





## FEDERAL TARGET PROGRAM “JOINT AIR TRAFFIC MANAGEMENT SYSTEM MODERNIZATION FOR 2009–2020”

### Main objective:

*To enhance safety and increase efficiency of airspace utilization through modernization of the existing ATM system and facilities by establishing and developing the air navigation system of Russia based on of brand-new technologies and equipment compliant with ICAO standards and recommended practices*



## FEDERAL TARGET PROGRAM "JOINT AIR TRAFFIC MANAGEMENT SYSTEM MODERNIZATION FOR 2009-2020"

### Major program activities:

- ✓ establish consolidated ATM areas;
- ✓ enhance terminal and en-route air navigation services;
- ✓ upgrade aeronautical telecommunications and data links;
- ✓ implement secondary surveillance;
- ✓ introduce Joint ASM System;
- ✓ transit to modern CNS/ATM technologies;
- ✓ implement automated air traffic control systems



### Establishment of Consolidated ACCs

#### Target:

13 ACCs, including Moscow Automated ATC Centre

#### 5 ACCs already established:

- Kaliningrad (2011)
- Khabarovsk (2011)
- Samara (2013)
- Magadan (2013)
- Irkutsk (2014)

+ Rostov ACC, automated ATC system to be replaced

#### 2016:

- Krasnoyarsk Consolidated ACC
- Flight Control Centre of Moscow ATC Centre



- ✓ Implement an automated ATM system
- ✓ Delivery, assembling and commissioning of equipment : Automated ATM system acceptance tests completed
- ✓ Final operational readiness tests: *November 14-18, 2016*





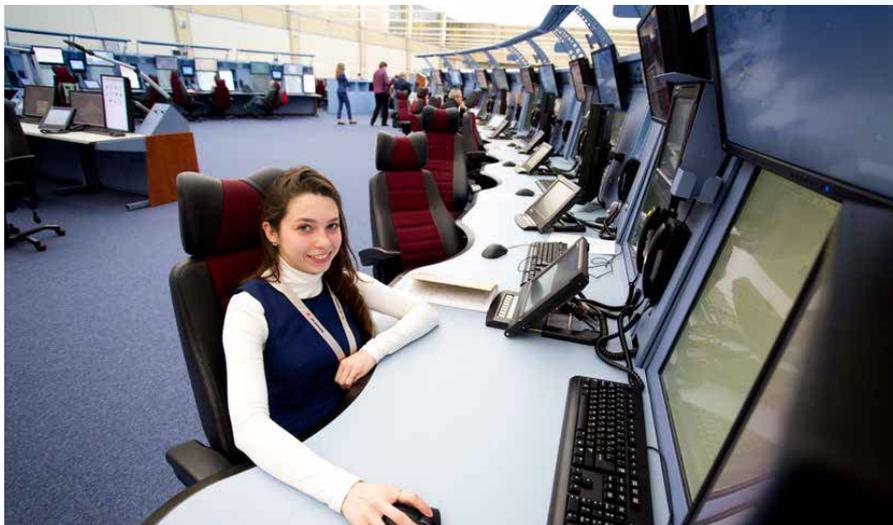
## FLIGHT CONTROL CENTRE (MOSCOW AUTOMATED ATC CENTRE)

### *Completed:*

- construction of the building;
- delivery, assembling and commissioning of both engineering and technological equipment;
- acceptance tests of an automated ATM system

### *At the present:*

- operational tests are in progress





- ✓ Construction of administrative and technological buildings
- ✓ Installation of Automated ATM System
- ✓ Basement works completed, focus on the building framework





