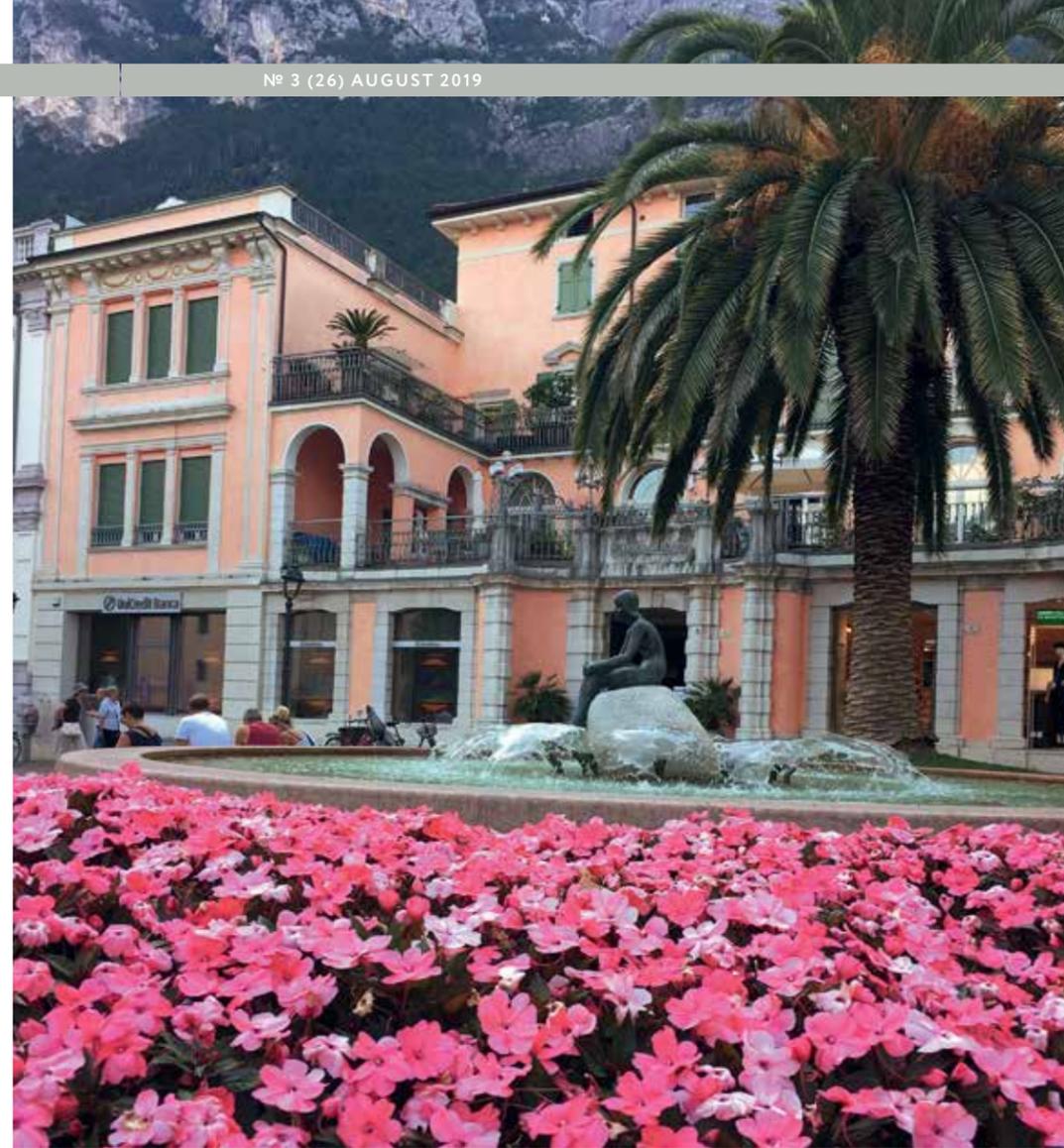
OUR WELL-THOUGHT-THROUGH VACATION WAS COMPLEMENTED BY UNFORGETTABLE EXPERIENCE



lake. I must note that stair railing is a poor medicine against fear when you see the land below from a bird's perspective.

Finally we won over the iron structures designed for fans of extreme sports (as for me, I also won over a panic attack).

We came back to the hotel all dirty and dehydrated and could hardly feel our feet, still we were happy. Our well-thought-through vacation was complemented by unforgettable experience.



