(№2 2000年11月1日号目次)

特集:原子力省関連研究開発機関(その2)

今号では、№1に引き続き、ロシア原子力省関連の研究開発機関を特集します。

トピック:

⑥ ブトケル核物理学研究所
(ノボシビルスク)

I. Name of the Institute (Organization)

In Russian: Институт ядерной физики имени Г.И.Будкера

In Russian abriviation: ИЯФ им.Будкера

In English: State Research Centre Of The Russian Federation Budker Institute of Nuclear Physics

In English Abbreviation: SRC BINP

II. Location

Official adress: 11,Academician Lavrentyev Ave.,Novosibirsk, 630090,Russia

Mail adress: 11,Academician Lavrentyev Ave.,Novosibirsk, 630090,Russia

Teltphone number: (383-2)35-60-31

Fax number: (383-2)35-21-63

E-mail for representative: root@inp.nsk.su

Access (transportation, necessary time): Novosibirsk international airport, about one hour by car.

III. History

The Institute of Nuclear Physics of the Siberian Branch of the Russian Academy of Science was founded in 1958. It came from a laboratory for new methods of acceleration headed by G.I. Budker at the Institute of Atomic Energy at that time under I.V. Kurchatov.

Academician G.I. Budker was the founder and first Director of the Institute. From his death in 1977 to the present time, the Institute's Director has been Academician A.N. Skrinsky. The "Round Table"-the Scientific Council of the Institute-governs the research and other activities of the Institute.

There are three thousand two hundred members of the Institute's staff. There are five hundred researchers, four hundred engineers, nine hundred technicians and workers, and nine hundred machinery shop personnel. Four researchers are full members and five are corresponding members of the Russian Academy of Science, while fifty are Doctors of Science and one hundred and sixty are candidates of Science.

In November 1994, the Russian Government granted the Institute the status of being a State Scientific Center of the Russian Federation with the title of "The G.I. Budker Institute of Nuclear Physics". This honor signifies the worldwide recognition of the Institute's research achievements.

IV. Management

Kind of organisation: State Scientific Center of Rf

Ownership: State property of Russian Federation

Responsible Ministry: Russian Academy of Sciences Siberian Branch

V. Executives

A.N.Skrinsky, Director of the Institute

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Administration

V.V.Anashin, Deputy Director, E-mail:V.V.Anashin@inp.nsk.su

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E.P.Kruglyakov, Deputy Director, E-mail:E.Kruglyakov@inp.nsk.su

G.N.Kulipanov, Deputy Director, E-mail:G.N.Kulipanov@inp.nsk.su

V.A.Sidorov, Deputy Director, E-mail:sidorov@inp.nsk.su

A.M.Kudryavtsev, Scientific Secretary, E-mail:A.M.Kudryavtsev@inp.nsk.su

VI. Current major activites

Some of the main activities of the Institute are given in the following list.

- Elementary particles and nuclear physics;
- Theoretical physics;
- Accelerator physics and techniques;
- Plasma physics and thermonuclear fusion;
- Synchrotron radiation and free electron lasers;
- Collaborations with other institutions

VII. Number of employee

Number of employee: 3.200 .

VIII. Major facilities

Several detectors for the experiments in High Energy Physics are working now or being under construction.

VEPP-2M collider.

Electron-positron collider VEPP-2M is the world only e+e- machine in a pre-phi-factory era, operating in the energy range 2E from 0.4 to 1.4 GeV, covering the energies of resonance production of lightest quarkonia: rho, omega, phi.

In 1992 experiments with CMD-2 detector started, and in early 1995 a new nonmagnetic Spherical Neutral Detector (SND) began data acquisition as well. Now both CMD-2 and SND detectors, located in opposite straight sections of VEPP-2M, take data in parallel.

Electron-Positron Facility VEPP-4M.
The VEPP-4M facility is an electron-positron collider of the State Research Center, Budker Institute of Nuclear Physics, Siberian Branch of Russian Academy of Science, Novosibirsk.

The VEPP-4M is the updated facility of that having been operated during the period from 1979 to 1985. It's updating was undertaken for an increase in its luminosity and for the change of its detector. The booster storage ring VEPP-3 was put into operation again in 1986 and the VEPP-4M was really commissioned in 1992.

The Most Important Subjects of Work:
•Physics of Y-meson resonances
•Two-photon physics
•Generation of high energy beams of gamma-quanta
•Electro- and photo-nuclear physics
•The use of synchrotron radiation (SR) in research and applications

VEPP-4M is the only one in Russia collider with the high energy beams of electrons and positrons.

Studies Being Carried out on the Facility at Present:

•DEUTERON experiment is a study of the form-factor of a deuteron by electron scattering on the inner target of VEPP-3.
•A study of the background of the KEDR detector being under construction. Experimental studies of the energy and spatial resolution of the liquid krypton calorimeter of the detector.
•First experiments have been conducted at the ROKK-1M installation on the photonuclear fission of heavy nuclei.
•Photon splitting in the strong Coulomb field of a nucleus.
•Delbryuk scattering in the strong Coulomb field of a nucleus.

•Experimental studies with the use of SR beams on the VEPP-3 storage ring.

•A study of a real structure and improvement of the injector, storage ring, and collider parameters.

XI. Commercial proposals

The Institute is highly integrated into scientific and technology cooperation on bilateral, multilateral and international basis.

The Institute provides a broad array of theoretical, experimental and expert services. The test and experiment facilities are available for the coordinated research within agreed programs and are also subject to separate agreements.

⑦ 原子炉研究所
(ウリヤノフスク州ディミトロフグラード市)

I. Name of the Institute (Organization)

In Russian: Государственный научный центр Российской Федерации Научно-исследовательский институт атомных реакторов.

In Russian abbreviation: ГНЦ НИИАР

In English: State Research Centre Of The Russian Federation Research Institute of Atomic Reactors

In English Abbreviation: SRC IAR

II. Location

Official address: 433510 Dimitrovgrad-10,Ulyanovsk region,Russia

Mail address: 433510 Dimitrovgrad-10,Ulyanovsk region,Russia

Telephone number: (84235)32021,32727,36620

Fax number: (84235)35648

E-mail for representative: gns@niiar.simbirsk.su

Access (transportation, necessary time): Nearest cities - Ulyanovsk (90 km) and Samara (250 km). Bus or car traveling time from Ulynovsk airport - 2 hours, from Samara airport - 3 hours. The nearest international airport - Sheremetjevo-2 in Moscow.

III. History

NIIAR was founded in 1958 by the Decision of the Soviet Government with the aim of carrying out researches in the field of nuclear power energy.

