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 № 590. Registered with the Ministry of Justice of the Republic of Kazakhstan dated August 2, 2019 № 19184.

Unofficial translation

Pursuant to sub-paragraph 14) of Article 15 of the Law of the Republic of Kazakhstan " On the Use of the Airspace of the Republic of Kazakhstan and Aviation Activities," **I HEREBY ORDER**:

Footnote. Preamble - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall come into force ten calendar days after the date of its first official publication).

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 № 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) a pilot-operator of an unmanned aerial vehicle (hereinafter referred to as UAV) is a member of the UAV crew authorised to perform UAV control functions at an aerodrome base ;

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.

Footnote. Paragraph 4, as amended by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall enter into force ten calendar days after the date of its first official publication).

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 flight navigation support activities shall depend on the nature of the tasks to be performed, the navigational situation in the flight area, the tactical and technical data of the aircraft, the level of navigational training of pilots, navigators, airborne command and control operators, flight control groups and control centre crews, as well as the time available.

Footnote. Paragraph 7 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall take effect ten calendar days after the date of its first official publication).

8. The main tasks of the state aviation navigation service 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 (sub-divisions);

3) development and implementation of measures for navigational support of flights;

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

5) organisation of information gathering and processing of statistical data characterising the accuracy, reliability and efficiency of air navigation and combat use;

6) continuous improvement of teaching methods and implementation of air navigation and combat application evaluation standards;

7) organising research, exploring ways to improve the accuracy parameters of sighting and navigation systems (sighting and navigation equipment) and improving methods for their application;

8) organising work to supply aeronautical information to aviation units (sub-divisions) of state aviation;

9) participating in the development of flight tasks and monitoring the quality of their execution by aircraft crews (UAV);

10) participation in the development and implementation of measures related to navigation equipment in the territory of the Republic of Kazakhstan and areas of base (flight) for state aviation;

11) development and implementation of measures aimed at ensuring flight safety in terms of navigation;

12) automation of navigation support tasks for combat training of state aviation units (sub-divisions).

Footnote. Paragraph 8 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall enter into force ten calendar days after the date of its first official publication).

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 equipment in the flight area shall include:

1) the placement of stationary and mobile radio-technical flight support equipment and ground control stations for the air traffic control system;

2) geodetic reference of the positions of radio-technical flight support equipment and ground control stations for unmanned aerial vehicles;

3) designation of the operational areas of radio-technical support equipment and possible areas for unmanned aerial vehicle flights at various flight altitudes;

4) development of flight radio support equipment data;

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

6) flight over the operational areas of flight radio support systems.

Footnote. Paragraph 10 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall become effective ten calendar days after the date of its first official publication).

11. Stationary and mobile radio-technical flight support equipment and ground control stations for airborne command and control systems shall be located in such a way as to create a continuous radio navigation field in order to ensure maximum accuracy in determining the position of aircraft and more reliable air navigation and combat use of aircraft.

The positions of mobile radio-technical flight support equipment shall be selected after determining the operating areas of stationary equipment.

The possibility and necessity of duplicating the working area of one system with the working area of another type of system shall be considered when arranging.

Positions for deploying radio-technical flight support equipment shall be selected by communications and radio-technical flight support specialists and navigation service officers.

Footnote. Paragraph 11 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall take effect ten calendar days after the date of its first official publication).

12. The geodetic positioning of radio-technical flight support equipment shall be carried out by the topographic and geodetic service.

The geodetic positioning of ground control stations for the UAV shall be performed by UAV crews (calculations) in conjunction with engineering and aviation support experts. The working areas of ground control stations for the UAV shall be designated by UAV pilot operators.

Footnote. Paragraph 12 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall enter into force ten calendar days after the date of its first official publication).

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 of flight data, working area boundaries and accuracy characteristics of radio-technical flight support equipment with pilots, navigators, flight management teams and control centre staff shall be performed after the flight has been completed.

