**ORDER**

**№ A 427**

**Sofia, 08.07.2022**

**AMEND**

EA BAS order reg.№ А 99/09.02.2022

**INSPECTION BODY OF TYRE C „ES and RZA“**

**at „ELECTRORAZPREDELITELNI MREJI ZAPAD“ AD, SOFIA**

**Management address:** 1784 Sofia, 159 Tsarigradsko Shosse Blvd.

**Office address:** 1303 Sofia, 1 Ohridsko ezero Str

**To perform inspection of:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Scope type:** *Flexible \** | | | | | | | |
| № | | Field of Inspection | Type of Inspection | Parameter of Inspection / Characteristic | Test and Measurement Methods Used During Inspection, Inspection Procedure | Regulations, Standards, Specifications, Schemes | |
| **1** | | **2** | **3** | **4** | **5** | **6** | |
| 1 | |  | **ELECTRICAL INSTALLATIONS AND EQUIPMENT OVER 1000 V** | | | | |
| 1.1. | | Commutation equipment | New and operating sites and facilities | **І.** CIRCUIT BREAKER:: | | |  |
| 1. Insulation resistance | БДС EN 62271-  100/AI NIEMS  ПК No. 7 09 | | Ordinance No 3  (SG, No 72/2004)  Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| 2.Transient contact surfaces resistance | БДС EN 62271- 100/A1  NIEMS  ПК No. 7 09 | | Ordinance No 3  (SG, No 72/2004)  NIEMS  TS |
| **II. DISCONNECTOR:** | | |  |
| 1. Insulation resistance | NIEMS  ПК No. 7 09 | | Ordinance No 3  (SG, No 72/2004)  Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| 2. Transient contact surfaces resistance | NIEMS  ПК No. 7 09 | | Ordinance No 3  (SG, No 72/2004)  NIEMS  TS |
| **III. Terminals and feed-through insulators:** | | |  |
| 1. Insulation resistance | Bulgarian State Standard БДС 7684  NIEMS  ПК No. 7 09 | | Ordinance No 3  (SG, No 72/2004)  Ordinance No 16-116 (SG, No 26/2008) NIEMS  TS |
| **IV. CHAIN AND SUPPORT**  **INSULATORS:** | | |  |
| 2. Insulation resistance | Bulgarian State Standard БДС 3637 ПК N°-7 09 | | Ordinance No 3  (SG, No 72/2004)  NIEMS  TS |
| **V. ELEMENTS AND SECONDARY CIRCUITS OF COMPLETE SWITCHGEARS:** | | |  |
| 1. Insulation resistance | БДС 15089  NIEMS  ПК N-7 09 | | БДС 10699  Ordinance No 3  (SG, No 72/2004)  Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| 2.Transient contact surfaces resistance | БДС 15089  NIEMS  ПК N-7 09 | | Ordinance No 3  (SG, No 72/2004)  Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| **1.2** | | CABLE LINES UP TO 35 kV | New and operating sites and facilities | 1. Insulation resistance | БДС 1986  ПК No. 7 12 | | Ordinance No 3  (SG, No 72/2004)  Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| 2.Increased voltage of cable lines | БДС 2581  БДС 2406  NIEMS  ПК Nо. 7 12 | | БДС 2581  Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 3. Increased voltage with ultra-low frequency 0,1Hz  (VLF) | БДС EN 60060-3  ПК No 7 12 | | IEEE 400.2: 2013  TS |
| 4. Resistance and integrity of conductive cores | БДС 2374  NIEMS  ПК Nо. 7 12 | | NIEMS  TS |
| 1.3 | | POWER TRANSFORMERS | New and operating sites and facilities | 1. Insulation resistance of windings | БДС 16654  ПК No. 7-04 | | Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| 2. Absorption index  R60/R15 | БДС 16654  ПК No. 7-04 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 3. Electric current and idle time losses: | | |  |
| a. For transformers from 25 кVA to 1600 кVA | БДС 15320ПК N7 04 | | БДС 5034БДС 5060Ordinance No 16-116 (SG, No 26/2008)Ordinance No 3(SG, No 90 and 91/2004)NIEMSTS |
| b. For transformers from 2500 кVA to 63000 кVA | БДС 15320ПК N°-7 04 | | БДС 5060NIEMSTS |
| 4. Short-circuit losses | | |  |
| a. For transformers from 25 кVA to 1600 кVA | БДС 15320ПК No.7 04 | | БДС 5034БДС 5060Ordinance No 16-116 (SG, No 26/2008)Ordinance No 3(SG, No 90 and 91/2004)NIEMSTS |
| b. For transformers from 2500 кVA to 63000 кVA | БДС 15320  ПК N°-7 04 | | БДС 5060  БДС 16654  Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 5. Winding connection group | БДС 15320  ПК N°-7 04 | | Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| 6. Transformation coefficient | БДС 15320  NIEMS  ПК N°-7 04 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 7. Windings resistance | БДС 15320  NIEMS  ПК N°-7 04 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 8. Transformer oil breakdown voltage | БДС EN 60 156  ПК No 7 04 | | БДС EN 60296  Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| 1.4 | | CURRENT MEASUREMENT TRANSFORMERS | New and operating sites and facilities | I. DRY to 20 kV | | |  |
| 1. Insulation resistance | БДС 10370  NIEMS  ПК 7 05 | | Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| 2. Windings resistance | БДС 15320  NIEMS  ПК 7 05 | | Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 3. Volt-Ampere characteristic | БДС 10370  NIEMS  ПК 7 05 | | Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 4.Increased voltage with frequency 50 Hz | БДС 10370  NIEMS  ПК No 7 05 | | NIEMS  TS |
| 5.Tranformation coefficient | NIEMS  ПК No 7 05 | | Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 6. Marking of terminals | NIEMS  ПК No 7 05 | | Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| II. OIL-FILLED 110 kV | | |  |
