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Pursuant to its legal mandate under Articles 26.1 and 26.2 of the Law on the Energy Regulator 2004/09, and in the absence of the relevant Metering Code, the Board of the Energy Regulatory Office, on a session held on 18 April 2006 is issuing the following:

# TEMPORARY INSTRUCTION No_01_2006

**For Metering Requirements of Eligible Customers**

1. The Temporary Instruction will come into force upon of publishing in the ERO web page and remain valid up to the approval of the relevant Metering Code by Board of Energy Regulatory Office.

2. The set of technical provisions regarding the metering and other associated devices that may be used in the commercial and check metering points is attached to this Temporary Instruction as Annex 1.

3. Suppliers and eligible customers are obliged to comply with requirements of this Temporary Instruction.

Board of ERO

Nick Frydas, Chairman,

Merita Kostari, member,

Theranda Beçiri,member

Nysret Avdiu,member

Naim Bejtullahu,member

# ANNEX I

# TO TEMPORARY INSTRUCTION No_01_2006

1 Introduction

This Administrative Instruction intends to provide a set of general and specific requirements that the metering scheme of eligible customers shall fulfill for their operation as electricity market participants. In this context, the present text sets out the minimum standards for the measurement and recording of metered quantities of electricity for the purposes of electricity trading and transport in Kosovo.

2. GENERAL PROVISIONS

2.2 Scope

The present Administrative Instruction is published by the Energy Regulatory Office (ERO) in order to cover connection requirements of Eligible Customers that exist prior to the sanction of the Metering Code. It is foreseen therefore that the once adopted the Metering Code shall amend and/or substitute the present Administrative Instruction and it shall thereof prevail to any dispute between them.

2.3 Objective

For all Commercial Metering Equipment, this Regulation specifies the conditions governing the following:

(a) technical, design and operational criteria;
(b) accuracy and calibration;
(c) meter reading.

2.4 General Metering Requirements

The metering requirements in customers installations must meet the higher standards for metering equipment accuracy limits as specified in the document and must also meet the following requirements specified in the document;

- provision of main and check meters
- provision of facilities for remote electronic interrogation
- provision of profile metering facilities
- provision of facilities for Seasonal Time of Day (STOD) trading.

## 3.0 GENERAL TECHNICAL CRITERIA

### 3.1 Introduction

This section defines the general technical requirements for the Metering Equipment required for the measurement and recording of electricity transfers at defined Metering Points. The provisions of this Regulation shall apply equally to main and check Meters.

### 3.2 References

The following Standards (European Norms and IEC) shall apply and are referred to in the text:
(a) EN 60687 – Alternating Current Static Watt-Hour Meters for Active Energy (Cl. 0.2S and 0.5 S)
(b) EN61268 – Alternating Current Static Var-Hour Meters for Reactive Energy (Cl. 2 and 3)
(c) EN60521 – Cl. 0.5, 1.0 and 2.0 for alternating-current watthour meters.
(d) EN 60044-1 – Current Transformers
(e) EN 60044-2 – Voltage Transformers
(f) EN 60044-3 – Instrument Transformers – Combined Transformers
(g) IEC Standard 61036 - Alternating Current Static Watt-hour Meters for Active Energy (Cl. 1 and 2)
(h) EN61107 – Data Exchange for meter reading – direct local data exchange.

### 3.3 Metering Point

3.3.1 The defined Metering Point shall be at the connection point on the Distribution or Transmission System as applicable, as defined in the relevant connection agreement to the system.

3.3.2 The actual Metering Point may be different from the defined Metering Point subject to the approval of the ERO. In these cases the accuracy requirements of the Metering Code shall apply at the defined Metering Point and Section 3.8.5 shall apply.

3.3.2 Metering Equipment shall be capable of determining Active and Reactive Energy flows (as required) during each Demand Period across each Defined Metering Point.

### 3.4 Main And Check Metering

3.4.1 For connections greater than 10 MVA Main and Check Metering shall be provided.Main and Check Meters shall operate from separate CT and VT windings.

3.4.2 CT and VT windings and cables connecting such windings to Main Meters shall be dedicated for such purposes and such cables and connections shall be securely sealed.

5.4.3 CT and VT windings and cables connecting such windings to Check Meters may be used for other purposes provided the overall accuracy requirements are met and evidence

of the value of the additional burden is available for inspection by the Settlement System Administrator.

3.4.4 The Main Meter, Check Meter and additional burdens shall have separately fused VT supplies.

3.5 Measurement Parameters

The Market Operator shall at all times have in place a policy document approved by the ERO, which will specify, but will not be limited to, the following policies:

- Thresholds for meters, which will measure KWh only;
    - Use of Time switches;
    - Use of Unmetered connections
    - Thresholds for Maximum Demand meters
    - Thresholds for Profile Metering

Changes to such policies requested by the Users or Market Operator from time to time shall be submitted to the ERO for approval.

