

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Case No. 165 of 2020

Case of Vidarbha Industries Association seeking removal of difficulty in implementation of MYT Order of Maharashtra State Electricity Distribution Company Limited in Case No 322 of 2019 dated 30 March, 2020

VidarbhaPetitioner	Industries	Association
Vs		
1. Maharashtra State Electricity Distribution Company Limited	Respondent
2. Tata Power Company Limited (Distribution)		... Impleaded Respondent 1
3. Adani Electricity Mumbai Limited (Distribution)		... Impleaded Respondent 2
4. The Brihanmumbai Electric Supply & Transport Undertaking		.. Impleaded Respondent 3
5. M/s. Gigaplex Estate Private Limited		... Impleaded Respondent 4
6. M/s Mindspace Business Parks Private Limited	 Impleaded Respondent
5		
7. M/s. KRC Infrastructure and Projects Private Limited	 Impleaded Respondent
6		

Appearance

For Petitioner: - Shri. R.B Goenka (Rep)
For Respondent: - Shri. Harinder Toor (Adv)
For Impleaded Respondent 1 Shri Prashant Kumar (Rep)
For Impleaded Respondent 2 Shri Vivek Mishra (Rep)
For Impleaded Respondent 3 Shri N.N. Chougule (Rep)
For Impleaded Respondent 4,5,6 Shri Nitin Chunarkar (Rep)

Coram
I.M.Bohari, Member
Mukesh Khullar, Member

ORDER

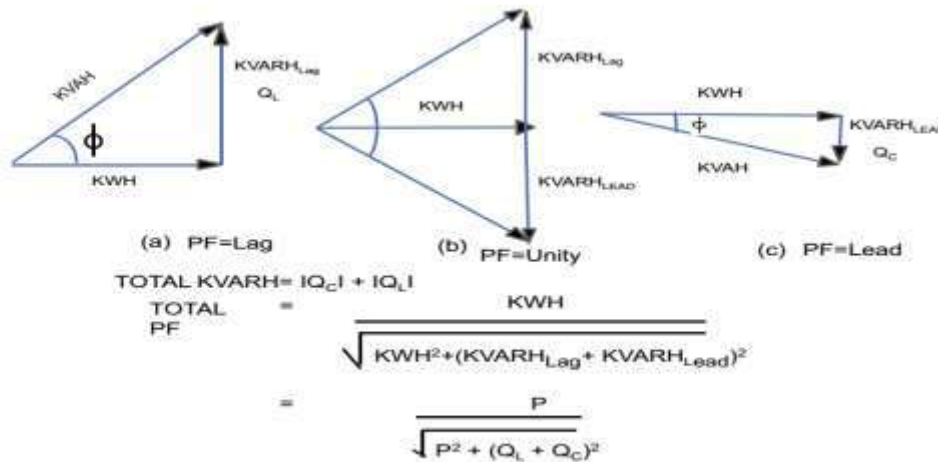
Date:19 November , 2020

1. Vidarbha Industries Association (**VIA**) has filed a Petition being Case No.65 of 2020, seeking removal of difficulty in implementation of the MYT Order of Maharashtra State Electricity Distribution Company Limited (**MSEDCL**) in Case No 322 of 2019 dated 30 March, 2020 under Regulations Nos. 91 to 94 of the MERC (Conduct of business) Regulations 2004.
2. **VIA's main prayers are as under:**
 - a) *Provide a grace period of 1 year i.e. from April 2020 to March 2021 so that consumers shall get suitable time for installation of required instantaneous PF correction systems and direct MSEDCL to charge KVAH consumption calculated based on monthly KWH and KVARH lag and KVARH lead consumptions in the energy bills of consumers.*
 - b) *Direct MSEDCL to refund the excess amount paid by consumers after revising the energy bills as per Prayer (i)*
3. **VIA in its Petition has stated as follows:**
 - 3.1 VIA is a registered Association of Industries in Vidarbha, formed in the year 1964 for the promotion and development of industry in the region, and is more than five decades old.
 - 3.2 The Commission vide its Order dated 30 March 2020, in Case No. 322 of 2019 has fixed Tariff for different categories of consumers of MSEDCL with effect from 1 April 2020. There is a major change in the methodology of levying energy charges in kVAh units instead of kWh, which has adversely affected industrial consumers in the State. The kVAh consumption has increased beyond expected kVAh consumption calculated considering kWh and average power factor of consumers.
 - 3.3 Calculation of kVAh consumption by average monthly Power Factor and comparison with recording of meter shows that the recorded kVAh consumption by the meter is more than the calculated kVAh consumption based on kWh, kVARh lag and kVARh lead consumptions.

S.NO.	PARTY NAME	KWH	KVAH	RKVAH (Lag)	RKVAH (Lead)	CALCULATED KVAH READING = $\sqrt{[KWH^2 + (RKVAH_{Lag} - RKVAH_{Lead})^2]}$	CALCULATED PF	BILLED PF	KVA MD	KVAH DIFF	KVAH % ERROR
1	R C PLASTO TANKS	332240	413620	6140	100860	349045	0.952	0.803	1970	64975	18.50047717
2	SHRINIVAS SPINTEX	899580	901605	30908	1112	900150	0.999	0.998	1449	1455	0.161674691
3	NANDED ROLLER	73913	108288	2678	48593	89955	0.822	0.682	387	18331	20.38059932
4	GURULAKSHI COTTEX	286200	292965	7965	16620	287254	0.996	0.976	1317	5711	1.988134879
5	GIMATEX INDUSTRIES	2080368	2084537	19344	12240	2080608	1.000	0.998	6288	3929	0.188851589
6	S S FOOD	191365	197691	23520	8380	194006	0.986	0.968	460	3685	1.899635354
7	SANSKAR AGRO	735213	735949	22725	2188	735635	0.999	0.999	1171	314	0.042687935
8	ASHOK LEYLAND LTD	47865	51746	17730	1860	51719	0.925	0.925	719	27	0.052740751
9	SRI SAINATH AGRI IND	497670	499665	35490	2310	499103	0.997	0.996	1289	562	0.112508711
10	CANDICO ID LTD	29035	29260	2895	115	29191	0.995	0.992	158	69	0.237736200
11	SIMPLEX CHEMOPACK	283407	285507	29414	2	284930	0.995	0.992	739	572	0.202676326
12	HIND STEEL	3248	9015	3360	4710	8699	0.373	0.360	52	316	3.631366878
13	ANKIT PULPS AND BOAR	355520	356310	12100	6765	356020	0.999	0.997	631	290	0.081409423
14	HARIWANSH PACKAGING	24352	35407	4055	12756	29591	0.823	0.667	311	5816	19.65446456
15	SANDEEP METAL CRAFT	13270	14005	2935	62	13604	0.975	0.947	109	401	2.945967827
16	PRIYA PRECI-COMP	3822	4175	1034	80	3981	0.960	0.915	61	194	4.872092009
17	GIMATEX INDUSTRIES W	2080368	2084537	19344	12240	2080608	1.000	0.998	6288	3929	0.188851589
18	GIMATEX HINGANGHAT	910823	913568	40928	4523	911956	0.999	0.996	2704	1612	0.176727694
19	GIMATEX WANI	255712	256759	13845	2841	256256	0.998	0.996	631	483	0.188499601
20	GIMATEX WANI	871944	874614	15270	7285	872249	1.000	1.000	1717	2365	0.271167552
21	GIMA MANUFACTURING	177540	178324	3515	3252	177669	0.999	0.995	0.995	401	0.225700707
22	ERA POWER LTD	6225	9278	83	6090	8767	0.710	0.670	62	511	5.831247164
23	SANVIJAY INFRASTRUCT	13733	35710	359	30681	32942	0.405	0.405	98	1768	5.208085542
24	SANVIJAY H3	23327	96856	0	93059	95938	0.243	0.243	147	918	0.956722281
25	SHRI SIDHARAJI ISPAT	70276	72687	16158	347	72188	0.974	0.974	195	499	0.691020137
26	N B ENTERPRENUIRS	159203	160003	14870	615	159954	0.995	0.995	0	49	0.030441611
Total Recorded KVAH V/S calculated KVAH			10702061			10583017				119044	1.12486

