



**«THE LENINGRAD DIVISION OF
CENTRAL RESEARCH AND DEVELOPMENT
TELECOMMUNICATION INSTITUTE (LO ZNIIS) -
Leading institute of the Ministry of Communications
And mass communications of the Russian Federation»**

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LO ZNIIS

- **Year of establishment : 1918**
- **The status: the state enterprise, subordinated to Federal communication agency Minkomsvjazi of Russia**
- **Number: nearby 360 persons (~190 scientific and technical staff), including 7 d.t.n., 16 k.t.n., 1 k.e.n.**
- **Directions of ITR and research assistants operations:**
- **Development of the telecommunication and test equipment** (~80 person)
- **System researches:** development of standard documents and concepts, the organization of skilled zones and certification (~85 person)
- **Operational and information support for communication networks operators** (~25 person)

SCIENTIFIC WORKS OF INSTITUTE

System researches:

- Branch NPA for Minkomsvjaz and Rossvjaz;
- Corporate standards for telecommunication network operators;
- The concept of mobile communication development in the Russian Federation for the period till 2015;
- The concept of payment for goods and services with usage of mobile radio telephone communication networks;
- The concept of standard TETRA implementation in Russia;
- Principles of development and interaction of by fixed and mobile communication networks at services of high-speed data transmission rendering;
- Methodological support of new technologies implementation (especially in SZFO): SoftSwitch, WDM, PON, SIP terminals.

Scientific and inventive activity :

- About 300 scientific publications for **5** years (since 2005);
- Results of scientific and technical activity: the rights on which belong to LO ZNIIS (patents, certificates) – **24** objects;
the rights to which belong to the third parties (patents) – **25** objects.

INSTITUTE DEVELOPMENTS

- **Technical support and hardware upgrade DX200 of the firm Nokia (within the limits of intergovernmental relations).**
- **Development, integration, adaptation, upgrade and implementation of UPATS ATCL-90 on the Ministry of Defence network .**
- **Development MSU SAPPHIRE. Combined automatic telephone exchange (IP/TDM) with SoftSwitch functions (class 4, 5), adapted for UTN and RTN .**
- **Development of the equipment of network clock synchronization (splitters, VZG).**
- **Development of the test equipment (Prisma, Amulet, Crab, Cometa).**

THE INTERNATIONAL PROJECTS

• **System attending of MSS Open Society «SZT» development on the base of RESIP together with Nokia Siemens Networks**

- development of recommendations on the base of the stated international standards;
- spanning of all stages from designing before implementation and decisions maintenance;
- preliminary modeling and testing ;
- support of multivendor decisions ;
- creation of own distributed test environment with engaging regional scientific and technical centers .

• **Development of SBC software together with Iskratel**

- the guaranteed quality and safety of service;
- protection against illegal access;
- the pass of the transit traffic and its correct tariffing;
- the codecs coordination.

• **Researches on WDM-PON technology application together with ETRI, Corecess, Ubiquoss**

- development of requirements to equipment adaptation for communication networks of the Russian Federation ;
- carrying out of tests at Technopark LO ZNIIS network .