The Institute development was promoted by the establishment of a large research complex incorporating a high-fiux reactor SM-2 designed by specialists of the Institute of Nuclear Energy, and two major laboratories - chemical, and material technology ones, both provided with protection chambers. In autumn, 1961, the SM-2 reactor reached the designed capacity of 50 MW. At the time it was the most powerful universal test reactor having the thermal neutron flux density of $2.2 \bullet 10^{15}$ $cm^{-2} \bullet s^{-1}$. Later, the reactor was several times upgraded due to which its rated values and experimental capacities were at least doubled. Chemical, and material technology laboratories were commissioned in 1963-64.

In 1963, there was put into operation an experimental NPP with a reactor cooled by high-boiling organic coolant. Later, this NPP was transformed into the prototype nuclear heat power plant AST-1 to provide heating for the Institute's production site. Since 1965, an NPP with a vessel-type boiling-water reactor VK-50 is effectively functioning. In 1966, there was constructed MIR, a large material-vesearch reactor, developed

at the NIKIET and intended for making loop tests of experimental fuel assemblies. In 1969, there was commissioned BOR-60, the first in the USSR experimental NPP with a fast breeder reactor; the design was drawn up in Obninsk.

In the succeeding years, the growth of the Institute was continued. In that period there were assembled various testing and experimental benches, novel test reactors, such as RBT-6, RBT-10/1, RBT-10/2, laboratories with protection chambers were extended and reequipped. In 1987, the material technology laboratory was completed with a set of large-scale protection chambers outfitted with unique equipment making it possible to perform primary non-destructive investigations of fuel assemblies of VVER-, RBMK-, and fast reactors.

IV. Management

Kind of organization: Scientific Center of the Russian Federation.
Ownership: State property of the Russian Federation.
Responsible Ministry: Ministry of the Russian Federation for Atomic Power.

V. Executives

Director - Victor B.Ivanov, Academician of the Russian Academy of Engineering Sciences.

VI. Current major activities

- **Physical and technical properties of test reactors**
- **Reactor material science**
- **Production of transuranium elements**
- **Reactive nuclides of light elements**
- **Investigations in the field of nuclear phisics**
- **Test reactors and environment**

VII. Number of employee

The NIIAR stuff includes 5952 employees, among them:

Scientists	474 (8%);
Engineers	2005 (33.7%);
workers	3473 (58.3%).

VIII. Major facilities

- SM-2 REACTOR
- REACTOR MIR

- REACTOR RBT-6

- RBT-10/1 AND RBT-10/2 REACTORS

- REACTOR VK-50

- BOR-60 REACTOR

- ARBUS REACTOR

- HOT MATERIAL SCIENCE LABORATORY

The biggest in Europe and one of the biggest in the world, the Material Science Laboratory was brought into operation in early 1964.

- RADIATION CHEMISTRY LABORATORY

- WASTE MANAGEMENT COMPLEX

XI. Commercial Proposals

Expansion of application of powerful gamma-unit for radiative sterilization of one-time medical instruments

Project entails direct investing in amount of $315,000 to create joint venture with participation of investor , SRC and .Resonans. JSC (up to 20-30% shares of investor) for the purpose of expanding scope of services in radiative sterilization of one-time medical instruments. A scheme of fast refunding of investment (40-50% of JV return) to investors will be used. Repayment will be compensated during first several years of joint venture operation up to its complete recompense at the expense of the sales of sterilized instruments to regional medical establishments.

Credit in amount of $315,000 with its repayment on the base of compensatory agreement is possible.
Project return period is 1 year. Expected internal rate of return is 24%.
Within several coming years attraction of additional 135,000 is being planned to update and realize the following technologies for industrial application:

- radioactive processing of agricultural products;
- radioactive polymer modification;
- radioactive technology for wood and plastic products

Expansion of production of board automated system for estimation of railed road (BAC KVL-P) for meter of distance CNII-2

Project entails attraction of a credit in amount of $500,000 to extend production capacities of JSC "INFAST" that will help with serial production expansion of board automated system for estimation of railed road for meter of distance CNII-2. The meter of distance that is equipped with such a system, will provide an automated estimation of a rail road state by means of geometrical parameters of a rail and dynamic parameters of interconnection between a road and a rolling stock.

Technical documentation development has been completed, a pilot lot of 10 pieces was produced and passed field testing. Meters of distance BAS KVL-P are put into operation on some of the railroads (branches - Kuibyshevskoe, Privolzhskoye, Gorkovskoye). A detailed business plan of investment project has been developed.

Production expansion of gamma-emitter based on high specific activity cobalt-60 isotope

Project entails direct investing in amount of $1,250,000 to create joint venture in which investor and SRC will participate for the purpose of production expansion of gamma-emitter equipment based on high specific activity cobalt-60 isotope using existing SRC facilities. A scheme of fast refunding of investment (40-50% of JV return) to investors will be used. Repayment will be compensated during first several years of joint venture operation up to its complete recompense at the expense of isotope sales to medical establishments, specialized servicing units, manufactures of emitters in RF and abroad in compliance with current contracts and contracts being concluded.

Credit in amount of 1,250,000 with its repayment on the base of compensatory agreement is possible. Project return period is 2 years. Expected internal rate of return is 21%. Annual return after production achieves calculated capacity is $700,000.

Technology updating and creation of a unit for protection coating of pyrolytic chrome

The project entails an attraction of direct investments in amount of $210,000 for JV forming with participation of an investor and SRC in order to purchase an additional equipment and to create a unit for protective coating of pyrolytic chrome by orders of car, aviation and oil chemistry industries.The investments compensation will be made to an investor in accordance with rapid scheme (40-50% of JV income) during the first years of JV activities up to the full indemnity at the expense of coating with preset features onto complex form surface products according to the existing contracts and that ones being under conclusion (Gorbunov aviation PU, Kiev KiJSPU, JSC "Lukoil", piston rings plants in Odessa and Stavropol etc.).

Credit giving variant is also possible (of $210,000) with its forth covering on the base of compensation agreement.

Estimated time to get project profit is 2 years. Internal rate of return expected is -21%. Annual return after running at the working capacity is $100,000.

Up to now a complex of experimental and pilot units of coating, including pyrolytic coating technology, is developed for radio technics, there were stand tests for internal combustion engines, equipment and technology of pyrolytic chroming were embedded for control system details of aircrafts TU-334 and TU-204-200.

⑧ 物理･エネルギー研究所
(カルーガ州オブニンスク市)

I. Name of the Institute (Organization)

In Russian: Государственный научный центр Физико-энергетический институт

In Russian abbreviation: ГНЦ ФЭИ

In English: State Scientific Center Institute of Physics & Power Engineering

In English Abbreviation: SSC IPPE

II. Location

Official address: 1, Bondarenko sq., Obninsk, Kaluga region, Russia 249020.

Mail address: 1, Bondarenko sq., Obninsk, Kaluga region, Russia 249020.

Telephone number: (08439) 98250, 98231, 98819, 98043, (095) 9133154

Fax number: (095) 2302326, (095) 8833112

E-mail for representative: postbox@ippe.rssi.ru

Access (transportation, necessary time):

Moscow international airport Sheremetjevo-2, than 2 and harf an hour by car.

