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Scope of validity:

UNIPETROL RPA, s.r.o. (excluding branches)



ELECTRIC ISOLATION PROCEDURE FOR ROTATING EQUIPMANT REPAIR

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Company executive

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For internal use only

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List of changes

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1 Purpose

Securing operation and work at the facilities of the Litvínov and Kralupy Refinery Units in a way that the health of employees does not become endangered by electric current or by undesirable start of the given equipment when equipment repairs are carried on.

Unambiguously dividing individual responsibilities for the conduct of individual activities between the employees of the operator of the¹ Litvínov and Kralupy Refinery Units and of the contractor.

2 Scope of validity

The document is valid for the following designated companies / branches:

- UNIPETROL RPA, s.r.o. BENZINA, odštěpný
 POLYMER INSTITUTE BRNO, odštěpný závod

The document is binding for the company employees and for the contractors who service and operate equipment at the Litvínov and Kralupy Refinery Units.

This edition cancels:

- Regulations 406, "Electric isolation of rotating equipment for repairs", Issue 4 from 16.2.2013, valid for ČESKÁ RAFINÉRSKÁ, a.s.

3 Terms, definitions and abbreviations

Abbreviation / Term / Definition	Explanation
Worksite	Delimited area for work on a given device or in its proximity.
Worksite security for work	Set of measures for securing safety of the workers. Worksites must be unambiguously designated and marked. Adequate workspace, access and lighting must be ensured for all parts of the devices that are used for or with a given work, or in the proximity of which work is conducted.
Securing devices against a repeated start	All circuit opening and closing devices that have been used for disconnecting electric equipment after working with it must be secured against a repeated start, ideally by locking the start mechanism. Should such a device not be lockable, appropriate measures must be adopted to prevent a repeated start in compliance with the given local conditions. Should an auxiliary power supply be used for controlling the given circuit opening and closing device, this power supply must be disconnected. Should circuit opening and closing devices with a remote control be used, the possibility of a repeated start must be eliminated. Parts of electric devices that remain charged after being disconnected from electricity, such as capacitors and cables, must be discharged using suitable means.

¹ UNIPETROL RPA, s.r.o.

Abbreviation / Term / Definition	Explanation
Putting electric devices back to operation	<p>Upon the work completion, all participating persons must be dismissed and informed that the work has been completed and no other work is permitted. All tools, equipment and devices used during the work must be removed. Only then the procedure for putting the device back to operation can commence.</p> <p>As soon as given safety measures are removed upon the completion of the given work and the procedure for putting the device into operational condition commences, this part of the electric device must be considered a device under voltage.</p>
Instruction "B"	<p>It is a written document that demonstrates the ordered technical and organizational measures used for ensuring occupational safety of employees who work with electric devices or in their proximity. Instruction "B" is described in detail in PPÚ_406, "Operation of electrical installations - Part 1: General requirements pursuant to ČSN EN 50110-1"</p>
Company	UNIPETROL RPA, s.r.o.
MV	Middle voltage
LV	Low voltage
Company employee	Physical person who has a labour relation with the company based on an employment contract or agreement, or physical person who holds a position in the company based on other agreements and contracts.
Contractor	Legal entity or physical person that has a commercial-law or civil relation with the company and that, as a contracting party (debtor), provides, resp. is obliged to provide, contracted activities (or activities that legally arise from the given contractual relation) for the company.

4 Electric isolation methods for engine outlets

4.1 Isolation method for LV outlets

MCC - (motor control centre) - it is isolated by turning the main switch to the "off" position + by locking it in compliance with the "Securing against a repeated start" definition (see Chapter 3 of this regulation).

OCEP - (steel sheet metal switchboard) - it is isolated by removing the power fuses or, if applicable, by turning the control voltage off in compliance with the "Securing against a repeated start" definition (see Chapter 3 of this regulation).

Turning the circuit breaker of in compliance with the "Securing against a repeated start" definition (see Chapter 3 of this regulation).

4.2 Isolation method for MV outlets

Instruction "B" is not issued for isolating devices where workers do not come in contact with any live parts and where no subsequent works will be conducted.