Footnote. Paragraph 15 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall become effective ten calendar days after the date of its first official publication).

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. Orders and instructions for navigational support of flights shall be worked out by the chief navigators of the state aviation authorities. Instructions for navigational support of flights shall reflect:

1) the content and specifics of combat training tasks for the training year in terms of navigation;

2) the specifics of training pilots, navigators and UAV pilot-operators for flights and monitoring their readiness for them in terms of navigation;

3) features of navigational training for control centre personnel (features of their work when guiding aircraft and monitoring flight operations);

4) features of training flight controllers at aviation training grounds (landing sites);

5) measures to maintain a high level of navigational training for pilots, navigators, airborne command and control operators, flight management personnel and control centre staff;

6) measures to ensure flight safety in terms of navigation;

7) measures relating to navigation equipment in the flight area;

8) measures to organise the providing of aeronautical information;

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

10) topics covered in classes conducted by senior navigators of aviation units (sub-divisions) with pilots, navigators, and the UAV flight operators.

Footnote. Paragraph 17 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall enter into force ten calendar days after the date of its first official publication).

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 charts shall be the part of the mandatory flight documentation kit for state aviation (UAV) aircraft crews.

The flight crew must have flight charts for the captain, co-pilot (second pilot, navigator), navigator (navigator-operator), flight instructor (navigator-instructor), and UAV flight operator. It shall be prohibited to depart without a prepared flight map.

Footnote. Paragraph 22 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 dated 05.04.2024 (shall come into force ten calendar days after the date of its first official publication).

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. For the sake of high accuracy and reliability in reaching the specified target, each crew and UAV pilot-operator shall make a large-scale map of the target (reconnaissance area, landing site, weapon use authorisation zone).

Footnote. Paragraph 25 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall become effective ten calendar days after the date of its first official publication).

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. When getting ready for a flight, aircraft crews (UAV) shall perform navigational and engineering-navigational flight calculations and develop a navigational flight plan.

Footnote. Paragraph 30 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall be enacted ten calendar days after the date of its first official publication).

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 flight plan shall be drawn up by the senior navigator of the aviation unit when performing flights, redeployments, combat operations and demonstration flights by a group of aircraft consisting of a flight or higher, and by each crew when performing a flight mission.

The navigational flight plan shall be worked out on a map and communicated to pilots, navigators and flight engineers by the commander or senior navigator when setting flight tasks.

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

Footnote. Paragraph 36 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall take effect ten calendar days after the date of its first official publication).

37. Depending on the type of aviation, navigation conditions and flight mission, the following issues shall be reflected in the flight navigation plan:

1) take-off time and sequence, combat (flight) order of the aviation unit (sub-division), methods of its formation, maintenance, dispersal and landing at the main and alternate airfields;

2) algorithm for reaching the starting point of the route and from the final point of the route to the landing airfield (to the point where the combat formation disperses);

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

4) safe flight altitudes for each stage of the route;

5) flight calculation, equalisation lines, meeting lines (with fighters, refuellers), start and end of refuelling, end of escort;

6) meeting algorithm (with fighters, refuellers);

7) target approach algorithm (weapons use authorisation zones, landing site), manoeuvre for approach at a specified time, departure from target (landing site);

8) distribution of targets, combat loading of aircraft, methods and conditions of combat use of aviation weapons (airborne assault);

9) algorithm for using the targeting and navigation complex (targeting and navigation equipment) and radio-technical flight support means at each section of the route, when approaching the target (landing site) and the landing airfield;

10) fighter engagement lines;

11) air patrol zones and independent search areas, their designation, echeloning and aircraft manoeuvres within them during target search and detection, the procedure for entering search zones and areas;

12) organisation of target guidance;

13) algorithm of actions for control points and crews when targeting and retargeting;

14) measures to ensure flight safety in terms of navigation;

15) measures to restore lost orientation;

16) use of objective navigation and combat control measures;

17) engineering and navigation flight calculations;

18) fuel consumption control algorithm.

