On approval of the Rules of navigational support of the state aviation of the Republic of Kazakhstan

Unofficial translation

Order of the Minister of Defense of the Republic of Kazakhstan dated July 31, 2019 no. 590. Registered with the Ministry of Justice of the Republic of Kazakhstan dated August 2, 2019 no. 19184

Unofficial translation

On the basis of sub-clause 14) of article 15 of the Law of the Republic of Kazakhstan dated July 15, 2010 "On Use of Air Space of the Republic of Kazakhstan and Aviation Activity" I HEREBY ORDER:

1. to approve the attached Rules of navigational support of the state aviation of the Republic of Kazakhstan.

2. Office of the Commander-in-Chief of the Air Defense Forces of the Armed Forces of the Republic of Kazakhstan in accordance with the procedure established by the legislation of the Republic of Kazakhstan shall ensure:

1) state registration of this order with the Ministry of Justice of the Republic of Kazakhstan;

2) direction of this order to the Republican State Enterprise on the Right of Economic Management "Institute of Legislation and Legal Information of the Republic of Kazakhstan" of the Ministry of Justice of the Republic of Kazakhstan for official publication and placement in the Reference Control Bank of the Regulatory Legal Acts of the Republic of Kazakhstan in Kazakh and Russian languages within ten calendar days from the date of state registration;

3) posting this order on the Internet resource of the Ministry of Defense of the Republic of Kazakhstan after its first official publication;

4) submission of information to the Legal Department of the Ministry of Defense of the Republic of Kazakhstan on implementation of measures stipulated by sub-clauses 1), 2) and 3) of this clause within ten calendar days from the date of state registration.

3. Control over execution of this order shall be entrusted to the heads of state aviation bodies of the Republic of Kazakhstan.

4. This order shall be brought to officials in the part concerning them.

5. This order shall come into force upon expiry of ten calendar days after the date of its first official publication.

Minister of Defense of the Republic of Kazakhstan

Brigadier General N. Yermekbayev

"AGREED"
Ministry of Internal Affairs
of the Republic of Kazakhstan
"____" _____2019
"AGREED"
National Security Committee
of the Republic of Kazakhstan
"____" _____2019

Approved by the order of the
Minister of Defense
of the Republic of Kazakhstan
dated July 31, 2019 no. 590

Rules of navigational support of the state aviation of the Republic of Kazakhstan

Chapter 1. General provisions

1. These Rules of navigational support of the state aviation of the Republic of Kazakhstan (hereinafter referred to as the Rules) shall determine the procedure of navigational support of the flights of the state aviation.

2. The navigational support of the state aviation involves organizing and conducting a set of measures in order to achieve high accuracy, reliability and efficiency of air navigation and combat use of aircraft, successfully solving the tasks of combat training and flight safety in the context of navigation.

3. The navigational support of the state aviation shall be organized by the heads of state aviation administration bodes.

General management and control of navigational support shall be carried out by the main navigators of state aviation administration bodies.

4. The following main definitions shall be used in these Rules:

1) aviation means of destruction are the means of destruction used from aircraft on ground , sea and air objects;

2) aircraft armament is a set of aircraft-mounted weapons of destruction deployed on aircraft, aircraft armament installations, aircraft artillery weapons and aircraft armament control systems ensuring their combat use;

3) combat use of an aircraft is a controlled process of using all types of aircraft weapons, characterized by a set of actions by the crew with the aim of hitting ground (sea) and air targets, their designation, as well as landing, aerial reconnaissance and application of means of electronic warfare;

4) air navigation is the science of methods and means of driving aircraft in the Earth’s atmosphere along predetermined trajectories, as well as a set of operations for determining flight navigation elements;

5) loss of orientation is a situation in flight in which the crew (pilot) of an aircraft does not know its location in airspace with the accuracy necessary to determine the further direction of the flight and fulfill the task;

6) command point squad is a military unit led by the appropriate chief, designed for continuous and sustainable flight control (military operations);

7) visual orientation is the comparison of the image of the terrain or individual landmarks on the map with their actual view on the earth's surface in order to determine the location of the aircraft relative to the identified landmarks;

8) navigation target acquisition system (complex) is a set of functionally related on-board facilities and systems providing automated flight and combat use of an aircraft according to a given program;

9) navigation target acquisition equipment is the equipment providing air navigation and combat use of an aircraft without flight automation along a predetermined path;

10) weapons permit zone (weapons zone) is the area of airspace in which the use of aircraft weapons and their guidance on specified targets along a given (programmed) flight path is permitted (provided);

11) target approach is the aircraft's approach to a specific area of the airspace in which target detection and recognition and combat mission solving are provided;

12) television day is the duration of daylight hours during which (according to the conditions of illumination) operation of television sights, systems of guided aircraft weapons with television seekers is provided;

13) operator of an unmanned aircraft system (hereinafter referred to as the UAS) is an aviation specialist manipulating the UAS during its flight;

14) navigation equipment is the equipment provided for by the supply standards and intended for carrying out necessary calculations, solving the problems of air navigation and combat use of aircraft in the preparation and execution of flights, as well as for storing documentation;

15) navigational service is a service designed to solve the theory and practice of air navigation and combat use of aircraft (groups of aircraft), as well as organize and conduct navigational training and flight support (combat operations) and is a flight service.

