

PUBLIC COMPANY ORLEN LIETUVA

APPROVED BY:

Deputy General Director for Operations

13 June 2023

Order No TV1(1.2-1)-0256

OPERATING PROCEDURE FOR ELECTRICAL MECHANISMS, MANUALLY OPERATED ELECTRICAL EQUIPMENT AND TOOLS, DOMESTIC ELECTRIC APPLIANCES AND PORTABLE LIGHTS BE-2

I. PURPOSE

1. The purpose of Operating Procedure for Electrical Mechanisms, Manually Operated Electrical Equipment and Tools, Domestic Electric Appliances and Portable Lights BE-2 (hereinafter, the Procedure) is to establish safety requirements for the operation of electrical mechanisms, manually operated electrical equipment and tools, domestic electric appliances and portable lights at Public Company ORLEN Lietuva (hereinafter, the Company).

II. SCOPE OF APPLICATION

2. This Procedure shall apply to all employees of the Company as well as employees of contractors outsourced by the Company who perform works within the territory of the Company using electrical mechanisms, manually operated electrical equipment and tools, domestic electric equipment and portable lights.

III. REFERENCES

3. Electrical Equipment Operation Safety Regulations approved by the Minister of Energy of the Republic of Lithuania.

4. Regulations on Installation of Electrical Equipment for Special Purpose Premises and Technological Processes approved by the Minister of Energy of the Republic of Lithuania.

5. Rules for Installation of Electrical Lighting Equipment approved by the Minister of Energy of the Republic of Lithuania.

6. ORLEN Lietuva Occupational Health and Safety Procedure BDS-7 'Hot Works' (hereinafter, BDS-7).

7. ORLEN Lietuva Procedure for Temporary Powering of Electrical Equipment BE-16 (hereinafter, BE-16).

8. ORLEN Lietuva Occupational Health and Safety Procedure BDS-4 (hereinafter, BDS-4).

9. Technical Standard ST S7 T7 - Use of mobile electric power supply equipment: building switchboards, electrical extension cords, generating sets issued by ORLEN S.A. Department of OHS and Prevention Coordination in Capital Group, 31 March 2022.

10. Specification for plugs and socket-outlets for domestic and similar purpose IECIEE CEE-7:1963.


11. Plugs and socket-outlets for household and similar purposes - Part 1: General requirements IEC 60884-1:2022.

IV. TERMS AND DEFINITIONS

Neutral connection – connection between conductive housing or any other structural element and grounded neutral conductor of power supply network.

Protective earthing – connection between conductive housing or any other structural element and ground conductor.

Chemically or organically aggressive environment – premises where chemically aggressive vapors, gas or liquids are present either continuously or often or where sediments, mold which may destroy the insulation and conductive parts of electrical equipment form.

Double insulation – insulation comprising both basic insulation and supplementary insulation. Double insulation is marked with symbol .

Electrical specialist – employee who has either adequate electrical engineering degree or has attended appropriate training and has been certified under applicable certification procedure and holds an appropriate certificate. The meaning of electrical specialist excludes any other persons referred to herein.

Electrical equipment – for the purposes of this Procedure, the entirety of electrical equipment, including electrical mechanisms, manually operated electrical equipment and tools, domestic electric appliances and portable lights.

Power cables H07RN-F – cables used to transmit electricity in aggressive environment. These cables are resistant to mechanical loads, humidity and water. Rubber insulation gives good water isolation and flexibility of the cable. H07RN-F cables are designed to supply electricity to various electrical equipment, including submersible. They are also used to connect electric domestic appliances or industrial devices to power network.

Generator – a stand-alone power generation unit with internal combustion engine.

Extension cord – flexible multi-wired insulated power cable fitted with a plug which is designed to extend an existing power cord so it can reach the power source and, in addition, to increase the number of sockets.

Tool – means of work (usually hand-held).

Portable light – light used to illuminate the workplace, movable staying connected to a power source and fitted with special supports or stands to place on stable surface and is not hand-held. Glass parts of lights must be protected against mechanical damage or accidental touch.

