The standard is binding on all subjects (natural and legal entities) performing attendance/operation and works on el. substation equipment using the determined protective equipment and working facilities within ORLEN UNIPETROL RPA, s.r.o. Does not apply to the Litvínov and Kralupy Refinery Unit.

Table of contents:

1 Introductory provisions....2
2 Scope of validity.... **Chyba! Záložka není definována.**
3 Terms, definitions, abbreviations .... **Chyba! Záložka není definována.**
4 General....4
5 Testing 9
6 Inspection under operation .... **Chyba! Záložka není definována.**
7 List of related documents....10
ANNEX A 12

1 Introductory provisions

This standard elaborates provisions of the legal regulations and technical standards for the conditions of UNIPETROL RPA, s.r.o. concerning determination of minimum amount and types of personal protective equipment and working facilities for el. substations from the safety point of view, which must be available for the attendance and maintenance staff.

This standard continue in experience with use of the company energy standards for power distribution PNE 38 1981 ed.3, (Personal protective and working facilities for el. substations of the distribution and transmission systems), based on the cancelled standard ČSN 38 1981 and PNE 35 9700 ed.3 (Dielectric protective and working facilities for common use in the distribution and transmission systems), based on the cancelled standard ČSN 35 9700.

The above mentioned ČSN standards have been cancelled due to contradictions with valid ČSN standards since 1.12.2003.

For the power engineering field of UNIPETROL RPA, spol. s.r.o. within Chempark Záluží premises, the standards have been replaced by this company standard N 11 010.

The standard does not define means and auxiliaries for assembly and revision of the distribution system of el. substations or specific tools and devices used for life working (work under voltage).

2 Scope of validity

The standard is valid within UNIPETROL RPA, spol. s.r.o., in particular for the Maintaining entity, Operator, LDS and Contractors executing their activities within the Chempark Záluží premises. The obligation of the external companies to accept and comply with this standard must be embodied in the Contract for work or any other similar contract between UNIPETROL RPA, s.r.o. and the Contractor, or the Lessee.

3 Terms, definitions, abbreviations

Company	- UNIPETROL RPA, s.r.o.
Chempark Záluží (premises)	- premises of UNIPETROL RPA, s.r.o., i.e. basic premises, petrochemical plants, low-temperature storage, waste water treatment facility, logistics center and other coherent fenced and unfenced areas outside the fenced premises, e.g. warehouses and landfills that the company owns, uses or under the company´s custody.
Contractor (electro)	- Natural or legal entity who wields a certificate of the relevant scope for installation, repairs, maintenance of electrical equipment together with a valid trade licence.
Contractor (general)	- Natural or legal entity selected for implementation of the order.
Operator	- UNIPETROL RPA, s.r.o. represented by its Executive pursuant to the company articles of association. The Executive is entrusted with the duty to properly maintain custody over the means entrusted to him/her by the employer and must guard and protect the assets against damage, loss,

	destruction and misuse and he/she may not act in contradiction with the legitimate employer's interests and he/she must ensure timely and effective measures for protection of its assets. For the purpose of fulfilment of the associated obligations, the operator nominates the users and maintenance entities, which is done through management, organizational and technical standards.
User	- head of any organizational section (e.g. Director of division, plant, or head of a department, plant or a section), to whom the assets are entrusted by the operator for use. He/she is responsible for compliance with the conditions needed for safe and steady operation in compliance with the guidance and regulations determined for the use, operation and attendance of the assets.
Maintaining entity	- Head of maintenance section, Head of LDS plant, Head of site management or an employee assigned otherwise, who is responsible for technical condition of identified individual groups of tangible assets, including maintenance, repairs, inspections and tests.
ČSN	- Czech technical standard
LDS	- local distribution system of UNIPETROL RPA, s.r.o. operated based on the licence for electricity distribution in the respective cadastral areas.
PLDS	- LDS operator, plant Electro, Energy service unit.
MPBP	- local operational and safety regulation

4 General

4.1 What concerns equipment of the el. substations, these are divided as per determination of their use for the needs of UNIPETROL RPA, s.r.o.

4.2 The following tables 2 and 3 contain the basic (minimal) list of equipment and facilities together with the number of pieces. As per the nature of the substation, the basic list may be extended by the operator in a form of local, operating and safety regulations (MPBP) both what concerns the number of facilities and types of facilities, which are not considered in the tables (e.g. telescopic manipulation rod, measurement rods and multi-purpose insulating rods for electrical operations on medium (high) voltage installations pursuant to ČSN EN 50508:2009, etc.).

