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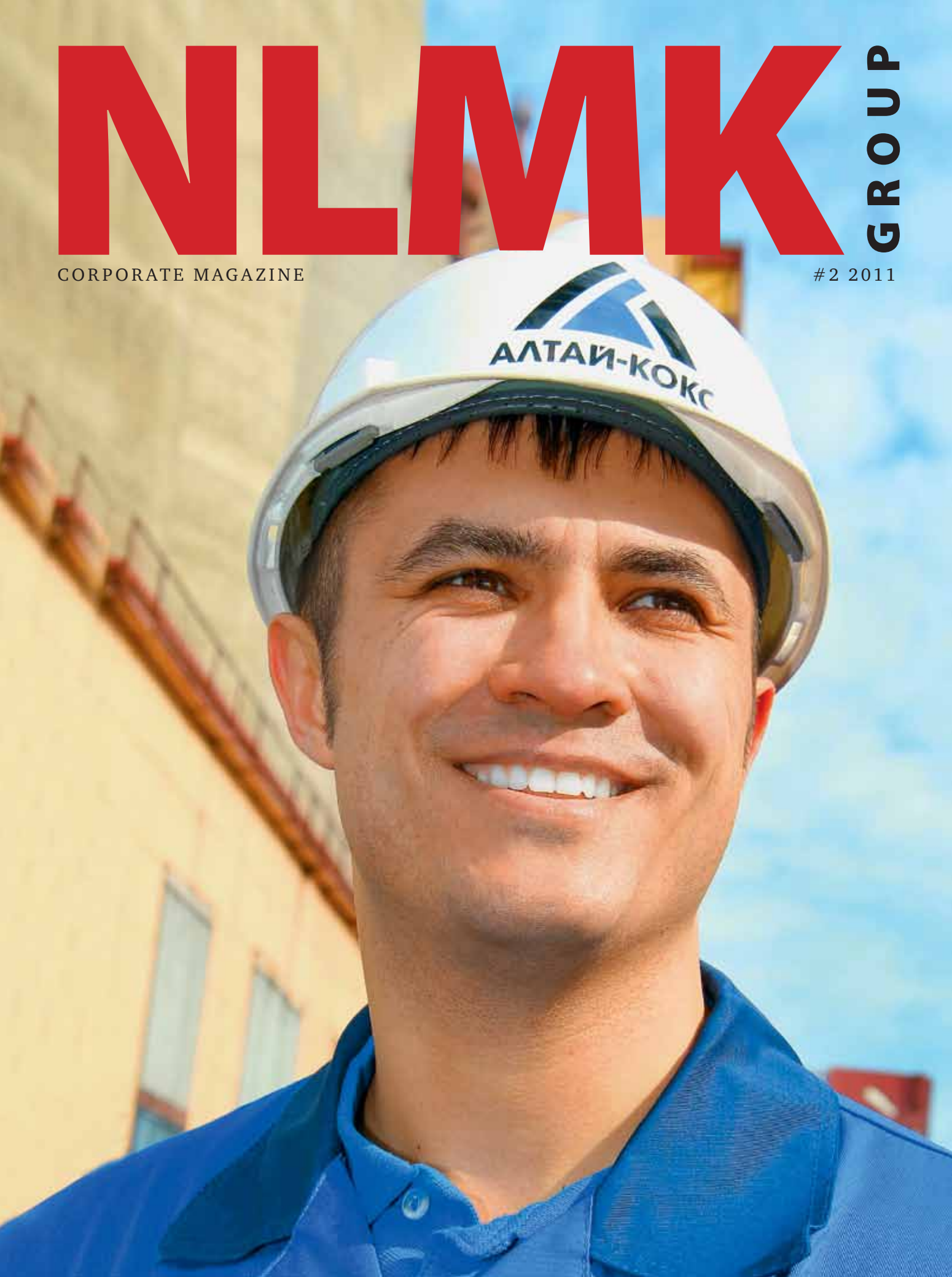


Investing in Development

NLMK President (Chairman of the Management Board) Alexey Lapshin and a group of senior managers toured Company businesses in the Urals.

ALEXEY LAPSHIN, NLMK PRESIDENT, VISITS THE ROLLING SHOP AT BEREZOVSKY

The delegation visited the new NSMMZ rolling shop at Berezovsky, the long products operations in Nizhnie Sergi, and the Melt Shop at Revda, where they met with representatives of the NLMK Long Products (NSMMZ and UZPS) personnel. Their discussions focused on the achievements to date and the future development of the Long Products Division. In 2010, businesses within the Division produced 1.7 million tonnes of steel and about 1.2 million tonnes of rolled products, while output of wire-rod was increased by 25%, and metalware production rose by 16%.

Unfortunately, things are not moving along as quickly as one could wish. At the time of their merger with NLMK Group the businesses were burdened with significant debt, and the subsequent crisis only complicated matters. Against this background and notwithstanding the fairly strong performance, the Long Products Division has yet to show positive net income. Almost RUR60 billion (~$2.1 billion) of debt continue to make an impact.

"Despite the debt pressures, we

need to invest in the development of the businesses," said Mr. Lapshin. "This is our policy. And unless we do, we should not expect any improvements for the better." Over a three- year period more than RUR20 billion (~$689.5 million) has been earmarked for investment projects in the NLMK Long Products Division. In 2011 investments are expected to reach RUR12.4 billion (~$432.1 million), including for the development of the steel smelting, rolling and metalware production operations. The key objectives of the Long Products Division include increased output, lowered costs, improved quality and stronger sales, whilst being mindful of environmental impacts and conditions of labor. "We need to improve matters little by little and one stage at a time across the board, and this will turn each business into a highly effective operation," stressed the President (Chairman of the Management Board) of the Company.

NLMK PRESIDENT TOURS THE LONG PRODUCTS OPERATIONS AT NIZHNIE SERGI

At VIZ-Stal Mr. Lapshin reviewed the new array of high temperature annealing furnaces, the laser installation, the straightening annealing machines and other facilities that are in the focus of the Technical Upgrade Program, which includes dozens of projects to install new and modernize existing technology. The overall objective is to begin production of high permeability steel, which significantly reduces consumption of electric power. The new products meet the task of reducing power consumption in the Russian economy and will help strengthen VIZ-Stal's position in the international markets.

A site meeting was held to hear the report of Sergey Makurov, Chief Executive Officer of the plant. Among other things he mentioned that in 2010 the Company sold 154 300 tonnes of transformer steel, which is 52% more than in 2009.

The working visit by the NLMK President (Chairman of the Management Board) was concluded by a meeting with representative of the personnel of VIZ-Stal and VIZ. In the course of the meeting it was stressed that since 2006 Company investment into the development of VIZ-Stal have increased three-and-a- half-fold compared to the preceding period of 2000-2005. This year expenditures covering the modernization of the plant will reach RUR1.5 billion (~$52.3 million), or 2.3 times as much as last year. The crucial objective is to complete all proposed technology upgrades at VIZ-Stal and to begin manufacturing of high permeability steel as soon as practicable.

Over a three- year period more than RUR20 billion (~$689.5 million) have been earmarked for investment projects in the NLMK Long Products Division

DURING THE MEETING WITH NLMK PRESIDENT

Fifty Years Old – but the Story is Only Beginning

On June 1, 1961 an excavator operator named Nikolay Bubelo removed the first bucketful of overburden. This date is considered to be the birthday of Stoilensky Mining and Concentration Plant. On this day the history of the Company began.

FIRST BUCKETFUL OF OVERBURDEN; JUNE 1, 1961

The Company overcame a number of challenges in the 1960s; an absence of hard-top access roads, shortages of ballast for laying railroad tracks. Home comforts and amenities for workers were also lacking. Nevertheless, despite all these difficulties, development of the Stoilensky mine, with a capacity of 4 million tonnes of ore per annum, continued. The excavator fleet grew bigger and other new technology kept arriving. In 1964 mine employees witnessed a different type of production when the northern edge of the pit became the location for filming of 'The Great Ore'. This movie, starring Evgeny Urbansky and Larisa Luzhina, portrayed the people developing iron ore deposits, and that meant the miners of Stoilensky as well.

Stoilensky became the first ore pit in the world to use ESh-10/60 walking excavators. It also utilized the Czech-built K-300 rotary excavator, the first of its kind to be used in our country. Residents of Stariy Oskol would travel to the pit just to see these powerful wonders.

Alexey Davydov was one of the men who learned how to use this unique machinery. He joined the Company immediately after school in 1965; this was the first year when the K-300 was put into

FIRST TEST PILES IN THE FOUNDATION PIT FOR THE SECONDARY AND FINE CRUSHING SHOP; SPRING OF 1976

operation, and the employees and the machinery were still getting used to each other. The team was mostly comprised of inexperienced youngsters, but they were really willing to work.