Chapter 2. Procedure for navigational support of the flights of the state aviation

Paragraph 1. Organization of flights navigational support

5. Navigation support for flights shall be organized by the senior navigator of the aviation unit (subunit) in accordance with the decision of the aviation unit commander for flights.

6. The main activities of navigational flight support shall be:

1) navigational equipping the flight area;

2) development of documents for flight operations, general organization of flights and for specific flights;

3) development of proposals justified by navigational calculations necessary for the commander of an aviation unit to make a decision on flights;

4) organization and control of the implementation of instructions and instructions for navigational flight support.

7. The scope and content of navigational flight support activities shall be determined by the of the tasks performed, the navigational situation of the flight area, the tactical and technical data of the aircraft, the level of navigational training of the flight crew, UAS operators, the flight management group and personnel of command posts, as well as the available time.

8. The main tasks of the navigational service of state aviation shall be:

1) ensuring high accuracy, reliability and safety of air navigation and effective combat use ;

2) development and implementation of measures to achieve and maintain the level of navigational training of aviation units (subunits);

3) development and implementation of flight operations support activities;

4) development and improvement of the theory and practice of air navigation and combat use of aircraft, as well as their support means;

5) organization of the collection of information and processing of statistical material characterizing the accuracy, reliability and effectiveness of air navigation and combat use;

6) continuous improvement of training methods and implementation of standards for assessments of air navigation and combat use;

7) organization of research, finding ways to improve the accuracy characteristics of sighting and navigation systems (sighting and navigation equipment) and improving the methodology for their application;

8) organization of work for providing aeronautical information to aviation units (divisions) of state aviation;

9) participation in the development of flight missions and quality control of their implementation by aircraft crews (UAS operators);

10) participation in the development and implementation of measures for the navigation equipment of the territory of the Republic of Kazakhstan and the areas of basing (flights) of state aviation;

11) development and implementation of measures aimed at ensuring the safety in the navigational context;

12) automation of solving the tasks of navigational support for combat training of aviation units (subunits) of state aviation.

Paragraph 2. Navigation equipping the flight area

9. Navigation equipping the flight area shall be carried out during the combat training of aviation units, taking into account the experience gained, changes in the tasks of combat training, as well as upon receipt of new aircraft, radio-technical flight support or automated control systems.

10. Navigation equipping the flight area shall include:

1) placement of stationary and mobile means of radio technical support of flights and UAS ground control stations;

2) geodetic reference positions of radio flight support facilities and UAS ground control stations;

3) definition of the operational areas of radio equipment and possible areas of UAS operations for different flight altitudes;

4) development of data on the operation of radio flight support;

5) calculation of corrections for the propagation of radio waves of various radio navigation systems;

6) flying around the work areas of radio flight support systems.

11. The arrangement of stationary and mobile radio-technical flight support facilities and UAS ground control stations shall be carried out in such a way as to create a continuous radio navigation field in order to ensure maximum accuracy in determining the position of the aircraft and a more reliable solution to the problems of air navigation and combat use of aircraft.

Positions of mobile means of radio engineering flight support shall be selected after determining the working areas of stationary means.

When arranging, the possibility and necessity of duplication of the workspace of one system with the workspace of a system of another type shall be taken into account.

The choice of positions for the deployment of radio-technical flight support equipment shall be carried out by communications and radio-technical flight support specialists and navigator officers.

12. Geodetic linking of the positions of radio-technical flight support facilities shall be carried out by the topographic and geodetic service.

The geodetic linking of UAS ground control stations positions shall be carried out by the UAS crews (personnel) in conjunction with aviation engineering specialists. UAS ground control stations shall be defined by UAS operators.

13. The definition of the work areas of radio-technical flight support facilities and the development of their work data shall be carried out by communication and radio-technical flight support specialists after attaching positions.

Operation data of radio flight support facilities shall include frequencies, callsigns and operating modes.

14. The flight of radio-technical flight support shall be carried out in order to clarify the estimated boundaries of the work areas and to determine the accuracy capabilities of the radio-technical flight support in conjunction with on-board means. Flight over the working areas of radio-technical flight support equipment shall be carried out by special laboratory aircraft, and in their absence, by trained aircraft crews.

15. The study with the flight crew, the flight control group and the personnel of command posts of the work data, the boundaries of the work areas and the accuracy characteristics of the radio-technical flight support shall be carried out after the flight.

Paragraph 3. Development of documents for flight navigational support, general organization of flights and for specific flights

16. The documents under development for navigational flight support, the general organization of flights and specific flights shall include

1) orders and instructions on flight navigational support;

2) reference data;

flight, onboard and operational maps;

4) navigational and engineering-navigational flight calculations;

5) flight navigational plan.

17. The orders and instructions for navigating flight operations shall be worked out by the main navigators of state aviation control bodies. The instructions for navigational flight support shall reflect:

1) the content and features of the implementation of combat training tasks for the school year in the navigational context;

2) features of preparing flight personnel for flights and conducting readiness control for them in the navigational context;

3) special aspects of the navigational preparation of personnel of command posts (features of their work when hovering the aircraft and when monitoring flight operations);

4) special aspects of the training of flight managers at aviation training grounds (landing sites);

5) measures to maintain a high level of navigational training of flight crews, UAS operators, persons of the flight management group and the personnel of command posts;

6) measures to ensure flight safety in the navigational context;

7) measures on navigational equipment of the flight area;

8) measures to organize provision with aeronautical information;

9) the use of objective flight control to determine the results of air navigation and combat use of aircraft;

10) themes of classes conducted by senior navigators of aviation units (divisions) with flight personnel.

