

## VNIIRA.

AIR TRAFFIC MANAGEMENT  
SYSTEMS AND AIDS

Complexes of Air Traffic  
Control Automation Aids

Air Surveillance Aids

Navigation and  
Landing Radio Systems

Weather Radar Systems

Airborne Navigation and  
Landing Equipment

Antenna and Feeder  
Systems and Devices

Automated Flight  
Test System (ASLK)

ATC Training Systems



JSC VNIIRA

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## Information about the Company:

All-Russian Scientific Research Institute of Radio Equipment (JSC VNIIRA) has specialized in the development, production, commissioning and maintenance of navigation and landing systems and aids, air traffic control automation, airborne equipment and weather radars.

Areas of activities:

- | automated ATC and ATM systems and facilities for various control areas and for large regions and separate countries;
- | simulator systems for AT controllers;
- | surveillance, approach control, secondary, and weather radars;
- | ground and airborne equipment of short-range radio navigation systems and instrument landing systems;
- | airborne equipment of range measuring, aircraft (A/C) collision avoidance, and early ground proximity warning systems, and transponders;
- | onboard integrated navigation and landing systems;
- | ground and airborne aids of the Automatic Dependent Surveillance-Broadcast (ADS-B).

In 1999 JSC VNIIRA has got a status of the Federal Scientific Production Center.

In 2004 JSC VNIIRA has joined JSC «Concern PVO «Almaz-Antey».

When working out a solution, VNIIRA specialists prove again and again that they are capable of achieving more, inasmuch as each follow-on development surpasses the previous one. The long experience and our Customers' acknowledgements confirm it.

VNIIRA is far more than:

- | 65 years of the successful performance for the benefit of air safety;
- | 150 prototypes of radio-technical systems and the complex of ground and airborne radio instruments;
- | 1 300 Inventor's Certificates;
- | 60 complexes of ATC automation systems and facilities for airports and regional centers of Russia and other countries;
- | 100 types of home-produced aircrafts and helicopters employ the airborne equipment, navigation and landing facilities developed by VNIIRA;
- | 1 600 employees including 11 Doctors of Engineering Science and 68 Candidates of Engineering Science.



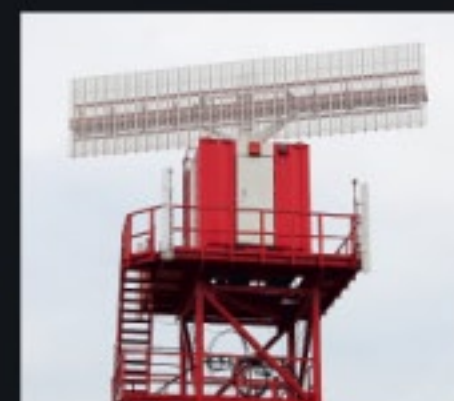
JSC VNIIRA-OVD was founded in 1992 as a subsidiary of JSC VNIIRA representing JSC VNIIRA in the CIS and far abroad countries in the area of development, delivery and service of the air traffic management (ATM) systems and facilities.

JSC VNIIRA-OVD holds the State Licenses for development, manufacture and maintenance of the entire range of the presented equipment, as well as the State Research Organization Accreditation.

Primary Activities of JSC VNIIRA-OVD:

- | Development of system projects and programs on comprehensive air traffic control automation for various countries and single regions;
- | Automated ATC systems;
- | Secondary and primary surveillance radars and radar facilities;
- | Ground-based transceiving surveillance stations (ADS-B) and data transmission links;
- | Training-simulating complexes and training systems for ATC controllers;
- | Airborne collision avoidance systems;
- | Airborne ATC transponders;
- | Radar plot extracting equipment;
- | Equipment for interfacing, data conversion and transmission, remote control and monitoring of airport radio systems and facilities.

# JSC VNIIRA-OVD



*Mrs. Tatyana Makarova, Director General of JSC VNIIRA-OVD: «Our systems are installed everywhere, our team is unique!».*

«It's not easy to be always at our best. Nevertheless, the number of customers and the extensive geography of deliveries prove that we still guarantee a high-level work. The VNIIRA-OVD's systems and facilities serve the air safety purposes from Vladivostok to Minsk, from Moscow to Cuba, in Kazakstan, and in Kirghizia. These are vast distances, but we are ready to provide the best services in any point of the world on customer's call. Every specialist of the VNIIRA-OVD's team trains regularly. That gives excellent results, maintaining the image of a trustworthy company with superbly qualified

specialists. Some of them work on the ATC systems, radar facilities, communications systems, and simulators for over 40 years. I am really happy to tell about our collective, because they are unique people indeed. Everyone «on the set» knows perfectly well what it do, having their own areas of responsibility and seeing the one future «picture», that is, a clear safe sky on controllers' monitors.