Instruction "B" is not issued for disconnecting, connecting and measuring MV electric engines and cables, provided the company of the contractor that maintains the given electric devices based on a contract has separate work procedures prepared for these works. In this case, instruction "B" is not issued for any subsequent works conducted on the given disconnected engine either.

MV switch - Persons who execute the isolation should check the given engine marking and its status (if it is or it is not running). They should subsequently isolate the MV switch(es) for the given engine based on the type of the used switch in compliance with the "Securing against a repeated start" definition (see Chapter 3 of this regulation). If the engine is off, they should also turn off the control mechanism and slide the switch out, install insulation dividers, test the voltage-free state of the switch outlet using an appropriate MV tester, return the switch to the revision position and put up the corresponding safety signs.

4.3 Electric isolation of rotating equipment for repairs

- The issuer of the conditions (shift manager / Refinery Unit foreman, or his/her authorized representative - see Regulation 435, "Work permit") is responsible for determining and complying with the given conditions; their compliance must be ensured for a safe implementation of the given equipment repair (electric isolation, sealing, reducing temperature, etc.).
- The person that is handing the equipment over for repairs (shift manager, foreman, Refinery Unit manager) should make sure that all participating parties know, which machine will be the subject of the repair (Machine identification).
- Based on an instruction of the shift manager or a production section foreman authorized by him/her, the authorized Refinery Unit operator turns the machine off. The shift manager or a foreman authorized by him/her, or an authorized company employee issues a request for electric isolation of the given device by recording it in the book of requests and implementations of electric isolations for individual devices² and notifies the given Electro contractor. The Electro contractor enters the date and time of the request acceptance, machine/outlet number and name of the person, from whom he/she accepted the isolation request, in the book of operations (located at the substation).

² A detailed description for issuing a request for electric isolation of rotating machines using the book of requests and implementations of electric isolations is included in the "Work permit" Handbook.

4.4 Electric release - after equipment repairs

- Upon the given equipment repair completion, all participating persons must be dismissed and informed that the work has been completed and no other work is permitted. All tools, equipment and devices used during the work must be removed. The contractor, resp. the work manager of the mechanical maintenance contractor should be responsible for properly terminating the work. Only then the procedure for putting the device back to operation can commence. The group manager should inform the Refinery Unit shift manager / production section foreman or his/her authorized representative about the completion of the mechanical works.
- Upon the notification about the device work completion, the authorized Refinery Unit operator should make sure that all the input and output pipes of the repaired device have been unsealed, the desludging (release) valves are closed and sealed, the pipeline route set, etc.
- The Refinery Unit shift manager / production section foreman or an authorized company employee issues a request for electric release of the given device by recording it in the book of requests and implementations of electric isolations for individual devices³ and notifies the given Electro contractor.
- The authorized Refinery Unit operator removes the "Attention, do not use the device" sign from the device switch. The machine is ready to be put in operation.
- The authorized operator records the fact that the device was electrically released on the corresponding mechanical maintenance work permit. The mechanical maintenance contractor must not conduct any work using the mentioned work permit anymore.
- The Electro contractor enters the date and time of the request acceptance, machine/outlet number and name of the person, from whom he/she accepted the release request, in the book of operations (located at the substation). He/she removes the signs from the switchboard and electrically releases the given machine. Moreover, he/she records the release time, release manner and his/her name, and attaches his/her signature in the book of operations.
- The Electro contractor records the release of the machine in the book of requests and implementations of electric isolations in the release inspection field.
- **Upon the completion of the release, both parties** (Refinery Unit shift manager / production section foreman, or authorized company employee) **sign the termination of the given mechanical maintenance work permit and the device is ready to be put in operation.**
- Should it be necessary to continue with the equipment repair, the procedure specified in Chapter 5.1, Electric isolation of rotating [equipment for repairs](#) equipment repairs (see 5.3, Responsibility matrix), must be observed, which means a new mechanical maintenance work permit must be issued, and so does a new electric isolation request in the operation book of requests and implementations of electric isolations for individual devices.
- Should it be necessary to subsequently balance the machine unit at operation temperatures, this work must be conducted based on a new work permit.

4.5 Qualification

The qualification of the persons who conduct work on electric devices is governed by Decree on technical qualification in electrotechnics no. 50/1978 Coll.

³ A detailed description for issuing a request for releasing a given device electrically using the book of requests and implementations of electric isolations is included in the "Work permit" Handbook.