Highly hazardous premises – wet premises or premises with chemically and organically aggressive environment, or premises that have two or more features of hazardous premises.

Normal (non-hazardous) premises – dry, non-dusty environment with low chemical/organic activity and the temperature up to +35°C.

Basic insulation – insulation applied to live (conductive) parts to provide basic protection against electric shock.

Supplementary insulation – independent insulation applied in addition to basic insulation in order to ensure protection against electric shock in the event of a failure of the basic insulation.

Hazardous premises – premises where relative air humidity exceeds 75% or where conductive dust or conductive flooring (metal, reinforced steel, bricks, soil, etc.) is present or where average daily air temperature is above +35°C or where the risk to touch simultaneously conductive non-grounded parts of electrical equipment and conductive structures with ground contact exists.

Potentially explosive atmosphere – environment which may become explosive due to certain properties of the environment or operations performed therein (for instance, process unit ISBL areas, OSBL piping, petroleum product storage areas, etc.).

Manually operated electrical equipment and tools – manual tools equipped with electric drives or actuated by electric power source in any other way.

Hand-held light – light fitted with insulated handle and used for temporary illumination of workplace. When in use, is hand-held or fixed in the workplace by means (for instance, hooks or clips) provided by manufacturer.

Differential current protection – device that disconnects the circuit when differential current exceeds the set trip value.

Reinforced insulation – a single insulation system for live parts which provides a degree of protection against electric shock equivalent to double insulation.

Wet premises – premises where relative air humidity is 90 to 100% and where ceiling, walls, flooring and stored objects/things become dewy.

V. GENERAL REQUIREMENTS

12. Electrical equipment must comply with legal regulations of the European Union (hereinafter, EU) and of the Republic of Lithuania, have EU declaration of conformity, operation manual and have mandatory parameters such as the manufacturer, serial number, power network parameters, CE marking, type of insulation indicated on the body in Lithuanian (or English).

13. If electrical equipment is used in potentially explosive atmosphere, the requirements of legal acts and operating procedures regulating the performance of work in the potentially explosive atmospheres must be observed.

14. Electrical equipment of contractors shall be connected to the power network of the Company in accordance with the requirements stipulated in the Procedure for Temporary Powering of Electrical Equipment BE-16.

15. Classification of electrical equipment according to protection against electric shock:

Class 0 – electrical equipment in which protection against electric shock relies on basic insulation only. Equipment that has no protective-earth connection falls under Class 0;

Class 0I – electrical equipment that has basic protection against electric shock and is provided with an earthing terminal. Has a power supply cord that has a plug not equipped with an earthing contact;

Class I – electrical equipment in which protection against electric shock does not rely on basic protection only, but which have their metal enclosure connected to a protective conductor in the fixed wiring of the installation. They have a power supply cord with a plug that is equipped with an earthing contact;

Class II – electrical equipment in which protection against electric shock relies on double or reinforced insulation;

Class III – electrical equipment in which protection against electric shock relies on supply at separated low-voltage (SELV) and in which voltages higher than 50 V of AC or 75 V of DC are not generated.

16. Switches installed on electrical equipment must be of good condition.

17. It is prohibited to operate switches hanging on the connecting wires.

18. Electrical equipment must have reliable switch into on/off position without self-switching, comply with applicable safety rules and norms, and be without any exposed live parts.

19. The design of plug connections used for power sources of up to 50 V must be different from plug connections designed for higher voltages. They must have the level of voltage indicated on them. Plugs for up to 50 V should not be compatible with higher voltage power sockets.

20. 230 V power network sockets and plugs must meet the requirements of applicable standards (Par. 10, 11).

21. Electrical equipment must be used in accordance with this Procedure and manufacturer user manuals.

22. Insulation resistance of electrical mechanisms, manually operated electrical equipment, tools, portable lights, grounding transformers, windings of frequency converters, differential current protections, power cables and wires shall be tested and operation of differential current protection shall be checked once a year at least.

