

APPROVED BY:

by the 20 November 2020 Order No
TV1(1.2-1)-597 of Deputy General
Director for Operations of Public
Company ORLEN Lietuva

**INSTRUCTION MANUAL BE-1 FOR COMMISSIONING AND OPERATION OF
ELECTRICAL EQUIPMENT**

I. PURPOSE

1. Instruction Manual BE-1 for Commissioning and Operation of Electrical Equipment (hereinafter – the Instruction Manual) defines the requirements and procedure for proper and safe operation of electrical equipment, including measuring instruments, operated in Public Company ORLEN Lietuva (hereinafter – the Company), except for portable domestic electric appliances.

II. APPLICATION

2. This Instruction Manual shall apply to all employees of the Company and of the contractors working at the Company under relevant contracts involved in the operation and maintenance of the electrical equipment of the Company.

3. Requirements of this Instruction Manual shall not apply to the operation of the electrical equipment of the Power Plant.

4. This Instruction Manual does not regulate the use of portable domestic electric appliances, hand-held electric devices and tools as well as other devices the operation of which is regulated by other legal acts and instruction manuals, e.g. Operating Procedure for Electrical Mechanisms, Manually Operated Electrical Equipment and Tools, Domestic Electric Appliances and Portable Lights BE-2.

III. REFERENCES

5. This Instruction Manual has been developed in line with effective revisions of the following documents:

5.1. Rules for Safe Operation of Electric Facilities approved by the Minister of Energy of the Republic of Lithuania;

5.2. Rules for Operation of Power Houses and Power Networks approved by the Minister of Energy of the Republic of Lithuania.

IV. TERMS AND DEFINITIONS

Electrical equipment – an element of a power network (circuit) that changes, regulates, measures, controls the electrical and non-electrical parameters of various processes, machines and mechanisms, generates, transmits, distributes, transforms or uses electrical energy.

For the purpose of this Instruction Manual, the electrical equipment operated by the Company are divided into two groups, depending on their purpose and operation:

Group 1 (switchgears) – power supply and distribution equipment (e.g., power substations, transformers, switchgears and related equipment), i.e. power supply system equipment or parts thereof, which are not controlled by employees operating the installation;

Group 2 (current-using equipment) – electrical equipment that transform one type of electric energy into another type of energy, i.e. electrical mechanisms, industrial current-using

equipment (compressors, pumps, fans, motor operated valves, electric heaters, cranes, electric hoists, lights, etc.), i.e. electrical equipment, which are controlled by employees operating the facility.

Process control – an entirety of technical and organizational means ensuring reliable, efficient and safe startup (activation), shutdown (deactivation) of a process unit, as well as troubleshooting, maintenance and restoration of the default operating mode. Group 2 electrical equipment are used to ensure process control.

Operation of Group 1 electrical equipment – an entirety of technical and organizational means ensuring reliable, efficient and safe startup of electrical equipment, maintenance of default operating mode, shutdown, troubleshooting and restoration of the normal operating mode. Operation of Group 1 electrical equipment is performed by an electrician on duty (this term shall be construed as defined in this Instruction Manual).

Voltage switch-off – interruption of circuit between electrical equipment and a power source by commutation devices, when the disconnection of power contact is not visible.

Electrical equipment disconnection – interruption of all circuits between electrical equipment and a power source by commutation devices that have a visible position of commutation contacts.

Electrical circuit connected – connecting the feeder of Group 2 electric equipment into the operating or testing position.

Operating position of electrical equipment – power and control circuits are connected and energized.

Testing position of electrical equipment – power circuits are disconnected, control circuits are connected and energized.

Electrical circuit disconnected – Group 2 electrical equipment are disconnected or de-energized, or other technical and organizational measures are in place to prevent their false activation, thus making the electrical equipment ready for safe repairs or other operations.

Facility – the Company's technological, production, loading, logistics and other facilities, including administrative buildings.