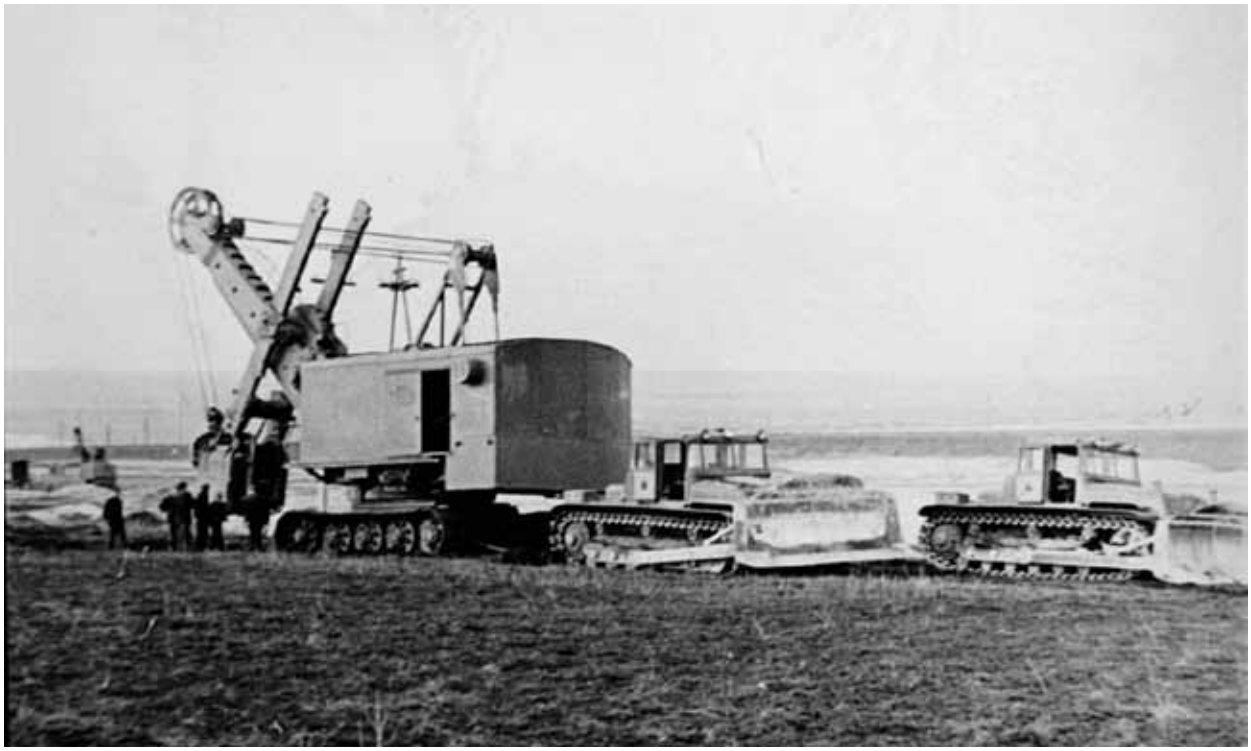
"We were lucky to have Vassily Kupriyanov, a power engineer by training and a teacher by calling, as our supervising foreman," recalls Mr. Davydov. "It required a lot of his patience to turn our 'loud-mouthed' group into real professionals. We would overcome all the difficulties as a single team and support one another through thick and thin. No one complained about the shortages or malfunctions, or the lack of 'pampered' treatment. We were all united by the common objective of reaching the top layer of the ore bed."

Some 56 million cubic meters of overburden had to be removed over a period of four years. There was a shortage of vehicles, but Stoilensky employees would not let that damp their ardor. Overburden would be removed by available vehicles around the clock, including weekends and holidays, slowly but surely getting closer to the objective.

At 3:30 pm on November 5, 1968 the pit witnessed the first single blast of ore at Stoilensky. The privilege of detonating it was awarded to Nikolay Likhushin, foreman of the best performing shift. The first ore was excavated by excavator operator Alexander Arishin, and it was removed from the pit by truck driver Vassily Chesnokov. The miners had finally reached the ore bed. But this was only the tip of a gargantuan iron ore deposit, which for millennia had been buried beneath 140 meters of the Earth's crust.

A number of significant events occurred in 1975. During this time the miners produced their first 10 million tonnes of sintered ore. It was now turn for the quartzite ores, which can only be used to produce iron ore concentrate.

COMMISSIONING OF THE CONCENTRATION PLANT



MOVING EXCAVATORS FROM THE LEBEDI TOWNSHIP TO THE SITE OF THE FUTURE STOILENSKY PIT

And the USSR Minister of Ferrous Metallurgy signed an order establishing the Stoilensky Mining and Concentration Plant as a replacement of the Stoilensky Ore Mining Division. The corporate charter and organizational structure of the works were approved. The Master Plan for Stoilensky called for the construction of dozens of kilometers of railway and roads, stations, repair shops, quartzite ore crushing and concentration plants, and numerous other buildings and facilities.

The Stoilensky Development Program is important both for the Company itself and the city of Stariy Oskol, which will benefit from the creation of more than 1,000 new jobs.

Several options for locating the plant site had been reviewed whilst still in the design stage. Eventually the Atamanskoye spot was selected, with the nearby Chufichka gully, which would make a convenient location for depositing tailings from quartzite dressing. The place where the Stoilensky administration building is now located was originally occupied by a watchman's cabin, with a stable and a tool shack next to it; 36 years ago there used to be a forest of old trees where the plant buildings now stand.

In December of 1975 the first peg was staked at the proposed construction site. Sometime later one could make out the shapes of the future secondary and fine crushing shops and the concentration plant. In 1976 the Stoilensky Mining and Concentration Plant became a Komsomol national top-priority project. By 1990 the wet magnetic separation units with a capacity of 4.8 mtpy of ore concentrate were commissioned at the concentration plant. The first train-load of ore concentrate from Stoilensky departed for the steelworks at Novolipetsk in February of 1984.

It wasn't all smooth sailing. The Company was given only 12 months to implement the technology for producing ore concentrate.

"The objective was to produce concentrate with a 67.5% content of iron," says Leonid Grabko, one of the first CEOs of Stoilensky. "And we could barely make it 66%. The Stoilensky team did not stand idle, though, but kept looking for ways to resolve this. They successfully met the challenge, eventually producing ore concentrate of better than required quality without reducing the overall yield of the plant."

Stoilensky entered the third phase of its development when it was corporatized as a joint-stock company. In 1999 it completed the largest renovation of the mining transportation system undertaken in the history of the business, and in 2000 finished renovation on the secondary and fine crushing facility. Introduction of new capacity allowed the Company to increase its output.

In March of 2001 the Stoilensky team produced 1 million tonnes of ore concentrate in a single month, setting a record in the history of the Company. And in January of 2002 Stoilensky produced its 100 millionth tonne of ore concentrate.

NLMK became the core shareholder of Stoilensky in 2004. Almost at once capital expenditures were increased three-fold. The same year more than RUR800 million (~$23 million) was spent on technology upgrades at Stoilensky,

TOP PERFORMERS, 1980

signaling the beginning of the fourth stage in its development. The effect was immediate. The new mining transportation equipment allowed the Company to pick up the slack in developing the ore pit after several years of slippages. In 2004 the target for the stripping of railroad-grade loose rock was over-performed by 14%, when some 6.7 million cubic meters of soil were removed from the pit.

Today the team at Stoilensky again faces important challenges. Output of iron ore concentrate is expected to be increased with the commissioning of sections four and five at the concentration operations. Naturally, this will require an increase in the production of iron quartzite. But this is only one part of the story. Stoilensky will start to manufacture new products; a decision has been approved to build a Pelletizing Plant with a capacity of 6 mtpy of iron ore pellets with iron ore content of about 65%.

The construction of the Pelletizing Plant is scheduled for completion in 2014. Once commissioned, by 2015 it will make NLMK fully self-sufficient in pellets, accounting for the commissioning at the Novolipetsk site of Blast Furnace No. 7 which will have a capacity of 3.4 mtpy of pig iron.

The project is being implemented in collaboration with the German and Finnish consortium of Siemens VAI / Outotec, which will supply the required equipment and technology, in addition to providing other services in connection with the construction project. Overall capital spending for operations and infrastructure facilities at Stoilensky in 2011-2014 will amount to around RUR39 billion (~$1.4 billion).

The Stoilensky Development Program is important both for the Company itself and the city of Stariy Oskol, which will benefit from the creation of more than 1,000 new jobs.

...The Stoilensky Mining and Concentration Plant is turning 50 years old in June. Its successes have been backed by the vast productive efforts of its employees and serve as a testimony to an invaluable combination of investments, experience, knowledge and daring. With so many exciting developments to come, the first fifty years marks only the beginning for the Company.

SIGNING OF DOCUMENTS FOR THE CONSTRUCTION OF THE PELLETIZING PLANT

THIRD LINE **PHASED IN**

NLMK's Novolipetsk site has launched its 200,000 tpa Color-Coating Line No.3 (CCL-3).

The addition of the facility will have a significant effect on NLMK's total production capacity for this high value added product, which will grow by 53% to 580,000 tpa, strengthening its position in the construction market. CCL-3 has expanded the Company's capability to produce finished coated strip 0.3-0.8 mm thick and 700-1250 mm wide. There is a consistently high demand for these gauges in the domestic market, which are used in the manufacture of steel structures, including all varieties of metal tile, profiled sheets, sandwich panels, interior and exterior lining for buildings, etc. The facility will produce unique thin color-coated flat steel that is also in high demand for the manufacture of air ducts, lighting fixtures and "white goods". Until recently NLMK could produce rolled steel with gauges 0.4 mm and higher.

The new production line meets the most progressive global energy efficiency and environmental protection requirements. As substrate for the color-coated steel production galvanized steel produced at Continuous Hot-Dip Galvanizing Line No. 4, commissioned in late 2009, will be used. ■

FOR REFERENCE

NLMK is Russia's leading manufacturer of color-coated steel with over 21% of the domestic market. In 2010 the Company produced more than 332,000 tonnes of color-coated steel, with 96% marketed domestically. Color-coated steel products account for 3.6% of NLMK sales.