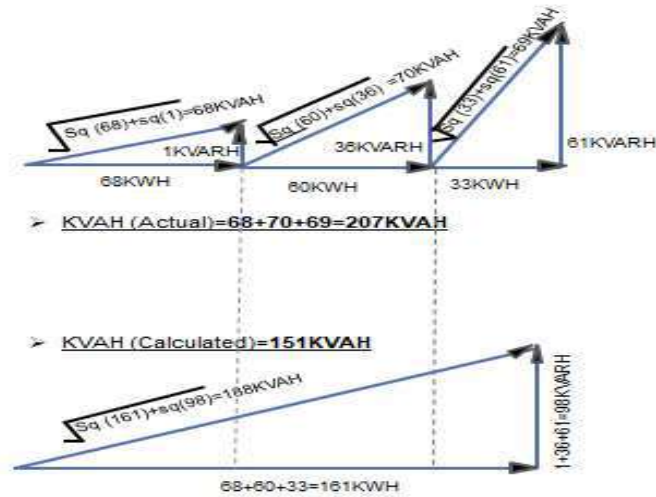
3.4 The kVAh consumption is varying from 0.1% to 18% higher than the calculated consumption of kVAh for different consumers i.e. different type of loads.

3.5 The technical reasons for these variations are explained below.



The above diagram represents the method of improvement of power factor (PF) by providing capacitor with Automatic Power Factor Control (APFC) panels and setting the final PF value near unity in the APFC relay. The kVAh is calculated by kWh kVARh lag and kVARh lead as shown in above diagram and formula on monthly basis.

3.6 New meters are installed by MSEDCL for recording consumption of kVAh. These meters are recording instantaneous kVAh values. In case the consumers load is such that the PF of load is varying, the monthly kVAh recorded in these meters shall be more than the kVAh calculated by consumptions of kWh and RkVAh in the same meter. This fact is clear from the illustration below.



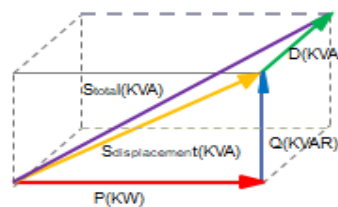
3.7 The above example is a vector diagram of variable PF load. In the above example

Power Factor	Active Energy kWh	Reactive Energy RkVAh	Apparent Energy kVAh
0.99	68	1	68
0.850	60	36	70
0.485	33	61	69
Total	161	98	207
As per Formula kVAh= $\sqrt{(161)^2+(98)^2}$ = 188.48			

This is less than recorded kVAh by meter i.e. **207 KVAh**.

3.8 Apart from the above, the kVAh recorded in meter is increasing because of harmonics present in the supply as illustrated below

EFFECT OF HARMONIC ON POWER FACTOR



$$DPF = \frac{P}{\sqrt{Sq(P)+Sq(Q)}} = \frac{P}{S_{displacement}}$$

$$PF_{True} = \frac{P}{\sqrt{Sq(P)+Sq(Q)+Sq(D)}} = \frac{P}{S_{total}}$$

- 3.9 It is observed that the harmonics present in the load further increases the kVAh consumption and recording of kVAh by adding 4th vector in the power triangle as illustrated above. Hence consumers are automatically paying harmonics penalty in the form of increased kVAh, though the Commission has deferred the harmonics penalty to be paid by consumers.
- 3.10 While submitting the Tariff Petition, MSEDCL did not consider above aspects and the kVAh consumption data was submitted by calculating kVAh from average power factor of consumers which is less than the kVAh recorded by new meters.
- 3.11 Consumers did not get time in Covid-19 pandemic situation for analyzing and doing load study of electrical systems and making required corrections by installing suitable gadgets to improve instantaneous power factor to reduce kVAh consumption of the electrical systems.

4. **BEST in its Submission dated 31 August 2020 has stated as follows:**

As per the directives of the Commission in the MYT Order in Case No. 324 of 2020, BEST has implemented kVAh billing to HT consumers from 1 April 2020 based on the calculated kVAh as per the following approved formula.

$$\text{kVAh is} = \sqrt{\sum(\text{kWh})^2 + \sum(\text{RkVAh Lag} + \text{RkVAh Lead})^2}$$

BEST has not received any objection on kVAh billing from its HT Consumers

5. **AEML-D in its submission dated 07 September 2020 has stated as follows:**

- 5.1 The kVAh is recorded on the basis of instantaneous values present i.e. phase wise voltage, current and power factor. The formula is as follows:

$$\text{kVAh} = \text{Sqrt. } ((\text{kWh})^2 + (\text{kVAh (lag+lead)})^2)$$

- 5.2 Thus, the recorded kVAh and the kVAh derived from monthly billing average power factor will not match. The recorded kVAh is the actual kVAh consumption of the consumer and the same shall always be higher than the kVAh calculated using average power factor. The reduction in PF can be achieved by installing suitable PF correction equipment.
- 5.3 During the three months of lockdown i.e. from April 2020 to June 2020, the average PF of the HT consumers has worsened compared to the situation prior to lockdown. This has largely been as a result of the inability of consumers to install real-time PF correction equipment, continual running of reactive compensation devices during lockdown period (inability to switch off due to restrictions on movement, closure of business, etc.). After lifting of lockdown restrictions, these consumers have been able

to take appropriate action to control their PF and reduce their kVAh consumption. The situation is slowly returning to the pre-lockdown state as far as average PF of the consumers is concerned.

- 5.4 About 91% of the consumers were having average PF of 0.81 or above in pre-lockdown period (March 2020), which significantly reduced to 78% during lockdown period, while returning to almost the same level (89%) after lockdown period i.e. in July 2020. Similarly, it can be seen that the percentage of consumers with PF lower than 0.81 have more than doubled (from 9% to 22%) during the lockdown period. Thereafter further improvement has been seen. This proves that, at least in AEML-D's area of supply, the HT consumers have largely aligned their systems to correct their PF and reduce their kVAh consumption.
- 5.5 The Commission could decide on an appropriate relief to the HT consumers for a limited period, say, April 2020 to June 2020, to shield them from the impact of kVAh billing. One of the ways could be to impose equivalent kWh-based tariff for the period for which relief is provided, to shield consumers from the impact of kVAh billing.

6. TPC-D in its submission dated 8 September 2020 has stated as follows

- 6.1 If conversion of kWh to kVAh is computed with actual recorded PF without rounding off up to three decimal point of PF for every fifteen-minute time slot then there will be negligible difference between recorded and calculated kVAh.