23. Manually operated electrical equipment and tools must have tags attached to them with inventory or ID number and upcoming inspection date. Reducing and isolating transformers, frequency converters and differential current protection must have tags with inventory or ID number, upcoming insulation resistance test or inspection date. Specimen tag is provided in Annex 5 to Procedure BDS-4.

24. Users of electrical mechanisms, manually operated electrical equipment and tools, portable lights, reducing transformers and frequency converters are responsible for their timely presentation for inspection.

25. Casings of frequency converters and isolating & reducing transformers must be always grounded. The secondary winding of reducing transformer shall also be grounded. Grounding of isolating transformers and frequency converters with separated windings is prohibited.

26. It is prohibited to pull the cable to remove the plug from a socket. The plug must be removed holding the socket with one hand and pulling the plug.

27. Differential current protection for electrical equipment power supply circuits is mandatory, for electrical equipment used in normal (non-hazardous) premises is recommended.

28. Live power sockets must be tight, with casing intact and wires unexposed.

VI. TEMPORARY MAINTENANCE POWER PANEL

29. Temporary maintenance power panels and welding stations (hereinafter, LPP) are fixed, attached to walls, columns, supports or other supporting structures in places where maintenance works are most frequent. Normally, LPP stays disconnected from voltage and it is connected only after proceedings described in Procedure BE-16 are completed.

30. LPP must be closed and protected against unauthorized access.

31. LPP maintenance, repair and other actions related to operation of LPP may be performed by the Company's electrical specialists only.

32. Access to LPP cabinets and electrical installations is allowed to the Company's electrical specialists only.

VII. EXTENSIONS, EXTENSION CORDS

33. Requirements for extensions used in the Company (except for non-hazardous premises) for temporary connection of electrical equipment and tools to power source at construction or maintenance sites:

33.1. Nominal characteristics on the manufacturer's data plate must be clearly readable;

33.2. Manufacturer part number (MPN) or inventory number must be clearly indicated;

33.3. Extension must have thermal overload protection or overcurrent protection;

33.4. During transportation, extension cable must be wound on a reel, and during use completely unwound to avoid overheating;

33.5. The users of extension cords must ensure that an aggregate rated power (currents) of all power users connected to the extension at the same time does not exceed the rated power (current) of the extension indicated on the data plate;

33.6. The level of protection of enclosure of the entire length of extension must be IP44 at least, all power sockets must have the self-closing lids.

34. Single-phase and three-phase extensions used for distribution of electricity at construction/maintenance sites must be resistant to mechanical impact (friction, abrasion) and water, H07 RN–F or equivalent.

35. It is prohibited to use domestic extension cords at construction/maintenance sites.

36. It is prohibited to use extensions (or distributors) without protective conductors (PE) at construction/maintenance sites.

37. Extension cords connecting LPP and temporary fixed LPP installed by contractor may be of types other than specified in Par. 36 (e.g., H07VV–F). As regards protection against impact and cable laying, the same requirements as those applicable to the extensions shall apply.

VIII. GENERATORS

38. Usually, temporary generators are used when power supply from network is not available, e.g. at construction sites far from power supply lines where electrification of the site is unreasonably costly or is unreasonable from technical point of view.

39. Temporary generators may be used:

39.1. As power source for electrical equipment not connected to distribution network (e.g., where access to distribution network is not available);

39.2. As power source for certain portable instruments, devices or equipment not connected to the system;

39.3. As a power source for amenity premises before connection of power supply from power network at construction site.

40. Generator must be operated in accordance with the manufacturer's manual prepared in language of the user and distributed to the staff for use. Manual must include instructions for installation, operation and maintenance of generator and description of grounding techniques.

41. Filling and operation of generator involves fuel (gasoline, diesel) which poses potential fire hazard. To prevent the spills, appropriate funnel must be used to refuel the generator. Before refueling, generator must be switched off and its body must cool down.