Occupational Prestige and the Brain Drain

The word 'engineer' derives from the Latin 'ingenium', meaning 'ability' or 'inventiveness'. What is a modern day engineer? A creator or someone in possession of a graduation certificate? What is his or her place in modern day society? These questions are discussed by NLMK employees, winners of the Engineer of the Year All-Russian Competition.

Vladimir Titov, Head of Laboratory, NLMK Engineering Centre:

The way I see it, an engineer occupies a fairly high position in today's world. This is due to increased reliance on technology in production operations. Hence, all key managerial decisions need to be based on an assessment provided by the engineers. This will raise the requirements applicable to university graduates. Today's engineers should not limit themselves to the scope of knowledge which they had acquired as students, and should continue to educate themselves all the time, including in areas outside their direct terms of reference, and should improve their levels of competence.

When it comes to occupational prestige, this is a somewhat ambiguous notion in present day Russia. That is, you hear people talk and you read a lot about it, but, effectively, this is not corroborated either by appropriate wages, or other incentives, with the exception of certain businesses that are attempting to restore the former status of engineers, like we do at NLMK.

I have a negative attitude towards the brain drain, but approach it with understanding. When fresh technical ideas are not wanted at home, which, in my view, is the main cause of the brain drain, then I find it normal that a talented engineer may want to attempt to implement them overseas. And I am pleased to hear when expatriate Russian engineers become successful in other countries. At the same time, I don't think we need to try and lure them back. It is better to create an environment when people would not want to leave.

Background

Vladimir Titov is a winner of the 2010 Engineer of the Year All-Russian Competition and a professional engineer with a Ph.D., Tech. He is 35 years old, and has been with NLMK since February 1999. Based on prior research , his competition paper, 'Assessing the behavior of alkali in a blast furnace and adjustments in operation modes to reduce their negative effect', offers recommendations on how to select operation modes for blast furnaces in order to achieve more complete removal of alkali from the furnace and mitigate their negative effect on the tap. The proposed method and recommendations are in use at all NLMK blast furnaces. Vladimir Titov also teaches at the Lipetsk University of Technology, where he is associate professor at the Department of Metallurgy and lectures on 'Basics of Designing and Equipping Blast Furnace Shops' and 'Blast Furnace Design'. Many of his former students, who had graduated under his supervision, are now employed by the Company.

Sergey Pashovkin, Chief of Bureau, BOF Shop No. 2:

A modern day engineer should be trained in general engineering, general science, and management and economics, and should combine professional knowledge and practical skills and abilities. They need to be able to think independently, and be prepared to develop new technology, and have computer-aided design skills. An engineer needs to clearly formulate his or her views on technical issues, be familiar with the principles of scientific research (modeling and experimental methods), continuously engage in self-education activities, be aware of advanced innovation ideas both in his core professional area and related fields, and promote their use in production operations.

I believe that in the past decade the engineering profession in Russia has been in low demand. I look forward to the emergence of new opportunities in the coming years for implementing engineering ideas, to the development of new instruments that would allow for proper assessment and quick implementation of the products of scientific, engineering and technology research activities.

As regards the brain drain from Russia, I think that this process can be managed. You need to focus more on young professionals and engage and involve them in the production operations. This is what we do at Novolipetsk, and we don't have a brain drain. And the engineers themselves need to assess their ideas, first and foremost, in terms of their relevance for production operations.

Background

Sergey Pashovkin, 34 years old, 12 years with NLMK, Ph.D., Tech.

For the 2010 Engineer of the Year All-Russian Competition he submitted a paper titled 'Raising the Effectiveness of Deep Drilling by Controlling the Topology of Drill Piloting Mechanisms', which won a Professional Engineer diploma in the Machine-Building nomination. Mr. Pashovkin proposed a new method for making deep orifices, which helps improve process technology parameters. The method was used to develop a new process and define the modes for the use of specially designed drill bits. The tools and equipment are protected by Russian patents, confirming the novelty and relevance of the subject of research. The findings were implemented at Novolipetsk repair operations. The new tools for treating deep orifices and the device for making directional micro-relief helped improve the durability of drill bits by 20% and otherwise ensure the effectiveness of treatment of deep orifices.

Konstantin Sablin, Chief of Bureau, Process Automation Centre:

At one point, before I joined Novolipetsk, I had the opportunity to leave the country for a job in Germany. But it did not work out, and I do not regret that in any way, because one can easily unlock one's creative potential at Novolipetsk, without having to travel overseas.

Of course, the role of the engineer will become more significant as technology becomes more numerous and sophisticated. For example, it would be difficult to find a business which does not use computers. This is especially relevant in light of the Government's policy of modernizing the economy. In the meantime, however, running a business or working at a bank carries greater prestige than calling oneself an engineer. And the primary reason why Russia is experiencing a brain drain is because highly qualified professionals are collecting low wages.

Sergey Dayev, Chief Specialist, Technical Upgrade Centre:

In my view in today's world an engineer is more than someone who generates ideas and acts as a core driver of progress, it should be a person required to be accountable for new technology solutions so that they would not hurt the environment, while ensuring strong reliability, especially at technologically sophisticated and hazardous facilities.

When it comes to occupational prestige then, in my opinion, presently in Russia most people would define a prestigious occupation as one that pays well. As regards self-respect, as long as the job of any engineer has room for creativity, one can be deservedly proud of being an engineer.

As regards the environment for the implementation of engineering ideas in Russia or abroad, I believe that the path from the emergence of an idea to the generation of a final product is always challenging, irrespective of the location, with a few rare exceptions. A good idea by itself does not guarantee its successful implementation. This requires a number of conducive factors. I think that this country presents ample opportunities for

Background

Konstantin Sablin, 41 years old, 10 years at Novolipetsk, Ph.D., Tech. Received the title 'Professional Engineer of Russia' based on the outcome of the All-Russian competition, in which he presented his professional achievements and research papers for the past several years. One of the papers was titled 'Visualization and Control Systems for the Finishing Group of the Hot-Rolling Operations Mill 2000', and it was part of a large and significant NLMK project involving the reconstruction of the primary drives and replacement of inter-stand spans for the finishing group of stands at Mill 2000, which was implemented in 2006-2010 by the best team of employees from the Process Automation Centre and the Hot-Rolling Operations.

Background

Sergey Dayev, 46 years old. Has been employed at Novolipetsk for 19 years. Based on the results of the 2010 Engineer of the Year All-Russian Competition his name was included in the register of Professional Engineers of Russia in the 'Heat and Power Engineering' nomination. For the competition he presented his paper 'Construction of Energy Recovery Facilities for Natural Gas Pipelines'.

Dayev's project will allow for the utilization of current idle potential energy of excess pressure of natural gas to generate electric power and cold. The practical value of the project lies in enhancing the effectiveness of production by reducing operational costs, including for purchase of electric power. Considering that the proposed technology does not utilize fuels ('green-tech'), implementation of the project would help mitigate the environmental impact by reducing emissions of green-house gases.

implementing almost any idea. Therefore, notwithstanding the fact that a proper professional certificate confirming one's qualifications would allow you a realistic opportunity to seek employment overseas, I would prefer to work for the benefit of my own country at a plant which I consider to be my home. In general, I don't believe that changing one's citizenship is the best way for unlocking one's potential.

Vadim Grigoryev, Lead Engineer, Industrial Ecology Department, Novolipetsk:

Engineering involves the efforts of an engineer to do good 'here and now' by creating, utilizing, modernizing and eliminating technology by means of engineering, in particular, through invention and designing. This implies that in the modern world the place of an engineer is defined by the capabilities of the team of which he or she is a part.

Engineer is an honorable occupation by definition, irrespective of whether one resides in Russia or elsewhere. As regards the brain drain, I see this as a regular process, because people seek to live better according to their own definitions and based on their own set of values, needs and capabilities.

Background

Vadim Grigoryev, 35 years old, has been employed at Novolipetsk for 11 years. Winner of the 2010 Engineer of the Year All-Russian Competition award for his paper 'Set of Measures to Eliminate Discharge of Industrial Effluents by Novolipetsk into the Voronezh River.' Novolipetsk was one of the first fully integrated steelmakers to implement such a project.

Keeping the Environment Clean

Production of steel inevitably leads to a pronounced impact on the environment. NLMK is dedicating significant efforts and funding to mitigate this impact.

Novolipetsk Sets a Record in terms of Funding for its Environmental Protection Program

Since the Technical Upgrade Program at the Lipetsk site was first launched in 2000 Novolipetsk has spent more than RUR16 billion (~$572.6 million) on environmental improvement measures. Novolipetsk has reduced its impact on air within city limits by 22% over the past decade, while at the same time achieving significant growth in output. As a result, Lipetsk is no longer included in the list of Russian cities with high levels of air pollution, compiled on the basis of observations by Rosgidromet (Russian state weather forecaster).

The reduced environmental footprint is directly related to the increased spending on conservation efforts. Annual environment-related outlays by Novolipetsk have increased more than 30-fold, from RUR130 million (~$ 462,200) in 2000 to RUR4.14 billion (~$136.3 million) in 2010. Last year Novolipetsk allocated a record amount towards environmental protection projects since the launch of the Company's Technical Upgrade Program and the highest investment into environmental technologies among Russian steelmakers.