Particulars	PF Digits	Without rounding off	3 Decimals	4 Decimals	5 Decimal	6 Decimal
Meter Energy (kWh)	A1	44006856.00	44006856.00	44006856.00	44006856.00	44006856.00
Meter Energy (kVAh)	A2	45723048.00	45723048.00	45723048.00	45723048.00	45723048.00
Billing Power Factor	C=A1/A2	0.962465490	0.962	0.9625	0.96247	0.962465
Calculated kVAh	D=A1/C	45723048.21	45745172.56	45721408.83	45722833.96	45723071.49
Difference	E=A2-D	-0.21	-22124.56	1639.17	214.04	-23.49

- 6.2 There is no need to defer the implementation of kVAh based billing as enough time was given since last MTR Order issued in September 2018 to all the stakeholders for installing required infrastructure for kVAh based billing.

7. VIA in its additional submission dated 8 September 2020 submitted as follows:

- 7.1 VIA has not requested to change the billing system of kVAh billing but has only requested to calculate this kVAh consumption for billing purpose by dividing kWh consumption with monthly average PF.

- 7.2 MSEDCL is discriminating between consumers by calculating kVAh for billing purpose. In some consumer cases where solar net metering is not installed, MSEDCL is billing on the recorded kVAh consumption by the meters installed by MSEDCL. In case of consumers who have installed solar net metering, MSEDCL is calculating kWh consumption by deducting exported kWh from imported kWh and then calculating kVAh consumption for billing purpose by dividing the resultant kWh by monthly average PF. Hence two different methodologies are being adopted for different type of consumers. For these consumers MSEDCL is not considering and even not recording the consumption of kVAh from the meters installed by MSEDCL. In the energy bills the reading of kVAh recorded by the meter is not entered at all but only calculated kVAh is being shown in the bills.
- 7.3 In its reply BEST has also confirmed that they are calculating kVAh from kWh consumption with RkVAh lag and lead consumption. AEML has also supported the technical submission of VIA.
- 7.4 Therefore, there is discrimination between consumers by MSEDCL for kVAh billing. This violates the provisions of Section 62(3) of Electricity Act 2003.

8. MSEDCL in its reply dated 19 October, 2020 has stated as follows:

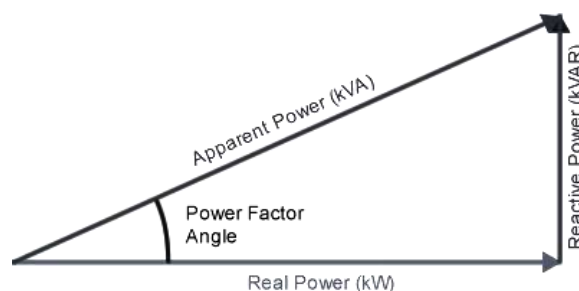
- 8.1 VIA in the Petition has requested for modification in the MYT Order dated 30 March 2020 in Case No. 322 of 2019 in respect of kVAh billing methodology for the period of one year. Regulations 91, 92, 93 and 94 do not provide for modification or alteration of Tariff Order which is passed by the Commission after conducting the public consultation contemplated in the Electricity Act 2003. In these circumstances, the Petition is clearly not maintainable in Law and needs to be rejected at the outset.
- 8.2 MSEDCL has duly installed/recalibrated the new meters for the Members of VIA as well as other HT consumers complying with the provisions of the Section 55 (1) of the Electricity Act 2003 and the CEA (Installation and Operation of Meters) Regulations 2006 and the MERC (Electric Supply Code and Other conditions of supply) Regulations, 2005.
- 8.3 These new meters are tri-vector meters and record the real power (in kW) and reactive power (in RkVAh) and the apparent power is derived from these two parameters. Once the meter readings are available from the meter, the readings are binding on the consumer and they need to pay the charges for consumption as per the Section 45 of the Electricity Act 2003. VIA cannot seek a recalculation of energy charges contrary to the meter readings which is impermissible in law.
- 8.4 On the contention raised by VIA to provide grace period for installation of suitable gadgets for power factor correction, by the previous MTR Order dated 12 September 2018, the Commission had declared its intent to introduce kVAh billing for selected

consumer categories from 1 April 2020. KVAh billing is implemented after conducting the due procedure contemplated under the Act and after hearing the suggestions/objections of the consumers. Thus, consumers were well aware of the kVAh billing system and had sufficient time to get prepared for such change in the billing system. Prior to the MYT Order dated 30 March 2020, MSEDCL has taken various initiatives for consumer awareness to explain the concept of kVAh billing and its implications. Thus, the kVAh billing is not a new event which the consumer especially HT consumers are not aware of. In fact, the Commission has introduced it in phased manner first for HT Category and later during next MTR; it will be applicable to select LT Categories.

8.5 The Commission in its Order dated 2 January 2019 in Case No. 329 of 2018 has given sufficient time i.e. period of 1 September 2018 to 31 March 2019 for taking corrective measures regarding leading RkVAh. From April 2019, consumers have been billed considering the effect of leading RkVAh also. It is expected that by March-2020, all the consumers would have taken the corrective actions regarding the power factor. This is not a new situation which happened due to COVID 19. Hence, no grace period should be provided to consumers as kVAh billing has been approved after giving ample time to make necessary adjustments for PF correction.

8.6 VIA has given examples of different power factor at different hours. VIA has submitted that the apparent energy in kVAh computed by above formula is less than the total kVAh shown in meter. However, there appears to be some error in the computation of apparent power by VIA. As per the power triangle, PF can be calculated using the following relationship.

Figure 1: Power Triangle



$PF = kW / kVA$ where kW is active/real power and kVA is apparent power.

Reactive power, RkVA, can be calculated using the following relationship:

$$RkVA = kW \times \tan(\theta) = kW \times \tan(\cos^{-1}(PF))$$

Considering the Pythagoras theorem, $(\text{apparent power})^2 = (\text{active power})^2 + (\text{reactive power})^2$

$$\text{i.e. } (kVA)^2 = (kW)^2 + (RkVA)^2$$

$$\text{i.e. } kVA = \sqrt{\sum (KW)^2 + (RkVA)^2}$$

8.7 The apparent energy (kVAh) shown in the meter for the recorded active energy (kWh) and recorded PF is correct as per the above Formula which is summarised in following table.

Table 1: Calculation of Apparent Energy as per MSEDCL

Recorded PF	Active Energy	θ in Degree	Reactive Energy	Apparent Energy
PF	A (kWh)	$\text{COS}^{-1}(\text{PF})$	$B=A*\text{TAN}(\theta)$ (RkVAh)	$\text{SQRT}(A^2+B^2)$ (kVAh)
0.990	68	8.11	10	69
0.850	60	31.79	37	71
0.485	33	60.99	60	68
Total Sum	161		106	207
For average power factor the 3 scenarios gives the similar result				
0.775	161	39.19	131	208

8.8 In the kVAh compatible energy meters installed by MSEDCL, the measurement of kVAh is based on kVARh lag and leads hence these meters record the power factor based on lag and lead consumption of kVARh. The power factor which is recorded by meter can be directly used for billing purpose and hence there is no need of computation of power factor externally. The power factor recorded by energy meter is to be used for billing purpose.

8.9 Considering the billed PF for the selected consumers as provided by VIA , MSEDCL has computed the Apparent Energy using above formula which is same as billed.