The Institute of Physics and Power Engineering (IPPE) is located in Obninsk, Kaluga region, 107 km to the South-West from Moscow on the picturesque bank of the Protva-river, of the Oka tributary.

III. History

The Institute of Physics and Power Engineering (IPPE) was established on May 31, 1946 to solve scientific and technical problems of nuclear power development.

In 1951 the IPPE was charged with the task of construction of nuclear power plant. The world's first NPP, with the thermal power of 30 MW (5 MWe) was commissioned on June 27, 1954. After 5 year operation as a nuclear power plant, it has been in use as a research facility to test the channels generating electricity in direct thermionic rnergy conversion mode, for research of nuclear materials, production of isotopes, etc.

The Institute has become a major research and development center dealing with complex studies on the problems of reactor development for nuclear power facilities (NPFs), for various purposes. Solution of serious problems in science and technology is possible due to a high scientific potential of the IPPE where 67 Doctors, 370 Candidates of Science work, and about 4000 research workers and engineers altogether work, and up-to-date experimental and production base has been created. In April 1994, the IPPE was given the status of the State Research Center of Russian Federation (SRC IPPE). Its organisation structure corresponds to the main directions of its activities.

IV. Management

Kind of organization: State Scientific Center of Russian Federation

Ownership: State property of Russian Federation

Responsible Ministry: Ministry of Russian Federation for Atomic Power

V. Executives

DIRECTOR of SRC - RIAR, A.Zrodnikov

VI. Current major activities

Reactor Ataterial Science and Methods for Nuclear Power Plant (NPP) Materials and Elements Testing incorporate: development of theoretical basis for reactor material science methods; methodical support, software and hardware of material science investigstions, design and manufacture of devices for testing, metrological certification of systems applied for real measurements; acquisition of data on physical-mechanical properties of irradiated materials under different loading character and effect of factors modelling operation conditions; vessel structural material investigation, invessel devices, the VVER snd BN fuel element claddings and fuel assembly jackets, fuel absorbing materials, moderators and reflectors, TRU pure metals and their alloys, ceramics for nuclear and fusion power plants.

- **Fast Reactors**

Fast reactors have been designed since 1949.

- **Lead-bismuth cooled reactors**

Since 1952 the IPPE has been engaged in designing nuclear power reactors cooled by the lead-bismuth eutectic alloy. Units like these are used in high-speed, highly-maneuverable, nuclear submarines.

- **The World's First NPP and thermal neutron reactors**

In 1951 the IPPE was charged with the construction of a nuclear power plant. The plant in Obninsk was originally designed and created as the first nuclear plant to demonstrate the peaceful application of nuclear power.

- **Scientific supervising and reactor design**

Since 1956 the IPPE has been a scientific supervisor for the creation of small-scale NPPs for power generation in remote and hard-to-reach regions.

- **High-Temperature Nuclear Reactors for Space Applications**

IPPE is one of the primary developers of compact, efficient reactors for space nuclear power systems which use direct conversion of nuclear heat into electrical energy.

- **Physics of Nuclear Induced Plasmas and Nuclear Pumped Lasers**

Investigations in the field of physics of nuclear-induced plasmas and nuclear pumped lasers (NPL) were started in the IPPE in 1981. They are aimed at the development of laser systems with pumping from pulse

nuclear reactors. At the reactor power pulse, neutrons penetrate into the laser-active medium containing U-235 of heterogeneous or homogeneous form and induce its fission. As a result of fission fragments stopping in the medium a nuclear-induced plasma generates there with the parameters required for the laser to operate.

– Material Irradiation Study – Solid-State Physics

Significant attention in the R&D programs implemented by the Institute is given to investigation of materials irradiated by intensive neutron fluxes in reactors of various types as well as to theoretical and experimental studies on material irradiation and solid-state physics.

– Reactor Core and Shielding Physics

The IPPE specialists made a considerable contribution in the development of the theory of nuclear reactors with various neutron spectra, calculation techniques, multi group calculations, as well as algorithms and codes as applied to the methods and algorithms of nuclear data preparation.

– Nuclear physics and neutronic

A comprehensive program on experimental and theoretical studies in the field of low- and medium-energy physics is carried out in the IPPE. Special attention is paid to studying the basic processes of fast neutron-nuclei interaction and fission that is fundamental for nuclear power generation.

VII. NUMBER OF EMPLOYEE

The NIIAR stuff includes 5952 employees, among them:

Scientists	474 (8%);
Engineers	2005 (33.7%);
workers	3473 (58.3%).

67 Doctors

370 Candidates of Science work

about 4000 research workers and engineers

VIII. Major facilities

A powerful experimental foundation has been laid. which includes 20 facilities and enables comprehensive substantiation of various reactor types with liquid-metal coolant and other coolant types.

- The world's first NPP reactor

- Zero-power BR-1 reactor

- The BR-2 fast breeder reactor

- The BR-5 fast breeder reactor

- The BR-10 fast reactor

- Experimental fast BOR-60 reactor

- BN reactor series

- Zero-power reactors (critical assemblies)

- The BFS-1 test reactor

- The BFS-2 reactor

- The KOBR critical assembly

- PF-4 test rig

- The high-temperature pressurized-water critical assembly, MATR-2

- Heat Transfer Data Centre

IX. Commercial Proposals

Creation of an irradiating unit for treatment oncological diseases by every method of neutron therapy

Project entails an attraction of external investments in amount of $500,000 for creation a joint venture (an investor's share 50%of capital) and additional external credit in amount of $5,000,000 for creation together with SRC of the Russian Academy of Medicine Sciences (RAMS) of irradiating unit for treatment of oncological diseases. RF network of irradiating units, providing reliability and radiation safety is planned to be created.. The project will be recouped at the expense of rendering services in treatment of oncolocical diseases, and also from selling license for production of similar units in Russia and CIS countries.

Production expansion of isotope MO-99 for medical application by creatingits production complex based on liquid fuel reactors.

Projects entails creation of a complex for production of isotope MO-99 on the base of existing SRC facilities and technology for Mo-99 isotope extracting from reactor fuel, elaborated by SRC. The complex productivity is 5000/6000 Ci/week (under verification for the 1-st day). Project implementation is being expected in form of joint venture, in which an investor will have 50% of capital; additional credit will be attracted. Investments and credit will be used for technology development and for purchasing and installing additional equipment and as a floating capital.

Project recoupment is based on the profit gained from isotope sales to medical establishments in the Russian Federation as well as abroad (up to 90%). SRC is interested to get support in penetration to international market.

Feasibility study and technical design have been made.

Technology elaboration completion and organisation of serial production of chemical-resistant track membranes and filters on their base

Project envisages expansion of nomenclature of track membranes and filters produced (using technology based on reactor equipment and accelerator equipment) using existing SRC facilities and creating a joint venture, in which an investor will have 30% share of capital. Investing is necessary to update the technology, to organise production and also to receive certificates of the Russian Federation for track membranes.