Implementation of the Best Available Technologies has resulted in a significantly reduced environmental impact from BOF operations, with average emissions falling by 20% whilst the site saw steel production grow by 9.2%. Emissions reductions were achieved by reconstructing the BOF off-gas ducts with a secondary emission collecting and cleaning system as well as by improving the BOF smelting process. New slag cooling technology has halved atmospheric emissions, greatly improving the environment and ecology of local communities. The agenda calls for new large-scale projects. Last year Novolipetsk launched a new large scale project at its Sinter Plant,

involving the reconstruction of the central aspiration system for two sintering machines. This RUR1.2 billion (~$39.5 million) worth project will reduce the machines' environmental footprint 1.4 fold within one year.

Benchmarking European Standards

It has become NLMK's policy to use European standards as a reference point. All new equipment and facilities commissioned by NLMK meet the most stringent environmental requirements. In particular, the new Co-generation Plant, integrated with Blast Furnace No. 7. It will use blast-furnace gas – a by-product of the main metallurgical process – for the generation of electric power. The blast furnace itself shall be equipped with latest generation equipment, which will make it environmentally friendly.

Overall, environmental measures implemented at Novolipetsk have allowed a reduction in gross emissions in 2010 by 1 400 tonnes, a decrease in the stock of previously accumulated industrial waste by more than 500,000 tonnes. In addition, the measures have succeeded in bringing down fresh water intake from the Voronezh River by 11.1 million cubic meters. During 2010, Novolipetsk maintained zero discharge of industrial effluents, the latter having been discontinued in 2009 through a large-scale refurbishment of the process water supply system.

There was, nevertheless, room for adventure. Some, possibly over-agitated, local activists attempted to stage a picket line at the Moscow office of NLMK, claiming that they had identified effluents from Novolipetsk. This 'discovery' is equivalent to claiming to find a black cat in a dark room where no cats are present. Novolipetsk is able to treat process water to a level where it can be re-used numerous times in the production cycle.

A completely different assessment of NLMK's environmental protection efforts was displayed in 2010, when Novolipetsk won the National Environmental Award instituted by the V.I. Vernadsky Foundation and the State Duma of the Russian Federation with the Support of the Council of the Federation and the Government of Russia; it also won the nomination for Socially Responsible Treatment of the Environment in a rating of Russian companies compiled by the Agency for Political and Economic Communications (APEC).

VIZ-Stal is Eliminating Accumulated Wastes

VIZ-Stal is consistently pursuing environmental protection measures. Over the last decade VIZ-Stal has reduced its atmospheric emissions 4.3-fold.

In 2010 the business spent about RUR170 million (~$5.6 million) on conservation efforts and completed more than 60 environmental projects. It also completed Phase 2 of the land reclamation project at the Lesnoy landfill. The Company has repaired access roads for heavy machinery, and planted trees and grass over two hectares of its territory. This year regeneration efforts at the landfill will continue. VIZ-Stal is also introducing new processes for manufacturing inputs for refractories, which will eliminate any further dumping of industrial waste at the Lesnoy landfill.

VIZ-Stal is the only business in the Sverdlovsk Province which treats waste containing polychlorinated biphenyl (PCBs) itself. The method for safe elimination of PCBs was developed in-house by NLMK and complies with all international standards. It allows for the full elimination of toxic wastes and prevents their accumulation. Since 2008 the Company has recycled 120 tonnes of PCBs, of which 80 tonnes were recycled last year.

The business also received approval for project documentation for the renovation of industrial and storm sewage treatment facilities. The project will be completed in three years. It will be launched this year with the installation of oil product separators. A positive review was also obtained for a proposal to create and develop a common industrial and sanitation zone for VIZ-Stal, VIZ, and Kontsern Uralmetprom. In collaboration with the Urals Academy of Architecture and Arts, work is under way to design the landscaping plan for the territory adjacent to the plant, and implementation is proposed to begin this year as well.

An accredited on-site environmental laboratory is

conducting daily monitoring. For many years the amounts of emissions, discharges and industrial waste have remained within established limits and have been consistently declining. For its achievements in protecting the environment the Company won a gold medal in the Russia's 100 Best Businesses: Environment and Industrial Safety competition in 2010.

Altai-Koks is Open to the Public

In 2010 Altai-Koks spent RUR83 million (~$2.7 million) on environmental protection measures, twice as much as in the previous year. With a view to significantly reducing its environmental footprint the Company renovated its coking chamber doors, air scrubbing systems, replaced coking chamber door frames, relined the heating partitions of coking batteries and completed other works.

In late March Zarinsk hosted a round-table environmental discussion in which Altai-Koks management also took part. The discussion focused on the pencil pitch production facility, which was proposed for commissioning at the plant. The facility gave rise to a number of appalling rumors and fears, including one allegation that it would kill all the residents of Zarinsk, notwithstanding that similar installations are in operation at dozens of Russian and overseas businesses and do nothing but good: by recycling products of the coking process they help prevent atmospheric pollution and consumption of scarce coking coals. And, naturally, new jobs are created.

Participants in the round-table discussion were shown documents and materials detailing the process and uses of pitch and its properties. It was made clear that the public was in no danger, and that the concern had been caused by lack of information. It was decided that the issue can be resolved through disclosure and an unscheduled inspection by representatives of Rospotrebnadzor (Russia's public health and consumer protection agency).

NSMMZ Reduces Emissions of Phenols

NSMMZ is also paying closer attention to environmental issues. Long products operations have been allocated RUR1.5 billion (~$49.4 million) to renovate gas scrubbing systems and design work has already begun. Some RUR116 million (~$3.8 million) were spent on renovating the heating, ventilation, conditioning and aspiration systems, leading to lowered phenol content in emissions.

Stoilensky Implements 24 Measures

In 2010 Stoilensky spent almost RUR120 million (~$4 million) on environmental projects and implemented 24 measures aimed at reducing its environmental footprint.

Among other things, the supply and exhaust ventilation systems were renovated at various sections of the Concentration Plant. The tailings operations were complemented with a special system that helps suppress dust from the spoil heaps within the dam. This required the installation of more than four kilometers of pipes and the crest of the dam was fitted with nine distribution sections equipped with more than 650 sprayers.

By Alexander Sutormin

Everyone's PaL

The Personnel and Labor (PaL) information system has been introduced at VIZ-Stal, Stoilensky, Altai-Koks, Stagdok and Dolomit. Now a total of 15 businesses, two representative offices and one affiliate of NLMK are linked within a common information environment.

It all began in 2006 when it was decided to modernize the existing local personnel records system at Novolipetsk. Developers at the Information Technology Directorate were tasked with what was at the time an unprecedented challenge in terms of its scope: they were required to come up with an automation solution for managing personnel across a number of units, including the employment and wages functions for all shops, within a common information environment. The task was completed in July 2007 with the creation of computer networks and the development and deployment of the Personnel and Labor information system.

PaL maintains the list of staff for the Company, handles all personnel records by automating operations involving the hiring, transfer, and dismissal of personnel, and also handles payroll/wage calculations as well as compiling reports and data to be shared with government agencies. In addition the system maintains a database of job seekers and potential trainees, provides for personnel evaluation and reviews, and helps handle the talent pool. At a separate level the system analyzes personnel data allowing Company managers to monitor changes in the quantitative and qualitative properties of the workforce and to make informed decisions.

"The common database provides HR managers of companies within NLMK Group with direct access to updated, complete and consistent information," says Sergey Slauta, NLMK Information Technology Director. "And most importantly, the introduction of PaL allowed for the best possible unification of efforts to manage employment, remuneration and HR at Company businesses. We have standardized most of the personnel management processes, introduced uniform input and reporting formats, methods and routines for calculating wages, as well as arrangements for interacting with banks and government institutions; in addition, we also rely on a shared database of statutory and reference documents."

During the introduction of the information system all the specific features of individual businesses were accounted for, for example, regional wage adjustments for Altai-Koks and VIZ-Stal, and aggregated accounting of work time for mining businesses. With every additional deployment the system continues to develop and best available technologies are added on as model practices to be used by all businesses. Two methodology development centers –one at the level of Vice President for HR and Management System, which focuses on personnel issues, and another one at the NLMK-Uchetniy Tsentr (Accounting Office), which focuses on wages – review proposals from businesses and decide on the their advisability and priority for implementation.

Locations for PaL deployment

Better Quality Earns Higher Wages

Compensation is one of the key incentives for motivating personnel for effective performance. This is one reason why the Company determines wages based on the most equitable and accurate criteria that would in the best unbiased manner take into account the contribution of each employee to both generating output and improving the quality of products. New approaches to monetary compensation are the focus of Alexander Sutormin's discussion with Stanislav Tsyrlin, Vice President for HR and Management System at NLMK.

Q: Mr. Tsyrlin, the topic is remuneration. At Novolipetsk, the parent company of the Group, a lot has been done to improve remuneration arrangements. To what effect?

A: During the first stage of the remuneration system reform we were able to tackle several issues. Firstly, we eliminated the significant gap between the wages of newcomers and long-time employees in order to attract younger people to work at Novolipetsk. For this purpose the length-of-service allowance, which accounted for up to 40% of the wage rate, was included in the rate itself, thereby putting all Company employees on an equal footing. Secondly, engineering staff were transferred to a salary-based remuneration scheme, where the salary scale defines a set of pay brackets linked to functions performed and sophistication of the work done. Thirdly, we leveled out the unwarranted disproportions in remuneration paid to employees involved in similar operations, a case in point being the Blast Furnace Shops No. 1 and No. 2. Other changes have also been made, e.g. the Grade 1 pay rate was raised to the level equal to minimum wage rate as defined by the Government of the Russian Federation, and by now even exceeds the statutory amount. While the minimum wage rate at the Company is 1.3 times higher than the minimum subsistence level defined for the region. For lack of time I shall skip the details of all the innovations, let me just stress that their goal was to ensure that compensation is paid at an appropriate level while at the same time providing enthusiastic and highly-skilled employees with an opportunity to earn more than the average amount.

