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The current concept of air traffic control based on human work supported by anthropotechnical systems was developed many years ago and is now at the limit of its capacity. The problem is to concentrate the work and decision-making process in a human being whose information processing capabilities are limited. Consequently, new methods of air traffic management are being sought. One idea is to delegate the responsibility for ensuring separation between aircraft from the air traffic controller to the aircraft crews, with the aim of relieving the workload of the air traffic controller and increasing the capacity of airspace sectors. In the long run, this idea is expected to lead to the exclusion of humans from the air traffic control process and its full automation. However, it should be taken into account that the transition from a centralized system (where an air traffic controller is responsible for ensuring separation between aircraft) to a decentralized system (where aircraft crews are responsible for ensuring separation between aircraft) will occur in stages due to technical limitations. It is necessary to provide for the expansion of airborne collision detection and resolution systems. In addition, modification of the information network requires the provision of appropriate communication methods.

The paper presents a method of ensuring separation between aircraft in case of change of air traffic control, i.e. in the transition period between the centralized and decentralized system. The traffic rules are presented. Methods of communication and negotiation between conflicting parties are also presented. For the proposed method, a model of air traffic was created using Petri nets. Base on that, experiments were conducted to evaluate the proposed solution in the context of safety of the performed operations.