AUTHOR
EMMA YAGMUROVA

VIEW FROM ONBOARD A TANKER

KONSTANTIN, CHIEF OFFICER AT AN OIL TANKER, HAS AN INSTAGRAM ACCOUNT, WHERE HE BLOGS ABOUT A SAILOR'S LIFE. IN AN INTERVIEW WITH US, HE SPOKE ABOUT WHAT MADE HIS JOB UNIQUE AND SHARED SOME AMAZING PHOTOS

FIRST STEPS

Konstantin had not always wanted to be a sailor: after finishing school, he planned to study mechanical engineering, but, inspired by his uncle's stories of the high seas and dozens of distant countries the latter had been to, he changed his mind. And enrolled in the Rostov-on-Don branch of the Novorossiysk State Maritime Academy (NGMA), where he studied for four years, and then spent

another two years at the Academy in Novorossiysk, from where he put out to sea for the first time.

From day one of his career, Konstantin worked at multinationals because he had failed to find a job in Russia upon graduation.

"I was scared even to send in my CV, but I had to get a job somewhere!" he recalls.

In time Konstantin came to fully appreciate the benefits of working

for multinationals, which involved following his contract and job description to the letter. Different companies can assign different duties, but these will be written up without fail, and full compliance will also be demanded.

"LIVE AND LEARN!"

Although a chief officer is an executive, "marine" duties are also in his job description: Konstantin, just as

his subordinates, stands eight-hour watches.

"Sometimes fortune favours me: when the crew has three junior officers, the chief officer is excused from watch," he smiles.

Supervision of the ship's deck crew, its safety and security, maintenance of logs and thousands of documents, shipboard timetabling, keeping inventory of all of the ship's deck items — these are all the responsibility of the chief officer. "Sailing is a business, and business is headquarters optimization," opines Konstantin.

Is it easy to become a chief officer? Sailors, like many other technicians, continue learning after graduation. To get on board ship, it is not enough to graduate. You also need to get reams of certificates.

There are two types of certificates. The first, valid for 5 years for all ship types, you get when you graduate. The second type of certificates depends both on the ship type and on the requirements of a specific company. Once these are in place, you get Endorsement (clearance for a specific ship type). These certificates are classified into two large groups in keeping with the position sought: a junior officer

(a starting position, up to second officer) and top officer (executive positions starting as chief officer).

Certificates of the first type are fairly easy to obtain: you choose the type of ship you like: an oil tanker, gas tanker or bulk carrier. You need to decide in advance what ships you want to serve on. Our hero chose petroleum tankers.

A hiring company may require further training. Konstantin had to complete additional courses in processing, loading, unloading and ballasting. Such requirements became a must after two incidents that took place on ships through the fault of chief officers who failed to correctly wash and degas tanks, thus causing explosions due to static electricity.

AMONG AIVAZOVSKY'S LANDSCAPES

It's no easy task to sail on the high seas for several months. Konstantin's working day, much as that of any other member of the ship's crew, starts at sunrise, 3:40 am. Then he stands deck watch until 8:00 am. Half an hour for breakfast and an armful of tasks: do a ship inspection, answer corporate emails, compile cargo plans and meet with the captain for

his input and feedback on the deck crew's performance. This is followed by lunch and the coveted forty winks... Between 4:00 pm and 8:00 pm, it's watch again with a 15-minute break for dinner. The watch is followed by the so-called safety round. Not a night goes by without somebody leaving the door open, most often a fire door. Sailors keep them open for ventilation, and the safety officer makes sure they are closed. Until 10:00 pm it's free time, calls to your significant other and children, who are waiting onshore. By lights-out, you are all in. Come daybreak the next day, it all starts anew.