JSC VNIIRA-OVD VNIIRA has effectively accumulated the previous experience of OJSC VNIIRA, has realized and is now successfully developing a new generation of ATC automation facilities:

- | unified series (US) of the SINTEZ automated air traffic control systems and facilities;
- | monopulse secondary surveillance radars and automation complexes RSACs, including primary surveillance radars;
- | ground-based transceiving surveillance stations (ADS-B) and data links based on Mode S secondary radars;
- | radar plot extracting equipment;

- | equipment for interfacing ATC systems and facilities with information sources, data conversion and transmission equipment;
- | remote control and monitoring equipment for airport radio systems facilities;
- | airborne ATC transponders including Mode S ones;
- | Controllers' simulators, training centers, and other equipment.

Range of Works Performed Within the Frameworks of Projects:

- | Site surveying and development of comprehensive projects, whose implementation provides the most efficient achievement of the CUSTOMER's objectives;

- | Integration of any radar aids, both CUSTOMER's existing ones and the latest ones from any manufacturers, into the system;
- | Employment of the accumulated experience and knowledge of in-service ATC facilities with a view to ensuring their use until the complete exhaustion of service life, which allows a considerable decrease of expenditures for re-equipment;
- | Turnkey operation of sites, warranty and post-warranty service of introduced ATC systems and complexes throughout their life cycles.

## Geography of Achievements

JSC VNIIRA-OVD represents OJSC VNIIRA in the export markets on an exclusive basis, acting as a solution provider of a new generation of ATC systems and facilities in the CIS and far abroad countries. Equipment of ATC automation complexes for en-route, terminal and area centers, monopulse secondary surveillance radars (MSR), and airborne electronics have been delivered, put into operation and are now efficiently operated in a number of countries for the recent years.

- SINTEZ-KSA-OVD
- SINTEZ-ARM-A
- SINTEZ-ARM-R
- SINTEZ-ARM2
- MSSR
- RADUGA
- CSS

### Belarus

In 2003, the SINTEZ-AR2 integrated terminal and area ATC AS, realized in full compliance with the latest EUROCONTROL's Recommendations on the EATCHIP Phase III Program, was delivered to the Republic of Belarus for the Minsk Joint Area and the Minsk Airport. Thereby, the air traffic control over the entire territory of the Republic of Belarus was provided. The SINTEZ-TC complex system simulator equipment was delivered and put into operation.

The full-scale modernization of the whole equipment set, providing the transmission and display of data on the air traffic of the bordering states (Lithuania, Poland, Ukraine, etc.), was carried out in 2010.

### Kazakhstan

In 1993, JCS VNIIRA-OVD, in cooperation with SIEMENS-ATM and RGP «KAZAERONAVIGATSIA», worked out the «Project and Program of ATC System Modernization for the Republic of Kazakhstan». The participation in its successful implementation by the equipping of 13 radar sites on the basis of 4 RADUGA-2 SSRs, and 9 MSR-SVK with the automation complexes provided the complete coverage of the upper airspace the Republic of Kazakhstan.

JSC VNIIRA-OVD provided a delivery of 14 additional sets of terminal and area MSR-SVK, equipped the ATC area and the Schimkent airport area with the SINTEZ-KSA integrated complex of ATC automation facilities, and all 14 areas of air traffic servicing with the SINTEZ-ARM-R work stations. Thereby, the ATC automation over the territory of the Republic of Kazakhstan was completed.

The automated ATC centers of the cities of Almaty and Aktiubinsk employ the area and terminal ATC work stations (WKSs) as «by-pass» subsystems. JCS VNIIRA-OVD is now implementing the «Program of ATC System Modernization for the Republic of Kazakhstan» in regard of equipping Towers of 11 airports with terminal ATCWKSs.