The conditions for its execution, the type of aircraft, and the level of navigational training of pilots, navigators, and UAV control operators, other activities (actions) aimed at the successful completion of the assigned tasks may be included in the plan based on the mission.

Footnote. Paragraph 37 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall come into force ten calendar days after the date of its first official publication).

38. Based on the combat training tasks facing the unit, with consideration of the instructions of the chief navigator of the state aviation control authority, as well as based on the results of analysing and evaluating the navigational situation, the senior navigator of the aviation unit, shall prepare and make proposals to the unit commander on navigational support for flights and navigational training for pilots, navigators and the UAV flight operators.

Footnote. Paragraph 38 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall enter into force ten calendar days after the date of its first official publication).

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 nature of the terrain in the flight area, the following shall be revealed:

1) general description of the terrain by area (flat, rugged, mountainous, forested, steppe, marshy, desert) and its elevation above sea level, coordinates and heights of artificial obstacles;

2) the effect of terrain and artificial obstacles on the organisation and execution of flights at low and extremely low altitudes, as well as on the working range of air traffic control signals and the operation of radio-technical flight support equipment;

3) the presence of snow and ice cover, seasonal and flood waters and their impact on changes in the configuration of the sea coastline, the outlines of rivers and water bodies, and on visual (television) and radar orientation when entering training grounds (tactical targets) and landing sites (landing);

4) the ability to conduct visual (television) and radar orientation, use landmarks to correct targeting and navigation systems, and as aiming points when bombing (launching missiles) invisible targets and landing troops;

5) magnetic declination and areas of magnetic anomalies, their impact on navigation systems, especially during flights at low and extremely low altitudes.

Footnote. Paragraph 41 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall be brought into force ten calendar days after the date of its first official publication).

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. The status of navigational training for aviation units (sub-divisions) shall be monitored through:

1) hearing officials from the navigation service and control centres of aviation units (sub-divisions);

2) checking completed documents, reference data, calculations, flight programmes, and requests for the operation of radio-technical flight support equipment;

3) hearing the flight mission briefing;

4) checking the flight readiness of pilots, navigators and UAV flight operators, the flight control group and control point crews in terms of navigation;

5) checking the navigational readiness of aerodromes and the availability of aeronautical information documents for aviation units (sub-divisions);

6) monitoring the navigational readiness of units, divisions, and aircraft crews (aircraft);

7) conducting flight control;

8) checking data from ground and on-board objective control devices;

9) checking the completeness and quality of flight tasks performed by aircraft crews.

Footnote. Paragraph 50 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall come into force ten calendar days after the date of its first official publication).

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 № 744 "On approval of the State Aviation Flight Operation Rules" (registered with the Register of State Registration of Regulatory Legal Acts as № 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 readiness of crews (UAV pilot-operators) for flight in terms of navigation shall be assessed based on:

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

2) the availability of prepared flight and other charts needed by the aircraft crew to complete the flight mission, flight engineering and navigation calculations, aeronautical information documents, and the required navigation equipment;

3) knowledge of the flight programme entered into the targeting and navigation system;

4) the presence of records in the flight logs of the frontline aviation aircraft crew, data necessary for solving air navigation and combat application tasks, landing at the main and alternate airfields;

5) knowledge of the navigational situation along the flight route and in the target area (weapons use authorisation zone);

6) knowledge of the specifics of bypassing restricted areas and flying near the state border (border zone);

7) knowledge of the terrain, main landmarks and radio-technical flight support facilities along the route, target search (landing site) and approach characteristics, safe flight altitudes along route sections, safe conditions for the use of aviation weapons;

8) knowledge of measures to ensure flight safety in terms of navigation.

Footnote. Paragraph 55 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall come into force ten calendar days after the date of its first official publication).

