

PUNJAB STATE ELECTRICITY REGULATORY COMMISSION
SCO 220-221, SECTOR-34 A CHANDIGARH

Petition No.47of 2017

Date of order: 28.02.2018

In the matter of: Petition under Section 50 read with section 86 of the Electricity Act, 2003 for directions in regard to the metering Protocol and alleged complaints regarding Trivector ToD meters.

AND

Punjab State Power Corporation Limited, The Mall, Patiala

.....Petitioner

Present: Sh. S.S. Sarna, Member
Ms. Anjuli Chandra, Member

Order:

1.0 The present petition has been filed by Punjab State Power Corporation Limited (PSPCL) under section 50 ready with section 86 of the Act for *ex-post facto* approval of the Commission to change the Tariff protocol of ToD meters from LAG only to LAG+LEAD. PSPCL submitted as under:

1.1 The Commission has designed the retail supply tariff for which consumers based on kVAh consumption in the tariff order for the year 2014-15 with effect from 01.04.2014. Prior to the above tariff order, the tariff protocol was based on kWh consumption. All the existing meters of PSPCL were based on the then existing protocol of kWh billing.

1.2 The primary difference between kWh and kVAh consumption is that in kVAh billing, the reactive energy drawal is also accounted for, whereas in kWh billing reactive energy drawal is not considered. kVAh billing also takes into account the incentive and disincentive for power factor and would result in reduction of T&D losses in the system.

1.3 In LAG only meters, at leading power factor, the Apparent Energy (kVAh) was being equated to Active Energy (kWh) considering the

power factor as unity. By considering the power factor as unity, the Reactive Energy Lead (KVARh lead) was considered to be zero.

- 1.4 When the tariff order for the year 2014-15 was issued, the procurement of HT meters as per the specification No.MQP-66 was in progress. After the kVAh billing was introduced, the metering specifications were required to be amended with the following clause:

The registration of reactive and apparent energy at leading/lagging power factor shall be as follows

- (i) Reactive energy shall be stored in separate registers.
- (ii) Apparent energy shall be computed as under considering reactive (lag/lead) as under:

$$\text{Apparent Energy} = \frac{\text{Active Import Energy}}{\sqrt{[\text{Active Import Energy}]^2 + [\text{Reactive energy (Lag/Lead)}]^2}}$$

- 1.5 The above specifications are also being followed by many other distribution licensees. It is also the scientific manner of measuring the energy supplied taking into account the reactive power both lag as well as lead, which is the requirement of kVAh measurement and is based upon actual electrical parameters.

- 1.6 Such switch over from kWh to kVAh measurement under the meter specifications ought not to have any real impact on the energy consumption of the consumers, as the consumers are required to run their motive load only which is inductive in nature and compensate the inductive factor by using capacitors of adequate capacity.

- 1.7 The consumers who were not aware of the nature of kVAh measurement and billing and had not installed their capacitors through starters of their motors were affected.

- 1.8 PSPCL has also attempted to educate the consumers about the nature of the kVAh billing and the meters capability of recording the reactive power both lag as well as lead and the requirement to maintain their power factor close to unity under all loading conditions. Wide publicity

of the same has also been made by PSPCL through public awareness programmes and also by publishing the same in leading newspapers.

- 1.9 The allegation of inflated energy recording was only because the consumers did not fully comprehend the requirement to maintain the power factor close to unity under different conditions of load and the consequences of not maintaining the same.
- 1.10 The changed metering specification is only to comply with the shift from kWh to kVAh billing. While majority of the consumers at large are still with the old meters, PSPCL has till date installed around 3000 meters under new specifications MQP 95 and will progressively shift the existing consumers from the old meter specifications to the new specifications which is capable of recording energy on kVAh basis. PSPCL did not in any manner seek to violate any order or direction or Regulation framed, but on the other hand only to comply and implement the kVAh billing in letter and spirit.
- 1.11 There is no Regulation, order or direction of the Hon'ble Commission which prohibits the action taken by PSPCL, on the other hand the very implementation of the kVAh billing by the Hon'ble Commission requires the meters to be progressively changed to ensure proper recording of the reactive energy and energy recording on kVAh basis.
- 1.12 The status quo regarding billing of consumers under kVAh Tariff regime existing prior to installation of meters with changed specification No. MQP-95 cannot be maintained until and unless the meters are replaced at the end of consumers' premises.
- 1.13 This alternative for replacement of meters is time consuming and having large financial implications.
- 1.14 Status quo is also not feasible to be maintained with the existing meters as Apparent Energy (kVAh) cannot be calculated correctly from the parameters available in the meter i.e. Active Energy (kWh) and reactive Energy is kVARh lag and kVARh lead.

