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Editor K. Dorokhin, phone: (495) 660-89-50,
k.dorokhin@tmholding.ru. Editorial office adress: 127055,
Moscow, Butyrsky Val st., 26, bld. 1

Authors: K. Dorokhin, E. Bychkova,
E. Kozachenko, A. Severov, A. Omelchenko,
N. Belova, M. Fedorova
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ONE MORE SUBWAY CARS PRODUCER ESTABLISHED IN RUSSIA

Oktyabrsky Electric Railway Car Repair Plant (OEVRZ, is a part of CJSC Transmashholding) has won the tender for the supply of the train set of 4 subway cars — 2 head cars and 2 intermediate cars for the Novosibirsk subway. "Conclusion of the contract with the Novosibirsk subway means that one more subway car manufacturer has appeared in Russia", said the First Deputy of Transmashholding General Director Anatoly Meshcheryakov. According to his words "start of manufacture of the new product opens brand new market perspectives for the plant".

Under the contract terms the train set should arrive to Novosibirsk till October 15. The customer will get the cars model 81-714/717, which have for many years made the basis for production of the largest Russian subway cars producer- Metrowagonmash plant. OEVRZ has mastered production, guided by the technical documentation obtained from this enterprise.

The cars, which Oktyabrsky Plant will manufacture for the citizens of Novosibirsk, will possess the whole range of special features. Under the customer`s requirements they will be equipped with BARS automatic operation system; traction equipment in the original design. The saloon interior finishing will be executed of metal with powder painting not of plastic.

Mastering of subway cars production is a brand new activity for Oktyabrsky Plant. The main activity of the enterprise is heavy overhaul of passenger locomotive-hauled cars and electric train cars. Since 2008 OEVRZ has also been carrying out operations on the repair of the rolling equipment for the Moscow subway.

15 KV GAS ENGINE HAS BEEN CREATED AT KOLOMNA PLANT FOR THE FIRST TIME IN RUSSIA

CJSC Transmashholding together with the partners is mastering production of the conceptually new type of product — gas engines designated for generation of electric and heat energy at the base load, standby and emergency power plants.

Creation of the gas motor has a significant importance for meeting the market demand for 800-2000 kV power local energy sources which are currently purchased abroad.

New gas motor 6GMG was created together with OJSC Kolomna Plant (a part of Transmashholding), Conver LLC, CJSC Radugaenergo on the basis of diesel D49 basic design. It can be produced with 8, 12 and 16 cylinders depending on the power required by the customer in the range of 800–2000 kV.

Gas engine is a reciprocating motor with electric ignition. Different types of gas: natural, associated, generator and manure, can be used as fuel. Following the results of the complex tests carried out at CJSC Radugaenergo (Vladimir region), the acceptance committee recommended construction of the pilot series of gas engines.

"The advantage of the new gas engine is high efficiency coefficient which is ensured by the original way of gas supply through quick-response solenoid gas charging valves, individual for every cylinder", said the Chief Designer for Machine Building of OJSC Kolomna Plant Valery Ryzhov.

According to his words such design significantly improves dynamic characteristics of the engine, increases safety of operation by means of elimination of gas penetration into the exhaust line. "Control system allows monitoring the operation of every cylinder on the basis of vibration spectrum measuring and in case of knocking occurrence eliminating it, up to the cylinder switch off. Inclusive of cogeneration (generation of electric and heat energy) coefficient of efficiency of the gas engine can reach 90%", the Chief Designer said.

In the course of tests, ecological and vibroacoustic characteristics meeting the Russian and European standards were achieved and that allows operating gas engines in the dwellings zones with minor expenses on noise insulation.

The application of gas engines is economically effective — estimated production cost of electric power, generated at the application of the gas engine, makes less than 1 ruble per kilowatt that is four times less than the existing rates.

Gas engines can be applied both in the remote regions of the country and as local power

sources in the industrially advanced regions. Particularly efficient is the application of gas engines in the areas where gas is the main type of fuel.

According to the experts` opinion, the implementation of gas engines into the country`s power grid will contribute to increasing reliability and stability of power supply, reducing emissions of harmful and pollution agents into the atmosphere, raising the economical efficiency of power supply. Application of gas engines will allow decreasing circuits` voltage during peak loads.

Potential customers of gas engines are the enterprises of gas, coal, energy industries, fuel and power sector, military institutions, municipalities and other consumers.

Application of gas motors in municipal engineering has a great social implication. It will allow keeping down the rates growth and ensuring failure-free operation of heating systems within winter season. The pilot project with the application of gas engines is planned to be implemented in Kolomna.

TRANSMASHHOLDING IS ESTABLISHING LOCOMOTIVE CORPORATE SERVICE SYSTEM AT THE RZD NETWORK

CJSC Roslocomotive (Transmashholding affiliate company) and OJSC Russian Railways have signed a contract for the after-warranty service of locomotives. The service will be carried out by the affiliate structure specially created by the holding — TMH-service LLC.

Corporate service, established on the basis of the Bratsk locomotive repair depot will serve mainline electric freight AC locomotives, operating at the Eastern range of OJSC RZD (attached to the Vikhorevka depot). Moreover, TMH-service, as a contractor, was handed over the servicing of locomotives attached to the Nizhneudinsk depot.

Transmashholding undertakes obligations of servicing not only the new locomotives which have been supplied to the Russian railways recently (E5K, 2ES5K, 3ES5K) but also electric locomotives produced at the Novocherkassk Electric Locomotive Plant (being a part of the company) in Soviet years — series VL80 and VL85.

The personnel which will be involved into the corporate service system completed special training (also at the locomotive producing plant); the employees obtained the relevant accreditation.

The special feature of the concluded agreement is in the fact that OJSC RZD, as a customer, pays for the actual operating time of the locomotives. This encourages the service center to continually maintain higher level of the stock mechanical availability and also enables the holding specialists to define the schedule and volume of maintenance service and repair of the locomotives on their own.

The Bratsk locomotive repair depot is not the only centre for locomotive servicing. Currently an alternative is being considered of opening service centers on the basis of locomotive depotes of Primorskaya station (Far East railway), Kaliningrad station (Kaliningrad railway), Kurbakinskaya section (Moscow railway), on the basis of the Tuapse depot (Nothern Caucasian railway) and also in the new locomotive repair depot Maksim Gorkiy (Volga mainline).

In future there are plans to expand after-warranty service on the whole spectrum of the manufactured products.

"With the introduction of the corporate service network the holding will get an opportunity of carrying out engineering developments monitoring, keep track of the performance of its products in the real operating conditions, stated Viktor Ivanov, Deputy of Transmashholding General Director for Service Maintenance. Such a monitoring within the whole products` life cycle will allow introducing modifications to the future developments and upgrading the existing machinery samples. The company anticipates that the new policy in the sphere of the after-warranty product service will lead to the cost-cutting of the rolling stock life cycle and increase of the economic return at its operation".

KOLOMNA PLANT:
Universal industrial colossus

Amand Egorovich Struve — the founder of the Kolomna Plant: «For the creation of such a plant unwearying and plodding efforts, patience and long-term experience are required… The most energetical aspirations, work up a sweat, many concerns and efforts are put into it. The time the plant existed is the pledge of its future prosperity and development…»

ON THE WAY OF TECHNICAL PROGRESS

The creation of the Kolomna Plant was caused by the intensive railroads construction in Russia in the second half of the XIX century. A military engineer Amand Struve, who won a contract for the construction of the bridge across the Oka river in Colomna, rented from the peasants of Bobrovo village 10 tithes and 315 fathoms of "unsettled land" and on September 2(14), 1863 obtained a right to "carry out construction both industrial and manufacturing" on the rented land. Originally, the enterprise comprised of several machining workshops and specialized in the production of bridges (railroad, pedestrian, for town transport) the metal work for which had been earlier purchased abroad. The perfect examples are Palace and Liteyny bridges in Saint-Petersburg, Borodinsky, Krasnokholmsky, Moskvoretsky, Krymsky bridges in Moscow, the longest at that time bridge across the Dnepr in Kiev. The plant developed at a quick pace. The need for the railroad engineering grew with every introduced mainline. And already in 1865 production of various types of cars (total of 75 thousand cars of different types were manufactured), field engines was launched, preparation for the construction of locomotives started. Amand Struve invited his brother Gustav Struve as a companion, who headed the enterprise. In 1869 Kolomna Plant was one of the first in Russia to start manufacture of locomotives, mastered their mass-production (mainline, industrial, narrow-gauge) and created locomotives of its own design. For 88 years of locomotive building at the Kolomna Plant over 10 300 locomotives of 200 types were produced.

On November 5, 1871 the Emperor Alexander the II approved the KMZ charter, in 1892 the enterprise was transformed into "The Joint Stock Company of Kolomna Machine-Building Plant". Among the cofounders was the merchant of the 1st guild Anton Ivanovich Lessing.

