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SOVIET ELECTRICAL EQUIPMENT

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Introduction

This serial publication contains translations of selected articles on electrical equipment in the Soviet Union on the specific subjects indicated in the table of contents. Complete bibliographic information accompanies each article.

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CENTRALIZATION OF TECHNICAL POLICY  
MANAGEMENT IN ELECTRICAL INDUSTRY

[Following is the translation of an editorial article in the Russian-language periodical Vestnik Elektropromyshlennosti (Herald of the Electrical Industry) No 1, Moscow, 1963, pages 1-3]

In discussing the problem of the development of the economy of the USSR and the Party's management of the national economy, the November Plenum of the Central Committee of the CPSU appeared as an important stage in the life of the Communist Party and of the Soviet population as a whole.

In its work, the Plenum paid great attention to the problem of the centralization of technical policy management. With the accelerated pace and broad scope of economic development the management of technical policies becomes all important. Upon technical policies depend: a broad utilization of modern achievements of science and engineering in the national economy, the pace of creating and introducing new developments and advanced manufacturing methods, latest know-how, correct and effective specialization and cooperation. For this reason the centralization of the management of technical policies is at the present stage of the development of all

industrial branches and agriculture a timely and necessary measure. In connection with the establishment of sovnarkhozes there were organized in recent years many new enterprises, scientific research institutions and engineering design bureaus of the electrotechnical industries in all the economic regions of the country.

These enterprises and scientific research organizations execute a large volume of work in the field of electric machine building, high- and low-voltage electric apparatus, transformer and electric instrument construction, production of electro-ceramic materials, electric traction and electric hoisting equipment, cable products, chemical sources of electric energy, electrothermal and electric welding equipment, electric current sources, lighting equipment, electric home appliances.

Inasmuch as historically the development of the electro-technical industry experienced insufficient specialization, it is quite natural that a number of organizations and engineering design bureaus carry on simultaneously scientific research, project planning and manufacturing work, the theme of which is overlapping.

For instance, synchronous generators of a capacity of up to 100 kw are designed and built in thirteen different series: APN, GAB, SGR, BMZ, SGS, SG, ES, etc., a part of which is obsolete, while others could be replaced without damage to operations with more modern machines. The production of these generators is organized in fourteen plants at a scale of from 250 to 10,000 units.

More than 10 scientific organizations are concerned with the design of one and the same voltage regulators for generators of a capacity of up to 1,000 kw the circuits of which differ only insignificantly; more than five engineering design bureaus develop blueprints for a single series of induction electric motors of up to 100 kw capacity.

Up to the present time the method of standardizing large turbogenerators of a capacity of 100,000 to 200,000 kw has not yet been determined although the technical-economic and production practicability of establishing a single series of turbogenerators of such capacity range has been ripe long ago.

If 10-20 years ago such duplication of the work of engineering design bureaus and manufacturing organizations did not affect seriously the economy of the enterprises, as in comparison to the yearly growth of the established capacities of electric motors their quantitative output was relatively low, at the present time the situation has changed radically.

The Party program adopted at the 22nd Party Congress provides for an increase of electric power production in 1980 up to 3 trillion kilowatt-hours. Consequently, the annual increment in capacity in the USSR will amount to tens of millions of kilowatts of installed capacity. In connection with this there will be a continuous increase in volume and output of special purpose electrotechnical equipment, as for instance, turbogenerators of 800,000 to 1,000,000 kw per unit, transformers of a voltage of up to 1,000,000 v and corresponding

capacity, powerful electric motors with semiconductor control systems, controlling computer machines for electric drive, and of highly complicated high-voltage apparatus. Simultaneously, mass production will be applied in the production of electric motors, transformers for distributing networks, adjusting devices and other products.

Suffice it to state that according to preliminary estimates the output of asynchronous motors will reach tens of millions and of small micromotors and semiconductor apparatus hundreds of millions annually.

Production on such scale requires maximum centralization of the development of engineering design and manufacturing methods, concentration of forces and means for a timely and thorough investigation of operating characteristics, dependability and durability of electrical equipment. Without a centralized development of the design of mass products it is impossible to attain a rational consumption of materials that are in short supply, and maximal automation and mechanization of production processes with a minimum of labor consumption.

It is for this reason that the decree of the November Plenum of the Central Committee of the CPSU must be implemented in the shortest possible period of time in order to achieve on time a state organization of production methods for the electrotechnical industry at the new stage of its development.