THE MAIN DIRECTIONS OF WORKS

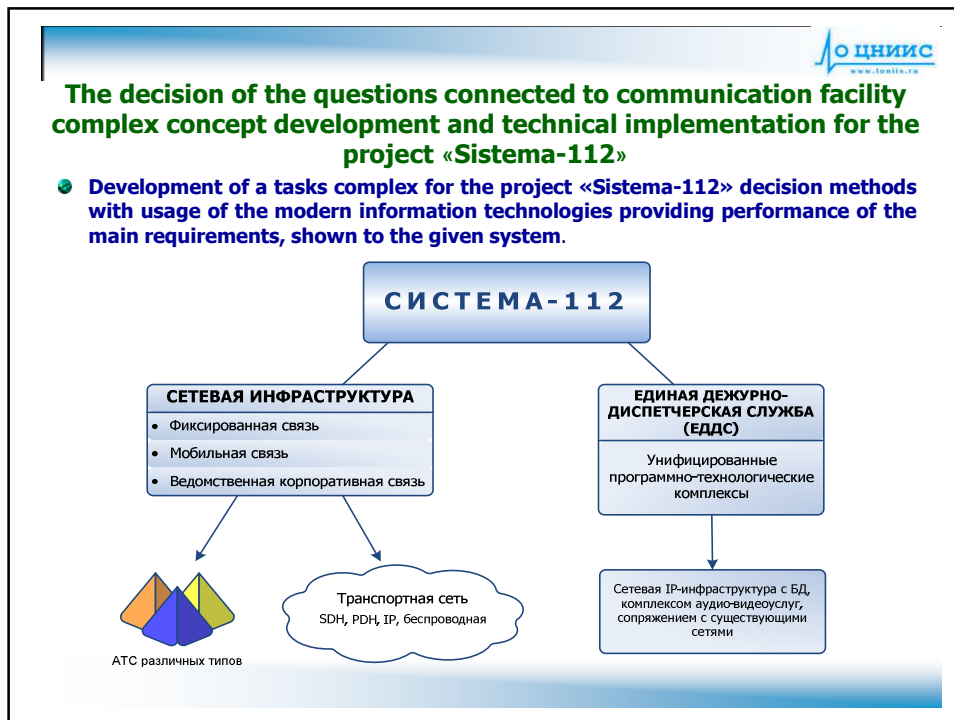
- System researches: development of the regulatory-legal acts, concerning questions of multiservice networks creation and principles of their functioning.
- Development of innovative network products, unified technical decisions for new generation communication networks creation concepts.
- Development, manufacturing and delivery of modern IP telecommunication equipment for creation of multiservice communication networks.
- Certification and expertise.
- Operational and information support for hardware manufacturers and communication network operators on the Technopark LO ZNIIS basis.
- Maintenance, repair of the delivered equipment, mounting and starting-up and adjustment operations.

Within the limits of implementation and development of platform IMS in LO ZNIIS, system and conceptual questions of creation IMS are developing :

- ✿ Elaboration of operators communication networks development Concepts on intermediate term and long-term perspective.
- ✿ Development of system-network decisions on new technologies (PON, DWDM, NGN/IMS, femsotes, sensor networks, etc.) introduction on communication networks of operators.
- ✿ Development of decisions on systems OSS/BSS organization and development.
- ✿ Development of system-network decisions on communication networks convergence ensure.
- ✿ Analysis of communication technologies carrying out with the purpose of optimal technological base choice for the operator network development.
- ✿ Carrying out of the traffic analysis in communication networks, development of estimation quality criteria for data services.
- ✿ Networks and communication systems audit carrying out.

Complex of the SAPPHIRE equipment. The further development directions

- ✿ Implementation of compatibility with exterior interfaces of wireless communications mediums on technologies Wi-Fi, Wi-MAX, LTE.
- ✿ Development and implementation in constructed IP-networks structures of a key fragment – telecommunication platform IMS (IP Multimedia Subsystem) which provides:
 - the uniform scheme of multimedia services provision;
 - a unified method of mobile, wire communication and IP networks convergence;
 - the new mechanism of the operator business development, enveloping mass market.



 **ЛО ЦНИИС**
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Participation of LO ZNIIS in meetings concerning implementation of the project «Sistema-112 » in regions

Republic Komi, Syktyvkar, on March, 15th 2011.
(the Representatives of the state and regional organs took part in meeting deputy director of department of a state policy in the field of communication of Minkomsvjazi of Russia Moiseeva T.A., the reviewer of RK Head Seljutin A.V., etc.), the Ministry of Emergency Measures (the chief of communication of Northwest regional center of Ministry of Emergency Measures Vlasov. C.B., chief GU of the Ministry of Emergency Measures of Russia on RK Manujlo O. L), «NIS GLONASS» (the assistant to general director Jurasova L.V. and the director of Department of support of reaction and regional development of the Program of "ERA-GLONASS" Popov AP), LO ZNIIS (the director of institute Osadchij A.I.), developers of system decisions.