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 losing orientation shall be:

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

2) insufficient organisation and management of flights;

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

4) insufficient training and failure by the crew to follow the sequence of the flight navigation plan;

5) poor practical skills of pilots, navigators and flight operators of the UAV in the integrated use of airborne and ground-based air navigation aids;

6) poor visual and radar navigation skills;

7) crew unpreparedness for flight in difficult conditions;

8) malfunction or complete failure of the aircraft's navigation equipment;

9) loss of the lead aircraft (group) during formation flight, when the trailing crew did not maintain common orientation.

Footnote. Paragraph 57 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall take effect ten calendar days after the date of its first official publication).

58. The main measures to prevent cases of disorientation shall be:

1) continuous study and passing of tests at least twice a year by pilots, navigators and UAV pilot-operators on knowledge of the flight area, radio technical support and crew actions in case of loss of orientation;

2) regular training sessions with pilots, navigators, UAV pilot-operators, flight management teams and command post crews on various methods of restoring orientation, actions in the event of navigation equipment and course instrument failure, and the comprehensive use of air navigation equipment in flight;

3) inspection of the condition of navigation equipment and annual deviation and radio deviation work on the aircraft;

4) monitoring the regularity and quality of flight crews' performance on routes;

5) studying with pilots, navigators, UAV pilot operators, the flight management group and command post calculations cases of loss of orientation and deviation of crews from routes;

6) thorough navigational training of aircraft crews (UAV) for flight;

7) comprehensive use of technical navigation equipment while flying and timely detection of malfunctions.

Footnote. Paragraph 58 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall become effective ten calendar days after the date of its first official publication).

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

59. Collisions between aircraft and the ground (water) surface and obstacles shall be prevented by:

1) thorough navigational training of aircraft crews (aircraft flight crew) and targeting and navigation systems (targeting and navigation equipment) prior to flight;

2) study by aircraft crews (UAV), flight management team and calculations of terrain relief and its heights, location and heights of artificial obstacles;

3) maintenance of safe flight altitudes by aircraft crews (UAV) in the vicinity of the aerodrome and along the route, and monitoring of their maintenance by the flight management group and control point calculations;

4) adherence by aircraft crews (UAV) to the rules for changing flight altitude and breaking through cloud cover in line with the Rules for State Aviation Operations;

5) clear performance of their functional duties by all members of the aircraft crew (UAV) and timely execution of the flight director's commands;

6) the crew's ability to determine the moment to begin recovery from a dive, depending on the speed and angle of the aircraft's dive;

7) adherence to safety measures when flying at low and extremely low altitudes;

8) knowledge by the flight management and control centre staff of the navigation and combat use features of the aircraft, flight management and control at low and extremely low altitudes;

9) the ability of the aircraft crew (UAV), flight management team and control centre staff to respond quickly to changes in air, meteorological and ornithological conditions;

10) strict observance by the aircraft crew of flight rules in mountainous terrain and consideration of the specific features of using barometric altimeters when landing at high-altitude aerodromes in line with the Rules for State Aviation Operations.

Footnote. Paragraph 59 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall enter into effect ten calendar days after the date of its first official publication).

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 preventing cases of complete fuel consumption during flight shall be:

1) regular comprehensive training exercises with pilots, navigators, UAV control operators, flight management teams and control centre staff on calculating (monitoring) fuel consumption during flight;

2) checking pilots, navigators, UAV control operators, flight management teams and control centre crews on their knowledge of initial data and methods for determining aircraft capabilities in terms of range and airborne duty time;

3) verification of the accuracy of calculations of minimum fuel reserves required for flight and landing at an alternate aerodrome.

Footnote. Paragraph 61 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall become effective ten calendar days after the date of its first official publication).

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

62. Prevention of dangerous approaches and collisions between aircraft in the air can be achieved by:

1) adherence by crews (UAV pilot operators) to vertical, lateral and longitudinal echelon formation, as well as maintaining specified flight modes;

2) control over adherence to flight procedures by the flight management team and control centre calculations.

