



**Design and production potential of Kharkov State
Production Amalgamation «Monolit».**

**Specifically, this information is related to the fields of
development, manufacture and introduction of equipment
for automated control systems in nuclear and thermal power
stations as well as devices for general industry applications.**





Company Background and Scope of Business

Kharkov Shevchenko State Instrument-Making Plant, a lead enterprise of Kharkov State Production Association «MONOLIT» (KhSPA «MONOLIT»), was founded in 1900 as a machine manufacturing plant. According to the requirements of national economy, the plant was restructured in 1949.

As a result of this restructuring, the main activity of the plant became documentation development, manufacture and operational support for:

— Power equipment control systems of nuclear, thermal and other types of power plants;

— Automatic telephone exchanges;

— Control systems for space vehicles;

— Medical devices, surgical tools and single-use needles;

— Consumer appliances.

The output production in the volume of 80 per cent has been developed by own special design department.

The main technological processes used to manufacture the above mentioned products are:

— Machining and sheet metal stamping;

— Electroplating and paint coating;

— Manufacture of single and double sided boards and multi-layer printed circuit boards;

— Casting of ferrous and non-ferrous metals and alloys;

— Manufacture of plastic parts;

— Tool-making;

— Protective decorative coatings;

— Manufacturing syndust stereo read-record heads;

— Manufacture of microelectronics;

— Mechanical and electric assembly;

— Adjustment and quality control for manufactured equipment.

The plant has all of the technical capabilities to provide full support for the above manufacturing processes as well as a high level of quality control systems supported by automatic control systems. The quality and reliability assurance system, with regard to the requirements of international standards ISO-9000, 9001 has been introduced to the plant.

To meet the new market economy demands, Shevchenko Plant has gone through further restructuring. The plant branches have been organized around technological principles. They have also gained financial autonomy, which has given them a right to conclude contracts for the manufacturing of products and for the rendering of services above the nomenclature established for the Production Association.

Application of Modern Technologies

The plant has the extensive cooperation experience with foreign companies located in such countries as USA, Canada, Germany, France, Holland, China, Slovenia, Russia, Bulgaria, Byelorussia, Lithuania and Japan.

Shevchenko Plant relies on technologies and equipment from such firms as SHAUBLIN, BILLER, ADJU, BEHRENS, SHERING, ATOTECH, COLUMBIA CHEMICEL, TRUMPF, SIEMENS, and PHILIPS to produce the wide range of products manufactured by the plant.

An output of qualitative products wouldn't be possible without regular replacement of older equipment and technological changes.

Among the latest acquisitions of the plant is a sheet metal processing complex produced by the firm TRUMPF of Germany. The complex consists of two machine tools:

- Sheet metal bending center with CNC of type «TRUMABEND V130»;
- Sheet metal processing center with CNC of type «TRUMATIC TC200R».

In order to complete a manufacturing cycle for the pieces of sheet metal, a protective corrosion-resistant electroplating coating is applied using materials purchased from the American firm COLUMBIA CHEMICAL for the galvanizing and phosphatizing as well as for the treatment of welds with coatings on the basis of zinc. We have also studied the possibility of an absorption of the technology for coating with powder paints using the paints produced by JOTUU of Denmark.

Taking into consideration the rigidity requirements to accurately manufacture printed-circuit boards, the plant has mastered the technology for manufacturing single- and double-sided boards of Class 3 - 4 both on the rigid and flexible substrates as well as multi-layer printed-circuit boards (up to 20 layers) of diverse designs.

The following equipment and technologies are employed in the production of printed circuit boards:

- System Optiline from MULTILIME TECHNOLOGY, Germany, is used for precision alignment of layers of multi-layer printed-circuit boards;
- Technology developed by LANTRONIC, Germany, for manufacturing printed-circuit boards by the application of a protective mask on the copper with subsequent hot tinning in the fabrication system of model HALL-204;
- For the through-hole metallization the chemicals by Atotech are being used;
- Automated board mounting of electronic components by the use of production line produced by firm SIEMENS, Germany.

Based on a microelectronic devices production, the plant is looking for cooperation with foreign partners in manufacturing packaged microcircuit chips using thin films as well as packaged microcircuit chips from supplied wafers.

Medical Equipment

KhSPA «MONOLIT» is traditionally a designer and manufacturer of the latest electronic medical equipment, surgical and stomatologic instruments.

MONOLIT's equipment is intended for use in obstetrics and gynecology, proctology, gastroenterology, stomatology, general and emergency surgery, oncology, otolaryngology, physiotherapy and cosmetology. A number of apparatuses are unique in world practice.

Main directions of development and manufacture of medical equipment are as follows:

- Diagnostic ultrasonic equipment;
- Surgical ultrasonic, cryo-ultrasonic and cryogenic equipment;
- Local hypo - and hyperthermia equipment;
- Blood transfusion equipment;
- Equipment for a treatment for malignant tumors.

«ONKOTON» is a set of equipment developed by KhSPA «MONOLIT» and is used to treat malignant tumors with low intensity SHF and UHF radiation methods in conjunction with chemotherapy, magnetotherapy and other traditional methods of treatment.

The treatment results of cancer patients, especially at final stages of the disease, are expected to surpass those obtained by currently available methods of treatment.

The plant is advantageously located to:

1. Highways - there is developed highway network leading to Moscow, Kiev, Sumy, Voronezh, Rostov, etc.;
2. Railroads - the plant is connected by a branch-line at the Kharkov-Levada train station;
3. Airport - Kharkov's international airport is located four kilometers from the plant;
4. Water-supply system - there is a system of independent water-spring chinks at the plant;
5. Power-supply system - Kharkovoblenergo system.

The enterprise is subordinated to the Ministry of the Industrial Policy. Basic working conditions of the enterprise include a 5-day work week and shift duration equaling 8 hours per day or 40 hours per week.

Business Activities of the Plant in the Field of Power Engineering

From 1971 the Kharkov Shevchenko State Instrument-Making Plant is a leading enterprise in developing and serial manufacturing the equipment of automated control systems for technological processes (АСУТП) of nuclear, thermal, hydro and wind power stations on the basis of high technologies ensuring the output of automated control systems for space vehicles. From 1972 the Kharkov State Production Association «MONOLIT» takes part in the complex automatization of nuclear and thermal power stations and realizes:

- implementing research and experimental development works on automated control systems for technological processes of nuclear power stations (including software, absorption of new technologies, introduction of constructives, component base, means of adjustment and testing, etc.) under contracts with organizations of Ministry of the Power Industry of Ukraine and at the own expenses of the plant;

- manufacturing and supplying in full plant readiness the complex means of automatization, monitoring and diagnosis of nuclear and thermal power station equipment in the scope of machine rooms for turbine and reactor (in connexion with systems securing normal operation) departments according to own developments;

- manufacturing means of automatization of nuclear power station including special systems of the reactor department according to developments of JSC «Khartron»;

- training personnel of a nuclear power station;

- carrying out erection, starting and adjustment works for the means of automatization supplied by the plant;

- putting into operation, service maintenance after an expiration of a guarantee period up to final replacement of equipment with exhausted resource.

During the preceding period five generations of electrical part of equipment (at all - 29 sets of equipment) of automated systems for controlling technological processes (АСУТП) were developed, prepared and mastered in pilot and serial production, and put into operation in nuclear and thermal power stations of Ukraine, Russia, Lithuania, Bulgaria and China. Further 16 sets of equipment on «turn-key» basis are in stages of manufacture and introduction in the nuclear and thermal power stations of Ukraine, Russia, Byelorussia and two ones are in a stage of the development (See Table 1, p. 8-9).

