

APPROVED BY  
Public Company ORLEN Lietuva  
**Deputy General Director for Operations**  
Order No. TV1(1.2-1)-27 of 9 February 2012

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

**Revision 3**

## I. PURPOSE

1. The purpose of this Operating Procedure is to establish safety requirements for the use of electrified mechanisms, manually operated electrical equipment and tools, domestic electric appliances and portable lights (hereinafter electric equipment) in Public Company ORLEN Lietuva (hereinafter the Company).

## II. SCOPE OF APPLICATION

2. This Operating Procedure shall be followed by all employees of the Company as well as by employees of other organizations under relevant contracts concluded between the Company and such organizations performing works in the territory of the Company and using any electrical equipment referred to therein.

## III. REFERENCES

3. *Regulations of the Safe Use of Electrical Equipment* approved by 30 March 2010 Order No. 1-100 of the Minister of Energy of the Republic of Lithuania.

4. *Rules for the Installation of Special Purpose Premises and Operating Process Electrical Equipment* approved by Order No. 4-140/D1-232 as of 29 April 2004 of the Minister of Economy and Minister of Environment of the Republic of Lithuania;

5. *Procedure for Organizing and Performing Hot Works BDS-7*, approved by Order No. 180 as of 22 November 2004 by AB Mažeikių Nafta Deputy General Director of Process Engineering and Capital Integration.

6. *Rules for the Installation of Lighting Electrical Equipment*, approved by Order No. 1-28 as of 3 February 2011 of the Minister of Energy of the Republic of Lithuania;

7. *Procedure for Temporary Powering of Electrical Equipment*, approved by Order No. TV1 (1.2-1)-19 as of 30 January 2012 by AB ORLEN Lietuva Deputy General Director for Operations.

## IV. ABBREVIATIONS, TERMS AND DEFINITIONS

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

**9. 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.

**10. Double insulation** – insulation comprising both basic insulation and supplementary insulation. Symbol □ is used to mark double insulation.

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

**12. Protective earthing** – electrical connection between conductive shells or any other structural elements and ground conductor.

**13. Neutral connection** – electrical connection between conductive shells or any other structural elements and grounded neutral conductor.

**14. Electrical specialists** – employees that have either adequate electrical engineering degree or attended appropriate training/probation sessions and have been certified and issued appropriate certificates under applicable certification procedures. Any other persons referred to in this procedure are not electrical specialists.

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

**16. Hand lights** – lights that are used for temporary illumination of workplaces and have insulated handles. They can be either held in hands or fixed anywhere in the workplace by means (for instance, hooks or clips) provided by lights manufacturer.



Fig.1. Hand lights

**17. Portable worklights** – lights that are used for the illumination of workplaces and can be moved from location to another while being connected to a power source. They have special supports or stands for placing them on a stable surface and they should not be held in hands during work operations. The parts of the worklights made from glass must be protected against mechanical damage or accidental touching (see Figures 2 and 3).



Fig. 2 Portable worklights



Fig. 3 Portable worklight with a telescoping tripod stand, 2.5 m high

18. **Differential current protection device** - device that disconnects a current circuit flowing through its differential element whenever the current exceeds the set trip value.

19. **Tool** – a means of work (usually held in hand).

20. **PK/VK** – primary/medium category of electric protection.

21. **Extremely hazardous premises** - wet premises or premises characterized by chemically and organically aggressive environments, or premises that exhibit two or more hazardous characteristics.

22. **Hazardous premises** – premises in which the relative air humidity exceeds 75 % or which contain conductive dust or conductive flooring (metal, reinforced steel, bricks, soil etc.) or in which the average daily air temperature is above +35°C or there is the possibility of simultaneous touches on the one hand to conductive corps of electrical equipment and the other hand to the structures, having a good ground contact.

23. **Wet premises** – premises in which the relative air humidity is 90 to 100% and in which the ceiling, walls, flooring and any stored objects/things become dewy.