An analysis of production methods in use in the electrical

industry shows that in spite of evident achievements in creating new assembly lines, organization of new methods of winding, soaking and drying windings, in perfecting casting and welding, the general level of manufacturing methods in the electrical industry does not correspond to the given tasks.

The volume of technological work at plants, the number of technological divisions, pace of their activity are entirely insufficient. Problems of production methods have not yet captured the attention of the managers of enterprises and of the sovnarkhozes.

At many of the large plants of the electrical industry the machinery equipment is worn out and is not being replaced. Suffice it to state that in many plants machine tools over 20 years in service constitute 30-40%, and in such plants as Elektrosila and Elektroaparat this index is even higher. In the Sevkabel' Plant is a rolling mill which has been in operation since 1912.

In his report to the Plenum Comrade N. S. Khrushchev pointed out the necessity of systematic replacements of production equipment and the introduction of modern types of high-production machine tools and machines. Hence, a critical analysis should be made of the existing technical equipment of the electrical industry, the necessary measures which would ensure in the shortest possible time the replacement of equipment should be initiated, and the technological activity of engineering design bureaus and technological divisions of industrial enterprises and scientific research institutes should be

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intensified.

The ukase of the Presidium of the Supreme Soviet USSR concerning the formation of a State Committee of the Council of Ministers USSR on Electrical Engineering is a highly important landmark in the development of the electrotechnical industry of our country.

Being the law-giver for the new technology in the electrical industry, the State Committee of the Council of Ministers USSR on Electrical Engineering will establish within the framework of prospective and current State plans a product list of industrial production, remove from production obsolete types of products, replace them with new more advanced ones, solve problems regarding the specialization of branch enterprises, determine the extent of the experimental industrial base of scientific and planning and design organizations.

In utilizing the right of distributing the financial and material resources allocated for the fulfillment of plans according to the new technology, the State Committee can ensure the fulfillment of problematical scientific research work by correct planning of the subject matter among the various scientific research, engineering design and technological organizations and a simultaneous solution of operating problems for the development of the new technology. This would provide an adjustment to the new technology that would accelerate current production by 3-4 years.



## TASKS OF LOW-VOLTAGE APPARATUS CONSTRUCTION

[Following is the translation of an article by Engineer N. A. Dodogorskiy in the Russian-language periodical Vestnik Elektropromyshlennosti (Herald of the Electrical Industry) No 1, Moscow 1963, pages 4-5]

The rapid growth of electric power production, the electrification of the national economy and the automation of production processes require a sharp increase of the output volume of low-voltage apparatus including low-voltage contact-less control devices for electric drives, and also presuppose improvements of design of the product list of this electric equipment.

The Seven-Year Plan for the development of the national economy foresees an increase of output of low-voltage apparatus by 5 times while the over-all growth of the volume of production of the electrotechnical industry will be 3.13 times.

In recent years, the electrotechnical industry created and produces in series a number of new modern low-voltage apparatus and complete sets of devices. Designed by VNIIEM [Vsesoyuznyy nauchno-issledovatel'skiy institut elektromekhaniki; All-Union Scientific Research Institute of Electromechanics] in production are series

of KI alternating current contactors and corresponding PA starters for currents of 40 to 600 amperes with a voltage of 380 volts, a mechanical wear resistance of about 10,000,000 contacts and electrical wear resistance of approximately 2,000,000 contacts; direct current switches series KPV600 of the Cheboksary Electrical Equipment Plant for currents of <sup>up to</sup> 630 amperes with a mechanical wear resistance of about 7,000,000 to 10,000,000 contacts; universal automatic switches series AM of the Elektrosila Plant; series of UMP and UM-3P magnetic amplifiers developed by VNIIEM, and a number of other series of apparatus.

Simultaneously with the introduction of new apparatus modernization of all the older types has been accomplished. Produced in series are large capacity complete sets for use under normal and tropical conditions, the output of which in 1962 was approximately 21% of the total volume of production of low-voltage apparatus.

However, the quality level of some low-voltage apparatus is lower than that of modern models, particularly in regard to reliability, wear resistance, weight and dimensions.

The product list of low-voltage apparatus is also in need of substantial improvement. The plants are producing in several series contactors of alternating and direct current, control relays, magnetic amplifiers and other apparatus of similar purpose.

It is necessary to avoid duplications of purpose in the design of apparatus and to retain in production only the best series. At the same time, the product list of low-voltage apparatus should be

expanded and substantial changes made in some designs.

The output of complete sets of large capacity equipment is delayed by the lack of the necessary low-voltage apparatus relay, universal and adjusting automatic devices of the plug-in type, and also switches, relay, knife contactors suitable for installation on racks.

