

MODELING OF DECISION-MAKING BY HUMAN-OPERATOR IN FLIGHT EMERGENCIES OF FUEL SHORTAGE ONBOARD

Nowadays one of the most innovative spheres in global industry is aviation. Along with its constant and impetuous development, the demands to its efficiency in general and to its safety specifically continuously increase.

According to the statistics, each year 700 to 1000 facts of fuel shortage were registered since 2001 till 2010 and only 38% of them resulted in safe landings on the aerodromes.

Let us consider common technological procedures that should be performed by an air traffic controller when he is informed about fuel shortage onboard:

1. determine the position of an aircraft, establish constant radar contact;
2. provide the opportunity to proceed direct to destination aerodrome to an aircraft;
3. provide the priority landing to an aircraft;
4. execute the control of air traffic according to technological procedures and decisions of the aircrew;
5. reconcile the availability of the destination aerodrome to provide landing for an aircraft with adjacent approach control unit or area control unit of the destination aerodrome, clarify weather conditions and weather forecast for it;
6. involve masters of aviation engineering service for providing support for the aircrew (if necessary);
7. inform air defense unit and adjacent air traffic control units (in direction of flight) about an aircraft suffering distress;
8. inform an aircrew about the position of an aircraft, meteorological conditions and air situation;
9. inform the aircrews of other aircraft about the flight route and flight level (altitude) of the distress aircraft;
10. transmit the control of an aircraft if it is identified by adjacent air traffic control unit on the established boundary.

For more detailed study of emergency situations onboard algorithms of aircrew actions and air traffic controller actions are developed. Appropriate determinate and stochastic models of decision-making by method of graph theory were constructed. These models allow to formalize the behavioral activity of human-operators when emergency situations onboard during the flight occur.

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