4.3 Classification of the substations is provided in the table „Table 1“ below:

Table 1: Classification of substations in terms of equipment with the facilities

Determination of substation	Designation of group	
	with attendance *	without attendance **
Substations 110kV	1	
Distribution transformer stations of HV/LV - transformer stations in civil structures (built-in or independent – kiosk bricked or tower)	2	2a
HV substations	3	3a
LV substations	4	4a
Computer rooms (server rooms)		5a

Legend:
* substations with attendance staff include substations with permanent attendance with supervision (see ČSN 33 0050-605)
** substations without attendance staff including the remote control substations (see ČSN 33 0050-605)

4.4 It is recommended to situate the facilities located in the el. substations as per determination of the substation:

4.4.1 with attendance:

- in the control room, substation or in an appropriate room close to the distributing system.

4.4.2 without attendance:

- **As for distribution transformer stations of HV/LV - group 2a** facilities listed in „Table 2“ under items No. 18, 20, 21, 23, in the substation or in an appropriate room in the vicinity of the distribution system, other facilities as a part of employee equipment or group equipment.
- **As for medium/high voltage substations - groups 3 and 3a** facilities listed in „Table 2“ under items No. 18, 20, 21, 23, 24 in the substation, other facilities as a part of employee equipment or group equipment.

- **<u>As for low voltage substations - groups 4, 4a and 5a</u>** facilities listed in „Table 2“ under items No. 18, 20, 21, 23, in the substation, other facilities as a part of employee equipment or group equipment.

4.4.3 Facilities that may be located in the accumulator (battery) room or in its vicinity arise from the table *„Table 3: Protective equipment available in the accumulator (battery) room in the substation “*.

4.5 The facilities must be stored at accessible place, clearly and concentrated in order not to be devaluated by effects of the environment, rodents, insects or mechanical damage.

4.5.1 Storage conditions are determined in detail by the respective standards. Areas, where the facilities are stored, must comply with the following requirements:

- Must be dry – relative humidity approx. 40 - 70 %,
- Must not be dusty,
- Must be protected against direct sun shine and ionizing radiation.

4.5.2 The user must adhere to the instructions and manuals of the manufacturer in terms of use, storage, verification of functional and dielectric properties of the facilities.

4.6 Perfect condition of determined facilities must be verified in a form of periodical tests, in case the respective technical and subject standards require so. In case of facilities, where the periodical test is not defined as per respective standard, the perfect condition is verified by an inspection pursuant to art. 6, hereof. Defective facilities must be excluded from further use.

4.7 The facilities must be available already during complex tests of the new equipment of the substation.

4.8 What concerns equipment of the substations with facilities, the el. substations are divided as per determination of voltage and size, see the table *„Table 2: Equipment of the el. substation as per determination of voltage and size“*.

4.9 The following tables 2 and 3 contain **the basic (minimum)** list of facilities and number of pieces.

Table 3: Equipment of the el. substation as per determination of voltage and size

Station		Station 1, 2, 2a, 3, 3a (medium/high/very high voltage)			Station 4, 4a, 5a (low voltage)			Revision periods of tests (in months)
Subject-matter		Number of fields			Number of fields			
		1-30	above 30	with attendance	1-5	5-20	above 20	
1.	Live conductor tester – Medium or high voltage (very high voltage)	1	2	2	-	-	-	24
2.	Phasing sets	DP	DP	DP	-	-	-	24
3.	Short-circuiting set as per (ČSN EN 61219; ČSN EN 61230 ed.2) or short-circuiting device in distribution boxes	2	3	3	DP	DP	DP	-
4.	Insulating barriers [1]	DP	DP	DP	DP	DP	DP	-
5.	Locks for position OFF	MP	MP	MP	MP	MP	MP	-
6.	Discharge rods (discharge device) - ČSN 35 9703	DP	DP	DP	DP	DP	DP	-
7.	Insulating gloves for electro-technology up to 500V, or 1000V	2	2	2	1	1	1	12
8.	Protective full-face mask	1	1	1	DP	1	1	-
9.	Insulating footwear up to 1000V	1	2	2	1	1	1	24
10.	El. insulating matting 2x1m as per ČSN EN 61111	1	1	1	1	1	1	-
11.	Rescue hooks (ČSN 35 9701)	DP	DP	DP	DP	DP	DP	24
12.	Foldable stretcher	-	-	1	-	-	-	-
13.	First aid box	ST	ST	1	ST	ST	ST	-
14.	Mobile lamp	ZA	ZA	1	ZA	ZA	ZA	-
15.	Disconnecting rod - insulated (ČSN 35 9701)	DP	DP	DP	DP	DP	DP	24
16.	Fuse tongs	DP	DP	DP	DP	DP	DP	24
17.	Telephone set (fixed line)	1	1	1	ZA Mob.	ZA Mob.	ZA Mob.	-
18.	**Safety tables from insulation material as per ČSN ISO 3864 (01 8010). Designation of tables as per ČSN ISO 3864 (01 8010)[2]**							
	Medium(high) voltage – life in danger	2	4	4	-	-	-	-
	Attention – live	2	4	4	2	2	2	-
	Attention – back current	2	2	2	2	2	2	-
	Attention – earthed	2	4	4	2	2	2	-
	Attention – live system	2	4	4	2	2	2	-
	Attention – works on equipment	2	4	4	2	2	2	-
	Work only here	2	4	4	2	2	2	-
	Do not switch on, works in progress	2	4	4	2	2	2	-
	Exit	2	3	3	-	1	2	-
19.	Local safety regulations and working instructions	MP	MP	MP	MP	MP	MP	-