PSPCL prayed that:

- a) To take on record the change in meter specification from MQP-66 to MQP-95 to comply with the kVAh billing specified by the Commission.
- b) To pass such other Order(s) as the Commission may deem just in the facts of the present case.

2.0 While admitting the petition, the Commission noted that the subject matter in the petition involves the public interest at large. Therefore, PSPCL was directed vide order dated 20.09.2017 to issue public notice by 06.10.2017 inviting objections and suggestions from public and all stakeholders by 23.10.2017. PSPCL was directed to submit its comments on the same to the Commission by 02.11.2017 and the next date of hearing was fixed on 15.11.2017.

3.0 PSPCL published the notice which appeared in various Newspapers on 10.10.2017. The commission observed that there was delay in publication of the notice by PSPCL so the utility was directed to extend the date for receipt of objections to 30.10.2017. The necessary public notice was published on 19.10.2017. In response, 37 number objections were received.

4.0 During hearing on 15.11.2017, the learned Counsel for PSPCL submitted that kVAh meters with LAG+LEAD Tariff Protocol have been procured by PSPCL after the introduction of kVAh tariff by the Commission. The learned Counsel admitted to the lapse of PSPCL for changing the Tariff Protocol of the meters without getting the permission of the Commission and assured that there is no intention of PSPCL to penalize the consumers. PSPCL admitted that no technical study regarding any adverse effect of leading power factor maintained by the consumers, on power system, has been carried out by the licensee. PSPCL was directed to come up with quantifiable data, if any, regarding system requirement to justify the introduction of LAG+LEAD Tariff Protocol meters. It was decided to hold public hearing on 09.01.2018 at 11.30 AM in the office of the Commission.

PSPCL was further directed to withhold the procurement of LAG+LEAD Tariff Protocol meters with immediate effect and also stop installing such meters till further orders of the Commission. PSPCL was also directed to ensure that no

consumer is penalized in case of leading power factor recorded by LAG+LEAD Tariff Protocol meters already installed on consumer premises.

5.0 A public hearing was conducted in the office of the Commission on 09.01.2018. Various industrial consumers submitted their objections against LAG+LEAD tariff protocol meters which were taken on record. PSPCL also submitted their comments on the objections raised by thirty six stakeholders whose objections were received in the office of the Commission. PSPCL failed to supply any report of the technical study regarding adverse effect of leading power factor maintained by the consumers on power system nor the petitioner could supply any quantifiable data to justify the introduction of LAG plus LEAD Tariff Protocol.

6.0 The gist of the objections received from various stakeholders is as under:

- a) No State in India has adopted LAG plus LEAD Tariff Protocol.
- b) The proposed kVAh Tariff in ARR for FY 2014-15 was based on the data of LAG only Tariff Protocol. The Commission issued Tariff Order for FY 2014-15 on the basis of LAG only Tariff Protocol and not on the basis of LAG plus LEAD Tariff Protocol. The LAG plus LEAD Tariff cannot be allowed against tariff fixed on LAG only Tariff Protocol.
- c) PSPCL has not sought the permission of the Commission for changing any Tariff design or meter design, & PSPCL has illegally installed LAG plus LEAD Tariff Protocol meters on consumers.
- d) CGRF set aside the illegal demands raised on the basis of consumption in kVAh recorded through LAG plus LEAD protocol tariff meters when the consumers made complaints to PSPCL, CGRF and Commission.
- e) The consumers have already installed shunt capacitors as advised by PSPCL with LAG only Tariff protocol and maintaining p.f. of 0.90. If new meters are installed with LAG plus LEAD Tariff protocol then consumers shall have to spend around one to five lakhs rupees per consumer to install suitable capacitor bank regulating panels and scrapping existing shunt capacitors. This is a huge burden on

consumers and a big national wastage to scrap existing capacitor banks.