It is obvious that in a competitive environment high quality of steel is the key to survival

Naturally, monetary compensation and the criteria for paying it should be linked to the changing economic realities, because the world is moving on, and new challenges are emerging... And we cannot disregard them.

Q: What are these challenges? What is their nature?

A: They are rooted in stronger competition, which will be more severe. We are used to seeing the West as an example, however, the European steel industry has for many years been in a very challenging state. In the meantime developing countries are increasing their production of steel, making the competition even more intense. Statistical data suggests that over the last 15 years China has increased its share of global steel production from 10% to almost 50%, they have installed modern facilities and are strongly pushing

STANISLAV TSYRLIN,
VICE PRESIDENT FOR HR AND MANAGEMENT SYSTEM AT NLMK

to enter the international markets. The steel industries of India and Brazil are enjoying rapid growth and becoming major exporters, supported by inexpensive labor. Countries in the Middle East are also entertaining serious plans to develop the steel sector.
As experts correctly point out, existing steelmaking facilities rely on relatively similar technology that does not allow any of the companies a clear competitive edge. It is obvious that in a competitive environment high quality of steel is the key to survival. Recent inquiries into what may cause the manufacture of unfit products by Novolipetsk suggest that it is impossible to improve quality unless the employees are highly motivated. But I can't say that they are not motivated. An employee who achieves lower rates of defective or unfit products or lower input consumption rates will receive an increased monthly bonus. Unfortunately, we are not yet seeing a visible breakthrough in quality improvements, notwithstanding the introduction of new technology. And this can be explained. Some still fail to appreciate the link between remuneration and the quality of steel, while others, it seems, don't feel the bonus for better quality to be sufficiently large to encourage them to change their entrenched attitude to work, and others yet are guided by the simple principle that quality is the managers' job, and it is none of our concern. In the end, personnel costs are growing quickly; this year for the Russian part of NLMK Group and inclusive of social security contributions they will very nearly reach $1 billion, and then exceed this amount in the following year, assuming that the trend continues. And we are not seeing a reciprocal improvement in quality.

Q: Well, maybe it is none of their concern? Why should employees care that quality is not improving? As long as their job is done.

A: It is of their concern. And very much so! You don't just manufacture something; you also need to sell it at a profit. And when an employee lives by an "it will do" principle and produces defective steel products, who would want to buy those? No one wants to pay top dollar for a bad product, especially when more and more companies are offering good steel. One needs to understand that unless the quality of our products continues to improve then, sooner or later, NLMK will lose its ground, its competitors will definitely benefit from that, while the Group companies will lose, because money to pay higher wages and bonuses does not come out of the blue.

Q: What do you intend to do in order to focus the employees on improving the quality of products?

A: Let me stress from the outset that we have no intention of coercing employees into manufacturing quality products by relying on

administrative measures; we understand that one cannot change people's mentality overnight, generating an inner desire to manufacture a quality product. Hence, paramount importance is accorded to changes in the remuneration arrangements and long-term awareness efforts.

Q: How will this be done?
A: Our meetings with the personnel suggest that some employees fail to see the connection between stronger performance in terms of quality and a higher bonus. When Novolipetsk was implementing serious work-force streamlining efforts and the wage-bill savings were used to pay emoluments on a regular basis over a span of several years, this created a wrong perception that one would get paid irrespective of how strongly or poorly they perform. I can assure you that this is not the case, and currently, when we no longer expect to have a large number of vacancies as the Company continues its development, this practice of using wage-bill savings for paying emoluments across-the-board has been discontinued. Hence, the link between remuneration and performance will continue to grow more evident. The employees need to be made aware of this on a continuous basis. Secondly, we are now in the process of critically reviewing both the approaches towards increased bonuses for over-performance in terms of quality, as well as their size. We understand that an extra 100 rubles (~$3.5) is unlikely to encourage anyone to change, but a 1,000 rubles (~$35) and paid on a monthly basis may warrant some effort, and if you offer several thousand rubles, one can expect people to become enthusiastic. Of course, in order to properly set the bonus adjustment one needs to understand what improved performance in terms of defective and unfit products means for the Company as a whole.

The link between remuneration and performance will continue to grow more evident. The employees need to be made aware of this on a continuous basis

Q: Couldn't it happen that someone would over-perform once, twice and then a third time, and then the target would be made tighter, as often is the case. And there goes your bonus...
A: Concerns that targets will be adjusted to make them tougher are sound. Better yet, this is often what happens in real life. And for a good reason. Again, in the West no one would imagine paying an additional bonus for over-performance in terms of quality targets. And there quality is usually not an issue. The applicable ratios of defective and unfit products are based on the state of technology and the health of equipment and are then statistically adjusted to account for the human factor. Then the objective is to meet the requirement, rather than over-perform. I am certain that the day will come when we shall have tight but sound requirements and there shall be no need to over-perform by right or wrong. However, as long as we are confident that a significant proportion of issues is caused by employees' attitude to work, the proposed system would be effective. And then, firstly, it is desirable that the targets for quality performance would be set on a medium-term basis, and at the very least would not be revised during the year. Secondly, and obviously, if the target defect rate for a certain operation is set at 3%, while effectively the defect rate is only 2%, then the rate should be set at 2% in all similar units or operations. But then any additional value should be reflected in the size of the regular bonus, so that the employees would continue to perform just as strongly and without losing any pay. This is crucial for motivation and of course we shall monitor this.

Q: Mr. Tsyrlin, do you expect to roll-out Novolipetsk's experience across the Group?
A: It's too early to say, because we have not completed the pilot at Novolipetsk. Its outcome and the specific situation at each individual business shall help us choose the appropriate solution, based on the premise that our objective is to introduce uniform corporate standards for HR policy, including a remuneration arrangement applicable across the Group. Today, all NLMK Group businesses use an almost uniform approach to remuneration. For operational personnel it includes a wage grade, bonuses, hardship allowances, etc.

VIZ-STAL IMPLEMENTED THE PAL INFORMATION SYSTEM

I said 'almost uniform' because some businesses allow for regional variations. For example, in the Urals pool and the Coke-Chemical Plant in Zarinsk the wages have a regional adjustment component. This factor, as well as the aggregated recording of work time for mining businesses, was taken into account when introducing the Personnel and Labor Information System company-wide. This system is also another step towards single corporate standards.

The overall trend for the Group is for operational personnel wages to remain consistently above the average for the enterprise. In their turn, our businesses pay consistently and significantly higher wages than the average for their region, with Stoilensky paying 50% more, VIZ-Stal paying 60% more, while Altai-Koks holds the corporate record with wages 100% higher than the regional average. This comes as a result of our full compliance with our commitments to increase wages, as defined by the collective bargaining agreements and the sector wage rate contracts. And this is also one of our Company-wide corporate standards.

As I have stressed above, a characteristic feature of NLMK are the continuous and sustained increases in the average wage at a rate above the rate of inflation. In 2010 wages at the Group's Russian businesses increased by about 18%. This year wages will also increase at all businesses. In fact, some increases have already been put in place in January and March, depending on the business. One needs to understand that wage increases depend on the financial standing of the business, which in turn depends on market developments. Unless you factor this in, one will see a repetition of what happened at NSMMZ where in 2006-2007 the wages were first raised quite steeply, but then the Company began to run wage arrears. It's hard to say what would have happened to the business, were it not for support provided by NLMK.

Overall, when it comes to introducing Company-wide corporate standards for HR policy I believe that we shall get there in two to three years. I am confident because NLMK has always been and continues to be very diligent when it comes to paying wages, and would not allow even a single day's delay even during the crisis period. We want our employees to be motivated to perform and for their performance to allow us to consistently improve their well-being.

ALTAI-KOKS
IS USING THE PAL SYSTEM

Boris Parshakov's 100 Days

April 10 marked 100 days since Boris Parshakov took over the Cold Rolling Shop at VIZ-Stal. He is 31 and has been with the factory for 11 years. He also participates in the NLMK Leader 2020 project. Natalia Kachmasheva picks this as the starting point for the interview.

BORIS PARSHAKOV, COLD-ROLLING SHOP SUPERVISOR

Q: Why did you join the NLMK Leader 2020 project and what did you gain?
A: It is still a mystery to me how I made it to the list of participants. This question should be addressed to the HR managers at the Company. I have always found the production process overwhelmingly exciting, and it probably shows, and that is why I was nominated. I love to implement new things, and there were more than enough of those in the project. I enjoyed the training sessions, where we were taught to make the right decisions in different situations. We obtained additional knowledge in economics, finance, etc. I try hard to use these in my job, sometimes it works, sometimes it doesn't.

Q: Are you in touch with other project participants? Do you know how they are doing?
A: Of course, I do. There were 22 of us in the group, and we are still in touch, some more often than others, however. Many of us got promoted. For example, Sergey Grachev became Supervisor of Blast Furnace Shop No. 1 at Novolipetsk; Evgeniy Bychek is now HR Director at NLMK-Vtorchermet; Anton Zuyev was promoted to Supervisor of Automation Shop at NSMMZ.