Facility operator – a person, who operates the technological, production, loading, logistics or other facilities, including administrative buildings, and Group 2 electrical equipment located in these facilities in accordance with the Company procedures.

Requisitioner – a facility operator appointed by decree of the manager of respective organizational unit of the Company and included in the list of persons authorized to submit requisitions to electrotechnical personnel (Annex 2). Facility operator is authorized to submit requisitions for the facility/territory assigned to him/her only.

Electrical engineer – an employee of the Company's Maintenance Department or Electrical and Automation Department responsible for the maintenance of the facility's electrical equipment and authorized to submit requisitions to the Response Team for switching on/off the supervised electrical equipment (Group 1).

Electrician on duty – an electrical specialist of Power Plant Electrical Shop who carries out operational maintenance and/or operational switchovers of the Company's electrical equipment.

Requisition – a task submitted to the Response Team. It may be written (Annexes 1, 3 or 4) or submitted via a special computer program (Annex 5).

Log of requisitions for electrotechnical personnel – a log of requisitions maintained in accordance with the procedure established by the Company (in paper form (Annex 1) or in a special computer program (Annex 5)).

Response Team – Power Plant Electrical Shop Response Section that carries out the operational maintenance of the Company's electrical equipment.

Instrumentation specialist – contractor's employee who carries out the technical and operational maintenance of the Company's measuring and control instruments.

Automation engineer – Company's employee from the Maintenance Department or Electrical and Automation Department who is responsible for the maintenance of facility's measuring and control instruments.

CD (commutation device) – electrical equipment designed to connect or break the electrical circuit. Usually, commutations devices are turned on/off to connect (or break) the power circuit between a power source and current-using equipment.

V. RESPONSIBILITY

6. Facility operator is responsible for the proper operation of Group 2 electrical equipment and timely submission of requisitions.

7. Electrical engineer is responsible for the proper and timely submission of requisitions regarding Group 1 electrical equipment.

8. Electrician on duty is responsible for the proper and timely completion of tasks set out in requisitions, operational maintenance and/or operational switchovers of electrical equipment.

9. Persons in breach of the requirements stipulated herein will be liable in accordance with legal acts of the Republic of Lithuania and the Company as well as the provisions of relevant contracts concluded with other legal entities.

VI. ACTIONS

10. Electrician on duty operates Group 1 electrical equipment.

11. Facility operator operates Group 2 electrical equipment.

12. Facility operator shall inform electrician on duty about all process faults for causes related to electrical equipment (electrical equipment tripping, failures, etc.) and, if needed, participate in investigating the causes of such faults, as well as maintain a fault log, promptly notify relevant employees and act in accordance with the Company procedures.

13. After emergency shutdowns of process units, facility operators shall compile the lists of electrical equipment that tripped/switched off and could not be restarted either manually or automatically, and present them to electrical engineer.

14. Maintenance of electrical equipment shall be organized by electrical engineer.

VII. Interactions among facility operators, electrical engineers and electricians on duty

15. Facility operator shall fill out a requisition to delegate tasks (connection/disconnection of electric circuit, connection/disconnection of temporary electrical equipment, electrical equipment faults and failed startups, etc.) to electrician on duty.

16. In the Company's facilities that have a computer program for handling requisitions (hereinafter – the program, Annex 5), requisitions are executed in this program only; requisitions can be filled out manually (in a logbook of requisitions for electrotechnical personnel, Annex 1) only when the program is not functional or in other extraordinary cases. Pipelines & Terminal Operations Subdivision (PTOS) operators may submit requisitions in respect of crude oil metering skid equipment located in Juodeikiai to the Response Team in charge of operational maintenance of this facility by e-mail (elektra.dispeceris@orlenlietuva.lt).

17. Facility operator shall indicate in the requisition the date and time, electrical equipment tag number, actions to be taken and any other related information, his full name and sign the requisition. The same information shall be provided in requisitions executed in the program (Annex 5).