Technical design has been elaborated and market investigation confirming the existence of effective and demand, has been made. Investments will be returned from the profit gained from the sales of a new product in Russia.

SRC is interested in marketing and management support. Agreement on compensatory transaction is possible.

Investments may be guaranteed by mortgaging of capital goods.

⑨ ペテルブルグ核物理学研究所
(レニングラード州ガッチナ市)

I. Name of the Institute (Organization)

In Russian: Государственный научный центр Санкт-Петербургский институт ядерной физики им.Б.П.Константинова Российской Академии Наук

In Russian abbreviation: ГНЦ ПИЯФ РАН

In English: State Research Center Of The Russian Federation B.P.Konstantinov Petersburg Nuclear Phisics Institute of Russian Academy of Sciences

In English Abbreviation: PNPI RAS

II. Location

Official address: PNPI RAS,Gatchina,Leningrad district,188350,Russia

Mail address: PNPI RAS,Gatchina,Leningrad district,188350,Russia

Telephone number: (812)298-35-38,(812-71)360-25

Fax number: (812-71)371-96,(812-71)313-47

E-mail for representative: ryabov@lnpi.spb.su

Access (transportation, necessary time):

St.Petersburg (Russia) international airport Pulkovo.

From airport Pulkovo:

•by car to Gatchina, Orlova Roscha, PNPI (about 30 minutes);

•by bus number 13 from international line airport or number 39 from domestic line airport to local train station "Platforma Airport" (about 10 minutes); then you can choose a bus number 431 to Gatchina; bus stop "Farmer Machinery plant" (about 50 minutes); then a bus number 4 to PNPI (about 10 minutes).

III. History

In picturesque suburb of Leningrad, at ancient town of Gatchina, the construction of the brand of the A.F.Ioffe Physical-Technical Institute of the Academy of Sciences of the former USSR began in 1954, where the research activities in the field of nuclear physics must be concentrated. In December 1959 the research reactor WWR-M was put into operation and in 1970 - 1 GeV proton synchrocyclotron, remaining the main physical facilities of the Institute up to the present. By that time the direction of biological investigations was formed.

In 1971 the branch of the PTI was reorganized into an independent Institute named in honor of Academician B.P.Konstantinov who played a decisive role in its advancement. In 1992 it received the name "Petersburg Nuclear Physics Institute"(PNPI). In 1994 PNPI was given the status of State Research Center of Russia.

At present the staff of the Institute includes more then 600 scientists and about 1000 engineers, among them there are 62 doctors and 275 candidates of science. The works carried out in the Institute were awarded Lenin and State Prizes, B.P.Konstantinov Academic Prize, 5 scientists were elected Corresponding Members of the Academy of Sciences.

IV. Management

Kind of organization: State Scientific Center of RF

Ownership: State property of RF

Responsible Ministry: Russian Academy of Science

V. Executives

Director of the Institute - Vladimir A. Nazarenko

Phone: +7(81271)3-0036, +7(812)298-3538

FAX: +7(81271)3-7196, +7(81271)3-134

E-mail: PNPI@LNPI.SPB.SU

VI. Current major activities

Physics of Elementary Particles and Fundamental Interactions

Physics of Nuclei and Nuclear Reactions

Neutron Physics

Condensed Matter Physics

Theoretical Physics

Physics and Technology of Nuclear Reactors and Accelerators

Molecular and Radiation Biophysics

New Methods and Research Equipment

NEUTRON RESEARCH DEPARTMENT (NRD)

•Neurton Physics

•Condensed Matter Research

•Reactor Physics and Technology

•Automation of Physics Experiments

•Semiconductor Detectors of Nuclear Radiation

•Neurton Optics

HIGH ENERGY PHYSICS (HEP) DEPARTMENT

•Elementary Particle Physics

•Few Body System

•Muon Catalyzed Fusion

•Mesoatom Physics

•HEP Detectors

•Polarization Phenomena

•Meson Physics of A Condensed Matter.

•Meson Physics

•Accelerator

MOLECULAR AND RADIATION BIOPHYSICS DEPARTMENT

At present there are four main areas of research in Department of Molecular and Radiation Biophysics.

I. Biophysics (development of new physical methods and approaches for analysis of biological systems)

II. Radiation Biology

III. Molecular Biology and Genetics

IV. Genetic and biophysical methods in medical diagnostics and monitoring of environment

VII. Number of employee

Number of employee:. Institute includes more then 600 scientists and about 1000 engineers, among them there are 62 doctors and 275 candidates of science

VIII. Major facilities

RESEARCH NUCLEAR REACTOR WWR-M

Field of science: Physics (nuclear physics, experimental particle physics, solid-state physics, nuclear methods for condensed-state magnetic properties study).

Fields of research:

•Fundamental physics (research in P- and CP-parity violation in fundamental interactions, investigation of fundamental neutron properties: life-time, electric dipole moment, decay asymmetry).

•Condensed-state physics (structure and dynamics of solids, polymers, liquids, high-temperature superconducting ceramics, etc.).

Major advantages: This reactor is virtually the only one in Russia for in-beam investigations in operation now.

Current research:

The main investigations are:

•Research in the dynamics of fission by slow and resonant neutrons.

•Investigation of free-neutron beta-decay (life-time measurement with a gravitational trap for ultra-cold neutrons and precise measurement of the asymmetry coefficient).

•Testing of parity violation in neutron reactions with heavy nuclei.

•Measurement of electric dipole moment of a neutron.

•Investigation of structure of the states of nuclei excited in the (n, gamma-reaction, neutron-activation analysis for sample tests.

•Investigation of HTSC.

•Research in physics of crystals and magnetic structures.

•Research in atomic and spin dynamics.

•Investigation of magnetic phenomena in alloys and compounds.

•Investigation of phase transitions and crystalline states.

•Investigation in polymer physics and molecular biophysics.

•Research in radiation physics.

•Research in reactor physics and technology.

XI. COMMERCIAL PROPOSALS

The Institute is highly integrated into scientific and technology cooperation on bilateral, multilateral and international basis.

The Institute provides a broad array of theoretical, experimental and expert services. The test and experiment facilities are available for the coordinated research within agreed programs and are also subject to separate agreements.

For more details, please refer to i.i. VII "Current major activities" and X "Major facilities" of the above document.

⑩ トロイツク・イノベーション熱核物理学研究所
(モスクワ州トロイツク市)

I. Name of the Institute (Organization)

In Russian: Государственный научный центр Российской Федерации Троицкий институт инновационных и термоядерных исследований

In Russian abbreviation: ГНЦ РФ ТРИНИТИ

In English: State Research Center Of The Russian Federation Troitsk Institute of Innovation and Fusion Research

In English Abbreviation: SSC TRINITI

II. Location

Official address: 142092,Troitsk,Moscow region,Russia

Mail address: 142092,Troitsk,Moscow region,Russia

Telephone number:(095)334-50-41

Fax number: (095)334-57-76

E-mail for representative: lazebnik@serv.triniti.troitsk.ru, nemov@anet.sovam.com

Access (transportation, necessary time): The institute is situated at picturesque town, Troitsk by name, at a distance of 20 kilometers from Moscow. Moscow international airport Sheremetjevo-2, then 2 hours by car.

