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Assessment of airspace surveillance and control in Albanian territory from the current and historical prospective

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Abstract

The main goal of this article is to present the background importance of airspace control and surveillance with aim to increase the capacity of detecting potential issues and establish a safety traffic flow management and the optimal allocation of airspace resources. Further on the approach consider the multi-sector airspace scenario established after the second world war, securing the territorial integrity, provision of maritime and airspace monitoring. To that fact immediately after the year 1944 the relevant military structure was organized for aerial surveillance, notification and communication with a reduced force, which was organized in visual posts equipped with optical tools with limited capabilities in detection distances, that alter on was accomplished via radio-electronic means. In an organized manner and with a clearly defined mission, the radio-locator stations have started their work in the unified system. In terms of variety, radar stations of various types of Soviet production were used, and after the seventies, the radar-park was completed with other more powerful Chinese production stations. With further advancements the electronic airspace detection power absolutely guaranteed the air sovereignty of Albania, in the conditions where the closed skies strategy was implemented for over 40 years. The experience accumulated over the years, the studies and experiments carried out have turned this service into an integral part of NATO.

Introduction

The current developments of different sectors of economy are directly connected with air traffic management with aim to provide safe and effective movement of goods, services and humans. Following [1] ones the flight traffic continues to increase, the traditional air traffic management methods can no longer meet the current practical needs. Further on it is worth to mention that the air traffic situation prediction can help air traffic management departments anticipate the trend of future operation status to identify congested airspace and formulate traffic balancing and management measures in advance [2].

The main goal of this article is to present the background importance of airspace control and surveillance with aim to increase the capacity of detecting potential issues and establish a safety traffic flow management and the optimal allocation of airspace resources. Further on the approach consider the multi-sector airspace scenario established after the second world war, securing the territorial integrity, provision of maritime and airspace monitoring.

With this regards the beginnings of the Albanian Radio-technical service date back to the year 1947, when the airspace compnay was created, based in Tirana, with a workforce of 80 people, which spread to nine Visual Posts with over twenty points of Visual-Optical Surveillance in dominant positions such as Koplik, Shishtavec, Dibër, Korçë, Bilsht, Gjirokastër, Saranda, Vlora, Cape Rodoni, etc. from where the Air Space was continuously monitored and data on the Air situation was transmitted to the Headquarter unite. Within the first year, the department

managed to organize a unique system of observation with optical means, played a decisive role in air defense, laying the foundations of the future military strategy for ensuring the air sovereignty of the country.

Air traffic situation assessment is an objective representation of the airspace operational status, and its results are also the basis for air traffic situation prediction [1]. The national advancement in Alkbania followed similar path with other countries, so the mainstream assessment methods mainly represent the air traffic situation with the help of the concept of air traffic complexity (also called airspace complexity or air traffic control complexity) [3]. Since there is no precise definition of this concept and many factors affect air traffic complexity, researchers can deconstruct air traffic complexity to represent air traffic situations from multiple perspectives [4-6].

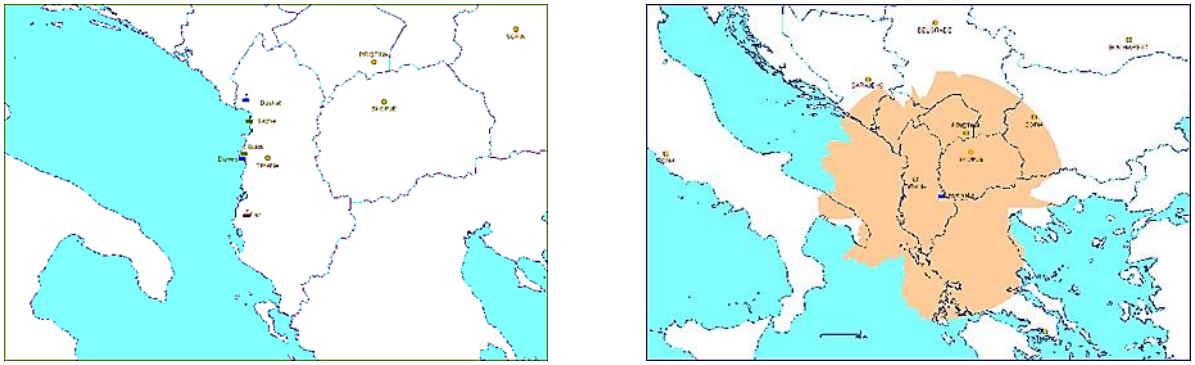

Figure 1. (left) The position of our Albania in relation to its neighbors and (right) The surveillance at the altitude of 1000 m a.s.l.

