



ҚАЗАҚТЕЛЕКОМ

STANDARD OF KAZAKHTELECOM JSC

**SAFETY RULES AND OCCUPATIONAL SAFETY AND HEALTH
REGULATIONS ON CABLE LINES OF KAZAKHTELECOM JSC**

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Preface

1. **DEVELOPED** by the Department for the Development of Regulatory and Technical Documents of the Administration of the Academy of Infocommunication Technologies, a branch of Kazakhtelecom JSC

2. **INTRODUCED** by the Operations Department

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4. **INSTEAD** "Occupational safety and health regulations for work on cable communication lines and wire broadcasting (radio)", approved by Order No.100 of 15.04.2002

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SAFETY RULES AND OCCUPATIONAL SAFETY AND HEALTH REGULATIONS ON CABLE LINES OF KAZAKHTELECOM JSC

1 Area of application

1.1 These Safety Rules and Occupational Safety and Health (OSH) Regulations on cable lines (CCL) of Kazakhtelecom JSC (hereinafter - Rules) contain the safety and health protection requirements to be met/complied with when working on CCL.

1.2 Compliance with the requirements of these Rules is mandatory for Kazakhtelecom JSC's branches and structural subdivisions servicing CCL line facilities.

1.3 Failure to comply with the requirements of these Rules is a violation of the work of an employee of Kazakhtelecom JSC's branches and their structural subdivisions.

1.4 Responsibility for compliance with the Rules rests with the management of Kazakhtelecom JSC's affiliated branches and their structural divisions.

2 Terms and definitions

The following terms with their respective definitions shall be used in these Regulations:

2.1 **Occupational safety:** The state of employees' protection provided by a set of measures that eliminate the impact of harmful and(or) hazardous production factors on employees in the course of their work activities;

2.2 **Safe working conditions:** Working conditions in which the levels of exposure of employees to occupational factors do not exceed the established standards.

2.3 **Occupational safety and health:** System for providing safety of life and health of employees during their work activities, which includes legal, socio-economic, organisational and technical, sanitary and epidemiological, therapeutic and preventive, rehabilitation and other measures and means;

2.4 **Personal protective equipment:** Equipment designed to protect employees from the effects of harmful and(or) hazardous production factors, including special clothing;

2.5 **Technical Safety and Health Inspector:** Employees' representative who performs internal safety and health control;

2.6 **Workplace:** A place of permanent or temporary location of an employee while performing his/her job duties in the course of his/her work activities;

2.7 **Cable ducting:** A set of underground pipelines and manholes (manholes) designed for laying, installation and maintenance of communication cables;

2.8 **Wells (inspection devices) of cable communication:** A device designed for laying cables into cable ducting pipelines, cable installation, placement of related equipment and maintenance of communication cables;

2.9 **Collectors:** Part of an urban sewer system, they collect wastewater and convey it outside the sewer system to pumping stations, treatment plants or to a discharge point;

2.10 **Tunnel:** An underground facility in the form of a corridor with tracks;

2.11 **Telecommunication Network Protection Zone:** The land located along and around the telecommunication line with vegetation and structures in it.

2.12 **Cable Distribution Cabinet:** A device designed for installation of cable boxes with plinths without electric protection elements and for connection of trunk and distribution cables of subscriber lines of local telephone networks included in the boxes;

2.13 **Optical coupler:** A device used for splicing of technological lengths of optical cable.

3 Designations and abbreviations

The following abbreviations shall be used in these Regulations:

JSC - Joint Stock Company;

OSH - Occupational Safety and Health;

CCL - cable communication line;

CAS - compressor alarm system;

REI - Rules for Electrical Installations.

4 Organisational and technical measures to provide the safety of the work

4.1 In order to conduct organizational and technical measures providing the safety of work at the CCL, the heads of workshops, departments, sites and other officials heading the work sites are obliged to:

- provide safe working conditions;
- to know the list of works with increased hazard, the list of works performed along with, the list of works in the order of current operation, the list of hazardous and harmful production factors;
- organize training of subordinate employees in safe methods and techniques of work and conduct all types of briefings, monitor compliance with rules and instructions on labor protection;
- provide proper and safe organization of work;
- provide employees with special clothing, special shoes, and other personal protective equipment and prevent them from working without overalls, safety shoes or with faulty personal protective equipment.

4.2 Responsible persons for the safe conduct of work, appointed by the order of the head of the branch, are required to personally attend and provide compliance with safety and health protection requirements at work sites to which increased safety requirements are imposed:

- when loading and unloading drums with cable, reinforced concrete and concrete products with markings and other materials with an indication of the actual weight of more than 20 kg;
- when performing work in protected areas of overhead power lines, pipelines, gas pipelines and other ground and underground utilities;
- when laying an underwater cable from floating vehicles and from ice;
- when working in places where communication lines intersect with overhead power lines, ground transport contact wires;
- when performing work at intersections of railway tracks, tram tracks and when working at a distance of up to 1.5 m from them;
- when repairing cables with remote power supply circuits;
- when working in underground communication facilities;
- when working with construction machines, lifting cranes and mechanisms;
- when testing the electrical insulation strength of communication cables;
- when installing overhead and cable crossings across a road with heavy traffic.

4.3 Before starting work in areas with increased occupational safety requirements, the work head shall instruct all employees on safe methods of work. The briefing shall be recorded in the register of OSH briefings at the workplace with a mandatory signature of the persons who received the briefing and the person who conducted it and issued the briefing in an admission outfit.

4.4 The control of safety and health protection when performing work at the CCL shall be conducted in accordance with these Rules.

5 Liability for violating the requirements of the OSH

5.1 Persons who do not comply with the requirements of these Rules are held liable in accordance with the legislation of the Republic of Kazakhstan.

5.2 Supervision and control over compliance with these Rules is conducted by the Chief Head of Safety and Health Protection of the Department of Operation and Technical Inspection of the Department of Technical Support of Telecommunications Networks of Kazakhtelecom JSC, services /departments of labor protection of branches of Kazakhtelecom JSC.

5.3 Every employee who finds a violation of the requirements of these rules, notices a malfunction of equipment or protective equipment, or an insufficient number of protective equipment, is obliged to immediately inform his direct head, and in his absence – to a higher head.

5.4 It is forbidden to conduct the orders of the head that contradict these Rules and pose a clear hazard to employees. An employee who has received such an order is obliged to draw the attention of the head who gave the order to its contradiction to the Rules and bring this to the attention of a higher-level head.

5.5 The victim or an eyewitness of the accident shall immediately inform the direct head about each accident at work.

5.6 Accidents that have occurred with employees at work are subject to review, registration and accounting in accordance with the Rules of Investigation and Accounting of Accidents and Other injuries to the health of Employees Related to Work, approved by the Decree of the Government of the Republic of Kazakhstan.

5.7 In case of accidents, it is necessary to immediately take measures to provide first aid to the victim and call a doctor.

6 Technological documentation on OSH

6.1 The technological documentation on OSH shall specify:

- technical solutions and organizational measures to provide the safety of work;
- measures for sanitary and hygienic maintenance of employees;
- fire and explosion safety and environmental protection measures;
- necessary means of protection.

6.2 The technology and organization of work, hazardous and harmful production factors that may arise during the performance of work, and provide for measures to prevent their impact on employees, are given in the Instructions on OSH for employees of branches and other internal documentation of Kazakhtelecom JSC.

6.3 When drawing up a draft for the production of works, it is necessary to provide for a technological sequence of production operations so that the previous operation is not a source of industrial hazard when performing subsequent ones.

6.4 On the basis of these Rules, as well as technical, regulatory, legal acts containing labor protection requirements for employees performing work at the CCL, OSH instructions shall be developed taking into account specific production conditions and types of work.

7 Requirements for production equipment

7.1 Lifting and construction machinery and equipment

7.1.1 The device, repair, operation of lifting machines, construction mechanisms and removable lifting mechanisms shall comply with the Rules for the device and safe operation of lifting cranes, the Rules for the device and safe operation of lifts (towers), Safety regulations for the operation of electrical installations of consumers, as well as the requirements of operational and repair documentation to prevent exposure to hazardous and harmful production factors.

7.1.2 The place of work on the movement of goods by cranes shall be illuminated in accordance with the draft of work or regulatory documentation.

7.1.3 Drivers of earthmoving machines are required to know the operating instructions of the machines on which they are to work, and to comply with all safety regulations prescribed by these instructions.

7.1.4 Instructions shall be kept with the machine at all times.

7.1.5 Before starting work, the operator of the earthmoving machine shall sound a sound signal, the values of the signals shall be explained to all employees associated with the operation of the machine.

7.1.6 During operation, excavators shall be installed on a planned site and, in order to avoid spontaneous movement, fixed with inventory stops.

7.1.7 Moving an excavator, except for a pneumatic wheel, on artificial structures (bridges, overpasses, etc.) is allowed only after obtaining the permission of the relevant organizations.