In developing new series of switches, automatic and a number of other apparatus it is necessary to provide plastic housing which will enclose them together with the arc-extinguishing devices.

The development and series production of such apparatus makes it possible to create the most economical, small-size, easy to produce and serviceable complete units of equipment. The design of these apparatus should be tied up with standard sets and their elements.

In order to standardize the design of the elements of control units for electric drives it is necessary to unify the circuits of electric drives produced in largest quantities and also of special design drives with labor-consuming units that may be reproduced.

The establishment of an optimal product list of low-voltage apparatus which will satisfy completely and economically the needs of the national economy remains the most important task of scientific research and planning and design organizations. The started standardization of low-voltage apparatus should be completed in 1963-1964. The approved standard types actually represent future blueprints for the production of low-voltage apparatus, therefore the design of the standard types must be very carefully carried out and

thoroughly discussed by all the interested organizations.

In developing the technical features of the low-voltage apparatus one must strive for a high degree of reliability, wear resistance and other characteristics. It is necessary to have in view a simultaneously modified design of apparatus of varied performances including one of various voltages for use in the tropics envisaged not only by GOST [Gosudarstvennyy obshchesoyuznyy standart; State National Standard] but encountered also most frequently in countries which have an agreement with the USSR for the supply of low-voltage apparatus.

The design of new series of low-voltage apparatus should be coordinated with and executed parallel with the development of the design of complete units.

Impending is the speeding-up of the design of apparatus for 660 volts as this voltage is already utilized for the electrical equipment in mining and will be introduced also for the equipment of chemical and a number of other enterprises.

The increasing use of semiconductor rectifiers for the control of electric drives and for transformers of large capacities requires the speeding-up of the design of fast acting safety fuses, short-circuiting devices and high-speed automatic apparatus for currents of 12-20 ka.

In recent years the normalization work of this branch was lagging. This important work must be rearranged, the basic organizations provided with qualified staffs and their activities

coordinated by the branch institute of normalization and standardization. It is urgent to accelerate the review of basic standards for low-voltage apparatus, to set stricter requirements for their reliability and wear resistance, and to develop <sup>more</sup> precise testing methods with the utilization of MEK\* materials.

The creation of reliable, wear resistant and small-size low-voltage apparatus requires the execution of scientific research work connected with the solution of a number of problems on the determination of heating norms for the apparatus, improvement of arc-extinguishing systems, increase of the commutative capacity of automatic devices, application of water cooling for apparatus operating on strong currents, utilization of semiconductor diodes and triodes in low-voltage apparatus and the creation of large series of drives with contactless control devices.

The solution of tasks connected with the building of low voltage apparatus is unthinkable without an organizational reconstruction of scientific research and planning and design work.

In accordance with the decree of the November Plenum of the Central Committee of the CPSU of 1962, a concentration of the scientific research and planning and design activity of organizations concerned with the building of low-voltage apparatus is under way at the present time.

A provision is made to conduct the planning and financing of all the development work from one center which will completely

\*[International Electrical Engineering Commission]

eliminate duplication of work.

The stage of planning, technical assignments and manufacturing plan will be approved by the top scientific research institutes, while the acceptance of the finished product models before their assignment to series production will be effected by the State Commission of Specialists.

These and a number of other measures will make it possible to raise the technical level of low-voltage apparatus and also to organize their production in large quantities for the satisfaction of the demands of the country's national economy.

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AWARDS TO THE PARTICIPANTS OF  
THE EXHIBITION OF ACHIEVEMENTS  
OF THE NATIONAL ECONOMY OF THE USSR

[Following is the translation of an article by  
Engineers M. A. Borisov and V. I. Smorgonskiy in the  
Russian-language periodical Vestnik Elektromyshlennosti  
(Herald of the Electrical Industry) No 1, Moscow 1963,  
pages 36-38]

The Committee of the Council of the Exhibition of Achievements  
of the National Economy of the USSR awarded diplomas of the first  
degree to 11 staff collectives of institutes, planning organizations  
and enterprises, of the second degree to 24, of the third degree to 20,  
and prizes of 10,000 and 2,500 rubles to two organizations, for the  
creation of new models of machines, instruments, apparatus, materials,  
and other equipment exhibited in the pavilion "Electrification of the  
USSR" and in thematic exhibits.

Medals and valuable prizes were awarded to 651 persons,  
including a large gold medal to 18, a small one to 43, a large silver  
medal to 126, a small silver one to 190 and a bronze medal to 274  
persons.