At meeting, the decision to prepare the preliminary specifications on creation and implementation of « Sistem-112» in Republic Komi taking into account the Russian and international experience, and also creation in the Russian Federation system «ERA-GLONASS» was accepted.



MRF "Ural" Open Society "Rostelecom", Ekaterinburg, on May, 25th 2011.
In meeting participated: **The Deputy director of macroregional branch - technical director Bagrov I.B., the chief of communication of communication department notification and MANAGEMENT information system of the Ministry of Emergency Measures GU of Russia on Sverdlovsk area Alipov A.A., the director of LO ZNIIS Osadchij A.I., chiefs of scientific and technical centers of LO ZNIIS Petrichenko A.K. and Gilchenok L.Z.**
Within the limits of meeting experts of LO ZNIIS presented presentation with sentences on implementation of the project «Sistemy-112» in MRF «Ural».

Development of the firmware means KAPSK complex

KAPSK is the integration system with channel switching and packet switching technology, intended for easy passage to IP-networks :
The TDM-switchboard, IP-switchboard and the media gateway (MG).

Allows to give to subscribers high quality telephone communication, data transfer, and also a wide dial-up of multiservice services:

- Audio and video-conferences;
- The automatic notification;
- Selector meeting;
- The Call-centers ;
- IP TV services;
- IP- video surveillance;
- A telemedicine ;
- Remote learning ;
- Interactive communication, etc.

SBC «Obereg»

- ☛ Provides safety of a corporate IP-network at connection to a public service network and INTERNET.
- ☛ Provides the guaranteed quality of subscribers service.

The diagram illustrates the SBC «Obereg» acting as a bridge between two networks. On the left, the 'Корпоративная сеть' (Corporate network) contains SIP-phones and an 'IP Access' cloud. This connects to the 'SBC «Оберег»' (SBC 'Obereg'), represented by a red server icon. On the right, the 'Сеть оператора А' (Operator A network) includes a 'Сервер обработки вызовов' (Call processing server) and SIP-phones. Below it, the 'Сеть оператора В' (Operator B network) contains an 'IP' cloud, SIP-phones, and servers for 'VoIP услуги, SIP Proxy, Сервер приложений, Media сервер.' (VoIP services, SIP Proxy, Application server, Media server).

Internetwork screen «BarGUs»

It is intended for access demarcation in segments of the local computer networks constructed with usage of TCP/IP protocols stack .

Provides :

- The continuous round-the-clock work without operator intervention.
- Creation of the cryptography protected communication path (IP-tunnel) between a LAN (on the second class).
- Concealment of an inner structure of a securable LAN from exterior hosts (network addresses translation).
- Filtration of IP-packages from exterior and internal networks according to the inserted configuration parameters.
- Authentication and identification of the administrator at remote requests about access .
- Network remote control on the basis of web-technology .
- Control of software operability and integrity .

Modifications and application of ME «BarGUs »

«BarGUs-K» - for handling of the confidential information.

«BarGUs-SS» - for information processing with a security label not above «Top secret».

