



On approval of the rules for construction and safe operation of passenger cableways

Unofficial translation

Order № 476 of the Minister of Emergency Situations of the Republic of Kazakhstan dated September 29, 2021. Registered with the Ministry of Justice of the Republic of Kazakhstan on September 30, 2021 under № 24565

Unofficial translation

In accordance with subparagraph 14-4) of Article 12-2 of the Law of the Republic of Kazakhstan "On Civil Protection", I hereby **ORDER** to:

1. Approve the attached Rules for construction and safe operation of passenger cableways.
2. In the manner prescribed by law, the Industrial Safety Committee of the Ministry of Emergency Situations of the Republic of Kazakhstan shall provide:
 - 1) state registration of this order with the Ministry of Justice of the Republic of Kazakhstan;
 - 2) place this order on the Internet resource of the Ministry of Emergency Situations of the Republic of Kazakhstan;
 - 3) within ten working days after the state registration of this order with the Ministry of Justice of the Republic of Kazakhstan, report to the Legal Department of the Ministry of Emergency Situations of the Republic of Kazakhstan on the execution of the actions referred to in subparagraphs 1) and 2) of this paragraph.
3. The supervising vice minister of Emergency Situations of the Republic of Kazakhstan shall be in charge of enforcement of this order.
4. This Order shall take effect sixty calendar days after the date of its first official publication.

*Minister of Emergency Situations
of the Republic of Kazakhstan*

Y. Ilyin

"AGREED"

Ministry of Industry and
Infrastructure Development
of the Republic of Kazakhstan

"AGREED"

Ministry of National Economy
of the Republic of Kazakhstan

Approved by order No. 476
of the Minister of Emergency Situations
of the Republic of Kazakhstan
dated September 29, 2021

Rules for construction and safe operation of passenger cableways

Chapter 1. General Provisions

1. These Rules for construction and safe operation of passenger cableways (hereinafter referred to as the Rules) have been developed in accordance with subparagraph 14-4) of Article 12-2 of the Law of the Republic of Kazakhstan “On Civil Protection” (hereinafter referred to as the Law) and define the procedure for construction and safe operation of passenger cableways.

2. These Rules shall apply to the following passenger aerial cableways and equipment used in conjunction with them:

single-rope aerial cableways with ring movement permanently fixed on a carrying-traction rope;

single- and two-rope aerial cableways with ring movement fixed on a carrying-traction (hauling) rope and uncoupled at the rolling stock stations;

single- and two-rope cableways with pendulum movement of the rolling stock;

towing cableways for skiers with towing gear permanently attached to the traction rope;

towing cableways for skiers with towing gear attached to the traction rope and uncoupled at stations.

3. The following terms and definitions shall apply in these Rules:

1) detachable clamp - a clamp intended for automatic coupling (uncoupling) to the carrying-traction or traction rope of rolling stock at stations;

2) single-rope cableway with ring movement- a cableway with continuous ring traffic of rolling stock permanently attached to a carrying-traction cable;

3) bypass pulley - a pulley intended to bypass the rolling stock of ring cableways;

4) span - the horizontal distance between the supports on the cableway route;

5) rope safety gear- a device that prevents the traction rope from falling when it descends from the roller balancer;

6) guiding pulley, block, roller - a device intended to deviate the rope in the required direction;

7) control system - a set of control devices that ensure the operation of the cableway in accordance with a given program;

8) single-rope pendulum cableway - a cableway with a pendulum movement of rolling stock permanently attached to a carrying-traction rope;

9) car- a type of rolling stock of pendulum cableways for the carriage of passengers;

10) car safety gear- a device on the car trolley for gripping the carrying rope with tips in the event of a break or weakening of the traction rope tension;

11) two-rope pendulum cableway - a cableway with pendulum movement along the carrying rope of the rolling stock, permanently attached to the traction rope;

- 12) input device - an electrical device for supplying and removing voltage from supply lines;
- 13) drive - a mechanism consisting of a motor and a device that transmits mechanical energy from the motor to the drive pulley;
- 14) drive pulley - a pulley that transmits traction force through friction of the traction or carrying-traction rope in the pulley groove;
- 15) passenger aerial cableway - a structure that serves to transport passengers in the rolling stock that moves along a carrying rope or by means of a carrying-traction rope;
- 16) rolling stock - a means for accommodating passengers during transportation on the cableway;
- 17) rolling stock capacity - the estimated number of people in the rolling stock;
- 18) cabin - a type of rolling stock of ring cableways for the carriage of passengers;
- 19) tension rope - a rope connecting a carrier, carrier-traction , traction rope with a tension device;
- 20) carrying rope - a rope along which the rolling stock moves;
- 21) carrying-traction rope - a rope for moving the rolling stock attached to it;
- 22) chair - a kind of rolling stock in the form of an open or semi-closed seat for the carriage of passengers;
- 23) clamp - a suspension unit of a rolling stock, which serves to secure it on a traction or carrying-traction rope;
- 24) single-rope cableway with pulsating movement- a cableway with circular intermittent movement of a rolling stock permanently attached to a carrying-traction rope, which, when passing through a station, stops or switches to traffic at low speed;
- 25) nominal speed - the maximum speed of the rolling stock (rope), for which the cableway is designed;
- 26) capacity - the maximum possible number of passengers transported per unit of time;
- 27) roller balancer - a system of rollers for supporting the carrying-traction rope;
- 28) station - a structure intended for embarkation and disembarkation of passengers and placement of a drive and (or) a tensioning device;
- 29) towing track - a track along which the skier is moving;
- 30) traction rope - a rope for moving rolling stock along a carrier rope or skiers on snow;
- 31) support - a structure for supporting ropes on the cableway line;
- 32) support shoe - a device for supporting the carrier rope on supports and stations;
- 33) towing cableway - a structure designed to tow skiers with the help of towing gear permanently attached to the traction rope or with the possibility of dethatching them at the station;
- 34) towing device - a means for moving skiers along a towing track;
- 35) track - a section of terrain between the terminal stations of the cableway with the cableway equipment on it.

Chapter 2. Construction and installation of passenger cableways

4. The passenger cableways shall be installed according to the design documentation, taking into account the requirements of these Rules, national and (or) interstate standards and state regulations in the field of architectural, urban planning and construction activities for the installation of metal structures and lifting and transporting equipment.

Deviations from the construction documentation in the manufacture of passenger cableways shall be agreed with the designer.

5. To calculate the rolling stock, the load from one passenger is assumed to be at least:

for single-seat rolling stock - 0.9 kilonewtons (hereinafter - kN);

for two and three-seat rolling stock - 0.85 kN;

for four-seat rolling stock - 0.8 kN;

for rolling stock with a capacity of more than 4 passengers - 0.75 kN.

6. In the calculation of the cableway as a whole, the load from one passenger is assumed to be at least 0.75 kN.

7. The safety margin (the ratio of the temporal resistance of the material to the stress from the maximum static loads) of all load-bearing elements of the mechanical equipment of passenger cableways is taken as at least five. Parts that receive dynamic loads shall be tested for fatigue strength.

8. The construction and placement of equipment along the passenger cableways route shall enable free longitudinal swing of the rolling stock at an angle of ± 20 degrees.

9. The foundations of passenger cableways structures must rise above the ground by at least 0.2 m.

10. On passenger cableways, steel non-twisting ropes for freight and passenger carriages shall be used. The conformity of the rope is confirmed by a certificate issued by the rope manufacturer.

In the absence (loss) of the certificate, the rope shall be tested before hanging at the rope testing station and supplied with the test certificate.

