

Electrical Securing of Equipment for Engineering Repair

(2nd Level of TMS Documentation)

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Summary of changes

Change no.	Page number		Subject of the change	Date	Signature
	removed	inserted			
1					
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Directive no. 406 “Electrical Securing of Equipment for Engineering Repair”

1. Purpose

The purpose of this directive is:

- To ensure operation and work on the equipment so as to prevent jeopardizing employees' health by electricity.
- To clearly split responsibilities for performing individual activities between employees of the operator (ČESKÁ RAFINÉRSKÁ, a.s.) and the contractor.

2. Validity

This directive is binding for all employees of the Company and its contractors.

It applies to all voltages.

This directive must be in line with the PPÚ_406 “Operation and work on electrical equipment according to the ČSN EN 50110-1ed 2”.

3. Abbreviations, terms, definitions

Abbreviation / Term / Definition	Explanation
Worksite	Confined area for working on the equipment or in its vicinity.
Securing the worksite for work	A set of measures to ensure the employees' safety. A worksite must be clearly defined and marked. For all parts of the equipment, on which, with which or near which work activities are performed, adequate working space must be ensured, as well as access and lighting.
Securing against switching on	All switches that have been used to disconnect the electrical equipment in order to work on it must be secured against accidental switching on, by means of locking the switch, if possible. If the equipment/switch cannot be locked, adequate measures must be put in place according to the local conditions, so as to prevent the accidental switch-on. If an auxiliary electricity source is used to control the switching mechanism, it must be unplugged. If remotely controlled switches are used, it must be ensured that they do not get switched on. Parts of the electrical equipment, which remain charged after the equipment has been completely disconnected from the power supply, e.g. condensers and cables, must be discharged using suitable means.
Putting the electrical equipment back to operation	Upon completion of the work, all participating persons must be called off and informed that the work has been completed and that no further work is permitted. All tools, equipment and instruments used during the work must be removed. Only after the above conditions have been met, the procedure for putting the equipment back to operation may be commenced. Once, after completing the activity, the safety measures have been removed and the procedure for putting the equipment back to operation has been commenced, this part of the electrical equipment must be considered under voltage (live).
Order “B”	It is a written document on the order measures, both technical and organizational ones, serving to ensure safety of employees when working on the electrical equipment or in its vicinity. Detailed description of the order “B” can be found in the PPÚ_406 “Operation and work on electrical equipment according to the ČSN EN 50110-1ed 2”
Company	ČESKÁ RAFINÉRSKÁ, a.s.
VN	High voltage
NN	Low voltage

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Employee of the Company	A natural person who is in a labor-law relationship with the Company based on an employment contract or agreement, or a natural person holding a job position in the Company based on other agreements and contracts.
Contractor	A legal entity or a natural person that is in a commercial-law or a civic-law relationship with the Company and, as a contracting party (debtor), provides or is bound to provide contractual performance (or a mandatory performance resulting from the contractual relationship) to the Company.

4. Ways of electrical securing of motor outlet

4.1 Way of securing the NN outlet

MCC - (drawer switchboard) – is secured by turning the main switch into the “off” position + locking in line with the in line with the definition “Securing against switching on” (see the chapter 3 hereof).

OCEP - (steel-metal switchboard) – is secured by removing the power fuses or also + switching off the control voltage in line with the definition “Securing against switching on” (see the chapter 3 hereof).

Switching off the circuit breaker in line with the definition “Securing against switching on” (see chapter 3 hereof).

4.2 Way of securing the VN outlet

Order “B” is not issued for securing an equipment, at which persons do not come in touch with live parts and no subsequent work is to be performed on the equipment.

Order “B” is not issued for disconnecting, connecting and measuring electrical motors and VN cables, provided that the contractor company performing maintenance of the electrical equipment based on a contract has separate work procedures defined for such work. In such a case, the Order “B” is not issued for subsequent work performed on the unplugged motor either.

VN switch – Persons performing the securing shall check the labels on the motor and its state (whether it is on or off). Then they shall secure the VN switch(es) for the given motor, based on the type of the used switch in line with the definition “Securing against switching on” (see the chapter 3 hereof). If the motor is off, they shall switch off the control and take out the switch, install insulations, test the voltage-free state of the switch outlet by the relevant VN tester, return the switch to the revision position and install the safety signs.