Together with the locomotive building shipbuilding was developed at the plant: since 1878 river paddled steamers, towing and passenger, steam schooners were built. Total of 128 steam vessels were constructed.

Electric street car as a type of public transport was firstly applied in Russia due to Armand Struve and Kolomna Plant. Here also the first electric street cars for Kiev were manufactured.

Kolomna Plant

IN 1869 KOLOMNA PLANT WAS ONE OF THE FIRST IN RUSSIA TO START MANUFACTURE OF LOCOMOTIVES, MASTERED THEIR MASS-PRODUCTION. OWN DESIGN LOCOMOTIVES WERE CREATED. IN 1871 THE EMPEROR ALEXANDER THE II APPROVED THE KMZ CHARTER, IN 1892 THE ENTERPRISE WAS TRANSFORMED INTO "THE JOINT STOCK COMPANY OF KOLOMNA MACHINE-BUILDING PLANT". SINCE 1878 RIVER PADDLED STEAMERS, TOWING AND PASSENGER, STEAM SCHOONERS WERE BUILT.

In 1902 Kolomna Plant acquired a license for the production of diesel engines from "The Russian Society of Diesel Engines" and after a while became the largest Russian developer and manufacturer of various purpose diesels (transport, industry, power engineering, military-industrial complex etc.). In 1907 the first world river motorship was constructed in Kolomna, in 1908 — four-stroke marine diesel and the first world marine double-screw motorship tanker for the transportation of petrol. Total of 85 motorships were produced by the plant.

Kolomna Plant was the first in the USSR to master production of the revolutionary for Russia diesel and electric locomotives, was the first domestic enterprise to organize series manufacture of diesel locomotives (1933), produced within its history over 3 thousand diesel locomotives. In 1932 together with "Dinamo" plant Kolomna Plant introduced the first Russian electric freight locomotive.

ELECTRIC STREET CAR WAS FIRSTLY APPLIED IN RUSSIA DUE TO ARMAND STRUVE. IT WAS FIRSTLY MANUFACTURED BY KMZ FOR KIEV.

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Practically from the first years of its operation Kolomna Plant was the supplier of products for the Military Department — narrow-gauge steam engines, machine-gun carts, pontoons for boat bridge across the Danube, airship hangar, armament trolleys, ambulance cars, motorships "Kuban" and "Terek", even submarines.

With the beginning of the Great Patriotic War of 1941–1945 the major part of the plant was evacuated to Kirov where on →

Kolomna steam locomotives of the beginning of the XX century

→ a tight schedule production of military equipment was set up: tanks, "katusha" mine throwers, self-propelled mountings. The employees, remained in Kolomna, carried out repair of military equipment. Manufacture of various types of armaments and munitions was established, construction of traveling platforms for air defence guns was mastered, 2 armored trains were built. Moreover, during the war the plant executed large orders of metallurgical complexes: manufactured coke pushers, equipment for blast furnaces, hot-metal ladle cars, mine hoists, convertors. For the reconstruction operations on the liberated territories diesel engines, spare parts for power plants were produced.

In the middle of 1950s with the cease of the steam locomotive building, Kolomna Plant mastered production of diesel locomotives. TEZ diesel freight locomotives under the drawings of the Kharkov Plant named after Malyshev were massively manufactured (812 units constructed), production of the new diesel locomotives of own design was mastered. At the same period the first in the country gas turbine locomotives G1 and GP1 were fabricated at the plant, works on the creation of the mobile power plants were carried out.

IN THE MIDDLE OF 1950S KOLOMNA PLANT MASTERED PRODUCTION OF DIESEL LOCOMOTIVES. TEZ DIESEL FREIGHT LOCOMOTIVES UNDER THE DRAWINGS OF THE KHARKOV PLANT NAMED AFTER MALYSHEV WERE MASSIVELY MANUFACTURED (812 UNITS CONSTRUCTED), PRODUCTION OF THE NEW DIESEL LOCOMOTIVES OF OWN DESIGN WAS MASTERED. AT THE SAME PERIOD THE FIRST IN THE COUNTRY GAS TURBINE LOCOMOTIVES G1 AND GP1 WERE FABRICATED AT THE PLANT, WORKS ON THE CREATION OF THE MOBILE POWER PLANTS WERE CARRIED OUT.

In 1959 Kolomna Plant was appointed the head enterprise for the development and production of diesel passenger locomotives. In 1960 manufacture of the TEP60 diesel passenger locomotives which were in serial production till 1987 was launched.

Total of 1472 units of TEP60 were constructed and some of them are still in oper-

TRADITIONS OF QUALITY

The products of the Kolomna Plant many times picked up the highest Russian and international awards. In the pre-revolutionary period the enterprise had a status of "the Emperor's plant": at the All-Russian exhibitions in St-Petersburg in 1870, in Moscow in 1882, in Nizhny Novgorod in 1896 the plant products were awarded Coat of arms — the highest state award.

At the World exhibition in Paris in 1900, at the international exhibitions in Milan in 1906, Bordeaux in 1907, Turin in 1911 the enterprise took the Gran Prix, at the international exhibition in Buenos Aires in 1910 — the DE GRAM PREMIO diploma. Moreover, at various international and Russian industrial exhibitions it won several gold and silver medals.

In Soviet times Kolomna Plant was awarded three orders: the Order of Lenin (1939), the Red Banner of Labour (1945), the Order of the October Revolution (1971). Currently Kolomna Machine-Building Plant also traditionally preserves the high-quality of production.

Great attention is paid to both personnel development and equipment capability of the facility.

TEP70BS diesel locomotive in operation

ation. Within 1960–1968 new family of marine diesels for the Navy (types D42 and D43) was introduced, moreover, engines type D42 acquired wide application not only in military but also in civil shipbuilding. In the mid of the 60s a line of medium-speed four-stroke diesels D49 of modular design for diesel locomotive building, shipbuilding, power plants, large dump trucks etc. was created. Total of about 40 thousand diesels of various modifications were produced at the Kolomna Plant.

Development and mastering of production of perspective diesel series D49 became the basis for the creation of the new generation of diesel locomotives. Series-produced from 1987 to 2006 2 942 kV diesel passenger mainline locomotives TEP 70 carry out considerable part of passenger transportation on non-electrified sections of Russian railroads and the CIS countries. In 1975–1977 two prototype models of diesel passenger locomotive TEP 75 of 6 hp in one unit were manufactured. One of the two diesel locomotives TEP80 constructed at the end of 1980s during trial runs for the first time in the world showed the speed of 271 km/h.

During the economic crisis at the end of 1990s the work on the new equipment did not cease. The first domestic high-speed AC locomotives EP200 of 8 000 kV were designed and manufactured. Since 2000 production of modular portable power plants has been mastered at the enterprise and they are applied as the sources of self-contained power supply for the enterprises of oil and gas extracting industries in the remote Russian regions.

MANUFACTURING COMPLEX

Traditionally all the products are manufactured directly at the plant. Production of such a diversity of goods required mastering of all technological conversions: iron, steel and non-ferrous metals smelting, organizing of welding of huge and solid structures, acquiring all types of metal-cutting equipment, providing assembly and comprehensive tests of produced goods. Advanced methods of heat, chemical heat and galvanic treatment found application at the facility. A system of strict control over the treatment and assembly procedures was set up together with the comprehensive testing of products.

Developments of the designers, scientific-research, manufacture of the first pilot products stipulate close cooperation of the designers, industrial engineers, production facility.

This allows introducing new products at the high technical level and prepare their series production under tight schedule.

In the total volume of the plant`s production machining of parts, product assembly and testing makes 60–65%. Only at the main production facility about 2 thousand cutting machines are installed. Taking →

→ into account mass serial manufacture of diesel products, automatic and in-line systems with the application of special machines, CNC machines are operated in the workshops, including "machining centre module" type mainly of foreign producers.

Product quality control system is introduced and applicated at the plant. It includes all the stages of the products life-cycle: development, manufacture, operation. The specialists follow through fitting out of the production, including pre-project scientific-research work, designing, production, testing, experimental development of the prototype models, technological and organizational and material production support work.

Methodic work on improving series products aimed at quality upgrading is carried out. Quality control is executed under the process requirements including the application of non-destructive examination method (gamma and X-ray flaw detection, ultrasonic testing, dye penetrant inspection etc.). Production procedures imply sufficient amount of various types of tests of both single parts and units and products on the whole. All bench testers and test instruments pass recertification with the participance of the GosStandart representatives. All series-produced goods have certificates of compliance.

NOT RESTING ON LAURELS

In the modern conditions competition of any goods in the market comes to the competition of the technologies applied. Precisely on the technological level are the possibilities of the implementation of the designers` technical solutions defined together with the product cost value and its consumer appeal.

Reconstruction of engineering and designer basis is carried out at the plant, "combined" technologies of design and production are being implemented which allow avoiding extra costs and moving to a new level. Complex computerization is executed and new information technologies covering the whole facility are introduced.