Awarded diploma of first degree:

Elektrotyazhmash Plant imeni V. I. Lenin - for the design and construction of the TGV-200 turbogenerator of a capacity of 200 Mw.

The application of direct hydrogen cooling of the stator and rotor windings at a pressure of 4 atmospheres and a number of other features of design made it possible to reduce the specific material consumption more than 1.5 times as compared with turbogenerators produced heretofore, to lower the cost of a kw-hour by 6.5 percent, and to raise the efficiency coefficient by 1.0-1.5 percent. Simultaneously the vibration resistance of the generator has been increased considerably. The TGV-200 turbogenerators are successfully operating at the Zmiyevskaya GRES [Gosudarstvennaya rayonnaya elektrostantsiya; State Regional Electric Power Station] and at other electric power stations.

All-Union Scientific Research Institute of Electric Current Sources - for the design and production of an air-zinc system of current source with alkali electrolyte and wet magnesium current sources.

The capacity of the air-zinc system of current with an alkali electrolyte is 2-3 times larger than that of batteries of the manganese-zinc system.

The small gradient of the initial and final voltage (10-20%) makes it possible to use them widely for transistor receivers and portable television sets. Cup-shaped elements are used in the



batteries which permits the mechanization of the production of parts and of the assembly process.

The electromotive force in wet magnesium current sources designed for feeding hydrometeorological instruments is generated after their immersion in water.

The specific power of these sources of current is 75-77 watt-hours/kilogram.

Scientific Research Institute of the Cable Industry - for the development and introduction into series production of a trade-mark MSSA-110 power cable with tapered insulation and voltage of 110 kilovolt, a type VKP-1-200 direct current outlet for a voltage of 220 kilovolt, light-duty multicore power cable trade-mark AVVG and APVG with fittings for agriculture, small-size coaxial cable trade-mark MKTP-4 for interurban telephone communication and television, PRVVA cable for radio and telephone equipment in rural places, city telephone cable trade-mark TPKSH, branch cable trade-mark MKPP-150 for remote control and dispatching service on trunk pipelines, flexible telephone cord trade-mark SHTSH, POSKHV wire for heating agricultural premises, PSDKT winding wire, PAOP oxidized aluminum wire, PETV-TL enameled wire, small-size seismic cable of trade-mark KPVS and cable terminals made from epoxy compound for external installations of a voltage of 1, 6 and 10 kilovolt.

Moskabel' Plant - for participation in the development, design and series output of the MSSA-110 power cable of a voltage of 110

kilovolts with tapered insulation, lead-ins for a direct current voltage of 220 kilovolts for the Volzhskaya GES imeni 22 Party Congress and PSDKT winding wire.

All-Union Scientific Research Institute of Electromechanics

-- for the design and introduction into production of the ATR-1 thermoregulator in a set with DT-1 temperature pickup and actuating mechanism BIM-1, hermetic electric motor without stuffing box trade-mark DTsNG, sparking indicator II-5, calculating-transposing [schetno-preobrazuyushchiy] apparatus SPU-1, type P-42M direct current electric motor with terbium [terbitovy] collar, the FKU-30 outfit for automatic tracing of the electrode in welding spiral pipes, MBK-1 compound, water-emulsion lacquers of trade-marks 321T and PFL-8V, thermoreactive lacquers of trade-marks KP-22, KP-23, direct current micromotors series DPT, mechanization and automation of the packing of soft filling stator windings and design of a semi-automatic stator-winding machine of OS-627-31M type.

Experimental Plant of the All-Union Scientific Research

Institute of Electromechanics -- for participation in the design and introduction into production of the ATR-1 thermoregulator with a DT-1 temperature scale and BIM-1 power mechanism, the DTSPG electric motor without stuffing box, calculating-transposing apparatus SPU-1 and the FKU-30 outfit for the machine for spiral pipe welding, and stator winding machine OS-627.