The means of automatization developed and produced by Kharkov State Production Association «MONOLIT» and which are offered to customers consist of:

- Turbine regulation systems which ensure controlling turbine plant operation under start-stop, operating and emergency modes taking into consideration working modes of reactor, operational protection circuitry and an automatic anti-failure equipment of the power system;

- Systems for functional-group control and automatic regulation of machine rooms equipment of turbine and reactor departments for nuclear power stations with reactors of Types ВВЭР (See Tables 2, 3, 4, p. 10);

- Systems for uninterrupted operational monitoring and diagnosis of heat and mechanical condition as well as electrical parameters of turbogenerators and turbine feeding pumps (See Table 5, p. 11).

Delivery completed:

- Frames of controlling computing complexes (УБК);

- Frames of equipment for the matching of input-output signals with level of 380/220 volts (СВВС);

- Frames of terminal connectors (КШ);
- Frames of electric power supply (ЭП);
- Individual control consoles (ПУИ);
- Removable group commutators for temperature monitoring (ВГК);
- Set of contactless sensors for vibration and displacement monitoring;
- Sets of cables;
- Set of spare parts;
- Sets of control-and-test instruments and maintenance equipment;
- Set of devices and arrangements;
- Set of tools and accessories;
- Set of service documents (including software).

Typical structure of the complex:

Soft- and hardware means ensure the organization of decentralized complexes with distributed architecture which are built on highway-and-module principle using local networks with various levels and workstations on the basis of industrial personal computers.

Soft- and hardware complexes of automated control systems for technological processes (АСУТП) are realized:

- Acquisition and processing of information;
- Technological protection and blocking of equipment;
- Automated and remote control;
- Automated keeping of parameters and regulation;
- Automatic recording during long period of time;
- Representing information per displays, panels, mnemonic and printers to an operator;
- Diagnosis of soft- and hardware complexes» functioning and technological equipment;
- Monitoring energy consumption by automated control systems for technological processes (АСУТП) for own purposes;
- Transmitting information to communicating automated systems for controlling technological processes (АСУТП) and automated control systems (АСУ) including transmitting per local area computer networks;
- Built-in automated metrological control of measuring channels.

The Kharkov State Production Association «MONOLIT» has the license authorizing for the development, manufacture, delivery, erection, starting and adjustment works, putting into operation and and service maintenance of soft and hardware complexes of automated control systems for technological processes (АСУТП) of nuclear power station as well as for the implemented quality system developed in compliance with the requirements of standards ISO 900 -94.

The Kharkov State Production Association «MONOLIT» is ready to consider the proposals of American firms concerning:

- Completing automatization means produced by us with purchased articles of radio engineering industry from a list of ones permitted for the use at nuclear power stations;
- Mastering technologies in production and manufacturing separate assemblies and assembly units;
- Completing automatization means with articles manufactured by us under technology and technical documentation of American firms as well as using articles purchased by them;
- Offering services connected with erection, starting and adjustment works, supervision of equipment and apparatus functioning, which are delivered to nuclear power stations by American firms, during guarantee and post-guarantee periods of its operation.

Table 1

Objects of introducing the automated systems (ACYTH) supplied by Kharkov State Production Association «MONOLIT» for controlling technological processes of nuclear and thermal power stations

Object of automatization	Scope of automatization	Name of a system	The number of sets (pieces)			
			in operation	in manufacture, time of delivery	in the stage of erection, starting and adjustment works	in development (including manufacture of experimental model)
Power unit No.5 (two turbogenerators per 500 MW), reactor of Type BBÖP-1000 Novovoronezhskaja nuclear power station (Russia)	Turbine regulation systems (CPT)	ÖH ACYT-500 (analogue-digital)	2 c 1978y.			
	Turbine regulation systems (CPT), automatic regulation systems (CAP), functional group control (ÖFY) of protection and blocking in the scope of machine room of turbine department (TO)	ÖH ACYT-500M (microprocessor-based)		2 1999y.		
Power units No.1 and 2 (two turbogenerators per 1,000 MW), reactor of Type BBÖP-1000 Yuzhnoукраinskaja nuclear power station (Ukraine)	CPT	ÖH ACYT-1000 (analogue-digital)	2 1982y.- 1995y.			
	CPT, CAP and ÖFY of machine room of TO	ÖH ACYT-1000 (microcomputer-based)	2 1995,1997yy.			
	Systems of normal operation of reactor department (CHÖPO)				2 1998y.	
Power units No.1 and 2 (two turbogenerators per 1,000 MW), reactor of Type BBÖP-1000 Kalininskaja nuclear power station (Russia)	CPT	ÖH ACYT-1000 (analogue-digital)	2 1983-1998yy.			
	CPT, CAP and ÖFY of machine room of TO	ÖH ACYT-1000K		2 1999-2000yy.		
Power units No.1 and 2 (four turbogenerators per 750 MW), reactor of Type PBMK-1500 Ignalinskaja nuclear power station (Lithuania)	CPT	ÖH ACYT-750 (microcomputer-based)	4 c 1983y.-1998y.			
	CPT, CAP and ÖFY of machine room of TO	ÖH ACYT-750 (microcomputer-based)			2 1998y.	

Power units No.1 - 6 (six turbo-generators per 1,000 MW), reactor of Type BBOP-1000 Zaporozhskaia nuclear power station (Ukraine)	CPT, CAP and ФГУ of machine room of TO	ЭЦ АСУТ-1000-2 (microcomputer-based)	6 1983y., 1989y.			
Power unit No.1 (modernization)	CPT, CAP and ФГУ of machine room of TO	ЭЦ АСУТ-1000М (microprocessor-based)			1 1998y.	
Power unit No.1 (modernization)	Systems for monitoring and diagnosis of mechanical parameters of turbine plant (СКМБТ)	ЭЦ СКМБТ (microprocessor-based)				1 1998y.
Power units No.1 and 2 (two turbo-generators per 1,000 MW), reactor of Type BBOP-1000 Rostovskaja nuclear power station (Russia)	CPT, CAP and ФГУ	ЭЦ АСУТ-1000-2 (microcomputer-based)			2 1985y., 1987y.	
Power units No.5 and 6 (two turbo-generators per 1,000 MW), reactor of Type BBOP-1000 «Kozloduy» nuclear power station (Bulgaria)	CPT, CAP	ЭЦ АСУТ-1000-2 (microcomputer-based)	2 1985y., 1987y.			
Power unit No.5 (two turbogenerators per 550 MW), reactor of Type ПБМК-1100 Kurskaja nuclear power station (Russia)	CPT, CAP, ФГУ and others in the scope of machine rooms	ЭЦ АСУТ-550P (microprocessor-based)		1 1999y.	1 1999y.	
	Systems for monitoring and diagnosis of turbogenerators (СКДТТ)	ЭЦ АСУТ-550P (microprocessor-based)				1 1998y.
Power units No.1 - 4 (four turbo-generators per 1,000 MW), reactor of Type BBOP-1000 Balakoveckaja nuclear power station (Russia)	CPT, CAP and ФГУ of machine room of TO	ЭЦ АСУТ-1000-2 ЭЦ АСУТ-1000-2P	4 1984y., 1988y.			
Power units No.1 and 2 (two turbo-generators per 320 MW), thermal power station «Nankin» (China)	CPT	ЭЦ ЭЦП-320	1 1995y.	1 1998-1999yy.	1 1998-1999yy.	
Power units No.1 and 2 (two turbo-generators per 320 MW), thermal power station «Inkou» (China)	CPT	ЭЦ ЭЦП-320	2 1994y.			
Minsker thermal power station No.5, 250 MW (Byelorussia)	Automated microprocessor-based control system (МАУС)	ЭЦ МАУС-250ГМ-Т			1 1998y., 1999y.	