Material and Method

The method used in this approach is based on description of background documents and historical developments of the air traffic situation in Albania that can be understood as the operational status in a specific airspace environment. Different scholars have proposed various methods to characterize the airspace operational situation. So, for the national for large-scale airspace, an objective and concise way must be designed to solve the air traffic situation assessment problem. Now the centre of importance for the continuation and advancement of the airspace control continues to go directly through equipment's with radars of different frequency ranges and detection parameters.

Results and Discussions

At the current circumstances based on the air force development plan and under the direct supervision of the headquarters, concrete cooperation with similar structures of other countries for the analysis and study of the state of the existing system as well as the design of transformation projects has begun. and modernization at the levels of standards of interaction and integration in the Airspace control system of South-Eastern Europe. In this framework, in implementation of the new strategy and approaches in 2003 was appointed an air surveillance structure under which two main air surveillance headquarter and a temporary one spread in their previous locations, Porto-Romano Durres and Zefjan, Bushat.

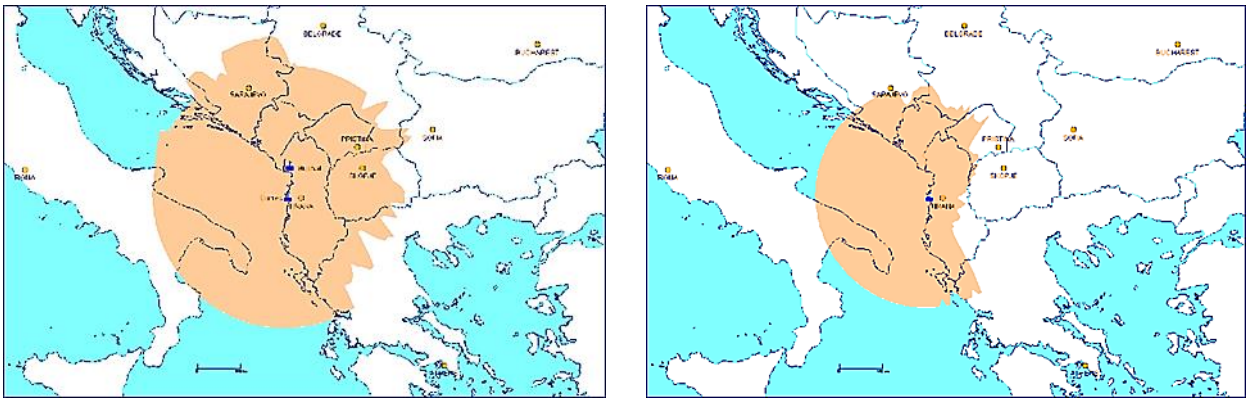

Figure 2. (left) Radar detection area for the guidance of combat aviation at an altitude of 10,000 meters a.s.l., and (right) Radar detection area in Durres

Further on the air surveillance for the continuous observation of the Airspace, although with reduced continues to be implemented with the motto: to make maximum use of the existing technique in order not to interrupt the combat task until the introduction of the new technology. Airspace control and management, system modernization is a primary objective of the air force headquarters. This is no longer promising, but a problem that needs to be solved. Thus, the glorious history of this department and its continuous air surveillance will continue to be narrated with the legitimate pride of an effective that is transformed and developed day by day, to achieve modernization and the most contemporary technologies for the continuation of its Mission that has been will remain vital for ensuring the country's air defense and sovereignty.

Conclusion

Due it geographical location of the country, the terrain particularly in the northeastern and southeastern areas is mainly hilly and mountainous, which limits radar detection at low altitudes, so further technical advancements are required.

Regardless of radar detection, the value and importance of visual and optical detection in specific directions cannot be neglected, so an integrated approach is also pursued.

The experience accumulated over the years, the studies and experiments carried out served for the dignified integration of this service in the framework of the international structures.

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