III. History

The Troitsk Institute for Innovation and Fusion Research (TRINITI) is one of the leaders scientific research and high technology in Russia. Formerly TRINITI was the branch of Kurchatov Institute of Atomic Energy.

Plasma physics, lasers, engineering applications of superconductivity, and magnetic hydrodynamic (MHD) generators were among the subjects of their scientific investigation. Theoretical basis for new areas of science and technology was constructed by joint efforts of both physicist and engineers. It is worth noting, however, that from its early days, the Troitsk Institute for Innovation and Fusion Research was primarily focused on applications.

Till 1978 academician Eugeny P. Velikhov was at the head of the Institute.

IV. Management

Kind of organization: State Scientific Center of Russian Federation

Ownership: State property of Russian Federation

Responsible Ministry: Ministry of Russian Federation for Atomic Power

V. Executives

Director of the TRINITI Corresponding Member of Russian Academy
Vyacheslav D. Pismennyi .

VI. Current major activities

The Troitsk Institute for Innovation and Fusion Research (TRINITI) is one of the leaders scientific research and high technology in Russia. Formerly TRINITI was the branch of Kurchatov Institute of Atomic Energy.

Plasma physics, lasers, engineering applications of superconductivity, and magnetic hydrodynamic (MHD) generators were among the subjects of their scientific investigation. Theoretical basis for new areas of science and technology was constructed by joint efforts of both physicist and engineers. It is worth noting, however, that from its early days, the Troitsk Institute for Innovation and Fusion Research was primarily focused on applications.

Principal lines of activity of TRINITI:

- scientific research on plasma physics and plasma interaction with materials;
- investigation of plasma influence on structural materials of the first wall and divertor plates under parameters similar to thermal stage of disruption.
- design and manufacturing of lidar laser system for high temperature plasma diagnostics;
- investigation and design of pulsed plasma and quasi-stationary accelerator with MJ energy power sources;
- investigation of physical and conceptual tasks of "Compact Torus" system;
- investigation of physical process taking place when irradiation a target in double liner explosion scheme under effective temperature 100-150 eV, investigation of high densed Z-pinches in deuterium plasma on "Angara-5" facility;
- application of ion intensive sources and short wave radiation;
- creation of excimer lasers with nanosecond and femtsecond pulse duration;
- modeling of basic physical processes of controlled fusion, development and improvement of dense plasma diagnostics;
- laser physics research to design advanced lasers and improve the laser systems performances;
- design of laser technological process and systems for industrial application;
- theoretical and experimental investigation on low temperature plasma for providing theoretical foundation of new plasma technologies;
- design and application of pulsed sources on the base of MGD compression and inductive energy converts and new technological processes with its usage;
- design and manufacturing of modern computers;

- investigation on physical processes while working on complicated experimental and commercial power facility both in design and emergency models to increase its safety.

VII. Number of employee

Four thousands employees work for the Institute, including three Members of the Academy and 300 scientists with Dr.Sc. or Ph.D. degrees. Many of the Institute personnel are the winners of various government or scientific awards.

VIII. Major facilities

Experimental facilities of the Institute had been growing very rapidly and in a few years the series of principally new and unique installations were completed.

Facilities for studies of nuclear fusion are the most advanced installations for fundamental research at the TRINITI. The most prominent among them is the Tokamak-14, often called the Strong Field Tokamak (SFT) and well known to physicists all over the world, which has becomeoperational in 1987. Especially interesting experiments on inertial confinement fusion have been made at another big facility, the Angara-5. Experiments made using both these systems are the essential part of the ongoing exploration of ignition and burning of fusion reaction.

Several lasers (Mishen, TIR and others) have been created at the Institute for laser fusion experiments. Important studies of processes in hot plasmas are conducted at specialized facilities, Compact Torus and MK-200. Both theoretical and applied aspects of laser physics and laser technology are always paid a special attention at the Troitsk Institute. Wide range of lasers and laser systems are being developed at the Institute over the years. Among them are carbon dioxide, carbon monoxide, excimer and solid-state lasers operating in different modes (continuous wave, single pulse, high repetition-rate pulses) and featuring different characteristics. These lasers have been and currently are used for various purposes, rangingfrom fundamental physics experiments to patented industrial technologies working at many plants.

Recently, new techniques for diagnostics and treatment of cancer and heart decease's have been developed in TRINITI. Other biomedical spin-offs of the physical research are also investigated. Proprietary software and computerized experts systems for medicine have been created by our scientists.

MHD generators built by the Troitsk Institute scientists are used for geophysical research: electrical probing of the Earth's crust, search for minerals and fossils, and earthquake forecasts.

Supporting facilities of the TRINITI include the Computer Center and the Experimental Workshops.

XI. COMMERCIAL PROPOSALS

The Institute is highly integrated into scientific and technology cooperation on bilateral, multilateral and international basis.

The Institute provides a broad array of theoretical, experimental and expert services. The test and experiment facilities are available for the coordinated research within agreed programs and are also subject to separate agreements.

For more details, please refer to i.i. VII "Current major activities" and X "Major facilities" of the above document.

⑪ 実験物理学研究所
(ニジェゴロド州サロフ市)

I. Name of the Institute (Organization)

In Russian: Российский федеральный ядерный центр Всероссийский научно-исследовательский институт экспериментальной физики

In Russian abbreviation: РФЯЦ ВНИИЭФ

In English: All-Russian Research Institute of Experimental Physics Russian Federal Nuclear Center

In English Abbreviation: ARIEPh

II. Location

Official Address: 607190, Sarov, Nizhegorodskaya region, prosp. Mira, 37

Telephone number: (83130)5-46-38, 5-6951, 5-38-08

Fax number: (83130)5-45-65

Telex: 151109 ARSA SU

Teletype: MIMOZA

E-mal: Karelin@ntc.vniief.ru

III. History

Founded: 1949

IV. Management

Ownership: State Enterprise

V. Executives

Director: Radiy I. Il`kayev

General designer: Stanislav N. Voronin

VI. Current major activities

- Theoretical research

- Applied gasdynamics

- Fundamental and applied physics research

- Laser physics

- Research and engineering activities

- Testing capabilities

- Materials science and technology

- Metrology

- Radiation safety and environment

VII. Number of employee

Staff: 21 000

VIII. Major facilities

Production capabilites

Tool-mashining shop.

The Institute is supported by its pilot production plant. This is what provides diversified capabilities in manufacturing of a broad range of products and materials.