(manipulation diary; order B)							
20. First aid – poster	1	1	1	1	1	1	-
21. Fire alarm directives	1	1	1	1	1	1	-
22. Extinguisher	PO	PO	PO	PO	PO	PO	-
23. Single-line diagram	1	1	1	1	1	1	-
24. Working instructions	1	1	1	-	-	-	-
25. List of equipment	1	1	1	1	1	1	-

[1]Equipment with respective types of facilities depends on the el. substation design

[2] Number of safety tables is understood as minimum. The number may be increased as needed.

MP – local regulation

DP – as needed

ZA – permanent equipment of employee

PO – as per fire regulations

ST – available at dedicated place

ZA Mob.- mobile phone of employee

Table 4: Protective equipment available in the accumulator (battery) room in the substation

Equipment item		Accumulator (battery) room		
		with open cells	with closed cells	with controlled valve[1)]
		Facilities – number of pieces		
1*	Swinging frame for acid tank	1	-	-
2	Rubber wellington boots (pairs)	1	-	-
3	Rubber protective apron	1	-	1
4	Chemical protective shield (ČSN EN 166)	1	1	1
5	Chemical protective gloves (ČSN EN 374 -1-3)	1	-	1
6*	Wooden lath mat - portable	1	-	-
7	Rubber rug (1 x 1) m	1	1	-
8*	Tank for electrolyte filling	1	-	-
9*	Tank with neutralizing solution	1	-	-
10*	Ecological sorbents	1	-	-
11*	Battery oper. manual	1	1	1
12*	Instructions on first aid in case of acid or caustic burns	1	1	1
13	First aid box	ST	ST	ST
14*	Source of water for rinsing the parts contaminated with acid (running water or vessel with clean water of min. 20l content, properly designated)	1	1	-
15	List of actual equipment of the substation	1	1	1

Notes:

1) hermetically sealed cells – service-free.

* facilities and equipment may be located directly inside the accumulator room, others may be located in the vicinity of the accumulator (battery) room.

ST - available at dedicated place

5 Testing

5.1 Facilities, for which a periodical test of their condition is prescribed, arise from the table „Table 4“. The given maximum periods for periodical tests may be shortened by the Maintaining entity as per local conditions, frequency of use and effects of the ambient environment.

Table 5 : Periods for periodical inspection and tests of protective equipment and working facilities

Activity	Scope of activity - operations	Period (months)	Record
Periodic inspection	Inspection of cleanness	6	form „ANNEX A“
	Inspection of dryness	6	
	Inspection of intactness	6	
	Inspection of non-deformation	6	
	Inspection as per manufacturer´s recommendation	6	
	Inspection of short-circuiting set designation	6	
	Inspection whether it contains date of the test with designation of the test laboratory or legible stamp with valid test date	6	
	Inspection of completeness as per list of equipment of the respective substation	6	
	Inspection of storage	6	
Test	Facilities and periods for which the test is carried out are defined in table „Table 2“ The method of prescribed tests is not defined in this standard as these are executed by suppliers and the scope of tests is governed by the ČSN EN and by the manufacturer´s recommendations.	24	Supplier´s protocol + form „ANNEX A“

5.2 Protective equipment and work facilities, which do not pass the executed inspection activities or revisions, must be eliminated and the respective Maintaining entity must be notified of this elimination.

6 Inspection under operation

6.1 Before each use of the given facilities their external mechanical conditions must be checked through a visual inspection. Surface of the facilities must not be grossly damaged, protective collar must be on place and the hollow rods must be sealed. The facilities must not be deformed and connecting parts must ensure easy assembly of the facility without extensive effort. The facilities with external mechanical condition visibly damaged are excluded without further testing. Indication equipment will be verified by the control element of indication equipment in case of live conductor testers and phasing sets.

6.2 LDS operator/contractor is obliged to check the external mechanical condition of all facilities and their storage method periodically. Periods of inspections under operation are defined in this standard, in the table „Table 4“. The maintainer may shorten this period in MPBP as per the type of operation and frequency of the facility use. These periods must not exceed 6 months and execution of the inspection must

be demonstrably documented by entry in the form „ANNEX A“, where the facilities may be registered under the reg. number or other identification numbers.