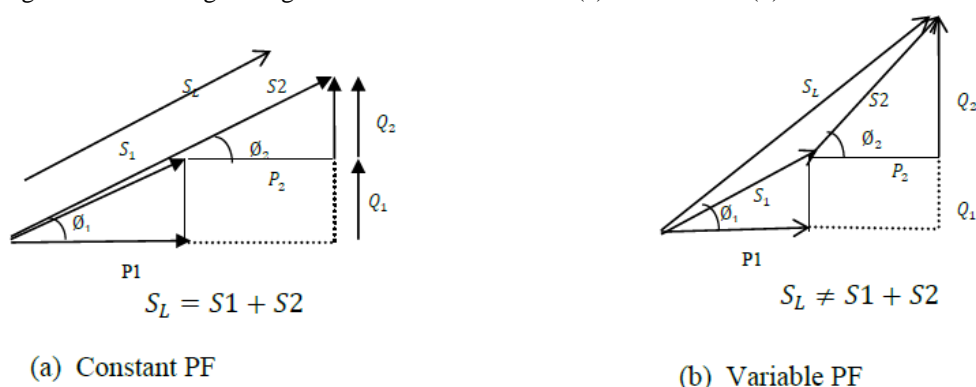
Table 2: Calculation of Apparent Energy as per MSEDCL for selected Consumers

S.NO.	PARTY NAME	BILLED PF	Active Energy	in Degree	Reactive Energy	Apparent Energy	Billed Apparent Energy	Difference
		PF	A (kWh)	$\text{COS}^{-1}(\text{PF})$	$B=A*\text{TAN}(\theta)$ (RkVAh)	$\text{SQRT}(A^2+B^2)$ (kVAh)	kVAh	
1	R C PLASTO TANKS	0.803	3,32,240	36.56	2,46,370	4,13,620	4,13,620	-
2	SHRINIVAS SPINTEX	0.998	8,99,580	3.84	60,394	9,01,605	9,01,605	-
3	NANDED ROLLER	0.683	73,913	46.96	79,140	1,08,288	1,08,288	-
4	GURULAXMI COTTEX	0.977	2,86,200	12.34	62,594	2,92,965	2,92,965	-
5	GIMATEX INDUSTRIES	0.998	20,80,368	3.62	1,31,771	20,84,537	20,84,537	-
6	S S FOOD	0.968	1,91,365	14.53	49,610	1,97,691	1,97,691	-
7	SANSKAR AGRO	0.999	7,35,213	2.56	32,906	7,35,949	7,35,949	-
8	ASHOK LEYLAND LTD	0.925	47,865	22.33	19,662	51,746	51,746	-
9	SRI SAINATH AGRI IND	0.996	4,97,670	5.12	44,606	4,99,665	4,99,665	-
10	CANDICO (I) LTD	0.992	29,035	7.11	3,622	29,260	29,260	-
11	SIMPLEX CHEMOPACK	0.993	2,83,407	6.95	34,565	2,85,507	2,85,507	-
12	HIND STEEL	0.36	3,248	68.88	8,410	9,015	9,015	-
13	ANKIT PULPS AND BOAR	0.998	3,55,520	3.82	23,714	3,56,310	3,56,310	-
14	HARIWANSH	0.688	24,352	46.55	25,703	35,407	35,407	-

S.NO.	PARTY NAME	BILLED PF	Active Energy	in Degree	Reactive Energy	Apparent Energy	Billed Apparent Energy	Difference
		PF	A (kWh)	$\text{COS}^{-1}(\text{PF})$	$B=A*\text{TAN}(\theta)$ (RkVAh)	$\text{SQRT}(A^2+B^2)$ (kVAh)	kVAh	
	PACKAGIN							
15	SANDEEP METAL CRAFT	0.948	13,270	18.64	4,477	14,005	14,005	-
16	PRIYA PRECI-COMP	0.915	3,822	23.73	1,680	4,175	4,175	-
17	GIMATEX INDUSTRIES W	0.998	20,80,368	3.62	1,31,771	20,84,537	20,84,537	-
18	GIMATEX HINGANGHAT	0.997	9,10,823	4.44	70,767	9,13,568	9,13,568	-
19	GIMATEX WANI	0.996	2,55,712	5.13	22,941	2,56,739	2,56,739	-
20	GIMATEX WANI	0.997	8,71,944	4.48	68,288	8,74,614	8,74,614	-
21	GIMA MANUFACTURING	0.996	1,77,540	5.37	16,703	1,78,324	1,78,324	-
22	ERA POWER LTD	0.671	6,225	47.86	6,880	9,278	9,278	-
23	SANVIJAY INFRASTRUCT	0.385	13,733	67.38	32,964	35,710	35,710	-
24	SANVIJAY H3	0.241	23,327	76.06	94,005	96,856	96,856	-
25	SHRI SIDHABALI ISPAT	0.967	70,276	14.8	18,566	72,687	72,687	-
26	N B ENTERPRENEURS	0.995	1,59,203	5.73	15,980	1,60,003	1,60,003	-

8.10 The Energy meter records the active energy and reactive energy in separate register and derives the apparent energy as per formula approved by the Commission vide MYT Order in Case No. 322 of 2019 dated 30 March 2020. The energy meter records both energy (Active and Reactive) and calculates the kVAh by vectorial summation for small time intervals by considering the PF at that time and record in the register. These recording of small intervals are added arithmetically for the complete month to arrive at the total consumption.

Figure2: Power Angle Diagram in different condition (a) PF Constant (b) Variable PF



8.11 From the above figure, it is clear that, when consumer is maintaining the PF constant throughout the month, kVAh recorded in the meter will match the kVAh calculated by formula. But if there is variation of PF throughout the month, then total monthly

KVAh will not match with the calculated kVAh from other two registered value of kWh and kVARh.

- 8.12 The apparent energy calculation is done on instantaneous basis i.e. on a second interval. Each & every second, based on active and reactive power quadrant position; apparent energy is accumulated. Apparent energy registration is time based energy accumulation based on vector components position of active & reactive component.
- 8.13 Thus, the summation of all instantaneous apparent energy provides the correct measure of apparent energy and not the square root of the sum of square of Monthly active power and reactive power. Since the apparent energy calculation is done on instantaneous basis, it is not appropriate to consider the same on formula basis for specific time such as hour or month or time block. The energy recorded in the meter is correct as per the formula specified by the Commission and meter specifications and any calculations based on certain period of time will not give correct results as the meter continuously records the energy and provides monthly results. The apparent energy shall also depend on the vector position in different quadrant (lag only or lag + lead). This is as per the Appendix I of the CBIP Guide on Static Energy Meter-Specifications and Testing (Research Publication No. 325) which provides the methodology of apparent energy calculations. The relevant extract of the CBIP Guide is reproduced below:

I-5 Apparent Energy Calculations

Apparent energy calculation is done on instantaneous basis i.e. on a second interval. Each & every second, based on active and reactive power quadrant position; apparent energy is accumulated.

- 8.14 The energy meter records both energy (Active and Reactive) and calculates the KVAh at real time basis as per Pythagoras theorem and record in the cumulative kVAh energy register continuously. This cumulative kVAh energy register value gets in billing profile and is used for billing.
- 8.15 As per CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007 notified amendment dated 6th February 2019 and as per the MERC (Electric Supply Code and Other conditions of supply) Regulations, 2005, Distribution Licensee and Bulk consumers are required to provide adequate reactive compensation to compensate reactive power requirement in their system. Further, the said amendment also mandates for installation of power quality meter and sharing the recorded data thereof.
- 8.16 Computation of kVAh is based on root mean square (RMS) current and thus harmonics affect kVAh consumption. The distortion power factor increases with increase in harmonic content which reduces true power factor and increases kVAh consumption. The consumers are required to keep apparent power close to active power by installing capacitor bank with automatic power factor controller so as to reduce the KVAh consumption and also to keep the system healthy.