5. Rules and procedure for electrical securing / releasing the equipment

5.1 Electrical securing - for engineering repair

- ❑ The party having defined the conditions (Shift Manager / Foreman of the Production Section, possibly his/her appointed deputy – see the directive no. 435 “Permit to Work”) is responsible for defining and meeting the conditions, the adherence to which is necessary to be ensured in order to safely perform the engineering repair (electrical securing, blunting, reducing temperatures, etc.).
- ❑ The person handing the equipment over for repair (Shift Manager, Foreman, Operator of the Production Section) shall make sure that all participants know what piece of equipment the engineering repair will take place on (Identification of the equipment).
- ❑ Based on an order from the Shift Manager or from the Production Unit's Foreman appointed by him/her, an authorized operator of the Production Section shall switch off the equipment. The Shift Manager or the Foreman appointed by him/her, or an authorized employee of the Company, shall issue a request to electrically secure the equipment into the handling logbook of requests and executions for the electrical

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securing of the equipment¹ and shall call the Electro contractor. The Electro contractor shall record into the handling logbook (located in the electrical switch-room) the date and time of receiving the request, the equipment/outlet no. and the name of the person from whom the request for securing has been received.

- ❑ Employees of the Electro contractor shall perform the electrical securing of the given equipment in line with the definition “Securing against switching on” (see the chapter 3 hereof). The securing will only be performed after the authorized Production Section operators have switched off the motor or other electrical equipment.
- ❑ Employees of the Electro contractor shall place a safety/caution sign on the switchboard informing about the performed securing and then they shall make a record into the so-called handling logbook at the switch rooms (time of securing, way of securing, his/her name and signature).
- ❑ Employees of the Electro contractor shall make a record of having performed the securing into the handling logbook of requests and executions for the electrical securing of the equipment.
- ❑ When handing over the equipment to the Engineering Maintenance, an authorized operator of the Production Section shall make sure, by turning on the switch, that the equipment’s motor cannot be switched on. After switching it off again, the operator must place a sign saying “Caution, danger, do not handle the equipment” on the switch (see the Appendix no. 406/D).
- ❑ By this, the work on the electrical equipment is considered safe.
- ❑ The Shift Manager, however usually the Foreman appointed by him/her, or an operator or the Production Section shall hand over the equipment in a safe condition to the Engineering Maintenance contractor for repair.

5.2 Electrical releasing - after the engineering repair

- ❑ Upon completion of the engineering repair work, all participating persons must be called off and informed that the work has been completed and that no further work is permitted. All tools, equipment and instruments used during the work must be removed. The contractor or the Engineering maintenance contractor’s supervisor is responsible for proper discontinuation/completion of the work. Only after the above conditions have been met, the procedure for putting the equipment back to operation may be commenced. The crew supervisor shall inform the Production Section’s Shift Manager / Production Unit’s Foreman or his/her authorized deputy about having completed the engineering work.
- ❑ After notification about the completion of the work on the equipment, the authorized operator of the Production Section shall check un-blunting the inlet and outlet pipes of the repaired equipment, closing and blunting the sludge (release) valves, set up of the pipeline route, etc.
- ❑ The Shift Manager of the Production Section / Foreman of the Production Unit, or an authorized employee of the Company, shall issue a request to electrically release the equipment into the handling logbook of requests and executions for the electrical securing of the equipment² and shall call the Electro contractor.
- ❑ An authorized operator of the Production Section shall remove the sign saying “Caution, danger, do not handle the equipment” from the equipment’s switch. The equipment is ready for being put into operation.
- ❑ The authorized operator shall record into the Engineering Maintenance’s Permit-to-Work that the equipment has been released. Then, the Engineering Maintenance contractor must not work on this Permit-to-Work anymore.
- ❑ The Electro contractor shall record into the handling logbook (located in the electrical switch-room) the date and time of receiving the request, equipment/outlet no. and the name of the person from whom the request for release has been received. He/she shall remove the signs from the switchboard and perform electrical releasing of the given equipment. He/she shall also record into the handling logbook the time of releasing, way of releasing, his/her name and signature.
- ❑ The Electro contractor shall record releasing the given equipment to the handling logbook of requests and executions for the electrical securing of the equipment to the ‘release check’ field.
- ❑ **Upon completion of the releasing, both parties** (Shift Manager of the Company / Foreman of the Production Unit, or an authorized employee of the Company) **shall sign the completion of the Permit-to-Work of Engineering maintenance and the equipment is ready for startup.**

¹ Detailed description for issuing a request for electrical securing of equipment using the handling logbook of requests and executions for electrical securing is contained in the “Permit to Work” manual.

² Detailed description for issuing a request for electrical securing of equipment using the handling logbook of requests and executions for electrical securing is contained in the “Permit to Work” manual.

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- In case of need to continue with the engineering repair, the procedure defined in 5.1 Electrical securing - for engineering repair needs to be followed (see 5.3 Responsibility matrix), which means a new Permit-to-Work for the Engineering maintenance and issuing a new request for electrical securing into the handling logbook of requests and executions for electrical securing of equipment.
- In case it is then necessary to subsequently balance the different pieces of equipment to the same operating temperature, this needs to be performed based on a new Permit-to-Work.