42. For indoor applications, removal of exhaust gas from the premises must be ensured. The worksite must be arranged so that exhaust gas from internal combustion engine does not reach the worksite and does not pose threat to people.

43. During refueling, open flame, smoking and any other activities which generate sparks are prohibited.

44. Electrical equipment may be connected, repaired, inspected, serviced and maintained by duly authorized electrical specialist only.

45. All electrical equipment shall have protection rating IP44 at least.

IX. ELECTRICAL MECHANISMS, MANUALLY OPERATED ELECTRICAL EQUIPMENT AND TOOLS

46. It is prohibited to use manually operated electrical equipment and tools of Class 0 and 0I in highly hazardous, hazardous premises and outdoor environments.

47. Only Class I, II and III equipment and tools may be used in hazardous premises.

48. Class I, II and III equipment and tools may be used in highly hazardous premises or outdoor environments only if they are connected to isolating transformers, frequency converters and differential current protection.

49. It is prohibited to take isolating transformers, frequency converters or residual current protective devices inside metal vessels, tanks and highly hazardous premises.

50. It is allowed to connect only one piece of equipment or single tool to isolating transformer, frequency converter or residual current protective device.

51. It is prohibited to connect 50 V power equipment and tools to the common power grid using an autotransformer.

52. Before use of any electrical equipment, employees must be trained and briefed on operation safety.

53. When electrical mechanisms, manually operated electrical equipment and tools are not used (e.g. during work breaks or in case of power supply interruptions), they must be disconnected from power supply.

54. Before each use of electrical mechanisms, manually operated electrical equipment and tools, the following must be checked:

- 54.1. if voltage and frequency are compatible with power network parameters;
- 54.2. if drills, abrasive discs and other bits of work tools are securely fixed in place;
- 54.3. if cables and plugs are visually in good technical condition;
- 54.4. if grounding is in good integral condition;
- 54.5. if the switch works properly – switches on/off the electrical tool;
- 54.6. if operates properly at idle run without vibration or abnormal noise and sparks.

55. Electrical cables must be of sufficient length to prevent stretching and to prevent the wiring contacts of the plug from getting loose.

56. Electrical mechanisms, manually operated electrical equipment and tools connected to power network shall never be left unattended on the scaffolding, supports or hanged on ladders.

57. When using electrical mechanisms, electrical equipment and tools, it is important to make sure that drill bits, milling cutters and other parts do not bend during operation.

58. When electrical mechanisms, electrical equipment and tools are used on scaffolds, the scaffolding must be grounded.

59. While working with electrical mechanisms, manually operated electrical equipment and tools, it is forbidden to:

59.1. Measure the workpiece before the mechanism is switched off and comes to a full stop;

59.2. Remove drill shavings and sawdust, lubricate before the mechanism is switched off and comes to a full stop;

59.3. Adjust or replace any bits before the mechanism is switched off and comes to a full stop;

59.4. Stop rotating parts of tools by hand or using other means not dedicated for this purpose;

59.5. Carry equipment by its power cord;

59.6. Operate electrical equipment under rain or snow;

59.7. Repair electrical equipment and tools, their cables or cords;

59.8. Work on a lean-to ladders;

59.9. Leave equipment connected to power network unattended;

59.10. Pull, bend or twist cables, place any loads on them, to allow the cables to intersect with ropes, other cables, gas welding hoses, etc.

60. It is forbidden to operate electrical mechanisms, manually operated electrical equipment or tools if:

60.1. Plug, cable or its protective conduit is damaged;

60.2. Brush holder cover is damaged;

60.3. Switch is faulty;

60.4. Collector brushes start sparking and a fire ring appears on their surface;

60.5. Lubricant leaks from a reducer;

60.6. Smoke or smell of burning insulation appears;

60.7. Abnormal noise and vibration occur;

60.8. Cracks appear on the body of the tool;

60.9. Equipment has not been tested.

61. If any mechanical defects are noticed, manually operated electrical equipment or tools must be disconnected from power supply and defects must be immediately reported to the immediate superior.