Total:

29

16

2

Table 2

Basic control systems in the scope of automated systems for controlling technological processes (ACYTII) of nuclear power station with reactor of Type BBЭP-1000

1	System of operational protection equipment
2	System of automatic regulation and control of motors
3	System of process water supply
4	Vacuum condensing system
5	Feed-and-deaerator system of the steam supply for own needs
6	Low-pressure regeneration system
7	High-pressure regeneration system
8	Turbine feeding pump No.1
9	Turbine feeding pump No.2
10	System of steam lines
11	Turbine

Table 3

Basic control systems (without turbine regulation system (CPT)) in the scope of automated systems for controlling technological processes (ACYTII) of nuclear power station

Process systems of turbine plant:	
System of live steam generation	
Systems of separation and intermediate warm-up	
System of oil supply for turbine and generator	
Vacuum condensing system	
System of low-pressure preheaters	
System for burning the detonating mixture	
System for generating the secondary-used steam	
Auxiliary systems of generator	
System for the water circulation and the supply of non-essential loads with cooling water	
System of preheaters for heating water	
Venting system	

Table 4

Basic systems of automatic regulation and blocking for hot loop of a nuclear reactor

1	System for detecting the pressure differential in seals of main circulating pump
2	System for monitoring the pressure within the hot loop of a nuclear reactor
3	System for detecting the pressure differential between the pressure pipe-line of make-up pump and the pressure within the hot loop of a nuclear reactor
4	System for monitoring the level in the pressure compensator
5	System for monitoring the level in the tank provided for orderly leakages
6	System for cooling the reactor water
7	System of protection and blocking
8	System for diagnosing the components of automatic regulation systems (serviceability of regulators and control valves, check of mating, test of sensors and frames)

System for monitoring and diagnosing the turbogenerators

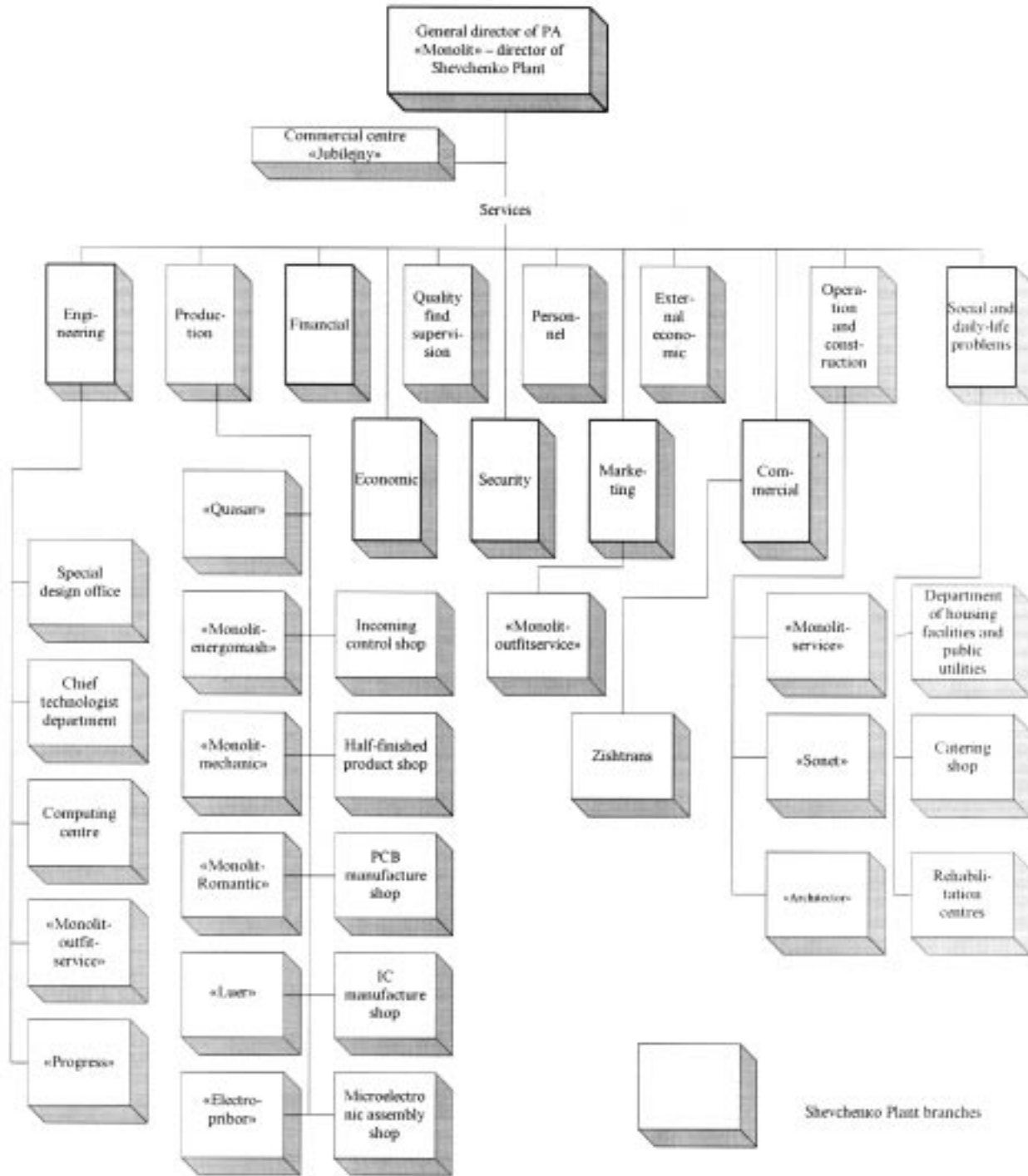
1. System for measuring and monitoring: Temperature; Vibration of the rotor and bearing supports; Axial shear, deflection, eccentricity of relative rotor expansion; Absolute expansion of the housing; Electrical parameters of the generator (active power, reactive power, total power, power factor); Emergency recording of current and voltage values (with 8-fold overload).	
2. System for generating the signals of warning and alarm signalling as well as signals causing operation of protective circuits guarding axial shear, levels and vibration abrupt change	
3. System for generating and output the unified signals of current (4...20 mA) and voltage (0...10 V) as well as digital signals to communicating systems and to indicating instruments	
4. System for spectrum analysing the vibration signals on the basis of fast Fourier transform	
5. System for indicating the information within the required volume and configuration per video monitors of specialized and operative personal computers	
6. System for uninterrupted monitoring the serviceability of the electronic part of systems for monitoring and diagnosis of turbogenerators (СКДТТ)	
7. System for diagnosing the condition of equipment concerning:	
a) Turbine plant in the scope of:	b) Electric generator in the scope of:
Technical and sudden disbalance of the rotor; Oblique or cranked mating of the rotors; Radial grazes; Low-frequency vibration; Wear of the stator; Decentering of the supports.	Deflection of the rotor as result of local overheating; Rigidity fault of the support system; Breakage of the bearing fasteners; Cracks within the rotor; Lessoning of the oil clearances; Monitoring of excitation current in accordance with the regulation characteristic and Potier diagram; Turn-to-turn short circuits.

