

BAIKONUR SPACE HALL - SPACE AND EARTH ETERNAL GOLDEN BRIDGE

Baikonur cosmodrome is a unique historical place for space professionals and young learners and for all mankind, the golden bridge between space and Earth, the source of many world innovations and the first manned spaceflight.

How many spacecraft are flying from the cosmodrome - their flight has opened the way for mankind to live in a better direction. After the establishment of satellite communications, radio and telecommunications, global Internet technologies, oil and gas, aerospace, geodesy and space engineering and other areas are constantly evolving. In the field of space engineering and technology, innovations such as the design and launch of spacecraft and ships, rockets, as well as types and purposes of spacecraft, space and space communications, space stabilization and navigation, as well as autonomous and intelligent control systems of spacecraft. is evolving.

The Baikonur Cosmodrome is like the cosmos and the Earth's core, or like the Golden Bridge of space and the Earth, how many years the space and the Earth have been connected by this Baikonur cosmodrome and will be connected in the future. Spacecraft have been launched from the Baikonur cosmodrome since 1955, how many of them have been successful and unsuccessful?

Therefore, if we look at the past and the present, the sacred Baikonur is the first and largest spaceport in the world, located on the territory of Kazakhstan. In Kazakhstan, there is a small town called Baikonur, which is located about 350 km from the village of Tore-Tam, where the cosmodrome is located. In 1955, during the Soviet era, it was published in the media - in newspapers, on radio and television.

The Baikonur cosmodrome is located on the territory of Kyzylorda oblast of the Republic of Kazakhstan. The space area covers an area of 6717 km² and stretches from north to south - 75 km, from west to east - 90 km.

Historically, the option of locating a new landfill in Kazakhstan, close to the Aral Sea, near the railway station Tore-Tam in Kyzylorda region of the Kazakh SSR, was chosen. 1955 On February 12, the USSR Council of Ministers adopted Resolution 292-181 on the construction of the landfill.

The azimuth range of carrier rockets is 35-92. The main facilities are based on the launch sites of intercontinental ballistic missiles (ICBMs) and the technical facilities of the test site. By November 1956, many facilities and constructions, construction and installation works will be completed, which will ensure the preparation for the launch test of the CBD. The constructed facilities: launch complex, launch control point, assembly and test building, part of measuring points, computer center building, water supply, water pumping station and power plant were put into operation. Road and railway stations will also be built.

The first launch of the Soyuz, a prototype of the 8K71-5L-R-7 intercontinental ballistic missile, took place on May 15, 1957.

The first successful launch of the 8K71-6 rocket was in 1957. It was carried out on August 21, and on October 4 of the same year the first artificial satellite "PS-1" 8K71 PS was launched from the spaceport. On April 12, 1961 the first astronaut of the planet Yu. A. Gagarin flew into space in a spaceship.

In the following years, the training of spacecraft with the use of light ("Cyclone-M"), medium ("Soyuz", "Lightning", "Zenith"), heavy ("Proton") and heavy ("Energy") class rockets was carried out at the test site. Launch and technical complexes were created for launch, and the infrastructure providing the landfill began to develop.

The first Soyuz RT launcher was commissioned in 1957. The second, a similar device was given in 1961. Two launchers of the Cyclone-M RT were commissioned in 1967. The first launch vehicle of the RT "Proton" was commissioned in 1965, the second - in 1966 and two more - in 1979.

Along with the construction of the "Energy-Buran" complex at Baikonur, a ground-based complex for a new generation of medium-class rocket carriers "Zenith" capable of carrying a payload of 15 tons into orbit near the Earth was built. The peculiarity of the complex "Zenith" is the maximum automation of the process of preparation for the launch of RT. Chief Designer of the launch complex of RT "Zenith" V. P. Developed by the Bureau of Transport Engineering under the direction of Sobolev.

Rocket and Dnepr RT re-equipped mine launchers will be used to launch the spacecraft. The first launch of the RT "Rokot" took place in 1994, and the RT "Dnepr" - in 2000.

From the Baikonur cosmodrome, all manned spacecraft and all spacecraft (GS) will be launched into geostationary orbit (communications, television broadcasting, GLONASS space navigation system). This spacecraft is also used for launching spacecraft into low and medium orbits (meteor meteorological system, study of the Earth's natural resources, etc.), as well as for automatic launches of interplanetary stations and spacecraft.

A significant contribution of the Baikonur cosmodrome to space development was the launch of Proton rocket launchers to the Moon, Sholpan, Mars with interplanetary stations and long-term orbital stations Salyut and Mir.

The Baikonur cosmodrome was used to implement the following space programs and projects: Vostok, Voskhod, Salyut, MIR, Mars, Venus, Luna and Energy-Buran.

The Baikonur cosmodrome has played a significant role in the implementation of the MIR project. About 220 organizations and 80 research institutions took part in the MIR project. 104 people visited Mir station, including 62 foreigners; More than 31,000 experiments were performed in the fields of medicine, biology, engineering and astrophysics, 64 docking with Progress spacecraft, 31 contact with Soyuz spacecraft, and contact with American shuttles under NASA's MIR 9 program. 170 tons of various cargoes were delivered to the station and more than 4700 kg of cargo returned to Earth as a result of experiments.