62. After work which involved the use of electrical mechanism, manually operated electrical equipment or tool is completed:

62.1. Disconnect from power supply;

62.2. Put work site into order;

62.3. Clean from dirt, grease and dust and wipe parts sensitive to corrosion with oiled cloth;

62.4. Wipe wires or cable with dry cloth and wind up.

X. PORTABLE LIGHTS

63. Portable lights must not have live parts exposed to contact; light bulbs must have safety covers made from glass, metal grid or mesh.

64. Cable and wire jacket ends must be securely fixed inside the light and plug connections.

65. Portable lights used in highly hazardous and hazardous premises shall be max. 50 V and those used in potentially explosive atmospheres max. 12 V.

66. It is permitted to use transformers, generators, converters and capacitors as a source of power for portable lights. Use of autotransformers for this purpose is forbidden.

67. Portable lights shall be connected to the power network by plugs. 12V and 50 V plugs or sockets must be of different design and be incompatible with 127V and/or 220/230/380/400 V plugs and sockets.

68. Portable lights must be visually inspected prior to start of work. In case of any damage or failure (damaged cable insulation, naked cable cores, cable jacket not securely fixed inside the light or plug, damaged integrity, etc.), use of the lights is forbidden.

XI. DOMESTIC ELECTRICAL APPLIANCES

69. Before using any domestic electrical appliance, the users must read user manual provided by manufacturer.

70. Before connection to power supply, it is important to check the appliance and cable insulation for visible mechanical defects and damage such as cuts, cracks, signs of burning, etc.

71. Domestic electrical appliances may be connected to the general-purpose sockets (designed for domestic appliances) which are marked in the Company with letters 'BKL'.

72. Sockets for computers are marked with letters 'KKL'. These sockets may be used for computers and monitors only. It is forbidden to use them for any other electrical appliances. In certain facilities, in addition to marking with letters 'KKL' the casings of these sockets may be red.

73. The appliance must be immediately disconnected from power supply and taken from service if the appliance, power cable or socket become hot, abnormal noise is heard, etc.

74. Appliance must be disconnected from power supply when it is cleaned, washed and when not in use.

XII. MANUAL ARC WELDING MACHINES

75. Manual arc welding machines shall be subject to the following minimum requirements:

75.1. Nominal characteristics shown on the data plate must be clearly readable;

75.2. Manufacturer part number (MPN) or inventory number must be clearly indicated;

75.3. Voltage at idle must not exceed 50V AC and 75V DC;

75.4. Flexible welding cables coated with flame resistant insulation shall be used as connection between the welding current source and the electrode holder;

75.5. Cable segment of at least 3 meters from the electrode holder must be intact without any signs of repair or insulation defects.

76. It is prohibited to use self-made electrode holders and welding machines.

77. It is prohibited to use grounding for the extension of welding cable.

XIII. SAFETY REQUIREMENTS

78. For work in confined spaces, tight metal tanks, wells/manholes and in other places where employee works in inconvenient posture, gets in contact with conductive surfaces (steel, reinforced concrete, wet, etc.), hand-held lights of max. 12V shall be used.

79. For outdoor applications and works in the vicinity of large open structures, metal vessels and installations (heaters, boilers, towers etc.) that are in direct contact with the ground the following shall be used:

79.1. Hand-held lights, max. 12V;

79.2. Class I & II 230 V portable lights that are attached to stands at the max height of 2.5 m or are made stationary (lights are secured to various structures by fastening devices that can be disengaged only using special tools and the power supply cable is securely fixed and protected against mechanical damage) and which are used with differential current protection devices with operating current set at $\Delta I \leq 30$ mA or which are connected to isolating transformers. The conductive parts of Class I lights must be grounded.

80. For the connection of hand-held and portable lights in metal vessels and facilities (heaters, boilers, towers, etc.) it is important to use cables, extension cords and differential current devices that are not intended for other power users, i.e. the lights cannot be connected to the same cables and differential current devices that are used to supply power to the electrical equipment.