7.1.8 During icy conditions, the movement of the excavator is allowed if measures are taken against the sliding of its tracks. The movement of the excavator through shallow rivers fording is conducted with the permission of the responsible head of work after the inspection of the way of movement.

7.1.9 Before starting work, the driver of the bulldozer shall inspect the place of work. Large stones, stumps and other objects shall be removed. Warning signs shall be installed near underground structures.

7.1.10 The development of soil by a bulldozer near underground utilities and structures is allowed only in the presence of the work head.

7.1.11 It is forbidden to develop soil with a bulldozer near electric cables that are energized.

7.1.12 Before starting work, the operator of the cable car shall inspect all the nodes and check the condition of the ropes.

7.1.13 In case of installation of cable machines near pits, trenches or slopes, it is necessary to put strong shields under the stops of the machine.

7.1.14 Before tightening the cable into the cable ducting, the cable car shall be installed on the brake, and stops shall be placed under the front wheels.

7.1.15 It is necessary to roll drums with a cable on the platforms of the machine in a mechanized way.

7.1.16 The cable drums loaded onto the cable machine shall be securely attached to it.

7.1.17 Transportation of employees in the back of a cable car with a drum loaded on it is prohibited. In the case when there is no special transport for employees, drums with cable shall be transported on towed cable trolleys.

7.1.18 Compressor units shall be serviced in accordance with the manufacturer's Operating Instructions.

7.1.19 In the case of using an electric motor as a compressor drive, the operator of the compressor unit shall have an electrical safety group of at least III.

7.1.20 To operate a mobile compressor unit, it is necessary to place the unit on a flat platform at a distance of at least 10 meters from flammable materials; fix the wheels of the unit; check the condition of the equipment and the lubrication system.

7.1.21 The driver can connect compressed air consumers only after he is convinced of the serviceability of the switched-on installation.

7.1.22 It is forbidden to leave the equipment unattended during operation of the compressor unit.

7.1.23 The compressor unit shall be stopped immediately in the following cases:

- if the pressure gauge on the low or high pressure cylinder, as well as on the discharge line, shows a pressure above the permissible;
- if the electrical appliances on the switchboard indicate an overload of the electric motor;
- in case of failure of the control and measuring devices of the compressor unit;
- if knocks, blows are heard in the compressor or engine, as well as their malfunctions are detected, which can lead to an accident;
- if the heating of any parts of the compressor or the compressor drive motor is continuously increasing and their temperature has exceeded the permissible norm;
- in case of sudden termination or reduction of the cooling water supply;
- if there is no lighting;
- in case of fire.

7.1.24 If the compressor unit has been temporarily stopped, it can be put into operation only with the permission of the person responsible for the safe operation of the compressor unit.

7.1.25 It is forbidden to conduct work on the prevention or repair of compressor unit equipment by one employee.

7.1.26 Oil separator, intermediate and terminal, refrigerators, air collector, if they do not have devices for automatic purging, it is necessary to purge at least after 2 hours of operation. Filters shall be cleaned periodically, and the oil in them shall be replaced with fresh oil every 40 hours of operation.

7.1.27 During the operation of the engine and compressor, it is necessary to provide that there are no leaks of oil and fuel in tanks and pipelines.

7.1.28 To prevent an explosion during the operation of the compressor unit, it is necessary to use only the oil of the established brand.

7.1.29 The maximum temperature of the compressed air in the compressor shall not exceed the limit set by the instructions.

7.1.30 During operation, at least once every 6 months, the air collector, the oil separator, the intermediate and end refrigerators and the discharge air ducts shall be cleaned of oil deposits in a way that does not cause metal corrosion.

7.1.31 It is forbidden to clean the intermediate and end refrigerators, oil separator and air ducts by burning.

7.1.32 It is forbidden to use gasoline or kerosene to flush all parts associated with the passage of compressed air through them.

7.1.33 It is forbidden to smoke and light a fire near the compressor unit.

7.1.34 Work with defective hoses and faulty butt joints is prohibited.

7.1.35 Pressure gauges and safety valves shall be sealed. On the scale of each pressure gauge, a red mark shall be applied indicating the maximum pressure for

this compressor, at which the work is prohibited. Pressure gauges shall be checked at least once a year and periodically checked every 6 months.

7.1.36 The pressure gauge is not allowed to operate when:

- there is no seal or brand;
- the verification period has expired;
- the needle of the pressure gauge does not return to the zero mark of the scale when it is turned off;
- the glass is broken or there are other damages that may affect the correctness of its readings.

7.2 Mobile power plants

7.2.1 Employees who have an electrical safety group not lower than III are allowed to service mobile power plants.

7.2.2 For operation, a mobile power plant shall be installed away from wooden and storage rooms, and in the field – from kopen, stacks and crops at a distance of at least 10 m.

7.2.3 The housing shall be grounded using portable earthing devices. The grounding of the power plant shall be conducted in accordance with the Rules for the installation of electrical installations.

7.2.4 Switches, terminals and other live parts shall be covered with covers that protect against accidental contact with parts that are energized.

7.2.5 Smoking and lighting a fire near a mobile power plant, as well as leaving it unattended during operation is prohibited.

7.2.6 In case of ignition of liquid fuel or insulation on the live parts of power plants, it is forbidden to extinguish the flame with water. To extinguish the flame, it is necessary to use carbon dioxide fire extinguishers or a fire-fighting cloth.

7.2.7 If the engine ignites, it is necessary to immediately stop the access of fuel.

7.2.8 Fuel shall be stored in a canister or metal canister. In the dark, refueling can be done only by the light of a lantern.

7.2.9 During the operation of the power plant, a poster shall be hung on the switch: "Stop. Tension."

7.2.10 Mobile power plants shall be equipped with protective equipment.

7.3 Power tools, hand-held electric machines and hand-held electric lights

7.3.1 To work with power tools and manual electric machines of class I in rooms with increased hazard and outdoors, personnel with an electrical safety group of at least II may be allowed.

7.3.2 The connection of auxiliary equipment (transformers, frequency converters, protective disconnecting devices, etc.) to the network and its disconnection are conducted by electrical personnel with a group not lower than III.

7.3.3 Depending on the category of the room according to the degree of hazard of electric shock, power tools and manual electric machines of the following classes shall be used:

- Class I - when operating under production conditions (except for the preparation and production of construction and installation works).

Personal protective equipment shall be used when working with power tools and Class I manual electric machines. It is allowed to work with power tools and manual electric machines of Class I without the use of personal protective equipment, if the machine or tool, and only one, receives power from a separation transformer, an autonomous motor-generator set, a frequency converter with separate windings or through a protective-disconnecting device;

- Classes II and III - during operation in production conditions in all cases, and during the preparation and production of construction and installation works indoors - in high-risk conditions and outdoors. When using machines of class II and III, it is allowed to work without the use of personal protective equipment, except for the preparation and production of construction and installation works, when it is necessary to use these means when working with electric machines and tools of class II;

- Class III - in the presence of particularly unfavorable working conditions (in vessels, devices and other metal containers with limited ability to move and exit the operator), as well as in particularly hazardous conditions during the preparation and production of construction and installation works.

During the preparation and production of construction and installation works, it is allowed to use in these conditions manual electric machines and tools of class III only with the use of personal protective equipment.

Note - in the absence of manual electric machines and equipment of class III, with the permission of the person responsible for the electrical equipment, it is allowed to use machines and tools of classes I and II, provided that the machine or tool, and only one, receives power from an autonomous motor-generator set, a separation transformer or a converter with separate windings or if there is a protective shutdown device.

7.3.4 When **conducting** work in rooms with increased hazard and especially hazardous, manual electric lamps with a voltage not higher than 42 V. are used. When working in particularly unfavorable conditions, hand-held lamps with a voltage not higher than 12 V. shall be used. Step-down transformers, machine converters, generators, and rechargeable batteries are used as a power source for lamps with a voltage of up to 42 V AC. It is not allowed to use autotransformers for these purposes.

7.3.5 The primary windings of portable step-down transformers shall be connected to the mains with a voltage of 127 and 220 V using a cord no longer than 2 m long, enclosed in a rubber hose, and equipped with an appropriate plug (connector).

7.3.6 The housings of step-down transformers shall be grounded, for which the grounding clamp on the transformer housing shall be connected to the grounding clamp of the plug outlet through which power is supplied to this transformer, or by means of a screw clamp to the grounding. The grounding wire shall be uninsulated and have no breaks, fractures, etc. The low voltage windings shall also be grounded.

Grounding of the winding is performed by connecting the corresponding output of it to the grounding terminal on the transformer housing.

If the step-down transformer is also a separation transformer, then the secondary electrical circuit shall not be connected to the ground.

7.3.7 The insulation resistance of step-down transformers is measured between the primary and secondary windings and between each of the windings and the housing. The frequency of measurements is at least once every 6 months.

The insulation resistance value shall be at least 0.5 mOhm, and in the presence of double insulation, at least 2 mOhm.