18. A list of persons authorized to submit requisitions to electrotechnical personnel (its copy) (Annex 2) signed by a respective organizational unit manager shall be enclosed with the log of requisitions for electrotechnical personnel (Annex 1). Organizational unit manager shall make sure that the log of requisitions submitted to electrotechnical personnel always includes a copy of the most recent/updated list. Also, a copy of the updated list shall be submitted to the head of Response Team in charge of operational maintenance of the facility's electrical equipment.

19. Requisitions may not be placed by employees not included in the list of persons authorized to submit requisitions to electrotechnical personnel (Annex 2) or when this list has not been signed by a respective organizational unit manager.

20. Facility operator shall inform electrician on duty about the requisitions completed in the log of requisitions for electrotechnical personnel (Annex 1) by electronic means of communication or otherwise. When a requisition is submitted in the computer program (Annex 5), it is not necessary to inform the electrician on duty unless the requisition is urgent and must be executed immediately.

21. After reading the requisition, electrician on duty shall note down the time of familiarization with the requisition and sign it. Upon completion of work, electrician on duty shall describe the tasks completed or for what reason he was unable to complete the task and indicate the date of entry, time, full name and sign it. If the requisition requests locking a commutation device (CD), the number of the padlock shall be entered in the requisition after locking. If it is technically impossible to lock out a commutation device, 'CD is not locked out' shall be entered

instead of the lock number in the tag. The same information on actions shall be provided in the program (Annex 5). After implementing requisitions received by e-mail from PTOS Būtingė Terminal or Main Pipelines Service Group, electrician on duty shall inform about the completion by replying to the same e-mail.

22. In case of emergency response or process faults, electrician on duty shall also carry out verbal instructions given by facility operators to handle the emergency situation, with requisitions formalized later by facility operator.

23. If electrical equipment cannot be disconnected from power sources for maintenance by electrician on duty alone and this also requires the involvement of instrumentation contractors, the provisions of contracts concluded by the Company with contractors and statements on responsibility limits shall be observed.

24. For temporary connection of electrical equipment in territories of process units, contractors shall apply to facility operators in accordance with the Procedure for Temporary Powering of Electrical Equipment BE-16. Facility operator shall evaluate information submitted and, if necessary, issue a hot work permit for the site of temporary connection of electrical equipment as well as submit requisitions to electrician on duty for temporary connection and disconnection of electrical equipment in accordance with the Company procedures.

25. Company employees using, as part of their direct job duties, electrical equipment and tools to be powered from the grid in the territory of process unit, shall request that facility operator submit a requisition to electrician on duty for connecting such equipment and tools to the grid. In this case, a request for temporary powering of electrical equipment shall not be formalized.

VIII. Organizational actions for maintenance of Group 1 equipment

26. Electrical engineer shall complete a requisition for disconnection/connection of electrical equipment for the Response Team in accordance with the requirements set out in Annex 3.

27. Electrical engineer shall agree the requisition with the respective organizational unit manager and submit it (electronic or hard copy) to the shift supervisor of the Response Team. This requisition is the basis for the disconnection and preparation of electrical equipment for repairs.

28. If organizational unit managers approve a requisition that specifies restrictions applicable to disconnection of powerful current-using equipment, they shall ensure that such restrictions are notified to facility operator. If current-using equipment exceeding the specified power limits have to be connected, facility operator shall get approval from the shift supervisor of the Response Team.

29. Maintenance personnel shall be permitted to work in the Company's operating electrical facilities by electrician on duty (under a permit to work in electrical facilities).

30. Upon completion of maintenance or at the end of shift, maintenance personnel shall verbally inform electrical engineer (by phone) on the status of work or equipment and formalize the end of work or a break in accordance with the procedure established by the Company, i.e. in respective permits (e.g. permit to work in electrical facilities). The formalization of the end of work

and the requisition of electrical engineer shall be the basis for connection of Group 1 electrical equipment. Electronic or hard copy of requisition (recommended form is provided in Annex 3) shall be submitted to the shift supervisor of Response Team. If it is not possible to submit the requisition to shift supervisor, it may be submitted to electrical engineer.