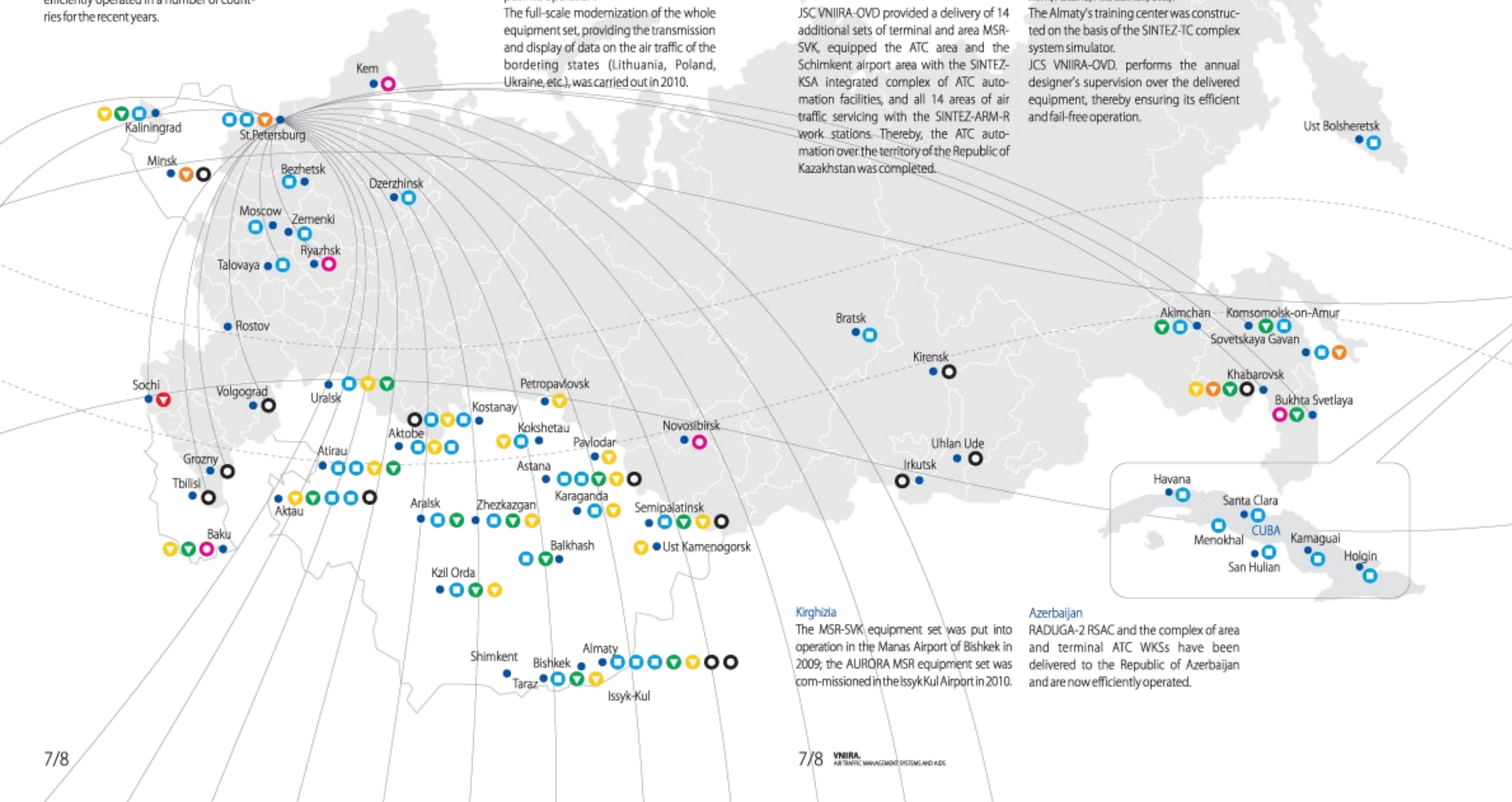
15 sets of the SINTEZ-T controller simulators have been delivered and are efficiently operated (in the cities of Almaty, Schimkent, Astana, Aktiubinsk, etc.).

The Almaty's training center was constructed on the basis of the SINTEZ-TC complex system simulator.

JCS VNIIRA-OVD performs the annual designer's supervision over the delivered equipment, thereby ensuring its efficient and fail-free operation.

### Cuba

Within the period from 2009 to 2010, 6 sets of the AURORA Monopulse Secondary Surveillance Radars with Expanded Surveillance Functions in ADS-B 1090 ES Mode were delivered. Thereby, the air traffic control over the entire territory of the Republic of Cuba and the Caribbean region was provided.





## Advantages of JSC VNIIRA-OVD

Development of ground-based and airborne equipment of the air traffic management systems and facilities is carried out using the state-of-the-art technologies, long-range components, and advanced materials.

The enterprise's production base and quality management system ensure an effective control of products quality in accordance with the requirements of the GOST R ISO 9001-2008, GOST RV 15-2003 and SRPP VT standards, the full-scale adjustment and testing of the equipment, commissioning at CUSTOMER's facilities, as well as the warranty and post-warranty service of the delivered equipment.

The Quality Management System was successfully certified in the Defense

Certificate System.