In the list of new production methods is the implementation of the production technology of main and connecting-rod inserts of diesel engines of CHN 26/26 dimension of bimetallic Gliko band. Brand new production methods of turbochargers, cylinder caps and liners final machining on the multipurpose machining centers Hermle and Traub have been introduced.

Technologies of plasma-powder welding deposition of diesel engine valves are launched in the welding facility, metal-polymer compounds for the formation of fixed joints and elimination of defects of ferrous and nonferrous castings are introduced in welding.

In forging shop the technology of crankshaft hot forming with the unique method of upset bending is applied. Production of bogie suspension springs with hot coiling method is set up.

In thermal shop processes of the workpiece normalization and improvement are mastered together with carburizing and nitriding of various types of workpieces, thermal treatment of locomotive drive gear teeth surface with high-frequency currents.

In order to increase lacquer coating operating life a new Helios company technology of locomotive painting was introduced.

At the current stage of scientific development it is difficult to imagine designing of products and structures without CAD (computer-aided design) system. At the moment OJSC Kolomna Plant carries out designing of the new objects with the wide application of PCs, peripheral equipment and modern software.

Currently the fleet of modern computers and servers numbers over 1700 items, the majority of them are united into local networks on functional basis. In the course of development of the new products, finishing of the manufactured ones and preparation of production, design-engineering divisions are actively applicating CAD of all levels and packages of engineering analysis. Within the framework of the implementation

ALL TECHNOLOGICAL CONVERSIONS ARE MASTERED FOR DIVERSIFIED OPERATION: IRON, STEEL AND NON-FERROUS METALS SMELTING, WELDING OF SOLID STRUCTURES IS ARRANGED, ALL TYPES OF METAL-CUTTING EQUIPMENT ARE PURCHASED, ASSEMBLY AND COMPREHENSIVE TESTS OF PRODUCED GOODS ARE PROVIDED. A SYSTEM OF STRICT CONTROL OVER THE TREATMENT AND ASSEMBLY PROCEDURES AS WELL AS COMPREHENSIVE TESTING OF PRODUCTS WAS SET UP.

Equipment for metal laser cutting

of the integrated production control system operations on the installation of the single information network which unites all the existing local networks and all the plant`s divisions are being completed at the enterprise.

"Today there are no doubts that the progress is achieved only where they manage to implement to the maximum modern information technologies. Symbiosis of technologies — information and manufacturing — allows attaining ultra-high quality, production level and processability", believes Vladimir Karpov, OJSC Kolomna Plant General Director.

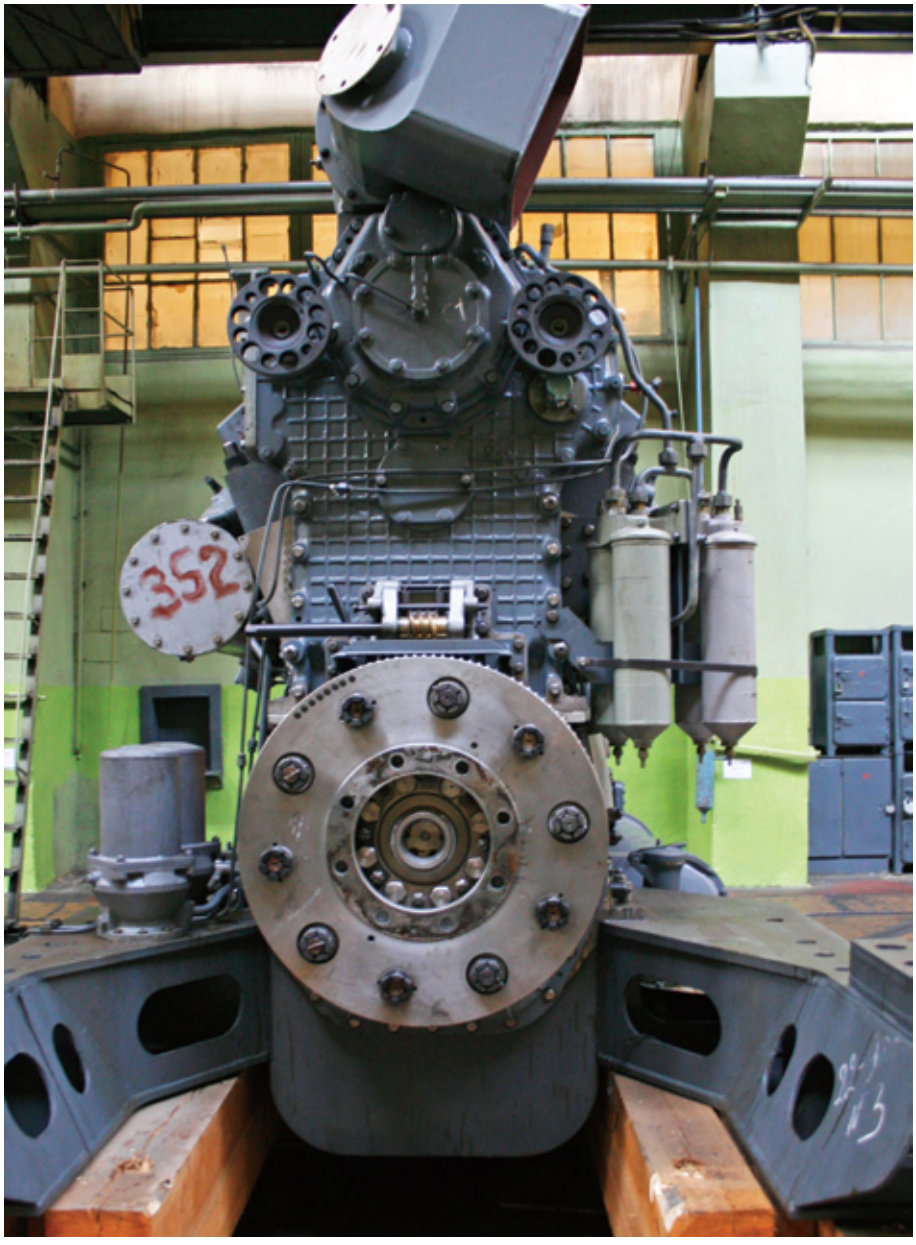
MASTERING IN DEVELOPMENT

The main areas of the Kolomna Plant activity are engineering design, industrial production and after-sales service of the mainline locomotives (passenger and diesel freight locomotives, electric passenger locomotives), diesel units (medium-speed engines and diesel electric-power generators for diesel locomotives, power plants and vessels). OJSC Kolomna Plant is a monopolist in the Russian market of diesel passenger mainline locomotives. Its share in the market of diesels and diesel-generators makes 78%, spare parts for diesels — 62%.

OJSC Kolomna Plant is the only Russian producer of the diesel mainline passenger locomotives, creator of the first domestic prototypes of the mainline high-speed passenger AC locomotives EP 200, passenger DC locomotives EP2K, diesel freight locomotives 2TE70.

In 2002 modern 4000 hp diesel passenger locomotive TEP70BS with the train cars power supply was developed and produced. The diesel locomotive is completed with the economy diesel engine type D49, modern microprocessor control and diagnostic system, air purification units of the original design and a range of other modifications is introduced. TEP70BS has a modular structure which is accepted as the basic one for the creation of the standard range of locomotives: 4000 hp diesel passenger locomotive TEP70U (without power supply), 8 160 hp diesel twin-unit freight locomotive 2TE70 and 4 800 kV passenger DC locomotive EP2K.

In 2006 series production of diesel passenger locomotives TEP70U and TEP70BS with 160 km/h (120 km/h) design speed was set up. TEP70BS diesel locomotives carry out passenger operations on the mainline railways in Russia, Lithuania, Belorussia and Uzbekistan.



In the diesel engine assembly shop

PRODUCT QUALITY CONTROL SYSTEM IS INTRODUCED AT THE PLANT. FITTING OUT OF THE PRODUCTION, DESIGNING, MANUFACTURE, TESTING, EXPERIMENTAL DEVELOPMENT OF THE PROTOTYPE MODELS AND MATERIAL PRODUCTION SUPPORT WORK ARE CARRIED OUT.

In 2004 the enterprise for the first time in Russia developed and manufactured a new 6 000 kV diesel twin-unit mainline freight locomotive 2TE70. It is equipped with high-efficiency diesel — generator, microprocessor control and diagnostics system of the diesel locomotive systems, conditions →

➔ in the driver`s cabin are improved. The new diesel freight locomotive 2TE70 is designated for the replacement of the diesel locomotives 2TE116 and 2TE10, the operational life of which has ended, and compared to them, it has higher traction effort that allows increasing the consist weight on lines with diesel traction, raising travel speed of the freight trains by 10–20 km/h, cutting down operating costs by decreasing fuel and oil consumption and application of the microprocessor control and diagnostics system, improving working conditions of the locomotive crews. Setting in operation 2TE70, able to run 6 000 ton trains, allows increasing railroads carrying capacity by hauling trains with diesel and electric traction without their rebuilding. The results of the 2TE70 diesel locomotives operation in difficult weather conditions in the Ulan-Ude depot confirm the compliance of 2TE70 technical and operational characteristics with modern requirements to diesel mainline freight locomotives.