18. In order to reduce time for preparation for flights, the main navigators of state aviation control bodies and senior navigators of aviation units (subunits) shall organize and conduct work on the preparation of reference data.

19. Reference data necessary for solving the problems of air navigation and combat use of aircraft shall be prepared during the general preparation for flights.

The reference data shall include:

1) tables with the tactical and technical data of aircraft, aircraft weapons, means of electronic flight support, control and guidance systems;

2) tables with data on the combat capabilities of aircraft of aviation units (subunits) and graphs of calculations for the defeat of typical objects (targets);

3) catalogs of geodetic coordinates of objects;

4) ambient light tables;

5) nomograms and graphs for performing navigational calculations;

6) rating tables for air navigation and combat use of aircraft.

Based on the combat mission of the aviation units and tasks, by the decision of the chief navigator of the state aviation control body, the list of reference data shall be supplemented with other necessary information, their specific content, quantity and composition shall be determined.

20. Reference data aims to determine:

1) tactical radius of action of aircraft with various combat charge options and typical modes and flight profiles;

2) maximum practical flight ranges of aircraft (groups of aircraft);

3) aircraft duty time and range of operations during operations from on-board duty zones;

4) rational combat charging of aircraft for actions on typical objects (targets);

5) required power units for a given degree of defeat of typical objects (targets) or the expected result of actions with a given force order;

6) the necessary means of radio technical support for flights, ensuring the performance of flight tasks;

7) the boundaries of the entry into the battle of fighters for hitting air targets from various positions and degrees of readiness;

8) fighter control targeting capabilities;

9) capabilities for landing (transporting) troops and machinery;

10) assessment of the actions of crews (units, parts) in air navigation and combat use of aircraft;

11) safe conditions for air navigation and combat use of aircraft.

21. To solve the problems of navigation and combat use of aircraft, flight, onboard and operational maps shall be used. Flight maps shall be divided into route and district goals.

The main scale of the maps used in state aviation of the Republic of Kazakhstan shall be provided in the annex to these Rules.

The preparation of maps shall be carried out in the course of general preparation for flights in accordance with these Rules, manuals on air navigation and the instructions of the chief navigator of the state aviation control body.

22. Flight cards shall be included in the mandatory flight documentation set for aircraft crews and UAS operators of state aviation.

Crew flight cards must be available to the commander, assistant commander (co-pilot, navigator), navigator (navigator-operator), pilot-instructor (navigator-instructor). Departure without a prepared flight map shall not be allowed.

23. Route maps shall be selected in such a way as to cover an area that makes it possible to fly along a route, bypass dangerous weather conditions, straighten or change a route, leave for an alternate aerodrome and restore orientation if it is lost.

24. General preparation of a route map shall include:

1) designation of the state border and border strip;

2) plotting on and designation of forbidden zones and zones with a special flight regime, cut-off bearings (azimuths) and their ranges;

3) plotting on the flight routes, sections of airways and modes of their intersection;

4) plotting on (raising) the magnetic declination;

5) plotting on the control lines (escort, refueling, detection, entry into battle etc.);

6) plotting on the extra-aerodrome radio engineering flight support;

7) plotting on the borders of work areas and equal accuracy curves of radio navigation systems of the flight area, the boundaries of the beginning and end of continuous correction of sighting and navigation systems;

8) raising characteristic visual and radar landmarks that provide guidance and correction of the navigation target acquisition system, determining and plotting on their coordinates;

9) raising the main heights of the terrain and putting artificial obstacles.

25. In order to ensure high accuracy and reliability of reaching a given target, each crew and UAS operators shall prepare a large-scale map of the target (reconnaissance area, landing site, weapons permit zone).

26. General preparation of target area maps shall include:

1) marking the boundaries of the landfill (action area);

2) plotting on the target layout;

3) designation and rising of the target, aiming points and auxiliary aiming points;

4) selection, raising and designation of the beginning of the military course;

5) laying and marking of the line of the combat route;

6) measurement and plotting on the direction angle, distance and flight time from the beginning of a military way to the target;

7) marking the specified time to reach the target;

8) plotting on the permitted sectors of attack (intelligence) of targets;

9) determination and plotting on the height (excess) of the target above sea level (departure aerodrome);

10) designation of radar and visual (control) landmarks, means of radio-technical support for flights, providing correction of the navigation target acquisition system, bringing the aircraft to the beginning of the combat route and to the target, its search and recognition;

11) plotting on the coordinates of the target, aiming points, the beginning of the combat path and reference points (correction points of the navigation target acquisition system);

12) plotting on the safe lines of using weapons from their troops.

27. The on-board map shall be prepared in such a way as to ensure coverage of the entire territory of the Republic of Kazakhstan.

General preparation of on-board maps shall include:

1) designation of the state border, border strip and restricted areas;

2) plotting on the main and alternate aerodromes;

3) plotting on the extra-aerodrome radio engineering flight support;

4) marking (plotting) on the grid of the coordinate system and data application for the use of the navigation target acquisition system (sighting and navigation equipment).

The on-board card shall be kept on board the aircraft.

28. Operational maps shall be designed to reduce the time for the navigator to prepare proposals for the commander of the aviation unit for making decisions on flights and personal preparation for the formulation of the task, as well as for developing flight tasks and flight programs.