JSC VNIIRA-OVD holds the Licenses for development, manufacture and maintenance of the entire equipment range. All the produced equipment of the enterprise is certified by the Interstate Aviation Committee (IAC) that proves the compliance of the equipment and production operations with the certification requirements.

For the development of SINTEZ ATC AS UR, a wide use of the wealth of experience obtained by the specialists, who have passed the school of the development and implementation of three generations of ATC AS (START, SPECTR, SINTEZ), and the knowledge of the state-of-the-art data process automation technologies by the new generation specialists are combined.

For the software adjustment, test checks and factory tests of the facilities and systems of SINTEZ ATC AS UR to be supplied, the SINTEZ system's multipurpose bench constructed at the enterprise, interfaced with the information sources of the Pulkovo Airport in Saint-Petersburg, is used. The site systems are supported by the problem analysis on the benches duplicating the real systems in remote-controlled exchange of digital information.

Customers' representatives carry out the full-scale control over the progress of development and deliveries.

JCS VNIIRA-OVD performs the annual designer's supervision over the delivered equipment, thereby ensuring its efficient and fail-free operation.

## Reviews and recommendations

13.04.2004  
Interstate Aviation Committee (IAC)

«The committee for IAC certification of airdromes and equipment during the period from 1999 to 2003 conducted the works on certification of a number of workstations and air traffic control automation complexes developed by JSC VNIIRA-OVD, with issuing corresponding type Certificates. Including the type certificates issued by IAC committee on the basis of positive results of certification testing in 2003:

No. 333 dated 09.09.2003 for air traffic control automation complexes in integrated areas of ATC, terminal area (air complex) including take-off and landing areas, SINTEZ-AR2;

No. 334 dated 11.09.2003 for air traffic control automation complexes in integrated areas of ATC and in the ATC areas with high and medium air traffic density SINTEZ-R2. Availability of IAC type Certificates approves full compliance of the given equipment with the certification requirements, accepted by the CIS countries, considering both national features of ATM systems and requirements and recommendations of ICAO and EUROCONTROL. Complexes developed by JSC VNIIRA-OVD fit well into the world concept of CNS/ATM.

JSC VNIIRA-OVD was certified as a manufacturer of the indicated equipment in accordance with the established procedure and has corresponding IAC Certificates for its manufacturing».

09.04.2004  
Unitary enterprise BELAERONAVIGATSIA

Business and professional relationship between air navigation services unitary state enterprise Belaeronavigatsia and All-Russian Scientific Research Institute of Radio Equipment (JSC VNIIRA-OVD) was formed in 1995 from the date of installation of SPEKTR ATC AS in the Republic of Belarus. During operation of Spektr ATC AS we have no appreciable problems in the system operation and cooperation with JSC VNIIRA-OVD.

Terminal and area automated air traffic control system SINTEZ-AR2 (TAA ATC SINTEZ-AR2), which was put into operation in a year and 9 months from the date of contract award with JSC VNIIRA-OVD is now in operation in the Republic of Belarus.

Support of operating system, the entire system, deserves high estimation. A set of recommendations of EUROCONTROL and ICAO for Human Machine Interface (Eurocontrol EATCHIP phase III HMI catalogue) is comprehensively implemented in TAA ATC SINTEZ-AR2 unlike the world systems of a similar class. From the point of view of a controller the interface of ATM personnel operation with the system is very simple.

TAA ATC SINTEZ-AR2 deserves the highest estimation as a system of the highest international level complying with all modern world requirements».

27.03.2007  
Unitary Enterprise BELAERONAVIGATSIA. Report of TAA ATC SINTEZ-AR2 field evidence in the Republic of Belarus.

«The system operation for more than 3.5 years approved high stability and reliability of the system. During 2006 flying operation of more than 146 thousand of aircrafts was ensured by TAA ATC SINTEZ-AR2. Actual average daily load on the system is up to 700 aircrafts. TAA ATC SINTEZ-AR2 deserves the highest estimation as a system complying with all modern world requirements».

15.10.2010  
Republic State Enterprise KAZAERONAVIGATSIA, the Republic of Kazakhstan

«Republic State Enterprise Kazaeronavigatsia informs that monopulse secondary surveillance radar MSSR-JAC manufactured by JSC VNIIRA-OVD is used as a main secondary surveillance radar in the Republic of Kazakhstan since 1998. At the moment 23 radar facilities MSSR-JAC installed in the airports and base navigation stations of the Republic of Kazakhstan are in operation. The facilities proved to be reliable sources of radar data providing high reliability and safety of air traffic control. Supplier JSC VNIIRA-OVD maintains guarantees and provides technical support of the equipment».