Metering Code

By :

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KEMENTERIAN TENAGA, TEKNOLOGI HIJAU DAN AIR

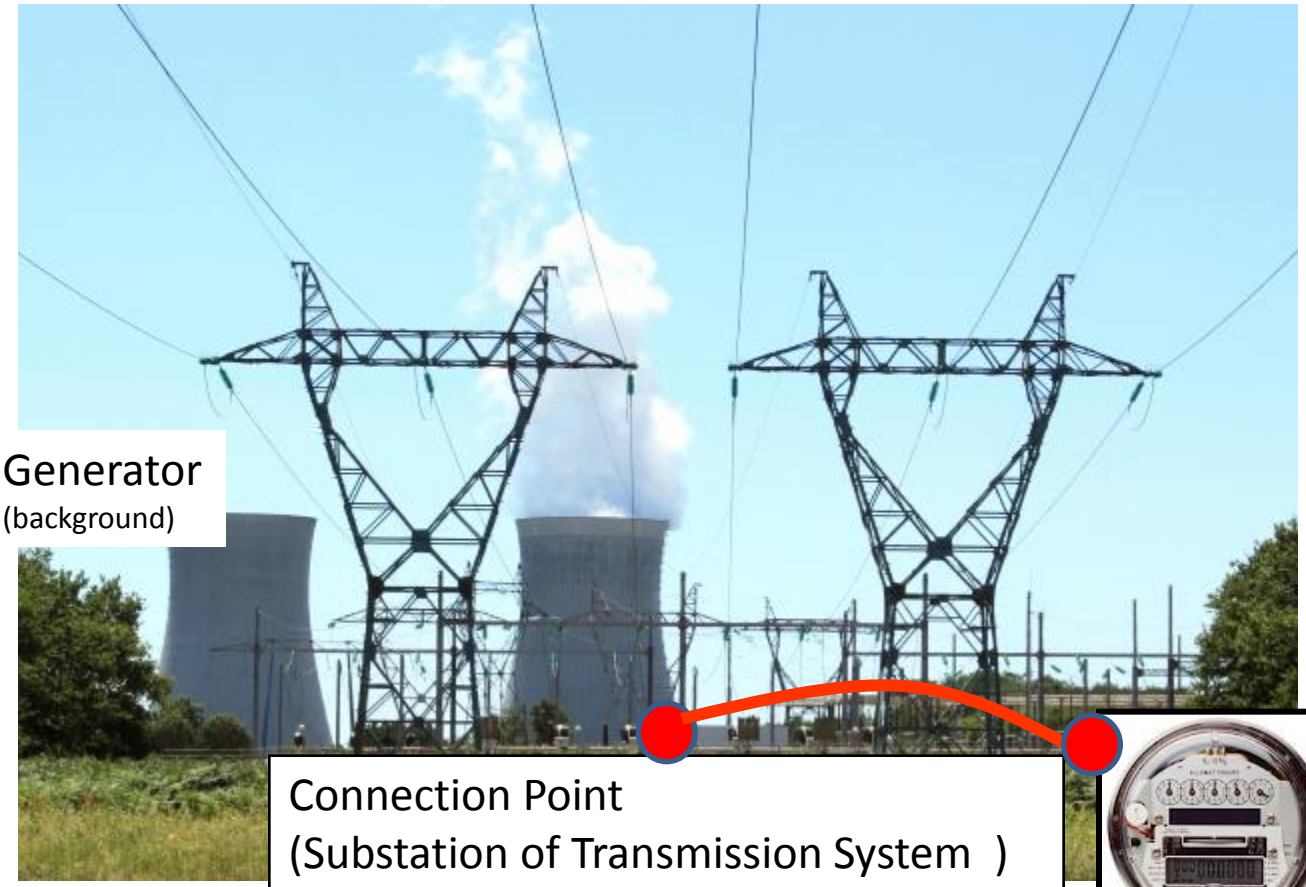
Suruhanjaya Tenaga

The Malaysian Grid Code Awareness Programme Funded by Akaun Amanah Industri Bekalan Elektrik (AAIBE)

Agenda

- Overview of Metering Codes
- Discussion on selective clauses
- Closing

Transmission Metering



Generator
(background)

Connection Point
(Substation of Transmission System)

Revenue Meter (Billing)

- Energy (Active/Reactive)
- Power (Active/Reactive)

Overview of Metering Codes (MC)

- 13 main sections
  - MC 1: Introduction
  - MC 2: Objectives
  - MC 3: Scopes
  - MC 4: Requirements
  - MC 5: Ownership
  - MC 6: Metering Accuracy and Data Exchange
  - MC 7: Commissioning, Inspection, Calibration and Testing
  - MC 8: Security of Metering Installation and Data
  - MC 9: Processing of Metering Data for Billing Purposes
  - MC 10: Confidentiality
  - MC 11: Metering Installation Performance
  - MC 12: Operational Metering
  - MC 13: Disputes

Objectives of MC

✓ **Sets out metering requirements for all grid connected Users relating to**

- Active Power (P)
- Reactive Power (Q)
- Active Energy (kWh)
- Reactive Energy (kVarh)