- 8.17 Since the Commission has not approved harmonics penalty, no separate penalty is being levied for not maintaining the harmonics which is generally in terms of some percentage of energy charges and is over and above the energy charges for consumption. Since, no such penalty is being levied separately, it is not appropriate to say consumers are paying harmonics penalty in the form of increased kVAh consumption.
- 8.18 Since the kVAh billing system itself need not be changed, the need for rectification of bills and refund of differential amount does not arise. Hence, being devoid of any merits, the request of Petitioner deserves outright rejection or dismissal by the Commission.
- 8.19 In its additional submission, VIA has raised the issue of billing to the consumers with net meter. In reply. MSEDCL states that it is doing billing as per the Commission's Clarificatory Order dated 30 April 2020 in Case No. 79 of 2020. Hence, there is no discrimination amongst the consumers.
- 8.20 AEML-D and TPC-D has in fact supported the submission of MSEDCL. BEST has not replaced the meters; therefore, it has to go as per the Formula approved by the Commission for kVAh computation.
9. **VIA in its rejoinder dated 22 October 2020 has stated as follows:**
- 9.1 VIA did not oppose kVAh billing in this Petition though it is not in favour of kVAh billing due to various technical reasons which were raised during the public hearing of MYT determination process.
- 9.2 The fact of recording higher kVAh by meters compared to calculated kVAh came to the knowledge of VIA only after first bill was issued in April 2020 based on KVAh consumption recorded by newly installed meters.
- 9.3 VIA is well aware that it is mandatory for consumers to maintain PF as well as harmonics within the prescribed limits. But with respect to harmonic penalties, Commission has deferred imposition of this penalty vide its Order in Case No. 322 of 2019. The kVAh meter consumption is increasing because of harmonic present in system.
- 9.4 VIA is not interfering with MYT Order of the Commission and never said that the meter installed are incorrect nor is it opposing the kVAh billing but is simply asking for calculating kVAh by monthly recording of kWh, kVARh lag and kVARh lead for one year from the date of implementation of the MYT Order.
- 9.5 MSEDCL while filing the Tariff Petition wherein kVAh calculation was done based on consumption of kWh and average PF of different categories of consumers and submitted calculated consumption of kVAh. After installation of new meters recording

of kVAh has increased beyond the estimation of MSEDCL because of variable power factor of some consumers which has been accepted by MSEDCL in its reply on merits.

- 9.6 VIA is not denying that the consumers were well aware that kVAh billing is going to be introduced through MYT Order of Commission but were not aware of the facts that the kVAh consumption recorded by meter shall increase beyond the expectation of consumers and even beyond the expectation of MSEDCL itself because MSEDCL had also calculated kVAh consumption on average power factor of different categories of consumers in its MYT petition and did not consider that kVAh consumption shall increase for consumers having variable power factor load.
- 9.7 MSEDCL itself accepting fact in the example that kVAh meter shall record 208 as consumption in the given example as against 188.48 calculated by monthly consumption of kWh, kVARh lag and lead.
- 9.8 Prior to installation of these meters power factor was being calculated from consumption of kWh, kVARh lag and lead and this average power factor is used for computation of kVAh consumption at the time of filing of MYT petition.
- 9.9 The billed PF recorded by meter is based on instantaneous reading of kVAh computed by kWh and RkVAh consumptions every second. VIA is not questioning the correctness of these meters but simply requesting that considering the increased meter readings, for issuing energy bills the actual reading should be deferred by one year and kVAh should be calculated as was being done prior to installation of these meters.
- 9.10 VIA has always maintained that apparent energy is a calculated energy and is not the actual energy. This fact is clearly stated by MSEDCL in its reply. It is also stated that apparent energy accuracy class shall not be inferior to active energy accuracy class by more than one class. This means that for 0.2 class accuracy of kWh, kVAh recording may be inferior to 0.5 class.
- 9.11 MSEDCL has accepted that kVAh consumption shall increase because of harmonics present in the system but it is not correct to say that simply by installing capacitor banks this effect can be neutralized. Only the fundamental PF can be brought near to unity. But still kVAh consumption shall be more than kWh consumption because of harmonics present in the system and consumers shall be automatically penalized though the Commission has deferred the harmonics penalty.
- 9.12 VIA has raised the issue of discrimination between consumers. The consumers who installed net meters for roof top solar generators, in their energy bill kVAh consumption recorded by meter is not considered but is calculated in the manner as is requested by VIA in this petition. MSEDCL has said that this is done in the light of Commission's order. But it is observed that even for those consumers who have not installed roof top solar system, kVAh consumption recorded by meter is not considered

but is calculated based on monthly consumption of kWh, kVARh lag & lead. One example is given below:

Month	Units recorded as per KVAH meter	Units as per Energy Bill of MSEDCL
May. 20	2053500 kVAh	2048651 kVAh
Jun. 20	2547540 kVAh	2539451 kVAh
Jul. 20	2625360 kVAh	2623120 kVAh

Hence MSEDCL's submission is incorrect that there is no discrimination between consumers.

9.13 VIA has not been erroneously claiming that AEML-D is supporting the say of VIA that the recorded kVAh consumption by meter shall always be higher than kVAh calculated using average power factor.

9.14 BEST has confirmed that it is billing kVAh based on monthly consumption of kWh, kVARh lag and kVARh lead. This methodology is not violation of Commission's Order and VIA is requesting to adopt the same methodology for at least one year.

10. At the time of E hearing held on 23 October 2020:

10.1 VIA and MSEDCL reiterated their respective submissions made in the Petitions and the replies.

10.2 VIA has stated that it is not opposing the kVAh billing system and also the accuracy of the newly installed meters but wants to highlight the fact that the HT consumers having variable load are billed on higher side because of higher kVAh recorded by the meter as per the formula approved by the Commission. This fact was not highlighted in MYT Petition as well as at the time of public hearing. As the meters are recording instantaneous PF, consumers are required to install instantaneous PF corrective equipment after carrying out load study of their installations. On account of Corona pandemic and scarcity in manpower as well as in the gadgets, VIA has requested for grace period of one year up to March 2021 and till that time the billing based on the earlier approved formula should be continued. VIA has further stated that MSEDCL is doing discrimination between the net meter consumers and normal HT consumers. In case of net meters MSEDCL is computing the bills based on the approved formula by the Commission and not on the actual meter reading.

10.3 Advocate of MSEDCL has raised procedural objections that VIA has not submitted the authorisation to represent on behalf of the consumers and also that the Petition filed under Regulations 91,92,93 and 94 of the MERC Conduct of Business Regulations, 2004 does not empower the Commission for doing any change/ modification in the MYT tariff Order. He has also stated that the implementation of Energy conservation Act 2001 is mandatory for the industries and accordingly energy efficient equipment/ machinery and corrective PF equipment are required to be installed. Therefore, the argument about requirement of time for load flow study is flawed and VIA is trying to

take advantage to hide its inefficiencies. New Meter specifications are available in public domain and could not challenge the correctness of the same as the installed meters are calibrated meters as per CEA standards and specifications. VIA in Case 344 of 2018 had requested the Commission to follow the older methodology for billing purpose till MSEDCL reprogrammed the meters. Now when the new meters have been installed, on some other pretext VIA is again pointing out to use the old methodology for billing. One cannot adopt inconsistent and contradictory stand. The consumer bill referred by VIA is having mixed load of Industrial and residential load and MSEDCL has billed it correctly as per the tariff Order.