Q: For 100 days now you have been in charge of a key shop at VIZ-Stal, and I understand that you are very busy. Nevertheless, what do you see as your priorities?
A: There is no such thing as a second priority in steelmaking, everything here is interconnected. One simply needs to get their priorities straight. For now it would include the technology upgrade at the Cold Rolling Shop (CRS). Significant capital expenditure projects are under way. In 2010 we put on-line eight modern LOI reheating furnaces. This year the core project is the Reversing Mill, and installation work started on March 21. Since the commissioning of the CRS nothing similar had ever been installed. At the same time we are installing the second module for the Laser Treatment Installation, and are beginning renovations of the Decarbonizing Annealing Machines and the Electrical Insulation Coating Machine No. 8. In other words, we are moving in several directions at once. This requires utmost concentration, but it is very exciting work. Getting acquainted with new technology is another exciting task. And isn't it exciting to come up with new process solutions that improve the quality of our steel products? We have quite an ambitious objective of manufacturing high permeability steel, which is in high demand on the markets.

Q: In 2012 you are planning to resume pickling operations at the CRS. What is the reason for that?
A: The reason is increased output by the NLMK Group. We have started overhauling our continuous Pickling Line, which had been moth-balled during the crisis. It was already in need of an overhaul, and now we have the opportunity to do a complete and proper job, unlike if it were operational.

Q: Based on your own experience would you be in a position to describe what a manager should be like? What are you like?
A: I can't be the judge of myself as a manager. But I prefer a frank and open dialogue with everyone. Steelworkers are strong people, people of integrity, of principles, and they want to be treated in a similar manner. A manager needs to hear what the people have to say, so that from a variety of opinions he would select the most crucial and necessary one and use it for the benefit of the common cause. A manager does not need to know how to tighten one bolt or another; the manager's job is to determine the proper course

of action. Instead of dealing with trifle matters and routine practices a manager needs to get involved in every project in such a manner that the efforts of the team would generate maximum effect. And, of course, a manager needs to supervise how tasks are performed.

Q: Have you already selected a team?
A: The team at the shop had been in place for a long time before my arrival. I have no reason to doubt their competence. I was put in charge of a soundly operating process. And my objective as I see it is to become the leader of the existing team rather than create a team of my own.

Q: What type of employees do you prefer: ones who are self-reliant, or very cautious ones, who would refer to the manager for guidance in everything they do?
A: The production operations need both types. Is it bad when an employee can think for himself and is pro-active? And then there are upsides to working with a cautious employee who would double-check everything before making a decision. It is bad when people don't care about a thing. This indifference is the cause of many of our troubles, whether economic or social.

Q: Now let's turn to your private life. Do you have a family, what are your hobbies?
A: My wife is at home, always there for me, together with our eight year old son and one year old daughter. They are my support, the meaning of my life. Talking about hobbies, I enjoy fishing, especially in winter. I can really relax only in the open. With my family and friends, but it has to be in the country-side.

Q: Mr. Parshakov, where are you from originally and what brought you to VIZ-Stal?
A: I am from the Perm area (in the European part of Russia near the Urals mountains), I went to school there, later was drafted into the Armed Forces. While I was serving in the Strategic Missile Forces, my then wife-to-be, who attended the same school as me, enrolled in the Sverdlovsk Institute of National Economy (presently called the Urals Economic University). After my service in the military I joined her in Yekaterinburg. I saw a job advertisement and was hired as Cold Steel Cutter in the CRS Finishing Section. Later I was acting crew chief and then crew chief.

Q: Any steelworkers in your family before you?
A: No, except my grandfather, who was the village ironsmith. My father was a mechanic, and my mother, who, unfortunately, has died, was a veterinarian.

Q: What were your hobbies as a child? You must have been an exemplary child and a straight A student...
A: I was neither a straight A student, nor an exemplary child. I was a good student. I enjoyed history lessons; I even attempted to enroll in a normal school, and together with some friends applied to a military academy... In other words, it took me a while to choose my professional calling. But as soon as I joined the plant, I knew I had my heart for it. And I immediately enrolled in the Metallurgy School at the Urals University of Technology.

Q: You have made very quick progress in your career...
A: Most likely, because I had good teachers, like Section Supervisor Sergey Ryabukhin and Senior Foreman Evgeniy Burdov, who taught me the basics of metallurgy, while Sergey Kutepov, then QC Supervisor, enlightened me about the processes. I also gained a lot from my studies at the university.

Q: That is, you had climbed all the rungs of the ladder?
A: Not exactly. I never became a foreman, although I had been acting foreman for a long time after the university. When the supervisor of the finishing section was about to retire, he suggested me as his replacement. In 2007 I was relieved of my core duties for six months when I was busy commissioning the Laser Treatment Installation. And on December 31, 2010 came the New Year's surprise when I was appointed CRS Supervisor. Frankly speaking, this appointment is a collective vote of confidence awarded to me in advance, and I still need to earn it.

Guard Yourself from Trouble

VIZ-Stal is the only Company in the Russian metallurgy sector that reported no incidence of occupational injuries in 2010. Our magazine reports on how the Urals-based business achieved this performance and how Group businesses manage occupational safety issues related to the human factor in production operations.

Zero Occupational Injuries

"It is, certainly, an outstanding achievement", this is how Mikhail Melnikov, Chief Engineer and Technology Director of VIZ-Stal, commented on the zero injury rate. "It has always been our objective. Look at the statistics over the past few years. In 2000 we recorded 23 accidents, then only two in 2009, and none in 2010."

Last year we spent RUR145 million (~$4.8 million) to ensure safe and stable operations. We implemented 25 actions to eliminate the technical causes of injuries. More than RUR2 million (~$65,800) were spent to improve the conditions of labor, making the environment more comfortable for more than 1,500 steelworkers. Among other things, we upgraded the heating system in the Cold-rolling Shop, modernized the tracks for the transfer carts in the High-temperature Annealing Operations section, and are now doing an overhaul of the floor surfaces, and so forth.

VIZ-Stal's experience in industrial safety received strong praise from international experts who had visited the plant

For a number of years VIZ-Stal has been showing one of the lowest personnel morbidity rates in Yekaterinburg. This was achieved through the successful preventive efforts of the plant-based medical unit. For example, last year on-site medical staff inoculated more than 70% of plant employees. VIZ-Stal's successes in occupational safety were rewarded with a 40% discount on accident insurance premia offered by the Social Security Fund. This adds another RUR5 million (~$164,600) towards improved working conditions. VIZ-Stal's experience in industrial safety received strong praise from international experts who had visited the plant.

One Incident for Three Sites

Another Urals-based business of the Company, NSMMZ, reported only one occupational injury in 2010, while in 2007 a total of 16 had been reported. This plant also put in a lot of effort to reduce possible risks to a minimum. Every year they adopt an action plan to improve conditions of work, and spent RUR34 million (~$1.1 million) for these purposes in 2010. The main building of the electric steel smelting operations was equipped with heating and ventilation systems, while at Nizhnie Sergi a supply and exhaust ventilation system was installed in the oil cellar, and an automatic fire warning system was set up at Berezovsky. And this is only the short list.

A strong focus is made on providing training to personnel in occupational safety, teaching them how to act in the case of an emergency and how to provide first aid. More than 2,000 employees received this training last year. Units are subjected to comprehensive audits of compliance with all occupational, industrial and fire safety requirements; targeted audits are followed-up with debriefing sessions. Every year in time for the World Day for Safety and Health at Work competitions are held to identify best shop, best team and occupational safety representative. These and other activities encourage people to respect established rules and help develop a habit of working without violations.

Immediately after joining the NLMK Group NSMMZ developed its Health Program with an emphasis on disease prevention. Employees have the opportunity to improve their health at proper sanatoria in the Sverdlovsk region as well as at sea-side resorts. The on-site medical unit offers physiotherapy treatments and healthy lifestyles are strongly encouraged. As a result, the incidence of occupational disorders declined by 25% on average for the Revda and Nizhnie Sergi sites, and contracted almost three-fold at Berezovsky.

Personal Carelessness is the Cause of Injuries

At Stoilensky a study of occupational injuries showed that more often than not people get hurt through their own carelessness and misconduct. Out of ten minor accidents recorded at Stoilensky seven involved falling from small heights. And neither are the injured newcomers - six of them have been

employed for more than 10 years.

"I guess, over time one becomes less alert," says Pyotr Nikishin, Head of Occupational Health and Safety at Stoilensky. "In addition, we learned that often accidents are caused by a combination of several factors, for example, personal carelessness, and irregularities in how operations are managed."

Last year disciplinary action in connection with incidents involving injuries was taken against 22 employees of Stoilensky, while 13 employees forfeited their bonuses.

Currently Stoilensky is finalizing a review of workplaces in terms of working conditions. This review is a key instrument for managing risks. An employee must be aware of the potential hazards and how they can be avoided. In order to minimize the risks Stoilensky is continuously pushing for improved working conditions and spent RUR17,879,000 (~$ 588,600) for these purposes in 2010. For example, systems were installed at the drain well that preclude any direct contact with vibrating equipment, helping prevent the tunnel workers from developing vibration disorders. The plan for 2011 calls for another 46 actions at a cost of more than RUR14 million (~$ 460,900).

Preventive Check-ups for Everyone

Last year Altai-Koks spent RUR125 million (~$4.1 million) on industrial and occupational safety and improved the working conditions for 410 employees by replacing conveyor enclosures, renovating operations and amenity premises, installing special equipment to prevent accidents, etc.

