

CREATION OF A UNIFIED NETWORK OF MONITORING AND CORRECTION STATIONS FOR NAVIGATION SUPPORT IN UKRAINE

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The paper reviews the creation of a network of monitoring and correction stations in Ukraine ensuring the implementation of national plans for the radio navigation support of various sectors of the economy using NAVSTAR and GLONASS satellite radio navigation systems including long-term plans for connecting this network to the GNSS global civil satellite navigation system based on the European projects EGNOS and GALILEO.

The commissioning of global satellite radio navigation system GNSS will make the introduction of new processes of the coordinate-time support of stationary and mobile bodies possible. The main components of the GNSS system include the constellation of navigation spacecraft (SC) of GPS and GLONASS, communications SC of Inmarsat-III with navigational support and the national additions of these systems in the form of the ramified network of monitoring-and-correction stations (MCS) to implement the desired accuracy of positioning while using the differential mode of satellite radio navigation systems (SRNS). The coordinate-time and navigation support represents the sphere of national interests of Ukraine.

At present, different agencies in Ukraine are engaged in wide-scale activities to create the network of stations for monitoring signals of SRNS GLONASS and NAVSTAR. In particular, the Main Astronomical Observatory of NAS of Ukraine creates an array of permanent GPS-benchmarks in Kiev, Simeiz, Yevpatoriya, Kharkov, Uzhgorod, and Poltava for the benefit of the State Standard Frequencies and Time Service in accordance with the GosStandart (State Committee of Standards) instructions; Kiev Research Institute "Kvant-Navigatsiya" creates a network of stations for generating differential corrections for SRNS GLONASS and NAVSTAR aimed at creating the monitoring system of observations over the above-water conditions in the Azov-Black Sea basin while using the existing coastal radio beacons. The last project is carried out in accordance with the resolution of Mintrans (Ministry of Transport).

At the same time, Kiev state enterprise Ukrkosmos in accordance with the order of the National Space Agency of Ukraine (NSAU) develops the Single Satellite Data Transmission System [1] which includes the entity for transmitting the radio navigation data, such as differential corrections and signals of integrity of satellite radio navigation fields. The Kharkiv Research Radio Measurement Institute designs the system consisting of the Center for Monitoring the Navigation Field and the network including 10–12 MCS. This project is performed in accordance with the order of NSAU using the principles of wide range differential navigation. This system should produce the correction differential information with the maximum potential error of 2–6 m in terms of coordinates and 1–3 cm/s in terms of components of the velocity vector. These data shall be supplied to users in Ukraine having the equipment for receiving navigational signals of SRNS GLONASS and NAVSTAR. The creation of such a system will make it possible to solve the problems of transport, defense, actions under the emergency conditions, cartography, etc. This system will be open for the use by the world community.

The creation and effective operation of the national system of space navigation support depend on numerous factors of scientific-technological, economical, and political nature. The basic scientific-technological factors include: 1) the availability of the precision (up to the centimeter level) geodetic attachment of monitoring stations to the world system of

REFERENCES

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