- 10.4 AEML-D has stated that there will always be difference in the recorded kVAh and the kVAh derived from monthly billing average PF. The recorded kVAh is the actual kVAh consumption of the consumer and the same shall always be higher than the kVAh calculated using average PF. Consumers in the AEML-D License area have faced problems in the lockdown period and are unable to take corrective actions for maintaining the PF. Post lockdown, the situation has improved and the consumers are maintaining their PF. It is observed that consumers are getting benefits of kVAh billing.
- 10.5 BEST has stated that it is billing the HT consumers as per the methodology approved by the Commission and has not received any complaint about the same in its licensed area.
- 10.6 TPC-D has stated that there is no need to derive the apparent energy by using the formula as there is negligible difference between recorded consumption and calculated consumption without rounding of the PF up to three digits. TPC-D has not received any complaints about the same in its licensed area.
- 10.7 Representative on behalf of MBPPL, GEPL and KRC have stated that HT and LT consumers have installed the PF corrective equipment and have no complaints about the billing methodology.

Commission's Analysis and Ruling

11. VIA has filed the present Petition for allowing grace period of one year from April 20 to March 21 for installation of instantaneous PF correction equipment and till that period is seeking direction for charging kVAh consumption based on the approved formula in the energy bills of consumers instead of actual recorded consumption and also to refund the excess amount paid by consumers after revising the energy bills.
12. VIA has stated that it is neither opposing the kVAh billing introduced by the Commission vide its Tariff Order in Case No 322 of 2019 dated 30 March, 2020 nor is it raising questions about the correctness of the new meters installed by MSEDCL. It states that the meters are recording higher kVAh consumption than that arrived at by the formula approved by the Commission in case of variable PF. The difference in the actual Vs

calculated kVAh consumption is in the range of 0.1% to 18%. This came to the notice of VIA for the first time after receipt of the bill for the Month of April 2020. This fact was not disclosed by MSEDCL in its MYT Petition or at the time of public hearing thereon. Also sample calculations shown at the time of Petition were based on formula approved by the Commission. A number of industries have installed the PF correction equipment, but they are not capable of instantaneously nullifying the effect of variation in the PF. Also, harmonics in the supply further increase the RkVAh units. Due to COVID-19 there is unavailability of manpower and material and therefore VIA is seeking time of one year up to March-2021 for carrying out modifications in the installations and till that time is seeking directions to MSEDCL to calculate KVAh as per the formula approved by the Commission. VIA has further stated that MSEDCL is doing discrimination between the net meter consumers and normal HT consumers. In case of net meters MSEDCL is computing the bills based on the approved formula by the Commission and not on the actual meter reading.

13. MSEDCL has opposed the maintainability of the Petition under Regulation 39 (a), 39 (b), 91-94 of the MERC Conduct of business Regulation 2004. These Regulations do not empower the Commission to undertake modification of MYT Order in Case No 322 of 2019 dated 30 March 2020. MSEDCL has further stated that the Commission had expressed its intent of applying kVAh billing through its MTR Order in 2018 and the MYT Petition filed by MSEDCL is also based on kVAh billing. Therefore, it is well known fact to the consumers. The newly installed meters are tri-vector meters as per the CEA standards and specifications measuring instantaneous real and apparent power and are binding on the consumers as per Section 45 of EA, 2003. The installed meters are recording the simultaneous values and kVAh is calculated by the same Pythagoras triangle as referred by VIA in the formula. Maintaining PF and harmonics within specified limits is the responsibility of the consumer. In case of Net meters, MSEDCL is billing to the consumers as per the Commission's Order in Case No 79 of 2020 dated 30 April 2020
14. The Commission notes that Regulation 95 of the MERC Conduct of Business Regulations empowers the Commission to amend its Order but while exercising such jurisdiction, the Commission needs to be conscious of Regulation 85 of MERC the (Conduct of Business) Regulations, 2004 which restricts the powers of the Commission to review its decision only if there is error apparent on face of record or there is discovery of any new fact.
15. The Commission notes that VIA is not seeking modification in the MYT Order but is seeking clarification in kVAh billing. Therefore, the Commission deems it fit to address the issues raised by the VIA in seriatim as follows:
16. **To allow grace period of one year from April 20 to March 21 for installation of required instantaneous PF correction equipment:**
 - 16.1 The Commission notes that VIA has neither opposed the kVAh billing of HT consumers nor opposed the correctness of the newly installed meters. VIA has

contended that the new installed meters will record simultaneous/ instantaneous reading and that there will be consequent increase in RkVAh consumption was not revealed by MSEDCL in its Petition and also during public hearings.

16.2 In this regard, the Commission notes that while submitting the preparedness for implementation of kVAh billing, MSEDCL has submitted the following information which is part of MYT Order as well as part of MYT Petition available in public domain. Relevant extract of the same is as follows:

8.10.16 Consumer Awareness: Petitioner has conducted around 100 awareness programs across the state to explain the concept of kVAh billing and its implications to various Industrial category consumers from sub-division officer level to the director level i.e. management level. During this program, various aspects of the proposed kVAh billing were discussed and deliberated upon using a PowerPoint Presentation (PPT), which is attached as Annexure 7 to the MYT petition. The FAQs on kVAh billing were uploaded on the MSEDCL website and the Petitioner sent letter through E-Mail, on 2nd February 2019, informing proposed implementation of kVAh billing from 1st April 2020 to all HT consumers having email IDs registered with MSEDCL.

8.10.17 MSEDCL submitted that, it has already initiated meter replacement drive which will be completed by January 2020 for HT consumers and by March 2020 for net meter and Open Access consumers. Meters for all LT consumers will be replaced in a phased manner by March 2021 so as to enable kVAh billing for LT consumers during the MTR process in accordance with readiness of such implementation.

8.10.22 Petitioner submitted that it has not done any change in the billing software at present, but it shall be done, along with software updating of Open Access consumer meters, within a month as per the Commission's order. Metering specifications are changed to measure kVAh or kVA MD considering rkVAh (Lag & Lead).

8.10.23 Petitioner further submitted that it shall strive to complete metering/programming of all HT consumers by March 2020. However, in case the replacement/programming is not done for any consumer, then the existing methodology to derive the kVAh shall be used for kVAh billing of those consumers. Petitioner stated that it is committed to provide the kVAh meters to all consumers for whom kVAh billing shall be applicable.

8.10.24 Energy Consumption details: Petitioner has collected category-wise consumption details in kVAh and kWh for HT category consumers. Details of the same are as provided below:

Table 8-15: Category wise energy consumption details in kVAh and kWh

Category	Apr-19 to Oct-19
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	MkWh consumption	MkVAh consumption	PF %
<i>HT – Industry</i>	19161	19482	98%
<i>HT – Commercial</i>	1280	1318	97%
<i>HT – Railways/Metro/ Monorail traction</i>	47	48	97%
<i>HT – Public Water Works (PWW)</i>	1110	1152	96%
<i>HT – Agriculture</i>	733	801	91%
<i>HT – Group Housing Societies (Residential)</i>	124	128	97%
<i>HT – Public Services</i>	643	658	98%
<i>HT – Electric Vehicle Charging Station</i>	3	3	99%

8.10.25 Petitioner requested the Commission to allow gradual implementation of kVAh billing consisting of the first stage of rollout to HT consumers. Petitioner stated that it proposed the kVAh billing, like other states, initially for HT consumers considering higher awareness about advantages of maintaining PF among HT consumer groups and that the kVAh billing will be proposed subsequently for LT consumers in the next MTR petition.