11. In the construction of passenger cableways, newly made ropes shall be used.

12. When choosing, the ropes shall be checked by calculating the tensile strength according to the formula

$$F_0 \geq S \times k_3,$$

where F_0 is the breaking force of the rope as a whole, taken according to the manufacturer's certificate or test certificate;

S - is the maximum rope tension;

k_3 is the minimum safety factor according to Appendix 1 to these Rules.

If the manufacturer's certificate or test certificate presents the total breaking strength of all wires, the breaking strength of the rope as a whole is determined by multiplying the total

breaking strength of all wires by a correction factor according to the national and (or) interstate standards for each specific design of the selected rope.

In the absence of a correction factor in the national and (or) interstate standards, the correction factor 0.83 is accepted for round-strand ropes, for ropes of a closed structure - 0.9.

13. When determining the carrier rope tension, the mass of the counterweight is taken into account, in the presence of a hydraulic tensioner, the force developed by it, the constituents of the mass of the rope, the resistance in the tensioners and on the shoes. When the rope is anchored at both ends, the mass of the rope and its loading, the resistance on the shoes, temperature, wind and ice effects are taken into account.

The forces of inertia and the braking force transmitted to the rope when the car safety gear is actuated are not taken into account.

14. The minimum tension of the carrier rope for pendulum roads with a tensioner is assumed to be at least 10 Fps, where Fps is the weight of the loaded rolling stock, the load on one running wheel of the rolling stock is no more than the minimum tension of the carrier rope.

15. When determining the tension of the carrier-traction and traction ropes, the weight of the counterweight is taken into account, in the presence of a hydraulic tensioner, the force developed by it, the constituents of the mass of the rope and the loaded rolling stock, the resistance in tensioners, support rollers and pulleys at stations. Inertial forces are not taken into account.

16. The minimum tension of the carrier-traction rope is assumed to be at least 15 Fps.

17. Depending on the purpose, steel ropes of the following types and designs shall be used

:

as carrying and cable-stayed ropes - ropes of a closed structure or multi-strand ropes with a metal core;

as carrier-traction, traction and tension ropes to them - round-strand ropes of a double lay with a linear contact of wires with an organic core;

as tension ropes to carriers - triple lay ropes with a metal core;

as ropes for suspension of an electric cable - single lay ropes.

18. Carrier, carrier-traction, traction and tension ropes, the expiry date of which has exceeded the manufacturer's warranty period, shall be tested at a rope testing station before being mounted on the road.

19. For towing devices, steel ropes, ropes made of polymeric or combined materials are used.

20. The breaking force of the ropes of towing devices is assumed to be at least 4000 newtons (hereinafter referred to as N) with a single towing device and 8000 N with a double towing device.

21. Steel ropes of passenger cableways shall be rejected according to the number of breaks and the presence of defects in accordance with the national and (or) interstate standards for each specific design of the selected rope.

22. Each end of the carrier rope is secured by means of a coupling or an anchor drum.

23. The carrying rope of a closed structure is fixed in the coupling by filling with a fusible alloy or by wedges.

24. Multi-strand ropes used as carrying, traction and tension ropes are fastened in the coupling by casting with a fusible alloy.

25. The use of clamps for fastening ropes is allowed when connecting a tension rope to a counterweight or a tension trolley, as well as for attaching a traction rope to a car or cabin trolley.

For fastening of the tension rope to the counterweight or tension trolley, steel thimbles or wedge bushings with clamps are allowed. The number of clamps is determined by calculation and is assumed to be at least three.

26. Steel couplings and wedges shall be used, bearing the manufacturer brand indicating the diameter of the rope and the rated force. The use of cast and welded couplings is not allowed.

27. Reuse of end and adapter couplings of carrier and tension ropes is not allowed. Couplings of traction ropes may be reused if during their dismantling they were not exposed to heat and have no visible damage.

28. When fixing the end of the carrier rope with a drum, at least three coils of the rope must be provided on the drum in one layer.

The end of the rope descending from the drum is fixed with at least two clamps, each of which is calculated for a force equal to at least 20 percent (hereinafter referred to as %) of the maximum construction tension of the carrier rope.

29. The number of links when splicing traction and carrier-traction ropes is taken to be minimal and is determined taking into account the length of the supplied ropes.

The minimum length of the link is assumed to be at least $1300dk$, where dk is the nominal rope diameter. When making two or more links, the distance between them is not less than $3000dk$.

The rope diameter in the splicing area must not exceed the nominal diameter of the rope by more than 8%.

30. Splicing of the carrying rope in the rolling stock movement area, as well as splicing of tension ropes is not allowed.

31. The tension of the carrier, carrier-traction and traction ropes is created by a counterweight or a device that provides the amount of tension within the limits determined by the calculation.

When using several tension ropes, their uniform tension must be ensured.

32. When anchoring the ends of the carrier rope, a device for tension control must be provided.

33. For carrying ropes of passenger cableways with intermediate supports, an additional length of the rope is provided, equal to twice the length of the support shoe plus 20 meters (hereinafter - m), to enable the rope to move.

The carrier rope is re-positioned once every three years or according to the flaw detection results in the presence of defects in the bend zone of the rope on the shoes of supports and stations.

34. The stroke of the carrier rope tensioner is calculated in each specific case, taking into account the possible largest difference in sags from load fluctuations, expected temperature fluctuations, elastic and residual elongation of the rope, as well as a power reserve of the tensioner of at least 1 m. With limited stroke possibilities of the tensioner, the residual elongation of the rope may not be taken into account. In this case, during the operation of the passenger cableway, the rope is shortened as necessary.

35. The course of the tensioner of the carrier-traction and traction ropes is calculated based on the possible largest difference in sags from load fluctuations, expected temperature fluctuations, elastic and residual elongation of the rope.

To compensate for the residual elongation of the carrier-traction and traction ropes and changes in their length with seasonal temperature fluctuations, devices shall be provided for installing the tensioner in the design position.

36. The course of the tensioner is limited by stops and controlled by limit switches. In the case of using a counterweight, the clearance between it and the wall on the side of the cable guides is taken to be at least 0.7 m, on the other sides - at least 0.5 m.

37. Counterweights are made of concrete or reinforced concrete slabs, as well as frame boxes filled with concrete or metal blocks. In addition to the counterweight, it is allowed to hang metal chains. In manual loading, it is not allowed to exceed the weight of each block by more than 30 kilograms (hereinafter referred to as kg).

The area under the counterweight shall be fenced off. When the counterweight is located in the pit, the latter must be protected from water, snow and ice.

38. The mass of the counterweight or the force developed by the hydraulic cylinders of the tensioner are indicated in the passport of the passenger cableway.

39. In tensioning of the ropes with a hydraulic device, the following requirements shall be observed:

the pressure in the hydraulic cylinders or the force developed by them is recorded by appropriate instruments;

hydraulic cylinders are equipped with devices that automatically close the pressure chamber of the hydraulic cylinder in case of damage to the pipeline;

automatic maintenance of the calculated tension force with fluctuations within $\pm 10\%$ is provided, as well as automatic shutdown of the cableway drive when leaving this range;

a visual control device is installed to register the hydraulic fluid reserve.

40. The permissible diameter of the drum, pulley, roller, shoe, roller chain support bar, wrapped around by a steel rope, is determined by the formula

$$D \geq dk \times e,$$

where D is the diameter of the drum, pulley, roller, shoe, roller chain support bar, measured along the center line of the coiled rope, millimeter (hereinafter referred to as mm);

dk – rope diameter, mm;

e - coefficient depending on the purpose of the rope, drum, winch, pulley, roller and shoe, the value of which is given in Appendix 2 to these Rules.

