

# ANDHRA PRADESH

# CODE OF TECHNICAL INTERFACE

## Section 5

## METERING CODE

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## 5. METERING CODE

### 5.1 Introduction and Scope

This Metering Code sets out or refers to the requirements of Metering at Generating stations and Sub-stations for:

- a) Tariff Metering for Active and Reactive Energy at delivery points at Generating stations and at delivery points at **APTRANSCO**'s Substations.
- b) Operational Metering for Active and Reactive Power and monitoring of Power Stations and Grid Substations and deals with metering at delivery points which are generally the same as relevant connection sites.

Where the requirement for Metering are too extensive for inclusion in the main code, they are set out in the Subcodes and Agreed Procedures. The Sub-codes and Agreed procedures cover the following matters:

### **5.1.1 Generating Metering Sub-codes**

<u>Sub Code No</u>	<u>Subject</u>
1	Generation Tariff Metering - Interim Scheme
2	Generation Tariff Metering Final Scheme
3	Generation Operational Metering

### **2. Distribution Metering Sub-codes**

<u>Sub Code No</u>	<u>Subject</u>
4	Distribution Tariff Metering Scheme
5	Distribution Operational Metering Scheme

### **3. Agreed Procedures**

<u>No</u>	<u>Title</u>	<u>Reference</u>
1	Maintenance, testing, inspection and sealing of Tariff Metering (Generation) and Generator Circuits	5.7.7
2.	Meter Advance reconciliation (Generation)	5.9
3.	Settlement Value Estimation (Generation)	5.12 & 13
4.	Communication Protocols	5.3.4
5.	Maintenance, testing, inspection and sealing of Tariff Metering (Distribution)	5.7.7
6.	Meter Advance reconciliation (Distribution)	5.9
7.	Settlement Value Estimation (Distribution)	5.12 & 13
8.	Notification for new Registrant	5.18.1

Note:- Agreed Procedure nos. 2 to 8 and Sub-Code 5, i.e., Distribution Operational Metering Scheme will be added into future editions of CTI.

#### 4. *Word/Number Definitions*

A word expressed in the Metering Code in masculine gender includes the feminine gender also and vice versa. Similarly a singular number includes the plural and a plural applies to a singular also.

### 5.2 General

#### 5.2.1 *Energy and Power Metering*

Active and Reactive Energy and Power exported or imported by parties shall be metered and generating units/grid substations shall be monitored as required by this Metering Code. Each Generating unit which is subject to central dispatch (whether alone or jointly with other generating units) shall have separate Tariff Metering. Each power transformer of a grid substation supplying power to Distribution Companies shall have separate tariff meters on the L.V. side.

#### 2. *Tariff Metering*

Tariff metering shall be designed and installed so as to measure imports from the APTRANSCO's Transmission system and net output from each generating unit. Data from tariff metering required under this Metering Code shall be collected from Generator data collectors, or any other data collector mutually agreed by APTRANSCO, and respective generators. Data required by Distribution Companies shall be collected from APTRANSCO's Load Dispatch Centre. As far as possible the tariff metering shall be connected at the delivery point i.e., for energy exported from the generating unit to the grid at the HV side of the unit transformer (step up transformer) and for energy imported from the grid for station consumption on the HV side of the station auxiliary transformer. At both the delivery points one main meter which shall be an electronic trivector meter and a check meter which shall also be an electronic trivector meter are to be connected. The main meter and check meter shall preferably be of two different makes. Permission has been given by APERC to APTRANSCO to connect tariff meters for Feeders. But Generators shall have a programme to instal tariff meters on the HV side of the Generator Transformer.

The existing metering at locations of energy transfer between Generators and APTRANSCO shall continue as they exist until the FMS is approved by the Regulator and metering is changed as per the FMS within the time prescribed by the Regulator.

Similarly on the LV side of the Power Transformers at EHT Sub-Stations two electronic trivector meters shall be installed (one main and the other check meter for measuring energy delivered by APTRANSCO to DISCOMs).

#### 3. *Ownership*

All Generation Metering shall be owned by respective Generators and the Generators

are responsible for ensuring that all such metering complies with the Metering Code.

1. All tariff metering at EHT Sub-stations shall be the responsibility of **APTRANSCO**.
2. All metering to interconnection points shall be governed by the provisions of the relevant interconnection agreement. The Party responsible for metering shall be known in this Metering Code as the Registrant in respect of such Metering.
3. The energy consumed by auxiliary machines at generating stations shall be measured accurately by the Generator concerned. The power tapped from the output of the generating unit before the step-up transformer and consumed by the auxiliary equipment etc. in generating stations is an internal issue of the Generator and not an interface matter. However, the energy so consumed shall be measured by Generator by providing accurate energy meters on the primary side of the unit auxiliary transformer and monthly readings shall be furnished to **APTRANSCO** and **APERC** for statistical and other miscellaneous purposes. The data from this metering shall be furnished to the Metering Committee when required. However, if plant Load Factor is calculated based on gross generation and if some clauses pertaining to Tariff are related to PLF then the auxiliary Consumption shall be metered in the same way as Tariff Metering and the metering of consumption in auxiliaries shall be treated as an interface issue.
4. The part of energy consumed by auxiliary equipment inside the Generating Station and drawn from the Grid shall be measured by tariff metering. Generators shall pay for this energy which is drawn through the Station Auxiliary transformer from the Grid. The metering shall be connected on the HV side of the Station Auxiliary transformer and is subject to the Metering Code in all details.