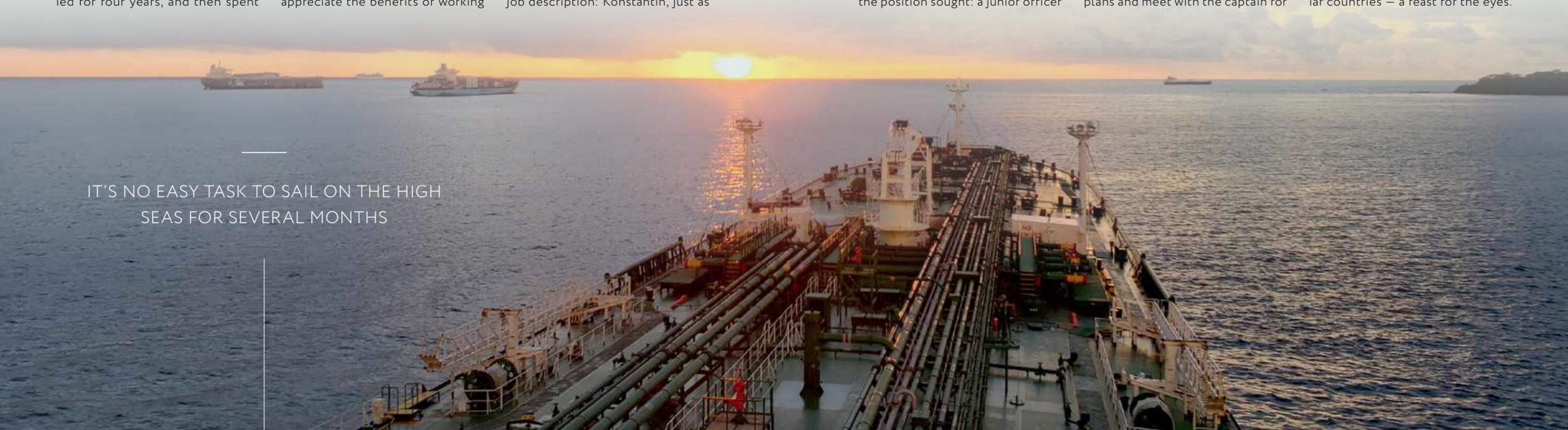
Even after nearly 13 years of on-board service, Konstantin still marvels at nature's beauty.

"Every day you see spectacular sunsets. This makes it easy to feel like a super photographer; you don't even have to make an effort: the sea and shore do the job for you."

"Do sailors like Aivazovsky's paintings?"

"They live them!" says Konstantin. "When you watch the sea for a long time, you start missing people, and when you watch people for a long time, you start missing the sea. The high seas, new shores, unfamiliar countries — a feast for the eyes.

IT'S NO EASY TASK TO SAIL ON THE HIGH SEAS FOR SEVERAL MONTHS



But four months far from your family and homeland..."

CUTTING-EDGE SOLUTIONS

Tank ships are among the most sophisticated vessels in the merchant fleet. In a world where oil is «black gold», petroleum shipping plays a very important role. A large number of new ships are being built; oil-loading terminals are being improved. The tanker crew are responsible not only for their lives, but also for the planet at large: no crude spills may take place during loading or carriage.

Any human activity shapes the environment. Of undisputed benefit to mankind, petroleum production, transportation, processing and use affect the environment. That is why CPC prioritizes environmental measures. It uses the latest tanker loading process based on offshore Single Point Moorings (SPMs). The SPMs consist of a buoy and an underwater pipeline end manifold connected to onshore oil custody transfer meters.

The installation of a Single Point Mooring requires far less bottom dredging as compared with the mooring option, which virtually eliminates any impact on the aquatic wildlife.

Konstantin offers arguments for using SPM rather than the conventional oil-loading terminals:

"The thing is that sailors must be off duty 77 hours in any 7 days, which could be quite a headache. If a person completes his watch and then is engaged in mooring operations and cargo handling, then he simply fails to clock his off hours. You need to strike a balance between the off-duty requirements and the need to do cargo handling as promptly as possible while de-

and when a supertanker moors at the pier, 20 winches are deployed. How many ends you deploy, 4 or 20, makes a lot of difference. The obvious benefit for the company in using SPMs is ease of use and cost cutting."

"And is there a downside to SPM?"

"I believe it is the challenges in servicing the underwater structure. It must be monitored 24/7 against corrosion and oil spillage. Once, when our tanker was loading at a foreign port, an oil slick appeared on the

TANK SHIPS ARE AMONG THE MOST SOPHISTICATED VESSELS

playing the fewest number of crew. SPM use significantly cuts down on labour input and makes it possible to avoid problems due to off-duty period non-compliance. You only need your mooring gang on the tank; there is no need to have people on the stern — this means you only need half as many hands. This is because a SPM only has 2–4 ends,

water surface because some SPM components had rusted through. Divers did their best to stop the leak as soon as possible by adjusting the bolt torque."

My interviewee said that CPC is safe against such accidents because the Consortium's offshore single point moorings are in perfect condition! ●