41. The radius of curvature of the support shoe of the carrying rope is taken to be at least 250 of the rope diameter, subject to the following condition:

$$V^2 / R \leq 2 \text{ meters per second squared (hereinafter - m/s}^2\text{)},$$

where V is the maximum operating speed of the rolling stock, meters per second (hereinafter referred to as m/s);

R -is the radius of the support shoe curvature, m.

42. Drive, bypass and deflecting pulleys, as well as rollers for carrying-traction and traction ropes must be lined. Pulleys, blocks and rollers on which the rope lies motionless are allowed not to be lined.

43. Support shoes and roller chains, as well as drums for anchoring the carrier rope, are lined.

44. The permissible angle of bending of the carrier-traction and traction ropes on one balancer roller is no more than 4.5 degrees.

45. The installation units of the drive and bypass pulleys for the carrier-traction rope are adopted in a construction that excludes the possibility of:

pulley fall in case of damage or destruction of the bearing support assembly;

spontaneous fall of the carrier-traction rope off the pulley.

46. The following shall be used as rolling stock on passenger cableways:

open chairs, semi-open (chairs with a folding cap), with steps and without steps;

semi-open and closed cabins, with and without seats;

closed cars;

towing devices with a support plate and with a support traverse.

47. Doors of cars and cabins must be provided with inward-opening or sliding doors and have a lock to prevent their spontaneous opening. The doors must have a lock that prevents the cableway from starting when the doors are open.

Dimensions of doorways are assumed to be no less than:

in the cabin - 0.6 x 1.55 m;

in the car - 0.75 x 2.15 m.

48. The useful area of the floor of the car and cabin, where passengers embark and disembark at their full stop, is taken to be at least 0.2 square meters (hereinafter - m²) for each passenger.

The useful area of the cabin floor, where passengers embark and disembark on the move, is taken to be at least 0.3 m² for each passenger.

49. Semi-open cabins in which passengers stand shall be equipped with a solid or mesh wire fencing at least 1.3 m high from the floor.

50. The railings of semi-open cabins with seats must rise above the seats by at least 0.5 m.

51. For the carriage of passengers seated, the width of the seat per passenger shall be at least 0.5 m, for the carriage of passengers sitting on solid seats - at least 0.45 m.

52. In cabins, the depth of a seat is assumed to be at least 0.35 m, the distance from the floor to the seat must be within 0.45-0.5 m.

53. The ceiling of the cabin and the car shall be designed to withstand in any place a concentrated load of at least 0.1 kN and a total load of at least 0.25 kN.

54. Inside the car must be equipped with handrails.

55. The car shall be equipped in the floor and ceiling with hatches measuring at least 0.5 x 0.5 m.

The hatches must be equipped with covers that open in the floor – inwards into the car, in the ceiling - outwards.

56. The car shall be provided with steps for exit to the car roof.

To inspect the car trolley and the carrying rope, a fenced area is made on the car suspension.

57. The height from floor to ceiling in the cabin with seats is assumed to be at least 1.5 m.

The height from floor to ceiling in the car is assumed to be at least 2.1 m.

The internal width of the cabin at the level of the seats shall be no less than 1.3 m.

58. The extreme traverses of the car trolley are equipped with limiters that prevent the trolley from coming off the carrying rope. The size of the limiters in height (from the top of the rope down) is taken to be at least two diameters of the carrier rope.

Car trolleys of unsupported pendulum roads, instead of limiters, are supplied with brackets covering the carrying rope.

59. Closed cars and cabins must be equipped with ventilation devices.

60. A plate is installed in the car indicating the permissible number of passengers and the carrying capacity of the car.

61. On the ring chairlift cableway, a chair seat with a depth of at least 0.45 m is used, tilted back down at an angle of at least 8 degrees.

62. A chairlift seat shall be equipped with a folding rigid or flexible crossbar preventing passengers from falling out of the seat, a backrest at least 0.4 m above the seat level, and side supports.

If there are footrests with the chair, they are rigidly connected to the crossbar.

63. During the cableway operation, the safety crossbar and the hood of the semi-open seat must be security held in the end positions from spontaneous movement.

64. To protect the seats of empty open chairs from atmospheric precipitation, the seats are folded towards the backrest or backrests are used that lean back onto the seats.

65. The drive of passenger cableways shall be equipped with the main and standby (emergency) engines with independent power sources.

The reserve engine is to be used only in emergency situations and preventive maintenance works on the cableway.

Only one engine is allowed for the towing cableway drive.

66. When the reserve engine is running, the speed of the rolling stock is taken with account to the delivery of all passengers on the line to the station in no more than 1.5 hours from the start of the main engine failure.

67. For the cableway drive a revision is provided of the carrying, carrying-traction and traction ropes throughout their length at the speed of no more than 0.5 m / s.

68. The safety margin coefficient of coupling of traction and carrying-traction rope with a drive pulley is assumed to be at least 1.25 under the most unfavorable road loading conditions (taking into account the forces of inertia during starting and braking) and is determined by the formulas:

in traction drive mode

$$(S_2 \times (e^{\mu_1 a} - 1)) / (S_1 - S_2) \geq K$$

during brake operation of the drive

$$(S_1 \times (e^{\mu_1 a} - 1)) / (S_2 - S_1) \geq K$$

where S_1 is the tension of the entering rope branch, H;

S_2 – tension of the leaving rope branch, N;

μ_1 - is the coefficient of adhesion of the rope to the pulley lining under the most unfavorable operating conditions (rope greased with mineral oil, wet lining);

a - is the angle of wrapping around the pulley with a rope, radians;

K - clutch reliability safety factor - 1.25.

69. The drive of a passenger cableway shall be equipped with two automatically operating spot-type disk brakes or disc brakes of a normally closed type:

service- on the motor shaft;

emergency - on the rim of the drive pulley.

When combining the functions of the service and emergency brakes in one construction, it is equipped with two independent devices that impact the rim of the drive pulley to apply a braking torque in normal and emergency modes.

70. The drive of the towing cableway must be supplied with one brake, preventing the cableway from inadvertent reversing. Instead of a brake, it is allowed to use for this purpose an automatically working locking device or a self-braking gearbox.

71. The rotation speed of the drive pulley is controlled by a tachometer generator or other means that provide the necessary control accuracy.
72. On cableways with self-braking at speeds up to 3 m/s, it is allowed not to install an emergency brake and a speed control device.
73. Each brake (service, emergency) develops a braking torque, at least 1.25 static torques coming from the cableway under the hardest conditions of its load on the corresponding impact surface.
74. On the passenger cableway drive a, a blocking shall be provided against exceeding the rated speed by 15%.
75. The drive must ensure the start of the cableway, both empty and loaded with an acceleration of not more than 0.4 m / s^2 .
76. In the metal structures of closed profile supports, the possibility of precipitation must be excluded, with drainage holes provided.
77. Supports are provided with brackets for suspension of load-lifting devices, fenced platforms for servicing shoes or roller balancers and ladders for accessing the cap of the support.
78. Stairs of ring road supports shall be at least 400 mm wide and pace of the steps not more than 300 mm. On supports with a height of more than 15 m, the stairs are fitted with enclosing arches at the distance of no more than 800 mm apart and interconnected by at least three longitudinal strips. The distance from the stairs to the arch is taken within 700-800 mm with an arch radius of 350-400 mm. On the caps of the supports, a safe passage of rescuers with life-saving equipment shall be ensured.
79. Supports of pendulum cableways up to 30 m high must be equipped with vertical or flight stairs, supports over 30 m high only with flight stairs. Stairs must be at least 500 mm wide at least and a step of no more than 300 mm with platforms every 8-12 m in height. Inclined stairs are provided with railings. On the supports, platforms are installed at least 500 mm wide with a fence for the maintenance personnel's exiting the car to the support.
80. All supports must be numbered.
81. In the dimensions of the engine room doors the possibility of carrying the largest integral elements of equipment shall be envisioned. In necessary cases, special openings are provided to move large parts.
82. In the engine room, above the main equipment, lifting mechanisms are provided. It is allowed not to install such means at open stations.
83. The drive, electrical equipment and measuring equipment shall be protected against atmospheric influence.
84. The control panel (shield) of a passenger aerial cableway with a workstation for the engine operator must be located in a closed room, within the field of view of the passenger landing site and the adjacent track route.