Nevertheless, in 2010 the Company reported 10 minor accidents. A review of these accidents suggests that the notorious human factor was also at play here.

The NLMK Group's chemicals business pays special attention to preventive medical check-ups of its employees. Last year 4,256 employees were screened for an almost 100% coverage.

Human Factor Versus Advanced Technology?

Novolipetsk hosted a series of traditional competitive exhibitions focusing on occupational, industrial and fire safety, and industrial culture and design. The best performers included teams from the Coke-chemical Operations, the Rail Transport Department, the Safety Directorate, and others. Altogether more than 50 business units at Novolipetsk reported no injuries in the previous year.

Reducing injuries to zero at a large industrial business, however, is no easy task. Even with advanced technology and modern collective and personal protective means and gear there still exists the hazardous factor of carelessness and disregard for industrial safety procedures. Unfortunately, in 2010 it was exactly this factor which was behind two fatalities and 23 cases of injuries to employees at Novolipetsk. A lot depends on the employee's attitude and their desire to protect themselves from trouble. The value in VIZ-Stal's experience is that it proves conclusively that injuries and occupational diseases are by no means part and parcel of a business' operations.

By Alexander Alekseev

The Time is Here and There's Strength to Spare

It all began when on Town Day Yulia Privalova came to the junior arm-wrestling tournament to root for her son. By now she is training on a daily basis, has won several medals and last March was fifth in her weight category in the Russian Arm-Wrestling Championship.

"Seven months ago I would never have dreamt of this. I had not been much into sports previously, apart from running the cross-country races in school," smiles Yulia.

Initially, her friends and family were shocked by her new passion. And all because of her choice of sport, which is believed to be for men only, and the amount of training she would need to have. Yulia, however, is not known for having a faint heart and proof of that came when she won the silver medal in the Yekaterinburg Open.

Later she would win her first gold the Urals Federal District Championship. Naturally, this would never have been possible without focused training. Now her life revolves around training sessions, their schedule and the schedule of tournaments, and it's quite an eventful life, with competitions happening almost on a monthly basis.

Under the guidance of Sergey Rybolovlev, his coach, Yulia's son Evgeniy is also training for new victories. He has been with the team for slightly more than a year, and is already showing rather good results compared to other junior athletes and is bringing medals home from tournaments. And Mom is the best interlocutor when you want to discuss your meets.

"Sometimes our little daughter Katya comes to watch us train. She is eight years old and is only a spectator for now."

Yulia has been with NSMMZ since 1998. For the past six years she has worked as lime unloader at the electrical melt shop's input preparation operations.

Naturally, some men at work occasionally challenge her to a wrestle, but Yulia declines. It is not only a matter of strength, and men are, in any case, stronger. Arm-wrestling is a challenging and serious sport. It is prone to injuries, and both the athletes and their competitors need to appreciate that.

"Sport makes you more disciplined," says Privalova. "You can no longer allow yourself to relax at leisure. My arms may hurt after a competition, but I shall still be training the same night, because one can ill afford to lose shape."

Yulia was part of the Urals Federal District team in the Russian Championship. It serves as a qualifier for the European and World Championships.

"I was unbelievably nervous. But, once you sit down at the wrestling table all the uneasiness goes away, you stop hearing the fans, and all you think about is how to make the proper stance and grip. The championship drew many women from different weight categories and of various ages. There were some who had organized the first Russian arm-wrestling championship twenty years ago."

So, Yulia was up against some very serious competition, and she was not disappointed when she did not make it to the top three, because she can be sincerely happy when someone else wins. As long as there is someone to represent Russia.

YULIA PRIVALOVA AND DENIS TSYPLENKOV, ALL-ROUND RUSSIA AND WORLD ARM-WRESTLING CHAMPION

P.S. The match itself lasts only seconds. Yulia shows me a video of Denis Tsyplenkov, all-round Russia and world professional champion.

"Are they wrestling already?" I inquire.

"No."

"Are they wrestling now?"

"No, the referee is making sure whether their postures and grip are proper," explains Yulia.

"And now?"

"No, one of them raised his elbow, this is no allowed, now he's doing it right. Well, that's it, Denis wins."

"What, they're done? Let's watch it again."

By Marina Sayfieva

The Dangle in the Kingdom of Beauty

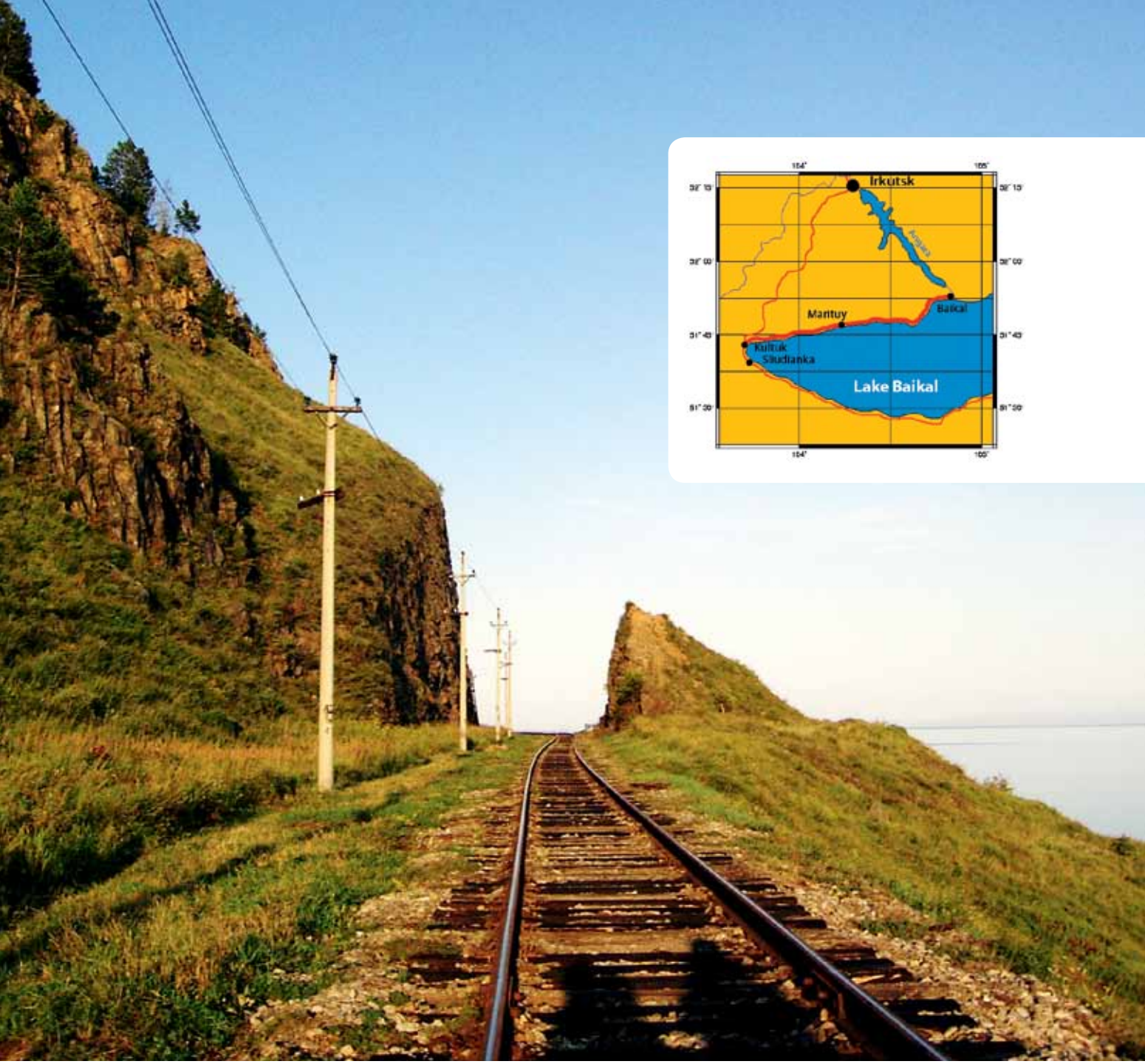
The Circum-Baikal Railroad (CBR) is the most unusual in the world. It is a single track railroad stretching for 89 kilometers along the southern shore of Lake Baikal amid knolls and ridges. It crosses 38 tunnels, 5 stone and 3 reinforced concrete galleries, 248 bridges and viaducts. It represents the beauty of nature and engineering design merged into one... The CBR is well-known by many and many have visited it, although officially it does not exist.

At one point in time the CBR was much longer that it is today, and would follow along the whole southern part of Lake Baikal as part of the great Trans-Siberian railroad. Before the Russian Revolution it was referred to as the 'Golden Buckle of Russia's Steel Belt', an allusion to the high cost of this vital part of the Trans-Siberian, connecting it along Lake Baikal. However, during the construction of the Irkutsk Water Reservoir, the most important leg of the railroad between Irkutsk and Lake Baikal was inundated and trains started using a new track. The 'buckle' became unbent and turned into an almost straight line with a small bend at its end. The ring around Lake Baikal was no longer a ring, and the railroad lost almost all of its economic significance, but the name stayed. Today a diesel locomotive with two or three carriages travels between the two end stations twi ce a day. The locals call it 'Motanya' (from the Russian word for 'dangle') because of its back-and-forth routine. But the story doesn't end there. In the 1980s the CBR was designated as an architectural and landscape preserve, and it does attract tourism, including railroad tourism, which is still rather unorthodox for Russia. Nowadays special retro-trains with steam-powered locomotives provide the opportunity to enjoy the wonderful sights of Lake Baikal, marvel at the remarkable engineering structures (there are more than 400 of them, quite a record for a railroad this short), or simply enjoy the ride on an old railroad. Seasoned tourists, however, suggest that for a complete experience one should ride 'The Dangle', which is operated by very merry and friendly engine drivers. Or rent a motorized trolley...