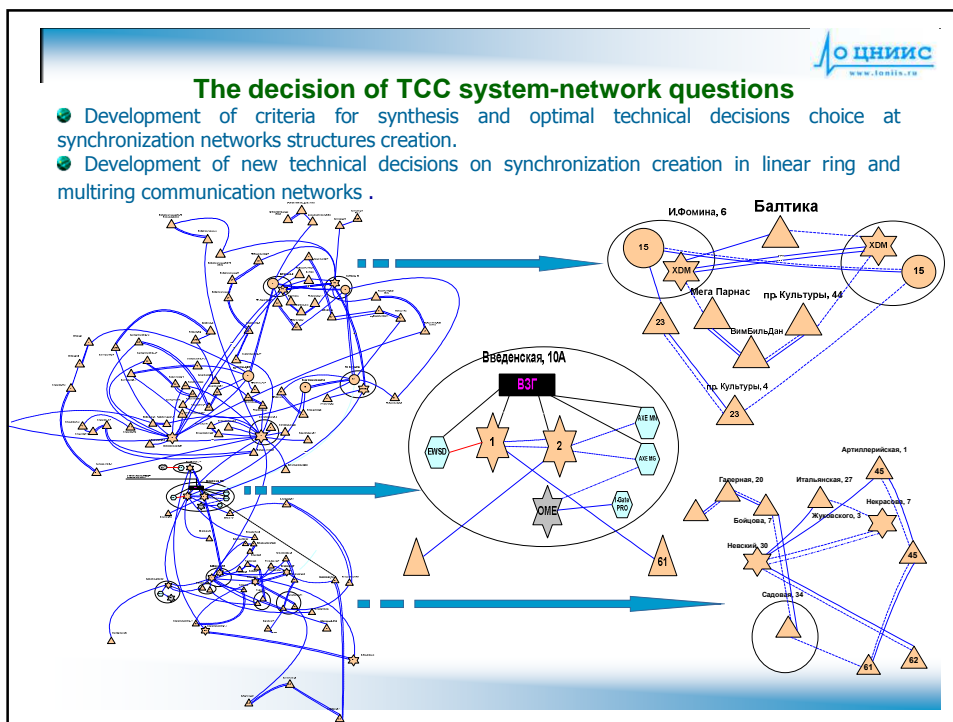



IP- scrambler «Barrier»

- It is intended for support of cryptography protection of the information transferred on open communication paths, and provides possibility of the protected territorially distributed local computer networks organization, interacting among themselves on TCP/IP protocol.
- Functions in a full duplex mode: has two independent paths for handling outgoing (encryption) and incoming (decryption) traffics. In each direction processing rate to 512 Mbit/s is provided, and the full transmission capacity makes 1 Gbit/s.
- Provides:
 - The continuous round-the-clock work without operator intervention.
 - Creation of the cryptography protected communication path (IP-tunnel) between a LAN.
 - Concealment of an inner structure of a securable LAN from exterior hosts .
 - The transparent encryption/decryption of IP-packages without setting of additional firmware means.
 - Filtration of IP-packages from exterior and internal networks according to the inserted configuration parameters and keys.
 - packages integrity control, provided with data imitation-protection mechanisms.

SCIENTIFIC AND TECHNICAL CENTRE FOR TELECOMMUNICATION NETWORKS SYNCHRONIZATION

- The decision of system-network questions of network clock synchronization (TSS).
- Unique, protected by patents, technical decisions on systems TSS creation.
- Methodical attending of design works and projects implementation on systems TSS.
- Standards development for TSS systems of departmental communication networks.
- Clock equipment development.
- Measurements of synchronization quality parameters on communication networks of operators.
- Acceptance tests and clock equipment starting-up and adjustment works.
- Work on audit of communication networks synchronization systems.
- Works on support of packet switched networks and existing circuit switched networks interaction.
- Research of communication networks synchronization singularities at implementation of transmission systems DWDM.
- Research of communication networks synchronization singularities at NGN development.







Synchronization equipment development


- Development of the equipment with the parameters considerably exceeding existing requirements (PC TSS-M, M100, M101).
- Development of the synchronization equipment allowing remotely and flexibly adapt structure and functions of synchronization system to specific needs and current network structure when in operation (M100, M101).
- The equipment development for phase, frequency and time measurement and synchronization (M101T, M101).
- Development of network hub sites synchronization innovative principles in the absence of possibility of network TCC signals immediate usage (M101-IP).

The multifunctional synchronization device M100
(The certificate of conformity OS-2-SP -0930)



The network synchronization clock signals branching device PC TSS TH
(The certificate of conformity OS-2-SP -0930)





LO ZNIIS TECHNOPARK

- ✿ It is created in 1997 at Ministry of Communications of Russia initiative, as association of equipment support Centers and leading telecommunication equipment manufacturing companies decisions.
- ✿ Since 2001 it enters into system of telecommunication equipment operational support according to «Requirements to system of telecommunication equipment operational support, applied on «Vzaimouvjazannoj (interlocked)» communication network of the Russian Federation» (*Application to the order of Ministry of Communications of the Russian Federation and MAP of the Russian Federation» from January, 15th, 2001 № 2/23*).