85. The distance from the engine room walls to the drive and other equipment of the passenger aerial cableway requiring maintenance, as well as the passageways between the equipment, is taken to be at least 0.8 m. Where necessary, platforms and stairs are provided.

Safe access shall be provided to mechanisms, electrical and hydraulic equipment, safety devices requiring maintenance.

86. All rotating parts of the cableway equipment, as well as moving ropes placed at the height of less than 2.5 m, shall be fenced.

87. The platforms of the stations must be equipped with control panels (pillars) used by the station attendants. These panels are provided with the means of stopping the cableway and signaling.

88. Passenger landing platforms at stations and approaches to them, except for cableways intended for passengers with skis on their feet, shall exclude slipping of feet. When the platforms are located above ground level, they must be equipped with railings of at least 1 m high and a solid fence at the bottom to the height of at least 0.1 m.

89. On passenger cableways, a stable radio or telephone connection between stations shall be provided.

90. Passenger aerial cableways shall be provided with loud-speaking transmission, for the purpose of which they are installed on the linear supports and stations in transmitting and receiving devices.

91. An anemometer shall be installed at the station or support of passenger aerial cableways, which is most exposed to wind that sends a signal about the wind speed to the control panel.

When the wind speed rises to the maximum allowable, indicated in the passport of the passenger aerial cableway, a sound signal is given, and the work of the cableway stops.

92. Drives of passenger aerial cableways must be equipped with a blocking, excluding the possibility of launching the road into operation from standby engine when the main engine is turned on, and vice versa.

93. Passenger cableway drives with hydraulic motors must be equipped with blocking devices that stop the hydraulic pump with simultaneous application of an emergency brake in case of an extraordinary pressure drop in the supply hydraulic system.

94. Passengers and skiers are not allowed to bypass the station pulleys on circular passenger cableways and towing cableways.

95. The voltage from the main power source to the drive of the cableway is supplied through an input device with a manual drive. It is allowed to use a switch equipped with a manual drive as an input device.

In this case, the start is made manually.

96. The input device turns off the power and completely removes the voltage from the electrical circuits, with the exception of:

illumination of the control panel of the passenger cableway;

voice communication.

Separate switches must be provided to disconnect the above circuits.

97. Passenger cableways must be equipped with two independent power supplies - the main and backup electric motors. Instead of a backup electric motor, the use of an internal combustion engine is allowed.

Connection of the standby engine is provided within no more than 45 minutes.

98. Ropes, rolling stock, all metal parts of stations and supports shall be grounded.

For grounding of the carrier-traction rope and rolling stock, it is allowed to use the lining of balancing rollers and running wheels made of conductive material or to install separate metal rollers and running wheels. If the traction rope is used as a current conductor in signaling and control circuits, then it must be isolated from the ground. In this case, discharge switches for this rope must be envisioned.

99. Cars carrying passengers at nighttime must be equipped with internal and external lighting, lamps at stations and supports of cableways operating at night.

100. The maximum inclination angle of the carrier and carrier-traction rope on passenger cableways is taken to be no more than 45 degrees.

101. The maximum inclination angle of the traction rope of the towing cableway and the inclination angle of the towing ski track is taken to be no more than:

30 degrees - on towing cableways with single towing devices;

26 degrees - on towing cableways with double towing devices.

102. The maximum inclination angle of the traction rope of towing cableways with towing devices detachable at stations is selected issuing from the condition of preventing spontaneous displacement along the rope of freely hanging unloaded towing devices.

103. Passenger aerial cableway in the plan between the stations must be made rectilinear. The deviation of the rope on the support in the plan is allowed to be no more than 0.5 degrees.

104. The route of the towing cableway in the plan is allowed to be non-straight in areas where horizontally or slanted deflecting pulleys, blocks or rollers are installed.

105. It is not allowed to lay the passenger cableway route over the territory of schools, kindergartens and other children's institutions.

106. Crossings of the towing cableway with ski tracks, pack trails and winter roads at the same level are not allowed.

Crossings at different levels are allowed, subject to the construction of bridges. At the same time, the ski track on the bridges shall be made with a solid fence in the form of a wall with a height of at least 1 m from the snow cover.

107. Approaches or entrances shall be provided for all structures of passenger cableways in accordance with the construction.

108. The vertical distance from the lowest point of the rolling stock or any rope of a passenger cableway to the ground is taken to be at least:

3 m - taking into account the snow cover in those places where the presence of people is possible;

2 m - taking into account the snow cover in the places where the presence of people is excluded.

When approaching the stations, this height decreases to the distance indicated below for a specific type of passenger cableways. The area in which this distance is less than the above shall be fenced off.

109. The vertical distance from the lowest point of the rolling stock or any rope of a passenger cableway is taken to be not less than:

1.5 m - to the top of the trees;

2 m - to the highest point of a building or structure located under the route of a passenger cableway, as well as to the top of a railway, motorway or navigation clearance.

110. When determining the lowest points of the track, a component is added to the calculated value of the static sag, taking into account the dynamic nature of the loads during its operation. For the specified component, the largest of the following values is taken:

5% of the largest sag of the carrier rope at a given point;

10% of the maximum sag of the traction or carrying-traction rope at the given point.

111. The clearance of buildings or natural obstructions to the external dimensions of the passenger cableway is allowed at a distance of at least 1 m and 2 m for towing cableways.

When determining dimensions of a passenger aerial cableway, deviations, sags of ropes and rolling stock under the influence of wind load during the cableway operation, as well as sags and deviations of the carrying, carrying-traction, traction and other ropes when the cableway is stopped and exposed to the standard wind load at the location of the passenger cableway shall be taken into account.

Chapter 3. Passenger cableways operation

112. Commissioning of passenger cableways is carried out in accordance with the requirements of subparagraph 22) of paragraph 3 of Article 16 of the Law and these Rules.

113. Prior to the passenger cableways commissioning, the operating organization shall:

1) ensure fulfillment of the requirements established by paragraph 130 of these Rules;

2) check the availability and completeness of:

passports for passenger cableways. The passport form is given in Appendix 3 to these Rules;

certificates of the manufacturer of ropes;

acceptance report of embedding ropes in couplings;

certificates on the rope splice;

certificates of measuring the sag of the carrier rope;

counterweight weighing certificates;

rolling stock test certificates;

certificates on fixing the metal structures of stations and supports on the foundations;
acceptance certificates of foundations and supporting structures;
hidden works acceptance certificate;
certificates of testing hydraulic systems;
certificates of testing station equipment;
manuals for the operation of passenger cableways;

3) organize the work of the commission in order to make a decision on the possibility of putting passenger cableways into operation, consisting of:

the chairman of the commission - representative of the owner (owner);

commission members:

representative of the operating organization;

a representative of the territorial unit of the authorized body in the industrial safety or the local executive body exercising state supervision in the industrial safety, if the cableway is installed at a social infrastructure facility.

By agreement, the commission includes representatives of:

organizations that performed the design, construction, installation of passenger cableways;
organization-manufacturer and (or) organization-supplier of equipment.