The internal consumption of the substations of **APTRANSCO** (Substation auxiliaries such as lighting, fans and cooling equipment) shall be measured by **APTRANSCO** by connecting a metering system of suitable accuracy. The data shall be furnished to the **APERC**, Government (on requisition), Metering Committee (on requisition) and Statistical authorities and to other organisations.

#### 4. *Responsibilities*

Each Party, shall by the applicable date, become bound by this Metering Code in respect of that Metering or those Generator circuits for which it is responsible and each party shall ensure such Metering or Generator circuits are properly installed and that they comply with the requirements of this Metering Code.

Details of such Metering or Generator Circuits shall be provided by the relevant Registrant to the Interested Party on request for the purposes of maintaining the Register pursuant to 5.7.6.1. provided always that all reasonable costs of upgrading

any Generator Circuits/Substation Circuits to ensure compatibility with the requirements of the Interim Metering Scheme or the Final Metering scheme or any other changes will be the responsibility of the Generators/**APTRANSCO** respectively. Any other change to the Data collection system required by **APTRANSCO** shall be met by **APTRANSCO**. Maintenance and replacement of Generator circuits/Substation circuits in the ordinary course shall be carried out by the relevant Interested Party.

#### 5. *Installation of Tariff Metering*

Under the Final Metering Scheme all current and voltage transformers associated with Tariff Metering must be installed at the expense of the Registrant as close as reasonably practicable to each Delivery Point taking into account physical location and cost. Under the Interim Metering scheme, Tariff metering shall remain where sited at the Effective Date.

#### 6. *Compliance with FMS*

After the FMS Date all Tariff Metering shall comply with the Final Metering Scheme. Tariff Metering installed after the Effective Date shall also comply with the Final Metering Scheme except for replacement Tariff Metering installed after the effective date and prior to the FMS date at generating units, Grid Substations or Relevant connection sites which were commissioned on or before the Effective Date. In such case Metering shall comply with Interim Metering Scheme or the Final Metering Scheme as the relevant Registrant may reasonably decide.

#### 7. *Location of Operational Metering*

Operational Metering shall be sited where reasonably required by **APTRANSCO** after consultation with the Interested Party so as to measure the parameters at the points reasonably determined by **APTRANSCO**. Installation of Operational Metering shall be undertaken by the Interested Party, as soon as is reasonably practicable following the request of **APTRANSCO** and under the supervision of **APTRANSCO** with the Interested Party bearing all such reasonable costs in respect thereof.

#### 8. *Registrant's Responsibility*

A Registrant shall continue to be responsible for Metering in accordance with this Metering Code, until another party becomes Registrant in respect of such Metering or until electricity ceases to be imported or exported at the relevant connection site as a result of permanent disconnection.

#### 9. *Generator/Substation Circuits*

Subject to 5.2.4 above Generator Circuits/Sub-station Circuits are the responsibility of the Interested Party which operates the Power Station /Substation where such circuits are



installed. Such Interested Party shall be required to maintain the same in accordance with this Metering Code.

### ***5.2.10 Revision of the Metering Code***

Any part of the Metering Code can be revised by the CTI Review Panel. When the CTI Review Panel takes decisions to revise the Metering Code the Chairman of the Metering Committee or a Member of the Metering Committee authorised by the Chairman, shall be present.

## **5.3 Data Collection**

### ***5.3.1 Rights of Data Acquisition***

**APTRANSCO**/Distribution Co. shall have the right to collect, import/export data relating to Active Power, Reactive Power, Active Energy and Reactive Energy imported and exported and Operational Metering data permitted to be collected by remote interrogation or manual on site interrogation in accordance with the terms of this Metering Code.

#### ***2. Meter Registers***

Each interested party shall read each meter register in respect of which it is the interested party, daily at or around midnight, and pass such readings to **APTRANSCO**/Distribution Co. as soon as possible thereafter.

#### ***3. Remote Monitoring***

For the purposes of remote interrogation **APTRANSCO** may use its own data communications network or failing this shall enter into, manage and monitor contracts to provide for the maintenance of all data links by which data is passed from Generator Data Collector or operational metering. Similarly, a Distribution Company may use its own data communication network to collect data from substation/Load Dispatch station of **APTRANSCO**. In the event of any fault or failure of such communication lines or any error or omission in such data **APTRANSCO** shall, if possible, retrieve such data by manual on-site interrogation in accordance with Agreed Procedure No.5 or No.6 as the case may be, failing which it shall estimate the same in accordance with the relevant Agreed Procedure.

#### ***4. Communication Protocols***

Each party shall use communications protocols in relation to Metering specified in Agreed Procedure No.4.

## **5.4 Description of Metering**

- a) Metering shall comply with the requirements set out in the relevant Sub-code.
- b) All Tariff Metering shall be compatible with the Data Collection System.

- c) All Generator Circuits/Substation circuits shall be compatible with the relevant Metering.