⑫ 技術物理学研究所
(チェリャービンスク州スネジンスク市)

I. Name of the Institute (Organization)

In Russian: Российский федеральный ядерный центр Всероссийский научно-исследовательский институт технической физики

In Russian abbreviation: :РФЯЦ РФ ВНИИТФ

In English: All-Russian Research Institute of Technical Physics Russian Federal Nuclear Center

In English abbreviation: ARITPh

II. Location

Address: 456770, Snezhinsk, Chelyabinsk кegion, P.O. Box 245

Telephone number: (351-72) 3-26-25

Fax number: (351-72) 3-20-77, 3-23-51

Teletype: 124137 MECH, 568254 MODUL, 124161 DRUZHBA

III. History

Founded: 1955

The Russian Federal Nuclear Center - The ALL-Russian Research Institute of Technical Physics (ARITP) - is a large and unique research and design institution established in 1955 in the South-Urals region near Chelyabinck.

The Center carries out: fundamental and applied research in nuclear physics, the physics of high pressures, hydrodynamics, computer engineering.

Designs and technological studies are conducted in the field of nuclear charges, automatic instrumentation and systems, nuclear explosions recorders, transport and storage containers for radioactive materials, ultradisperse diamond pulvers, ionizing radiation dosimeters, perforators with cumulative charge, indicating instruments for ionizing radiations.

The Center played a leading role in the development of the country's "nuclear shield" and in development of methods for the verification of nuclear explosions. Great attention is paid to research and design support for the elimination of phased-out nuclear warheads.

The Center carries out: fundamental and applied investigations in nuclear physics, high pressure physics, hydrodynamics, computer engineering.

IV. Management

Ownership: State Enterprise

V. Executives

Director: Georgy K. Rykovalov

Deputy Chief Engineer: Valery V. Drozdov

Phone: (351-72)3-20-28

VI. Current mejor activities

Theoretical Physics

In solving the main problem raised before the Institute the role of theorists is high and multipronged. They perform the search for new physical schemes for the developed items, substantiation and statement of the most complicated computations of their operation modes, formulation of full-scale tests set up and analysis of their results, substantiation of the acceptability of the items operation mode for their efficiency, estimation of the influence of the unforeseen changes arising during their operation in systems, ensuring of nuclear weapon safety.

Mathematical Modelling Center

Basic directions of the Center work are associated with the mathematical modeling of the continuum mechanics with taking into account many components, heterogeneity, porosity, dynamic destruction, transition from one aggregate state to the other one.

The techniques have been created for numerical computer calculations of separate physical processes and their different combinations.

The available packages of programs can be used for the computations of physical and technical installations, technological processes and fundamental scientific investigations.

Experimental physics

Experiments connected with studying nuclear explosions hold the important position in the work of the Institute. They are directed to the investigation of processes taking place during nuclear explosions, to the modeling of these processes by means of installations realizing high densities of energy in laboratory conditions, to the development of nuclear technologies.

Work is actively performed with respect to nuclear safety, study of properties of fissile materials and isotopes of light elements, determination of nuclear cross-section, measurement of hydrodynamic parameters of substances, measurement of neutron, X-ray, electromagnetic and gamma-radiations.

The whole row of modeling installations has been created:

- BARS-pulse nuclear reactor with a metal active zone;
- IGRIK, YAGUAR-pulse solution type reactors;
- SOKOL-2-powerful neodymiumdoped glass laser installation;
- EKAR, SOM-installations for investigation of gravitational turbulent mixing;

- GNUV-installation designed for creation of short-term loads by an electrical explosion;
- X-ray installations "Krus" and IRTP-2.

Designing

The specialists of the design bureaus of the Institute solve the wide range of problems with respect to development and design of different mechanisms devices, arrangements, equipment (rigging). Computation department, multiprofile laboratory and experimental complex, test laboratory and SAPR laboratory are successfully interacting in bureaus.

Technology

VNIITF has a great experience in the development of various technologies, in the carrying - out research work and tests of materials, in the processing of control methods of the manufactured items.

Pilot-scale production

The pilot-scale production of the Institute-mechanical, instrumental, casting, pressing assembling production of electronic equipment and special pilot production in conjunction with developers is concerned with the control of the constructions efficiency, processing of separate design and technology decisions and manufacture of prototypes.

Tests

The need of developers for new equipment in the complex test of mock-ups and prototypes with respect to a wide spectrum of environmental factors is successfully satisfied by the unique possibilities of the specialized division of the Institute - the scientific and research testing complex.

Information, patents and licences

A great scientific & technical and patent data file with respect to the wide spectrum of scientific and technical knowledge has been accumulated in VNIITF.

The automatized system of the information service of developments (ASIOR) which is based on the central computer complex EBM ES-1066 and is supported by the unique program of mathematical software of the dialog information systems (MODIS) developed in VNIITF.

Conversion

The program is realized with respect to development and serial production of components of fibre-optical equipment and systems.

The work is performed in the field of medicine, instrument making, irradiation equipment, study of conditions for obtaining powder of ultra-dispersive diamonds (UDA) by the method of explosion, the

development and creation of electrochemical sources of energy, small-scale borehole perforators, portable dosimetric devices.

トピック：ウラル軍事技術展報告

去る 7 月 10 日より 14 日まで、ロシアの軍事技術および軍民転換技術を紹介する全国的展示会である「URAL EXPO ARMS-2000」が、ウラル地方のニージュニイ･タギル市(スヴェルドロフスク州)において開催されました。

ロシアの技術開発力を考える際に常に意識せざるを得ない軍事技術について、そのソ連時代からの変化と軍民転換の状況等について伺い知る貴重な機会と言えます。

当会モスクワ事務所ヴォロンツォフ副所長のレポートをお送りします。

連邦規模の展示会

2000 年 7 月 10 日～14 日の５日間、ニージュニイ・タギル市（ウラル地方スベルドロフスク州）において、兵器、軍事技術、防衛テクノロジーと軍民転換製品の第 2 回展示会《URAL EXPO ARMS-2000》が開催された。会場には、約 200 のロシア企業が 1600 点の自社製品を展示していたが、その多くは陸軍用の兵器や軍事技術であった。

第１回の展示会は１年前の 1999 年 6 月に開催された。参加者らによると、今回の展示会は第 1 回よりも、規模の面でも参加者構成の面でも上回っている。今年は国際的な展示会になり、NATO 諸国を含む 43 カ国からの代表者が出席した。日本からの出席者はロシア東欧貿易会モスクワ駐在員だけであった。この軍事技術展は、今後は 2 年に 1 回開催する予定で、主催者によると、次回は 2002 年の夏の開催になるという。

また、展示会の性格も変わる予定とのことで、外国の軍事技術のサンプルをも紹介しての総合的な商談の場を目指すようだ。言い換えれば、ニージュニイ・タギルを《ロシアのアブダビ》（アラブ首長国連邦の首都アブダビで開催される軍事兵器展示会は世界で最大規模の中のものの一つである）にしたいのだ。