7.3.8 During major repairs, at least once every 12 years (based on local conditions and operating conditions), the insulation of the windings of step-down transformers are tested with an increased voltage of industrial frequency.

7.3.9 The value of the test voltage of the insulation of step-down transformers shall be: at a voltage of the primary winding of 127–220 V - 1,350 V, at a voltage of 380–440 V - 1,800 V.

The test results shall be recorded in the measurement protocols.

7.3.10 When working with power tools and manual electric machines, personal protective equipment includes dielectric gloves, galoshes, carpets.

7.3.11 Step-down transformers shall have an inventory number, be registered and stored in a dry place together with the power tool.

7.3.12 Before starting work with manual electric machines, portable lamps and power tools, it is necessary to check:

- completeness and reliability of fastening parts;

- external inspection of the serviceability of the cable (cord), its protective tube and plug;
- integrity of the insulating parts of the housing, handle and brush holder covers;
- the presence of protective covers and their serviceability;
- the clarity of the switch operation;
- idling operations;

For Class I machines, in addition, it is necessary to check the serviceability of the grounding circuit (between the machine body and the grounding contact of the plug).

Manual electric machines, hand-held lamps, power tools and accessories to them that have defects are prohibited to be issued for work.

7.3.13 When using power tools, hand-held electric machines and hand-held lamps, their wires or cables shall be suspended whenever possible. Direct contact of wires and cables with metal, hot, wet and oily surfaces is not allowed.

If any malfunctions are detected, work with manual electric machines or manual electric lamps is immediately stopped.

7.3.14 Control over the safety and serviceability of manual electric machines, power tools, portable lamps is conducted by specially assigned personnel with an electrical safety group not lower than III.

7.3.15 When the current supply is stopped while working with power tools or during a break in operation, the power tool is disconnected from the mains.

7.3.16 Persons using power tools and manual electric machines are prohibited:

- transfer manual electric machines and power tools at least for a short time to other persons;
- disassemble manual electric machines and power tools and make any repairs yourself (both the power tool itself or the manual electric machine, and the wires of plug connections, etc.);
- hold on to the wire of a manual electric machine or power tool or touch a rotating cutting tool;
- remove shavings or sawdust with your hands during operation until the manual electric machine stops completely;
- work with ladders. To perform these works, strong scaffolding or scaffolding shall be installed;
- bring portable transformers and frequency converters inside the drums of boilers, metal tanks, etc.;
- leave manual electric machines and power tools unattended connected to the power grid.

7.4 Manual and pneumatic machines

7.4.1 Each pneumatic tool shall be provided with a passport, which specifies the vibration amplitudes of the handle and body of the tool and the date of release, as well as the requirements for its safe operation.

7.4.2 The vibration tool is checked in special laboratories, testing centers in accordance with the established procedure.

7.4.3 Work with pneumatic tools from ladders is prohibited.

7.4.4 Overtime work with the use of pneumatic tools is prohibited.

The working time with a vibration-hazardous tool shall not exceed 2/3 of the duration of the working day.

In emergency situations, when interruptions in work are impossible, work with a pneumatic tool is allowed to be conducted constantly, providing the replacement of employees.

7.4.5 When working with a pneumatic tool, it is necessary to use protective glasses and vibration-dampening gloves.

7.5 Hand-held tool

7.5.1 For work, a hand tool shall be used that meets the following requirements:

- the wooden handles of the tool shall be made of hard and viscous wood, smoothly processed and securely fixed;

- the working part of the tool shall not have cracks, burrs and chips.

7.5.2 Hand tools of impact action (chisels, beards, notches, punchers, cores, hammers) shall have:

- the length of the handles is not less than 150 mm, jammed with metal wedges;

- side faces without burrs and sharp edges;

- working ends without damage (potholes, chips);

- bandage rings on the handles.

7.5.3 The handles of hammers and sledgehammers shall have an oval shape along the entire length in cross section, be smooth and without cracks. The working surface of the heads of sledgehammers and hammers shall be smooth and convex without bumps, cracks and chips.

7.5.4 When working with a chisel or other hand tool for cutting metal, it is necessary to use protective glasses with unbreakable glasses and mittens.

7.5.5 Wrenches shall be marked and match the size of the nuts.

7.5.6 The working surfaces of the mouth of the wrenches shall not have knocked down and crumpled edges, and the handles shall not have burrs. The

sponges of the keys shall be parallel. The size of the key shall be indicated on the handles.

7.5.7 The manual locksmith and assembly tool shall be inspected before use in order to identify a faulty tool.

7.5.8 When working with jacks, it is forbidden to load jacks above their rated load capacity.

7.5.9 A tool with insulating handles (pliers, pliers, side and end pliers, screwdrivers, etc.) shall:

- have dielectric covers or coatings without damage (delaminations, blisters, cracks) and fit snugly to the handles;
- stored indoors, without touching the heating batteries and protected from sunlight, moisture, aggressive substances.

7.5.10 Tools with insulating handles shall have stops or collars that prevent slipping of fingers working on unprotected metal parts. It is forbidden to use tools with insulating handles that have not been tested with increased voltage, as well as with dielectric covers or coatings that are loosely adjacent to the handles, with blisters, delaminations, shells and other defects.

7.5.11 Testing of tools with insulating handles shall be conducted in accordance with the requirements of the "Rules for the use and testing of protective equipment used in electrical installations, technical requirements for them".

8 Requirements for the use of protective equipment

8.1 Employees performing work at the CCL shall be provided with special clothing, special shoes and other personal protective equipment in accordance with the Decree of the Government of the Republic of Kazakhstan "On approval of the norms for issuing special clothing, special shoes and other personal protective equipment to employees at the expense of the employer".

8.2 The head of the branch is responsible for the timely regulation of employees with overalls, safety shoes and other personal protective equipment.

8.3 For the storage of workwear, safety shoes and other personal protective equipment issued to employees, the head of the branch is obliged to provide special equipped rooms (dressing rooms), in accordance with the requirements of building regulations.

8.4 Employees are obliged to take care of special clothing, special shoes and other personal protective equipment issued to them for use.

8.5 Protective equipment shall be stored and transported in conditions that provide their serviceability and suitability for use.

8.6 Protective equipment shall be stored in closed rooms, do not touch heating devices, be protected from sunlight, moisture and aggressive environment (acid vapors, alkalis, etc.).

8.7 Protective equipment is placed indoors in separate designated areas. Storage areas shall be equipped with hooks or brackets for rods, insulating tongs, portable earthing, posters and safety signs, as well as cabinets, racks for dielectric gloves, boots, galoshes, carpets, insulating pads, mittens, safety belts, ropes, safety glasses, etc.

8.8 Protective equipment, insulating devices and devices designed for live work shall be stored in a dry, ventilated room. Delivery to the workplace shall provide their serviceability and suitability for use.

8.9 All electrical protective equipment and safety belts in operation shall be numbered. The numbering order is set depending on the operating conditions of the protective equipment.

8.10 The inventory number is applied directly to the protective equipment with paint or stamped on metal (for example, on metal parts of a belt, insulated tool, rod, etc.), or on a special tag attached to the protective equipment (insulating rope).

8.11 If the means of protection consists of several parts, then the number is placed on each part.

8.12 The insulating tool, voltage indicators up to 1000 V, as well as safety belts and safety ropes are allowed to be marked with available means with a record of the test results in the journal of accounting and maintenance of protective equipment in accordance with Annex B.

8.13 The availability and condition of protective equipment shall be checked by inspection periodically, but at least once every 6 months, by the person responsible for their condition, with the results of the inspection recorded in the log.

8.14 Sets of portable earthing devices shall be numbered and stored in designated places. Special places for hanging and laying portable earths shall be provided with the numbers available on these kits.

8.15 Protective equipment, except for insulating stands, dielectric carpets, portable earthing, protective fences, posters and safety signs received from the manufacturer or from the warehouse for operation, shall be checked according to the standards of operational electrical tests.

8.16 On the means of protection that have passed the tests, it is necessary to put a stamp of the following form:

№ _____
 Valid until _____ kV
 Date of the next test _____ 20 __.

(name of the laboratory)

Protective equipment, the use of which does not depend on the voltage of the electrical installation (dielectric gloves, boots, gas masks, etc.) is stamped:

№ _____

Date of the next test _____20 __.

 (name of the laboratory)

The stamp shall be clearly visible. It shall be applied with indelible paint or glued to insulating parts near the limiting ring of insulating means and insulating devices for work under tension or at the edge of rubber products and safety devices. If the means of protection consists of several parts, the stamp is placed only on one part.

Protective equipment that fails the test shall have the stamp scrawled across it in red paint.

8.17 Before each use of protective equipment, the personnel is obliged to check its serviceability, the absence of external damage, contamination, check the expiration date on the stamp.