5.3 Responsibility matrix

5.3.1 Electrical securing of the equipment for engineering repair

Electrical securing of the equipment for engineering repair		Responsibility					
Activity \ Employee V – own I – is informed P – contribute R – review S – approve (see the VIPRS matrix in the integrated management system manual of ČESKÁ RAFINÉRSKÁ, a.s.)		Shift Manager of the Production Section / Foreman of the Production Unit	Authorized operator of the Production Section	Rotating Equipment Maintenance Department	Contractor – Engineering maintenance	Instrumentation and Electrical Maintenance Department	Contractor – Electro
A	Permit-to-Work – fill in the header (engineering repair)	P		V	P	I	I
B	Permit-to-Work – define conditions	V/S	P	I	I	I	I
C	Identify the equipment	V			I		I
D	Switch off the equipment	V	P	I	I	I	I
E	Issue an equipment electrical securing request	V/P	V	P	I	R	I
F	Record into the handling logbook (Switch room – securing / date / time of receipt / equipment no. / requested by)	P					V
G	Electrical securing	I	I	I	I	I	V
H	Place safety signs on the switchboard						V
I	Record into the handling logbook (Switch room – securing / time of performing / way of securing – steps / performed by – name/signature)	P	P				V
J	Record into the handling logbook of requests and executions for electrical securing of equipment (FAR/FAS – date/time of execution / executed by – name, signature)	P	P				V
K	Test of securing by a local switch	V	P		P		P
L	Place safety/caution signs on the local switch	V	P		I		I
M	Record of the securing into the Engineering Maintenance’s Permit-to-Work	I	V	I			P
N	Hand over/take over the equipment for repair	V	P	P	P	I	I

Activity		Related documents
A	Permit-to-Work – fill in the header (engineering repair) The rotating equipment technician shall fill in the header of the Permit-to-Work.	
	Permit-to-Work – define conditions The party having defined the conditions (authorized person – see the directive no. 435 “Permit to Work”) is responsible for defining and meeting the conditions, adherence to which is necessary for safe execution of the work (electrical securing, blunting, reducing the temperature, etc.).	Directive no. 435 “Permit to Work”

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C	Identify the equipment	
	The person handing the equipment over for repair (authorized person) is responsible for identifying the equipment. They shall make sure that all involved persons know what piece of equipment the repair will take place on.	
D	Switch off the equipment	
	The authorized operator of the Production Section shall switch off (shut down) the equipment.	
E	Issue an equipment electrical securing request	
	The equipment securing request is issued by means of approval in the SAP environment and by means of making a record into the handling logbook of requests and executions for electrical securing of equipment.	<i>Manual “Permit to Work”</i>
F	Record into the handling logbook (Switch room – securing / date / time of receipt / equipment no. / requested by)	
	The Electro contractor shall record into the handling logbook the date, time of receipt of the request, equipment / outlet no. and the name of the person from whom the request for securing the equipment has been received.	
G	Electrical securing	
	The Electro contractor shall perform the electrical securing of the relevant equipment in line with the definition “Securing against switching on” (see the chapter 3 hereof).	
H	Place safety signs on the switchboard	
	Employees of the Electro contractor shall place on the switchboard a safety sign informing about the performed electrical securing and then they shall record it into so-called handling logbook at the relevant switch room.	
I	Record into the handling logbook (Switch room – securing / time of performing / way of securing – steps / performed by – name/signature)	
	The Electro contractor shall record into the handling logbook the time of performing the electrical securing, way of performing it, his/her name and signature.	
J	Record into the handling logbook of requests and executions for electrical securing of equipment (FAS/FAR - date/time of execution / executed by - name/signature)	
	The Electro contractor shall record into the handling logbook of requests and executions for electrical securing of equipment the date and time of executing the securing into the “Securing check” field and add his/her name, surname and signature.	
K	Test of securing by a local switch	
	Upon performing the electrical securing of the given equipment, an authorized operator of the Production Section shall make sure, by turning on the switch, that the equipment’s motor cannot be switched on.	
L	Place safety/caution signs on the local switch	
	The authorized operator of the Production Section shall place a sign saying “Caution, danger, do not handle the equipment” and record the check of the securing into the handling logbook of requests and executions for electrical securing of equipment.	
M	Record of securing into the Engineering Maintenance’s Permit-to-Work	
	The authorized operator shall record into the Engineering Maintenance’s Permit-to-Work that he/she has verified that the equipment has been electrically secured.	
N	Handover/Takeover the equipment for repair	
	The Shift Manager of the Production Section / Foreman of the Production Unit or an operator of the Production Section authorized by them shall hand over the equipment in a safe condition to the engineering maintenance contractor for repair.	