5 Responsibilities

5.1 Electric isolation of rotating equipment for repairs

Activity \ Worker		Responsibility					
		Refinery Unit shift manager / production section foreman	Authorized Refinery Unit operator	Rotating equipment maintenance department	Contractor - Mechanical maintenance	Instrumentation and electro maintenance department	Contractor - Electro
V - owns I - is informed P - participates R - revises S - approves							
A	Work permit - completing the heading (equipment repair)	P		V	P	I	I
B	Work permit - specifying conditions	V/S	P	I	I	I	I
C	Machine identification	V			I		I
D	Turning the machine off	V	P	I	I	I	I
E	Issuing request for electric isolation of rotating machines	V/P	V	P	I	R	I
F	Record in the book of operations (Substation - isolation / date / acceptance time / machine number / requested by)	P					V
G	Electric isolation	I	I	I	I	I	V
H	Placing a warning sign on the switchboard						V
I	Record in the book of operations (Substation - isolation / implementation time / isolation manner - operations / implemented by - name/signature)	P	P				V
J	Record in the book of requests and implementations of electric isolations for individual devices (FAR/FAS - date/implementation time / conducted by - name, signature)	P	P				V
K	Isolation test using the local switch	V	P		P		P
L	Placing a warning sign on the local switch	V	P		I		I
M	Isolation record on the corresponding mechanical maintenance work permit	I	V	I			P
N	Handing over/Accepting equipment for repairs	V	P	P	P	I	I

Activity	Related documents
A Work permit - completing the heading (equipment repair) The technician of the rotary machines fills in the heading of the work permit.	
B Work permit – specification of the conditions The issuer of the conditions (authorized person - see Regulation 435, "Work permit") is responsible for determining and complying with the given conditions; their compliance must be ensured for a safe implementation of the given work (electric isolation, sealing, reducing temperature, etc.).	Regulation 435, "Work permit"
C Machine identification The person who hands the device over for repairs (authorized person) is responsible for the corresponding machine identification. He/she should make sure that all participants know, which machine will be the subject of the repairs.	
D Turning the machine off The authorized Refinery Unit operator turns the machine off.	

Activity		Related documents
E	Issuing request for electric isolation of a rotating machine	
	Machine isolation requests are approved in the SAP environment and by recording them in the book of requests and implementations of electric isolations for individual devices.	"Work permit" handbook
F	Record in the book of operations (Substation - isolation / date / acceptance time / machine number / requested by)	
	The Electro contractor enters the date and time of the request acceptance, machine/outlet number and name of the person, from whom he/she accepted the machine isolation request, in the book of operations.	
G	Electric isolation	
	The Electro contractor electrically isolates the corresponding machine in compliance with the "Securing against a repeated start" definition (see Chapter 3 of this regulation).	
H	Placing a warning sign on the switchboard	
	Employees of the Electro contractor place a warning sign on the switchboard, inform about the implemented electric security and, subsequently, record the corresponding report in the book of operations at the given substation.	
I	Record in the book of operations (Substation - isolation / implementation time / security manner - operations / implemented by - name/signature)	
	The Electro contractor records the electric isolation implementation time, implementation manner and his/her name, and attaches his/her signature, in the book of operations.	
J	Record in the book of requests and implementations of electric isolations for individual devices (FAR/FAS - date/implementation time / conducted by - name, signature)	
	The Electro contractor records the isolation implementation date and time in the book of requests and implementations of electric isolations for individual devices in the "Isolation inspection" field, and his/her first name, last name and signature.	
K	Isolation test using the local switch	
	Upon the implementation of electric isolation of the given device, the authorized Refinery Unit operator should make sure that the device engine cannot be started by turning the switch on.	
L	Placing a warning sign on the local switch	
	The authorized Refinery Unit operator posts the "Attention, do not use the device" sign and records the security inspection to the book of requests and implementations of electric isolations for individual devices.	
M	Isolation record on the corresponding mechanical maintenance work permit	
	The authorized operator records the fact that he/she verified that the device was electrically isolated to the corresponding mechanical maintenance work permit.	
N	Handing over/Accepting equipment for repairs	
	The Refinery Unit shift manager / production section foreman or a Refinery Unit operator authorized by him/her submits the machine set in a safe condition for repairs to the Mechanical maintenance contractor.	