✓ **To facilitate the Single Buyer in respect of revenue metering**

✓ **To facilitate the GSO in respect of operational metering (MC12)**

✓ **To ensure Users are in compliance with statutory & License obligations**

Scope (MC3)

✓ MC applies to the GSO, Single Buyer and Users

- Generators,
- Distributors,
- Network Operators, Directly Connected Customers,
- Users seeking connection to Transmission System or to a User system,
- Externally Interconnected Parties and
- TNB Transmission

Requirements (MC4) (1/2)

- ✓ **SB is the responsible party for the Metering Installation**
- ✓ **Revenue meter**
  - To be installed at Connection Points and the nett output of each Generating Unit on the Transmission System
  - Shall be located as close as possible to the Connection Point
  - Data shall be recorded every 30 minutes interval and automatically collected once a day by the Data Collection System
  - Shall have adequate capacity to store data at least 45 days of on-site data to provide back-up
  - Shall be the primary source of data for billing purposes.
- ✓ **Revenue meter shall have Main Meter to measure and record the required data and Check Meter as back-up to validate the readings**

Requirements (MC4) (2/2)

✓ Operational meter

- To be installed to measure voltage, current, frequency, active and reactive power, and signals (status and alarms) for monitoring the circuits connecting the Generating Unit to the Transmission System.
- In addition, to include all the plant signals, indications, parameters and quantities that will enable the GSO to monitor the dynamic behaviour of the Generating Plant and spinning reserve.
- Data shall be collected by the Remote Terminal Units (RTUs) which are part of the GSO's SCADA system
- Installation and maintenance undertaken by the User

✓ Historical data shall be maintained in the metering Database

- Six (6) months on-line;
- Thirteen (13) months in accessible format; and
- Seven (7) years in archive

Ownership (MC5)

✓ **SB shall own the Revenue Meter**

✓ **If the SB does not own the premises where the Metering Installation is located, then the owner of that premises will provide:**

- 24-hour access and adequate space for the Metering and associated communications equipment;
- Reliable auxiliary power supplies; and
- Current transformers (CT) and voltage transformers (VT) compliant with this Metering Code and as agreed by the Single Buyer

Metering Accuracy and Data Exchange (MC6)

✓ ***Target availability of measurement transformers & Meter***

- *99% per annum connecting the Generating Unit to the Transmission System*
- *95% per annum (communication link)*

✓ **Accuracy requirements :**

Overall accuracy requirement of Metering Installation equipment

Type	Maximum Demand or Energy (GWh pa) per Metering Point	Maximum Allowable Overall Error (±%) (Refer to Tables 2&3) at Full Load		Minimum Acceptable Class of Components
		Active	Reactive	
1	More than 7.5MW or 60GWh per annum	0.6	1.0	0.2 CT Burden 30VA if ../1A, 15 VA if ../5A, 0.2 VT Min Burden 100 VA 0.2 Wh Meter 0.5 VARh meter
2	Less than 7.5MW or 60GWh per annum	1.0	2.0	0.2 CT Burden 15VA 0.5 VT Min Burden 75 VA 0.5 Wh Meter 1.0 VARh meter

Commissioning, Inspection, Calibration and Testing

✓ **User to ensure that the Metering equipment has been type tested to the standards – to furnish type test certificates to the SB**

✓ **Test & inspection interval :**

Maximum allowable period between tests

Metering Installation Equipment	Metering Installation Type	
	Type 1	Type 2
CT	10 years	10 years
VT	10 years	10 years
Burden Tests	Whenever Meters are tested or when Modifications are made	
CT Connected Meter (Electronic Type)	5 years	5 years

Maximum allowable period between inspections

Inspection of Metering Installation Equipment	Metering Installation Type	
	Type 1	Type 2
Maximum allowable period between inspections	2.5 years	2.5 years

Commissioning, Inspection, Calibration and Testing

✓ Commissioning

- User shall notify the Single Buyer the details of the new Metering Installation at least one (1) calendar month prior to the commissioning date

✓ Procedures in the event of non-compliance:

- In the event of non-compliance in respect of accuracy of Metering Installation with requirements of MC, User to notify Single Buyer within 1 Business Day of the detection of discrepancy

✓ Audit of Metering Data:

- Single Buyer may carry out periodic, random or unannounced audits of Metering Installations to confirm compliance

Metering Register

✓ **Forms part of Metering Database that holds static Metering information not subject to frequent change, that determine the validity and accuracy of Metering Data**

✓ **Information includes:**

- Connection and metering points
- Characteristic details (name, serial numbers, test certificates etc)
- Data validation processes (algorithm, check meter, alternate data source)
- Data communication and local and remote access details

✓ **SB is to prepare appropriate formats for collection of data for the Metering Register**

Appendices

- ✓ **APPENDIX 1 – Type & Accuracy of Revenue Metering Installations**
- ✓ **APPENDIX 2 – Commissioning, Inspection, Calibration & testing Requirements**
- ✓ **APPENDIX 3 – Metering Register**

Closing

✓ Metering Codes

- Sets out metering requirements for all grid connected Users relating to Active Energy, Reactive Energy, Active Power &Reactive Power

- Facilitate the Single Buyer and GSO in respect of revenue metering and operational metering respectively

- Ensure Users to be in compliance with statutory & License obligations

THANK YOU

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