24. **Premises characterized by the presence of chemically or organically aggressive environment** – premises that are always or often subject to chemically aggressive vapors, gas or liquids or contain sediments or mould capable of destroying the insulation and conductive parts of electrical equipment.

25. **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.)

## V. RESPONSIBILITIES

26. Persons who fail to meet the requirements specified in the present Operating Procedure shall be liable in accordance with the laws of the Republic of Lithuania and procedures established by the Company.

## VI. DESCRIPTION OF ACTIONS

27. When electrical equipment is used in a potentially explosive atmosphere, it is important to follow the requirements of laws and procedures governing works carried out in potentially explosive environments.

28. Categorization of electrical equipment into classes according to the method of 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 shell 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** - electric equipment in which protection against electric shock relies on double or reinforced insulation;

**Class III** – electric 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.

29. Switches installed on electric equipment must be of good condition.

30. It is prohibited to use switches hanging off of the connecting wires.

31. Electrical equipment must be switched on/off in a reliable way (not self-switching), comply with applicable safety rules and norms, and have no exposed live parts.

32. 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 an inscription indicating the level of voltage. Plugs intended for up to 50 V should not be compatible with higher voltage power outlets.

33. 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 metal surfaces and sharp edges.

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

35. Electrical equipment must be used in accordance with this Operating Procedure and instructions of equipment manufacturers.

36. At least once a year, insulation resistance tests must be carried out for electrified mechanisms, manually operated electrical equipment and tools, domestic electric appliances, portable lights, reducing transformers, frequency exchanger windings, differential current protection devices and electric wires & cables. Reliability/operation of differential current protection devices shall be checked as well.

37. Electrical equipment and tools must have markers attached to their bodies with inventory or identification numbers and upcoming inspection dates. Reducing and isolating transformers, frequency converters and differential current protection devices must have markers with inventory or identification numbers, upcoming insulation resistance test or inspection dates.

38. Users of electrified mechanisms, manually operated electrical equipment and tools, portable lights, reducing transformers and frequency converters shall make them ready for inspection in a timely manner.

39. 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.

#### **40. ELECTRIFICATED MECHANISMS, MANUALLY OPERATED ELECTRICAL EQUIPMENT AND TOOLS**

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

40.2. Only Class I, II & III equipment and tools of can be used in hazardous premises.

40.3. Class I, II & III equipment and tools can be used in extremely hazardous premises or outdoor environment only after such are connected to isolating transformers, frequency converters and differential current protection units. Electrical equipment owned by 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*.

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

40.5. Only one equipment or tool can be connected to the isolating transformer, frequency converter or residual current protective device at a time.

40.6. Connection of 50 V equipment or tool to the common power network using an autotransformer is prohibited.

40.7. Employees must be rendered safety training before use of any electrical equipment.

40.8. During work breaks or in case of power supply interruptions, electrified machinery and manually operated electrical equipment & tools must be disconnected from the power supply sources.

40.9. The following shall be checked up or done before each use of electrified machinery, manually operated electrical equipment & tools:

40.9.1. If voltage and frequency are in line with the power network parameters;

40.9.2. If work tools such as drill bits, abrasive discs and other have been securely fitted in place;

40.9.3. If cables and plugs are in good condition (visual inspection);

40.9.4. If grounding devices are in good condition;

40.9.5. Reliability of switch;

40.9.6. Idle tests

40.10. The electrical cables must be long enough so that it is not stretched taut and the plug in the socket does not get loose.

40.11. Electrified mechanisms and manually operated electrical equipment & tools connected to the power network shall never be left unattended on the scaffolding, supports or hanging on ladders.