《URAL EXPO ARMS-2000》が、地方だけのイベントでなく、ロシア全体規模のものであることは確かである。ロシア連邦政府特別令（第 2033 条 1999 年 12 月４日より有効）はこの展示会の組織に関してであった。展示会には、クレバノフ・ロシア連邦副首相、ラティシェフ・ウラル地方ロシア連邦大統領代表、ロッセリ・スベルドロフスク州知事、連邦弾薬管理庁代表、連邦軍事兵器管理庁代表、各大企業社長、ウラル地方都市市長らが出席した。展示会最終日には、軍事関係ならなんでも好きなことで有名なプーチン大統領が出席した。このことは、展示会主催者らにさらなる熱意を抱かせたように思われる。

国防省、連邦弾薬管理庁、スベルドロフスク州政府、スベルドロフスク州軍事産業部門企業連合等々が展示会主催者であった。展示会実施のために多大な努力が傾注されたことは一目瞭然であり、展示会は成功し、準備実行は万全であったことを指摘しておかなければならない。

多数の外国からの来訪者

最初の 2 日間は、外国人の入場が許可された。外国人招待客の中でも最も多かったのは、中国人（100 人以上）で、イラン、ベトナム、マレーシア、アラブ諸国、アフリカ諸国からの参加者も見られた。主催者によると、アメリカ合衆国、イタリア、イギリス、その他先進資本主義国からの代表者も参加した。地方紙の紙面には、アメリカ合衆国軍の主要戦車《アブラムス》の主要設計者、アメリカ人の F・レッタ氏の写真が載っていた。10 年前にはあり得ないことだ。

主力展示品の中の一つ、戦車の T-90C はすでに今年マレーシアで開催された軍事兵器展示会に出展され、同地で、T-90C は高く評価され、商談の対象となった。展示会では、マレーシア軍がこの戦車の性能調査のために、ニージュニイ・タギル領内の砲撃練習場におけるあらゆる特別実験に参加していることが報じられた。

全体として、この展示会で紹介されている陸軍用兵器は今日 20 カ国に輸出されている。

展示会入場者数は極めて多く、全くの専門家も、素人の見物人も各地から、またウラル地方の近隣都市から参加していた。見物席も陳列台の辺りも隙間がないくらいであった。大勢の若者、特に女性が多かったことは驚くべき点である。彼等が参加したのは、軍国主義精神とかいうものではなく、好奇心や興味から、または技術知識を得るためであろう。参加者の多くは兵器工場の代表らであり、基本的に年齢が 50－60 代のソ連時代に育った人々である。彼等はお互いによく知っているようであった。

迫力ある実演、実走

一日目は参加者は２つあるごく普通の屋内パビリオンで展示品を見学し、砲兵技術、戦車、軍事輸送技術、博物館蔵の軍事品が展示されている屋外をまわった。二日目は、軍事兵器の実演、実走が特別砲撃練習場で行われた。展示会自体と軍事技術デモンストレーションは、いずれも同じ場所で行われ、ニージュニイ・タギル鉄鋼試験科学研究所所有の《スタラテル》砲撃練習場の領内で実施された。このロシア内でも大規模な砲撃練習場は、幅 1.5 キロメートル、長さ 50 キロメートル以上もあり、ニージュニイ・タギル市から 10 キロメートルのところにある。このような砲撃練習場の広さがあって、砲兵・ミサイル技術のあらゆる実験が可能なのである。

ソ連時代に外国人がここに行きつくことがあったとはとうてい考えられず、今日、段階的な社会生活の自由化と、軍事技術協力拡大がロシアにとって必要という２つの要因からそれが可能になった。

ニージュニイ・タギル市は《ロシアのデトロイト》であり、軍事生産センターの一つとして有名である。ウラル地方の最も古い都市の中の一つであり、18 世紀には鉄鋼石が採掘され、そしてここにはロシアの有名な事業主デミドフの最初の溶鉱炉が建設された。製鉄業は現在も発展し、市内には製鉄コンビナートがある。そこには、ロシアで初めてのパイプライン用大径鋼管生産用圧延機《スタン 5000》を据え付けることが計画中である。このプロジェクトは向こう数年のロシア経済にとって最大のものの一つになることに間違いはなく、ロシア政府は外国企業や銀行の参加を期待している。

多くの来賓ら、特に外国からの来賓はこの軍事技術展示会から深く忘れがたい印象を得たと思われる。約 300～500m 離れた火点へ順番に戦車、曲射砲、その他の軍事技術が出て行き 2～20km 離れたところにある目標に向かって射撃のデモンストレーションを行った。そのような光景を生まれて初めて見聞きした人にとっては特に深く印象に残ったと思われる。6km まで目標が近くなった時は既に双眼鏡なしで砲弾の炸裂が観察できた。射撃場には、（軍人以外の人間にとって）恐ろしい騒音が轟いた。目標砲撃の正確さは、特別に設営されたテレビ画面で観察することができた。ロシア人としては二様の印象をもった。一方で専門家でなくともわかるほどロシア製の物を含む軍事技術が日進月歩の発展をとげたこと、コンピューターにより砲弾の照準をあわせ、その結果、射撃の正確さとともに効果がひじょうに上がったということである。特に専門家にとっては一般人にとってよりもさらに有益な情報を吸収したことは確かである。兵器紹介は全観覧席に専門家による英語訳付解説で中継されたことも指摘したい（これもまたロシアにおいてはかなり珍しいことで、以前は有り得ない事である）。

もう一方で、砲弾射撃と手榴弾の結果（例えば、100m離れた場所からの擲弾筒から発射された手榴弾は効果的に命中し、木造の家は全壊した）を観察した後、人間的には少し、恐ろしく心配に感じた。

国が支える軍事産業

全ての観察を通じて、以前の通り軍事産業コンプレックスにロシアの最高の知恵と力があり、世界で唯一のまたは世界の中でも上位に位置する軍事技術の発展の実例が多くあることが感じられた。

この事実をいろいろな角度から検証することができる。一方で明らかにロシアはある段階でソ連時代の軍事産業コンプレックスの豊富な知的潜在能力の保存に成功した。近年は国からの軍事産業に対する支出が拡大された。複雑で高価な軍事産業の構築は、輸出による利益のみでは発展することはできない。

ソ連時代程でもなくとも、結局ロシア連邦中央が軍事産業コンプレックスを支えている。実のところ、《URAL EXPO ARMS-2000》自体がかなりの部分を連邦政府の費用負担により実施された。言い換えれば、参加費だけでは（外資系企業の参加費は１人当たり１５０ドル）展示会実施