At the end of 2005 passenger electric locomotive of DC current EP2K with traction commutator motors of 4 800 kV hourly capacity was manufactured. The machine is designated for handling of passenger trains on the electrified (3 kV DC current) sections of the Russian railroads, gauge 1520. EP2K electric locomotive can also be operated in all the CIS countries. The new electric locomotive is destined for the replacement of the Czech locomotives ChS2 and ChS2T on the Russian railroads. 81 electric locomotives EP2K are already operated at the Western Siberian, Southern Ural and Oktyabrskaya railroads.

Medium-speed diesel engines and diesel-generators of the two power ranges ChN26/26(D49) and ChN30/38(D42), which are applied in diesel locomotive building, fixed and marine drilling rigs, mobile and modular portable power plants, as part of marine diesel-generators are in production. Series-production engines type D49 are manufactured in V-shaped design (8, 12 and 16 cylinders) and cover the power range from 588 to 4 412 kV. D42 engines are produced in lines (4, 6, 8 cylinders) of 450-1850 kV.

The Kolomna Plant engines are operated in Germany, France, Bulgaria, China, Egypt, Syria, Mongolia, India, Pakistan, in Cuba, in the states of the former Soviet Union and some others.

In 2006 D49 locomotive diesels were certified for the compliance with EURO IIIA environmental standards, which came into force in 2009.

In 2004 the enterprise was the first in Russia to produce the cutting-edge fully automatic electric power plant designated for the emergency power supply of the Busher nuclear power plant in Iran.

OJSC Kolomna Plant is the supplier of diesel products for the Russian Navy. In 2005–2006 a unique diesel-diesel unit DDA12000 for the main power plant of 24 000 hp total power for the corvette project 20 380, the modern multipurpose ship of the Russian Navy, was created. The main electric power plants for the XXI century diesel electric submarines “Lada” and “Amur” were produced.

Together with the series products manufacture works on the creation of the

Electric passenger locomotive of DC current EP2K

Corvette of 20380 project with the Kolomna Plant power unit

GOLDEN PROFESSIONALS

Today OJSC Kolomna Plant staff makes over 6,5 thousand people. Among the plant's specialists are: doctors and candidates of science, talented engineers, designers and technologists. The plant's employees were many times awarded state prizes and bonuses for the creation of the new equipment and mastering of series manufacture of the new products.

new and upgrading of the perspective modifications of the diesel engines are being carried out. Works on the construction of the new D500K diesel which should become the basis for the new series of multipurpose engines are executed.

Priority tasks in the sphere of the new equipment creation are: the future increase of the operating economy, decrease of metal consumption, increase of reliability and motor capacity, improvement of environmental characteristics, ensuring the possibility of the alternative fuel types application.

THE SECRET OF LEADERSHIP

The enterprise cooperates with the educational institutions on the issues of the training of specialists of the professions the plant requires, externships in the divisions of the OJSC Kolomna Plant, distribution of graduate students.

For the adaptation and integration of the new employees in the team, a system of the entry traineeships for the young specialists is functioning together with the system of the young employees mentoring and a School of the young supervisors and specialists. The contests of professional skills "Best in profession", "Young supervisor" and also scientific and technical conferences of the young specialists have become a good tradition.

The goal of preserving and increasing intellectual potential is successfully realized. In-plant training is arranged with the application of the new active learning methods: trainings, business games, computer-based education. The enterprise specialists carry out teaching and consulting of the employees from other organizations in accordance with the license for the right of conducting educational activities.

The system of social partnership is actively developing, based on the collective contract between OJSC Kolomna Plant and the employees represented by the Mechanical Engineers Trade Union Committee.

Guarantees in the sphere of the work safety and social safety of the employees are being realized under the contract and the working and living conditions are being improved. Medical and preventive treatment of the staff is arranged, rest and sanitation of the employees and their children are ensured.

Solidarity of goals, values and interests, transfer of the accumulated knowledge and experience contribute to the intergenerational continuity of the Kolomna Plant employees. ■

Metrowagonmash

has recreated subway cars of the 1930s

Since May 2010 a seven-car retro-train has been operating on the Sokolnicheskaya line of the Moscow subway. Produced by OJSC Metrowagonmash to commemorate the 75th subway anniversary, the train is the exact copy of the first train-set of the Moscow subway of 1934.

Recreated subway car of the 1930s. «Retro» project

Metrowagonmash design office started the preparation of the technical documentation for the future train-set of the "Retro" project subway cars only in the beginning of this year. Since the retro-train should be operated with passengers in the stand-by mode of traffic schedule, design of the series-produced cars model 81-717.5M, 81-714.5M was taken as a basis. Running gear, electric, pneumatic and brake equipment of retro-cars are the same as in the series rolling stock. Exterior design and interior finishing are maximum close to the old cars designs. The difficulty in the elaboration of the documentation for the "Retro" car was in the fact that the applied materials of the interior on the one hand had to be in maximum conformity with the formerly used in the type "A" cars and on the other hand comply with the effective requirements of the fire and public health codes.

Firstly, the design of the cushioned seats of the spring type had to be restored.

Such seats existed in many types of subway cars for a long time up to the current series cars model 81-717.5M, 81-714.5M.

Design of the cushioned seats was restored but the materials applied – covering of leatherette and fillings are of fire-resistant design. The color of seats of the retro-car complies with the materials of the interior finishing of the "A" type cars. Cheek trimmings of the sofas which separate the distance near the doors and seats are made of steel frame with lining of the fiberglass panels. The most complex was the restoration of the finishing material- flexible paper-based laminate used in the original cars. For the new cars to comply with the modern fire safety regulations it was decided to apply fire-resistant glass-fiber plastic with the embossing identical to the texture of the embossing on the flexible paper-based laminate in the cars of the 30s.

To make the new cars like the original ones it was necessary to equip passenger saloons with the wall lamps located in four rows on the side walls and on the ceiling. In type "A" cars domes of these lamps were of glass which is not acceptable under the modern safety requirements. The engineering office developed the design of such lamps with the application of domes of fire-resistant polycarbonate with energy-saving lamps fed by 80 V / 220 V 50Hz converter.

Details of the interior saloon finishing - window casings and guard beads – were made of beech, as in the old cars. Fixings of the interior finishing details – door sections, window friezes, air gratings, moulding fillets were made of aluminum alloys, as in the modern cars, but decorated with film coating imitating the wood in the old cars. Hand-rails of the passenger saloon are of the same design as in the "A" type cars of steel tubes with bichromated coating. Bodies of "Retro" cars are painted with modern polyurethane coloring agents of the same color as type "A" cars.

The external design of the head cars is maximum close to the design of the first subway cars. The headlights are the same as on the old cars but completed with more efficient xenon lamps.

At the body ends of the cars original wooden hand-rails made of beech are mounted.

Seven-car subway "Retro" train was constructed at Metrowagonmash at the end of April this year and delivered to the Moscow subway. In the beginning of May OJSC Metrowagonmash specialists conducted its tuning-up, inspection and running tests on the line of the Moscow subway and then passed it to the Moscow subway for operation.

On the day of the 75th anniversary of the Moscow subway the "Retro" train took on the first passengers and since then it is regularly operating on the Sokolnicheskaya line. ■

«Retro» car interior

Novocherkassk Sr1 electric locomotives have been in service of Finland for almost 40 years

In Finland they know well about the Novocherkassk Electric Locomotive Plant which is a part of CJSC Transmashholding. The history of this cooperation reaches back to the 70s of the last century, when a serious task was set for the Soviet partner - to create an electric locomotive for the Finnish railroads.

In those years the Finnish Railroad Department imposed severe requirements to the engineering level and quality of the locomotive. By the joint-efforts of the employees of the All-Union (now All-Russian) Scientific-Research and Design Institute of Electric Locomotive Building (VEINII) and NEVZ designers in 1971 a single-unit eight-wheel electric AC locomotive Sr1 was manufactured.

The machine, which the Finns used to call "the Siberian wolf" (sipe rian susi), was designated for hauling of the freight and passenger trains. Its equipment has a high level of reliability during the operation at the height of up to 1200 m above sea level, surrounding air temperature variations from -40 to +40 degrees and humidity up to 90 %.

In 1973 the first four electric locomotives were delivered to Finland. Deliveries of Sr1 to the Finnish railroads were carried out till 1995. Within the whole supply history Finland received 110 machines.

Sr1 electric locomotive. Finland

IN WAS OF INTEREST DUE TO THE FACT OF APPLICATION OF ANGLED TIE-RODS FOR THE TRANSFER OF LONGITUDINAL FORCES BETWEEN THE BOGY AND BOGIES AS WELL AS FRAME-SUPPORTED SUSPENSION OF TRACTION MOTORS (OF CHS2 TYPE) — BOTH WERE USED ON THE DOMESTIC SERIES LOCOMOTIVE FOR THE FIRST TIME.