All-Union Scientific Research Institute of Electrothermal

Equipment - for the design and introduction into series production of

the following electrothermal equipment: series SP saline electric furnaces for the thermal and thermochemical processing of products made of ferrous and nonferrous alloys and cutting tools in a liquid medium of salt solutions; a device for adjusting operation to continuous production lines; type OKB-759 electric furnace for drying and annealing welding electrodes; series EVT vacuum hoisting electric furnaces for thermal processing of magnetic alloys; series SHISN muffle-less electric shaft furnace for high-speed high temperature gas cementation; induction apparatus of the OKB-770 type for heating ingots of special alloys with industrial current; series SMO electric furnace with air chambers for enameling copper and aluminum wire; induction electric channel furnace of the ILK-1.6 type for smelting alloys with a copper base; OKB-554A electric vacuum furnace for the decarbonization of ferrochromium; high-frequency transformers (2,500/8,000 cycles) of the TVD-3 and TVSH-3 type with disc and checker windings for feeding inductors for through heating and annealing; series ARER automatic regulators for maintaining an optimal value of the capacity coefficient, voltage and current of high-frequency smelting furnaces; triple bifilar short network for compensating the reactive capacity in the short network of high-capacity electric arc steel furnaces.

Saratov Electrothermal Equipment Plant - for the design and series production of SMO electric furnace for enameling copper and aluminum wire, introduction into series production of an induction

electric channel furnace of the ILK-1.6 type for smelting alloys with a copper base and for series SP saline electric furnaces.

Central Design Bureau "Elektroprovod" of the All-Union Scientific Research Institute of Electromechanics - for the design and introduction into production of new flywheel-less transforming machine units for reversible rolling mills (blooming and slabbing), specialized synchronous motors with new automatic control for drill pumps and automatized electric drive with capacity regulator for large defibrer with a capacity of the drive motors up to 2,500 kilowatts.

Elektrosila Plant imeni S. M. Kirov - for the design and production of flywheel-less machine units for the main drives of reversible rolling mills and specialized synchronous motors for drilling pumps.

Awarded diploma of second degree:

State Scientific Research Electrical Engineering Institute of the Voronezhskiy Sovnarkhoz - for the design of direct current micromotors series DPT.

Kishinev Elektrodvigatel' Plant - for the series production of DTsNG type hermetic three-phase induction motors without stuffing box.

Elektromashina Plant of the Kemerovskiy Sovnarkhoz - for series production of P-42M direct current motors with terbium collar and series PKV electric drives.

Novosibirsk Turbogenerator Plant imeni 20 Party Congress - for the design and production of ATD three-phase induction motors of a capacity of 500 to 2,750 kilowatt.

Saransk Elektrovypryamitel' Plant - for the introduction of series production of semiconductor power valves.

Podol'skkabel' Plant of the Moscow Oblast Sovnarkhoz - for series production of PRVVA cable for radio and telephone equipment in rural areas and small-size seismic cables trade-mark KPVS.

Kuybyshev Communication Cable Plant - for series production of city telephone cable trade-mark TPKSH and branch cable trade-mark MKPP-150 for remote control and dispatcher service of trunk pipelines.

Mikroprovod Plant of the Moscow Oblast Sovnarkhoz - for series production of enameled wire trade-mark PETV-TD with TL-1 polyester lacquer base insulation.

Saransk kabel' Plant of the Mordovskiy Sovnarkhoz - for series production of multicore power cables trade-mark AVVG and APVG with plastic insulation for use in agriculture.

Moscow High-Frequency Electric Furnace Plant - for the design and series production of series EVT vacuum electric furnaces for the thermal treatment of magnetic alloys.

Biysk Elektropech Plant - for series production of muffle-less electric shaft furnaces series SHTsN for high speed high temperature cementation.

Moscow Electrothermal Equipment Plant - for series production of the OKB-770 device for induction heating of ingots of special alloys with industrial frequency current, vacuum electric furnace of the OKB-354A type for decarbonizing ferrochromium and high-frequency transformers of the TVD-3 and TVSH-3 type for induction annealing installations.

Leningrad Division of the State Planning Institute

Tyazhpromelektroproyekt - for the design and introduction into production of bus bar leads for a voltage of 6-10 kilovolt for strong currents in trunk lines of electric power supply for metallurgical and ore beneficiation enterprises.

Leningrad Planning and Experimental Division of the State

Planning Institute Tyazhpromelektroproyekt - for participation in the design and construction of bus bar leads for a voltage of 6-10 kilovolt and introduction of welded contacts in aluminum electric metallurgy.

Central Plant of the State Planning Institute

Tyazhpromelektroproyekt - for the design and introduction into production of inductive sliding couplings for regulating rotary velocity; for participation in the design and adoption of 6-10 kilovolt bus bars for strong currents in trunk lines of electric power supply for industrial enterprises; for participation and production of flywheel-less transformer units for reversible rolling mill stands and series of luminescent lamps OD, ODO, ODR, ODR.