8.18 It is prohibited to use protective equipment with expired expiration dates.

8.19 Technical requirements for certain types of protective equipment, rules for their use and testing, and the procedure for conducting tests are given in the "Rules for the use and testing of protective equipment used in electrical installations, technical requirements for them".

8.20 The norms and terms of operational mechanical and electrical tests of protective equipment are given in Annex C.

9 Process requirements

This section discusses the following technological processes:

- earthworks;
- cable laying;
- work in underground viewing devices;
- installation work;
- cable measurements and tests.

9.1 General safety and health requirements

9.1.1 Persons at least 18 years old who have passed a medical examination, introductory instruction, on-the-job instruction and training in safe working methods, who have passed a knowledge test on safety and health protection, who have an electrical safety group of at least 3 groups, are allowed to work independently on performing work at the CCL.

9.1.2 Before being assigned to independent work, the employee shall be trained in safe working methods in the amount of:

- technology of work;
- occupational safety rules for work on cable lines;
- application of protective equipment;
- regulation of first pre-medical medical care.

9.1.3 When working with power tools, it is necessary to comply with the requirements of the instructions developed on the basis of the Standard Instructions for Safety and Health Protection when working with power tools, manual electric machines and manual electric lamps.

9.1.4 When working on ladders and ladders, it is necessary to comply with the requirements of the instructions developed on the basis of the Standard Instructions on Safety and Health Protection when Working on Ladders and ladders.

9.1.5 Before starting work, ladders, ladders, scaffolding and car towers shall be carefully inspected.

9.1.6 It is forbidden to use ladders, ladders and other devices that have not passed the tests or with expired test dates, with damaged steps and stops, and other malfunctions. The ladder, stepladder shall be carried without touching the ground.

9.1.7 The lower ends of ladders, ladders shall have stops in the form of sharp steel tips when installed on the ground or rubber shoes when installed on the floor, asphalt, etc.

9.1.8 Sliding ladders–ladders shall have a locking device that excludes the possibility of spontaneous sliding apart while working on them.

9.1.9 Materials, machines, devices used during work on the CCL shall have a safety certificate.

9.1.10 Work on the CCL shall be stopped and reported to the head in case of the following changes in weather conditions:

- during a thunderstorm and its approach;
- at a wind speed above 15 m/sec (at a wind speed of 15-18 m/sec, thin branches and dry branches of trees break);
- in case of heavy rain, floods;
- during snowstorms, sandstorms;

– when the outside air temperature is below the norms set by the local authorities.

Exceptions are allowed for work on the elimination of accidents, the manufacturer of work in this case is obliged to provide heating facilities in the immediate vicinity of the place of work.

9.2 Earthworks

9.2.1 The production of works (soil development, cutting of glades) preceding the cable laying work shall be conducted in accordance with the requirements:

- SNiP 3.02.01-87 "Earthworks, foundations and foundations",
- Rules for the Telecommunication Network Protection Zone in the Republic of Kazakhstan (hereinafter - RK), approved by the Order of the Minister for Investment and Development of the Republic of Kazakhstan dated December 24, 2014 No. 281.

9.2.2 Before digging trenches and ditches related to the repair or laying of cable in the area of underground structures and communications, it is necessary to appoint a work head in advance and obtain written permission to perform the work from the enterprise or organization responsible for the operation of these structures and communications. The permit shall be accompanied by a plan indicating the location and depth of the laying of communications.

9.2.3 Before starting work, the personnel operating the cables shall perform a control opening of the ground (a pit is made) to clarify the location of the depth of the cable laying and install a temporary fence.

9.2.4 If cables, pipelines, underground structures are found not marked on tracing papers (plans), excavation work shall be urgently stopped and reported to the responsible work head. You can continue the work after obtaining permission from the relevant organizations.

9.2.5 The use of jackhammers for opening the cover over cables and earthmoving machines for excavating the soil, as well as crowbars and picks for loosening the soil is allowed only to a depth at which a layer of soil remains at least 0.3 m before the cables. Further excavation shall be conducted with shovels.

9.2.6 Trenches and pits at a depth of more than 1 m shall be conducted with slopes. In the case of vertical walls in the presence of quicksand and groundwater inflow, the walls shall be reinforced with boards, racks and spacers.

9.2.7 When digging trenches in weak or moist soil, when there is a threat of collapse, their walls shall also be securely reinforced. In loose soils, work can be conducted without fastening, but with slopes of at least 15 ° from the vertical wall of the trench.

9.2.8 In soils of natural humidity in the absence of groundwater and nearby underground structures, digging of pits and trenches with vertical walls without fastening is allowed to a depth of no more than 1 m in bulk, sandy and coarse-grained soils, 1.25 m in sandy loams, 1.5 m in loams and clays.

9.2.9 In dense cohesive soils, trenches with vertical walls can be dug with rotary and trench excavators without mounting fasteners to a depth of no more than 3 m. In these cases, the descent of people into the trenches is prohibited.

9.2.10 In the places of the trench where people need to stay, fasteners shall be arranged or slopes shall be made.

9.2.11 In winter, the development of soil (except dry) to the depth of freezing is allowed without fasteners.

9.2.12 The fastening of trenches and pits with a depth of 3 m or more shall be conducted with inventory shields provided for by standard drafts for this section of the cable route.

9.2.13 The "canopies" formed above the trench and the stones remaining on the slopes shall be immediately collapsed, while the electricians at this time shall be removed from hazardous areas.

9.2.14 Pits and trenches shall be fenced. There shall be warning signs and inscriptions on the fence, and at night — signal lighting. When performing emergency recovery work, it is necessary to use lighting at a voltage of 12 V. The lamps shall be installed on the extreme shields of the fence.

9.3 Cabling

Cable laying shall be conducted in accordance with the requirements of DBR 604-III-87 "Safety during the construction of linear cable structures" and according to the approved draft. The draft shall be coordinated with the underground utilities services.

A senior person shall be appointed by the order of the head of the branch to conduct the work on laying the cable. When laying the cable in particularly critical areas, the presence of the work head (engineer, foreman, etc.) is mandatory.

9.3.1 Cabling in the ground

9.3.1.1 When laying the cable manually, each employee shall have a section of cable weighing no more than 20 kg. When carrying the cable to the trench on their shoulders or in their hands, all employees shall be on one side of the cable.

9.3.1.2 Cable unwinding from moving conveyors (cable trolleys) shall be conducted as close to the trench as possible. The cable shall be unwound without tension so that it can be taken, brought and laid in a trench.

9.3.1.3 The inner end of the cable, which is placed on the cheek of the drum, shall be secured. The conveyor shall have a device for braking the rotating drum.

9.3.1.4 When cornering, it is forbidden to pull or adjust the cable with your hands, as well as to be inside the angle formed by the cable.

9.3.1.5 It is forbidden to leave trenches that are not filled in, it is allowed only if there is a fence and light signals.

9.3.1.6 Cable laying by cable installers is allowed in areas that do not have underground structures.

9.3.1.7 When laying cables with a mechanized column, the head of the column shall allocate signalers and install a clear alarm system. The employee who directs the laying of the cable, as well as the electrician who is on the cable laying machine, shall have signaling devices (whistle, flags).

9.3.1.8 Before starting work, it is necessary to carefully inspect the main elements of the cable laying unit and make sure that they are in good working order. If a malfunction is detected, it is prohibited to work on a tractor or cable-laying machine.

9.3.1.9 It is allowed to stand or sit on the cable laying machine only on specially designated platforms or seats. It is possible to enter the back working area of the cable laying machine to check the serviceability and connection of the cable ends during the column stop and only with the permission of the employee directing the cable laying. It is forbidden to be on this site while the cable-laying machine is moving.

9.3.1.10 During the refueling of the tractor with fuel, as well as during the inspection of the fuel tanks, it is forbidden to smoke or use an open fire. To illuminate the tanks and the entire fuel system, regardless of whether there is fuel in them or not, you shall use a safe electric lamp powered by a battery.

9.3.1.11 It is forbidden to pour water on ignited gasoline, diesel fuel or engine oil; the flame shall be extinguished with a fire extinguisher, thrown with earth, sand, covered with a fire-resistant cloth.

9.3.2 Laying cables in cable ductings, collectors, tunnels

9.3.2.1 Work in underground inspection devices – cable wells, collectors, cable entry rooms, etc. shall be conducted by a link or a team consisting of at least two people.

9.3.2.2 When working in underground inspection devices, a work permit shall be issued.

9.3.2.3 Fences-barriers shall be installed on both sides of the wells in which the work is conducted. If the well is located on the carriageway of the road, fences

are installed to meet traffic at a distance of at least 10-15 m from the fence. Warning signs shall be installed towards the traffic, and in case of poor visibility, additional light signals shall be installed.

9.3.2.4 Before starting work in wells located on the roadway, it is necessary to inform the authorized body about the place and time of the work.

9.3.2.5 Install a cable machine, a cable unwinding device (when working with an optical cable) so that they do not interfere with the movement of pedestrians or vehicles. The car shall be installed on the brakes, and put stops under the front wheels.