## Target for 2016

- 4 aerodromes

### Completed

- Petropavlovsk-Kamchatsky
- Bodaybo

Implementation ongoing at Makhachkala aerodrome

## December 2016

New ATC Tower equipage at Taman ATC Centre



# OPERATIONAL UNITS EQUIPPED WITH ATC AUTOMATION AIDS

## Makhachkala (before)



## Petropavlovsk-Kamchatsky (after)



## Bodaybo (after)



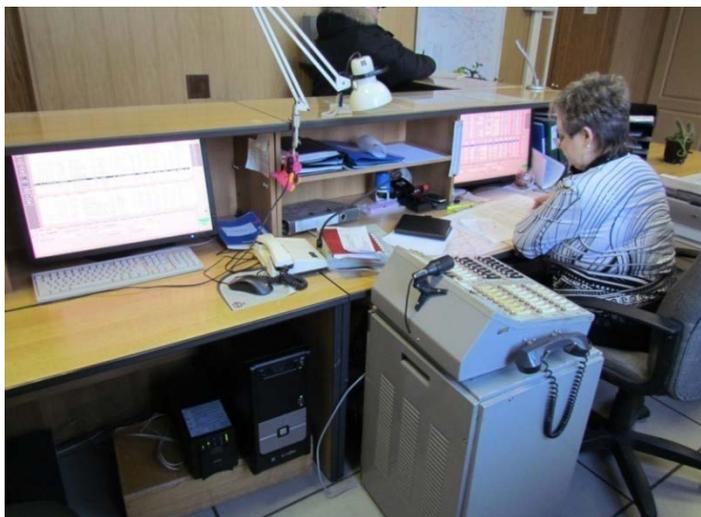


### Ongoing

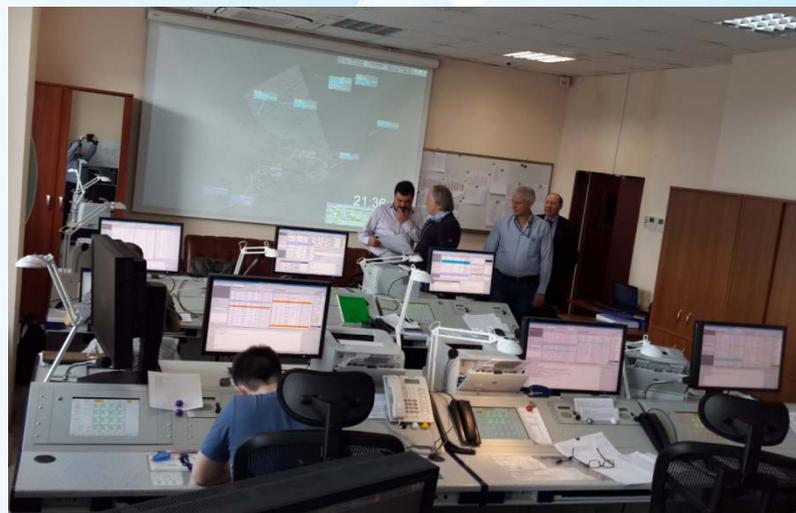
- implementation of automated ASM and ATFM system in Main Air Traffic Management Centre;
- implementation of automated ASM system at Gelendzhik, Anapa and Ulyanovsk aerodromes;
- implementation of automated ASM system at Astrakhan aerodrome;
- implementation of training tools at Surgut airport;
- implementation of automated ASM subsystem (integral part of automated ATM system) in Krasnoyarsk Consolidated ACC