## 5.5 Accuracy

Metering shall be accurate within the prescribed limits set out in the relevant Subcodes. With respect to Tariff Metering these prescribed limits shall be applied after adjustments have been made in accordance with the relevant Subcode to compensate for any errors due to measuring transformers and connections thereto and/or due to Generator/Substation Circuits.

## 5.6 Calibration

Each Registrant shall ensure that all Metering for which it is responsible and each Interested Party shall ensure that all Generator Circuits/Substation Circuits for which it is responsible shall, at the Effective date and thereafter, be calibrated or compensated in accordance with this Metering Code in order to meet the accuracy requirements in the Subcodes. The Registrant in the case of Metering or **APTRANSCO** in the case of Generator circuits and the Distribution Co. in the case of Substation circuits shall be granted access to such Metering or Generator/Substation circuits by the relevant Party upon reasonable notice and at reasonable times, in order to make or inspect any adjustments thereto and to attend any tests or inspection thereof required pursuant to this Metering Code.

## 5.7 Proper Order, Testing, Sealing and Readings

### 5.7.1 Proper Order

5.7.1.1 Each Registrant shall at its own expense keep in good working order, repair and condition all Metering in respect of which it is the Registrant to ensure the correct registration, recording and transmission of the requisite data relating to, or in respect of, the quantity of Active and Reactive Energy and Active and Reactive Power measured by the relevant Metering and of the performance of the relevant Power Station/Sub-Station.

5.7.1.2 Each Generator shall, at its own cost and expense, keep in good working order, repair and condition all Generator circuits for which it is responsible.

3. **APTRANSCO** shall at its own expense, keep in good working order, repair and condition all substation circuits for which it is responsible.

### 2. Testing

5.7.2.1 Any new or replacement meters shall be tested by the Registrant as soon as reasonably practicable after installation.

2. Any new or replacement meters shall be calibrated at

**APTRANSCO's/Generator's** meter testing department prior to installation of the same.

3. No less frequently than is specified in the relevant Subcode each Registrant shall carry out a periodic calibration of all Metering in respect of which it is Registrant.
4. The Registrant shall give **APTRANSCO** or (in the case of metering of which **APTRANSCO** is the Registrant) the Distribution Co. at least one month's prior written notice of a routine test and 5 days prior written notice in the case of every site test of new, replacement or modified metering stating the date, time, work required and estimated duration of every such test except where such test is carried out as a result of an emergency or equipment failure in respect of metering which is already in service.
5. **APTRANSCO/Distribution Co.** as the case may be shall have the right to attend any such test should it so require. Any such test shall comply with the relevant Sub-code. A copy of all test reports shall be given to the Interested Party.
6. The costs and expenses of such testing shall be borne by the Registrant.
7. If all or any part of a Generator/Substation circuit is replaced, the relevant Generator/Substation circuit shall be recalibrated as soon as possible. If required Generator/Distribution Co. and **APTRANSCO** shall agree to any change that may be necessary to the existing compensation for that circuit.

## 2. *Ad-hoc Testing*

5.7.3.1 If any party has reason to believe that Metering or Generator Circuits/Substation Circuits are not performing properly or within the prescribed limits of accuracy referred to in the relevant Subcode, then such party (where it is not **APTRANSCO**) shall promptly notify **APTRANSCO** accordingly.

2. Subject to 5.7.3.3 **APTRANSCO** shall notify the relevant Registrant or Interested Party promptly and require him to test the accuracy of the relevant Metering or Generator/Substation Circuits as soon as practicable but in any event within 24 hours of receiving notification of such requirement, whereupon the relevant Registrant or Interested Party, as the case may be, shall inspect such Metering or Generator Circuits/Substation Circuits and carry out such tests as **APTRANSCO** shall reasonably deem necessary to determine the accuracy of the same.
3. Where **APTRANSCO** has reason to believe it would not be appropriate for the relevant Registrant or Interested Party to test the accuracy of Metering or Generator/Substation Circuits then **APTRANSCO** shall, without being required to give prior notice to the relevant Registrant or Interested Party, as

the case may be, inspect such Metering or Generator Circuits/ Substation Circuits and make such tests as **APTRANSCO** shall reasonably deem necessary to determine the accuracy of the same.

4. Subject to 5.7.3.5 below:
  1. the Registrants' costs associated with any such inspections and tests of Metering referred to in 5.7.3 shall be borne by such Registrant and
  2. the Interested Party's costs associated with any such inspections and test of Generator Circuits /Substation circuits referred to in 5.7.3 shall be borne by such Interested Party.
5. Where any Metering or Generator /Substation Circuits pass all inspections and tests required pursuant to 5.7.3.2 or 5.7.3.3, the costs of or associated with such inspections and tests referred to in 5.7.3.4 shall be borne by the Party which has notified **APTRANSCO** pursuant to 5.7.3.1, or otherwise by **APTRANSCO** which shall reimburse the relevant Registrant or Interested Party such costs and expenses on demand.
6. Calibration certificates for test equipment shall be made available for the relevant Registrant or Interested Party.

#### ***5.7.4 Testing General***

*5.7.4.1* Subject to 5.7.3.3 above, any testing of any Metering or Generator/Substation Circuits shall, prima facie, be carried out by the Registrant in the case of Metering, or by the Interested Party in the case of Generator Circuits/Substation Circuits, on the relevant Metering or Generator/Sub-Station Circuits mounted in their operational position.