The CBR's modern day route starts at Port Baikal and through the towns of Marituy and Kultuk takes you to the city of Slyudyanka. 'The Dangle' covers the route in 4 hours and 40 minutes, stopping at every settlement, just like most other single-track commuter trains.

Cheaper and Safer

The question of how to connect two parts of the Trans-Siberian Railroad, which were separated by Lake Baikal, initially was raised during the design stage of the Trans-Siberian. In the 1890s on-site surveys were performed under the guidance of I. Mushketov, an outstanding scholar, based on which two options were formulated for laying tracks along the western shore of the lake. In both cases the first leg of the connection would go to Kultuk, but after the town the proposals diverged. One option was to take the railroad straight on to Irkutsk, which was the end station for the Trans-Siberian at the time, or follow the shore of Lake Baikal to Angara River. Mushketov insisted on the second option, believing that


Irkutsk
Angara
Baikal
Mantuy
Kultuk
Slyudianka
Lake Baikal

it was safer and less expensive that way, but the other proposal also had strong advantages. After additional research management sided with Mushketov and that was the beginning of the Circum-Baikal Railroad. It is noteworthy that in Soviet times, after part of the CBR was inundated, the new tracks were laid along the route which had been rejected before the revolution, notwithstanding the proposal to rebuild the track along Angara River. Just as before, the key arguments were safety and lower costs. ✪

Icebreakers on Lake Baikal

During the construction of the Circum-Baikal Railroad the two parts of the Trans-Siberian Railroad on opposite shores of Lake Baikal were connected by steamship train ferries. The first ferry for these purposes was imported from England in knock-down form back in 1896. Three years later it was re-assembled and launched immediately, and named after the lake. It was 87 meters long, 17 meters wide, had a load capacity of 4,200 tonnes and could carry 25 carriages and 200 passengers in one go at a speed of 22 kilometers per hour.

Later another ferry, The Angara, was delivered to Lake Baikal. The ferries were in

use until January 1, 1901, when tracks were laid across the ice on Lake Baikal. The Baikal icebreaker ferry was lost during the Russian Civil War, but The Angara was preserved. It remained in operation until 1975, when it became a museum. It is now anchored in the Irkutsk Water Reservoir.

An Inconspicuous Genius

Santiago Calatrava is one of the most brilliant and popular architects of modern times. His style – often compared to that of Gaudi himself – is easily recognizable. His works can be found in many cities across Europe and America, and they are extremely unusual and strike one's imagination with structures made of glass and steel.

THE SAMUEL BECKETT BRIDGE

SANTIAGO CALATRAVA

Known for his sculptures in addition to his extravagant architectural masterpieces Santiago Calatrava was born in Spain. This year he will be turning 60 and he has no resemblance at all to a man of arts, let alone a genius. He doesn't even look like an engineer, even though he owns a certificate to prove that. Calatrava today looks like a regular lawyer or dentist; he is not tall, wears his hair clean-cut, no beard, and always appears in public in a white shirt and tie. No high-profile statements about wishing to rebuild the world, no insights into his private life, no outstanding background information, just the date of birth, education and employment record... An inconspicuous representative of the European middle class, of which there are millions. It's not surprising that even in his native Spain people don't recognize him when he is walking down the street or taking the metro. The metro? Yes, the outstanding architect does not have a driver's license and doesn't want one. And it turns out that someone who designs the most expensive buildings in the world sometimes cannot afford to hire a driver. On the other hand, a personal car and driver would be too much for your average lawyer or dentist.

THE JERUSALEM CHORDS CABLE-STAYED BRIDGE

For a long time Calatrava had been known mostly as a designer of technical structures, railway stations, and bridge builder.

Back in 1983 Calatrava won a competition for the renovation of the railroad station in Zurich by proposing to preserve the old building and to install new buildings, platforms and crossings next to it. The project took seven years to complete and its trademark became the curved roof above the entrance and the bow-shaped pedestrian crosswalk above the platforms, which is suspended on projecting steel elements.

While working in Zurich Calatrava is also busy on the new railway station in another Swiss city, Lucerne, designing a shopping centre in Basel, building warehouses for Jakem Steel, and building the Bac de Roda Bridge in Barcelona. Just as expected from a beginner architect he is working laboriously on very different projects developing a style of his own. In the case of Calatrava style implies something minimalistic with a lot of curves and numerous

THE ZUBIZURI FOOTBRIDGE

THE TURNING TORSO
SKYSCRAPER

engineering challenges. Everything that he would design from now on would be ultimately simple, lacking décor, have curved surfaces and have more in common with a technical structure than architecture.

A vivid example of Calatrava's 'engineering aesthetics' and one of his better known works is the Planetarium in the City of Arts and Science culture and entertainment centre in Valencia. In 1996 in the eastern suburb of the Spanish urban sprawl Calatrava used steel to build a spherical structure semi-submerged in a pool of water. The design exactly follows the shape of the eye, with a huge iris and an eyelid made of glass and metal, which opens and closes. Another classic Calatrava design are the cable-stayed bridges in Dublin and Jerusalem. While a regular cable-stayed bridge would have at least one support in the middle, with cables (stays) connecting it to the bridge floor, and the support itself is usually a tower tapering off at the top, the Samuel Beckett Bridge, designed by Calatrava and built in Dublin in 2009, is nothing of the kind. It resembles a giant harp: the support is an elegant steel arc, slightly bent and located closer to the end of the bridge, rather than its centre.

The bridge in Jerusalem, called David's Harp, was opened one year before its counterpart in Ireland. Notwithstanding that David's Harp has its support situated in its centre, it can't be referred to as a regular cable-stayed bridge. Firstly, it has only one support, or rather, the Harp has half a support. A huge, disproportionately thin spindle, 'broken' into two parts. One gets the impression that the author wanted to build a traditional tower (bearing a distant resemblance to

THE CITY OF ARTS AND SCIENCE IN VALENCIA

the Eiffel Tower), but for whatever reason left it only half-finished. Still, the bridge stands and even has street-cars travelling across it.

The architect's only finished skyscraper to date, the Turning Torso, has been standing in Malmo, Sweden since 2005. The tower was inspired by a sculpture of the same name by Santiago Calatrava, depicting the torso of a man in the characteristic posture of a tennis player during a serve. The tower is 190 meters tall and consists of 9 sections, each five stories tall plus a floor between sections, which gradually shift along each other. The giant structure is kept erect by a huge (10.6 meters in diameter) concrete pillar inside the building and an additional steel frame on the outside. The steel frame weighs only 820 tonnes.

We don't know what Calatrava thinks about straight lines in everyday life, but in terms of creativity he ventured beyond Gaudi. He sees the curve not only as a means, but as an end. Many of Calatrava's structures are lines or dimensions bent out of shape, which in some strange manner manage to perform utilitarian functions. It is by no accident that Calatrava prefers mostly metals, because no other material would stand these enormous trains and pressures.

Take, for example, the Zubizuri ('White') Footbridge, built by Calatrava over the Nervion River in Bilbao in 1995. Here Calatrava employed a leaning curved arc made of construction-grade steel, with two arching platforms suspended from it. The bridge is painted in white, adding to its lightness and transparency.

While making the Zubizuri Bridge Calatrava used glass bricks to tile the deck, which become very slippery if it rains.

In addition the glass tiles break all the time and have to be replaced at the cost of EUR6,000 per year. Driven to despair by complaints from tourists and local residents the municipal government commissioned a different architect to install a new deck on the bridge. Calatrava sued the authorities, claiming a violation of his moral rights. Eventually, he won the lawsuit.

Interestingly, Gaudi, who had his share of trouble with the local authorities, acted differently. At one point he was told that the house he had built in Barcelona

GARE DO ORIENTE, LISBON

THE BAC DE RODA BRIDGE
IN BARCELONA

THE ALLEN LAMBERT GALLERY IN TORONTO

overlapped the pavement and the protruding part of the building would have to be removed. Gaudi agreed but threatened to put up a sign on the remaining wall "Defaced by order of Barcelona authorities". The government backed down.

Calatrava and Gaudi are very different, but they do have a lot in common. Maybe because he recognizes this, Calatrava has paid homage to his great predecessor on several occasions. In addition to the telecommunications tower in Barcelona, Calatrava designed a building in a style similar to that of Gaudi. This is the Bodegas Ysios winery in Rioja. The single-storey building with a wave-like roof is an almost exact replica of the school building in the famous Sagrada Familia Cathedral.

Finally, in 1909 Gaudi proposed the design for a high-rise hotel complex, whose main building, shaped like a spindle, would stand 360 meters tall above the city of New York. The skyscraper would have become at the time the tallest building in the city, but the investors backed out at the last moment. Almost a hundred years later a similar project of Calatrava's was destined to the same fate. His spiral-shaped and resembling a snail's shell Chicago Spire would be 609 meters tall and the highest building in Chicago, and a residential one at that. In the autumn of 2008 after the construction crews had installed the first 34 cofferdams and the first 350 apartments had been sold, came the news of the global crisis and the project was immediately put on hold. And it was finally closed in 2010 after numerous delays and lawsuits.