においての経費全体はいうまでもなく、砲弾射撃の際の砲弾費さえカバーすることは不可能である。

例えば、無人偵察機《ミツバチ》は、地上から操縦できる航空機だが、部外からの印象でさえ、そのフォーメーション飛行に1万ドル、可能性として10万ドルの経費がかかるということは十分わかる。ジェット射撃システム《雹》は展示会開催中、毎日デモンストレーションを行い、毎回合計 40 回の射撃を実地した。そしてこれもまた安くはない経費である。このような例が多々ある。

ウラルの軍事企業群

ロッセリ・スベルドロフスク州知事は展示会の成功と多くの来賓に満足を隠さなかった。これは理解できることである。軍事産業は経済分野の中の中心軸の一つである。これはエカテリンブルグとヴェルフナヤ・イセチの弾薬製造工場や展示会の行われた射撃訓練場からそれほど遠くない場所にある巨大企業《ウラルワゴン工場》における戦車製造工場を挙げるだけでも十分である。

全体に、基本的展示品はウラル地方の企業の製品であった。第一に、スベルドロフスク州、ペルミ州、チェリャービンスク州とウドムルト自治共和国である。ペルミ州は別個のパビリオンにおいて紹介されていた。ウドムルトは銃器生産で有名であることは知られている。そこでは、世界中で有名な自動射撃銃カラシニコフの設計者が働いており、展示会にも現れた。展示会には、軍事武器だけでなくスポーツや狩猟用の銃器も数多く紹介されていた。

同時に他の軍事産業で有名な州からの展示品もあった。オムスク州（最先端のロシア製戦車T90の生産《オムスクトランスマシュ》工場）、トゥーラ州（ロシアで一番古い武器生産地）等があまり目立たずに紹介されていた。全部でロシア連邦の22州が展示を行っていた。

軍民転換はあまり振るわず

しかしながら、ロシアにおいて結局のところ軍事技術の発達がロシア国民の発展よりもかなり速いということは残念なことである。言い換えれば、軍民転換はうまく進展していないということである。少なくとも、この展示会において、注目に値し、日本市場で浸透しうる転換技術は見られなかった。しかしながら、もちろん専門家の目で確かめる必要性はあろう。

軍民転換、つまり軍事技術から民間商品生産への移行ではなく、民間用途商品と軍需品の《平行》生産に関する話をしたほうが良い。例えば、軍服を生産している会社が同時に登山家や、車両や二輪スポーツ用の悪くないウェアを生産している（例として、ペルミ市の《キラサ》社）。または、双眼鏡や、ナイトスコープ、照準器、その他の民間用途として使用できる光学技術を例にとることができる。現代的なデザインと高品質の商品は輸出の可能性もある。

とにかくも、展示会の根本的な目的は軍民転換への投資の要求というよりもむしろ、軍事技術製品の輸出を発展することだったことは明らかだ。これに関しては、外国人参加者の構成が証明している。軍事技術製品購買の潜在能力がある国が圧倒的に多く、その中でも中国が一番だった。

かつて、技術開発の精鋭はまず軍事部門に集められた。しかしロシアは既に軍国主義国家ではない。しかし、同時にロシアはソ連から膨大な軍事コンプレックスを受け継いだ。その民間路線への転換は今日のロシアにはない巨額の資金を要している。科学技術製品分野の精鋭達は近年苦しんだが、結局のところ、見捨てられずにまさに軍事産業コンプレックスに残っている。科学技術者は基本的に逃げ場のない軍事技術（民間レベルではなく）分野で働いている。軍事生産業、軍事加工品の分野にはソビエト時代の大がかりな基盤があるが、民間の科学技術分野は著しく弱い。

展示会のカタログを見ると、軍需企業間の協力がよく組織されているという結論が引き出せる。ソ連時代からの古い関係が、今日も生きている。複雑な軍事技術はその殆どは基本的に国中に散らばっている製造業者のパーツから生産されている。ロシア民間産業もそのようなレベルの高い協力関係に達することを願いたい。

主要な展示品

この展示会についてマスコミで報道され、その多大な情報から教えられるように、多くの展示品は海外の類似品のレベルより勝っているようだ。専門家でない私達にとってはその判断は難しいが、最も対外的に鮮明な印象を与えた兵器と技術の具体的な型を紹介したい。（下記）

- 改良型自動曲射砲　《Msta‐SM》
- 戦車　T‐90C
- 自動迫撃砲　《チューリップ》
- 一斉射撃ジェットシステム　《雹》
- 高射ロケット砲　《Tor‐M》
- 無人偵察機　《ミツバチ》

それ以外に、特に優良の展示品、製品を提供した企業も紹介しておく。

- 国有単一企業（GUP）《ヴェルフネツーラ車両工場》（スベルドロフスク州ヴェルフナヤ・トゥーラ市）‐　砲弾のボディ
- 有限会社（OOO）《ザゴルスク光学機械工場》（モスクワ州セルギエフパサード市）‐　双眼鏡、照準器
- GUP《イジェフスク機械工場》（イジェフスク市）‐　猟銃、合図用・スポーツ用ピストル
- 株式会社（OAO）《イルビット自動二輪工場》（スベルドロフスク州イルビット市）‐　軍事・民間用途用大型自動二輪車、アメリカに自動二輪車を輸出している唯一のロシア企業
- 株式会社《カザン光学機械工場》‐　双眼鏡、距離計

- 株式会社《コンツェルン《イジュマシュ》》（イジェフスク市）－　誘導弾
- 株式会社《クルガン車両工場》（クルガン市）―ロシアの軍事産業コンプレックス指導的企業の一つ、歩兵用装甲の生産を行うロシア唯一の企業
- M.L.ミーリャ名称モスクワヘリコプター工場（モスクワ市）－　ヘリコプター《Mi》（ロシアおよびCIS諸国で使用されている全ヘリコプターの95%、世界の生産高の25%を占め、60ヶ国に輸出している）
- 株式会社《モトビリハ工場》（ペルミ市）曳航可能な大砲や自動砲、戦車砲その他を含む大砲技術製品、デモンストレーションの最初に公開された152mm曲射砲《Msta－M》の製造社
- 株式会社《ムロム車両工場》（ウラジーミル州ムロム市）－　戦車・装甲車の部品、軍事分野の最も古い企業の一つ
- 株式会社《ムロムディーゼル機関車工場》－　高速キャタピラー車、軍事用牽引車、道路掘削車
- 株式会社《ニージュニイ・タギル冶金コンビナート》ロシア大手鉄鋼業者の一つ（スベルドロフスク州ニージュニイ・タギル市）－　展示会では戦車製造のための円形圧延機を出展
- GUP《国立科学生産企業《スプラフ》》（トゥーラ市）一斉射撃システム《雹》（《カチューシャ》）の加工製造
- GUP《ウラルワゴン工場》（スベルドロフスク州ニージュニイ・タギル市）－　戦車技術
- 株式会社《ウラル車両工場》（チェリャービンスク州ミアス市）－　高走破性大型ディーゼル車

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