8.10.28 Petitioner further submitted that the consumers who have already spent money to maintain power factor will have an added advantage as they already have the resources to maintain higher power factor which will benefit them in terms of reduced consumption. (Underline added)

The Commission notes that MSEDCL has conducted consumer awareness programs on kVAh billing across Maharashtra including Nagpur Rural Circle on 18 February, 2019 and for Nagpur Urban Circle on 25 February, 2019. MSEDCL has specifically mentioned that metering specifications are going to change while doing replacement and in case replacement/ reprogramming is not done, existing methodology to derive the kVAh shall be used for kVAh billing. The Commission notes that this part of the Petition is in public domain and is easily accessible to VIA. As an Association of consumers, VIA would have approached MSEDCL for any further clarification. The purpose of the above table is to put forth the current data of HT consumers in terms of PF, kWh and kVAh in front of the Commission for helping it in introducing kVAh billing. Therefore, just by referring the table above and complaining that MSEDCL has not revealed the facts will not suffice the purpose.

- 16.3 VIA has further contended that the newly installed meters are recording higher kVAh as compared to that calculated by the formula approved by the Commission in case of variable load. MSEDCL has opposed the same stating that the meters are as per CEA standards and Specifications and has inbuilt configuration of using Pythagoras formula for getting kVAh reading as approved by the Commission. AEML-D has specified that as the meters are reading cumulatively, there is difference between actual reading and calculated reading. AEML-D is billing the consumers on actual readings. TPC-D also stated that there is a negligible difference between actual and calculated readings.

- 16.4 In this regard, the Commission notes that as per Section 55 of the EA, 2003, it is obligatory on the Distribution Licensee to install consumer meters fulfilling the requirements specified by the relevant Authorities under this Section and as per Section 45 of EA, 2003, it is binding on the consumer to pay the electricity charges as per the consumption recorded in the meter. The Commission notes that MSEDCL has installed new tri-vector meters complying with the provisions of the Section 55 (1) of the EA, 2003 and the CEA (Installation and Operation of Meters) Regulations 2006. These tri-vector meters enable the simultaneous measurement of different electrical parameters for accurate assessment of the power consumed. This will ensure correct billing of the consumption of electrical energy to the consumers. Therefore, any calculations based on certain period, based on any formula will give a different measurement of consumption. To avoid any ambiguity and to have correct measurement, mass replacement of the meters has been undertaken by MSEDCL. All the other Licensees except BEST has been billing the consumers on cumulative/simultaneous reading as recorded by the meter only and no separate calculations have been carried out while billing. The Commission also, considering the preparedness of the Licensees in terms of capability of meters has taken a considered decision of introducing the kVAh billing. Therefore, contention of VIA that meters are showing higher KVAh reading as compared to the formula is not justified and cannot be considered.
- 16.5 VIA has further contended that even though the consumers have installed PF correction equipment in their premises, these are not able to do adjustment instantaneously for variable PF. Now as the new meters are reading instantaneous power, it is required to install instantaneous PF corrective equipment for reactive power compensation. Therefore, VIA has requested for allowing grace period of one year. Also, it was contended that harmonics present in the load further increase the kVAh consumption. MSEDCL has opposed the same stating that sufficient time has been given to the consumers and no further grace period needs to be granted. Also, it is the responsibility of the consumer to install the relevant equipment for reactive power compensation and to control the harmonics up to the level prescribed in the relevant standards and specifications depending on their load conditions.
- 16.6 The Commission notes that as per the MERC (Electricity Supply Code and Other conditions of Supply) Regulations, 2005, maintaining the PF of its installation within prescribed limits is the responsibility of the consumers. Relevant extract of the same is as follows:

12.1 It shall be obligatory for the consumer to maintain the average PF of his load at levels prescribed by the Indian Electricity Rules, 1956 with such variations, if any, adopted by the Distribution Licensee in accordance with Rule 27 of the Indian Electricity Rules, 1956 and in accordance with the relevant orders of the Commission.

Provided that it shall be obligatory for the HT consumer and the LT consumer (Industrial and Commercial only) to control harmonics of his load at levels prescribed by the IEEE STD 519-1992, and in accordance with the relevant Orders of the Commission.

16.7 Also, as per amendment in CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007 dated 6 February, 2019. Distribution Licensee and Bulk consumers are required to provide adequate reactive compensation to compensate reactive power requirement in their system. Further, the said amendment also mandates the installation of power quality meter and sharing of the recorded data thereof. Relevant extract of the same is as follows:

2. Reactive Power

(i) The distribution licensee and bulk consumer shall provide adequate reactive compensation to compensate reactive power requirement in their system so that they do not depend upon the grid for reactive power support.

(ii) The power factor for distribution system and bulk consumer shall be within ± 0.95 ;

(3) Voltage and Current Harmonics. –

(i) The limits of voltage harmonics by the distribution licensee in its electricity system, the limits of injection of current harmonics by bulk consumers, point of harmonic measurement, i.e., point of common coupling, method of harmonic measurement and other related matters, shall be in accordance with the IEEE 519-2014 standards, as amended from time to time;

.....

.....

(iv) The bulk consumer shall install power quality meter and share the recorded data thereof with the distribution licensee with such periodicity as may be specified by the appropriate Electricity Regulatory Commission:

Provided that the existing bulk consumer shall comply with this provision within twelve months from the date of commencement of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2018.

16.8 The Commission notes that the computation of kVAh is based on root mean square (RMS) current and thus harmonics affect kVAh consumption. The distortion in power factor increases with increase in harmonics content which reduces true power factor and increases kVAh consumption. The consumers are required to keep apparent power close to active power by installing capacitor bank with automatic power factor controller so as to reduce the kVAh consumption and also to keep the system healthy. If the harmonics are controlled within the threshold limit prescribed, it is not affecting the PF and therefore there will be no increase in kVAh consumption.

16.9 It is the prime responsibility of the consumers to install the corrective equipment to maintain PF and harmonics within specified limits depending on its load condition. This may be achieved with the use of fixed, automatic, real time equipment or combination of these all. It may vary from consumer to consumer depending upon its load whether it is constant or variable.

16.10 The Commission in its MTR Order in Case No 195 of 2017 dated 12 September, 2018 had clearly intended about its intentions to RkVAh billing from April, 2020 for the consumers above 20 kW and through that Order made changes in computation of PF effective from 1 September, 2018. The Commission, considering the difficulty faced by the consumers for installation of PF corrective equipment and extended the period of applicability of the same from 1 April, 2019 vide its Order in Case No 329 of 2018

dated 2 January, 2020 to 1 April 2020. Therefore, the eligible consumers have been very well aware about the implementation of kVAh billing from 1 April 2020.