9.3.2.6 When tightening the cable from the cable conveyor, it is necessary to put stops under its wheels.

9.3.2.7 Install the cable unwinding device at a distance of 1.5 m from the well hatch.

9.3.2.8 When tightening the cable, it is forbidden to be near the bends of the rope and touch the moving cable or cable with your bare hands.

9.3.2.9 The manual wire winch shall be installed no closer than two meters from the well hatch.

9.3.2.10 Before laying the construction length of the optical cable, a cable tip (a cable stocking with a torsion compensator) shall be installed at the end from which its laying will begin.

9.3.3 Running cables through the walls of buildings

9.3.3.1 Work at a height of more than 2.5 m with an electric tool, a pneumatic tool, a blowtorch and a gas burner, as well as with an installation pyrotechnic gun, regardless of height, is allowed only from scaffolding or ladders with upper platforms fenced with railings.

9.3.3.2 To conduct shroblenie walls and ceilings in which hidden radio and electrical wiring can be located shall be after disconnecting these wires from power sources. At the same time, measures shall be taken to prevent the erroneous appearance of voltage.

9.3.3.3 When strobing and punching holes in concrete or brick walls, gloves and safety glasses with shatterproof glasses shall be used.

9.3.3.4 Parts and tools shall be given to the employee upstairs using a rope or climbing a ladder. You can not submit parts and tools by tossing.

9.3.3.5 A employee climbing with a rope shall keep it in the assembled state. The rope can be lowered down only after fixing its end to the structure. If the rope is temporarily not needed, the person working at the top shall assemble it and fix it on the structure. It is forbidden to tie the rope to a safety belt or tie it around the torso.

9.3.3.6 Before lowering parts, tools and other cargo, an employee on the stairs shall warn the employee at the bottom about this.

9.3.3.7 To store and carry tools when working upstairs, you shall use a tool belt, a special bag or a drawer.

9.3.4 Installation of cable distribution cabinets

9.3.4.1 Indoor cable cabinets shall be installed and attached to the floor or wall in such places so as not to interfere with the movement of people. Cabinet doors shall open freely.

The distance from electrical equipment or gas pipelines to the distribution cabinet shall be at least 0.5 m.

Distribution cabinets installed both on the street and inside buildings shall be grounded.

9.3.4.2 The inlet to the cabinet shall be hermetically sealed.

9.3.4.3 The design of the outdoor distribution cabinet shall provide for the possibility of its natural ventilation.

9.3.4.4 Cabinet doors shall be equipped with hooks that would prevent them from closing spontaneously while working in the cabinet.

9.3.4.5 On the outside of the inner door of the switch cabinet, a warning inscription shall be applied: "Check for the presence of extraneous voltage on the terminals and gas."

9.3.5 Work in attics

9.3.5.1 When working in attics, care shall be taken to avoid falling into open unprotected hatches, injury by nails protruding in beams and boards, etc.

9.3.5.2 In the absence of lighting in the attic, the work is conducted by the light of an electric lantern on a battery or batteries.

9.3.5.3 It is forbidden to use an open fire in the attic (candles, matches, etc.) and smoke.

9.3.5.4 Work with a blowtorch or a gas burner in the attic is prohibited.

9.3.6 Before climbing from the landing to the attic and from the attic to the roof, as well as when moving through the attic, all metal structures encountered on the way (doors, if they are covered with iron, stairs, hatches, beams, ventilation and heating structures, metal roofing, etc.) shall be checked with a low voltage indicator.

9.3.7 Suspending cables on poles

9.3.7.1 Cable supports shall be equipped with a cable platform, lightning rod and grounding. The underground cable placed on the cable support shall be protected from mechanical damage; current leads (grounding descents) that do not have a gap are closed along the entire length of the support with a wooden rail (gutters).

9.3.7.2 If there is a remote power supply voltage on the wires suitable for the cable support, the circuits are tested in dielectric gloves and dielectric galoshes. Repair work in the cable box shall be conducted with the remote power supply removed.

9.3.7.3 The absence of extraneous hazardous voltage on the cable, grounding descent and cable shall be checked with a voltage indicator. To check for the presence of extraneous voltage on cables and CCL that have air intersections with power lines with a voltage higher than 1000 V, it is necessary to use high-voltage indicators.

After it is established that there is no extraneous voltage above 1000 V on the cables and CCL, using the low voltage indicator, it is necessary to make sure that there is also no extraneous voltage below 1000 V on the cables and communication cables.

9.3.7.4 On air CCL, the steel cable to which the cable is suspended shall be grounded. Outside of populated areas, the grounding of the cable shall be conducted on average after 2-3 km. If the section of the suspended cable does not exceed 2 km in length, then the cable is grounded at the ends of the section. On subscriber lines, the cable is grounded at the last kilometer every 250 m.

9.3.7.5 The grounding shall have a resistance of at least 20 ohms for normal soils with a specific electrical resistance of not more than 100 ohms * m (for example, clay / loam), according to the Rules of Electrical Installations (REI) section 1.7.

If the ground has a higher electrical resistivity, then often (but not always) the minimum values of the grounding resistance are increased by 0.01 of the ground resistivity.

For metal shields and cable sheaths, the following values are accepted: grounding resistance (the dependence on the electrical resistivity of the ground (ER) is shown in Table 1.

Table 1

ER, Ohm*m	< 100	> 100 < 300	> 300 < 500	>500< 1000	> 1000
R, Ohm	20	30	35	45	55

9.3.7.6 Work on the dismantling of supports and overhead communication lines is described in the organization's standard "Rules for safety and health protection when working on overhead communication lines".

9.4 Working in underground inspection facilities

9.4.1 Determining the presence of hazardous gases in underground communication installations

9.4.1.1 Before starting work in underground structures, the air in them shall be checked for the presence of hazardous gases. The presence of gas shall be checked in the well, where work will be conducted in nearby adjacent wells.

9.4.1.2 In underground structures, the air shall be examined for the presence of methane and carbon dioxide in it, regardless of whether there is an underground gas network in the settlement or not.

9.4.1.3 Having made sure with the help of a gas analyzer that there are no explosive gases, it is necessary to check the presence of carbon dioxide in the well.

9.4.1.4 If no gas was detected in the well when it was opened, then a further check for the presence of hazardous gas shall be conducted by a gas analyzer (gas indicator) every hour.

9.4.1.5 Gas analyzers (gas indicators) shall be checked periodically in specialized laboratories. Checking the serviceability of the gas analyzer (gas indicator) shall be recorded in a special journal.

9.4.1.6 If the analysis showed the presence of hazardous gas, then work in underground structures shall be stopped until the cause of the hazardous gas intake is eliminated. About the presence of explosive gas in an underground structure, the senior team member shall immediately notify the head of the branch and the emergency service of the gas industry.

Inspection devices in which methane and carbon dioxide are periodically detected shall be registered.

All work on the elimination of gas contamination of inspection devices with explosive gases shall be conducted only by employees of the gas management service.

9.4.1.7 Until it is established that there are no explosive gases in the wells, it is forbidden to approach the hatch with matches, a cigarette, a gas burner and other sources of open fire.

9.4.2 Ventilation of cable wells

9.4.2.1 Before starting work, it is necessary to ventilate the well in which the work is to be conducted, as well as the wells adjacent to it. Ventilation is conducted naturally or by fans.

9.4.2.2 At the time of ventilation in the well in which work is to be conducted, at least one channel on each side shall be temporarily opened. The same channels shall be opened in adjacent wells, but only in the direction of the well in which the work is to be conducted. It is desirable to open free channels and, if possible, upper ones.

9.4.2.3 With the end of ventilation, the channels in the well in which the work is to be conducted shall be closed again with traffic jams. In adjacent wells, these channels can remain open during the entire time of work.

9.4.2.4 Channels shall be opened with all measures, as gas may accumulate in them. When opening channels, it is forbidden to use an open fire.

9.4.2.5 The hatches of adjacent wells shall be open for the entire duration of the work. Special lattice covers are installed on them. Open wells shall be fenced and monitored.

9.4.2.6 Fans used for ventilation of wells shall provide a complete exchange of air in open wells for 10-15 minutes.

9.4.2.7 The well shall be ventilated during the soldering of cables.

9.4.2.8 To open the well hatch, you shall use crowbars with hooks, with tips made of non-ferrous metal.

9.4.3 Lighting of underground inspection facilities

9.4.3.1 Portable electric lamps with a voltage not higher than 12 V or manual electric (battery) lanterns shall be used to illuminate underground viewing devices. The lamps shall be explosion-proof.

9.4.3.2 Electric portable lamps shall be connected via step-down transformers or directly to the power panel of the cable machine.

9.4.3.3 The step-down transformer can be connected to the power grid or to a mobile power plant.

9.4.3.4 Portable electric lamps and step-down transformers shall comply with the requirements set forth in clause 7.3 of these Rules.