Sr1 was the first electric locomotive on the Finnish railroads. The name for this series of locomotives can be decoded as Sahkoveturi raskas — heavy electric locomotive. Its weight makes 84 tons. Length over coupler pulling faces - 18,96 m. One-hour rating -3 280 kV, continuous rating 3100 kV. Design speed 140 km/h. The electric fixtures were supplied by the Finnish company Stromberg.

All the 110 machines are in operation today and are not going to rest. One third of them have already passed the 6-million mileage and continue to work. It is the evidence of the design reliability and high-grade execution of the locomotive. Despite the anecdotes of the Finns temperament, they became the great fans of our machinery which they highly estimate. Specialists of the Finnish Locomotive Plant (Hyvinkaa), where they carry out repairs of the Sr1 electric locomotives, heartily speak of the cooperation with the Novocherkassk Electric Locomotive Plant, are grateful for showing true attention to their orders of spare parts delivery for the repairs and prolongation of the Sr1 electric locomotives life cycle.

The cooperation with the Finns continues today. Currently 10 rotors of the Sr traction engines are being repaired at NEVZ, the contract for 20 collector-shoe gears has been concluded, an order for 120 brackets of traction engines brush holders has been received. In the second half of the year an order for repair of 8 stators and 8 traction engine rotors will be received.

The service life of the electric locomotive is almost 50 years! Not every machinery manufacturer can boast with such a quality characteristic of the products. ■

THE WORLD CRISIS HAD AN IMPACT ON THE FINNISH ECONOMY ALSO. THE FINNISH RAILROADS ARE PLANNING TO EXTEND THE SERVICE LIFE OF THE SR1 ELECTRIC LOCOMOTIVES TILL 2016-2018. AND THE NEVZ –PRODUCED ELECTRIC LOCOMOTIVES ARE RUNNING FROM VAINIKKALA, A SETTLEMENT, LOCATED ALMOST AT THE RUSSIAN-FINNISH BORDER, TO HELSINKI. THEY CERTAINLY MAKE STOPS IN THE SMALL COSY TOWN LAHTI IN THE SOUTH OF FINLAND WHICH IS CONSIDERED TO BE THE HEART OF THE COUNTRY. THEY CARRY PASSENGERS AND CARGO.

TVZ: implementation of the IT-technologies

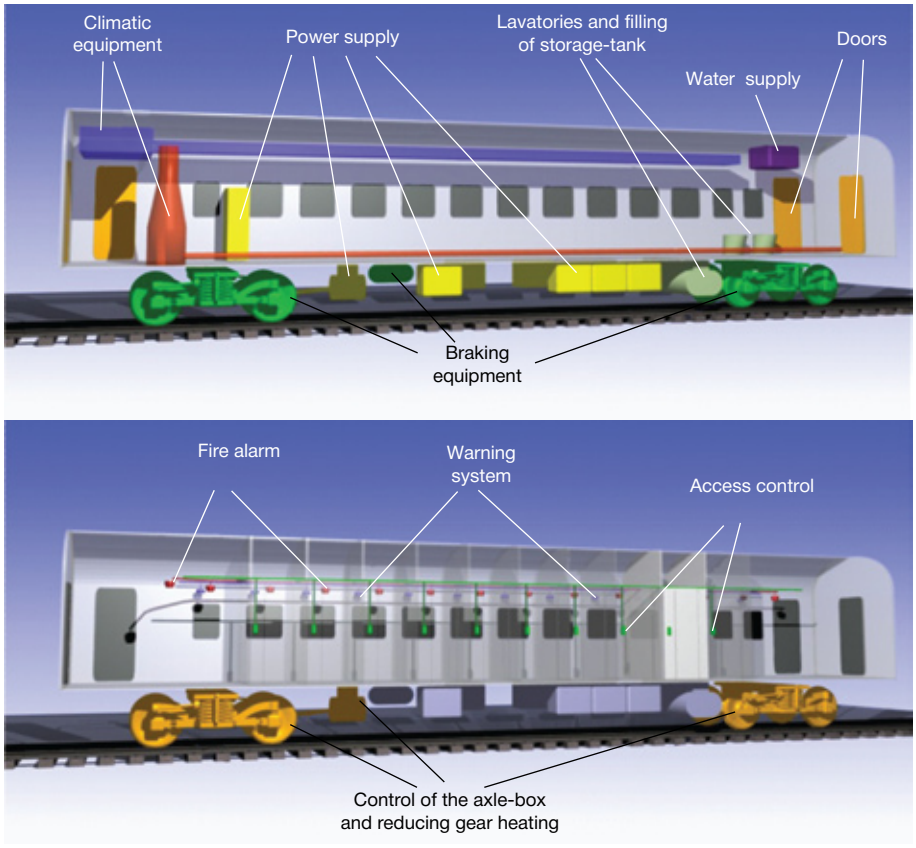
Severov Aleksandr Vasilievich, Head of the OJSC TVZ IT Department

With the beginning of the XXI century the Tver Carriage Works started production of the first cars fitted with the IT systems. Surely the ideas, studies and attempts had been 4–5 years earlier. But it was in 2001 that the first passenger cars with the speed of 200 km/h for the "Nevsky Express" train were produced.

What was their difference from the usual parlor and compartment cars?

For the first time a centralized system of diagnostics control and monitoring was introduced in the cars, which monitored the equipment condition, power supply data, climatic variables of the car. It controlled the lighting, the end users and the climatic unit, maintaining the automatically set temperature in the car rooms. The system allowed to get the information from the converter and door controller. The data on the operation of all systems, of the events and faults was reflected on the display in the service facility. The system displayed on the screen the information on the next stop, speed, current time and date.

The first experience showed that the centralized system of control and diagnostics has no future. It is not able to expand without the increase of the overall dimensions, complication of the software and respectively constant increase of the hardware capacity. Then TVZ decided to abandon the idea of the centralized system of control and diagnostics and switch to the distributive system. The goal was to cover all the car systems with the monitoring, expand the system diagnostic functions within the consist, minimize the control elements of the car equipment, widen the control functions of the car/consist systems. The problems of division of information networks on the local car and consist network,



Unified cars control system. Equipment components

unification of the communications protocol between the devices on the transport level were solved. Various diagnostics and control systems were implemented: for the car and for the consist.

In 2004 the "Burevestnik" train was manufactured and it had a self-contained system of car/consist control and monitoring (TCMS) for that time, a passenger information system. TCMS allowed reflecting information on the condition of the cars doors, climatic variables of the cars, power supply data, condition of the cars fire alarm, condition of the cars lavatory system and system of the axle-box heating. TCMS gave the train master an opportunity to control doors (close, block), set the temperature limit of the cars, report the detected parameters and information about the contingency cases to the marshalling points via GSM-modem. In 2006 "Krasnaya Strela" train was produced. The amount of monitored

parameters in the cars, compared to "Burevestnik" train, increased almost twice and the number of devices joined up into the single information space grew by 30%.

Since 2006 operations on the implementation of the IT systems not only on the selected trains but on the series cars started. First, they were car models 61-4179, 61-4194. In 2008 IT systems were introduced in the series cars of the new model lineup. Practically, 2008 became the year of the series implementation of the IT systems.

How can the modern appearance of the passenger car be described? Let`s start with the doors. The cars are completed with reclining side doors with both automatic and manual drive. The end doors are automatic. The door control is carried out by push-buttons outside and inside the car via door control modules. Information on the doors is reported from the doors monitoring box to the car TCMS. Then let`s look at the brake equipment. The cars are completed with bolster and bolsterless bogies. Bolsterless bogies are equipped with disc brakes with antiskid device. The information from this device it transmitted to the car TCMS. The car power supply is carried out via the high-voltage power-line, from the generator or from the peripheral device during the stop in the depot. The cars are completed with the following equipment: car electrical equipment control panel, converter, equipment box, generator, battery. The information on the car power supply is reported to the car TCMS.

The climatic equipment is represented by the three main systems: ventilation, conditioning and heating. Climate control in the car is possible both in manual and automatic modes. Information on the operation of the climatic equipment, control modes, temperatures is passed on to the car TCMS. The fire alarm is represented by the fire alarm system with room sensors. The sensors determine the level of smoke, dust, measure the temperatures. On the basis of this data a conclusion of the fire existence in this or that room is made as well as of the sensors` condition and terms of their maintenance inspection and service. Information on the operation of the fire alarm, sensors` condition and fire is reported to the car TCMS. Car compartments are completed with LCD TVs, conductor`s compartment is equipped with the car information system broadcasting video and audio data. The system of monitoring, access control and security of the passenger train enables passengers to travel safely in the compartments with their luggage. This system checks the passenger in and gives an access to the compartment, allows to engage its alarm. Information displays in the cars are divided into 3 types: displays in compartments or in the common premises of the sitting cars, displays in the compartments for the disabled people, route boards. The information to the display is passed on from the car TCMS.