Footnote. Paragraph 62 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall enter into force ten calendar days after the date of its first official publication).

63. To avoid dangerous encounters and collisions between aircraft in the air, pilots, navigators, air traffic controllers, flight management teams, and control centre staff shall be tested at least twice a year on their knowledge of rules for flying in formation and performing group flights as set out in the Rules for State Aviation Operations.

Footnote. Paragraph 63 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall be put into effect ten calendar days after the date of its first official publication).

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

64. Prevention of aircraft entering dangerous and restricted areas can be achieved by:

1) strict compliance by aircraft crews (UAV) with established flight rules near state borders, dangerous and restricted areas as per the Rules for State Aviation Operations, and adherence to the flight programme and plan;

2) reliable air traffic control;

3) comprehensive use of air navigation aids and methods by aircraft crews (UAV);

4) marking on flight charts, radar station indicators and air situation tablets of restrictive bearing vectors, state border and border zone lines, restricted areas and minimum permissible aircraft approach limits to them, allowing for manoeuvres when turning away from the state border;

5) studying the location of radio-technical flight support equipment and refining data on their operation;

6) careful planning and study of the flight route, characteristic visual and radar landmarks, clarification of control transfer boundaries;

7) monitoring the operability of the sighting and navigation complex (sighting and navigation equipment), the accuracy of flight programme input, and the timely correction of aircraft location coordinates.

Footnote. Paragraph 64 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall come into force ten calendar days after the date of its first official publication).

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. Cases where aircraft enter the strike zone of their own weapons can be avoided by:

1) by aircraft crews (UAV) studying the conditions and procedures for performing flight missions, the aeronautical passport of the aviation training ground (weapons use zone), safety measures during firing, bombing and missile launches, as specified in the flight operations manual and methodological guidelines for the combat use of aircraft;

2) knowledge of the operational limitations of aircraft and aviation weapons, the parameters for the safe use of aviation weapons (safe altitudes, speeds, ranges, group depths,

distances between groups, and specified flight conditions), the sequence of operations with aircraft weapon control systems, and actions to be taken in the event of their failure.

Footnote. Paragraph 66 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall be brought into force ten calendar days after the date of its first official publication).

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

67. Prevention of cases of use of aviation weapons against non-designated targets (outside the test range), landing of troops and equipment outside designated areas, and strikes against friendly forces can be achieved by:

1) detailed examination by aircraft crews (UAV) of the aeronautical passport of the aviation training ground (target area, weapon use authorisation zone, landing site), distinctive and revealing features of the target, and knowledge of the exact coordinates;

2) maximum use of the capabilities of the sighting and navigation complex (sighting and navigation equipment), weapon control systems (landing);

3) selection of the most rational method of correction of the sighting and navigation complex, verification of the accuracy of the correction (readings) using data from backup means;

4) accurate calculation of the setting data, entry (control of entry) into the sighting and navigation complex (sighting and navigation equipment) prior to entering the combat course;

5) selection of a reliable aiming point and correct aiming at it;

6) reliable identification of the target (landing site) by several features, especially in low visibility conditions;

7) knowledge of targeting methods and retargeting signals, means of identifying (recognising) one's own troops and the procedure for their use;

8) following the instructions and commands of the flight director at the training ground (landing site);

9) ensuring that aircraft crews (UAV) observe safety measures when using aviation weapons in close proximity to the operational area of the training ground (their own troops), completely ruling out their destruction.

Footnote. Paragraph 67 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall become effective ten calendar days after the date of its first official publication).

68. When the crew (pilot-operator of the UAV) has doubts regarding the aircraft's approach to the designated target (landing site), the use of aviation weapons (landing) shall be prohibited.

Footnote. Paragraph 68 - as revised by Order of the Minister of Defence of the Republic of Kazakhstan № 331 of 05.04.2024 (shall become effective ten calendar days after the date of its first official publication).

Annex to the
к 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	