114. Based on the commission's work results, a report is drawn up on the possibility of putting the cableway into operation in accordance with the form of Appendix 4 to these Rules

115. The person in charge of serviceability condition and safe operation of passenger aerial cableway shall make an entry in the passport of the passenger aerial cableway about the commissioning of the cableway, indicating the date of its commissioning.

116. After putting the passenger cableway into operation, the operating organization shall register the passenger cableway in accordance with the Rules for registration and deregistration of hazardous facilities and hazardous technical devices approved in accordance with subparagraph 14-3) of Article 12-2 Law.

117. The passenger cableways shall be operated in accordance with these Rules, the operating manual drawn up by the manufacturer or the organization that designed the passenger cableway.

118. The wind speed at which the operation of passenger cableways is allowed is indicated in the passport of the cableway. In the absence of such instructions, the wind speed at which boarding of passengers is not allowed and all passengers are disembarked at the stations from the rolling stock is assumed to be no more than 15 m/s.

119. Production control is organized and performed in accordance with the Instructions for the organization and implementation of production control at a hazardous production facility, approved by Order No. 315 of the Minister of Emergency Situations of the Republic of Kazakhstan dated June 24, 2021 (registered in the Register of State Registration of Regulatory Legal Acts under No. 23276).

120. The organization operating passenger cableways shall provide its serviceability and safe working conditions by organizing maintenance, technical inspection and repairs.

The technical inspection of a passenger cableway is performed by the organization operating it or, on the basis of a contract, by organizations certified for the right to conduct industrial safety inspection in accordance with Article 72 of the Law, in the presence of a person who is responsible for the serviceable condition and safe operation of passenger cableways.

The methods of control and diagnostics used during a passenger aerial cableway operation , or its technical inspection, are indicated in the operating manual of a passenger aerial cableway.

121. Primary technical inspection is carried out before the start of the passenger cableways operation. During the initial technical inspection, the measures provided for in paragraph 123 of these Rules shall be carried out.

122. Annual technical inspection shall be performed at least once every 12 months after its commissioning, but not earlier than 2 months before the start of seasonal operation of passenger cableways. A sample of the technical inspection report is given in Appendix 5 to these Rules.

123. Annual technical inspection shall comprise:

verification of operational documentation;

checking the technical condition of the equipment and elements of the cableway by inspection and measurements;

dynamic tests;

verification of the evacuation training operation.

124. Full technical inspection is carried out in the following terms:

the first - no later than 10 years from the date of the first commissioning;

all subsequent ones - no later than 5 years after the first full technical inspection.

With a full technical inspection, the following shall be carried out:

measures provided for in paragraph 123 of these Rules;

geodetic control of the planned-high-altitude position of passenger cableways;

unit-wise diagnostics of passenger cableways;

static tests.

125. An extraordinary technical inspection is carried out after:

upgrades (reconstruction);

repair of drives and designed elements of metal structures using welding or their replacement.

126. Static tests of the passenger cableway rolling stock are carried out with a double load in relation to the nominal one. Rolling stock tests are carried out by turns. Test time for cars - 30 minutes, seats (cabins) - 15 minutes.

127. Static tests of towing vehicles are carried out by suspending a load equal to the weight of the skier to the towing gear. The test time is at least 15 minutes.

128. Dynamic tests of the pendulum cableway are carried out at rated speed for three cycles with the loading of each car by turns 1.1 of the construction load.

Dynamic tests of the ring cableway are carried out at the nominal speed:

for cableway up to 600 m long with a continuous load of 90% of the rolling stock of the lifting side with a load of 1.2 calculated for the cableway as a whole for each seat;

for cableways with a length of more than 600 m with a continuous load of 95% of the rolling stock of the lifting side with a load of 1.15 calculated for the cableway as a whole for each seat.

Bypass of loaded seats (cabins) around the station pulleys when testing the ring cableway is at a reduced speed of not more than 1.25 m/s.

129. A record of the technical inspection results shall be made in the passport of the passenger cableway by a person responsible for serviceability and safe operation of passenger cableways.

130. An organization operating passenger cableways shall:

appoint a person responsible for serviceability and safe operation of passenger cableways;

ensure availability of staff sufficient for the management of the passenger cableway and for its maintenance, in accordance with the construction documentation;

the procedure for periodic examinations, technical maintenance and repairs, technical inspections of passenger cableways shall be established in accordance with the operating manual, with their fulfillment ensured;

training, retraining of the cableway maintenance staff shall be organized in accordance with the Rules for the training , retraining and knowledge testing of specialists, professionals in the industrial safety, approved by Order No. 332 of the Minister of Emergency Situations of the Republic of Kazakhstan dated July 9, 2021 (registered in the Register of State Registration of Regulatory legal acts under No. 23461) (hereinafter referred to as the Training Rules);

persons in charge of production control over compliance with industrial safety requirements during the operation of passenger cableways, and safe operation of passenger cableways, shall be provided with regulatory legal acts establishing industrial safety requirements, and personnel with technological regulations;

ensuring that the persons responsible for production control over compliance with industrial safety requirements during the operation of passenger cableways, for serviceability and safe operation of passenger cableways, comply with the requirements of these Rules, and the personnel – with technological regulations.

131. A passenger cableway may carry passengers:

when inspection and test run are being performed;

in the presence of staff in the workplace;

if conditions for the safe transportation of passengers provided for by these Rules are fulfilled.

132. Constant presence of the operator at the control panel of the passenger cableway is mandatory.

133. Resumption of the passenger cableway movement after its stoppage due to the safety device activation is carried out by the operator from the control panel.

134. If there is an intermediate station on the passenger cableway, closed for passengers boarding and disboarding:

passengers shall be notified about it at the terminal stations;

at an intermediate station closed for embarkation and disembarkation of passengers, an announcement is put up in the place of best visibility;

passenger access to the intermediate station shall be terminated.

135. Before the end of the passenger cableway work, the absence of passengers in the rolling stock must be ensured.

136. In the event of an accident or incident, the passenger aerial cableway shall be stopped immediately. The fact of the stoppage shall be recorded in the cableway operation and shift transfer log in accordance with the form of Appendix 6 to these Rules.

137. Repair of the passenger cableway malfunction and the measures taken shall be recorded in the inspection and maintenance log in accordance with the form of Appendix 7 to these Rules (hereinafter - the inspection and repair log). The work of the passenger aerial cableway is resumed only after identification, examination and elimination of the stoppage causes.

138. Operation of passenger cableways is not allowed in the following cases:

expired technical inspection term;

non-fulfillment of routine maintenance provided for by the operation manual and (or) design documentation of the passenger aerial cableway;

malfunctions of safety instruments and devices, alarms and telephone communications and also of protective structures;

presence of cracks in the design elements of metal structures and units;

rope wear in accordance with rope rejection standards according to the national and (or) interstate standards;

brake failures;

absence of employees who have passed the knowledge test in the industrial safety in accordance with the Training Rules;

adverse weather conditions specified in the passport and the operation manual of the passenger cableway.

139. When stopping passenger cableways in case of emergency (storm, thunderstorm, ice formation, avalanche, lightning), before resuming work, the readiness of passenger cableways

for work and control start-up shall be carried out in accordance with the operation manual of the passenger cableway.

140. Routine maintenance work during the operation of passenger cableways and their elements is carried out in accordance with the operating manual for passenger cableways, subject to the requirements of these Rules.

If the operating manual does not specify the maintenance works procedure, these works shall be carried out in accordance with paragraphs 148-155 of these Rules.

The routine maintenance results, including checks and revisions, except for daily checks, shall be recorded in the inspection and maintenance log.