5.2 Electric release of the rotating equipment after repairs

Electric isolation of rotating equipment for repairs		Responsibility					
Activity \ Worker		Refinery Unit shift manager / production section foreman	Authorized Refinery Unit operator	Rotating equipment maintenance department	Contractor - Mechanical maintenance	Instrumentation and electro maintenance department	Contractor - Electro
		V - owns I - is informed P - participates R - revises S - approves					
A	Mechanical maintenance work completion	I	I	I/R	V		
B	Issuing request for a machine release	V/P	V	P	I	I	I
C	Removing the warning sign from the local switch	V	P		I		I
D	Release record on the corresponding mechanical maintenance work permit	I	V	I			P
E	Record in the book of operations (Substation - release / date / acceptance time / machine number / requested by)	P					V
F	Removing the warning sign from the switchboard						V
G	Electric release	I		I	P		V
H	Record in the book of operations (Substation - release / implementation time / release manner - operations / implemented by - name/signature)	P	P			I	V
I	Record in the book of requests and implementations of electric isolations for individual devices (FAR/FAS - date/implementation time / conducted by - name/signature)	P	P				V
J	Mechanical maintenance work permit termination	V/S	P	P	P	I	I

Activity		Related documents
	Mechanical maintenance work completion	
A	An authorized person of the Mechanical maintenance contractor ensures the work on the given machine is suspended and notifies the Refinery Unit shift manager / production section foreman or a representative authorized by him/her about the work suspension / termination.	
	Issuing request for a machine release	
B	Machine release requests are approved in the SAP environment and by recording them in the book of requests and implementations of electric isolations for individual devices.	
	Removing the warning sign from the local switch	
C	The authorized operator removes the warning signs from the local switch - the device is now considered released!	
	Release record on the corresponding mechanical maintenance work permit	
D	The authorized operator records the fact that the device was electrically released to the corresponding mechanical maintenance work permit. The mechanical maintenance contractor must not conduct any work using the mentioned work permit anymore.	
	Record in the book of operations (Substation - release / date / acceptance time / machine number / requested by)	
E	The Electro contractor enters the date and time of the request acceptance, machine/outlet number and name of the person, from whom he/she accepted the release request, in the book of operations.	
	Removing the warning sign from the switchboard	
F	The Electro contractor removes the warning signs from the switchboards.	
	Electric release	
G	The Electro contractor electrically releases the corresponding machine.	

Activity		Related documents
H	Record in the book of operations (Substation - release / implementation time / release manner - operations / implemented by - name/signature)	
	The Electro contractor records the release time, release manner and his/her name, and attaches his/her signature in the book of operations.	
I	Record in the book of requests and implementations of electric isolations for individual devices	
	The Electro contractor records the release inspection to the book of requests and implementations of electric isolations for individual devices. He/she includes the date, time, his/her entire name and signature.	
J	Mechanical maintenance work permit termination	
	Work permit is terminated as of the moment it includes a record on the given machine release, provided such a release has been confirmed by the Electro contractor in the book of requests and implementations of electric isolations for individual devices.	

6 List of related documents

6.1 Generally binding legal regulations

Decree of the Czech Office for Safety and Czech Mining Office No. 50/1978 Coll., on technical qualification in electrotechnics, as amended.

6.2 Technical standards

ČSN EN 50110-1ed.3, "Operation of electrical installations - Part 1: General requirements".

6.3 Internal documentation

Decision 2018/18, "Authorization of people responsible for the condition of dedicated technical devices, dedicated fire safety devices and dedicated material fire protection equipment"

Regulation 435, "Work permit"

PPÚ_406, "Operation of electrical installations - Part 1: General requirements pursuant to ČSN EN 50110-1"

PRP-01 – JRKR, "Work procedure for isolating devices when the locking and marking LOTO system is used"

7 Separate appendixes

Appendix 406/A, "Book of operations - ISOLATION - RELEASE part"

Appendix 406/B, "Book of operations - MALFUNCTIONS - OTHER ACTIVITIES part"

Appendix 406/C, "ATTENTION, HAZARD! DO NOT USE THE DEVICE sign"