The train system apart from the train TCMS includes car information system, satellite communication, satellite TV and GLONASS/GPS position control system.

What comes next? The Chief-Designer Department and the IT Department are collectively developing and mastering IT technologies, applied in the cars.

One of the directions of development is the switch from the Uniform car systems protocol to the General-purpose car systems protocol. Its distinguishing feature is that on the physical layer it is based on the Ethernet and on the transport layer on TCP/IP — on the whole it all gives infinite possibilities of connecting new devices to the car TCMS, substantial increasing of the amount and speed of data transmission. Currently part of the suppliers, including foreign ones, is switched on to this protocol.

TVZ HAS PRODUCED CARS EQUIPPED WITH THE IT SYSTEMS. IDEAS AND ELABORATIONS WERE FIRST INTRODUCED IN 2001 FOR THE «NEVSKY EXPRESS» TRAIN. IN FUTURE CLOSE CONNECTION BETWEEN THE CONSIST AND THE LOCOMOTIVE IS SEEN. IT WILL ALLOW EXCHANGING DATA ON THE SYSTEMS OPERATION AND CARRY OUT VISUAL COMMUNICATION.

Almost all the car systems are united into the network via network adapter. All the information on the operation of the car equipment is reported to the car TCMS, processed there and is passed on to the train TCMS. All the cars are united into the train network via network adapters. The train network is designed on the basis of the Ethernet technology on the physical layer and on the TCP/IP on the program layer. The train TCMS gathers all the information from the TCMS of all cars and reflects it on the display in the HQ car. The train TCMS allows controlling climate, doors, starting up car equipment testing, sending running lines to the displays, information on the next stops.

In 2008 the work on the implementation of the wireless RF information communication system (BRISS) between cars was completed. This work was started after analyzing the operation of the train networks. Due to the fact that the notion of the "constant formation trains" does not exist in OJSC RZD, the cars are sorted in the consist and this leads to the constant connection and disconnection of the railway couplings. Steady-state contact should be provided for the information channels, that is not possible to ensure at constant connection and disconnection and also at the low qualification of the employees in the marshalling yards. Radio channel eliminates this problem because it doesn't depend on the maintenance personnel. The cars are automatically connected into the train network by their coupling.

Another direction is the integration of the car systems, the consist and in perspective the train into the single OJSC TVZ and OJSC RZD information space. Currently a system of data accumulation and transfer is introduced, which is connected with the OJSC TVZ information centre. This system allows transmitting any data on the operation of the car systems, events and contingency cases. In 2011 connection of the OJSC RZD service centers to this system is planned.

In future we see the close connection between the consist and the locomotive. Currently they are like two different worlds connected at best with a 3 000 V power line. These two worlds have something to talk about, in particular, data on the operation of the brake equipment, condition of the system of axle-box heating, operation of the power supply system, contingency cases can be transferred. Information on the start of braking action can be transmitted to the cars, in future — a picture from the head cam for the passengers etc. Visual communication can be arranged between the consist and locomotive teams. ■

Quality management: new approaches

Evgeny Kozachenko, Head of the Technical Regulation, Tests and Quality Control Department, CJSC Transmashholding

Since March 2010 CJSC Transmashholding has started procedures on the implementation of the new quality management tools at the Holding enterprises.

In accordance with the provisions of the Concept "Flawless quality. Strategy and road map", developed by Alstom specialists, since March 2010 an implementation of procedures on the introduction of modern quality management tools such as 8D — Problem Solving; FMEA — Failure Mode and Effects Analysis; Statistical Process Control (SPC) and Poka Yoke (Mistake proofing) has begun.

At the first stage a training on the application of the 8D tool — Problem Solving is carried out. This is the most simple and clear to the vast audience of the consumers quality management tool which does not require any extra specific knowledge, comprehensible to everyone who intends to apply it, on the intuitive level.

As additional tools during the 8D: brain storm, Pareto and Ishikawa Diagrams, Five Whys and PDCA cycle are used.

8 STAGES OF SOLVING

8D represents an effective tool of solving problems connected with quality of product manufacture. The basis of the tool are eight steps (stages) of problem solving:

D1. Description of the problem/failure
D2. Building of the team
D3. Problem evaluation
D4. Defining of actions of the problem localization. Corrective actions to protect the customer
D5. Identification of the root cause
D6. Permanent corrective actions
D7. Preventive actions
D8. Conclusions, closure

This quality tool has been successfully implemented for many years at the enterprises all around the world, in particular, it is widely spread at the machine building facilities. Efficiency of the 8D is associated with the fact that is contains all the essential steps of problem solving, starting from the root cause analysis, eliminating of the problem causes up to their prevention.

The training course on the 8D tool is elaborated and carried out by the Director of the Quality Directorate of CJSC Transmashholding Valogi Sukhinin. 30–40% of the training course consists of the theory insight and the rest of the time is devoted to case studies solution. For this purpose the whole group (40–50 people) is divided into sub-groups of 4–5 people who themselves set up a problem connected with the quality assurance, then with the help of the brain storm method and Pareto and Ishikawa diagrams gradually implement all the 8 steps of the problem solving.

ENTERPRIZE OF THE FIRST WAVE

NEVZ Production company LLC – is the enterprise of the so-called "first wave" of certification on the compliance with IRIS. The enterprise's choice is caused both by the economic and organizational factors. Currently alongside with the absolute advantages of the IRIS implementation we anticipate the following problem points:

1. Implementation of IRIS Standard requires elaboration of the substantial amount of documents, including new enterprise standards and reconsideration of the existing ones because:
   - 14 procedures should be documented under IRIS (in ISO 9001 only 6)
   - 19 required processes under IRIS – (in SO 9001 only 3).
2. As far as the enterprises have the system of quality management certified in accordance with ISO and certification audits are regularly carried out, the situation of the systems duplication and impossibility of using developed documents on the processes and procedures not stipulated in ISO 9001 will occur at the preparation for certification.
3. High cost of operations on the implementation of IRIS Standard associated firstly with the large amount of enterprises, remoteness of certification bodies and consulting companies (for example, the average number of employees at the IRIS-certified European enterprise makes about 500 people, NEVZ personnel capacity makes 8 500 people). IRIS implementation will be a serious, costly investment project, of which the company administration will await an effect and return of investments. At that, expenses on certification will most likely be recorded on the profit and loss account.
4. Suppliers of components do not have a desire to implement IRIS Standard and also carry out operations on the improving of the existing quality management system. Without this it is impossible to implement IRIS at TMH enterprises.
5. Implementation of IRIS Standard will require parallel implementation of quality management tools and international standards: ISO 14001:2004, EN50126 RAMS, which will lead to rising project cost.

Up to now the 8D training has been carried out at 6 enterprises — NEVZ, BMZ, MWM, TVZ, DMZ and Kolomna Plant. On the whole over 200 people have passed the training course. At the end of August it is planned to carry out training at OJSC DMZ and OJSC Kolomna Plant HC.

Since September 2010 a cycle of training seminars on the FMEA — Failure Mode and Effects Analysis has started. Firstly, the training was completed by CJSC Transmashholding specialists, supervising the issues of designing of the new rolling stock, then the training was carried out at NEVZ Product Company LLC and OJSC VEINII and then under the set schedule.

QUALITY MANAGEMENT: NEW APPROACHES

It also should be noted that CJSC Transmashholding is executing preliminary procedures on the implementation of the International Railway Industry Standard — IRIS at the "pilot" enterprise (NEVZ Product company LLC). The requirements of the introduction of IRIS at the railway engineering enterprises are specified in the Order of the OJSC RZD President V.I. Yakunin as of 17.09.2009 № 1943r "Of the approval of the main guidelines of OJSC RZD policy in the field of strategic management of product, consumed by OJSC RZD". In the framework of this project implementation, the following stages of operations are stipulated (see the diagram).■

2008–2009	2010	2011	2013–2014
Getting acquainted with the main principles of IRIS Standard	Execution of the preliminary audit by Alstom for the further evaluation of volume of work. Drawing of business-plan of IRIS implementation. TMH administration is taking a decision on the start of IRIS implementation. Carrying out training and implementation: 8D, FMEA, SPC	Choice of the consulting company. Submitting an application for certification. Actual start of work.	Certification of compliance with IRIS Standard

NEVZ youth projects — goal-oriented work

The V Youth Scientific and Technical Conference took place at Novocherkassk Electric Locomotive Plant. The projects presented on it are designated to improve production process and increase quality of manufactured products. The works were ranked basing on 6 criteria — priority of the presented issue, system application of analysis methods and problem identification, level of measures implementation, effectiveness in measurable units, freshness of ideas, personnel involvement, systematic data submittal and talent of presentation.