- f) Tariff petitions are to be filed before 120 days of the Financial Year. Tariff petition for FY 2017-18 has already been decided by the Commission on 23.10.2017. Thus this petition has become infructuous and same should be dismissed.
- g) PSPCL illegally, arbitrarily purchased Quadrant meters with LAG plus LEAD Tariff protocol basis and the same were installed on pick and choose consumers. Power factor of some of the consumers fell to 0.3 to 0.5 from 0.9 to 0.98 with the installation of LAG plus LEAD Tariff protocol meters. The petitioner has not even cared to get the approval from the Commission before placing the Order to purchase meters with a view to increase their income illegally. This is violation of Supply Code clause 21.2.7.
- h) PSPCL has not installed the required shunt capacitors regulating system at their Substations and not maintaining power factor of their own grids. Further the petitioner has installed meters with LAG only Tariff protocol at their works/grids/substations. In view of the above conversion of system recording kVAh reading from LAG only protocol to LAG plus LEAD Tariff protocol is a Tariff issue and as such the petition be dismissed.
- i) The objectors also questioned about the ownership of private meters installed by the consumers, in case of private meters installed by consumers are changed by the petitioner with new meters, the new meters be declared as the property of the consumers.
- j) PSPCL changed the meters without informing the consumers. PSPCL neither explained the working of new meters nor shared/supplied performance certificates of new meters. The stakeholders further desired the comparison in annotated form of the existing LAG only and proposed/new LAG plus LEAD Tariff protocol meters should have been supplied by PSPCL along with petition for proper analysis/understanding of proposal.
- k) Since the petitioner has not provided the illustrations of other Industrial States which have successfully adopted the proposed metering

arrangement, a detailed discussions among various stakeholders based on Staff Paper from PSERC is required.

- l) The industry has switched from kWh tariff to kVAh tariff and as such many Mills have invested crores of rupees to improve the power factor especially in Arc Furnace Industry and taking the same to 0.98 to 0.99 and even above. This has also improved the functioning of the PSPCL and has generated substantial advantages to PSPCL.
- m) The proposed LEAD and LAG metering system seems to be an act of haste and is totally inappropriate to shift the Industry of the State to LEAD and LAG metering arrangement and as such the proposal should not be accepted. Moreover, the proposed LEAD and LAG metering system does not seem to have taken into account the challenges of Steel Furnace Mills which have cyclical power consumption/load curve. During melting the power consumption shoots up and once the bucket is to be emptied by pouring the melted steel the consumption falls steeply. Also the automatic arrangement to monitor the control power factors takes seven to eight minutes.
- n) The claim of the petitioner that such meters are being used by UP was rejected. The purchase order of U.P. is of 16.09.2017 whereas the current petition was filed on 08.08.2017. No consumer was informed about the working of such meters and public was not informed about LAG + LEAD measurement of energy. Large industries like paper mills, steel industry and textile industry cannot install the capacitors through starters of their motors due to technical constraints. The consumers have alleged that energy recording was inflated and the petitioner admitted that KVAh reading was due to leading power factor because capacitors were not properly placed in the meters and the petitioner is getting revenue for power which is not used by the consumers. It is not a win-win situation for both parties.
- o) Due to change of ToD meter in Sept., 2016, the consumers have started getting highly inflated bills and the new meter is showing the power factor in the range of 0.1 to 0.2 against recording of power factor of 1.00 or slightly less with the old meter. The KWh consumption being shown in the new meter is also same as per previous Trivector meter.