9.4.3.5 The step-down transformer or battery (in the event that the portable electric lamp is powered by a battery) shall be located on the ground at a distance of at least 1 m from the edge of the well.

9.4.4 Safety requirements for working with a petrol pump when pumping water from wells

9.4.4.1 Employees who have an electrical safety group not lower than III are allowed to service a portable gas pump.

9.4.4.2 It is strictly forbidden:

- move the pump while it is running. Be sure to turn off the pump and only then move it;
- leave the pump running unattended, since after drawing the water, it will work "dry" without pumping water, and may fail;
- be in the water near a working pump, when installing a pump to pump water from wells;
- use the pump near places where flammable liquids and gases are stored;
- refuel fuel near an open fire;
- store the pump with a refilled fuel tank indoors, with potential sources of heat or fire.

9.4.4.3 It is necessary to turn off the engine before refueling, and also try not to spill fuel on the engine or muffler when refueling.

9.4.4.4 The location of the pump shall be on a firm and stable flat surface to avoid damage from possible increased vibration.

9.4.4.5 Before installing the pump, make sure that the pump itself and its connections are guaranteed against possible flooding. It is necessary to protect the pump from rain.

9.4.4.6 During transportation, the pump shall be in a horizontal position. When transporting the pump, the fuel tank shall be emptied as fuel may leak from the carburetor or fuel tank if it is tilted too much.

9.4.4.7 If fuel gets into your eyes or mouth, rinse the place with plenty of water and consult a doctor immediately. If fuel gets on the skin or clothes, it is necessary to wash the places of contact with soap and water and change clothes.

9.4.4.8 It is necessary to wear non-slip shoes, durable trousers, protective gloves, protective glasses (ordinary glasses are not protective) or a protective mask, protective headphones (with increased noise level), a protective helmet (in case of an appropriate hazard).

9.4.5 Working in a cable well

9.4.5.1 To conduct work in sewage facilities where there are cables through which remote power is transmitted, a person responsible for the safe conduct of work with an electrical safety group of at least IV shall be appointed.

9.4.5.2 Each employee descending into the well shall wear a life belt with straps and a strong rope securely attached, or a special suit with straps sewn into it and a protective helmet.

9.4.5.3 Near the well in which the work is being conducted, there shall be a duty officer whose duties include monitoring the condition of employees in the well.

9.4.5.4 At the first signs of ill health of an employee who has descended into the well, the duty officer shall immediately help him escape from the well or extract him from the well with a life belt and rope and give him first aid. The work shall be stopped until the reasons for the violation of the conditions for the safe performance of work are eliminated.

9.4.5.5 Periodic checks of the air in the well for the presence of hazardous gases and ventilation of wells in which work is being conducted are the duties of the duty officers: the air shall be checked at least once an hour.

9.4.5.6 If in case of an accident it is necessary to go down into a well into which gas is continuously supplied, then it is necessary to use a hose gas mask. The end of the hose shall be kept away from the hatch (no closer than 2 m) at a height of 1 m from ground level and turn it against the wind so that the gas escaping from the well could not get into the hose hole.

9.4.5.7 In this case, during the entire time the employee is in it, at least three people shall be on duty, including the person responsible for the safe production of work.

9.4.5.8 It is forbidden to use an open fire in a well where gas is continuously supplied. If artificial lighting is necessary, it shall be conducted from a strong light source from above through a hatch or from a portable flashlight.

9.4.5.9 In wells of cable ducting with remote power supply, they shall be painted red along the entire circumference with a width of 20-25 cm at the entrance to the well, in the middle and at the exit from the well, as well as at each cable coupling at a distance of 15-20 cm. Signs warning of the hazard of electric shock shall be installed directly at the cable couplings on the cables through which remote power is transmitted. In pass-through wells where there are no cable couplings, signs shall be installed on cables in the middle part of the well.

9.4.5.10 Employees servicing sewage facilities shall be notified on receipt that remote-powered cables are laid in the sewage facilities on their site.

9.4.5.11 If, after descending into the well, the employee does not find distinctive signs on the cable through which the remote power is transmitted (there will be no coloring or signs), then he shall inform the person responsible for the safe production of work.

9.4.6 Working in collectors

9.4.6.1 Work in the collectors shall be conducted in accordance with the instructions outlined in the Safety Regulations for the operation of electrical installations of consumers.

9.4.6.2 Work in the collector shall be conducted by at least two persons.

9.4.6.3 It is allowed to use the burners only after it is established with the help of a gas analyzer that there are no explosive gases in the collector.

9.4.6.4 All free cable channels for cable entry into the collector, as well as channels where cables are laid, shall be hermetically sealed.

9.4.6.5 Communication cables laid in collectors, through which remote power is transmitted, shall be painted with red paint along the entire circumference with a width of 20-25 cm every 100-150 m and at each coupling 15-20 cm from the last one. Signs warning of the hazard of electric shock shall be installed at the cable couplings.

9.4.7 Working in underground tunnels

9.4.7.1 Work in subway tunnels shall be conducted in accordance with Safety Regulations during the construction of subways and tunnels.

9.4.7.2 All employees of organizations that conduct work in existing subway structures are required to know:

- sections of the rules of technical operation of the metro relating to the procedure for supplying and removing voltage from the contact rail, the procedure for fencing work sites, the use of signals, closing of stages (sections) for work, instructions for signaling and movement of utility trains, fire safety rules;
- rules of personal safety for employees who are in subway tunnels.

9.4.7.3 In order to perform work in the existing metro facilities, the person responsible for the safe production of work is issued a work permit. The work permit is issued by the head of the enterprise or organization that performs work in the subway.

9.4.7.4 All work in subway tunnels shall be conducted only during the period of stress relief from the contact rail.

9.5 Installation work

Before starting the installation of the cable in the well of the cable ducting, the following safety requirements shall be met:

- install fences and warning signs,

- check the well for the absence of explosive and poisonous gases and ventilate it;
- drain the water, if available, and dry the well;
- install lighting.

When installing couplings, the greatest hazard is represented by work with the use of blowtorches, gas burners and technical hair dryers.

9.5.1 Persons who have completed a course on OSH and tested their knowledge of safety regulations are allowed to perform gas soldering work.

When performing the work, it is necessary to be guided by the requirements of the "Safety Regulations for the production of electric welding and gas flame works" of the BC RK 1.03-12-2011 .

When using a gas burner, the smell of gas shall not be felt. You can check the gas leak by applying a soap emulsion to the place of the alleged gas leak. Checking the gas leak by fire is prohibited.

When using a disposable gas cylinder, it is necessary:

- before connecting the device to the gas cylinder, make sure that the connecting gaskets are available and in good condition. Do not use the appliance if the gaskets are wet or damaged. Do not use the device if it allows gas leakage, is damaged or does not work properly;
- replace the cylinder only in the open air, keeping a safe distance from possible sources of ignition, such as an open fire, constantly switched on burners;
- in case of breakdown, do not conduct self-repair or troubleshooting.

It is prohibited during operation:

- disassemble and troubleshoot the burner and cylinder;
- leave a lit burner unattended.

9.5.2 When working with a blowtorch, it is necessary to observe:

- before igniting a blowtorch, first of all, check its serviceability; only after making sure of its suitability, you can proceed to ignition;
- it is allowed to use a blowtorch only after it is established with the help of a gas analyzer that explosive gases are absent in underground communication facilities;
- the blowtorch shall be lit outside underground structures, on the ground surface at a distance of at least two meters from them.

When working with a blowtorch, the following instructions shall be followed:

- pour kerosene or gasoline into the tank of a blowtorch no more than three-quarters of its capacity;
- wrap the filling plug by at least four turns of the thread;
- do not pour or pour fuel, do not disassemble the lamp, do not turn off the head, etc. near an open fire;
- do not ignite the blowtorch by feeding kerosene or gasoline to the burner;

- do not inflate the blowtorch excessively in order to avoid its explosion;
- do not remove the burner until the pressure drops;
- reduce the air pressure from the blowtorch tank through the filling plug only after the lamp is extinguished and its burner has completely cooled down;
- fill the lamp only with the flammable liquid for which it is intended to work.

9.5.3 When working with a technical hair dryer, the following rules shall be observed:

- there shall be no flammable liquids and objects in the workplace;
- work shall be conducted in overalls, which shall be clean, without oil and other stains formed by flammable liquids;

It is prohibited during operation:

- to block the air supply through special air intakes in the body of the hair dryer, this leads to overheating of the engine and breakage of the heating element.
- to put a hot hair dryer horizontally, you shall use special brackets for its vertical installation or hanging.
- keep the thermal gun vertically to the ground surface, but only at an angle to reduce the influence of the reflected hot air flow.
- in case of an unauthorized power outage, immediately unplug the power cord from the outlet.
- change the nozzles only in heat-resistant gloves or after turning off the hair dryer and completely cooling down the removable nozzle.
- the packing of the hair dryer shall be done only after all the elements of the tool have completely cooled down.