PROPOSAL SUMMARY

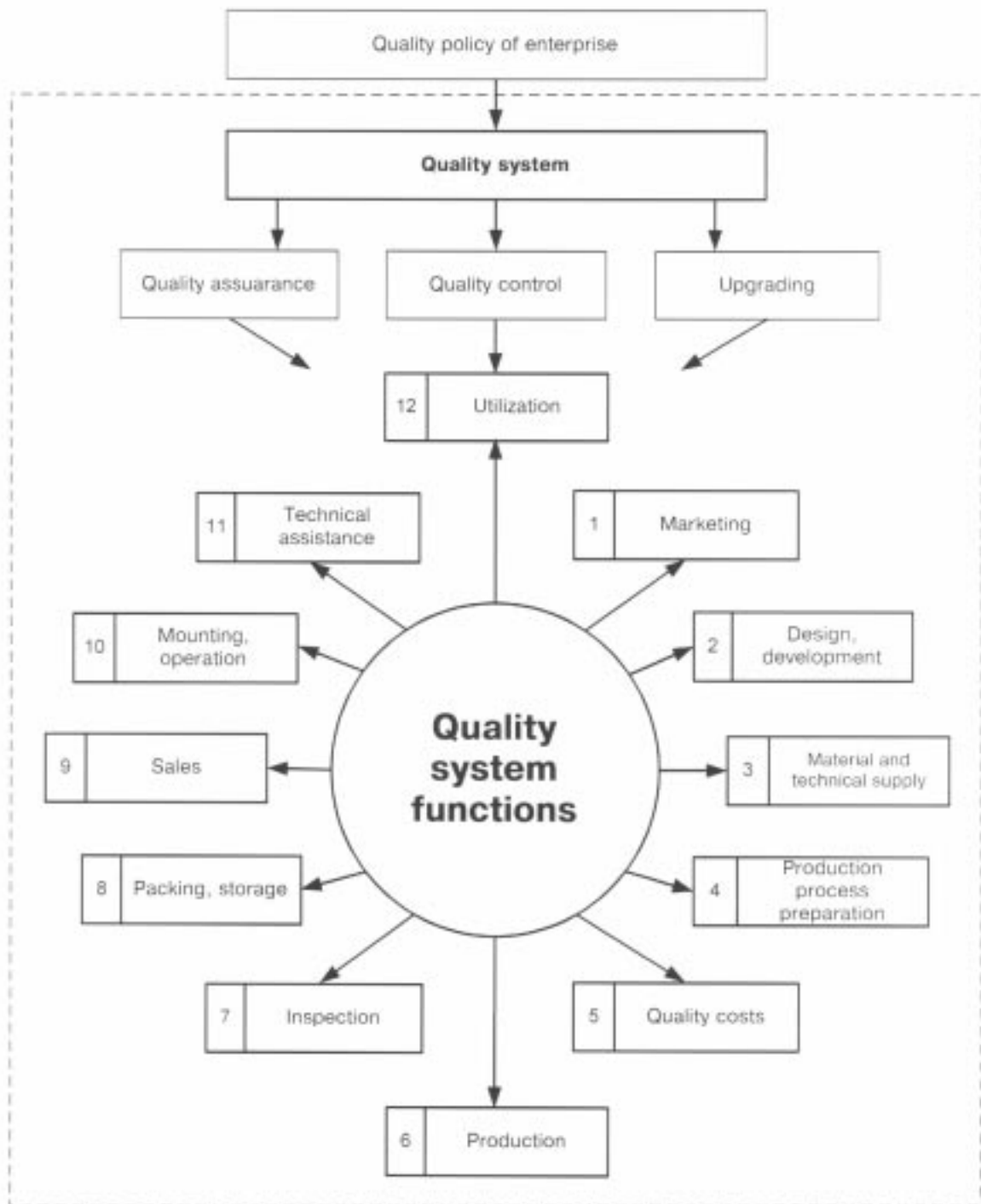
Number of item	Specific Proposal	Desirable US Firm
1	Manufacturing electrical and radio components and devices on the basis of thin films as well as packaged microcircuit chips from supplied wafers	Motorola, Dallas Semiconductor, Analog Devices, Hewlett Packard
2	Production of telecommunication hardware	
	2.1 Equipment for cellular, trunking and mobil radio communication systems	Motorola
	2.2 Community telephones with touch-tone and frequency dialing modes	Lucent Technologies
	2.3 ISDN terminals	Lucent Technologies
	2.4 Fiber transmitting system	Analog Devices
	2.5 Operative and dispatcher communication consoles	To be determined
	2.6 Mini automatic telephone exchanges	To be determined
	2.7 Compressor of subscriber lines	To be determined
	2.8 Radio line lengthener for small rural automatic telephone exchanges	To be determined
	2.9 Container variant of small rural automatic telephone exchanges with small capacity	To be determined
3	Production organization of hearing aids	Starkey
4	Production of household devices	Whirepool, General Electric, Philco Thermador
5	Technological additional equipment of present production facilities of PA «Monolit»	
	5.1 Improvement of printed board manufacture	Firm is to specify
	5.2 Assembly mastering of PB's packs using surface mounting technology	Quad Systems Corporation
	5.3 Purchase of software PCB design	ACCEL Technologies
	5.4 Purchase of CAD facilities	IBM
6	Organization of the output of children's toys of wide nomenclature produced in USA from plastic, mechanical to electronic ones both for home and CIS markets using all Shevchenko Plant's production facilities being additionally equipped with necessary process lines, equipment, materials, etc.	

7	With the aim of the advancement of products at the level of sales market in CIS, Near East, South Asia, Africa the creation of the centre for marketing studies with regard to American companies' methodology and Monolit's production capabilities	IESC (USA) with participation of «Agency for Trade and Development» (USA) and «Agency for International Development» (USA)
8	Purchase of completing articles manufactured by American firms for the application in equipment of automated control systems for technological processes of nuclear, thermal, hydro and wind power stations	XICON, CADDOCK, Micro Leniar (ML), National Semiconductors (NC), Burn Braun, IXYS, QT Electronics, Aromat, Carlingswitch, CPClare, Kingbright, Millmax, ADVANTECH, AMP, COOPER, Malnum, Altera, ANMEL, AESP, E-Switch and others.
9	Participation in the project or in the tender on independent audit in the part of production certification of KhSPA «MONOLIT» in accordance with international quality securing system ISO 9001-94	IESC (USA) with participation of «Agency for Trade and Development» (USA) and «Agency for International Development» (USA)