In the early 1990s, work on the space station under the Energy-Buran program was suspended, facilities were closed, and some of them were later used under other programs.

The contribution of the Baikonur cosmodrome to the implementation of national space programs is estimated by the number of spacecraft launched under each program. In particular, about 95% of space observations and Earth reconnaissance programs will be launched, more than 70% of coordinate and time support programs, 25% of communication and broadcasting programs, and more than 40% of meteorological support programs. , under the research program - more than 30%, under the pilot control program - 100%.

The Baikonur cosmodrome is used in state programs with Russia's participation. Plans to cooperate with the world community on the creation and operation of an international space station have been developed for this Baikonur cosmodrome.

After the collapse of the USSR, the Baikonur cosmodrome became the property of the Republic of Kazakhstan and leased by the Russian Federation. In 1990, the Baikonur test site was renamed the Baikonur Cosmodrome. With the development of the landfill, the residential complex, which was founded in May 1955 and changed several names in different years, was renamed Baikonur in 1995. The infrastructure of Baikonur includes more than 300 houses, 6 city hotels, a hospital, a city hospital, etc. applies. There are a number of educational institutions in the city: more than 10 secondary schools, a branch of HZA, a communication college, a medical school and other social facilities.

At present, most of the leased facilities of the Baikonur cosmodrome have been transferred to the Russian Federal Space Agency (2 rocket launchers of Soyuz NC, Zenit NC, Cyclone-M NC, Energia NC and SSAC, Proton has two launch complexes, technical complexes, technological equipment and life support systems, all assembly and test buildings, all substations, oxygen-nitrogen plant, GRT storage, gas turbine power plant, etc.).

In 2004 the President of the Republic of Kazakhstan NANazarbayev Nazarbayev and Russian President Vladimir Putin B. Putin instructed to start the project on construction of the Baiterek space rocket complex at the Baikonur cosmodrome. A new launch complex with a

universal launch pad is being built on the site of the decommissioned launch pad, which will allow launching the entire Angara rocket carrier group from a single launch vehicle.

Currently, together with Kazkosmos and Roscosmos, work is underway to agree on a joint decision on the establishment of "Baiterek" RCC on the basis of 250, 250A (SSA) of the Baikonur cosmodrome.

In order to develop Kazakhstan's space activities, the relations between the two Commonwealth states in the field of mutual use of the Baikonur cosmodrome are expanding.

The Republic of Kazakhstan is one of the secular states with its own spaceport, space education and institutions. There are several educational institutions in the Republic of Kazakhstan that train specialists in space engineering and technology, one of which is the Department of Space Engineering and Technology at LN Gumilyov Eurasian National University, which was opened in 2009 with a bachelor's degree in space engineering and technology. in preparation for a master's degree. Since 2014, undergraduates and bachelors majoring in space engineering and technology have been undergoing annual scientific internships at the Baikonur Cosmodrome.

As an example, undergraduate research (SPIIR-2) is held regularly and from March 23, 2018 to April 1, 2018 at the International Space School named after VN Chelomey in Baikonur on a scientific internship on the basis of the SPIID program (1.5 years) studied at our department. .

Since 2014, in accordance with the program of scientific internships and internships, students of the department were given a briefing in the field of space engineering technologies. etc., as well as training and practical classes.

Honored professors and qualified specialists give lectures at the International Space School named after VN Chelomei "Modeling of rockets", "Modeling of spacecraft", "Robotic control system", "Space astronomy", "Aerospace education", "Astronomical observations", "Starry skies and planets: Venus, Mars, Saturn, Jupiter, the Moon. During extracurricular activities, students are introduced to the city of Baikonur, visiting historical museums and laboratories of the International Space School.

Kazakhstan has been working with Russia for many years, and is familiar with the flight histories of many spacecraft, technological processes and realities in the preparation stages.

The results of cosmonautics training and scientific internships at the cosmodrome are defended by students and undergraduates at the International Space School named after VN Chelomey at Baikonur and at the Department of "Space Engineering and Technology" of the Faculty of Physics and Technology at LN Gumilyov ENU. Students and undergraduates will be awarded certificates and diplomas for internships at the Baikonur Cosmodrome and International Cosmonautics and for a series of training sessions.

Students and undergraduates of the Baikanur School of Space organize competitions called "Space Modeling" and determine the winners and award special diplomas.

The results of educational and practical classes and research internships at the Baikanur cosmodrome for students and undergraduates will collect interesting information on the topics of dissertations and master's dissertations, as well as visualize and get acquainted with the equipment and processes in the cosmodrome. The benefits of these educational and practical classes and scientific internships awaken the passion of the younger generation for the space industry and reflect on the real processes.

Located in our vast steppes, the Baikonur cosmodrome is a place of unique history for space students, young professionals, the Kazakh people and the world. It will always be a place of science and education in the field of space, as well as the sacred cosmodrome Baikonur, which will open the garden of future astronauts and fulfill the dreams of many specialists.

The text of the article is written on the basis of data and literature from open sources.

The author of the article is Candidate of Technical Sciences, associate professor Khuralai Moldamurat