The plant General Director and President of the jury Sergey Podust noticed that every year the projects become more and more creative. Proactive life approach of the participants, their enthusiastic attitude to work, desire not only to introduce proposals but also to maintain their ideas — it all allows young professionals and workers putting their knowledge into use and finding innovative solutions. Projects-winners of the previous conferences are successfully implemented in the workshops and have real economic effect. All materials presented at this conference fully comply with these terms.

I PRIZE

Project of the plating workshop **"Elimination of harmful effect of hazardous chemical substances on the employees and optimization of motion in the nameplate production area"**, authers: A. Platonova — industrial engineer, E. Tumanova — industrial engineer; O. Fedorchenko — workshop mechanic; A. Batishev — maintenance foreman.

The analysis of operational motions sequence in the nameplate area was executed with identification of losses, resulting from damage of special coating due to slipping of finished nameplates out of hands.

The employees designed and manufactured a new tank for photosensitive emulsion coating, implemented application of fixtures (clips) for dipping of plates into emulsion which allows to eliminate nameplates` slipping and cut down the risk of chemical injures by contact with poisonous aggressive environment. Rearrangement of the area and relocation of equipment, decreasing employees motions, were executed.

Economic effect is represented in natural value and amounts to motions reduction by 49,6 km per month (595,9 km per annum), cutting down of time spend on motions by 8,27 hours per month (99,24 hours per annum).

II PRIZE

Project of the welding and body builder workshop **"Application of tools of the "Lean manufacturing" in the hot bending area"**, authors: A. Marchenko — deputy workshop chief; Y. Zelenkov — job foreman; E. Rossol — senior industrial engineer; O. Ukraintzev — manager of the lean manufacturing department.

After the execution of the analysis of areas in the blank production facility, a section of hot bending, having the largest amount of the

intrashop motions, was chosen. Current state of traffic during the intrashop transfer of parts in this section was analyzed.

III PRIZE

Project of the fixing shop **"System approach to the optimization of production processes in the fixing shop with the application of modern industrial engineering methods"**, authors: H. Klochko – industrial engineer; V. Malenko – job foreman; M. Belokon – industrial engineer; E. Fomenko – senior industrial engineer; M. Kovalev – senior engineer of certification and quality management department; C. Gorbunov – manager of the lean manufacturing department.

It is planned to organize a new welding station for parts welding with gun welders which will allow cutting down traffic under the plan of 2010 by 878,7 km per annum, fully eliminating parts excess production and organizing operation of the section based on the "Pull" principle, avoiding welding seam defect, associated with the equipment being not adapted to manufacture.

In the area of six-spindle automatic machines elements of "SMED" which allowed cutting down changeover time by 40 minutes (by 20%) were implemented. Total amount of the saved working time made 996 hours per annum.

In the area of big drilling and tread-cutting after relocation and final disposal of inactive equipment, segmentation of production and optimization of material flow, 37 m^2 of production space was cleared, handling distance was cut down by 74% and handling time reduced by 82%. The cleared space was used for location of the end products storage area which allowed discharging passages of the second aisle and the area of big drilling, enabling segmentation of the A-product production process.

The third part of the project gives a review of the implementation of statistic methods in section 1. Noticed, that within 2 years about 30 parts were analyzed in the workshop. 15 technological processes are brought to controlled condition. Due to carrying out statistic analysis, workshop losses, resulting from defects in production, within 1,5 years were cut, on the average, by 89,6 thousand rubles.

The rest five projects also were highly estimated.

TOOL SHOP

"Allocation of the chemical oxidation section in the hardening area of the tool shop", author: E. Sorokin – deputy workshop chief.

For cutting down costs on the tooling repair, increase of its service life by 30%, improvement of quality of produced parts, it is proposed to apply modern method of metal chemical oxidation with changing of technology and allocating production facility for constructing optimal technological chain.

DEPARTMENT OF THE CHIEF PROCESS ENGINEER

"Project of the computerized recording system of introducing tooling limit for CNC machines", author: V.Samoylov – senior industrial engineer.

Analysis of the current condition of the limit introducing process is carried out. The analysis showed, that in the stowage of section 7 of the electric machinery shop №2 "inactive tooling" of various producers to total amount of 2,685 mln rubles was accumulated. Implementation of this project will allow defining actual tool consumption, keeping precise record of tool distribution, avoiding excessive storage of tools and eliminating of possible equipment downtime, reducing expenditure on purchase of costly tooling, arranging its distribution procedure. Moreover time spent by industrial engineers on inquiries and updates of limit approval will be cut.

EXPERIMANTAL SHOP

"Optimization of machining of assembly units for TASS 10 current collector", author: M. Tkachenko – chief on the electric machinery shop № 2.

Analysis of problems at the formation of sets of assembly units for current collector in the electronics workshop with the definition of customer demand for current collector components was executed.

It is proposed to change the technology by implementation of the new tooling (specification is handed out) which will allow cutting obvious losses and allotting time for TASS 10 configuration (or other nomenclature) machining by one month on 65,7 hours (basing on the plan of 45 current collectors monthly).

CHIEF WELDER DEPARTMENT

"Optimization of bogie side frame welding technology in the weld assembly shop", authors: S. Poverenniy – deputy chief welder; V. Mulika – industrial engineer; E. Melnikova – production manager.

Experimental work on the definition of economic effect of the welding rod ∅ 1,6 mm instead of ∅ 2 mm application in the section of bogie frames production in the weld assembly shop. The results showed that switch to ∅ 1,6 mm welding rod will cut total time of welding and fettling operations at the manufacture of bogie frames by 350,67 hours or 43,83 shifts and reduce costs by 164,5 thousand rubles (11,49%). Annual economic effect for the whole enterprise will make 1 369 573 rubles.

HARDWARE WORKSHOP

"Optimization of production process at the machine section", authors: V. Kovtun – industrial engineer; A. Ozersky – deputy workshop chief; A. Shchurov – head of workshop technical office; E. Kaygorodov – manager of the lean manufacturing department.

Analysis of estimated time spent on the changeover of lathe tools is carried out. Self-centering chucks which allow cutting changeover time are tested and proposed for application. Instead of tooling, produced by the tool shop, more innovative Sandvik cutting tool was offered.

Number of changeover operations is cut from 12 to 5 and changeover time of lathe tools is reduced by 33–50% at machining of shafts, anchors, piston. Lathe productivity increased by 37–40% at machining of shafts, anchors, piston due to the application of the Sandvik equipment. Economic effect of executed procedures made 163 thousand rubles. ■

Concept of the information support of NEVZ electric locomotives after-sales service

A.V. Omelchenko, Head of the Marketing Department

Novocherkassk Electric Locomotive Plant

Effective work of the Russian railroad transportation is based, as in the whole world, on the reliability and safety of the rolling stock operation. Timely and high-grade servicing, in the established amount, ensures high operating availability of the electric locomotive, reduces need for unscheduled repairs. NEVZ traditionally carries out after-sales service of manufactured products and recently it has been actively arranging servicing of its electric locomotives.

Currently the plant produces electric locomotives of new series – 2ES5K, E5K, 2ES4K, EP1M и EP1P. For their servicing and repair, together with the electric locomotives operation manuals, set of photographic sketches and depot set of drawings are supplied.

In accordance with GOST 2.601-2006 “Unified design documentation system. Operational documents” development of the whole range of operational documents is

Training manuals

stipulated: spare parts and assembly units list, spare parts and materials consumption rates, wall technical charts etc. However on the stage of the electric locomotive designing, developer of the design documentation doesn`t execute them in full.

Plant`s specialists studied problems arising in operation, servicing and repair of the new series electric locomotives. It was revealed that the reasons of their occurrence directly depend on the quality of depot personnel training, availability of training manuals and high-grade operational documentation.

NEW DOCUMENTATION

The following training and operational documentation is developed and issued typographically:

- Operation manual for electric locomotives EP1, EP1M(P), 2ES5K(3ES5K);
- Spare parts and assembly units list for electric locomotives EP1, EP1M(P), 2ES5K(3ES5K);
- Wall technical charts on the design of the electric locomotive EP1M (P).

These are high-quality polygraphic publications made with the application of 3D graphics.

Since 2006 the enterprise has been executing work on the establishment of the new and improvement of the existing operational documentation. Electric locomotives of all types are completed with produced laminated color circuit diagrams and pneumatic circuits (color charts), electric locomotive operation manuals in soft form: CD-disks.

A training film “EP1M (P) electric locomotive cabin arrangement” was produced.

Documentation is distributed to all RZD structures on commercial basis: railroad technical schools, training centers, technical schools, higher education institutions, centers of scientific-research information, Directorates for the railroad material and technical supply, Roszheldorsnab, Zheldorremmash enterprises.

But the future lies in the integrated and multitask, block, electronic, interactive documentation system on locomotives operation and repair. In search of such a system the experience of domestic industrial enterprises (aircraft, automotive, agricultural engineering), as well as foreign locomotive building companies, was studied. In Russia they did not find functionally complete and finished electronic system which would cover all required issues of equipment operation, service and repair.