Organizational Chart

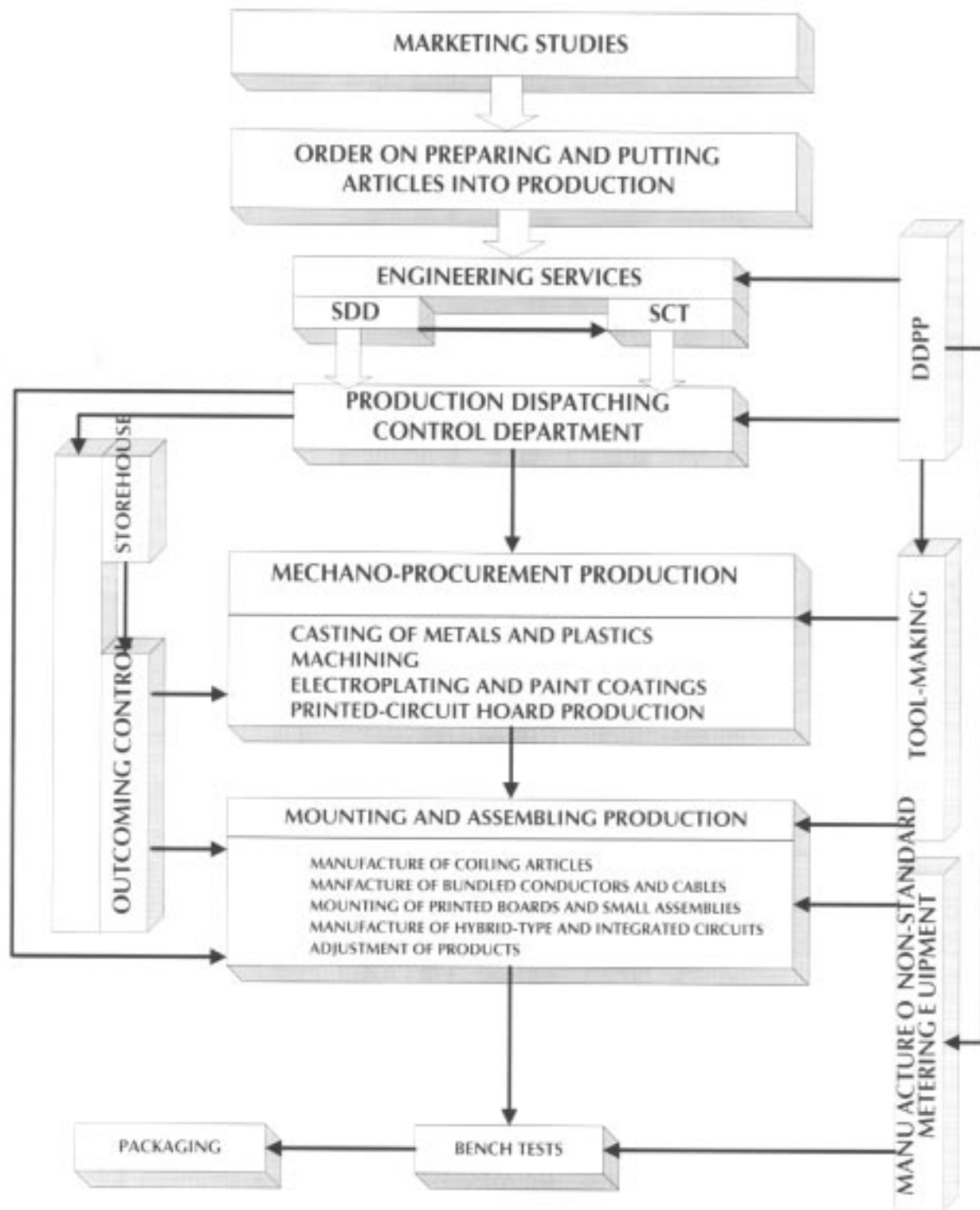


Quality Control Schematic ISO-9001 compliant

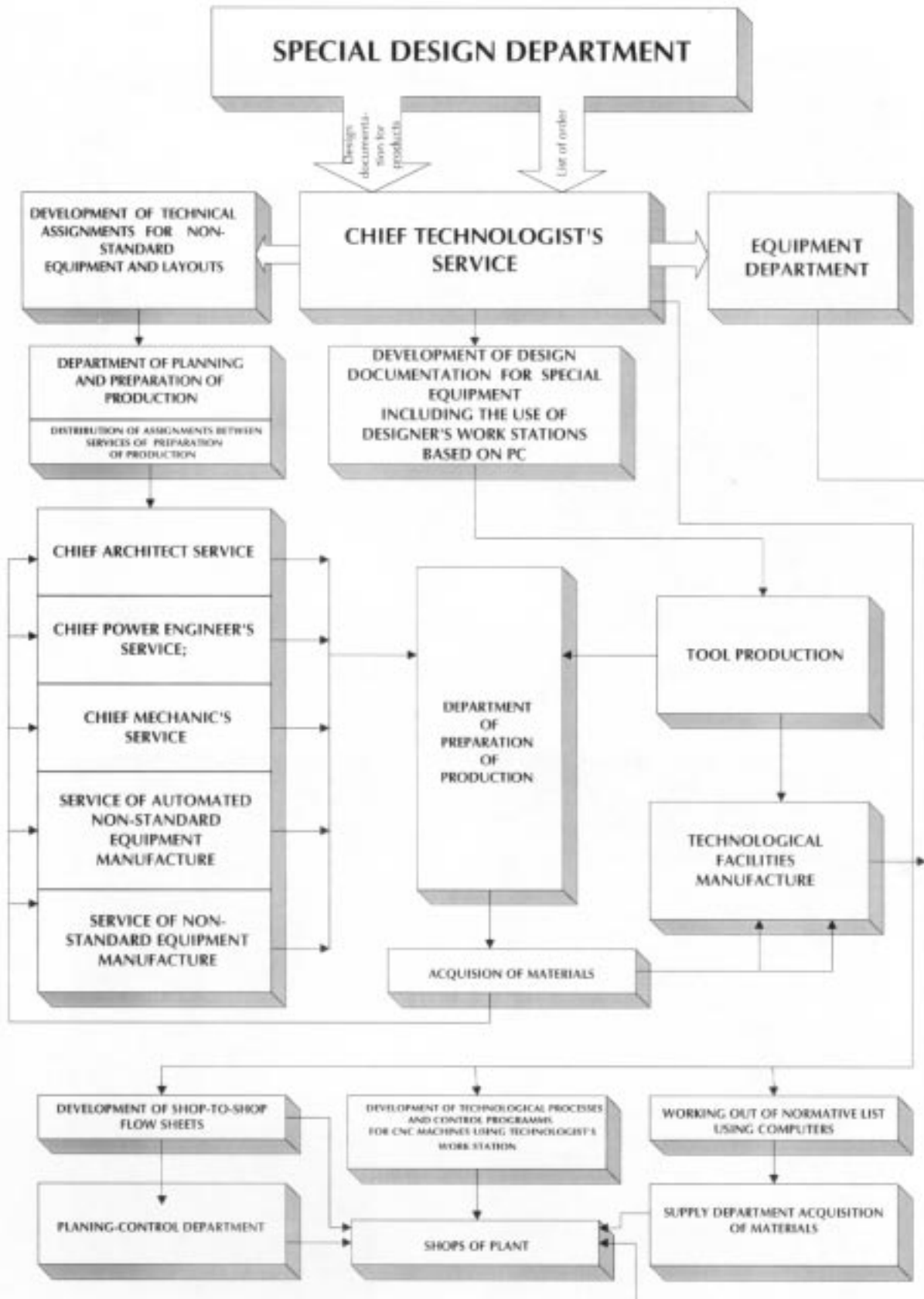


Approximately 119 plant standards have been introduced and integrated into the quality control system. This quality control system began in 1978 and was modified with regard to ISO-9001 requirements in 1997.

Diagram of manufacturing process



Preparation structure of new articles production



*Awards presented by the executive committee of international organization
B.I.D. «Business Initiative Direction»*



«INTERNATIONAL GOLD STAR FOR QUALITY», Madrid, 1994.



«WORLD QUALITY COMMITMENT AWARD», Madrid, 1996.



Production of the equipment for space-rocket hardware's control systems

Production of the apparatus for automated control systems of turbines and machine hall's equipment for nuclear and thermal power stations



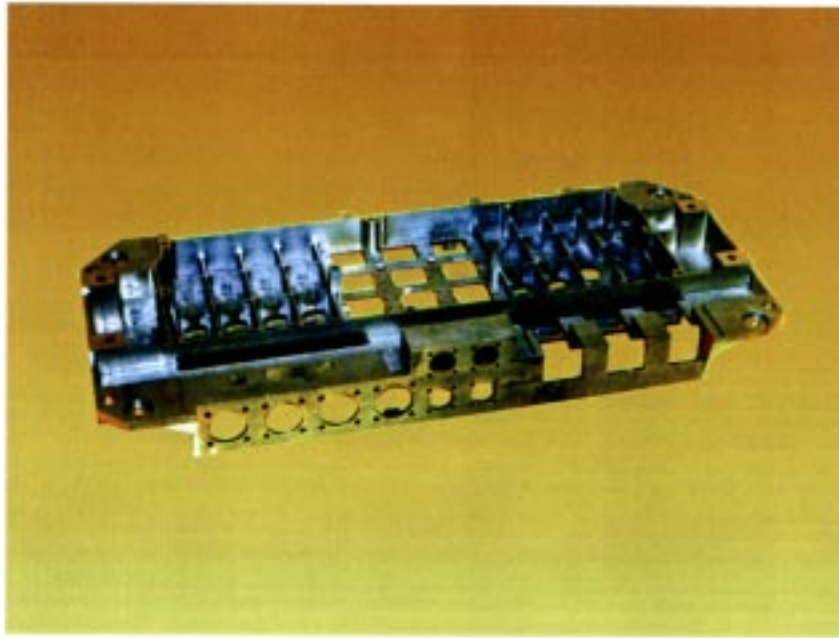
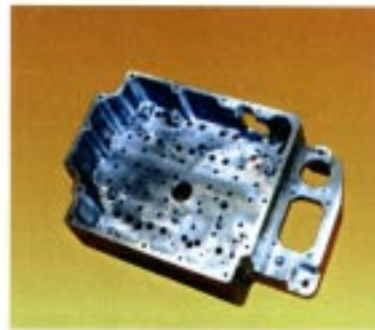
Production of communication means as automatic telephone exchanges "ISTOK", "DONETS" and mini automatic telephone exchanges