General preparation of an operational map shall include:

1) designation of the state border and border strip, restricted areas;

2) plotting on the primary and alternate aerodromes, radio-technical flights support facilities, data on their work and work areas;

3) plotting on the elements of a navigational situation in the flight area (airways, duty zones in the air);

4) marking (plotting) on the grid coordinate system.

Forms of operational and non-operational information and other necessary documents (target maps, photographs, images of the radar image of the target area, aerial photographs) shall be attached to the operational map.

29. Depending on the type of aviation and combat mission, the decision of the senior navigator of the aviation unit, other data shall also be plotted on the maps of all uses.

30. During pre-flight preparation, aircraft crews (UAS operators) shall perform navigational and engineering-navigational flight calculations, as well as shall develop a navigational flight plan.

31. Navigation flight calculation shall be made after understanding the flight mode, laying and marking the route on the map.

The purpose of the flight calculation shall be:

1) determination of the length of route sections, distances to control lines (climb and descent, leveling, refueling, detection and others), distances to the target (weapons permit zone), total route length;

2) determination of flight altimetric altitudes;

3) determination of time for building and dissolution of battle formation, flight time along route sections, to milestones (landmarks), to the target and total flight duration;

4) defining the boundaries of the meeting with interacting units, tactical groups, tanker aircraft;

5) determination of the estimated time of reaching the target (to the zone of permitting the use of weapons) at a given take-off time, or the estimated time of taking off, if the time of reaching the target (to the zone of allowing the use of weapons);

6) determination of the boundaries of meeting with darkness and dawn, course angles of celestial bodies (the Sun, the Moon and the North Star) for indicative control of the flight direction.

32. Flight engineering-navigational calculation shall be performed in the following cases:

1) when the route exceeds 75% of the practical range of the aircraft;

2) when flying at supersonic speed (regardless of flight duration);

3) when flying at extremely low and low altitudes;

4) in other necessary cases by decision of the commander (senior navigator).

33. The engineering-navigational calculation of the flight shall be carried out in accordance with the guidelines (instructions) for calculating the range and duration of the flight of the aircraft (if they are absent, the guidelines (instructions) for the flight operation of the aircraft) and shall be aimed at determination of:

1) the necessary refueling of the aircraft in order to achieve its goal (zone for permitting the use of weapons) for a given combat charge, to complete the task and return to the landing aerodrome;

2) combat charging and refueling the aircraft necessary to achieve its goal (weapons permit zone) at the maximum range, complete the task and return to the landing aerodrome;

3) fuel consumption over sections of the flight route and its balance at reference points (lines), engine operation mode and aircraft flight mode;

4) practical ceiling of the aircraft over sections of the route (in augmented and non-augmented modes), and in multi-engine aircraft - and if one or more engines fail;

5) fuel remaining and flight time reserve at the exit to the start point of the maneuver, with a decrease for landing and after landing;

6) the amount of fuel needed to complete the task (with incomplete refueling);

7) boundaries of return to the take-off and departure to alternate aerodromes;

8) the boundaries of the beginning and end of refueling in the air, its duration and the amount of received (given) fuel.

34. When performing the engineering-navigational calculation, the senior navigators of the aviation units (navigators of units, groups) shall calculate the time required to take off and build the battle formation of the aviation unit (units, groups), determine the distances, modes (speed, altitude) and flight time from the route sections, the total distance and flight time to the target (weapons permit zone) and from the target to the landing aerodrome, the time required for the dissolution and landing of aircraft of the aviation unit (unit, group), and also indicate aircraft combat charging time, time and place of combat use.

The deputy commanders of aviation units (subunits) for aviation engineering support shall calculate the practical ceiling of the aircraft (group), fuel consumption over sections of the route, fuel remaining at the landing airport and after landing, total fueling.

The calculated data on fuel consumption and remaining fuel, the practical ceiling for sections of the route, engine-operating mode and flight mode shall be recorded in the form of navigational flight calculation. Data on fuel balances for the main points of the route shall be plotted on flight charts and reflected in the navigational flight plan.

35. When performing the engineering-navigational calculation, the senior navigators of the aviation units (navigators of units, groups) calculate the time required to take off and build the battle formation of the aviation unit (subunits, groups), determine the distances, modes (speed, altitude) and flight time from the route sections, the total distance and flight time to the target (weapons permit zone) and from the target to the landing aerodrome, the time required for the dissolution and landing of aircraft of the aviation unit (unit, group), and also indicate aircraft combat charging time, time and place of combat use.

The implementation of the engineering-navigational calculation in peacetime is aimed at eliminating the triggering of an alarm about the emergency fuel remaining before the aircraft lands at the airport.

The remaining fuel after landing shall be determined by the decision of the flight operations commander, but not less than the minimum. The minimum fuel residue after landing shall be determined by the manual (instruction) on the flight operation of the aircraft.

36. The navigational flight plan shall be developed by the senior navigator of the aviation unit in performance of flights, relocation, combat use and demonstration group flight aircraft with the composition of a cell and above and each crew when the flight mission.

The navigational flight plan shall be worked out on the map and brought to the flight crew by the commander or senior navigator when setting the mission for flights.

The crew shall develop a navigational flight plan on a separate sheet in the form of a route diagram or on a flight map.