A concept of information support of electric locomotives servicing has been developed at the plant and the result of its implementation should become an interactive electric locomotive inquiry and communications system.

PRELIMINARY CONTENT AND STAGES OF THE SYSTEM CREATION

1. Systematization of the design documentation for all types of electric locomotives
2. Development of spare parts and assembly units list
3. Update of operation manual
4. Development of annex to operation manual – album with the description of main locomotive units and circuits
5. Manual on units assembly-disassembly
6. Manual on defects elimination
7. Manual on repairs
8. Service book

This set of service documentation is firstly created in hard copy and then converted into electronic form. Also interactive circuit diagrams and pneumatic circuits, scanned depot electric locomotive drawings set, pictures of units can come with the inquiry and communications system. Eventually the whole set of service documentation is integrated into electronic shell with search functions which can be placed on Web-platform of Transmashholding Intranet-network.

Implementation of the electric locomotive inquiry and communications system will allow the user having quick access to all necessary information on the design and operation of the electric locomotive and carrying prompt and high-grade repair of the rolling stock, cutting costs.

For training purposes creation of training programs, guideline films, programs on test passing, electronic trainers, sets of wall technical charts and other training tools is possible on the basis of inquiry and communications system.

For the purpose of the implementation of electric locomotive service information supply concept and also in solving the financing issue, NEVZ Production company LLC needs the support of CJSC Transmashholding. In case of positive decision, implementation of the electric locomotive interactive inquiry and communications system will contribute to the arrangement of high-quality servicing of the new electric locomotives. ■

Moscow–area shipwrights

Kolomna Plant, located far from the sea, made a great impact into the development of the Russian shipbuilding. Currently over 700 engines of 25 modifications, produced at the Kolomna Plant, are in operation on the ships and vessels.

Kolomna shipbuilding started in 1878. Then the first river steam-boat "Kulebaki" was manufactured at the plant, designated for the transportation of materials from Kulebakinsky Plant of Novgorod province. Because of the absence of the dock, the steam-boat was constructed in the plant facility and then carried on the rollers to the Moscow–river. In 1880 a steam-boat workshop, consisting of small sheltered dock, was established. Firstly the plant build stem-boats for its own cargo transportation but soon it started to receive orders for the ships of the same type from outside. Kolomna steam-boats appeared on the Oka, Moscow, Volga, Nothern Dvina rivers and the Kaspian sea.

Mastering of diesel engines production in 1903 became a significant step for the plant. Trials of the application of diesel engines as main ones for the river and sea vessels started. In 1907 "Kolomna diesel" paddle-tag was built under the project of the engineer Raymond A. Koreyvo. Motor vessel — that started to be the name for river and sea vessels with diesel engines. By 1910 series production of diesel engines was set up at the plant, 57% of them were marine ones. Marine diesel engine building at the Kolomna Plant before the First World War was successfully developing both due to the supply of diesel engines to the shipbuilding plants and construction of the motor vessels at its own dock. Due to the necessity of submarine fleet development during the First World War, designing of submarine diesel engines was launched. In the 1930s 3 submarines of "Shchuka" type were founded at the plant. In 1937 they were transported by the Oka river to Nizhny Novgorod and completed at the Krasnoye Sormovo Plant. The SCH-421 submarine was decorated with the Order of the Red Banner in 1942, SCH-422 in 1943 was awarded the Guard title and the SCH-423 submarine conducted a complicated transfer along the Northern way to the Pacific ocean. The majority of the Soviet submarines, produced during the Great Patriotic War 1941–1945, were equipped with the Kolomna engines.

«Delo» motor vessel, produced at Kolomna Plant in the beginning of the XX century

In the post-war years the Navy development program made the Kolomna Plant a creator and supplier of the combustion engines. In 1948 the plant started producing diesel engines for the Volga navigation company: for the towing motor vessels of the "Krasnoye Sormovo" type and "Bolshaya Volga" cargo motorships.

For many years the Kolomna Plant engines were installed at submarines of 611, 613, 615, 633, 641, 629, 641B projects and also at the tank ships and ship bases. The border ship "Purga", completed with the artillery, was also equipped with the Kolomna engines. This ship could navigate in the ice and was designated for fighting with jacklighters near the Kamchatka shores. In 1950-1960 the border ships were completed with the Kolomna engines.

In the beginning of the 70s the government motor vessel "Russia" of the "river-sea" class was manufactured.

In the 1980s construction of engines for the installation on submarines of 877 and 636 projects — the most low-noise submarines in the world, was set up. Because of the difficulty in detection, the western specialists called them "the black holes in the ocean".

The unique scientific — reseach ships type "Yuri Gagarin", antisubmarine cruisers type "Moscow", push boats "Marshal Blukher" and "Marshal Tukhachevsky" are equipped with the Kolomna engines.

Kolomna diesel engines as main ship engines were delivered to the USSR for the motor boats of different purposes, tank ships, marine rescue tugs, tuna boats, fire boats and were also exported to be applied on the war speed vessels.

OJSC Kolomna Plant has a license for development and production of marine diesel engines and diesel-generators for the NAVY ships and also the Certificate of Recognition of the Russian River Register.

Recently the activities of the Kolomna Plant in the field of marine diesel engine building, interrupted in 1990s, have been resumed. The plant is actively participating in the process of the marine fleet revival. Currently Kolomna Plant is taking part in several projects of the Russian Navy on the construction of surface ships class "Corvette", "Frigate", submarines of 636, 1650, 01570 projects

During its whole history Kolomna Plant, as the engine supplier closely connected with the Russian shipbuilding enterprises, has been honorably pursuing traditions of design and production of the high-grade and reliable marine engines. ■

ALSTOM

TRANSMASHHOLDING

ALSTOM — TRANSMASHHOLDING ALLIANCE OF TWO GIANTS

Signing of the documents on the entry of ALSTOM in the Transmashholding capital on March 1, 2010

EQUAL PARTNERSHIP WITH PROSPECTS

- Alstom and Transmashholding are joining their forces, advanced technologies and unique knowledge of the market within the "1520 gauge area"
- Alstom and Transmashholding set up a joint enterprise (50/50) for the purpose of designing the new models of the rolling stock
- Alstom acquires a share of 25% + 1 share in the Transmashholding parent company. Its representative is appointed deputy General Director of Transmashholding

PRAGMATIC APPROACH — EXCHANGE OF EXPERIENCE AND SKILLS

- Alstom will lend technological support to Transmashholding in the upgrade of the member plants as well as the production processes
- The Joint venture will deal with the establishment in Russia of the competence centers on the design of the new products on the basis of the skills and know-how possessed by both of the parties. The first result of the joint design is the passenger two-system electric locomotive EP20 built with the application of the base platform principle
- The basis for technical cooperation will be the creation of the interface between the competence centers of Transmashholding and Alstom

KEY MILESTONES

- **December 3, 2007 —** Signing of the contractual agreement on the establishment of the Joint Venture in the territory of the Russian Federation
- **March 27, 2008 —** signing of the agreement on the technical assistance. Three plants of the holding were audited
- **March 31, 2009 —** The companies sign an agreement on the strategic partnership
- **March 1, 2010 —** The companies signed a package of the documents on the inclusion of Alstom in the share capital of Transmashholding

Signing of the agreement on the strategic partnership March 31, 2009

Alstom Transport

- Offers a vast range of the equipment and services for the railway vehicles construction market
- Global leader in the high-speed trains market (300 km per hour and more)
- Ranks second globally in the urban transport market
- Turnover in 2009–2010 — 5.8 billion Euro
- The company is represented in 60 countries (27 000 employees)

Pendolino Allegro for the line Helsinki-St. Petersburg

2ES4K Donchak — first Russian freight DC electric locomotive

Transmashholding

- Leading producer in the CIS countries of the whole variety of the railway vehicles
- Sole producer of the rolling stock of the arctic service in Russia
- OJSC Russian Railways is a big share holder of the holding and the main consumer of the products
- Turnover in 2009 — 71 billion rubles
- Manpower — 54 000 employees

TRANSMASHHOLDING

www.tmholding.ru

1. The largest rolling stock manufacturer and seller in the CIS
2. A top ten world manufacturer of railway equipment
3. The only Russian company with expertise in development and production of equipment for Arctic climate
4. Transmashholding-manufactured equipment is in service in all climate zones

PRODUCTS AND SERVICES PROVIDED BY THE COMPANY:

- Main line and industrial electric locomotives
- Main line and industrial diesel locomotives
- Freight cars and passenger coaches
- Electric train cars and metro cars
- Rail buses and diesel trains
- Car castings
- Diesel engines for diesel locomotives and marine vessels
- Diesel-generators and turbo chargers
- Components for transport
- Spare parts
- Repairs and maintenance

Bld. 1, 26 Butyrsky Val street, Moscow, 127055, Russia
Tel/fax: (495) 660-8950, e-mail:info@tmholding.ru