Production of household and medical devices





Samples of casing parts



Pieces manufactured on the sheet metal processing centers of type «TRUMATIC 200R», «BERRENS - 625, 618»



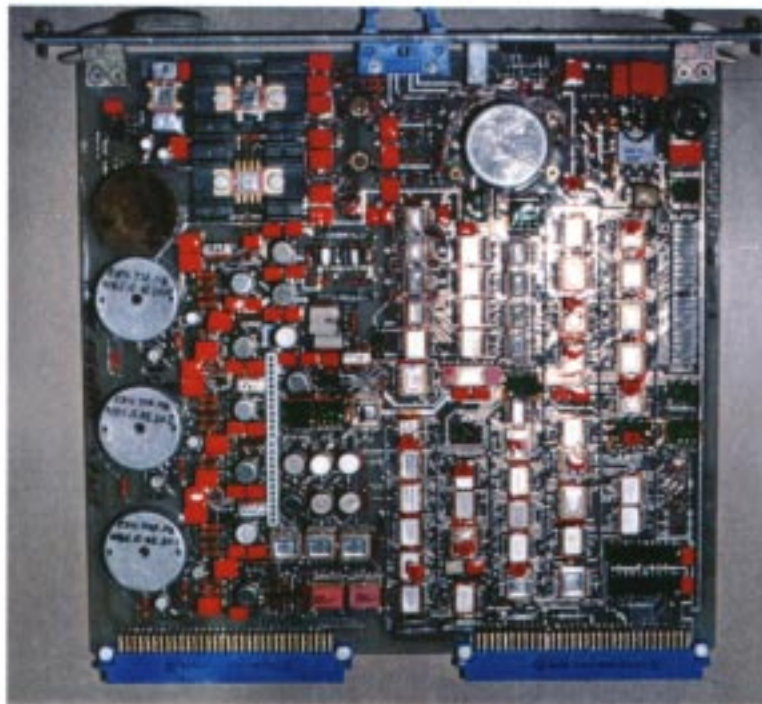
Frame-mounted «YBK» (Controlling computing complex) of System «Э4 АСУТ-1000P(2P)» (Electronic part of automated systems for controlling technological processes), systems of automatic regulation and functional-group control



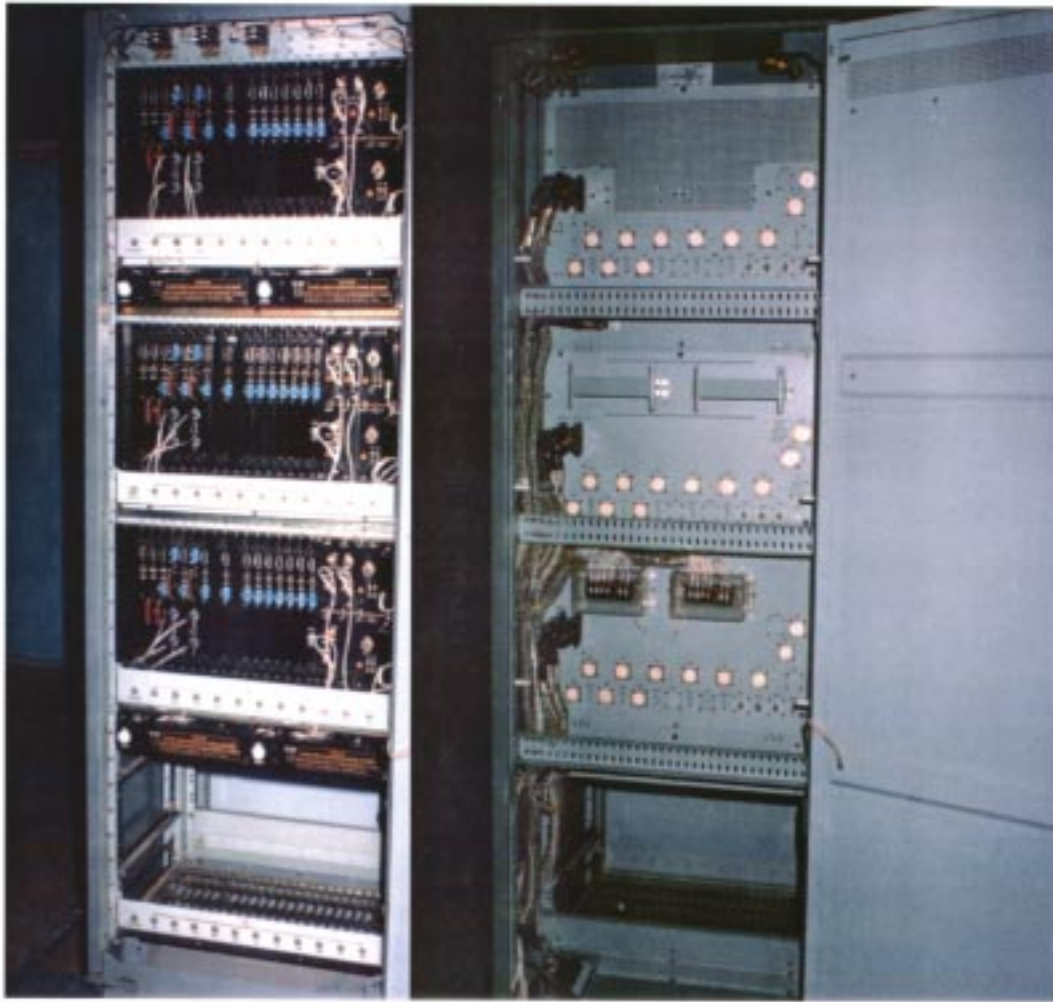
Adjustment means of CPT (Turbine regulation system)



Frame-mounted systems «ЭЧ СКДТГ» (Electronic part of system for monitoring and diagnosis of turbogenerators), «ЭЧ МАУС» (Electronic part of automated microprocessor-based control system) and means of adjustment: specialized personal computer, «КСО» (adjustment means complex) of equipment and equivalents