31. If not all works have been completed, maintenance personnel shall immediately notify electrical engineer and electrician on duty. Electrical engineer shall coordinate all subsequent actions and make a decision with respect to energizing and operation of particular electrical equipment.

IX. Organizational actions for maintenance of Group 2 equipment

32. Prior to maintenance of electrical equipment, electrical engineer shall get approval from the manager of organizational unit operating a particular facility.

33. Electrical engineer shall provide to facility operator the tag number of electrical equipment and other related information needed to fill out and submit a requisition for electric circuit disconnection.

34. Electrician on duty shall allow to work only maintenance personnel that has a respective work permit (e.g., a work permit for electrical facilities).

35. After work is complete, maintenance personnel shall inform electrical engineer verbally (by phone) and by e-mail about the condition of electrical equipment.

36. Electrical engineer shall assess the condition of electrical equipment and inform facility operator on the possibility to use this equipment. If Group 2 electrical equipment need to be used and electrical engineer confirms that it is safe to use this equipment, facility operator shall submit a requisition for electric circuit connection. Electrician on duty shall connect the electric circuit only after maintenance personnel makes an entry on completed work in the work permit for particular electrical facilities. The requisition for electric circuit connection shall be regarded as a confirmation that it is safe to use the electrical equipment.

37. If not all repair works have been completed, maintenance personnel shall immediately notify electrical engineer. Electrical engineer shall coordinate any further actions and make a decision on the use of electrical equipment.

X. General requirements for operation of electrical equipment

38. When organizing disconnection of electrical equipment, electrical engineer or automation engineer shall make ensure that the wires of cables disconnected from electrical equipment are twisted together and grounded or insulated; electrician on duty shall control or perform these actions if he himself has disconnected the cables.

39. If the tag 'Do not energize! Electricians at Work' is attached on electrical equipment or their switch buttons, it is forbidden to switch on such electrical equipment. This tag can be removed by electrician on duty only. Facility operator shall contact electrician on duty to clarify whether such electrical equipment can be used or not.

40. Prior to starting/switching on electrical equipment, it is necessary to make sure that this will be performed safely, without causing any risks to humans.

41. Electrical equipment shall be switched off immediately in case of accident or if fumes or flame can be seen coming out the equipment.

XI. Operation of Group 2 electrical equipment

42. Electric motors and their rotating mechanism shall be attached with labels containing a tag (ID) number and rotation direction.

43. Control buttons (keys) of electric motors shall be attached with labels containing tag numbers of equipment controlled by these buttons.

44. Stand-by electric motors shall be always ready for operation.

45. Devices for measuring the temperature of windings or bearings specified by manufacturers of motors shall be installed to allow facility operators (operators of electrical equipment) to monitor or control the temperature of motors. For electric motors that do not have temperature measuring instruments, electrical engineer shall arrange measurements if needed.

46. If electric motor temperature exceeds the thresholds set for the measuring instruments, facility operator shall check stationary instruments for motor current, and if such instruments are not available, apply to electrician on duty for current measurements and, in case of motor overload, reduce the load to permissible limits. If load is not exceeded or load reduction does not help to reduce the temperature of the motor, electrical engineer shall be informed about the heating of the motor for making a decision on further operation of such motor.

47. Facility operator shall monitor the current of the motor based on the readings of an ammeter mounted at the motor or the control panel, or the indications of the control system; where such indications are not available, facility operator shall submit a requisition to electrician on duty for performing motor current measurements. Stationary instruments for measuring the current shall be installed for 100 kW electric motors.

48. In case of motor overload or exceeding its rated parameters, facility operator shall immediately reduce the motor load to reach its rated parameters. Electrical engineer shall be noted if load reduction does not help to reduce the current or other parameters to the rated level.

