ANNEX C

APPENDIX L

SPECIFICATIONS FOR MAIN AND ALTERNATE REVENUE METERS

ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS
Accuracy Class	IEC 687 Class 0.2 / ANSI 12.20 Class 0.3 or better	Grid Code 9.2.3.3
No. of Stators	Blondel's Theorem compliant /3-element	Grid Code 9.2.2.1
Rating	115V 1 A or 5 A 60 Hz	The rating should be suitable to the secondary rating of the instrument transformers.
No. of Quadrants (Measurement)	Active Energy/Power Measurement: Bi-directional Reactive Power Measurement: 4 Quadrant	Grid Code 9.2.2.2 Grid Code 9.2.3.3
Interval Data	Programmable to 1, 5, 15, 30, and 60 minute interval	Grid Code 9.2.3.3
No. of Channels	**The 10-channels are as follows:** 1. **KWH (Del)** 2. **KWH (Rec)** 3. **KVARH (Del)** 4. **KVARH (Rec)** 5. **Voltage (Ph A)** 6. **Voltage (Ph B)** 7. **Voltage (Ph C)** 8. **Current (Ph A)** 9. **Current (Ph B)** 10. **Current (Ph C)**	Grid Code 9.2.2.2 Grid Code 9.2.3.3
Mass Memory	Minimum 60 day recording of a 5-minute time-stamped demand interval for **10** recording channels	WESM 4.5.1 (g) Grid Code 9.2.3.3

ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS
Meter Registers	The meter shall be capable of measuring, registering and recording the following electrical parameters per dispatch interval: • KWH (Delivered) • KWH (Received) • KVARH (Quadrant 1) • KVARH (Quadrant 2) • KVARH (Quadrant 3) • KVARH (Quadrant 4) • KVAH (Delivered) • KVAH (Received) • Max KW (Delivered) • Max KW (Received) • Power Factor • Frequency • Per Phase Current • Per Phase Voltage	Grid Code 9.2.2.2 Grid Code 9.2.3.3
Loss Compensation	Optional	WESM 4.5.2.2
Security	The meter shall have provisions for securing the meter data, meter configurations and programs by electronic means and/or passwords. It shall also be secured physically by way of security seals.	WESM 4.5.6 Grid Code 9.3.8.1 Grid Code 9.3.8.2 Grid Code 9.3.8.3
Communication Capability	The meter shall have at least a minimum of two independent communication ports that could operate independently. Each port can communicate simultaneously, with each one using a different protocol. It should be capable of a two-way communication.	WESM 4.5.7.1 WESM 4.5.1 (c) Grid Code 9.2.3.3
Internal Clock	The meter shall have an internal clock with an allowable error of +/-1 second	WESM 4.5.8.1 Grid Code 9.2.3.3
Time Synchronization	Crystal synchronization. The internal clock shall be capable of being reset set by the data collection software during normal collection operations.	WESM 4.5.8.1 Grid Code 9.2.3.3
Digital Display	The meter shall have a digital display with a minimum of 5 digits.	WESM 4.5.1 (c) Grid Code 9.2.3.3
Codes and Standards	The meter shall adhere to established International	Grid Code 4.2.10.1 IEC, ANSI/IEEE
Compliance	Standards	

ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS
Applicable Compliance Tests	These tests shall include material tests and established practice and/or other approved standards. Routine tests prescribed by the applicable standards shall be performed. In particular, the following tests shall be performed for the revenue meters: a. Power frequency tests (insulation) b. Impulse voltage test (insulation). c. HF interference test d. Surge withstand and fast transient tests	Grid Code 9.2.5.2 Grid Code 9.2.5.3 Grid Code 9.2.8.1 IEC 255-1 IEC 255-A (Class III) IEC 245-4
Battery	Capable of retaining readings and time of day for at least two days without external power source	WESM 4.5.1 (g) Grid Code 9.2.3.3
Enclosure	Minimum requirements **Indoor**: Protected against dust limited ingress (no harmful deposit) and Protection against vertically falling drops of water e.g. condensation **Outdoor**: **For meter cover: Minimum Ingress Protection Rating of IP51 or NEMA 2 to protect the internal component against the harmful elements of environment that may affect its measuring circuit and operation.** **For meter box: Minimum Ingress Protection Rating IP34 or NEMA Type 3.**	ANSI 12.1 4.3.4 Grid Code 9.2.2.3 Grid Code 9.2.2.4 Grid Code 9.3.8