3.5.1 For each separate circuit the Metering Equipment shall be capable of measuring the following parameters:

(a) Import kWh;

and, in addition, for connections with a Maximum Capacity greater than the threshold specified in the market operator policy document

(b) Import kVArh

3.5.2 For connections with a Maximum Capacity threshold as specified in the relevant policy the following maximum demand (MD) values shall be registered per charging period
(a) Import kW;
(b) Import kVA
The meters shall register MD over 24 hours and will be capable of separately registering four additional MD values for programmable time periods.

3.5.3 For connections where electricity is traded on a seasonal time of day (STOD) tariff, approved by the ERO, the metering shall provide the following registers;
(a) Eight energy registers selectable over the calendar year for three phase connections.
(b) Four energy registers selectable over the calendar years for single-phase connections.

3.5.4 For connections with a Maximum Capacity of less than the threshold specified in the relevant policy document, only import kWh shall be measured (except where supplies are unmetered by agreement as per the threshold specified in the relevant policy document).

Where required meters shall be suitable for multi or time of use tariffs controlled by [an integral clock].

## 3.6 Hourly Metering

### 3.6.1 Introduction

This Section describes the technical requirements for Hourly metering. These requirements are additional to those described in paragraph 3.5.

### 3.6.2 Measurement Parameters

3.6.2.1 For each separate circuit the Metering Equipment shall be capable of measuring the following parameters:
(a) Import kWh
(b) Import kVArh
For each separate circuit the Metering Equipment of Generators and customers with their own generation shall be capable of separately measuring the following parameters:
(c) Export kWh
(d) Export kVArh

3.6.2.2 For each separate circuit, and for each hour Demand Period, the Metering Equipment shall be capable of recording the following Demand Values:
(a) Import kW
(b) Import kVAr
For each separate circuit, and for each hour Demand Period, the Metering Equipment of Generators and customers with their own generation shall be capable of recording the following Demand Values:
(c) Export kW
(d) Export kVAr

## 3.7 Metering Equipment Standards

3.7.1 The Meter shall be enclosed in a cabinet or otherwise installed in a manner, which shall conform to the manufacturer's stated environmental conditions. The installation shall provide protection from moisture and dust ingress and from physical damage, including vibration. In addition, the cabinet or meter must be sealed to prevent unauthorised access.
3.7.2 A Current Transformer (CT), in accordance with EN 60044-1 and a Voltage Transformer (VT), in accordance with EN 60044-2 shall be provided for Metering as required.
3.7.3 Where a combined unit measurement transformer (VT & CT) is provided the 'Tests for Accuracy' as covered in Clause 8 of IEC Standard 60044-3 covering mutual influence effects shall be met.
3.7.4 Meters in accordance with EN 60687, EN61036 or EN60521 as appropriate shall be connected to the CT and VT, except where the meter is direct connected, and shall be located in a secure environment adjacent to any associated data logging and telecommunications equipment.

3.7.5 All Meters shall include a non-volatile Meter Register of cumulative energy for each measured quantity. The Meter Register(s) shall not rollover more than once within the normal Meter reading cycle.
3.7.6 Whole current meters will be installed in accordance with the market operator's policy.

3.8 Equipment Accuracy and Error Limits

3.8.1 The accuracy of the various items of measuring equipment shall conform to the relevant IEC standards (or equivalent European Standards).
3.8.2 For the purpose of this Regulation the rated circuit capacity in MVA shall be determined by the lowest rated primary plant (e.g. transformer rating, line rating, etc) of the circuit. The Metering Equipment provision and accuracy requirements shall anticipate any future up-rating of the installed primary plant. The primary plant maximum continuous ratings shall be used in this assessment.
3.8.3 The accuracy class or equivalent, is based on the MVA capacity of the connection and shall as a minimum be as follows, subject to operating within the combined limits of error set out in 3.8.6 below:-

| **Equipment Type** | **Equipment Accuracy Class** | | | |
|---|---|---|---|---|
| | **For Connections** | | | |
| | **>100 MVA** | **20–100 MVA** | **1 – 20 MVA** | **< 1 MVA** |
| Current Transformers | 0.2S | 0.2S | 0.5S | 0.5S |
| Voltage Transformers | 0.2 | 0.5 | 0.5 | 0.5 |
| Meters | 0.2S | 0.5S | 1.0 | 2 |

3.8.4 VT, CT and Meter Test Certificates shall be made available for inspection.
3.8.5 Where the Actual Metering Point and the Defined Metering Point do not coincide, then, where necessary, compensation for power transformer and/or line losses shall be provided to meet the overall accuracy requirement at the Defined Metering Point. The compensation may be applied locally within the Metering equipment or remotely. In both cases, compensation factors and the justification for them must be recorded. These records shall be made available for inspection.
3.8.6 For the measurement of Active and Reactive Energy, Metering Equipment shall be tested and calibrated to operate within the overall limits of error as set out below, after taking due account of CT and VT errors and the resistance of cabling or circuit protection. Calibration equipment shall be traceable to a recognised national or international standard.