49. Rated current is indicated by the red mark or special arrow on the scale of ammeter. If ammeter needle goes beyond the red mark, it means that motor load is too high (only short-term (up to 25 s) current increase is allowed during the startup of electric motor). Digital ammeters shall have a label with indicated rated motor current.

50. Facility operators operating brushed electric motors (list provided in Annex 6) shall check the brush mechanism for sparking every 2 hours during the shift. Sparking increases as brushes wear out and if this is overlooked, contact rings get burned, and this may be the cause of failure of entire brush mechanism or electric motor.

51. When facility operator notices a sparking brush, he shall call in electrician on duty (by submitting a requisition) to decide whether a particular electric motor can be further used.

52. In the event of significant, continuous sparking around the brush rings, the motor shall be shut down and reported to organizational unit manager and electrical engineer.

53. Electric motors of standby equipment:

54. Electric motors that have variable frequency drives and are installed outdoors or in damp premises (areas subject to constant condensation and humidity above 60 %) shall be inspected and tested together with standby equipment at least every 14 days. Lists of such electric motors shall be prepared by electrical engineers of relevant facilities.

55. Insulation resistance of stator winding shall be determined:

55.1.1. Prior to electric circuit connection after repairs made to electric motor feeders;

55.1.2. After electric motor has been flooded with water or if suspected that the motor may have become wet for other reasons.

55.1.3. For electric motors installed outdoors or in damp premises (in areas with constant condensation and humidity over 60%), with no heating of windings, operating DOL (not via VFD), insulation resistance of stator winding shall be measured at least every 14 days. Lists of such electric motors shall be prepared by electrical engineers of relevant facilities.

56. Insulation resistance measurements shall be conducted by electricians on duty on the basis of requisitions issued by facility operators.

57. If facility operator inspecting a running electric motor notices any abnormal operation (e.g., smell of burning insulation, increased vibration or noise, etc.), he shall report this to his direct supervisor and electrical engineer, and if needed, shut this motor and start a standby motor.

58. Electric motors of pumps, compressors, air coolers, fans and other similar equipment may be launched not more than twice in a row if they were not in service before and have a temperature of $<40^{\circ}\text{C}$, and only once if they were in service before and have a temperature of $>40^{\circ}\text{C}$. Another (repeat) start cycle is permitted after motor cools down (after at least 3 hours). For another start of equipment, facility operator shall apply to electrical engineer, who may permit it if allowed by existing conditions and motor manufacturer's instructions.

59. To launch an electric motor, its startup button or selector switch shall be operated (pressed/turned) for about 1 s and only after electrician on duty notes down in the requisition or reports to facility operator that he has completed electric circuit connection.

60. For electric motors equipped with an ammeter or any other current measuring instrument, the indications of such instrument shall be monitored during motor startup. Indications exceed rated values due to a starting current at the time of launching an electric motor. After 1÷25 s, the starting current decreases to a value within allowed limits.

61. Re-starting of electric motor is prohibited if any of the following situations occurred during its startup or load increase:

61.1. Starting current rises sharply and does not fall, motor produces a muffled roar sound and the equipment stops;

61.2. Motor is tripped by relay protection, instrumentation or process interlock.

62. If any of the above happens, facility operator shall note this down in the shift log and together with electrician on duty investigate the causes of emergency shutdown or tripping as well as take steps to fix them.

63. Unintended shutdown (tripping) of electric motor at the time of its startup or during its operation is considered an emergency shutdown.

64. In all cases of emergency shutdown of electric motors or failed startups of equipment, electrician on duty shall be called in.

65. After each emergency shutdown of electric motor, it is necessary to:

65.1 Identify and eliminate the causes of shutdown - to be performed by electrical engineer (if not done by electrician on duty) in cooperation with facility operator or other facility maintenance personnel;

65.2 Assess the condition of motor (if shutdown could be caused by motor fault) and determine whether it can be restarted – to be performed by electrical engineer.

66. If repeated motor startup is not successful, the causes of failed startup shall be ascertained and fixed (as in case of emergency shutdown).