| 1. Insulation resistance | NIEMS  ПК No 7 05 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 2. Windings resistance | БДС 15320  NIEMS  ПК No 7 05 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 3. Volt-Ampere characteristic | NIEMS  ПК No 7 05 | | Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 4.Increased voltage with frequency 50 Hz | NIEMS  ПК No 7 05 | | NIEMS  TS |
| 5.Tranformation coefficient | БДС 15320  NIEMS  ПК No 7 05 | | NIEMS  TS |
| 6. Marking of terminals | NIEMS  ПК No 7 05 | | NIEMS  TS |
| 7. Insulation oil breakdown voltage | БДС EN 60156  ПК 7 05 | | БДС EN 60296  Ordinance No 16-116 (SG, No 26/2008)  NIEMS  TS |
| 1.5 | | VOLTAGE MEASUREMENT TRANSFORMER | New and operating sites and facilities | I. DRY UP TO 20 kV | | |  |
| 1. Insulation resistance | ПК 7 05  NIEMS | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 2. Windings resistance | БДС 15320  ПК 7 05 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS  TS |
| 3. Volt-Ampere characteristic | ПК 7 05  NIEMS | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 4.Increased voltage with frequency 50 Hz | ПК 7 05  NIEMS | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 5.Tranformation coefficient | БДС 15320  NIEMS  HПК 7 05 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| **II. OIL-FILLED 110 kV:** | | |  |
| **1.** Insulation resistance | ПК 7 05  NIEMS | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| **2. Windings resistance** | ПК 7 05  NIEMS | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| **3. Volt-Ampere characteristic** | ПК 7 05  NIEMS | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| **4.Increased voltage with frequency 50 Hz** | ПК 7 05  NIEMS | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| **5.Tranformation coefficient** | ПК 7 05  NIEMS | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 6. Marking of terminals | ПК 7 05  NIEMS | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 7. Insulation oil breakdown voltage | ПК 7 05  NIEMS | | БДС IEC 60296  Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| **2** | |  | **Electrical installations and equipment up to 1000 V:** | | | | |
| 2.1 | | Relay protections, electric automation and telemechanics | New and operating sites and facilities | 1. Insulation resistance of:  a. Relays and relay protections | БДС 7862  ПК No 7 06 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004  Customer’s TS |
| 2. Voltage and inrush current of relay protections | БДС 7862  ПК No 7 06 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004)  NIEMS  TS |
| 2.2 | | EARTHING AND THUNDER-PROTECTION INSTALLATION | New and operating sites and facilities | 1. Resistance of earthing installations | ПК No 7 08 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004  TS |
| 2. Resistance of thunder-protection installations | ПК No 7 08 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004  TS |
| 3. Transient resistance of connections of the ground connections and earthed facilities | ПК No 7 08 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004  TS |
| 2.3 | | Phase - protective conductor loop | New and operating sites and facilities | Impedance of phase - protective conductor loop | ПК No 7 07 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004  TS |
| 2.4. | | Circuit breakers for safety trip | New and operating sites and facilities | 2. Tripping time | ПК No 7 07 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004  TS |
| 3. Contact voltage | ПК No 7 07 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004  TS |
| 3. Inrush current | ПК No 7 07 | | Ordinance No 16-116 (SG, No 26/2008)  Ordinance No 3  (SG, No 90 and 91/2004  TS |
| **3.** | |  | **ELECTRIC PROTECTION EQUIPMEN:** | | | | |
| 3.1 | | INSULATING RODS; VOLTAGE INDICATORS OVER 1000 V | Operating facilities | Electrical insulation strength through increased voltage | Ordinance No. 22  ПК No 7 11 | Ordinance No. 22  (SG No. 45/2006)  TS | |
| 3.2 | | Dielectric gloves, boots, high boots and rubber boots (galoshes) | Operating facilities | Electrical insulation strength through leakage current | Ordinance No. 22  ПК No 7 11 | | Ordinance No. 22  (SG No. 45/2006) |
| **4** | |  | **POWER QUALITY CONTROL:** | | | | |
| 4.1 | | Power quality control | New and operating sites and facilities | 1. Voltage frequency | БДС EN 50160  ПК No 7 10 | | БДС EN 50160 |
| 2. Voltage deviation | БДС EN 50160  ПК No 7 10 | | БДС EN 50160 |
| 3. Rapid Voltage Changes | БДС EN 50160  ПК No 7 10 | | БДС EN 50160 |
| 4. Voltage asymmetry | БДС EN 50160  ПК No 7 10 | | БДС EN 50160 |
| 5. non-sinusoidal voltage | БДС EN 50160  ПК No 7 10 | | БДС EN 50160 |

***\*Flexible scope:*** *Implementing a new version of standards/documents or standards/documents replacing them is allowed. An updated list of standards/documents and their dated versions is provided by CAB.*

**References:**

Ordinance № 3 (SG, № 90 and № 91/2004) - on the design of electrical installations and power lines

Ordinance № 16-166 (SG, issue 26/2008) - on the technical operation of energy equipment

Ordinance № 4 (SG, issue 6/2011) - on lightning protection of buildings, external facilities and open spaces in the use of personal computers in the education of students (SG, issue 46/1994)

Ordinance № 22 for testing of electrical protective equipment in operation (prom.SG, issue 45/2006 of 02.06.2006)