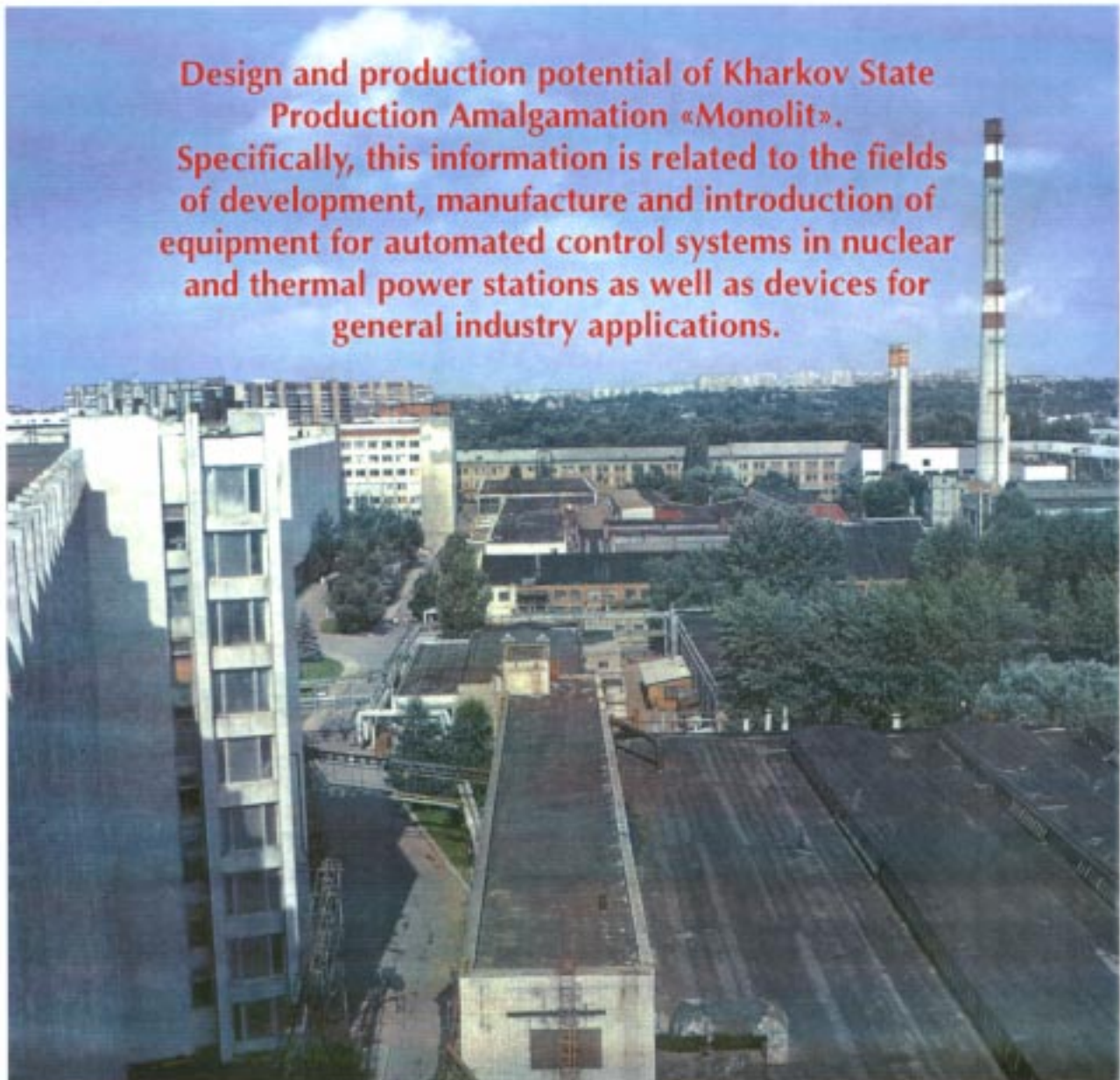
A subunit as integral part of «ЭЧ СКДТГ» (Electronic part of system for monitoring and diagnosis of turbogenerators), «ЭЧ МАУС» (Electronic part of automated microprocessor-based control system)



Equipment of Type «Veres», front view and cross connection part of the frame



A subunit as integral part of equipment of Type «Veres»



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Business Scope of KhSPA "MONOLIT"

The Shevchenko Plant was founded in 1900 as a mechanical engineering and boiler making plant. In 1949 the plant was restructured as an instrument manufacturer

	Scope of business activities	Year Introduced	Volume, %		
			1997	1998	1999
1.	Control systems for power equipment	1972	44	44	32
2.	Automatic telephone exchanges	1988	21	21	40
3.	Control systems for space vehicles	1949	29	29	17
4.	Equipment intended for general use in industry	1953	4	4	6
5.	Medical devices and tools	1970	2	2	5

*80% of all products manufactured at MONOLIT are developed by the internal R&D Department

Medical Equipment of KhSPA "MONOLIT"

"MONOLIT"

From 1970 KhSPA "MONOLIT" has been a traditional developer and manufacturer

Lines of specialization:

Equipment intended for treating cancerous diseases

Equipment intended for blood infusion (recurrent blood transfusion)

Equipment intended for local hypothermia and hypothermia

Equipment generating ultrasonic cryogenic actions for surgical purposes

Equipment intended for ultrasonic diagnosis

Medical tools

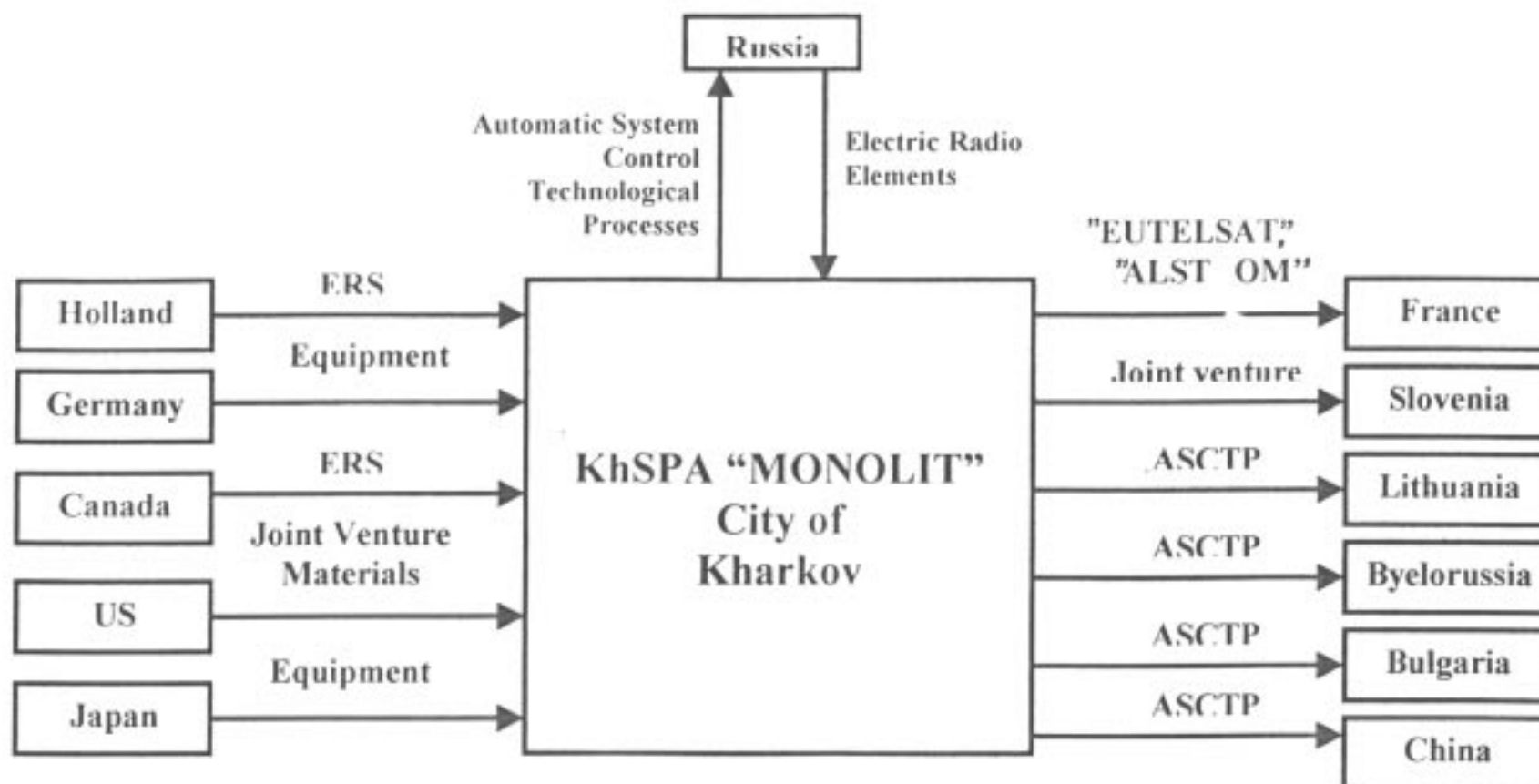
Assignment and application

- ◆ Final stage treatment
- ◆ During serious intracavitary operations
- ◆ Local cavitory thermophysiotherapy, gynecology, proctology, gastroenterology
- ◆ Treatment of tumors, otolaryngology, oncology, dermatology, gynecology, proctology, cosmetology, surgery, ultrasonic therapy, etc.
- ◆ Dentistry, diagnosis of maxillary sinus
- ◆ Scalpels, forceps, scissors