67. After each emergency shutdown, facility operator shall record in the shift log the signals and operating parameters, indications of measuring devices, causes of emergency shutdown, failed startups (if any), accurately indicate the sequence and time of events.

68. After determining onsite the causes of motor shutdown/tripping or failed startup, electrician on duty shall inform facility operator about the condition and possibility to start the motor.

69. It is forbidden to start equipment by launching multiple short-term motor startup cycles. Multiple startups are allowed only for special electric motors and equipment designed to work in this mode.

70. Electric circuit shall be disconnect if work involves touching rotating parts of electric motor or equipment (e.g. shaft coupling, shaft protections, etc.) or electric circuits (disconnection/connection of power cables) or this is required as part of isolation of other hazardous energy. In this case relevant CDs shall be also locked out by indicating this in the respective requisition. CDs shall remain locked out for the entire duration of repairs carried out on relevant equipment. Upon completion of work, a requisition for unlocking the CDs shall be issued.

71. If there is possibility of touching conductive parts of operating motors or other electrical equipment, a person issuing a work permit for electrical installations shall include grounding of power cables as mandatory safety measure and electrician on duty shall properly ground the cables when preparing the site for work.

72. Before working on flue gas blowers, coolers, fans, and other equipment or their electric motors that may rotate spontaneously as a result of product flow through them, precautions shall be taken to prevent spontaneous rotation of such equipment.

73. If equipment (e.g., compressor) has a shaft rotation mechanism and it is not going to be used when working on equipment, its electrical circuit shall be disconnected. This must be taken care of (submission of requisition) by the employee who issues a hot work permit.

74. Removing barriers, covers of rotating parts of electric motor while in operation is forbidden.

75. Starting a motor is prohibited if its cable terminal box is not covered or if motor housing is not grounded (except for special measurements, e.g., phase-zero loop measurements).

76. Electric motor shall be shut immediately in the following cases:

76.1 Smell of burning insulation;

76.2 Unacceptably high motor vibration;

76.3 Unacceptably high motor temperature;

76.4 Motor load exceeds permissible limits and cannot be reduced;

76.5 Risk of electric motor failure (flooded with water or other liquids, increased noise, etc.);

76.6 Motor rotating mechanism failure.

XII. Operation of electric heat tracing systems

77. All parts of process piping, vessels, tanks, including vents, valves, control valves, with electric heat tracing, shall be fully isolated. Any non-traced/uninsulated parts shall be reported by facility operator to direct supervisor, Maintenance Department mechanical and electrical engineer in charge of particular facility for taking immediate actions to fix this situation.

78. Repairs to pipelines, tanks, vessels or flooring (hereinafter – equipment) equipped with electric heat tracing shall be allowed only after de-energizing the electrical heat tracing cables. Facility operator shall indicate in a requisition the number equipment and tag numbers of electric heat tracing power supply lines to be disconnected. If it is not possible to find the tag number of power supply lines in the program of requisitions for electrotechnical personnel (Annex 5) or if a requisition is submitted not via the program, facility operator shall identify the power supply lines to be disconnected and their tag numbers in cooperation with electrical engineer and electrician on duty. Facility operator can duly execute a requisition only after electrical engineer makes appropriate changes to relevant single-line diagrams and electrician on duty enters these changes in the program of requisitions for electrotechnical personnel. Electrical engineer shall organize the updating of tag numbers on relevant elements of power supply cables based on updated single-line diagrams.

79. If a part of electric heat tracing cable needs to be removed due to repair, facility operator shall submit a requisition to electrician on duty for removal of heating cable from a pipeline or process vessel after thermal insulation is stripped off the particular pipeline or vessel. Electrician on duty shall remove the cable himself, unless the work scope is large and complicated (e.g., extensive heat tracing line (10 meters or longer), pipeline configuration is complex, restricted access, electrician on duty does not have the required tools or is busy performing other job duties, etc.). In such case, electrician on duty shall request electrical engineer to organize cable removal and note this down in the log of requisitions.