THE WORKS MAIN DIRECTIONS :


- **The technical decisions for communication networks modeling and testing: creation of the environment for telecommunication equipment testing at various stages of life cycle (development - certification - implementation - maintenance).**
- **The telecommunication equipment functioning analysis and its maintenance informational support: collection and the analysis of statistical data, development of instructions and recommendations about implementation and equipment maintenance, consulting technical seminars carrying out .**



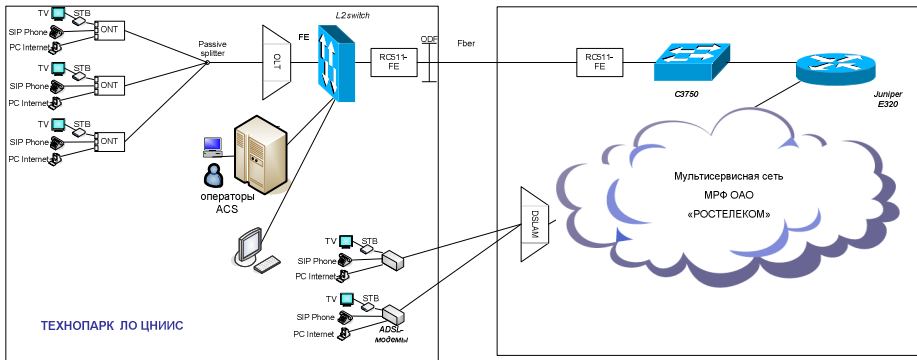
LO ZNIIS TECHNOPARK DEVELOPMENT

Now the Technopark develops as complex subdividing on mastering of new telecommunication technologies and performs the works, allowing to optimize implementation of the modern equipment and decisions process on communication networks of the Russian Federation, and also promoting intellectual-personnel potential development.

- **2009-2010:** a new subject direction: subscriber devices **autoconfiguring and control on TR-069** protocol (methodological support of various vendors decisions testing for Open Society «SZT»).
- **2010-2011: A demonstration zone of new technologies and decisions** (Home Device Manager of the Alcatel-Lucent company; SURPASS Business Connection of the Nokia of Siemens Network) company.
- **2009-2011: Consulting technical seminars** on a subject «Signaling protocols NGN» with practical training carrying out on the basis of a modeling network of Technopark.
- **2011:** Within the limits of IskraLON the **homologation Centre** for compatibility testing of indirect vendors CPE equipment with equipment SI3000 Iskratel is created.



The combined test bench on the Technopark for SHPD: GPON, ACS on TR-069, ADSL basis



- GPON equipment compatibility testing.
- Testing of autoconfiguring systems (ACS) on the TR-069 protocol basis.
- Quality of «Triple Play» services provision on the basis ADSL testing.



THE INFORMATION SOCIETY QUESTIONS

On October, 20th, 2010 the Government of the Russian Federation states a governmental program of the Russian Federation «the Information society (2011 - 2020)».

The responsible executive of the Program - the Ministry of Communications and mass communications of the Russian Federation.

Co- executors of Programs: The Ministry of health and social development of the Russian Federation, the Ministry of culture of the Russian Federation, the Ministry of Education and Science of the Russian Federation, the Ministry of regional development of the Russian Federation, the Ministry of economic development of the Russian Federation, Federal Agency of protection of the Russian Federation, Federal Agency of safety of the Russian Federation, subjects of the Russian Federation.



LO ZNIIS took part in work of the Eighth Tver social and economic forum «the Information society» on June, 30th - July, 1st, 2011. The forum has been devoted to questions of an information society in Russia current state, to perspectives of its development, and also key actions in this sphere.