Both the Interested Party and the Registrant or (where **APTRANSCO** is not the Registrant) **APTRANSCO** shall have the right to attend all such testing. All testing will be carried out in accordance with the relevant Subcode. Any breaking of seals and Sealing on Tariff metering will be carried out in accordance with Agreed Procedures No. 1 or 2 as the case may be. The test performance of any metering or generator circuits / substation circuits shall be compared with calibrated test equipment by one of the following methods:

*5.7.4.1.1* injecting into the measuring circuits (i.e. excluding the primary current and voltage transformers) and comparing the readings or records over such period as may reasonably be required by **APTRANSCO** or where an Interested Party has requisitioned the test, by that Interested Party to ensure a reliable comparison or

5.7.4.1.2 where practicable, operating the calibrated test equipment from the same primary current and voltage transformers as the meter under operating conditions. The readings or recordings of the meter and the calibrated test equipment shall be compared over the required period by **APTRANSCO** or, where the test is carried out at the behest of the Interested Party by the Interested Party, to ensure a reliable comparison or

5.7.4.1.3 in any other circumstance, such other method as may be reasonably specified by **APTRANSCO** or Interested Party.

### **5.7.5 Test Failures**

1. Any meter which fails any test whilst in its operational position shall be removed by the Registrant forthwith and tested by **APTRANSCO** under laboratory conditions at **APTRANSCO**'s meter testing department in the presence of the Registrant or the Interested Party. **APTRANSCO** shall give the Registrant or Interested Party, as the case may be, prior notice of such test.
2. Where meters are removed in accordance with 5.7.5.1 on circuits that are required to remain in service the meter shall be replaced by the Registrant forthwith with a previously recalibrated meter suitably prepared and compensated for the circuit or, where the Metering includes both main and check meters, and the meter (main or check) which is to remain on site is within its calibration period, such other metering may be removed provided it is returned to site or replaced within 14 days. In such circumstances where the remaining meter is the check meter it shall, for all estimation or retrieval purposes, be regarded as the main meter until replacement or return to site of the main meter.

## **6. Records**

5.7.6.1 Each Registrant or Interested Party shall at its own cost and expense maintain a register in relation to Metering for which it is responsible.

Each register shall detail any relevant loss adjustment factors and specification details e.g. serial number and accuracy class and all relevant matters as may be required by the relevant Subcode relating to the calibration of such Metering including the dates, location and results of any tests, readings, adjustments or inspections carried out. Any temporary or permanent replacement of meters and the dates on which any seal was applied or broken, the reason for any seal being broken and the persons carrying out and attending any such tests, readings, inspections or sealings shall also be recorded in the register. Such records shall also include any other details as may be reasonably required by **APTRANSCO** or any other Registrant. Any such records shall be

complete and accurate and be retained for a minimum period of 12 months following the removal of the relevant Metering or Generator Circuits/Substation Circuits. Any data which forms part of such metering records shall be made available to the Interested Party and/or **APTRANSCO**, as applicable. Copies of the results of all manual readings, adjustments, tests and inspections shall be provided to the Registrant, Interested Party or **APTRANSCO** as appropriate, but without limitation and in accordance with the Agreed Procedures.

5.7.6.2 Each Registrant shall pass such records or copies of the above to the successor Registrant in relation to any Metering.

5.7.6.3 Each Registrant or in the case of Generator Circuits/Substation Circuits, each Interested Party shall, at its own cost and expense, ensure that **APTRANSCO**/Distribution Co. is provided with copies of all records referred to in 5.7.6.1 and that these are updated forthwith whenever there is any change in the information contained in such records.

5.7.6.4 Each Party shall upon reasonable notice and at reasonable times have access to the records maintained by the Registrant or Interest Party pursuant to 5.7.6.1 and used for the purposes of a PPA which the Party has entered into and may take copies thereof.

5.7.6.5 Each Party shall upon reasonable notice and at reasonable times have access to the operational Metering data that is relevant to the Generating unit / Substation operated by such party.

## 7. *Sealing*

5.7.7.1 Following the Effective Date, all Tariff Metering as is capable of being made secure shall be sealed by **APTRANSCO**. The seal shall be replaced following any test or inspection in accordance with Agreed procedures No.1 or No.2 as the case may be, except, where sealing is impractical in the reasonable opinion of such Registrant and/or **APTRANSCO** or Interested Party as is appropriate having regard to the physical and electrical configuration at each relevant connection site.

2. Each Generator and **APTRANSCO** shall, following the Effective Date, make arrangements for all Generator Circuits/Substation Circuits as are capable of being made secure, to be sealed by it or on its behalf in accordance with Agreed Procedure No.1 except where in the reasonable opinion of the relevant Generator and **APTRANSCO**, having regard to the physical and electrical configuration at each relevant connection site, it is impractical.
3. No seal applied pursuant to this Metering Code shall be broken or removed except in the presence of, or with the prior consent of the Party affixing the seal, or on whose behalf the seal has been affixed unless it is necessary to do so in circumstances where (i) both main and check meters are malfunctioning,

or there occurs a fire or other similar hazard and such removal is essential and such consent cannot be obtained (provided that the Party which has affixed the seal and which has not given such consent shall be informed immediately thereafter), or (ii) such action is required for the purposes of 5.11. Where verbal consent is given it must be confirmed in writing immediately after taking the necessary action.