37. The following questions shall be displayed in the navigational flight plan, depending on the type of aviation, navigation situation and flight mission:

1) time and sequence of take-off, combat (flight) order of the aviation unit (subunit), methods for constructing, maintaining, dissolving and landing at the main and alternate aerodromes;

2) algorithm for reaching the starting point of the route and from the final point of the route to the landing aerodrome (to the point of the beginning of the dissolution of the battle formation);

3) routes and flight modes of crews (groups) of aviation units;

4) safe altitudes along the route stages;

5) flight calculation, leveling lines, meeting lines (with fighters, tankers), start and end of refueling, end of escort;

6) meeting algorithm (with fighters, tankers);

7) algorithm for approaching the target (zones for permitting the use of weapons, landing area), maneuver to exit at a given time, moving away from the target (landing area);

8) distribution of targets, combat loading of an aircraft, methods and conditions for the combat use of aircraft weapons (landing);

9) the algorithm for using the navigation target acquisition system (sighting and navigation equipment) and radio-technical support for flights on each section of the route, when reaching the target (landing site) and to the landing airfield;

10) boundaries of fighter entry into battle;

11) duty zones in the air and areas of independent search, their designation, separation and maneuver of the aircraft in them when searching for and finding a target, the procedure for entering zones and areas of search;

12) target guidance;

13) algorithm of actions of command posts and crews for target designation and retargeting;

14) measures to ensure navigational safety in the navigational context;

15) measures to restore lost orientation;

16) use of means of objective control of navigation and combat use;

17) flight engineering-navigational calculation;

18) fuel consumption control algorithm.

Depending on the task, the conditions for its implementation, the type of aircraft and the level of navigational training of the flight crew, other measures (actions) aimed at the successful completion of the tasks shall also be included in the plan.

Paragraph 4. Generation of proposals of a senior navigator to the commander of an aviation unit for making a decision on flights

38. The senior navigator of the aviation unit, on the basis of the combat training tasks set to the unit, taking into account the instructions of the main navigator of the state aviation control body, as well as on the basis of the study and assessment of the navigational situation, shall prepare and submit to the unit commander proposals for navigational support of flights and navigational training of flight personnel

39. The study and assessment of the navigation situation shall be carried out on the following main elements:

1) conditions for deploying an aviation unit;

2) terrain characteristics in the flight area;

3) meteorological conditions;

4) natural lighting;

5) equipping the flight area with radio-technical flight support facilities.

40. When studying and assessing the conditions of deploying an aviation unit, the following shall be covered:

1) main and alternate aerodromes, their coordinates, elevations (absolute altitude), landing conditions, dimensions and directions of the runway, equipment with drive and landing facilities and other topographic and geodetic data;

2) mutual disposition of aerodromes, the possibility and procedure for performing simultaneous flights on them;

3) airfields used (landing sites, tactical targets, zones for permitting the use of weapons), their removal from basing airfields, target environment.

41. When studying the terrain nature in the flights area, the following shall be covered:

1) general characteristics of the terrain by sections (flat, rugged, mountainous, forest, steppe, marshy, desert) and its elevations above sea level, coordinates and heights of artificial obstacles;

2) the effect of the terrain features and artificial obstacles on the organization and performance of flights at low and extremely low altitudes, as well as on the working area of the distribution of UAS control signals and on the operation of radio flight support;

3) the presence of snow and ice cover, seasonal and flood waters and their impact on changing the configuration of the coastline of the sea, the outlines of rivers and reservoirs, on the visual (television) and radar orientation when entering the landfills (tactical targets) and landing sites (landing);

4) the ability to conduct visual (television) and radar orientations, use landmarks for correcting sighting and navigation systems, and also as aiming points when performing bombing (launching missiles) at invisible targets and landing;

5) magnetic declination and areas of magnetic anomalies, their effect on heading systems, especially when flying at low and extremely low altitudes.

42. To assess meteorological conditions the following shall be studied:

1) actual weather conditions and possible changes during the flight;

2) the influence of the main meteorological elements and the ornithological situation on the combat (flight) orders, the methods of their construction and dissolution, approach, on the choice of flight routes and profiles, the ability to conduct visual (television) and radar orientations, access to targets and the use of sighting devices, on use of aviation weapons;

3) dangerous weather phenomena.

43. Assessment of natural light conditions shall be aimed at determining:

1) the time of dawn, sunrise and sunset, the onset of darkness, the duration of daylight and darkness, the duration of the “television day”, the time of sunrise and sunset of the moon and its phase for airfields and alternate airfields, ranges (landing sites) and tactical targets (zones use of weapons), the boundaries of the meeting with escort fighters, interacting groups and refueling;

2) the influence of weather conditions, terrain and flight altitudes on the change in natural light;

3) the possibility of visual orientation, the use of optical (electron-optical), television, thermal imaging laser sights (drift indicators) and astronomical means of air navigation.

44. When studying the equipment of the flight area by means of radio-technical flight support, the following shall be analyzed:

1) disposition and nature of the operation of radio-technical flight support and guidance systems;

2) workspaces for radio flight support and guidance systems;

3) the possibility of using radio flight support tools for correcting the navigation target acquisition system, determining the location of aircraft and navigation flight elements.