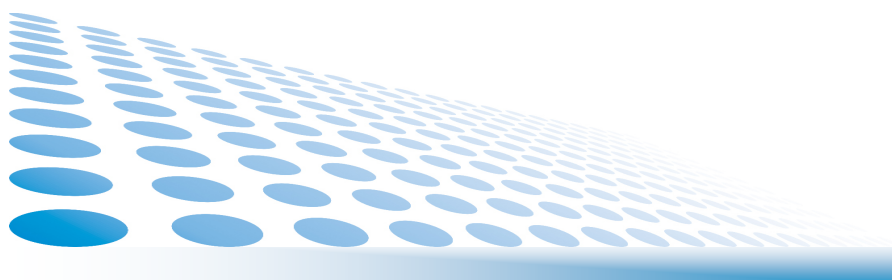


COOPERATION WITH DOMESTIC EDUCATIONAL INSTITUTIONS AND SCIENTIFIC AND TECHNICAL ENTERPRISES

In 2010-2011, Agreements on scientific and technical cooperation of LO ZNIIS with following organizations are signed:

- The St.-Petersburg state university of telecommunications after prof. M.A. Bonch-Bruevich (SPbGUT);
- The St.-Petersburg state Polytechnical University (SPbGPU);
- The St.-Petersburg state university (SPbGU);
- Military academy of communication after S.M. Budyonny;
- Military-space academy after A.F. Mozhaisky;
- FGUP «scientific research institute «Rubin»;
- FGUP «scientific research institute «Scale»;
- Open Society «NPO Factory «Volna»;
- Open Society «Inteltech»;
- Open Society «Russian institute of a powerful radio structures» (Open Society «RIMR»).

LO ZNIIS PROPOSALS ON JOINT COOPERATION PERSPECTIVE DIRECTIONS

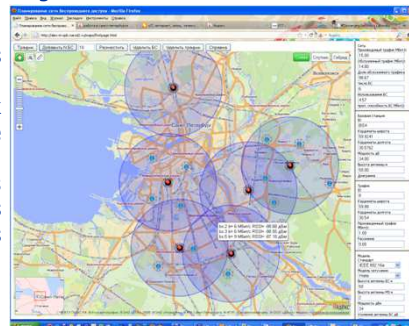



SCIENTIFIC DIRECTIONS ON POST-NGN TECHNOLOGIES

- ➔ Cognitive infocommunicative systems and networks.
- ➔ Development of problem-oriented convergent decisions.
- ➔ Development of perspective hybrid FiWi access networks.
- ➔ Systems of high-precision synchronization for IP-networks.
- ➔ Lidar and acoustic methods of the various objects state network analysis.

COGNITIVE COMMUNICATION NETWORKS

- Ⓢ Research of cognitive communication networks creation questions. Development of necessary functionality implementation methods in the modern structure of communication networks creation.
- Ⓢ Research of quality of service questions in cognitive communication networks. Development of traffic and quality of service patterns. Research of management methods taking into account cognitive communication networks functionality.
- Ⓢ Development of wireless access networks creation and control methods. The decision of wireless access network creation tasks taking into account the subscriber traffic and quality of service. Subscriber access network managements taking into account cognitive networks possibilities regarding power, base stations position and directivity of antenna arrangements control.



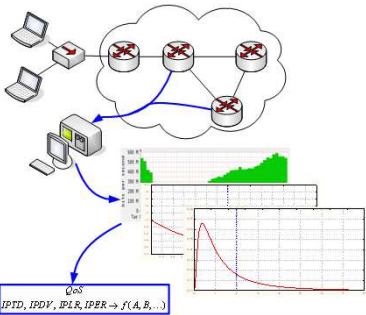

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TRAFFIC AND QUALITY OF SERVICE

- **Researches of the subscriber traffic of various telecommunication services users:**
 - Analysis of need for a telecommunication services. Analysis of need for the modern services, the forecast of users need change, the forecast of traffic parameters.
 - Traffic measurements at operating communication networks. The analysis of specific traffic parameters for various telecommunication services.
- **Modeling of the traffic and quality of service in communication networks:**
 - Creation of communication networks analytical and imitative models. Analysis of traffic parameters, quality of service (QoS). Statistical properties of the traffic research.
 - Development of management methods and communication networks designing, taking into account requirements to quality of service.

Development of traffic and quality of service parameters measuring techniques:

Usage of statistical techniques, allowing to provide measurements accuracy and lowering of requirements to sample volumes and measurements durations.