9.5.4 When installing the cable, the following rules shall be observed:

- when cutting an optical cable, there shall be a special box for its waste. It is impossible to allow the S to fall on the floor, the mounting table and the workwear of the installers. This can lead to injury by optical fibers to unprotected areas of the hands during other work and when cleaning the workplace.
- perform work in protective gloves;
- use safety glasses;
- waste textile rags and napkins shall be destroyed in a specially designated place, buried in the field in a designated place.

9.6 Cable measurement and testing

9.6.1 Working with measuring instruments

9.6.1.1 All work related to measurements with portable devices shall be conducted by a team consisting of at least two people, one of whom shall have an electrical safety group of at least III.

9.6.1.2 The metal housings of measuring instruments shall be grounded in accordance with the requirements of GOST 12.2.007.0-75, while grounding shall be conducted before the start of operation of the devices, and removed – after the end of operation of the devices.

9.6.1.3 The connection and disconnection of portable devices requiring the breaking of electrical circuits under voltage shall be performed when the voltage is removed.

9.6.1.4 Connection and disconnection of measuring devices that do not require a break in the primary electrical circuit is allowed under voltage, provided that wires with high electrical insulation and special tips with insulating handles are used. The size of the insulating handle shall be at least 200 mm.

9.6.1.5 Measurements with a megaohmmeter during operation are allowed to be performed by a trained employee from among the electrical personnel.

9.6.1.6 Measurement of insulation resistance with a megaohmmeter shall be conducted on disconnected current-carrying parts in which the charge is removed by pre-grounding them. Grounding from the live parts shall be removed only after connecting the megaohmmeter.

9.6.1.7 When working with a megaohmmeter, it is not allowed to touch the live parts to which it is attached. After finishing the work, the residual charge shall be removed from the live parts by grounding them for a short time.

9.6.1.8 When measuring the insulation resistance of current-carrying parts with a megaohmmeter, the connecting wires shall be connected to them using insulating holders (rods).

9.6.1.9 When operating portable measuring devices containing a laser generator, employees are prohibited from:

- visually observe the laser beam;
- direct laser radiation at a person.

9.6.1.10 On the body of a portable measuring device containing a laser generator, a sign about the hazard of laser radiation shall be placed in accordance with the current GOST.

9.6.1.11 Employees shall be trained in first aid methods in case of laser radiation damage.

9.6.1.12 When performing optical measurements, it is necessary to provide that:

- the optical source was connected last and disconnected first;
- the optical measurement circuit was closed before the power supply of the optical source was switched on.

9.6.2 Tests of insulation of wires of communication cables by voltage

9.6.2.1 Tests of the insulation of the wires of communication cables with voltage shall be conducted by a link or a team consisting of at least four people (two people on each measured section), one of whom is appointed senior for conducting tests. Persons allowed to conduct measurements of the electrical strength of the cable shall have an electrical safety group of at least IV.

9.6.2.2 For testing, devices whose housings are made of insulating material shall be used. Devices with metal housings shall be grounded. If it is impossible to provide grounding, measuring instruments made in metal cases shall be placed in wooden boxes or boxes made of other insulating materials.

9.6.2.3 For the wiring diagram (between the devices and the cable cores), flexible stranded wires with insulation for an operating voltage of at least 5 kV shall be used. Sockets of devices used for testing shall exclude the possibility of accidental contact with live parts.

9.6.2.4 Upon completion of the assembly of the electrical circuit, the equipment with connecting and measuring cords shall be tested with voltage. The test site, as well as the connecting wires that are under test voltage during measurement, shall be fenced.

9.6.2.5 To prevent the penetration of high voltage into other sections of the cable, all connections between the cable under test and other cables shall be removed.

9.6.2.6 Persons participating in measurements during tests of the electrical strength of the insulation of communication cables and located at different ends of the cable laid in the ground shall have a telephone connection that provides safe testing.

9.6.2.7 When testing the cable, the measuring personnel and equipment shall be located outside the pits (well). The ends of the cable or connected wires are output. At the same time, the possibility of contact of telephone communication wires and high-voltage wires shall be excluded. It is prohibited to switch wires, as well as to assemble a voltage test circuit.

9.6.2.8 Before each connection of the high-voltage test unit to the cable, the test head located at the end of the cable closest to the measuring equipment shall inform the test participants at the far end by telephone that a high voltage is supplied to the cable, and also prohibit any touching of the cable and terminal devices (boxes, terminal couplings, etc.) for the duration of the measurements. etc.) to avoid electric shock.

9.6.2.9 On the cable platform, the test site, the drum with the cable and the ends of the cable shall be fenced. A poster shall be posted on the fences and at the ends of the cable prepared for testing: "Test, life-threatening".

9.6.2.10 Before conducting tests on the cable installed in the reinforcement points, posters warning of the hazard of high-voltage shock shall be posted at the test sites on the introductory racks and in the boxes.

9.6.2.11 After the termination of each test, it is necessary to remove the supply voltage, discharge the capacitors and cable cores on which the tests were conducted. The removal of voltage and charges is controlled by the device. After that, a control check of the absence of charges shall be conducted by shorting the cores using a special discharge device (rod).

9.6.2.12 About the end of the tests, the removal of high voltage and charges, the senior for their conduct shall inform the test participants by phone at the far end of the measuring section.

9.6.2.13 At the end of all tests, fences and warning posters shall be removed. The posters shall be removed from the boxes of the symmetrical cable being tested after the cable cores that were not used directly during the tests are discharged. Charges are removed by short-term connection of cable cores or midpoints of linear transformers to the ground.

10 Maintenance of cable containment device under overpressure

10.1 Persons at least 18 years old who have passed a medical examination, introductory instruction, on-the-job instruction and training in safe working methods, who have passed a knowledge test on safety and health protection, who have an electrical safety group of at least group III, are allowed to service compressor and signaling installations (hereinafter - CAS).

10.2 The electrician servicing the CAS is obliged to know that the operation of the installation at a flow rate of air injected into the cable of more than 15 l / min is not allowed, since in this case sufficient dehumidification of the air does not occur.

10.3 During the maintenance of the CAS, protective measures shall be conducted:

- grounding of all metal structures of the CAS, the housing of the starting device;
- there shall be a dielectric mat on the floor near the drying and automation unit;
- in the compressor room there shall be permanently dielectric gloves, a voltage indicator, a set of tools with insulating handles;
- all maintenance and repair work conducted at the CAS shall be conducted after disconnecting the installation and removing the voltage;
- the voltage is removed by turning off the switches or starters and removing the fuses on the installation itself.

10.4 A poster "Do not turn on, people are working" is posted on the starter.

10.5 All work performed shall be reflected in the work log, indicating the name of the person who performed these works.

10.6 During the pneumatic test, measures shall be taken.

10.7 Tapping the cylinder under pressure during a pneumatic test is not allowed.

10.8 Periodically, especially after a long stop, the operation of the pressure regulator shall be checked.

10.9 When cleaning the walls of the cylinder and pistons, it is forbidden to use solid objects. Moisten the carbon with kerosene and clean off with a copper plate.

10.10 The use of gasoline for washing engines is strictly prohibited.

10.11 Periodically check the condition of the electric motor, drive belts, tightening density and fasteners.

11 Requirements for the materials used in the execution of the work

11.1 Use of gasoline B-70

11.1.1 When using gasoline B-70, the working room shall be equipped with supply and exhaust ventilation.

11.1.2 During transportation to the place of work and during work, solvents (gasoline B-70) shall be in a metal container with a tightly closed lid in the amount of the daily requirement of solvents. The container shall have an inscription about the contents in it.

11.1.3 Used textile rags soaked in solvents shall be stored in a metal container with a tightly closed lid. At the end of the work shift, the spent rags shall be destroyed in a specially designated place, agreed with the local fire supervision, or in the field, or disposed of.

11.1.4 Gasoline tanks shall be protected from static electricity.

11.1.5 When working with solvents, it is not allowed to use tools that give a spark on impact.

11.1.6 Spilled gasoline in the room shall be collected in a separate container and removed from the room. Wipe the spill site with a dry cloth or cover it with sand.

11.1.7 In the event of a fire, it is necessary to use carbon dioxide fire extinguishers for electrical equipment, and for solvents – sand, asbestos cloth, a bag.

It is forbidden to extinguish electrical equipment under voltage with a foam fire extinguisher and water.

11.2 Working with cylinders containing compressed and liquefied gases

11.2.1 The operation of pressure cylinders, their inspection, and the frequency of tests shall be conducted in accordance with the requirements of the Rules for the Device and Safe Operation of Pressure Vessels.

11.2.2 Periodic inspections of the cylinders shall be conducted at the factories filling the cylinders, or at specially organized testing points.

11.2.3 Gas cylinders can be stored both in special rooms and outdoors with protection from the effects of precipitation and sunlight.