45. The senior navigator of the aviation unit, based on the study and assessment of the navigational situation, shall develop and report to the commander of the aviation unit proposals for making decisions on flights on the following issues:

1) natural lighting in the area of the airfield, alternate aerodromes, training grounds (weapons permit zones, landing sites) and various boundaries, its impact on the performance of flight tasks;

2) routes and flight profiles;

3) flight calculation;

4) the procedure for completing flight tasks - from the take-off of an aircraft to its landing;

5) combat exercises, training grounds (permit zones for the use of weapons, landing sites), conditions for the combat use of the aircraft;

6) alternate aerodromes and approaching procedures;

7) navigational training activities and navigational readiness control;

8) the use of ground and on-board means of objective control in the interests of monitoring flight performance, determining and evaluating the results of air navigation and combat use of aircraft;

9) providing guidance for aircraft on specified aircraft and ground (sea) targets, especially the guidance of flights on firing and tactical training grounds;

10) measures to ensure navigational safety in the navigational context.

46. The scope and content of the proposals shall vary depending on the complexity of the tasks, the conditions for their implementation, the instructions of the commander and the time allotted for the report of the senior navigator.

47. After the commander of the aviation unit makes a decision to fly, the senior navigator gives instructions on the preparation of flight programs, issues data on the implementation of navigational and engineering-navigational flight calculations, and proceeds to develop a navigational flight plan.

Paragraph 5. Organization and control of the implementation of instructions and instructions for flight operations

48. Monitoring the implementation of instructions and instructions on navigational support for flights in aviation units (divisions) shall be organized by the main navigator of the state aviation control body.

49. Monitoring the implementation of instructions and orders shall be carried out in order to determine:

1) the compliance of the activities of the navigational support for the flights of the aviation unit with the instructions of the chief navigator and the tasks of combat training;

2) compliance of flight preparation activities in a navigational sense;

3) compliance of the flight readiness control measures in the navigational respect with the requirements of these Rules and the instructions of the main navigator;

4) the correct choice of means and methods of air navigation and combat use of the aircraft for the successful completion of flight missions;

5) completeness of the use of means of objective control of air navigation and combat use of an aircraft;

6) level of implementation of safety measures in a navigational sense.

50. Checking the status of the navigational training of aviation units (subunits) shall be carried out as follows:

1) listening to navigational officials and control units of aviation units (subunits);

2) verification of worked out documents, reference data, calculations, flight programs, applications for the operation of radio flight support;

3) listening to the task assignment for flights;

4) verification of preparedness of the flight crew, UAS operators, the flight management group and the personnel of command posts in the navigational context;

5) checking the readiness of aerodromes for navigation and the availability of aviation units (subunits) with aeronautical information documents;

6) monitoring the readiness for flights of units, divisions, crews of aircraft and UAS operators in the navigational context;

7) monitoring the flight management;

8) verification of ground and on-board objective control data;

9) verification of the completeness and quality of the flight crews.

51. The chief navigator shall check the status of the navigational training of aviation units at least once a year, individual units - twice a year, the senior navigator of the aviation unit - each unit at least once a month.

If necessary, according to the results of the audit, the chief navigator of the state aviation control body and the senior navigator of the aviation unit shall work out measures to eliminate (prevent) identified deficiencies.

Chapter 3. Ensuring flight safety in the navigational context

Paragraph 1. Organizing the aviation safety in the navigational context

52. The main navigators of state aviation control bodies, the senior navigators of aviation units (subunits) shall plan and conduct safety measures in the navigational context aimed at eliminating:

1) disorientation of aircraft crew during flight;

2) collisions of aircraft with the earth (water) surface and obstacles;

3) hazardous proximity and airborne collisions;

4) complete fuel depletion during the flight;

5) getting into dangerous and restricted areas by aircrafts;

6) getting into dangerous weather conditions and difficult ornithological conditions by aircrafts;

7) getting into the area affected by aviation weapons by aircrafts;

8) the use of aviation weapons not for predetermined targets (outside the range) and landing outside predetermined sites.

53. The flight safety in the navigational context shall be ensured by:

1) meeting the requirements of the order of the Minister of Defense of the Republic of Kazakhstan dated December 14, 2017 no. 744 "On approval of the State Aviation Flight Operation Rules" (registered with the Register of State Registration of Regulatory Legal Acts as no. 16210) (hereinafter referred to as the State Aviation Flight Operation Rules) and other documents, regulating the use of airspace and activities of aviation;

2) compliance with the procedure for the development of documents and readiness control in the navigational context in accordance with these Rules;

3) knowledge of air navigation and combat use of aircraft, safety measures in the navigational context and skillful use of this knowledge in flight operations;

4) clear digestion by crews, personnel of command posts and the flight management group of actions in special cases during the flight;

5) systematic study and analysis of errors made by crews, personnel of command posts and the flight management group in organizing and executing flights and taking measures to prevent them.

54. In order to exclude the flight of unprepared crews, as well as aircraft with faulty or unprepared sighting and navigation systems (sighting and navigation equipment) and an insufficient fuel supply, flight readiness control shall be carried out in the navigational context.

