

Flexible use of airspace

This paper deals with the implementation of ADS, the concept of FUA and navigation on PBN characteristics in the airspace of the Republic of Uzbekistan. The implementation of systems will become possible only as a result of coordinated and agreed actions and their phased implementation in all regions.

Introduction of radar stations, the appearance of civil aviation jet aircraft on the routes, the need to perform flights in adverse weather conditions, the emergence of high-speed aircraft, the increase in air traffic improvement of the organizational structure and methods of air traffic management (ATS) standard to improve the structure and classification of airspace, the increasing demand for objective control over the mutual position of aircraft in the airspace led to the introduction of civil aviation in the mid 60s of the ATS principle "I see, hear, guide". The 70s are characterized by the commissioning of automated air traffic control systems (ATC automated control systems), the creation of unified flight control centers for the aircrafts of all departments, and the further provision of the necessary organizational and technological measures. So, due to the introduction of the ATC system <start>, <the terkas> <track>managed to hang the traffic safety level by an average of 1.4 times the capacity of airports by 25-30%; save over 250000 tons of aviation fuel by a project of the main directions of economic development For 1986-1990 and for the period up to 2000, the country was tasked to further improve the unified ATC system (ATS ATC) to accelerate the implementation of technical landing, navigation, ATC and communications. The growth of consumers in air transport leads to an increase in traffic. to take into account the ever-expanding list of routes and air routes of the country followed by airplanes and helicopters of various passenger capacities, increasing flight speeds, the opening of new airports, it becomes obvious that it is necessary to perfect safety and efficiency of flight air traffic control system. Dispatch ATS (Air Traffic Control Service ATCS) is the most common type of ATS. It is intended for all flights in controlled airspace. Provides warning of aircraft from collisions in the air and on the ground.

The number of aircraft serviced by the ATC service does not exceed the number of aircraft whose flight control can be safely provided by the ATC unit under the prevailing conditions. In order to determine the maximum number of aircraft that can be safely maintained, the appropriate ATS authority should evaluate and declare ATC capacity for dispatch areas, dispatch sectors within the control area and for airfields. The capacity of the ATS should be expressed by the maximum number of aircraft that can be taken under control for a certain period in a given airspace or at the appropriate aerodrome. Where air traffic density changes daily or periodically, means and procedures should be provided to change the number of radar monitoring posts and / or sectors involved so as to meet the prevailing or expected air traffic requirements. In the case when specific events have negative consequences for the stated throughput of the airspace or range, the throughput of

the airspace and a specific aerodrome is reduced accordingly by the required period of time. As soon as possible, the capacity in such cases should be determined in advance. In cases where an increase in the demand for air transportation in airspace or at an aerodrome that exceeds the air traffic capacity of the ATC is planned to eliminate the threat to flight safety, measures are taken to control air traffic volumes. The concept of flexible use of airspace (FUA) (Flexible Use Airspace) is based on the principle that airspace should not be defined as purely civilian or military, but as a continuum in which all user requirements are realized to the greatest extent possible. FUA should lead to the exclusion of large areas of airspace with permanent or temporary restrictions or airspace of special use. More tangible benefits from the implementation of the FUA concept will be obtained through interstate cooperation, which may involve regional and sub regional agreements, since the reserved airspace is often established along critical sections of the flight path in the area of state borders. The effective and consistent application of FUA requires clear and consistent rules for coordinating civilian and military actions, which must take into account the requirements of all users and the nature of their various activities. Effective civil / military coordination rules should be based on norms and standards to ensure effective use of airspace by all users. When adopting the concept of FUA, it is extremely important to develop cooperation between neighboring states and take into account the presence of cross-border flights. In the airspace of the Republic of Uzbekistan for the implementation of activities related to the use of airspace, other special elements of the structure can be installed. The flexible use of airspace is applied according to the << Manual on the flexible use of airspace >>, developed jointly by the ATS authority and the BISP.