80. Upon completion of pipeline, tank, vessel, etc., repairs, facility operator shall issue a requisition to electrician on duty for reinstalling and energizing the electric heat tracing system. Electrician on duty shall re-install the heating cable, if he dismantled it himself, has tools to do so and conditions allow doing it. Otherwise he shall request electrical engineer to organize the restoration of electric heat tracing system and record this in the log of requisitions.

81. To save power, electric heat tracing systems shall be switched off when process piping, tanks or vessels are empty. Facility operator shall submit a requisition to electrician on duty for electric circuit disconnection for such electric heat tracing system.

82. During the warm season, heating of flooring in pump houses and other facilities shall be switched off unless otherwise required by design or technology. Facility operator shall submit a requisition to electrician on duty for power circuit disconnection for such heating system.

83. When submitting requisitions (Annex 4), facility operators shall organize connection/disconnection of electric heat tracing of measuring instruments and impulse tubes based on requests of automation engineers or instrumentation specialists responsible for maintenance of particular facilities.

84. Electrically traced pipelines, tanks, vessels and other equipment shall be affixed with an information sign 'Electrically traced surface' and a warning sign 'Attention! Hazard of Electric Shock' (a yellow triangle with a black arrow), indicating that heat tracing cables are installed under the thermal insulation. Organizational unit managers shall be responsible for installing and maintaining these signs.

85. When facility operator detects any malfunctions of electric heat tracing system based on measured process parameters, he shall submit a requisition to electrician on duty to check the heat tracing system. Electrician on duty shall check the condition and operation of electric heat tracing system and using available means identify and fix the fault. If it is not possible to fix the fault, electrician on duty shall notify electrical engineer, register the fault in a respective computer program and make entries on the inspection results and measures taken in the log of requisitions.

86. Many electric heat tracing systems are equipped with a light indicator of voltage in the heating cable. Indicator of voltage can be installed:

86.1. In control cabinet of electric heat tracing system. Light usually informs about the presence of voltage in the cabinet (that it is energized) but does not indicate that heating cables are supplied with power from this cabinet. If light indicator does not work (light is off), electrician on duty shall be called in to check the operation of system (if this system should be working at a particular time). There must be an inscription under such light to indicate its purpose;

86.2. At the end of electric heat tracing cable (on a pipeline, tank, vessel, etc.). This light indicator indicates the presence of voltage in a particular heat tracing cable. If light is on, this means that cable is energized and heating. If light is off, this means that cable is not energized and not heating.

86.3. Recommendations for troubleshooting for cables equipped with light indicators and regulated by thermostats:

86.3.1. If a periodic inspection determines that indicator light is always on, this can be caused by insufficient heating cable power or that it no longer able to operate at design capacity, or by low ambient air temperature, or poor condition of insulation;

86.3.2. If a periodic inspection determines that indicator light is never on, this can be caused by electric heat tracing system faults, absence of voltage, or because thermostat is set for a temperature lower than the ambient temperature or temperature of heated equipment.

87. To avoid inadmissible overpressure, heat tracing shall be switched off for pipeline sections or vessels that are completely isolated with valves (blinds) and do not have a temperature transmitter.

88. Electric heat tracing shall be switched off during steaming of pipelines. Facility operator shall ensure that permissible temperature of heating cables is not exceeded during steaming. Whenever necessary, electrical engineer shall inform facility operators about the permissible temperature of electrical heat tracing cables.