7.0 PSPCL submitted replies to the objections and submitted as under:

- a) UP has introduced LAG plus LEAD Tariff protocol and supplied a copy of P.O. dated 16.09.2017 placed by Madhyanchal Vidut Vitran Nigam Lucknow to support their claim.
- b) LAG plus LEAD protocol meters were installed because the Hon'ble Commission introduced kVAh Tariff in 2014-15.
- c) Only those consumers were affected who were in the habit of keeping their capacitor panels always in circuit.
- d) CGRF never directed PSPCL to change the metering protocol.
- e) The cost of automatic capacitor panels is about ₹50,000 to ₹70,000 and is one time investment and the benefits to the consumers and national grid are much more.
- f) The instant petition has been filed to change the metering protocol.
- g) The objections are not technically correct as power factor depends upon the type of load and metering equipment is there to record the same.
- h) Non installation of shunt capacitors is not tangible as the shunt capacitors installed at the grids or on the lines are to compensate the LAG kVAh of that particular system so that reactive current flow should be minimized. The capacitors installed at the consumers premises are to compensate LAG or LEAD kVAh generated at the consumer end.
- i) The private meters when replaced will be handed over to the consumers as per the standard procedure.
- j) The details of the meters are available in the specification uploaded with the petition. Two number meters from one of the lots offered for inspection by the firm are packed and sealed and the same are got tested from one of the reputed labs of India (NABL ACCREDITED LAB). The petitioner further submitted that test results as carried out in ME lab by the Committee to compare and check the working of the meters procured against current specification MQP-95.

8.0 Commission's Findings and Order

After going through the submissions made in the petition by PSPCL, objections raised by the consumers and justifications given by PSPCL, the

Commission observes that the kVAh Tariff was introduced in the Tariff Order for FY 2014-15 and the revenue neutrality was worked out with LAG only tariff protocol meters which were already installed at the premises of the consumers. The change of meter specifications from LAG only to LAG plus LEAD Tariff Protocol by PSPCL at their own level was a major change which affected the billing of the consumers adversely. As per regulation 21.2.7 of the Supply Code, 2014, prior approval of the Commission was required. Moreover, principles of natural justice also require that before introducing such a major change, the consumers should have been informed in advance. However, neither prior permission of the Commission was obtained by the licensee nor the consumers were informed in advance. Even the field officers were not aware of the change in the tariff protocol of the meters and were unable to reply to the queries of the affected consumers regarding excessive billing after change of meters. Such indifferent attitude of PSPCL towards its consumers is highly deplorable. Further it was observed that Lag plus Lead tariff protocol meters had been installed on only 3000 consumers thus resulting in operation of two different tariff protocols in the State. This led to increased billing of these 3000 consumers only. This selective installation of meters has created unfair loss to some of the consumers.

PSPCL has admitted that extra investment will be required by the consumers to install automatic capacitor panel for maintaining power factor near to unity. This may not be justified in a scenario where the existing power system of the utility is operating at lagging power factor. PSPCL failed to produce any system study or quantifiable data to justify the change of the meter specifications from LAG only Tariff Protocol to LAG plus LEAD Tariff Protocol.

The Working Group set up by the Forum of Regulators in its report of August, 2009 on 'Metering Issues' has discussed this issue in detail and observed that since most of the time the distribution system remains in a lagging environment, so leading power factor conditions be treated as unity power factor i.e. billing be calculated based on lagging power factor. Moreover, the recent Capacitor Bank Study got conducted by NRPC from Central Power Research Institute recommended capacitor compensation of more than 2600 MVAR for Punjab.

In view of the above, Commission finds no justification for introduction of LAG plus LEAD Tariff Protocol ToD meters at this stage and thus dismisses the petition of PSPCL for ex-post facto approval of introduction of LAG plus LEAD tariff protocol meters. The Commission directs PSPCL to either replace all the Trivector ToD meters with LAG plus LEAD Tariff Protocol procured against specification No.MQP-95 with LAG only Tariff protocol ToD Trivector meters or change the Tariff Protocol of all the meters procured against MQP-95 from LAG plus LEAD Tariff Protocol to LAG only Tariff Protocol within three months from the date of issue of this Order. The Commission also directs PSPCL to ensure that no consumer is charged extra for leading power factor recorded with LAG plus LEAD Tariff Protocol meters already installed on the consumers' premises and in such cases, the power factor shall be taken as unity. It is further directed that the amounts already charged on account of leading power factor may be refunded to the consumers. Any violation of the directions shall invite action under section 142 and 146 of the Act. It is further directed that PSPCL may submit a study indicating the power factor of the system at various voltage levels during various seasons.

The petition is dismissed accordingly.

Sd/-

(ANJULI CHANDRA)
MEMBER

Sd/-

(S.S.SARNA)
MEMBER

Chandigarh

Dated: 28.02.2018