| Condition | Limits of Error at Stated Power Factor ACTIVE ENERGY | | | | |
|---|---|---|---|---|---|
| Current Expressed as a Percentage of Rated Measuring Current | Power Factor | Limits of Error for Connections | | | |
| | | >100MVA | 20 – 100 MVA | 1 – 20 MVA | < 1 MVA |
| 120% to 10% inclusive | 1 | ±0.5% | ±1.0% | ±2.0% | +/- 3.0% |
| Below 10% to 5% | 1 | ±0.7% | ±1.5% | ±2.5% | +/- 3.5% |
| Below 5% to 1% | 1 | ±1.5% | ±2.5% | ±3.5% | +/- 4.0% |
| 120% to 10% inclusive | 0.5 lag | ±1.0% | ±2.0% | ±3.0% | +/-3.5% |
| 120% to 10% inclusive | 0.8 lead | ±1.0% | ±2.0% | ±3.0% | +/-3.5% |

| Condition | Limits of Error at Stated Power Factor REACTIVE ENERGY | | | | |
|---|---|---|---|---|---|
| Current Expressed as a Percentage of Rated Measuring Current | Power Factor | Limits of Error for Connections | | | |
| | | > 100MVA | 20 – 100 MVA | 1 - 20 MVA | <1 MVA |
| 120% to 10% inclusive | 0 | ±4.0% | ±4.0% | ±4.0% | +/- 4.0% |
| 120% to 20% inclusive | 0.866 lag | ±5.0% | ±5.0% | ±5.0% | +/- 5.0% |
| 120% to 20% inclusive | 0.866 lead | ±5.0% | ±5.0% | ±5.0% | +/- 5.0% |

3.8.7 Records shall be made of the pertinent data required for a successful test and calibration as per the requirements of Section 3.8.6 above.

3.8.8 Where existing measurement transformers do not comply with all of the conditions of this Code, then these shall be acceptable provided each of the following conditions are met:-
(a) New measurement transformers are installed (fully compliant with this Administrative Instruction and subsequently with the Metering Code) when a significant electrical plant alteration is to be carried out;
(b) Where the transformers are not wholly dedicated to settlement Metering, then the additional burdens must be quantified and accounted for in calibrations and testing.
The burden should not be changed without notification of the relevant market operator.
The main Meter, check Meter and additional burdens shall have separately fused VT supplies.

3.9 Data Storage

3.9.1 Data storage facilities for metering data shall be provided as follows:
(a) a storage capacity of 96 periods per day for a minimum of [30] days for all Demand Values;
(b) the stored Demand Values shall be integer values of kW or kVAr, or pulse counts, and have a resolution of better than ~ 0.1% (at full load)
(c) the accuracy of the energy values derived from Demand Values shall be within + 0.1% (at full load) of the amount of energy measured by the associated Meter;
(d) the value of any energy measured in a Demand Period but not stored in that Demand Period shall be carried forward to the next Demand Period;
(e) in the event of a Metering Equipment power supply failure, the Metering Equipment shall protect all data stored up to the time of the failure, and maintain the time accuracy in accordance with paragraph 3.11 below;
(f) to cater for continuous supply failures, the clock, calendar and all data shall be supported for a period of 10 days without an external supply connected;
(g) any "read" operation shall not delete or alter any stored metered data; and
(h) Metering Equipment shall provide any portion of the data stored upon request by the Data Collection System;
(i) Data storage shall be provided internal or external to the Meter by way of a data logger;
(j) Meters that provide data to data loggers external to the Meter shall provide an output per measured quantity.

3.10 Data Communications

3.10.1 Load profile metering will be equipped with standard communications ports for local and remote downloading of load profile data and other meter data.

3.10.2 All data communications equipment shall conform to the relevant International Telecommunications Union (ITU) standards and recommendations for data transmission over telecommunications systems.

3.10.3 Site-specific security requirements may also apply in accordance with established good practice and in line with the specific requirements of System Operator.

3.10.4 Meter data collection systems shall remotely interrogate Metering Equipment to extract data at appropriate intervals as set out by the Relevant Market Operator.
3.10.5 Remote interrogation shall be by means of dial-up telephone, leased line, mains borne, packet switching data networks or other suitable system, using Meter and communications equipment protocols as specified by the IEC 60870 -5 101
3.10.6 In the event of failure of communications facilities, Meter data shall be read by a Locally Attached Device and transferred to the central data collection system as set out by the market operator.
3.10.7 For new and replacement Meters, the following data shall be capable of remote interrogation:
(a) Demand Values
(b) Max Demand and Energy Registers

3.11 Synchronisation

3.11.1 Metering Equipment shall be set to Co-ordinated Universal Time (UTC) with the facility to switch annually to Daylight Saving Time (DST). No switching shall occur for quarter hourly data.
3.11.2 Time adjustments may be performed as required by communications with the Data Collection System.
3.11.3 The commencement of each Demand Period shall be within ±20 seconds of true time. The duration of each Demand Period shall be accurate to within ± 0.1% except where time synchronisation has occurred in that period.