55. The willingness of crews (UAS operators) to fly in the navigational context shall be determined by:

1) knowledge of the flight mission and the sequence of its implementation;

2) the availability of prepared flight and other maps necessary for the aircraft crew to complete the flight mission, flight navigational calculation, aeronautical information documents and established navigational equipment;

3) knowledge of the flight program introduced in the navigation target acquisition system;

4) the presence of records in the knee-high tablets of the front-line aircraft crew, data necessary for solving the problems of air navigation and combat use, approach to the main and alternate aerodromes;

5) knowledge of the navigation environment along the flight route and in the target area (weapons permit zones);

6) knowledge of the features of bypassing forbidden zones and flying near the state border (border strip);

7) knowledge of terrain features, basic guidelines and means of radio-technical support for flights in the route strip, features of target search (landing site) and access to it, safe flight altitudes along route sections, safe conditions for the use of aviation weapons;

8) knowledge of flight safety measures in the navigational context.

56. The navigation preparation for flight shall be controlled by:

1) main navigators (senior navigator inspectors) of state aviation control bodies - crews of pilot inspectors of state aviation control bodies, crews of the aviation unit control and other crews of the aviation unit;

2) senior navigators of aviation units - crews of the aviation units command, aviation squadron commanders and other aircraft crews;

3) navigators (commanders) of aviation squadrons - crews of deputy squadron commanders and unit commanders and other squadron crews;

4) navigators (commanders) of units (detachments) - crews of a unit (detachment).

Paragraph 2. Preventing the cases of disorientation during the flight

57. The main reasons for disorientation are:

1) poor navigational training of the crew, as well as poor preparation of the sighting and navigation complex (sighting and navigation equipment) for flight;

2) poor organization and flight management;

3) lack of control by officials over the preparation of the crew (pilot) of the aircraft for flight;

4) insufficient preparation and non-observance by the crew of the sequence of implementation of the navigational flight plan;

5) poor practical skills of flight personnel in the integrated use of on-board and ground-based air navigation aids;

6) poor visual and radar-location orientation skills;

7) unpreparedness of the crew for flight in complicated conditions;

8) malfunction or complete failure of aircraft navigation equipment;

9) loss of the lead aircraft (group) during the flight when the slave crew did not conduct a general orientation.

58. The main measures to prevent disorientation are:

1) continuous study and delivery of tests at least twice a year by the flight crew according to the knowledge of the flight area, radio-technical equipment and crew actions in case of loss of orientation;

2) regular conduct of training with the study of various ways to restore orientation, actions in case of failure of navigation equipment and course instruments, for the integrated use of air navigation in flight for flight crews, UAS operators, a flight management group, and the personnel of command posts;

3) checking the condition of navigation equipment and conducting annual deviation and radio-deviation work on an aircraft;

4) control over the systematic and quality of flight crews on routes;

5) studying with flight crews, flight management group and the personnel of command posts of the cases of disorientation and deviation of routes by crews;

6) thorough navigational training of aircraft crews and UAS operators for flight;

7) integrated use of technical means of navigation in flight and timely determination of their malfunctions.

Paragraph 3. Preventing the cases of collisions of aircraft with earth (water) surface and obstacles

59. Exclusion of cases of collision of aircraft with the earth (water) surface and obstacles shall be achieved through:

1) thorough navigational training of aircraft crews (UAS operators) and navigation target acquisition system (navigation target acquisition equipment) for flight;

2) studying by the flight crews, flight management group and the personnel of command posts of the terrain and its heights, location and heights of artificial obstacles;

3) the maintenance by aircraft crews (UAS operators) of safe flight altitudes in the area of the aerodrome and along the route and control over their maintenance by the flight management and crew control group;

4) compliance by aircraft crews (UAS operators) with rules for changing flight altitude and cloud penetration in accordance with the State Aviation Flight Operation Rules;

5) accurate performance by all aircraft crew members (UAS operators) of their functional duties and timely execution of the commands of the flight operations director;

6) the ability of the crew, depending on the speed and angle of the dive of the aircraft, to determine the moment of the start of the withdrawal from the dive;

7) compliance with safety measures for flights at low and extremely low altitudes;

8) knowledge the features of navigation and combat use of the aircraft, management and control of flights at low and extremely low altitudes by the flight management group and the personnel of command posts;

9) the ability of the aircraft crew (UAS operators), flight management group and the personnel of command posts to respond quickly to changes in the air, meteorological and ornithological conditions;

10) strict observance by the crew of the aircraft of flight rules in mountainous conditions and taking into account the peculiarities of using barometric altimeters when landing at high altitude aerodromes in accordance with the State Aviation Flight Operation Rules.

Paragraph 4. Preventing the cases of complete fuel depletion during the flight

60. Preventing the cases of complete fuel depletion during the flight shall be achieved through:

1) knowledge of the kilometer and hourly fuel consumption of the aircraft depending on the flight mass, flight mode, variable wing configuration, number and type of external loads, and also the required reserve to complete the flight mission and the remaining fuel, which will return to the landing aerodrome;

2) clarification before departure of the engineering-navigational calculation of flight, fuel consumption (balance) at the stages of the route, taking into account the latest data on wind, air temperature and changes in flight conditions (altitude and speed);

3) continuous monitoring of fuel consumption during the flight.

61. The main measures aimed at eliminating cases of complete fuel depletion during the flight shall be:

1) the regular conduct of complex simulations with flight crews, UAS operators, a flight management group and personnel of command posts for calculating (controlling) fuel consumption in flight;

2) verification of flight crews, UAS operators, a flight management group and personnel of command posts of basic knowledge of the baseline and methodology for determining the aircraft's reach and airborne time capabilities;

3) verification of the calculation of the minimum fuel residues required to complete the flight and landing on the alternate aerodrome.