81. Power users (lights, electrical equipment, extension cords, etc.) that are connected directly to the power installations of the Company via fixed or portable 230V plug sockets (compliant with standard referred in Par. 11) must have 10/16 A plugs and elastic copper core with a cross-sectional area of at least 1.5 mm².

82. Cables must enter confined spaces, vessels, tanks and process units through openings other than those used by the workers to enter. If such openings are not available, additional protections (conduits, additional cable fasteners at the top of opening, warning posters, etc.) must be used to avoid any cable damage. Cable must be always protected against damage (wedging, hampering, etc.) which may be caused in contact with edges of the opening.

83. Electrical equipment, portable lights, portable power distribution boxes, cables and extension cords must be inspected, tested and appropriately tagged. The tag shall bear the date of next inspection and inventory number or MPN.

84. All electrical equipment power supply cables, including the extensions, must have undamaged basic insulation and supplementary insulation.

85. Portable lights, portable power distribution boxes, cables and extension cords must have tags with the specified name of user (company) and contact phone number.

86. In case of equipment failure or if the user sustains any level of electric shock, work must be immediately be terminated and accident reported to the immediate superior.

87. If electrical equipment, hand-held or portable lights switch off upon actuation of the residual current device (overload, differential current protection, etc.) it is not permitted to switch on and operate them for until the cause of trip is identified and eliminated by a qualified electrical specialist (from either the Company or contractor, whoever is the owner of the tripped device).

Residual current devices in the power facilities of the Company may be switched on by electrical specialists of the Company only. Electrical specialists or other staff of contractors are not authorized to do so.

88. Company's electrical specialist can be contacted by tel.: 07, 2311 (land-line) and +370 443 92311 or phone number indicated on the power distribution panel used to supply power to contractor's electrical equipment.

89. In potentially explosive atmospheres it is required to use only special lights, electrical equipment and tools designed for explosive zones, otherwise it is required to obtain hot work permit as prescribed by the Company's OHS Procedure BDS-7 'Hot Works'.

90. Contractor must always ensure that cables running from the Company's power distribution box to the workplace are properly secured to available structures and do not block pathways and roads and are protected against any possible mechanical damage. Cables must be elevated to the height of at least 2.5 meters above pathways and at least 5 meters above roads.

91. Before use, the extension must be visually inspected, including the condition of plug and sockets and the integrity of insulation. Any identified damages of extension must be immediately reported to direct superior and damaged extension must be taken out of service and replaced with the new one.

92. Damaged extensions may be repaired by qualified electrical specialist only. Depending on the assessed condition of extension, it may be thoroughly repaired fully restoring its electrical, technical and mechanical properties.

93. It is forbidden to repair damages areas of extension with insulating tape as it does not ensure necessary protection against the electric shock and water.

94. Extensions must be laid so as to prevent the risk of tripping.

95. Extensions on passage ways (e.g. stairs) must be laid close to the walls and fixed to prevent dislocation.

96. Extensions on roads and driveways must be protected against mechanical damage, i.e. must be suspended or covered with trays of appropriate resistance or inserted into conduits of appropriate resistance. Conduit, tray or other protective structure must be prevented against dislocation and deformation when exposed to traffic.

97. Connection wires and cables of electrical equipment must be protected against accidental mechanical damage. Wires and cables should never come into direct contact with hot, wet or oily surfaces and sharp edges.

98. When laying cables or extensions, their direct contact with the ground surface must be avoided (supports, civil structures must be used).

99. Electric welding may be performed only by duly trained and certified persons (primary electric protection category required).

XIV. LIABILITY

100. Violators of the requirements set forth herein shall bear liability imposed by applicable regulations of the Republic of Lithuania and the Company.

XV. FINAL PROVISIONS

101. Responsibility for periodic review and, if needed, updating of this Procedure shall lie with the Director of Maintenance of the Company.

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