The seals of the Tariff meters shall be broken in the presence of representatives of both parties (e.g. Generator and **APTRANSCO**) i.e., the supplier of energy who raises the bill and the receiver who pays the bill.

4. No party shall incur any liability under this Metering Code in the event it cannot perform any of the duties hereby prescribed due to any such consent required by 5.7.7.3 being withheld, save that it shall promptly inform **APTRANSCO** and the relevant Registrant or Interested Party accordingly.
5. Each Party shall ensure, so far as it is able, that physical access to Metering and Generator Circuits/Substation Circuits is, where practicable, restricted to personnel who are required to have such access for the proper performance of their duties and have received permission for such access. Record of any such access shall be maintained by the Party on whose land the Metering or Generator Circuits/Substation Circuits are positioned, with copies provided to the Registrant and **APTRANSCO** pursuant to 5.7.6.3.

In addition, all Metering and Generator Circuits/Substations Circuits, where practicable, must be made secure, if necessary by providing padlocks.

The lists of persons authorized to inspect and to note meter readings shall be kept at Generating Stations and EHT Sub-Stations. The lists shall be updated periodically and whenever changes occur and the revised lists shall be kept at the Station.

6. Each Party shall control the issue of its own seals and sealing pliers and shall keep an accurate register of all such pliers and the authorised persons to whom they are issued.
- 7.
8. The points of sealing shall be
  - a. CT secondary boxes
  - b. PT secondary boxes
  - c. Meter Box

- d. Meter Test Block
- e. Meter Terminal Cover
- f. Meter Cover
- g. Panel doors where CT and PT secondary circuits are terminated and/or provisions for shorting/breaks/fuses/links etc., are available.
- h. PT selector relay where automatic change over of potential supply to meter from one PT to another is provided.
- i. CT primary links and top covers of CTs where ratio changes are by primary change over.

## 6. *Inspection and Readings*

5.7.8.1 **APTRANSCO** shall ensure that all meters which are subject to the terms of this Metering Code are inspected and read by it, or on its behalf, by on-site interrogation not less than once in every three months, and shall give the Registrant or the Interested Party at least five day's prior notice thereof, or such shorter period as the relevant parties may agree. A failure to notify in accordance with 5.7.8.1 shall invalidate the results of any such inspection or reading. Each reading shall be taken at or as close as is practicable to the end of a Settlement period. **APTRANSCO** shall keep written reports of all such inspections and readings and provide copies to the Registrant or the Interested Party for the purposes of 5.7.6.1. Any resulting discrepancies will be dealt with as provided in 5.9, the relevant Agreed Procedure and the relevant PPA.

5.7.8.2 The Registrant or Interested Party, as the case may be, shall have the right to attend any such inspection and readings, although their failure to attend shall not prevent such inspection or reading taking place nor invalidate its results. The representative of any Interested Party or Registrant shall acknowledge the results of any such inspection or reading in the manner required by the Agreed Procedure.

## 5.8 Access

### 5.8.1. *Rights of Access*

Each Party hereby agrees to grant to any other party, its employees, agents and contractors and persons duly authorised by them full right to enter and remain upon any part of such Party's property to the extent necessary for the purposes of this Metering Code subject to the other provisions of 5.8. Each Party granting access must further ensure that any consents or other forms of approval obtained remain valid at the time of such access including, if appropriate, rights of access across third party land.



### ***5.8.2 Access with Equipment***

The right of access provided for in 5.8.1 includes the right to bring in such vehicles, plant, machinery, test kits, loading kits, sub-standard meters and maintenance or other materials as shall be necessary for the purposes of this Metering Code.

### ***5.8.3 Authorization for Access***

Each Party shall ensure that any particular authorisation or clearance for any person which is required to be given to ensure access is available on the arrival of such person at the relevant site.

### ***5.8.4 Limiting Disruptions and Disturbances***

Subject to the right of **APTRANSCO** to inspect without notice pursuant to 5.7.3.3 each Party shall ensure that all reasonable arrangements and provisions are made and/or revised from time to time, as and when necessary or desirable, to facilitate any right of access granted pursuant to 5.8.1 with the minimum of disruption, disturbance and inconvenience. Such arrangements and provisions may to a reasonable extent limit or restrict the right of access and/or provide for any party to make directions or regulations from time to time in relation to a specified matter. Matters to be covered by such arrangements and/or provisions include:

1. the identification of Access relevant to Metering Circuits
2. the particulars of access routes applicable to the land in question having particular regard to the weight and size limits on these routes any limitation on time of exercise of the right of access
3. any requirements as to prior notification and as to authorisation or security clearance of individuals exercising such right of access and procedures for obtaining the same.
4. the means of communication of any relevant directions or regulations made by the Party granting access and
5. the identification of, and arrangements applicable to, personnel exercising the right of access granted by 5.8.1 and
6. Safety Procedures

Each person/employee granted access shall observe and comply with any such safety arrangements and all provisions (or directions or regulations issued pursuant thereto) that are made from time to time.