The documentation specified in this paragraph shall be stored at the workplace of the passenger cableway operator.

141. During routine maintenance, the following types of work shall be performed:
preventive maintenance;
checks and revisions;
general servicing.

142. Preventive maintenance includes cleaning, conservation, lubrication, replacement of parts and adjustment.

143. Revision includes measurements, control and determination of the actual state of parts, assemblies, structures and, in general, the passenger aerial cableway. The revision is carried out by the operating organization.

144. General servicing includes:
checking the functioning of the tension system;
checking the condition of information boards and signs;
availability of information on meteorological conditions (icing, snow, wind);
checking the functioning of anemometers;

checking the functioning of mechanical interlock devices (if they are expected to be blocked by frost, ice or a foreign object);

checking the functioning of communication facilities;

detection of any noises, screeching and sounds uncharacteristic of the normal operation of a passenger cableway;

visual control of the rolling stock;

checking the functioning of the stop switches in the embarkation and disembarkation areas;

checking the functioning of control equipment with a change in the movement speed of the passenger cableway;

checking the functioning of control cabinets;

checking the boarding and disboarding areas, including checking the distance between the landing site surface and the seat surface.

145. During a trial run of a passenger aerial cableway, visual check shall be made of:

position of supports, ropes, orientation and rotation of balancer rollers;
free passage of rolling stock next to linear structures and pulleys;
absence of ice, snow or other obstacles on linear structures that may be dangerous for operation;
presence and readability of the provided information signs and boards on the passenger cableway route.

146. During the trial run of passenger aerial cableways, the passage of each clamp of the rolling stock through the station must be ensured.

147. The following shall be monitored daily during operation:
presence of noise, screeching and sounds uncharacteristic of the normal operation of the cableway;
changing climatic conditions;
smooth operation of the drive, pulleys and rollers at the stations;
condition of embarkation and disembarkation sites;
passage of rolling stock through the station;
absence of damage to the rolling stock.

148. Weekly checks include:
checking for accumulation of oil or dust at the locations of the drive, drainage outlets and rolling stock;
checking the functioning of all stop buttons;
checking the stop of the passenger cableway with all types of brakes;
visual check of brake devices;
check of emergency engine performance;
checking the condition and adjusting the devices that prevent the rope coming off, and adjusting the balancers.

149. Monthly checks include checking of:
carrying, carrying-traction, traction, tension ropes and ropes for carrying out evacuation work for the presence of wire breaks or external damage;
rope connections, fastening of rope ends;
position of ropes and guides in the area of coupling-uncoupling with the rolling stock;
surface conditions, position and fastening of rollers, pulleys, as well as supporting shoes of the carrying rope,
rope position control device;
control devices at the entrance and exit of stations on the route;
entry, exit and passage of seats and towing devices through stations;
brakes and brake pads;
electrical and mechanical braking systems by measuring the braking distance and (or) braking time with seats and towing devices without passengers, as well as resistance when adjusting the braking force;

electrical equipment, operability of cabinets and control panels;
functioning of drives;
security devices;
external state of rolling stock, devices for closing and fixing doors, opening and closing of brackets, as well as towing devices;
accumulator battery.

150. If a passenger cableway has not been operated for more than one month, then a monthly check shall be made before putting it into operation.

151. If the passenger cableway has not been operated for more than six months, then an annual check shall be made.

152. During the annual checks on the passenger cableway, the following shall be performed:

visual control of station structures and structures on the route, concrete and steel, as well as other structures, lifting ladders, flights of stairs, fences and work platforms;

visual control and control of performance of the main, emergency and auxiliary drives;

visual control and monitoring of the performance of each individual brake at maximum load with various starting devices and all types of drives;

control of automatic start when the passenger aerial cableway is switched off with measurement of the residual force of the gripping brake;

visual control of rollers, roller balancers and their elements (without dismantling, but with a raised carrier-traction rope), supporting shoes of the carrier rope and pulleys;

visual control of all mechanical and tension devices;

visual control and check of the operability of the rolling stock and equipment for the evacuation of passengers with conducted training;

visual control and control of the operability of the personnel's protective equipment;

visual and/or electromagnetic control (if necessary) of ropes;

control of fixing of the ends of the ropes;

visual control of signal cable ropes and their fit, connection and fastening;

general control of the condition and control of the operability of all electrical equipment and installations;

control of overcurrent, overvoltage, grounding and lightning protection devices;

visual control and check of operability of control circuits, signaling and transmitting devices;

control of insulation resistance on ropes with insulation;

visual control and performance monitoring of anemometers;

visual inspection of each rolling stock or towing device, including suspensions, running gears and suspension axles;

check for shifting of at least 10% of the clamps with a tightening force against slipping, except for clamps of towing cable cars;

complete disassembly of 20% of all clamps. If a defect is detected (cracks, deformations, destruction of springs) in at least one clamp, 100% of the clamps shall be completely disassembled;

performance monitoring and control of adjustment of clamp control devices and clamping force unit in the working uncoupled state;

control of the serviceable condition of all doors, closing and slowing down devices;

control of load measuring and passenger counting devices;

control of brake operation with measurement of braking acceleration;

control of working capacity and checking of adjustment of control devices for detachable clamps;

monitoring of the performance of all doors, closing devices;

control of operation of speed limiting devices on the main and emergency drive;

control of the action of pressure limiting devices in braking and tension devices;

visual control of anti-avalanche structures, condition of trees along the route, fences, firefighting equipment, first aid equipment, special tools.

153. Regardless of the type and timing of routine maintenance, all clamps of the rolling stock of passenger cableways are subject to non-destructive testing for cracks 10 years after the operation commencement and then every two years.

Flaw-detecting inspection of carrier-traction, traction and traction (except for a rope for a safety cable) ropes of passenger cableways are carried out in the following terms:

primary - immediately after the rope installation on the cableway;

repeat inspection - every three years in the first 15 years of operation and then annually.

154. Repositioning of the clamps of passenger aerial cableways with non-detachable rolling stock is carried out every 200 hours of passenger aerial cableways operation. For aerial single-rope cableways with ring movement, the length of which, in meters, is 400 times bigger than the speed in m/s , it is allowed to rearrange the clamps every 500 hours. Each clamp is always moved in the same direction by a distance equal to the total length of the clamp, including hinged guides (valves), increased by two rope diameters. The tightening of the fixed clamps is carried out and controlled in accordance with the instruction manual.

155. For 25% of all clamps of passenger aerial cableways, tightening tests shall be carried out in accordance with the requirements of the cableway operation manual or within the following periods:

for detachable clamps after 9000 operating hours, but no later than five years;

for non-detachable clamps after 18,000 operating hours, but no later than 10 years after the start of operation of the clamp, and further after 9,000 hours, but no later than five years.

156. Change of the construction of individual elements or passport characteristics of passenger cableways shall be made in agreement with the designer.

157. An organization that performed works to change the design of individual elements or passport characteristics of passenger aerial cableways shall record these changes in the

passport of passenger aerial cableways, establish the residual life of passenger aerial cableway after their implementation.

158. On passenger cableways, and also during their maintenance, control and measuring instruments shall be used that meet the requirements of Article 17 of the Law of the Republic of Kazakhstan “On Ensuring the Uniformity of Measurements”.

159. Passenger cableways, whose standard service life expired are subject to survey of the technical condition in order to determine the possibility of their further operation by organizations certified for conducting an industrial safety examination in accordance with Article 72 of the Law.