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

40.13. While working with electrified mechanisms, manual power machinery and tools it is forbidden to:

40.13.1. Measure the workpiece before the machine is switched off and comes to a full stop;

40.13.2. Remove drill shavings and sawdust, apply lubricants before the machine is switched off and comes to a full stop;

40.13.3. Adjust the tool or replace it before the machine is switched off and comes to a full stop;

40.13.4. Use hands to stop the rotating parts of the tools;

40.13.5. Hold the equipment by its power cord when carrying it to another place;

40.13.6. Use the electrical equipment outdoors in the rain or snow;

40.13.7. Perform any repairs of the electrical equipment and tools and their cables or cords;

40.13.8. Work standing on a lean-to ladder;

40.13.9. Leave equipment connected to the power network unattended.

40.13.10. Pull, bend or twist cables, place any loads on them, also allow the cables to cross ropes, other cables, gas welding hoses, etc.;

40.14. It is forbidden to use electrified mechanisms, manually operated electrical equipment or tools if:

40.14.1. Plug, cable or its protective tube is damaged;

40.14.2. Brush holder cover is damaged;

40.14.3. Switch is unreliable;

40.14.4. Collector brushes start sparking and a fire ring appears on the surface;

40.14.5. Lubricant leaks from a reducer;

40.14.6. Smoke or smell of burning insulation appears;

40.14.7. Extraneous sound and vibration occur;

40.14.8. Cracks appear on the body of the tool;

40.14.9. Equipment has not been tested.

40.15. In case any mechanical defects are observed, electrified mechanisms, manually operated electrical equipment or tools must be disconnected from the power network and such defects must be immediately reported to the immediate manager.

40.16. Upon completion of work which involved using any electrified mechanism, manually operated electrical equipment or tool, it is important to:



40.16.1. Disconnect it from the power network;

40.16.2. Clean up the work area;

40.16.3. Remove dirt, lube oil and dust, use cloth dampened with lube oil for wiping corrosion-prone parts;

40.16.4. Wipe wires or cable with dry cloth and roll them up.

#### 41. PORTABLE LIGHTS

41.1. Portable lights shall not have any exposed live parts; light bulbs must be covered with safety shields made from glass, metal grid or mesh.

41.2. The ends of cable and wire jackets shall be safely fixed inside the electric lights or plug connections.

41.3. Portable lights used in extremely hazardous and hazardous premises must not exceed 50 V and those used in potential explosive environments shall not exceed 12 V.

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

41.5. Plug connections are used to connect portable lights to the power network. 12V and 50 V plugs and sockets must be of different design and thus it shall not be possible to use them with 127V and/or 220/230/380/400 V plugs and sockets.

41.6. Portable lights must be visually inspected prior to any work. In case of any damage or breakdown (damaged cable insulation, bare cable cores, cable jacket not securely fixed inside the light or plug, damaged structure of the lights, etc.) it is prohibited to use the lights.

#### 42. DOMESTIC ELECTRICAL APPLIANCES

42.1. Before using any domestic electric appliance the users must read the operating instructions provided by the appliance manufacturer.

42.2. It is important to check the appliance for visible mechanical defects and its cable insulation for any possible damage (for example, cuts, cracks, signs of burning, etc.) before the appliance is connected to the power supply.

42.3. The appliance must be immediately disconnected from the power supply source if the power cable becomes hot or any extraneous sounds come from the inside of the appliance, etc.

42.4. It is prohibited to pull the plug out of the socket by the cable when disconnecting the appliance. It shall be disconnected by holding the socket with one hand and the cable near the plug with another hand.

42.5. Appliance must be disconnected from the power source when it is cleaned, washed and when not in use.

### 43. SAFETY REGULATIONS

43.1. Lights of no more than 12 V shall be used when working in confined spaces, cramped metal tanks, wells/manholes and any other places where the workers are in a very inconvenient posture or touch electrically conductive surfaces (steel, reinforced concrete, wet etc.).