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ADAPTATION, CERTIFICATION, TESTING

- **Adaptation of the equipment and decisions (including software) for usage on communication networks of Russia.**
- **Performance of certification and the equipment declaration works within the limits of Exploring Centre accreditation area.**

For example: The decisions regarding management systems and OSS for operator Ethernet networks and MPLS networks certification and adaptation to application conditions on the Russian Federation networks.
- **Development of technical requirements, programs and testing techniques, testing carrying out, preparation of total protocols and the inferences by results of testing.**
- **Organization of verification benches on the basis of LO ZNIIS Technopark for the purpose of work on check for equipment and decisions of the company-supplier functional compatibility with the equipment and decisions of other vendors.**

METROLOGICAL SUPPORT OF COMMUNICATION NETWORKS

New generation of measuring apparatuses for telecommunication systems (are imported to the State register of measuring apparatuses of the Russian Federation):

- Measuring instrument of communication networks functioning indexes **CRAB**: objective measurement and analysis of communication networks functioning quality characteristics.
- The telephone connections generator **PRISMA-M**: checking and the statement of SIDS type (system of connections duration measurement) for telecommunication systems.
- IP-connections generator **AMULET-2**: checking and the statement of SIDS type (system of data transfer measurement) for telecommunication systems.
- Instrument PPT **COMETA-8**: for carrying out of coin telephones tariffication devices examinations and tests for the purpose of the measurement instrument type statement .

SOFTWARE DEVELOPMENT

- Program implementation of signaling various types in NGN equipment and their interactions with existing signaling systems (SS7, PRA, 2BCK). The decision of conjugation questions at various levels: hardware, program and information (DB actualization in a real time mode).
- Development of protocols at conjugation of communication complexes and the MANAGEMENT information system in system-wide software limits.
- Software development under OS Linux for ecological safety estimation systems: systems of decision-making support for chemically dangerous objects and radiation-dangerous objects (SPPR HOO POO).
- Software development in special projects frames for power structures.

CONSULTING SERVICES

- System attending of operators communication networks development together with the foreign company, rendering consulting services in the telecommunications field.
- Methodological toolkit development for control by number of large telecommunication company staff.
- Projects consulting attending at various stages, operational support of the equipment and manufacturing company decisions.
- Customer consultations rendering, modeling of problem situations, carrying out of testing on the Technopark LO ZNIIS basis.
- Carrying out of information-consulting seminars with a practical training on the Technopark LO ZNIIS basis.

MARKETING SERVICES

- The analysis and forecast of telecommunications technologies and services development in the world and the Russian Federation, the analysis and forecast of traffic changes.
- Carrying out of marketing researches for new equipment/services implementation on communication networks of Russia: the target market analysis, customers (telecommunications operators, various categories of users) requirements analysis, analysis of competitors state, development of marketing strategy and the marketing plan.
- Organization and support of the equipment and decisions demobenchs of hardware producing company on the LO ZNIIS Technopark basis for demonstration to potential customers, including and within the limits of conferences and seminars.
- Carrying out of joint and one-sided marketing actions, technical seminars.

INFORMATION SERVICES

- Documentation translation from English on Russian, including technical specifications adaptation for the Russian customers.
- Collection of statistical data on operation of various vendors telecommunication equipment on communication networks of Russia. Preparation of analytical surveys.
- Various information platforms/information infrastructure (for example, databases, e-learning, etc.) creation.

SERVICES ON EQUIPMENT REPAIR

- Repair of various telecommunication equipment carrying out on the LO ZNIIS basis.
- Possibility of ZIP regional warehouse organization.

THE INTERNATIONAL COOPERATION

- Foreign equipment adaptation to the Russian market conditions.
- Joint development of the telecommunication equipment.
- Delivery of LO ZNIIS equipment to the CIS countries and near abroad and its technical support.
- Cooperation with foreign exploring centers.
- Official meetings with foreign partners, including within the limits of the intergovernmental commissions on economic cooperation .



LO ZNIIS for today is the enterprise, possessing on the demanded scientific, and technical potential for the decision of communication networks upgrade actual tasks on the modern information technologies basis



THANK YOU FOR YOUR INTEREST AND ATTENTION !

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