Appendix 1
to the Rules for construction and safe
operation
of passenger cableways

Minimum safety factor of ropes

No.	Cableway type and purpose of the rope	Safety factor, k3
1	2	3
Double-rope cableway with pendulum movement of the rolling stock		
1	Carrying Factoring in the impact from the car safety gear operation Factoring in the wind and ice impact when the cableway is not in operation	3,3 3 2,7
2	Traction rope on cableways with one traction rope and without safety gear in the cars	4,5
3	Traction rope on cableways with two traction ropes and without safety gear in the cars	5,5
4	Traction rope for a rescue car on cableways with one traction rope and safety gear in the cars:	
	Serviceable	4,5
	out-of-service	2,8
5	Tension	5,5
Aerial single-rope or double-rope with annular movement of rolling stock fixed on a carrier-traction (traction) rope and uncoupled at stations		
6	Carrying	3
7	Carrying-traction	4,5
8	Traction	5
9	Tension	5,5

Aerial single-rope cableway with annular or pendulum movement of rolling stock permanently fixed on a carrying-traction rope

10	Carrying-traction	4,5
11	Tension	5,5
Towing station for skiers with towing gear permanently attached to traction rope		
12	Traction rope	4
13	Tension rope	4,5
Towing station for skiers with towing gear fixed on traction rope and uncoupled at stations		
14	Traction rope	4
15	Tension rope	4,5
For all cableways		
16	For cable suspension (factoring in the ice and wind effects)	2,5
17	Cable-stayed rope (factoring in the ice and wind effects)	2,5

Appendix 2
to the Rules for construction and safe
operation
of passenger cableways

Factor depending on rope, drum, winch, pulley, roller and shoe

№ п/п	Name of the rope	Purpose of the drum, pulley, roller, shoe, bar	Coefficient e	
			for passenger aerial cableways	for towing cableways
1	2	3	4	5
1	Carrying	Drums for anchoring a deflecting station shoe on which the rope lies motionless	65	-
		Pulley for guiding the rope directly connected to the counterweight	130	-
		Deviating station shoe on which the rope moves Support bar for roller chain that guides the rope when it is directly connected to the counterweight	180	-
		Support shoe on which the rolling stock moves	500	-
2	Carrying -traction	Drive pulley Bypass pulley	90	-

		Support roller	12	-
3	Traction	Drive pulley	80	60
		Bypass pulley		
		Deflecting pulley, support block at wrap angle, degree:		
		over 30	80	-
		over 20 to 30	60	-
		over 10 to 20	50	40
		under 10	40	30
		Support roller	15	10
4	Tension	Deflecting pulley of pendulum cableways	80	40
		Deflecting pulley of ring cableways	40	40
		Pulley, drum, winch, on which the rope lies motionless during the cableway operation	17	15

Appendix 3
to the Rules for construction and safe
operation
of passenger cableways

Form

Passport of passenger cableway

name, type of cableway)

PASSPORT

(registration number of hazardous facility) 1. Basic technical specifications

Cableway type	
Power-drive station	(position)
Tension station	(position)
Number of intermediate stations, pcs.	
Cableway load, %:	
on ascent side	
on descent side	
Capacity (in one direction), men/h	
Movement speed, m/s:	
Nominal	

Auxiliary			
Emergency			
Travel time in one direction, min.			
Rolling stock:			
Type			
Capacity, people			
empty weight, kN			
live load, kN			
number (en route), pcs.			
distance between rolling stock units/towing gear, m			
arrival time interval between rolling stock units/towing gear, s.			
Clamp:			
Type			
quantity per rolling stock unit, pcs.			
clamping force, N			
tightening torque, N/m			
tightening force on the rope, N			
Cableway length, m:			
down the slope			
Horizontal			
Elevation of upper station over lower one, m			
Track width, m			
Movement direction (clockwise or counter clockwise)			
Supports:			
No.	Height, m	Ascent branch balancer	Descent branch balancer
Maximum rope slope in the span, degrees			
Maximum wind speed at which cableway operation is allowed, m/s			

2. Technical specifications of drives

Type		
Drive pulley	Diameter, m	
	Lining (material)	
Total gear ratio during operation of	Main engine	
	Auxiliary engine	
	Emergency engine	
Main drive	Number of engines, pcs.	
	Type of engine	
	Engine power, kW	
	Engine rotation speed, min.-1	
	Cableway acceleration at start-up m/s ²	

Auxiliary drive	Number, pcs.	
	Type	
	Capacity, kW	
	Rotation speed,min.-1	
	Acceleration at start-up, m/s ²	
Emergency drive	Number, pcs.	
	Type	
	Capacity, kW	
	Rotation speed,min.-1	
	Acceleration at start-up, m/s ²	
Reduction gear	Type	
	Reduction ratio	
Service brake	Number, pcs.	
	Type	
	Type of drive	
	Longest braking distance (time), m (s)	
Emergency brake	Number, pcs.	
	Type	
	Type of drive	
	Longest braking distance (time), m (s)	

3. Technical specifications of tensioning gear

Type	
Number, pcs.	
Counterweight mass (force developed by hydraulic cylinder), kg (N), kg (N)	
Maximum tension force in the rope, N	
Stroke of the tensioner, m	

4. Information about the main elements of the metal structures of stations and linear supports

Name of units and elements	Steel, grade	Electrodes, welding wire, type, brand	Note
Drive station (drive-tensioning)			
Tensioning station (bypass)			
Linear supports			
Anchor bolts			

5. Specifics of ropes

--	--	--	--	--	--	--	--

Purpose	Structure	Diameter, mm	Length of spliced rope, m	Length of splicing section, characteristic s of rope fixing	Breaking force of the rope as a whole, kN	Maximum rope tension, kN	Minimum safety factor
Carrying							
Carrying-traction							
Traction							
Tension							
Cable-stayed							

6. Safety appliances and devices

Name	Type	Purpose	Installation place	Designation on functional electrical diagram

7. Signaling and intercom devices

Name	Type, designation	Purpose	Installation place

8. Type of electric current and voltage

Circuit	Type of current	Voltage, V
Power		
Control		
Working lighting		
Emergency lighting		

9. Cableway control place

Station	Location

10. Acceptance certificate

Cableway _____

(name, type, project code) manufactured in accordance with regulatory documents

—

—

The cableway equipment has been checked and accepted.

The cableway was found fit for service with parameters specified in the passport after tests on the program

(name of the program)

Warranty period for the cableway service, subject to the conditions of transportation, storage,

installation and operation is _____ from its commissioning date.

The term for flaw detection control of the carrier (carrying-traction) rope: initial – after rope hanging;

repeated – every three years; after 15 years of cableway service – every other year.

Authorized representative of the organization that performed the cableway installation:

Seal (if any) _____

Date

Authorized representative of the cableway owner:

Seal (if any) _____

Date

11. Documentation package

11.1. Documentation, included in the passport:

lay-out and longitudinal profile of the cableway;

general views of stations, supports, mobile equipment and drive;

functional electrical circuit of the cableway;

other documentation (as necessary).

11.2. Documentation provided (attached) with the passport:

conclusion of industrial safety expertise;

certificates, passports for separate units and components of the cableway equipment, manufactured (supplied) by various enterprises;

passports for safety appliances and devices;

drawings of fast-wearing parts;

list of spare parts and tools;

cableway operation manual;

instructions for splicing and filling rope couplings with fusible alloy;

other documentation (as necessary).

12. Information on appointing a person in charge of serviceability and safe operation of the cableway

Number and date of appointment order	Surname, initials	Position	Number and validity term of ID	Signature
--------------------------------------	-------------------	----------	--------------------------------	-----------

13. Information on the cableway maintenance and reconstruction

Date	Information on maintenance and reconstruction	Signature of the person in charge of serviceability and safe operation
------	---	--

(at least 10 sheets)

14. Technical inspection record

Date	Inspection results	Date of next inspection
------	--------------------	-------------------------

(at least 30 sheets)

15. Registration details

The cableway is registered under No. _____ in _____

— (registration body)

The passport has _____ pages numbered and _____ sheets laced, including drawings on _____ sheets.

