



# Metering Code

By :

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**The Malaysian Grid Code Awareness Programme Funded by  
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# Agenda



Overview of Metering Codes



Discussion on selective clauses



Closing

# 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, P & Q, 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 Metering installation**
- ✓ **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 & metering installation**
  - 99% per annum connecting the Generating Unit to the Transmission System
  - 95% per annum (communication link), unless otherwise agreed between the SB and the User
- ✓ **Accuracy requirements :**

Type	Maximum Demand or Energy (GWh pa) per Metering Point	Maximum Allowable Overall Error ( $\pm\%$ ) (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 P, Q, kWh, kVarh
- 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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