### ***5.8.5 Responsibilities of Access***

Each party granted access shall ensure that all reasonable steps are taken in the exercise of any right of access to:

1. avoid or minimise damage in relation to the property over which they have access, and
- 2.
3. cause as little disturbance and inconvenience as possible to any party or other occupier of such property, and shall make good any damage caused to any such property in the course of exercising such rights, as soon as may be practicable. Subject to this, all such rights of access shall be exercisable free of any charge or payment of any kind.

#### ***5.8.6 Locations of Operational Metering***

In the case of Operational Metering **APTRANSCO** shall agree with the Interested Party (such agreement not to be unreasonably withheld) whenever such Operational Metering is sited in an area which includes both Operational Metering and other equipment which is of importance in relation to a Generating unit and if it is so, the Interested Party shall maintain, or with the approval of **APTRANSCO**, shall arrange the maintenance of such Operational Metering on behalf of, and under the supervision of **APTRANSCO**, with **APTRANSCO** bearing all such costs and expenses as are reasonable in respect thereof.

#### ***5.8.7 Non-Liability if Metering Access is Denied***

For avoidance of doubt, no party shall incur any liability under this Metering Code in the event it cannot perform any of its duties hereunder due to access to Metering being denied to it, save that such party shall promptly inform **APTRANSCO**, the relevant Registrant and the Interested Party accordingly.

#### **5.9 Metering Discrepancies**

The parties acknowledge that, in transmitting metered data, impulses representing electrical quantities may be lost between the relevant meter and the **APTRANSCO** Data Collector or the Data Collection System, giving rise to inaccuracies in Settlement values, notwithstanding that the Metering is complying with the standards required by this Metering Code. In such Circumstances any differences between electricity flows recorded on meters and the total of the Settlement values recorded in the Data Collection System will be noted at the time that the meter is inspected and read pursuant to 5.7.8 or 5.3.2. Reports of such meter readings will be provided to the Interested Party and any resulting discrepancies will be dealt with as provided in the relevant Agreed Procedure and PPA. In any other circumstances where metering is not complying with the standards required by this Metering Code such difference will be dealt with in accordance with 5.12.

No financial adjustment shall be made to any payment to be made in respect of a day under

a PPA as a result of identifying any metering discrepancy in respect of such day unless a dispute is raised in respect of such discrepancy prior to the expiry of the seventh Business Day following receipt by the Interested Party of the confirmation statement in respect of such day, or the Meter Reconciliation statement which identifies such discrepancy.

As far as possible settlement values shall be derived from the direct readings of the meters read by personnel and conveyed by phone or by post.

## **5.10 Defective Equipment**

If at any time any metering is destroyed or damaged, or otherwise ceases to function, or is found to be outside the prescribed limits of accuracy referred to in 5.5, the Registrant or, the Interested Party shall, subject to compliance with its obligations under 5.7.7, promptly adjust, renew or, repair the same or replace any defective component or, procure the same so as to ensure that the relevant Metering is restored to service and operating within the prescribed limits of accuracy within one month from the date of noticing the defect. Metering includes the secondary circuits of instrument transformers.

## **5.11 Sanctions for non-compliance**

In the event that a Registrant or Interested Party cannot or does not comply with its obligations to repair, adjust or, replace or, renew any defective component pursuant to 5.10, **APTRANSCO** or the Interested Party shall have the right to carry out such repair, adjustment, replacement or renewal and to recover its costs, expenses and interest thereon from such Registrant or Interested Party forthwith on demand.

## **5.12 Meter Failure**

### ***5.12.1 Assumed Meter Readings in the event of Faulty Metering***

If at any time Metering ceases to function or is found to be outside the prescribed limits of accuracy referred to in 5.5 (as the case may be) for whatever reason then except in the circumstances in 5.12.4,

#### ***2. Non-Functioning of Metering***

In the case of Metering ceasing to function, during the period from the date of such cessation or,

### ***5.12.3 Other cases of Inaccuracy***

In any other case, during the period from the time when such inaccuracy first occurred or, if such time is unknown, from the midnight preceding the day during which the disputed reading occurred, until the date of adjustment or replacement, repair or renewal of such Metering under 5.10 and 5.11, the metering readings shall be deemed to be those calculated pursuant to Agreed Procedures No.1,2,3,4,5,6 and 7 as the case may be and in the case of disputes, the relevant PPA.

### ***5.12.4 Voltage Transformer Fusing***

If any time a voltage transformer fuse on a circuit supplying a meter has failed with the result that the Metering is outside the prescribed limits of accuracy referred to in 5.5, the meter readings from the time the failure is deemed to have occurred until the voltage transformer circuit is again restored to the meter, shall be deemed to be those calculated pursuant to Agreed Procedures Nos.1,2,3,4,5,6 and 7 as the case may be, and in the case of disputes, the relevant PPA.

### **5.13 Collection, Retrieval, Validation and Estimation of Data**

Where a party identifies that, as determined by the relevant Agreed Procedure, data required from a Metering is incomplete, inaccurate or has not been transmitted or received, that Party will notify **APTRANSCO**, the Interested Party or the Registrant as appropriate, in accordance with the relevant Agreed Procedure taking into account the following priorities in the following order:

1. The need to obtain accurate data
2. The need to apply verification procedures
3. The need to produce edited or substitute data where it is incorrect or unavailable.
4. The need to rectify the metering, PTs and CTs at the earliest possible time.
5. The need to estimate by realistic methods the energy exchanged during the period while the metering, and/or PTs and/or CTs were defective.