6.3 The inspections under operation verify, whether:

6.3.1 Insulating gloves, footwear and rugs, personal protective equipment against fall from height are clean, dry, intact and permanently non-deformed and non-mouldy,

6.3.2 Disconnecting rods, fuse tongs, rescue hooks, etc. are clean, the surface are not grossly damaged (due to moisture absorption), protective collars and plugs against inner moisture absorption are not missing, designation of rated voltage for the facility is clearly legible, what concerns segmented facilities, all segments are designated,

6.3.3 Live conductor testers (if they contain internal source, the functionality test is carried out by a test button), phasing sets, manipulation rods are clear, dry with protective collars and plugs, with intact surface, non-deformed and with legible designation of the rated voltage in particular, what concerns segmented facilities, all segments are designated including serial or registration number,

6.3.4 Short-circuiting sets have intact conductor and earthing terminals, intact cross-section of earthing ropes, intact connection of earthing rope with connecting shackles, mechanical condition does not display apparent damage of insulating rods,

6.3.5 As for facilities equipped with the control element of indication equipment (indicator) it indicates presence and what concerns phasing sets, it indicates non-presence of voltage on the contact electrode of the live conductor tester, presence and non-presence of correct sequence of phases between two parts.

6.4 Facilities that do not comply with requirements of N 11 010 or other relevant standard, or that are missing the designation of execution of the periodic test, the LDS operator/contractor shall exclude them from use and afterwards repair them according to the possibilities (gluing the collars, renewal of designation, etc.) or send it for repair. Upon agreement with the Maintaining entity the LDS operator/contractor shall invalidate the irreparable facilities and exclude them from use. The facilities after repair must be tested as per the respective standard.

7 List of related documents

ČSN EN 50110-1 ed.2 - Operation of electrical installations

PNE 38 1981 ed.3 – Personal protective and working facilities for el. substations of the distribution and transmission systems (company standard for power distribution system)

PNE 35 9700 ed.3 - Dielectric protective and working facilities for common use in the distribution and transmission systems

ČSN 33 0010 – Electro-technical regulations. Electric appliances - Classification and definitions (effective from 03/1984)

ČSN 33 0050-605 - International Electro-technical Vocabulary: Chapter 605: Generation, transmission and distribution of electricity - Substations

ČSN ISO 3864 - Safety colours and safety signs

ČSN EN 50272-2:2002 - Safety requirements for secondary batteries and battery installations. Part 2, Stationary batteries (36 4380)

ČSN EN 60855:1998 - Insulating foam-filled tubes and solid rods for live working (35 9711)

ČSN EN 60903 ed.2:2004 - Live working - Gloves of insulating material (35 9716)

ČSN EN 61219:1997 - Live working Earthing or earthing and short circuiting equipment using lances as short-circuiting device Lance earthing (35 9718)

ČSN EN 61230 ed.2:2009 - Live working Portable equipment for earthing or earthing and short-circuiting (35 9722)

ČSN EN 61243-1:2006 - Live working Voltage detectors. Part 1, Capacitive type to be used for voltages exceeding 1 kV (35 9724)

ČSN EN 61243-2:1999 - Live working Voltage detectors. Part 2, Resistive type to be used for voltages of 1 kV to 36 kV (35 9724)

ČSN EN 61243-3 ed.2:2011 - Live working Voltage detectors. Part 3, Two-pole low-voltage type (35 9724)

ČSN EN 61243-5:2001 - Live working Voltage detectors. Part 5, Voltage detecting systems (VDS) (35 9724)

ČSN EN 62193:2004 - Live working Telescopic rods and telescopic measuring rods (35 9737)

ČSN EN 50508:2009 - Multi-purpose insulating rods for electrical operations on medium (high) voltage installations AC 1 kV

ČSN EN 50321:2001 - Electrically insulating footwear for working on low voltage installations (35 9725)

ČSN EN 50365:2002 - Electrically insulating helmets for use on low voltage installations (35 9727)

ČSN EN 61481:2002 - Live working Portable phase comparators for voltages of 1 kV to 36 kV a.c. (35 9736)

ČSN EN 61111:2012 - Live working – Electrically insulating rug (35 9738)

ČSN EN 374-1:2004 - Protective gloves against dangerous chemicals and micro-organisms. Part 1, Terminology and performance requirements for chemical risks (83 2310)

ČSN EN 374-2:2004 - Protective gloves against dangerous chemicals and micro-organisms. Part 2:, Determination of resistance to penetration (83 2310)

ČSN EN 374-3:2004 - Protective gloves against dangerous chemicals and micro-organisms. Part 3: Determination of resistance to chemicals penetration (83 2310)

ČSN EN 166:2002 - Personal eye-protection - Specifications (83 2401)

Directive 401 – Basic OHS regulation

ANNEX A

Template of the Inspection protocol on protective equipment and working facilities

PRILOHA A -
PROHLIDKY PP