The manual specifies:

- a) the horizontal and vertical boundaries of the respective airspace;
 - b) the classification of any part of the airspace provided for use by civilian aircraft;
 - c) authorities or agencies that transfer responsibility for airspace
 - d) conditions for the transfer of airspace to the appropriate ATS unit;
 - e) the conditions for the transfer of airspace to the appropriate ATS unit;
 - f) airspace access periods;
 - g) any restrictions on UA(Use of airspace);
- other relevant rules or information.

The introduction of new technologies (such as RNAV (Area Navigation). Area navigation) and concepts (such as FUA - flexible use of airspace) will require the controller to know the structure of space and the restrictions in force in airspace directly outside the area of responsibility. This airspace is called the Common Interest Area (ACI). The area of common interest should include, at a minimum, all ATS routes crossing the border between adjacent centers. Air traffic control should be more functionally organized, and airspace should be organized in accordance with operational requirements and divided according to the nature of the structure of transport routes. As the use of more sophisticated navigation functions (for example, flight mode with parallel displacement, standard instrument layouts (SID Standard Instrument Departure) and standard instrument arrivals (STAR - Standard Terminal Arrival Route), flight patterns in the waiting area and approaches using RNAV) their

integration into air traffic control procedures will require appropriate training of controllers so that they can use such functions. The implementation of the task of integration into the international air navigation system involves the harmonization of regulatory legal acts in accordance with international standards and recommended ICAO, the introduction of international technology and standards activities facilities of the Air Navigation System. Compliance of technologies and standards with international requirements should be ensured by internal and external audit procedures and prompt elimination of deviations. The airspace of the Republic of Uzbekistan uses flexible use of airspace, which is carried out in accordance with the Manual on the Flexible Use of Airspace, developed jointly by the Center for Air Navigation and ATS. For flights of aircraft, regardless of their departmental affiliation, ATS routes are established in the airspace of the Republic of Uzbekistan. The ATS routes and the procedure for their use are developed by the Center for "UzAirNavigation", agreed with the State Inspectorate of the Republic of Uzbekistan for Flight Safety Oversight and approved by the Commander of the Air Defense Forces and the Air Force. ATS routes are included in the List of airways and local airlines developed by the State Inspectorate of Uzbekistan for Flight Safety Supervision and approved by the Commander of the Air Defense Forces and Air Forces, excluding standard arrival and departure routes, which are established by flight operations instructions in the airfield (aerodrome) area. Types of required navigation characteristics for area navigation routes are developed by the competent authority for the provision of ATS in civil aviation of the Republic of Uzbekistan, agreed with the State Flight Safety Inspectorate of the Republic of Uzbekistan and approved by the Commander of the Air Defense Forces and the Air Force. Flights along zonal navigation routes are carried out by aircraft equipped for flight operations using the zonal navigation method along any desired trajectory within the range of the navigation aids based on reference stations (including satellite) or within the limits determined by the capabilities of the autonomous onboard navigation aids or through a combination of these means. In the absence of restrictions on the use of the airspace of the Republic of Uzbekistan, the ATS units may apply, with the permission of the Aircraft Control US ATS and with the agreement of the air defense authorities, the method of vectoring of aircraft from any point of their location. Preparation and submission of proposals for improving the procedure for the use and structure of the airspace of the Republic of Uzbekistan are carried out in accordance with the existing document. The introduction of the FUA Concept in Uzbekistan will allow the coordination of civilian and military activities at the strategic, pre-tactical and tactical levels of airspace management by entering into rule-making agreements to improve flight safety and airspace capacity, as well as flight efficiency and flexibility. Implementation The concept of FUA will unite the airspace without departmental division into civil and military. Full implementation of all benefits associated with the above concepts will only be possible as a result of coordinated and coordinated actions and their phased implementation in all regions.

References

1. Doc 9750, AN / 963. Global Air Navigation Plan for CNS / ATM systems. Third edition, 2007. International Civil Aviation Organization.
2. Cir 330, AN / 189. Civil and military cooperation in air traffic management. International Civil Aviation Organization. ICAO, 2011.
3. A.I. LOTVIN, A.A. BABICH. Questions optimization elements of the structure of airspace. Scientific Bulletin of MSTU GA N126. 2007. p. 5-9.