Core "MONOLIT" Technologies and Our Partners

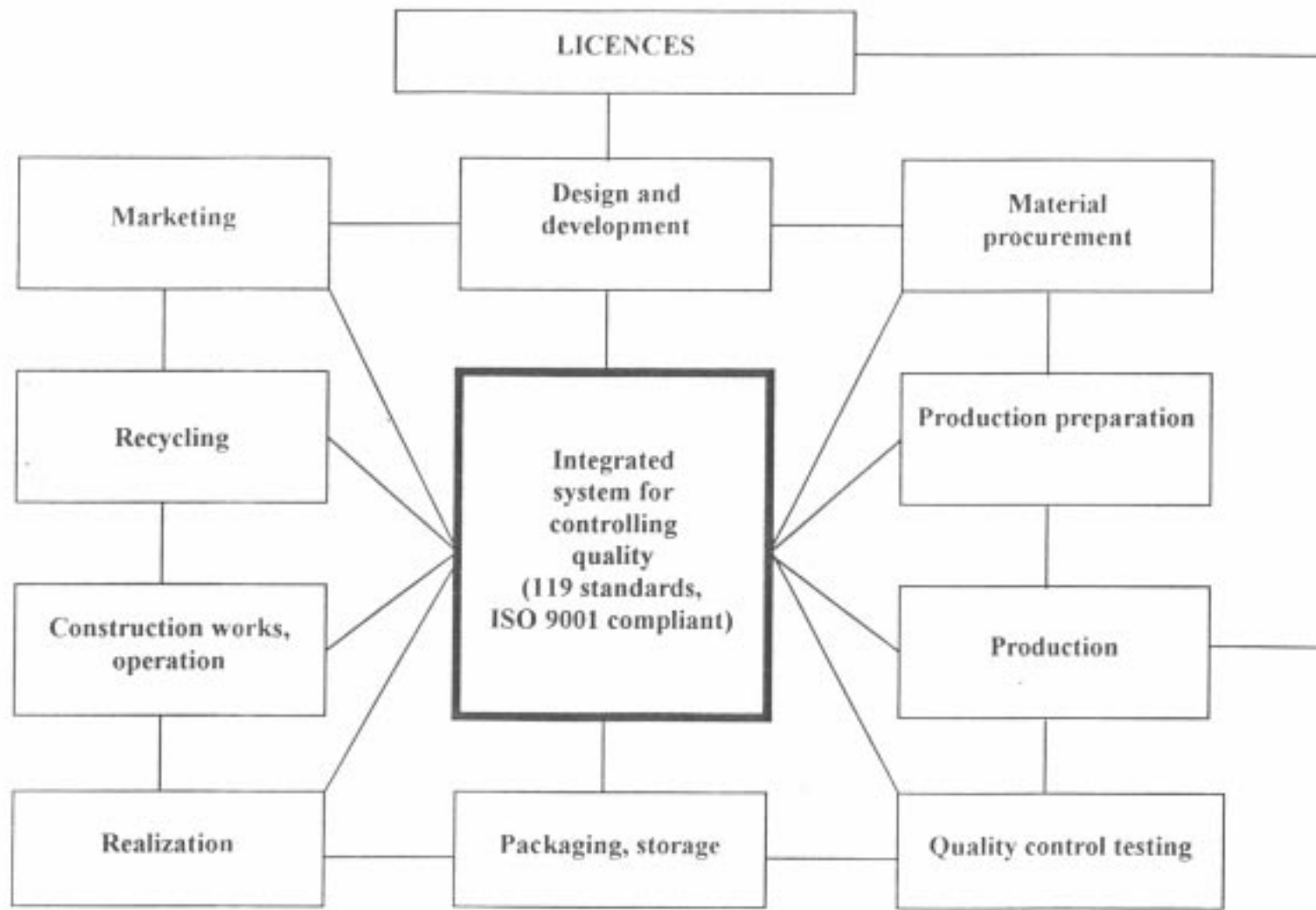
"MONOLIT"	Partner
Casting of ferrous and non-ferrous metals and alloys	ITALPRESS (Italy), CLPO (Czech)
Machining and sheet metal stamping	German firms: BOCH, BILLER, TRUMPF, BEHRENS Japanese firm: MACMATIC
Tool manufacturing	German firms: CHAUBLIN, MANO, OVERBECK, MICROMAT; Swiss firm: AGIE
Plastic articles manufacturing	BRESTIA (Italy), KIACY (Germany)
Protective and decorative coatings	COLUMBIA CHEMICAL (USA), PATERS (Germany)
Manufacturing of single and double sided boards as well as multi layer printed circuit boards	CEMCAT (USA), German firms: MALTILIME, CHERING, ATOTECH, BURCLE, LANTRONIC
Manufacturing of syndust stereo read record heads	JVC (Japan)
Manufacturing of articles for microelectronics	TABAI (Japan)
Mechanical and electrical assembly	SIEMENS (Germany)
Adjustment and quality testing of manufactured equipment	IBM (USA),

Business relations of KhSPA "MONOLIT" with foreign partners



1996 - Ukrainian-Slovenian joint venture "MONIS" on manufacturing digital automatic telephone exchanges;
 1996 - Ukrainian-American joint venture "ABB-MONOLIT" in the field of automated systems for controlling technological processes (ASCTP) of nuclear power stations;
 1998 - Contract with company "ALST OM" (France) concerning the producing control systems of hydroelectric power stations.

KhSPA "MONOLIT" Quality Control Systems



KhSPA "MONOLIT" is developing, manufacturing and supplying its products in accordance with requirements of standards and contracts.

KhSPA "MONOLIT" Sales in the power engineering

Country	Electric power plants	Power units	Sets of electronic parts (manufactured by "MONOLIT" on "Turn-Key" basis) of automated systems for controlling technological processes (□EP ASCTP)			
			Operation	Production	Constructing, starting and adjustment works	Development
Ukraine	2 NPS	8	10		3	1
Russia	5 NPS	10	9	6	4	1
Lithuania	1 NPS	2	4		2	
Bulgaria	1 NPS	2	2			
China	2 TPS	4	4			
Byelorussia	1 TPS	1			1	
TOTAL:			29	16		2

KhSPA "MONOLIT" provides safety and reliability for manufactured electronic parts of automated systems for controlling technological processes (EP ASCTP)

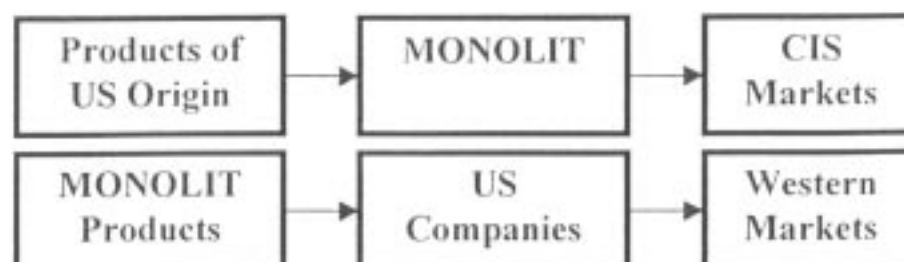
- **Monitoring and diagnosis of equipment**
- **Hardware and software redundancy**
- **Diagnosis of hardware and software**
- **Possible reconditioning of equipment downtime by using a set of spare parts**
- **Maintainability**
- **Periodic maintenance**

For automated systems controlling technological processes (EP ASCTP) of nuclear power station:

Mean-time-to-first-failure confirmed by results of operation amounts:

- **150,000 hours for functions of automatic regulation;**
- **400,000 hours for regulators being integral part of protection circuits**

"MONOLIT" COOPERATION PROPOSAL



Products

- ◆ Monitoring and control systems for nuclear and thermal power stations
- ◆ Monitoring and control systems for industrial use
- ◆ Telecommunication means
- ◆ Medical techniques and equipment
- ◆ Consumer goods

Forms of Cooperation:

- ◆ Placing orders from KhSPA "MONOLIT"
- ◆ US Partner will supply components and equipment for production
- ◆ Establishment of Joint Venture
- ◆ Participation of US companies in the production modernization of KhSPA "MONOLIT"