The ground-based infrastructure of high accuracy satellite navigation system in the Republic of Kazakhstan»

Managing Director,
Center for High-accuracy Satellite Navigation System
Abdikul E.Ashurov

The Republic of Kazakhstan

- Kazakhstan is the ninth largest country in the world;
- The area of the Republic of Kazakhstan is 2 724 900 square km;
- Water surface is 47.500 square km;
- About 16 305 000 people live in 14 regions.

National Space Agency of the Republic of Kazakhstan

Talgat Mussabayev

The Chairman of the National Space Agency of the Republic of Kazakhstan.

Talgat Mussabayev is the first-class pilot cosmonaut. He has made three long space flights more than 342 day long.

JSC «NATIONAL COMPANY «KAZAKHSTAN GHARYSH SAPARY»

Gabdullatif Murzakulov

The President of the JSC “National Company “Kazakhstan Gharysh Sapary”.

Mission of the Company

To implement competitive space technologies in the interests of the Republic of Kazakhstan.

Main projects of the Company

- Creation of the Earth Remote Sensing Space System of the Republic of Kazakhstan;
- Creation of the Assembly and Testing Complex of the Engineering and Design Office of Space Technology;
- Creation of the Ground Infrastructure of the High-accuracy Satellite Navigation System;
- Creation of the Space Center in the city of Astana.

Goals of the project “Creation of the ground infrastructure of the high-accuracy satellite navigation system”

- Creation of the infrastructure which allows system users to get the correction information and to improve positioning accuracy;
- Monitoring the satellite radio-navigation systems for the purpose to provide consumers with timely information about inappropriate work the systems;
- Creation of the National operator to provide global satellite navigation services;
- Development and expansion of the market of navigation and information services in Kazakhstan;
- Increase international cooperation in the field of satellite navigation.

