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ВОЄННІ НАУКИ, НАЦІОНАЛЬНА БЕЗПЕКА ТА БЕЗПЕКА ДЕРЖАВНОГО КОРДОНУ

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ПОЖЕЖНА ТА ЦИВІЛЬНА БЕЗПЕКА

ARTICLE

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PROTECTION MEASURES IN POWER ENTERPRISES AND OPERATING ELECTRICAL INSTALLATIONS

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Summary. *The article proves the use of the necessary protection measures at power plant and describes electrical safety requirements and labour protection instructions, that are needed on power enterprises.*

Keywords: *power enterprises, protection measures, operating electrical installations*

The use of the necessary protection measures at power plants and operating electrical installations to prevent electric shock to personnel is considered. Each organization must monitor compliance with electrical safety requirements and labour protection instructions and control the conduct of electrical safety briefings.

Ensuring the safety of maintenance personnel is an essential condition for working with electrical equipment and equipment. The employer is obliged to ensure the operability of electrical installations, reliability of operation and safety of operation, maintenance, labor protection of electrical and electrotechnical personnel.

Systematization, improvement and appropriate use of all modern measures to protect personnel when working at power plants and operating electrical installations helps prevent accidents and electric shock to personnel.

Human contact with a current of more than 50mA is dangerous to life and health. If an electric shock occurs, it is necessary to disconnect the power supply from the network as soon as possible. To prevent such an emergency situation, it is recommended to periodically carry out preventive protective measures [1].

There are basic requirements to prevent accidents from electric shock:

– inaccessibility to live parts of electrical equipment;

– mandatory insulation in one or two layers;

– housings of electrical equipment and power plants must be grounded and must have a zero phase;

– provision of reliable and high-speed circuit breakers and protective shutdown devices;

– creation of low voltage lines (from 42 V and below) for electric power supply of mobile current collectors;

– installation of blocking devices, warning alarms, provision of electrical equipment with protective inscriptions and warning posters;

– provision of protective devices and personal protective equipment;

– timely carrying out of scheduled technical inspections and preventive repairs of operational electrical equipment, networks and installations;

– organization of special training for personnel on technical safety, scheduled certification of workplaces, exams for the right to obtain work permits for objects of increased hazard category [2].

To exclude unforeseen or indirect contact of service personnel with current-carrying parts, it is necessary to provide basic protection measures against electric shock. Namely:

– it is mandatory to have solid insulation that prevents direct contact with exposed elements of electrical conductors;

– limit the access barrier for unauthorized persons to electrical equipment and electrical installations;

– to exclude physical contact during inspection, it is necessary to install current-carrying parts at a considerable distance from each other;

– use for lighting power electrical installations of lighting devices operating at low voltage from 12 to 36 W. This voltage is also needed to power the drive. For this, step-down transformers with a grounded secondary winding are used [3].

The main protective measures against possible electric shock are divided into three groups:

– organizational measures;
– technical measures;
– use of personal protective equipment.

An important component of protection measures is organizational work, which includes:

1. Selection of qualified service personnel for the maintenance of electrical installations and power equipment. It is forbidden to use untrained persons and persons who have not passed the mandatory medical examination, allowing admission to electrical work with an increased hazard category. Persons under the age of majority are not allowed to work.
2. Conducting timely briefings on work safety, special technical training for working in conditions of increased electrical danger, preparing and passing exams on labor protection when working with electrical installations.
3. Conducting introductory and visual briefings on priority actions in case of electric shock.
4. Appointment of persons responsible for electrical safety.
5. Maintenance of special daily logs to control the operation of electrical equipment and power plants.
6. Periodic inspections, measurements and tests of electrical equipment.

Technical protection measures include:

– mandatory use of grounding circuits and zeroing of electrical installations;
– mandatory use of device protectors in the form of fuses, protection relays and other means that protect electrical installations and equipment at the time of peak loads and short-circuit currents;
– installation of electrical equipment in inaccessible places (at a height of more than 2 meters) and the use of protective barriers that prevent contact of live parts with people and animals;
– additional insulation of electrical equipment from the housings of working devices and electrical machines.

The installation of dielectric work platforms and special insulating platforms are also technical protective measures. Means of protection against electric shock are divided into basic individual, additional and auxiliary. The main means of protection have special insulation and are used for prolonged contact of a person with current-carrying parts of electrical equipment with operating voltage, namely:

– for work with voltage up to 1000 V – special dielectric gloves, insulating rods, repair tool with handles covered with insulation;
– special voltage detectors.

The use of protective equipment with insulation does not exclude electric shock to a person [4].

Additional protective equipment is designed to reinforce the main insulating elements. For work in electrical installations up to 1000 V, special dielectric spikes, kovbiks, platforms and stands are used. Above 1000 V – dielectric protective boots, stand clerics, gloves.

If at least one component of additional personal protection is missing during repair or maintenance work in the area of operating electrical installations or equipment, then the use of fixed assets is prohibited. Auxiliary protective equipment includes: safety belts, ropes, claws, goggles, gloves, cloth suits, etc.

Grounding is an important safety feature. In electrical installations above 1000V, the current-carrying parts of all phases (poles) of the section disconnected for work from all sides, from where voltage can be supplied, must be grounded, with the exception of busbars disconnected for operation, on which it is enough to install one grounding. Portable grounding must first be connected to a grounding device. After checking the absence of voltage, install on live parts. Remove portable grounding in reverse order. All work must be carried out in dielectric gloves using an insulating rod. For grounding, use conductors that are designed for this purpose.

Conclusion. The main measures of protection against electric shock are aimed at creating safe conditions for a person when working with existing and operated electrical machines, installations and equipment. When working on electrical equipment, specific requirements for the safety of operating personnel must be observed. The main protection against electric shock is the knowledge that everyone who deals with various kinds of electrical equipment should have. It is necessary to be able to use this knowledge in ordinary and complex situations.

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