Paragraph 5. Preventing the cases of hazardous proximity and airborne collisions

62. Preventing the cases of hazardous proximity and airborne collisions shall be achieved through:

1) crew compliance (UAS) with vertical, lateral and longitudinal separation, as well as maintaining rear flight modes;

2) control over maintaining the flight mode on behalf of the flight management group and the personnel of command posts.

63. In order to exclude cases of dangerous approach and collision of aircraft in the air, flight crews, UAS operators, the flight management group and the personnel of command posts shall be checked at least twice a year for knowledge of separation rules and group flights in accordance with the State Aviation Flight Operation Rules.

Paragraph 6. Preventing of cases of getting into dangerous and restricted areas by aircrafts

64. Preventing of cases of getting into dangerous and restricted areas by aircrafts shall be achieved through:

1) strict observance by air crews and UAS operators of the established rules of flights near the state border, dangerous and restricted areas in accordance with the State Aviation Flight Operation Rules and adherence to the flight program and plan;

2) reliable air traffic control;

3) integrated use by aircraft crews and UAS operators of means and methods of air navigation;

4) the designation on the flight maps, indicators of radar stations and tablets of the air situation of the vectors of restrictive bearings, lines of passage of the State border and border strip, restricted areas and boundaries of the minimum permissible approach of the aircraft to them, taking into account maneuver when turning away from the state border;

5) studying the location of radio flight support facilities and updating their work data;

6) careful navigational plotting and studying the flight route, characteristic visual and radar landmarks, and clarifying the boundaries of control transfer;

7) monitoring the operability of the navigation target acquisition system (navigation target acquisition equipment), the correctness of entering flight programs, timely correction of the coordinates of the aircraft’s location.

Paragraph 7. Prevention of getting into dangerous weather conditions by aircrafts

65. Prevention of getting into dangerous weather conditions and difficult ornithological conditions by aircrafts shall be achieved by:

1) thorough study of the actual state and weather forecast, as well as the ornithological situation during the flight;

2) studying the nature, location and movement of zones of thunderstorm activity, chatter and icing, the choice of routes to bypass (exit the zones), taking into account the location of the state border, restricted areas, terrain and fuel supply;

3) determining the duplicating means and methods of air navigation used in case of deterioration of the operation of radio-technical flight support equipment due to thunderstorm activity;

4) determining the measures to prevent a collision with birds.

Paragraph 8. Preventing the cases of getting into the area of destruction by own aviation weapons by aircrafts

66. Excluding the cases of getting into the area of destruction by own aviation weapons by aircrafts shall be achieved through:

1) studying by the crews of aircraft and UAS operators of the conditions and procedure for completing a flight mission, aeronautical passport of an aviation training ground (weapons use zone), safety measures for firing, bombing and launching missiles, as provided for by the flight operation manual and methodological manuals for the combat use of the aircraft;

2) knowledge of the operational restrictions of the aircraft and air-launched weapons, the safe mode of using the air-launched weapons (safe altitude, speed, range, depth of groups, distance between groups, as well as the specified flight conditions), the sequence of work with aircraft weapon control systems and actions upon their refusal.

Paragraph 9. Preventing the cases of the use of aviation weapons not for predetermined targets (outside the range)

67. Preventing the cases of the use of aviation weapons not for predetermined targets (outside the range), landing of military forces and machinery outside the predetermined sites and fratricide fire shall be achieved through:

1) the detailed study by aircraft crews and UAS operators of the aeronautical passport of the aviation training ground (target area, weapons permit zone, landing site), distinctive and unmasking features of the target, knowledge of the exact coordinates;

2) maximum use of the capabilities of the navigation target acquisition system (navigation target acquisition equipment), weapon control systems (landing);

3) the choice of the most rational method of correction of navigation target acquisition system, verification of the correctness of the correction (indications) according to data of duplicate means;

4) the correct calculation of the background information, their input (input control) into the navigation target acquisition system (navigation target acquisition equipment) before entering the combat course;

5) choosing a reliable target aimpoint and correct aiming on it;

6) reliable identification of the target (landing site) on several grounds, especially in cases of retargeting;

7) knowledge of target designation methods and retargeting signals, means of designation (identification) of their troops and the procedure for their use;

8) fulfillment of the requirements and commands of the flight director at the range (landing site);

9) compliance by the crews of aircraft and UAS operators with safety measures when using aviation weapons in the immediate vicinity of the service area of the training ground (of their troops), which completely exclude their defeat.

68. If the crew (UAS operator) doubts the aircraft's exit to the intended target (landing site), the use of aircraft weapons (landing) shall not be allowed.

Annex to the
κ Rules of navigational support of
the state aviation of the
Republic of Kazakhstan

The main scales of maps used in state aviation of the Republic of Kazakhstan

Aviation type	Maps		
	Flight		On-board
	Route	Target area (border strip)	
front-line aviation	1 : 500 000	1 : 50 000	1 : 2 000 000
	1 : 1 000 000	1 : 100 000	
		1 : 200 000	
army aviation	1 : 200 000	1 : 50 000	1 : 1 000 000
	1 : 500 000	1 : 100 000	1 : 2 000 000
		1 : 200 000	
transport aviation	1 : 1 000 000	1 : 50 000	1 : 2 000 000
	1 : 2 000 000	1 : 100 000	1 : 4 000 000
		1 : 200 000	