### **5.14 Disputes**

#### ***5.14.1 General***

Any dispute relating to metering which would affect any payment to be made or reduced in respect of a Generating Unit/Delivery point to the Distribution under a PPA shall be dealt with in accordance with the relevant Disputes procedure.

#### ***5.14.2 Referrals to the Metering Committee***

Any dispute in relation to the following matters shall be referred to the Metering Committee whose decision shall be final and binding and shall be communicated to all parties concerned.

##### ***5.14.2.1 Siting of metering***

***5.14.2.2 Technical specifications for Metering and associated installations like measuring transformers or the Data Collection System***

***5.14.2.3 Sealing of Tariff Metering***

5.14.2.4 Compliance of Metering or Measuring transformers with technical specifications of the Metering Code.

5.14.2.5 Compensation values

5.14.2.6 Any other issue pertaining to interface metering which a party may raise.

### ***5.14.3 Procedure for Other Disputes***

Any other dispute under this Metering Code shall be dealt with in accordance the disputes procedure in the relevant connection Agreement or Section 1.5 of the General Code according to the subject and context.

### ***5.14.4 Testing of Metering***

Any testing of metering or measuring transformers required to settle a dispute shall be carried out in accordance with 5.7.4 and 5.7.5.

### ***5.14.5 Payment of Costs***

The Metering Committee shall have the power to order payment of costs and expenses in respect of any dispute referred to it in such manner as it considers appropriate. The Metering Committee shall have the power to demand any information it may properly and reasonably require to settle a dispute from any Party and such Party shall provide the relevant information on request.

## **5.15 Metering Committee**

### ***5.15.1 Composition of the Metering Committee***

A Metering Committee shall be appointed for the purposes of this Metering Code. The composition of the metering committee shall vary depending upon whether it is considering generation matters or supply matters. It will comprise:

5.15.1.1 when it considers generation matters, one representative from **APTRANSCO** (such person having one vote for each vote cast by a Generator at the meeting), one representative from each major Generator (> 100 MW) one representative to represent all CPPs, one representative to represent mini hydel and non-conventional, and one representative from the Commissioner's Office, and

5.15.1.2 when it considers supply matters, one representative from **APTRANSCO**, one representative from each Distribution Company, and one representative from APERC. The representative from APTRANSCO shall have one vote for each vote cast by a DISCOM at the meeting.

### ***5.15.2 Appointments to the Committee***

Members of the Metering Committee shall be appointed from time to time by the relevant Party or Parties concerned. In default of appointment by the relevant Parties, the Commissioner shall have the right to appoint representatives from the Parties who have failed to appoint their own representatives. Members of the Metering Committee shall be required to enter into confidentiality undertakings in favour of all parties in a form specified by the Review Panel of Code of Technical Interface.

#### ***3. Committee Voting Procedures***

Decisions of the Metering Committee shall be made by the voting of committee members attending any meeting. Save as provided in 5.15.1.1, and 5.15.1.2, each committee member shall have one vote. The Chairman, where necessary, shall have a casting vote. Two committee members with at least one member from APTRANSCO and one member from each DISCOM involved in the issues to be discussed shall be a quorum for any meeting of the Metering Committee when supply matters are considered. Two committee members with one member from APTRANSCO and one member from the Generating Company involved in the issue shall be the quorum of the committee meeting when Generation matters are considered. No less than 5 Business Days notice of a meeting of the Metering Committee shall be given to all committee members entitled to attend such meeting, unless otherwise agreed by all such committee members.

### ***5.15.4 Committee Chairman***

The Chairman of the Metering Committee shall be an ex-officio member of the CTI Review committee. He has one vote on matters pertaining to Metering. The Chairman shall be appointed by the Metering committee and in the absence of agreement, the representative from the Commissioner's office shall be the Chairman.

### ***5.15.5 Rules and Procedures***

The Metering committee shall operate in accordance with such other rules and procedures as are laid down by it.

### ***5.15.6 Committee Secretary***

One representative from **APTRANSCO** shall be the Member-Secretary and act as Secretary of the Metering Committee for the purpose, inter alia of giving and receiving of notices. The addresses and telephone numbers of all Committee Members shall be furnished to the Secretary. The address and telephone number of the Secretary shall be informed to all Committee Members, the Chairman of the Committee, the Corporate Offices of all entities and APERC.

### ***5.15.7 Attendance at the Committee by Non-Members***

A technical person from the manufacturers of Meters may attend any meeting without voting right on invitation by Generators/**APTRANSCO**/Distcoms/ Commissioner.

### ***5.15.8 Communicating Revisions to the Metering Code***

If, during any committee meeting, it is decided to revise any part of the Metering Code the decision shall be communicated in writing to the Code of Technical Interface Review Panel for effecting the revision. The Chairman of the Metering Committee shall attend the CTI Review Meeting whenever metering issues figure in the agenda. If the Chairman cannot attend the CTI Review Meeting he may authorise any Member of the Metering Committee to represent him in the CTI Review Meeting. Metering Code is part of CTI (Grid Code) and for any revision of Metering Code the same procedure for revision of Grid Code has to be followed. Proposals for revision of the Metering Code may also be sent direct to the Review Panel by any utility. The Panel shall in turn inform the proposals to the Metering Committee.