43.2. The following work lights can be used for outdoor works and works carried out in the vicinity of large and open structures, metal vessels and units (heaters, boilers, towers etc.) that are in direct contact with the ground:

43.2.1. Hand lights with the voltage of not more 12V;

43.2.2. Class I & II 230 V portable worklights 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  $I_V \leq 30$  mA or which are connected to isolating transformers. The conductive parts of class I worklights must be grounded;

43.2.3. Electrified equipment and tools that fall under Class II (with double insulation) and have differential current protection with operating current set at  $I_V \leq 30$  mA or that fall under Class III (<50 V).

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

43.4. Electric power users (worklights, electrified equipment, extension cords etc) that are connected directly to the electric installations of the Company via fixed or portable 230 V SCHUKO® CEE 7/7 plug sockets (Fig. 4) must have 10/16 A plugs and elastic copper core with a cross-sectional area of not less than 1,5 mm<sup>2</sup>. Extension cords must have plug connections that are properly protected against external factors (water, mechanical damage) and involve no risk of self-disconnection.

43.5. Cables must be drawn into confined vessels, tanks and process units through openings other than those used by the workers for entering such vessels, tanks and process units, and if there are no such openings available, additional protection measures (conduits, additional cable fasteners at the top of the opening, warning posters, etc.) should be applied to avoid any cable damage. In any case, measures should be taken to protect the cable against possible damage (being wedged or hampered, etc.) that may occur while drawing the cable over the sharp edges of the opening.

43.6. Electrified equipment, portable worklights, 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 or production serial number.

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

43.8. In case electrified equipment, hand lights or portable worklights are switched off upon actuation of the residual current device (overload, differential current, etc.) it is not permitted to switch on and operate the equipment or lights for as long as the reasons for power trip have not been ascertained and eliminated by a qualified electrical specialist (from either the Company or a contracting organization – whoever is the owner of the tripped device). Residual current devices located in the power facilities of the Company may be switched on by electrical employees of the Company only. Electrical employees or other staff of contracting organizations is not authorized to do so.

43.9. Electrical employees of the Company can be called in by fixed phone numbers: 07, 2311 or other phone number +370 443 92311 or phone number indicated on the power distribution panel used to supply power to contractor's equipment.

43.10. In workplaces with potentially explosive atmospheres it is required to use only special worklights, electrified equipment and tools that have been approved for use in explosive zones and for those not approved hot work permits have to be issued in accordance with the *Hot Works Arranging and Performing Procedure BDS-7* of the Company.

43.11. Contractors must always ensure that cables running from the Company power distribution box to the workplace are properly secured to available structures so that they do not block pathways and roads and are protected against any possible mechanical damage. Cables must be elevated to a height of no less than 2.5 meters above pathways and no less than 5 meters above roads.

43.12. Only trained and certified persons (primary electric protection category required) can perform electric welding.

43.13. When hand welding machines are in idle mode, the voltage must not exceed 50V of ac and 75V of dc. Flexible welding cables coated with flame resistant insulating materials shall be used as connection between the welding current source and the electrode holder. The cable segment of at least 3 meters from the electrode holder shall not be subject to any repairs or have any insulation defects. It is prohibited to use self-made electrode holders and welding machines.

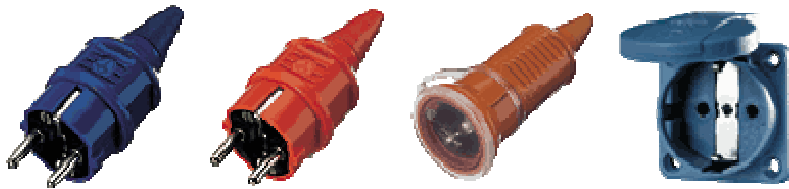


Fig. 4 230V SCHUKO® CEE 7/7 plugs and socket.



5 pav. 400 V 5-pole (3P+1N+1GND) plugs and sockets used in the Company



Fig. 6 Examples of stationary and portable power distribution boxes and extension cords

## VII. DOCUMENTS AND RECORDS

44. No records shall be made when acting under the present Procedure.