XIII. DOCUMENTS AND RECORDS

88. Documents indicated in Table 1 shall be maintained in accordance with this Instruction Manual.

Table 1

Document	Place of storage	Responsible person	Storage period
Logbook of requisitions for electrotechnical personnel	Response Section in Charge of Refinery	Head of section	1 year after completion of logbook
Requisitions submitted electronically or otherwise	Response Section in Charge of Refinery	Head of section	1 year
Lists of persons authorized to issue requisitions to electrotechnical personnel	Facility	Organizational unit manager	1 year

XIV. ANNEXES

- Annex 1. Logbook of requisitions for electrotechnical personnel (form)
- Annex 2. List of persons authorized to issue requisitions to electrotechnical personnel (form).
- Annex 3. Requisition for Response Team for disconnection/connection of electrical equipment
- Annex 4. Logbook for registration of instrumentation requisitions (form).
- Annex 5. Instruction for issue of requisitions in the computer program GOBELEN.
- Annex 6. List of brushed electric motors.

Prepared by:	Head of Electrical Shop of Power Plant		Arvydas Grigalaukas	
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Agreed with:	Position	Signature	Full name	Date
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	Director of Production		Rimantas Kontrimas	
	Head of Power Plant		Stasys Bliūdžius	
	Chief Electrical and Automation Engineer		Valdas Jonikas	
	Chief Mechanical Engineer		Dalijus Vozbutas	
	Occupational and Process Safety Control Manager		Rolandas Rupšys	

Facility _____

LOGBOOK OF REQUISITIONS FOR ELECTROTECHNICAL PERSONNEL (form)

Started on _____ 201__

Finished on _____ 201__

Date, time of requisition submission (hour, minutes)	Content of the requisition	Full name, signature of requisitioner	Full name, signature of electrotechnical employee, date, time	Description of work performed	Full name, signature of person having completed the work, date, time

Facility _____

LIST OF PERSONS AUTHORIZED TO SUBMIT REQUISITIONS TO ELECTROTECHNICAL
PERSONNEL (form)

	Full name	Position	Notes
1			
2			
3			
...			
n			

Head of organizational unit _____

(Position, full name, signature, date)

REQUISITION FOR COMMUTATION OF ELECTRICAL EQUIPMENT

Electrical equipment <i>(Switchgear, section, commutation device)</i>	
Action <i>(Switch on/off, disconnect, switch over, prepare for repairs, etc.)</i>	
Purpose <i>(Planned works)</i>	
Company <i>(Company, contractors for whom workplace is being prepared and/or who will perform the contracted work)</i>	
Start of preparation/cleanup of a workplace <i>(Operational switching is allowed from - date, time)</i>	
Planned/agreed start and end of works <i>(Date, time)</i>	
Additional information <i>(Connection of power supply, switch to another power source, alerts, etc. - optional attribute)</i>	
Requisitioner (position, full name, signature ⁴)	
Approvals (position, full name, signature ⁴)	

Notes:

1. When sending requisitions by email, they shall be provided inside the text field of an email and not as attachment (except for scanned signed requisitions).
 2. For requisitions submitted by phone, all information provided in the requisition form shall be communicated.
 3. Requisitions must use the terms and abbreviations that are described in the instructions for operational switchovers and other related documents.
 4. Signatures are required on paper requisitions only; electronic requisitions do not have to be signed.
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List of brushed electric motors

No.	Facility	Position	Electric motor
1	OS-1 LK-1 Gas Compressor House	SK-301, 302, 303, 304	СДКП2-18-26-16У4
2	OS-1 LK-2 Gas Compressor House	SK-301, 302, 303, 304	СДКП2-18-26-16У4
3	OS-2 S-100 VGO Hydrotreatment Unit	SK-101/1, 2, R	СДКП2-19-39-16УХЛ4
4	OS-3 Compressed Air, Nitrogen and Water Supply Section	DK-2	СТК2-17-26-12УХЛ4
5	OS-3 Compressed Air, Nitrogen and Water Supply Section	IK-1, 2	СТД-1000-2РУХЛ4
6	OS-3 Compressed Air, Nitrogen and Water Supply Section	OK-1, 2	СТК2-17-26-12УХЛ4
7	Mechanical and Biological Treatment Section	SOP-1, 2, 3	СТД-1000-23У4

Note. The list is updated depending on the number of brushed electric motors in service.