— (signature and surname of the registering person)

" _____ " _____ 20____ .

Appendix 4
to the Rules for construction and safe
operation
of passenger cableways

Form

**Report
on cableway commissioning feasibility**

City _____ " _____ " _____ 20____ .

We, the undersigned, commission members: authorized representative of the cableway owner- chairman of the commission

(name of the organization, position, full name, authorized representative of the operating organization)

(name of the organization, position, full name, authorized representative of the commissioning organization)

(name of the organization, position, full name, authorized representative of the organization, that performed the cableway installation (reconstruction))

(name of the organization, position, full name, authorized representative of the construction and installation organization

(name of the organization, position, full name

authorized representative of the organization - cableway manufacturer

(name of the organization, position, full name, state body representative exercising industrial safety supervision

(name of the organization, position, full name have drawn up this report stating that the submitted

documentation was reviewed, the cableway and its components were inspected and checked to

the extent provided for by the manufacturer's technical documentation and Rules for construction

and safe operation of passenger cableways. The cable was installed at the address:

Inspection and verification established that: construction, installation and commissioning works were performed in accordance with _____

(indication of technical condition) working technical documentation, installation drawings and Rules for

construction and safe operation of passenger cableways; the cableway complies with the passport data and

the requirements specified in the Rules for construction and safe operation of passenger cableways; the

cableway is in serviceable condition, enabling a safe use for its intended purpose; the operating organization

complies with the requirements of the Rules of construction and safe operation of passenger cableways.

The cableway is accepted by the owner. Signatures of the commission members.

Appendix 5
to the Rules for construction and safe
operation
of passenger cableways

Form

Technical inspection report

"__" _____ 20__.

General information about the cableway		
Type of the cableway		
Type of the rolling stock		
Manufacturer		
Operating organization		
Location of the cableway		
Date of commissioning		
Registration number of HPF		
Person in charge of serviceability and safe operation		
Slope length, m		
Altitude difference between end stations, m		
Drive station (location)		
Tension station (location)		
Number of intermediate stations, pcs.		
Number of intermediate supports, pcs.		
Main drive power, kW		
Emergency drive power, kW		
Route		
Running hours, engine hours		
Control parameters		
Name	According to the passport	Factual
Movement speed on the main drive, m/s		
Movement speed on the auxiliary drive, m/s		
Movement speed on the emergency drive, m/s		
Acceleration at start-up on the main drive m/s ²		
Acceleration at start-up on the auxiliary drive m/s ²		
Acceleration at start-up on the emergency drive m/s ²		
Time of transfer to the emergency drive, min		
Number of rolling stock on the track, pcs		
Capacity, men/hr		
Tension force of the traction (carrying-traction) rope, kN		
Tension force of the carrying rope, kN		
Traction rope (carrying-traction), Certificate No		

Carrying rope, Certificate No			
Braking deceleration control		Regulations	Fact
Service brake, m/s ²			
Emergency brake, m/s ²			
Safety brake, m/s ²			
Stroke of the tensioner	Full, m		Residual, m
Control checks carried out	Date	Date of next check	
Flaw detection of the traction rope			
Flaw detection of the carrying rope			
Electrical testing of the installation			

Technical inspection performed by specialist(s)

_____ (name of the organization, full name, position)

Annual technical inspection revealed the following flaws that prevent normal operation:

No.	Revealed violations and flaws	Item and name of the regulatory document	Remedial time

The inspection also found that:

1. The cableway operating organization complies/does not comply with the Rules for construction and safe operation of passenger cableways.
2. The cableway functions properly in all modes, except for _____.
3. Safety devices of the cableway function properly, except for _____.
4. Communication devices function properly, except for _____.
5. Results of the installation electrical tests are positive (negative).
6. The traction (carrying-traction) rope is (not) suitable for further operation.
7. The carrying rope is (not) suitable for further operation.
8. Visual and measuring control results are positive (negative).
9. The cableway route complies / does not comply with _____.
10. Equipment of stations, supports and rolling stock complies/does not comply with _____.

Recommendations

_____ Signed by the specialist who performed the technical inspection.

This report is stored together with the cableway passport until the next annual technical inspection.

Day, month, year	number of wire breaks on the rope lay	distance of the most damaged place from the conditional point on the rope	condition of splicing	other	Measures to repair the fault, due date, person assigned	Signature of the person in charge of serviceability and safe operation	When, by whom and how the revealed faults were repaired	person in charge of control over compliance with industrial safety requirements
1	2	3	4	5	6	7	8	9

Tension rope to carrier rope

Day, month, year	Inspection results			Condition of couplings			Measures to repair the fault, due date, person assigned	Signature of the person in charge of serviceability and safe operation	When, by whom and how the fault was repaired	Comments and signature of the person in charge of control over compliance with industrial safety requirements
	number of wire breaks in a two-meter rope length	distance of the most damaged place from the end of the rope at the anchor	total number of wire breaks along the entire length of the rope	adapter	end	other				
1	2	3	4	5	6	7	8	9	10	11

Tension rope to traction and carrier-traction rope

Day, month, year	Inspection results			Measures to repair the fault, due date, person assigned	Signature of the person in charge of serviceability and safe operation	When, by whom and how the revealed faults were repaired	Comments and signature of the person in charge of control over compliance with industrial safety requirements
	number of wire breaks on rope lay	distance of the most damaged place from the conditional point on the rope	other				
1	2	3	4	5	6	7	8

Tensioning device

Day, month, year	Inspection results	Measures to repair the fault, due date, person assigned	Signature of the person in charge of serviceability and safe operation	When, by whom and how the fault was repaired	Comments and signature of the person in charge of control over compliance with industrial safety requirements
1	2	3	4	5	6

Supports

	Inspection results				
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Day, month, year	condition of equipment	condition of the structure	other	Measures to repair the fault, due date, person assigned	Signature of the person in charge of serviceability and safe operation	When, by whom and how the revealed faults were repaired	Comments and signature of the person in charge of control over compliance with industrial safety requirements
1	2	3	4	5	6	7	8

Station

Day, month, year	Inspection results				Measures to repair the fault, due date, person assigned	Signature of the person in charge of serviceability and safe operation	When, by whom and how the revealed faults were repaired	Comments and signature of the person in charge of control over compliance with industrial safety requirements
	mechanical equipment	electrical equipment	Signature of the person in charge of safe operation	other				
1	2	3	4	5	6	7	8	9

Rolling stock

Day, month, year	Number of a car, seat (cabin)	Date of operation start	Inspection results	Measures to repair the fault, due date, person assigned	Signature of the person in charge of serviceability and safe operation	When, by whom and how the revealed faults were repaired	Comments and signature of the person in charge of control over compliance with industrial safety requirements
1	2	3	4	5	6	7	8

Safety devices. Signaling and communication equipment

Day, month, year	Inspected facility	Inspection results	Measures to repair the fault, due date, person assigned	Signature of the person in charge of serviceability and safe operation	When, by whom and how the revealed faults were repaired	Comments and signature of the person in charge of control over compliance with industrial safety requirements
1	2	3	4	5	6	7

Equipment maintenance

Day, month, year	Description of work (name of replaced parts: change of ropes, their lubrication, testing of equipment)	Signature of the person in charge of serviceability and safe operation	Signature of the person in charge of control over compliance with industrial safety requirements
1	2	3	4

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