# ASM SYSTEMS, SIMULATORS AND VIRTUAL TRAINING TOOLS



Automated ASM system  
Novosibirsk



Magadan ACC



Automated ASM system  
Rostov-on-Don





## Full-scale simulator Novosibirsk ATS Centre



Tower simulator



Automated CWP

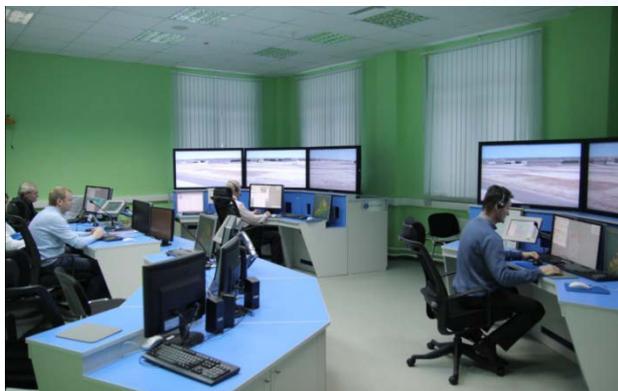


Automated working  
position for  
instructors



Classroom

## Controller simulator Vnukovo ATS Centre





## Aeronautical telecommunication network upgrade

*Target for 2016 :*

- install 7 data switching centres at Kemerovo, Tomsk, Barnaul, Gorno-Altai, Novokuznetsk and Norilsk ATS Centres;
- equip Krasnoyarsk, Magadan, Tyumen, Samara and Kaliningrad ATS Centres with AMHS;
- implement HF at Vorkuta, Samara, Mis Kamenskoe ATS Centres;
- install ground satellite communication stations at Tigil, Sobolevo, Yuzhno-Sakhalinsk, Ust-Maya and Palana ATS Centres;
- implement 19 automated Transmitting-Receiving Centres and relay stations



## Terminal radar sites

*Target for 2016:*

✓ **LIRA-A10**

- Voronezh
- Khabarovsk
- Petropavlovsk-Kamchatsky
- Saratov

✓ **AORL-1AC**

- Okhotsk



## RADAR SITES



**LIRA-A10**  
**Voronezh**



**LIRA-A10**  
**Saratov**



## Mono-pulse secondary surveillance radars (MSSRs)

- ✓ AURORA - Ufa
- ✓ AURORA - Vilyuysk
- ✓ KRONA-M - Tyumen
  
- ✓ AURORA - Tolmachevo
- ✓ AURORA - Petropavlovsk-Kamchatsky



KRONA-M (Tyumen)



## RADIO NAVIGATION



DVOR-2000/DME-2000



VOR/DME

**DVOR/DME:** Yuzhno-Sakhalinsk, Petropavlovsk-Kamchatsky, Neryungri airports.

**Implementation ongoing at:** Bodaybo and Khatanga airports.



## To support RNAV operations

### ✓ DME-N(NP):

- Ufa;
- Ukhta;
- Khabarovsk;
- Volgograd;

### ✓ (D)VOR/DME:

- Yuzhno-Sakhalinsk;
- Petropavlovsk-Kamchatsky;
- Neryungri ;
- Bodaybo;
- Kkhatanga.



## Implementation of ILS 2700/DME/NL 2700 ongoing in:

- ✓ Orsk;
- ✓ Petrozavodsk;
- ✓ Nadym;
- ✓ Irkutsk;
- ✓ Syktyvkar;
- ✓ Vorkuta;
- ✓ Kyzyl;
- ✓ Abakan;
- ✓ Iturup;
- ✓ Nizhnevartovsk;
- ✓ Ioshkar Ola, etc. (total 52)



PMC ILS 2700/DME/NL 2700 (localiser)



## Main activities

- ✓ GBAS implementation
- ✓ Regional Monitoring Centres establishment
- ✓ ADS implementation





## MAINTENANCE, DEVELOPMENT AND USE OF GLONASS SYSTEM FOR 2012–2020

- ✓ GBAS implemented at 103 aerodromes, including 1 aerodrome (Saratov) in 2016; Sevastopol aerodrome (planned)
- ✓ 9 Regional Monitoring Centres established (Yekaterinburg, Tyumen, Rostov-on-Don, Samara, Moscow (VKO), Novosibirsk, Irkutsk, Krasnoyarsk, Khabarovsk);

*Timeline:* Regional Monitoring Centres to be connected with Main Monitoring Centre in Moscow **in 2016.**



### **ADS-B implemented at 91 aerodromes, including:**

#### **2016:**

- ✓ 8 1090 ES ADS-B in Rostov Centre
- ✓ 9 1090 ES ADS-B in St. Petersburg Centre
- ✓ Mode 4 ADS-B in 5 sites of Sheremetyevo, Domodedovo (ADS-Moscow pilot project), Pulkovo, Kaliningrad, Velikiye Luki (Baltic-ADS pilot project)

#### **2016-2017:**

1090 ES ADS-B stations to be implemented in:

- ✓ Magadan (7)
- ✓ St. Petersburg (15)
- ✓ Tyumen (5)
- ✓ Yekaterinburg (5)
- ✓ Krasnoyarsk (17)



## FEDERAL TARGET PROGRAMS AND ITS IMPLEMENTATION IN 2016

# QUESTIONS