Awarded diploma of third degree:

Aleksandriysk Electromechanical Plant of the Cherkasskiy Sovnarkhoz - for series production and participation in the design of a control system for the drives of the EKG-4 excavator by magnetic amplifier units of the PDD-1.5V type.

Low-Voltage Apparatus Plant of the Moscow City Sovnarkhoz - for participation in the design and series production of UPP-1 and UPP-2 amplifier; for the design and series production of the KP-4 cross switch and the RQF phase break relay.

Odesskabel' Plant - for the series production of cables trade-mark PRVVA for radio and telephone equipment in rural communities.

Moldavkabel' Plant - for the series production of trade-mark PRVVA cables for radio and telephone equipment in rural communities.

Estikabel' Plant - for the series production of trade-mark PRVVA cables for radio and telephone equipment in rural communities.

Azovkabel' Plant - for the series production of small-size coaxial cable trade-mark MKTP-4 for telephone communication and television.

Ufimkabel' Plant - for the series production of trade-mark SHTSH telephone cord with plastic insulation and sheathing.

Losinoostrov Electrode Plant - for the development and production of type OKB-759 electric furnace for drying and annealing welding electrodes.

Kalinin Electrical Equipment Plant - for the series production of automatic regulators series ARER for maintaining optimal electric regime of high-frequency electric smelting furnaces.

Rostov Division of the State Planning Institute

Tyazhpromelektroproyekt of Glavelektromontazh - for the development and introduction of standard designs and design of complete units of compensation of reactive capacity.

Medals and Valuable Prizes Awarded to Workers of the following Organizations:

Kuzbasselement Plant of the Kemerovskiy Sovnarkhoz - for series production of wet magnesium current sources.

Urалеlement Plant of the Chelyabinskiy Sovnarkhoz - for series production of wet magnesium current sources and air-zinc sources with alkali electrolyte.

Cheboksary Plant of Electrical Actuating Mechanisms - for series production of the actuating mechanism BIM-1 for grain dryers.

Moscow Electric Machine Building Plant - for series production of the FKV-30 device for automatic tracing of electrodes in welding spiral pipes.

Zagorsk Lacquer Plant of Moscow Oblast Sovnarkhoz - for introduction into industrial production of water-emulsion lacquers, trade-mark 321T and PFL-8V.

Workers' Victory Plant of the Yaroslavskiy Sovnarkhoz - for



introduction into industrial production of water-emulsion lacquers 321T and PFL-8V and thermoreactive lacquers KP-22 and KP-23.

Experimental Scientific Research Institute for Metal-Cutting Machine Tools - for the design and introduction into production of series PKV electric drives with silicon rectifiers and semiconductor intermediate amplifiers of the UPP-1 and UPP-2 type.

Low-Voltage Electrical Equipment Plant of the Bashkirskiy Sovnarkhoz - for developing and introduction <sup>of</sup> series production of cam-regulating command apparatus, series KA-400 and KA-480.

Baranchinskiy Electromechanical Plant imeni M. I. Kalinin - for the development and introduction <sup>of</sup> series production of the electrical transforming unit of the PSCH-50 type.

Moscow Experimental Division of the State Planning Institute Tyazhpromelektroproyekt - for participation in the development of a cable terminal of an epoxy compound for an external installation of 1,6 and 10 kilovolts.

Plant imeni Vladimir Il'ich of the Moscow City Sovnarkhoz - for the development and introduction <sup>of</sup> series production of the SMM-1.5 washing machine.

Perm' Electrotechnical Plant - for the development and introduction <sup>of</sup> series production of the "Kama" centrifugal pump.

All-Union Scientific Research Institute for Rural Electrification of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin - for participation in the development and adoption

of trade-mark AVVG and APVG power cables in agriculture and of trade-mark POSKhV wires for heating hothouses and other agricultural buildings.

Osh Electricomechanical Plant of the Kirgiz SSR Sovnarkhoz - for the development and introduction <sup>of</sup> series production of the 8APVM electric pump.

Khar'kov Electricomechanical Plant - for the development and production of flywheel-less units of the main drives of reversible rolling mill stands (blooming and slabbing).

Monetary Prizes to:

Workers' Collective of the Plant imeni Vladimir Il'ich of the Moscow Sovnarkhoz - for the introduction of new electric insulation materials in the production of electrical machines and apparatus, in the amount of 10,000 rubles.

Workers' Collective of the Electrical Machinery Plant No 2 of the Moscow City Sovnarkhoz - for the introduction of the thermoreactive compound MBK-1 in the manufacture of measuring current transformers, in the amount of 2,500 rubles.

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