## **5.16 Information**

### ***5.16.1 Provision of Information to APTRANSCO***

All Parties shall give to **APTRANSCO** all such information in their possession regarding Metering which **APTRANSCO** shall reasonably require for the proper functioning of the Data Collection System including information regarding the dates and time periods for installation of new metering and the dates and periods when metering will be out of service.

### ***5.16.2 Dispute Resolution***

At the request of any Party which is a party to the dispute referred to in 5.14.2 any relevant data associated with the Metering in question shall be submitted by **APTRANSCO** to the Metering Committee for the purposes of resolving such dispute.

### ***5.16.3 Electronic Data***

*5.16.3.1* In the event of any malfunction, breakdown or other such occurrence or, difficulty affecting the Data Collection System which, in the reasonable opinion of **APTRANSCO** affects or, is likely to affect, any Party other than **APTRANSCO** to a material extent, **APTRANSCO** shall, as soon as reasonably practicable thereafter, provide each Party so affected (or likely to be affected), with a report describing in reasonable detail such occurrence or difficulty and its likely duration.

*5.16.3.2* Any Party that chooses to receive electronic data from Metering shall install such Computer equipment as may be necessary for such purpose and which shall be compatible with such Metering and shall comply with any relevant requirement of the Agreed Procedures. Each Party shall be responsible for its own computer equipment and communication lines.

*5.16.3.3* Each Interested Party shall have the right to receive electronic

data from any Metering in respect of which it is the Interested Party via the Generator Data Collector. **APTRANSCO** shall not, without good cause, interrupt or otherwise disturb such electronic data. The Interested Party shall be responsible for the maintenance of any communication lines to or from the Generator Data Collector.

## **5.17 Ownership of Metering Data**

The Registrant of any Metering shall own the data acquired therefrom. Any Party shall at all times have the right of access to the data and to use the same as may be permitted pursuant to this Metering code, free of charge. If the data is confidential, the party may only release such data to others to the extent required pursuant to this Metering Code or as permitted by the Connection Agreement.

## **5.18 Notice of Installation of New Meters**

### ***5.18.1 Timely Installation***

Where notice is served on **APTRANSCO** in the form set out in the relevant Agreed Procedure No.8 by a proposed Registrant of an existing Relevant Connection site, which is the point of supply of a Distribution Company, the proposed Registrant shall confirm that metering required for the purposes of this Metering Code will be installed and kept operational at the Relevant connection site. Where the necessary metering will not be installed and operational by a required date, the Registrant and **APTRANSCO** shall follow the provisions set out in 5.18.2. Such Metering shall be tested in accordance with the provisions of 5.7.2

### ***5.18.2 Settlement of Disputes***

Where 5.18.2 has effect pursuant to the provisions of 5.18.1 above:

*5.18.2.1* the Registrant and **APTRANSCO** shall agree demand Settlement values for each demand Settlement period, for each day from the expiry of the notice until the relevant Metering is installed and operational.

*5.18.2.2* if agreement cannot be reached in accordance with 5.18.2.1 within 14 days, the matters may be referred to arbitration in accordance with the relevant Connection Agreement and payments will be made on the basis of values as reasonably determined by **APTRANSCO** pending a decision of the arbitrator. Payments shall be adjusted as appropriate at the time of such decision to take into account the Settlement values so determined since the date of such notice;

*5.18.2.3* **APTRANSCO** shall take such values determined in accordance with 5.18.2.1 or 5.18.2.2, into account for the purpose of the Data collection system and the Registrant shall be bound to accept



such values, subject to adjustment in accordance with 5.18.2.2, for the purpose of electricity consumption until the relevant metering is installed and operational;

5.18.2.4 As soon as practicable after the Registrant has installed the required Metering, the Registrant shall notify **APTRANSCO**. As soon as reasonably practicable thereafter, **APTRANSCO** shall commence using the data collected from the meter for the purposes of the Data collection system and shall inform the Registrant of the date on which it commenced doing so.

## 5.19 Notices

### 5.19.1 Changes in Registrants

Any notice of a new Registrant or of a change in Registrant or any other communication required under this Metering Code to be given to **APTRANSCO** shall, if required, be sent by facsimile to number [ ] at [ ] attention [ ] (with hard copy to follow by first class post) or such other facsimile number and address as may from time to time be nominated in writing by **APTRANSCO**. Where it is required to be given to any other Party it shall be sent by a facsimile to such number, at such address and to such person as such Party shall nominate in writing to **APTRANSCO** (with hard copy to follow by first class post). In the absence of nomination such communication, as is required, shall be sent to the registered office of the other Party.

### 5.19.2 Validity of Facsimile Notice

Any notice or other communication sent by facsimile pursuant to 5.19.1 shall be deemed to have been received when dispatched.

### 5.19.3 Requirement for 28 Day Notification

A new Registrant must be notified to **APTRANSCO** at least 28 days prior to either:-

5.19.3.1 The date of the intended commencement of obligations of the Registrant or

5.19.3.2 The date of simultaneous termination of obligations by the existing Registrant and the assumption of those obligations by the new Registrant, (as the case may be) in connection with the relevant Metering.