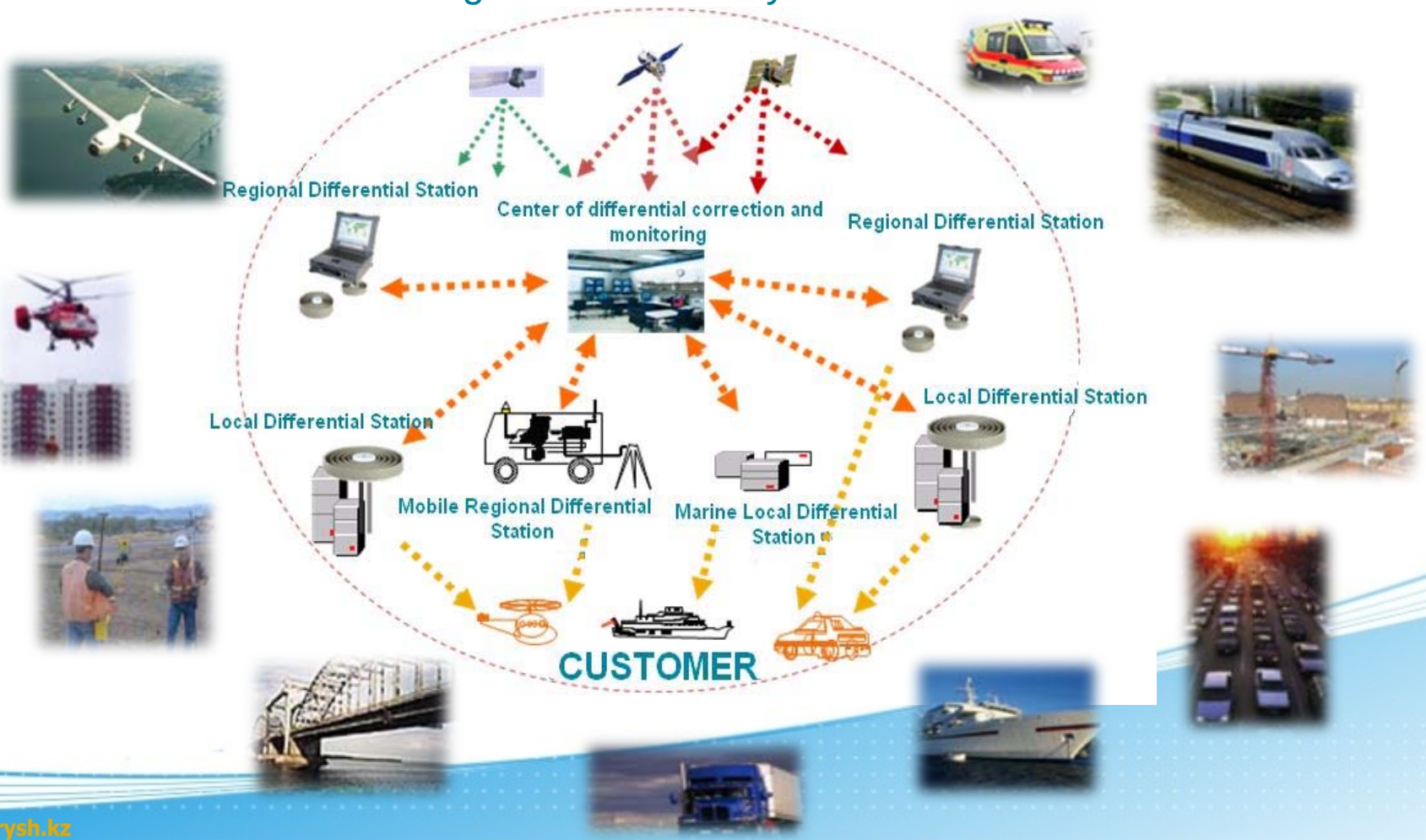
Implementation period

Project implementation period 2008 - 2012 years.

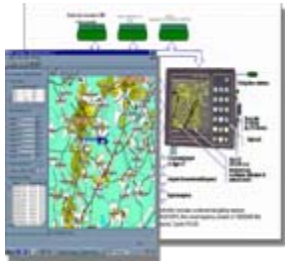
High-accuracy Satellite Navigation System

Mission of the project

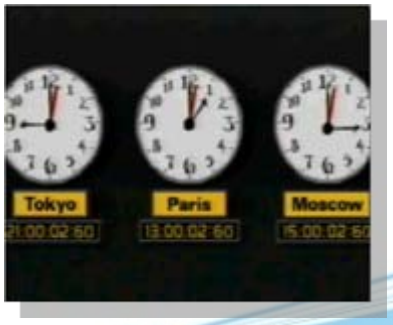
The provision of conditions for the guaranteed reception of qualitative real time-coordination and navigation services by consumers in Kazakhstan.



The basic scopes of HSNS of the Republic of Kazakhstan



- Global all-weather navigation
- Landing on unprepared airfields
- Navigation in harbors and inland waters
- Traffic management
- Route optimization
- Motion Control Systems
- Ensuring the safety of passengers
- Precise mapping
- Provision of construction works
- Reduced time to search and rescue operations
- Synchronization of communication systems
- Etc.



Existing differential stations

- At the moment there are more than 30 local differential stations functioning in the different regions of the Republic of Kazakhstan.