11.2.4 It is forbidden to store oxygen cylinders and cylinders with flammable gases in the same room.

11.2.5 The exchange and refueling of the cylinder shall be conducted only at gas stations or special points.

12 Safety requirements for work on optical communication cables

12.1 Requirements when working with an optical cable

12.1.1 When working with an optical cable, it is strictly forbidden to look at the end of the fiber fiber because this can lead to irreversible damage to the retina of the eye;

12.1.2 Avoid getting scraps of optical fiber formed during the installation of connectors and splicing of fibers on clothing or skin. These scraps shall be collected in tightly closed containers or on adhesive tape. Work with fiber shall be conducted in protective glasses.

12.1.3 While working with optical fiber, eating is strictly prohibited, and after work it is necessary to wash your hands with soap.

12.1.4 It shall be borne in mind that alcohol and solvents used to remove protective coatings are flammable and burn with a colorless flame, can be toxic and cause an allergic reaction.

12.1.5 Smoking while working with optical fiber can lead to a sharp decrease in the quality of welding or the connector being manufactured.

12.1.6 Installation of the optical cable in the field shall be conducted in a mobile installation and measurement laboratory.

12.2 Requirements for the mobile laboratory premises

12.2.1 The interior of the car shall be equipped with heating for the cold season, have supply and exhaust ventilation, natural and artificial lighting (12 V from the car battery or 220 V from an external voltage source using a step-down transformer), special hatches for cable entry and couplings.

12.2.2 In the interior of the body there shall be a place for:

- desktop and chair placement;
- optical fiber welding devices;
- boxes with mounting material and tools;
- installation of a reinforced gas cylinder for the operation of a gas burner;
- primary fire extinguishing means;

- water cans;
- first aid kits;
- containers for collecting used rags;
- personal protective equipment (PPE).

These items shall be positioned and reinforced in such a way as to exclude the possibility of injury due to limited freedom of movement in the cabin.

12.2.3 There shall be supply and exhaust ventilation in the interior of the body, and directly at the workplace there shall be a local suction that removes harmful vapors and gases during operation, using a fan or an electric vacuum cleaner.

12.2.4 The fan or vacuum cleaner for suction of harmful gases and vapors shall be turned on before starting work and turned off no earlier than 5 minutes after the end of work.

12.2.5 The interior of the body shall have natural and artificial lighting.

12.2.6 When using incandescent lamps, the illumination of the desktop shall be at least 70 lux.

12.2.7 The lamps shall be explosion-proof.

12.2.8 If there is a display screen in the fiber welding device, the illumination of the screen shall not exceed 50 lux.

12.3 Requirements for the organization of workplaces

12.3.1 The organization of the workplace for installation work shall provide the safety and convenience of the work performed.

12.3.2 The design of work furniture (table, chair, footrest, etc.) shall provide its adjustment to the individual characteristics of the employee's body (height of the table, seat, angle of inclination, etc.), correspond to the height of the employee and create a comfortable working position.

12.3.3 The working table shall be 630-680 mm in height. The table top shall be equipped with a device for fixing the ends of the cable to be mounted. The size of the countertop shall be 620x100 mm.

12.3.4 The surface of the table shall be of a matte texture and not create reflected brilliance.

12.3.5 The work table shall have a space for the feet of the employee: height of at least 600 mm, width of at least 500 mm, depth of at least 600 mm.

12.3.6 The work chair shall be of a lifting and turning design that provides height adjustment of the seat and backrest. The chair shall have armrests.

12.3.7 The height of the seat surface shall be adjusted within 400-500 mm. The front edge of the seat shall be rounded. The chair seat shall be easily cleaned of dirt.

The back and seat of the chair shall be covered with semi-soft non-electrifying breathable materials.

12.3.8 The workplace shall be equipped with a footrest with a depth and length equal to 400 mm and having a rim along the front edge with a height of 10 mm.

12.3.9 When cutting an optical cable, there shall be a special box for its waste. It is impossible to allow waste (fragments) of optical fibers to fall on the floor, the mounting table and work clothes, which can lead to injury by optical fibers to unprotected areas of the installer's skin. It is necessary to have a set of special wipes for removing the hydrophobic filler and wiping the optical fiber.

12.3.10 Work with optical fiber shall be done in an oilcloth apron.

12.3.11 The mounting table and the floor in the cabin shall be vacuumed after each shift and then wiped with a wet cloth. The wringing of the rag shall be done in tight rubber gloves.

12.4 Optical Fiber Welding

12.4.1 Portable optical fiber welding kits, regardless of their types, modifications, manufacturers, shall be operated in accordance with the technical documentation for them.

12.4.2 It is forbidden to use devices for welding fiber-optic cables that do not have a passport for the device, operating instructions and a safety certificate.

12.4.3 The sign of the electrical voltage according to GOST 12.4.026 shall be applied on the protective cover of the optical fiber attachment and movement unit.

12.4.4 The device shall have an indication of the power supply voltage and an indication of the high voltage supply.

12.4.5 The device shall be equipped with a high voltage supply lock to the electrodes when the node cover is open during the installation of the optical fiber. The operation of the high voltage lock shall be accompanied by a light indication.

12.4.6 It is forbidden to operate the device with the protective cover of the electrode block removed.

12.4.7 If it is necessary to observe welding, the employee is obliged to use protective glasses according to GOST 12.4.013. It is forbidden to look at the end of the optical fiber to exclude burns from laser radiation.

12.4.8 When welding in a mobile laboratory, all electrical consumers (welding machines of various types, reflectometers, optical testers, etc.) can be powered from an on-board 12 V network or an external 220 V network or from a gasoline power plant.

The connection is conducted using a set of cords, which shall be in good condition (do not have breaks, exposed from the insulation of places).

12.4.9 Before proceeding with the inspection or inspection of the optical fiber or optical connector, it is necessary to make sure that the optical source is turned off (this shall be confirmed by using an optical power meter).

12.4.10 It is not allowed to connect the output of the optical source to the line until the far end of it is closed.

12.4.11 It is not allowed to use magnifying glasses as a means to inspect any part of the optical fiber or optical connector. A special microscope shall be used to inspect the end of the fiber.

12.4.12 When working with a device for welding optical fibers, the following requirements shall be observed:

- all connections and disconnections of devices requiring disconnection of electrical circuits or connection to high-voltage circuits of the device shall be made with complete voltage removal;
- ground the device housing;
- during commissioning, it shall be remembered that the transformer, high-voltage wires, electrodes are under high voltage in welding mode;
- at least once a week to check the serviceability of the insulation of high-voltage wires. It is forbidden to work on the device if the insulation of high-voltage wires is damaged;
- to observe welding, the employee is obliged to use safety glasses;
- it is forbidden to operate the device with the protective cover of the electrode block removed.

Annex A
(compulsory)

Logbook for the recording and maintenance of protective equipment

(name of protective equipment, type)

Inv .No.	Test date	Date of the next test	Date of periodic inspection	The result of periodic inspection	Signature of the person who performed the inspection	Location	Date of issue for individual use	Signature of the person who received the PPE for individual use	Note
1	2	3	4	5	6	7	8	9	10

Note - when issuing test reports to third-party organizations, the protocol number is indicated in the "Notes" column.

Annex B
(compulsory)

Standards and time limits for in-service testing of protective equipment

Name of the means of protection	Voltage of electrical installations, kV	Test voltage	Test duration, min	Current flowing through the product, mA, no more	Frequency of tests
1	2	3	4	5	6
Voltage indicators up to 1000 V: -indication voltage circuit health check:	Up to 1 Up to 1	Not above 0,09	-	-	1 time in 12 months
single-pole pointers	Up to 1	At least 1, 1 maximum permissible operating voltage	1	0.6	
two-pole pointers		At least 1, 1 maximum permissible operating voltage	1	10	
insulating part	Up to 0.5	1 2	1 1	-	

	St. 0, 5 to 1		1	-	
Dielectric rubber gloves	All voltages	6	1	6	1 time in 6 months
Dielectric boots	All voltages	15	1	7.5	1 time in 36 months
Dielectric galoshes	Up to 1	3, 5	1	2	1 time in 12 months
Insulating pads: Tough	Up to 0.5	1	1	-	1 time in 24 months
	St. 0, 5 to 1	2	1	-	
Rubber	Up to 0.5	1	1	6	
	St. 0, 5 to 1	2	1	6	
Flexible insulating pads	Up to 1	6	1	-	1 time in 12 months

Notes

- 1 All protective equipment shall be inspected before use, regardless of the timing of periodic inspections.
- 2 Dielectric carpets in operation are inspected 1 time in 6 months.

NORMS AND TERMS OF OPERATIONAL MECHANICAL TESTS OF PROTECTIVE EQUIPMENT

Name of the means of protection	Static load testing	Test duration, min	Load, N (kGf)	Frequency of tests
Safety belts and safety ropes	On the break	5	4000 (400)	once every 6 months
Mounting claws and clawed gaiters			1350 (135)	once every 6 months