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5.3.2 Electrical releasing of the equipment after the engineering repair

Electrical releasing of the equipment after the engineering repair		Responsibility					
Activity \ Employee V – own I – is informed P – contribute R – review S – approve (see the VIPRS matrix in the integrated management system manual of ČESKÁ RAFINÉRSKÁ, a.s.)		Shift Manager of the Production Section / Foreman of the Production Unit	Authorized operator of the Production Section	Rotating Equipment Maintenance Department	Contractor – Engineering maintenance	Instrumentation and Electrical Maintenance Department	Contractor – Electro
A	Complete the engineering maintenance work	I	I	I/R	V		
B	Issue an equipment release request	V/P	V	P	I	I	I
C	Remove the safety/caution signs from the local switch	V	P		I		I
D	Record the release into the Engineering Maintenance's Permit-to-Work	I	V	I			P
E	Record into the handling logbook (Switch room – releasing / date / time of receipt / equipment no. / requested by)	P					V
F	Remove the safety/caution signs from the switchboard						V
G	Electrical release	I		I	P		V
H	Record into the handling logbook (Switch room – releasing / time of performing / way of releasing – steps / performed by – name/signature)	P	P			I	V
I	Record into the handling logbook of requests and executions for electrical securing of equipment (FAS/FAR – date/time of execution / executed by – name/signature)	P	P				V
J	End/close the Engineering Maintenance's Permit-to-Work.	V/S	P	P	P	I	I

Activity	Related documents
A Complete the engineering maintenance work The Engineering maintenance contractor's person responsible shall ensure that the work on the equipment is discontinued and shall notify the Shift Manager of the Production Section / Foreman of the Production Unit or his/her authorized deputy about the discontinuation / completion.	
B Issue an equipment release request The equipment release request takes place by means of approval in the SAP environment and by means of making a record into the handling logbook of requests and executions for electrical securing of equipment.	
C Remove the safety/caution signs from the local switch The authorized operator shall remove the caution signs from the local switch – the equipment is considered released.	
D Record the release into the Engineering Maintenance's Permit-to-Work The authorized operator shall record into the Engineering Maintenance's Permit-to-Work that the equipment has been electrically released. The engineering maintenance contractor must not work under this Permit-to-Work anymore.	
E Record into the handling logbook (Switch room – releasing / date / time of receipt / equipment no./requested by) The Electro contractor shall record into the handling logbook the date and time of receiving the request, equipment/outlet no. and the name of the person from whom the request for release has been received.	
F Remove the safety/caution signs from the switchboard The Electro contractor shall remove the safety/caution signs from the switchboards.	

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G	Electrical release
	The Electro contractor shall perform electrical releasing of the given equipment.
H	Record into the handling logbook (Switch room – releasing / time of performing / way of releasing – steps / performed by – name/signature)
	The Electro contractor shall record into the handling logbook the time of releasing, way of releasing, his/her name and signature.
I	Record into the handling logbook of requests and executions for electrical securing of equipment
	The Electro contractor shall record the check of the releasing into the handling logbook of requests and executions for electrical securing of equipment. He/she shall state the date, time, his/her full name and signature.
J	End/close the Engineering Maintenance’s Permit-to-Work
	The Permit-to-Work is ended once it contains a record of releasing the equipment and the releasing has been confirmed by the Electro contractor in the handling logbook of requests and executions for electrical securing of equipment.

6. Qualification

Qualification of persons performing work on electrical equipment is governed by the Regulation of qualifications in electrotechnics no. 50/1978 Coll.

7. Related documentation

7.1 Generally binding legal regulations

Regulation of the Czech Work Safety Authority and the Czech Mining Authority no. 50/1978 Coll., on expert qualifications in the field of electrotechnics, as amended

7.2 Technical standards

ČSN EN 50 110-1 ed. 2 “Operation of and work on electrical equipment”

7.3 Internal documentation

CEO Decision no. 01/2006 “Appointing Persons Responsible for Electrical Equipment under the ČSN EN 50110-1 ed. 2”

Directive no. 435 “Permit to Work”

PPÚ_406 “Operation and work on electrical equipment according to the ČSN EN 50110-1ed 2”

8. Appendices

The following appendices are only produced in the Czech language.

Appendix no. 406 / A “Handling logbook – part SECURING – RELEASING”

Appendix no. 406 / B “Handling logbook – part FAILURES- OTHER ACTIVITIES“

Appendix no. 406 / D “Sign – CAUTION, DANGER! DO NOT HANDLE THE EQUIPMENT!”