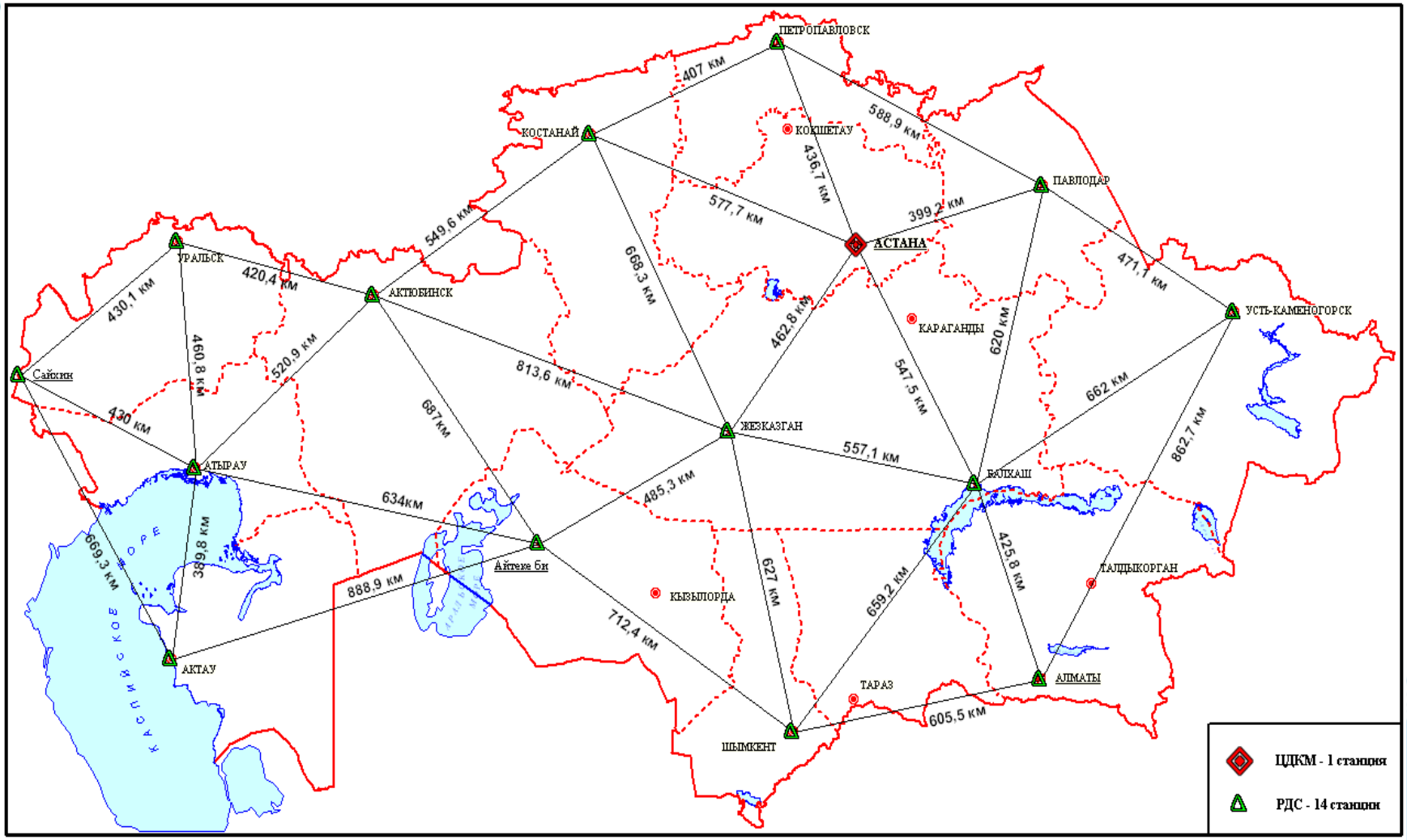
- All existing differential stations is planned to integrate into a unified system of high-accuracy satellite navigation system.

Ground-based infrastructure of HSNS RK

For the creation of high-accuracy satellite navigation system Kazakhstan has all necessary resources, which are:

- GSM infrastructure presence, radio station of ultra-short waves range for granting the differential correction data to consumers and covering all necessary zones of Kazakhstan;
- High-speed and highly reliable, ground-based and satellite communication channels for data transmission between system parts.

Base Differential Stations preliminary placing



CDCM and services

- In Astana city – will be located Center for differential correction and monitoring;

Services:

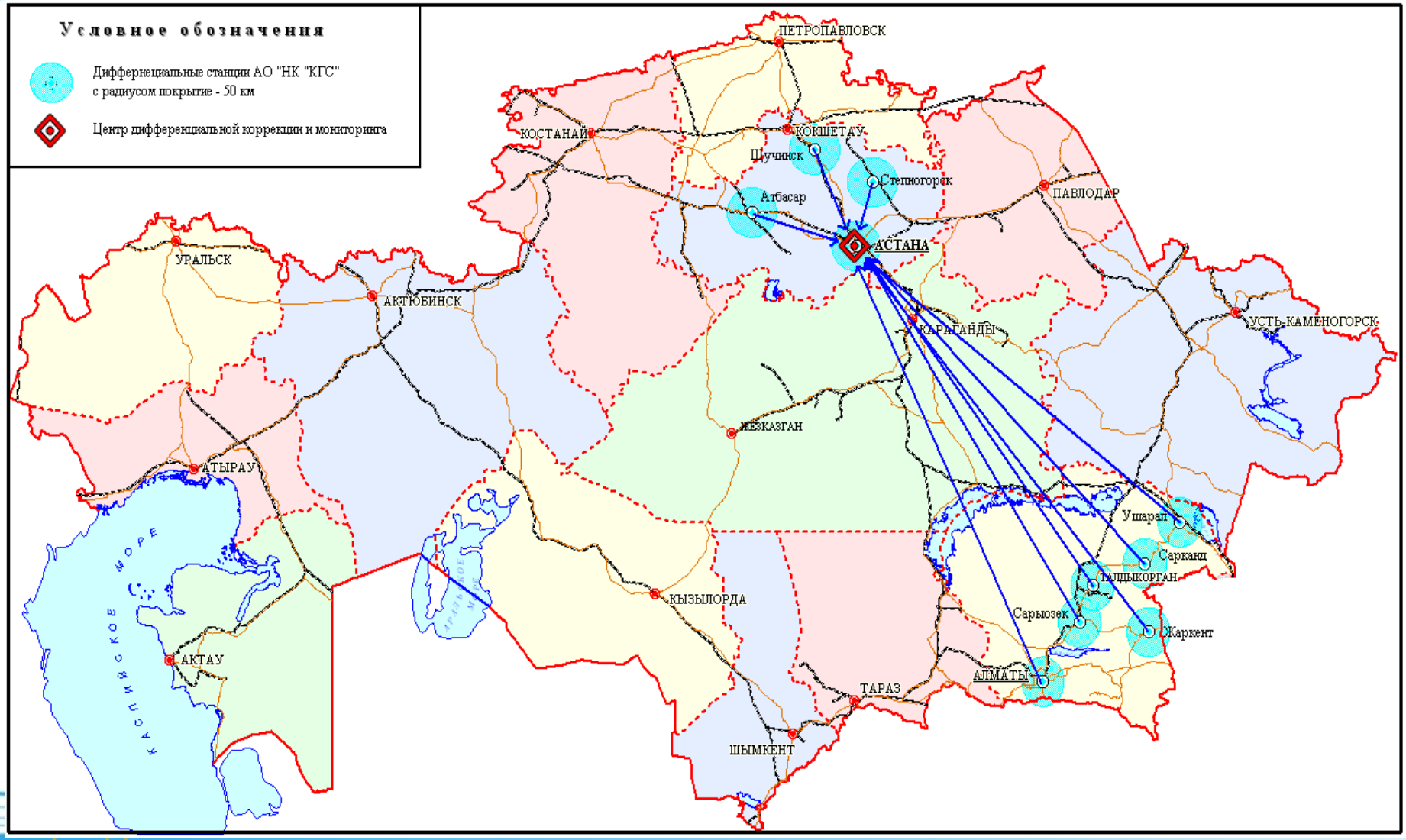
- DGPS service - for navigation and position coordination with accuracy from 0.5 – 3 m in plan, and 0.7 – 6 m in vertical;
- RTK service – for high-accuracy position coordination from 0,02 – 0,5 m in plan, and 0,06 – 0,7 m in vertical;
- Post Processing service – positioning as a information delivery for after session data processing working on demand with accuracy better than 1 sm.

Current condition of the Project

- Creating of a Regional Differential System (RDS) of the GI HSNS RK;
- Developed a technical project for RDS and mobile differential station (MDS);
- Developed a working documentation for RDS and MDS.

Regional Differential System

RDS consists of 1 Regional center and 10 Differential stations



Mobile Differential Station

The provision of conditions for the guaranteed reception of qualitative real time-coordination and navigation services in the regions which are not covered by regional differential stations for consumers.

Plans for 2011 - 2012

- Commissioning of RDS and MDS;
- Enlarge a number of differential stations until 60 differential stations;
- Creation of marine differential global positioning system in Caspian region;
- Creation of the Authority for compliance certification and laboratory for compliance evaluation of satellite navigation equipment;
- Organization of pilot production of satellite navigation equipment.

International cooperation

- Signed an intergovernmental agreement between the Russian Federation and the Republic of Kazakhstan in the use of navigation system GLONASS;
- JSC "NC "Kazakhstan Gharysh Sapary“ is a member of International Organization EUPOS (European Position Determination System);
- Participation in the Interstate Radio navigation Program of the Commonwealth of Independent States for the period up to 2012.

Conclusion

- Creation of GI HSNS RK will allow us to implement and develop various GNSS applications in the Republic of Kazakhstan;
- We are intend to further develop the GI HSNS to expand the coverage of service area;
- We hope to participate in the international cooperation for further GNSS application development.

THANK YOU!