- 16.11 MSEDCL had filed its MYT Petition with kVAh Tariff. The Commission after public consultation process issued the MYT Tariff Order allowing implementation of kVAh billing to HT Consumers from 1 April 2020. Thus, the Commission had provided a clear ruling in MTR Order dated 12 September 2018 which gave the consumers a period of almost 18 months to take corrective actions for kVAh based billing. Importantly, barring few days of last month (out of the 18 months provided), there was no lockdown due to the Covid-19 pandemic and hence it is incorrect to state that due to pandemic situation, consumers were not able to take corrective steps.
- 16.12 VIA has also contented that MSEDCL had projected kVAh sales in its MYT petition based on conversion through formula and now by billing based on actual metered kVAh, higher energy sales will be recorded. In this regard, the Commission notes that the correct reading of the consumption needs to be recorded at all times. Also, from the practical point of view sales during the Covid-19 pandemic are reduced and once consumers take corrective action (which actually should have been taken in the 18 months period already provided by the Commission), and simultaneously the consumption increases there would not be lower difference between kVAh and kWh consumption. Thus, MSEDCL's projection of kVAh consumption by applying formula (as actual historical kVAh consumption trend was not available for projections) on kWh sales projection cannot be reason for not billing the consumers based on kVAh recorded in the meter.
- 16.13 In view of the above, the Commission opines that it had given sufficient time to the consumers to do the necessary load analysis of their installation and carry out corrective measures for maintaining PF and harmonics within limit. Therefore, the Commission is not inclined to grant further extension and thus the prayer of VIA cannot be accepted.
17. The Commission is thus not making change in its kVAh billing and therefore the question of revising the bills by using values of RkVAh lag and lead and giving refund on that account doesn't arise.
18. **Discrimination in the billing between normal HT consumers and HT consumers having solar net meter**
- 18.1 VIA has contended that in case of consumers who have installed solar net metering, MSEDCL is calculating kWh consumption by deducting exported kWh from imported kWh and then calculating kVAh consumption for billing purpose by dividing the resultant kWh by monthly average power factor. Hence two different methodologies are being adopted for different type of consumers. For these consumers MSEDCL is not considering and even not recording the consumption of kVAh from the meters

installed by MSEDCL. The bill copy shows only calculated kVAh and not recorded kVAh

- 18.2 MSEDCL has stated that it is billing the consumers having solar net meters as per the methodology approved by the Commission's in its clarificatory Order in Case No 79 of 2020 dated 30 April 2020
- 18.3 The Commission notes that MSEDCL had filed the Petition vide Case No 79 of 2020 for clarity on various billing issues including consumers having rooftop RE installation as it involves bilateral transaction of energy. Relevant extract of the clarificatory Order dated 30 April, 2020 is reproduced as follows:

29. Regarding Rooftop arrangement, MSEDCL in its submission has not explicitly mentioned that it is seeking such clarification only in respect of rooftop installations of HT consumers. However, as kVAh billing is allowed only for HT consumers, for removing any doubt, the Commission clarifies that these clarifications will be applicable only to the rooftop installations of HT consumers. The Commission notes that in rooftop installations export or import of energy through banking facility is undertaken in kind i.e. energy banking facility is provided against energy injected into the grid. The Commission has already clarified that all energy balancing for utility (energy procurement from generator and sales to consumers) and OA transaction will be maintained in kWh terms only. Transaction of energy under rooftop installation is similar to these transactions. Hence, the Commission clarifies that for any adjustment in kind such as netting off or settlement of units in rooftop installations of HT consumers the same will be done in terms of 'kWh' and for levying charges on balance units, „kWh“ shall be converted into 'kVAh' by using billing Power Factor for that month.

Thus, the Commission has made it clear as to how to calculate the bills of the consumer having solar net meters. Accordingly, calculated kVAh is expected to be shown in the bills of these consumers. Billing of consumer who have installed Solar rooftop cannot be compared with that of normal consumers, hence claim of discriminatory treatment is not correct.

- 18.4 As far as reference to bill of Sheshrao Wanakhede Shetkari Sahakari Sut Girani claiming that actual metered kVAh is not being billed is a concern, the Commission notes that this bill is for mix load of residential as well as Industrial activities. As kVAh billing is not applicable to residential consumers, recorded kVAh cannot be used for billing purpose. This issue has already been clarified by the Commission in its clarificatory Order dated 30 April 2020 as follows:

“30. Regarding clarification sought for HT consumer having multiple LT connections (under Franchisee Agreement) or sub-metering for specific purpose of use different than main HT connection on LT side, the Commission notes that for LT consumers,

kWh based billing is continued till Mid-Term Review Order. Hence, LT consumers need to be billed on kWh basis only. Under these circumstances, the Commission clarifies that residual units in kWh after billing LT consumers on kWh basis need to be converted into kVAh by using billing Power Factor for levying charges applicable for HT consumers.”

- 18.5 Therefore, VIA’s contention that MSEDCL is discriminating in billing of HT consumers is not correct.
19. The Commission notes other Distribution Licensees have also stated that consumers in their Licence area have smoothly adopted kVAh billing system. Except BEST Undertaking, all Distribution Licensees in the State are billing HT consumers based on kVAh recorded on the meter. As BEST Undertaking is yet to replace its meters to make it compatible with kVAh billing based on RkVAh lead and lag, it is using the formula to compute kVAh consumption for billing purpose. Poor performance of one licensee in terms of installation of meters cannot be reason for not considering the actual meter reading recorded by correct meters. The Commission expresses its displeasure about the non-compliance of the directives and directs BEST Undertaking to submit the reasons for non-compliance and its action plan to replace meters of HT consumers to make it compatible with kVAh billing within a month from this Order.
20. Having ruled as above, the Commission would like to highlight that through its Order dated 13 November 2020 in Case Nos. 131, 135, 143 &144 of 2020, it has already provided relief to compliant consumers who were not able to maintain Power factor during lockdown as follows:

“19. Having ruled as above, although no relief needs to be granted as prayed for in these Petitions, the Commission notes that these Petitioners have highlighted that due to nationwide lockdown imposed from 25 March 2020, Industrial & Commercial consumers were not able to visit their premises and take appropriate action for maintaining PF which led to poor PF in April 2020. The Commission notes that this is genuine difficulty faced by some consumers due to which even though it has installed the necessary equipment for maintaining PF in its premises, due to non-accessibility of premises PF may have remained poor due to the higher compensation of reactive power for a low inductive load during lockdown period. Although it is correct that automatic PF correction equipment should have taken care of such situation, but depending upon nature of load, consumer may have installed fixed or partly fixed and automatic PF correction equipment for achieving desired PF. If such consumer and the equipment is giving desired PF of close to unity prior to lockdown, it may not be correct to penalise such consumer for poor PF during lockdown when their premises were closed/partially closed/ not accessible. Hence, the Commission is of the opinion that only such consumers, if have been subjected to penalties/ higher bill amount due to poor PF in the month of April and May of the lockdown, deserve some relief. Hence, the Commission grants following relief to such consumers:

- a. *This relief is applicable to eligible consumer from all consumer categories to whom PF incentive/penalty mechanism or kVAh billing mechanism is applicable.*
- b. *Consumer is eligible only if its monthly consumption during lockdown period of April or May is lower than or equal to 25% of consumption of March 2020. In case, the actual consumption of March 2020 is not available (due to shutdown/closure), then available actual consumption of immediate precedent month shall be used. Further, in case of billing of consumers based on assessed consumption during lockdown period, then monthly consumption during lockdown period shall be computed based on actual meter reading data as and when was available.*
- c. *Billed PF of eligible consumer for March 2020 or other preceding month whose consumption is used for reference purpose at 'b' above shall be used to arrive at reference PF. Consumer would be eligible for relief only if its 'Reference PF' is equal to or above 0.90 (lead or lag).*
- d. *If actual PF of eligible consumer during lockdown period is lower than 'Reference PF' then, 'Reference PF' shall be used for billing purpose. In case of higher actual PF than 'Reference PF', then billing shall be based on actual PF. Intent of use of 'Reference PF' is only to give relief to the eligible consumers (as mentioned above) for the PF penalty for LT consumers and reduce kVAh billing for HT consumer.*
- e. *In case of LT consumers where PF incentive/penalty mechanism is applicable, 'Reference PF' shall not be used for providing PF incentives or increasing actual PF incentives.*
- f. *In case of HT consumer, if consumer is eligible for use of 'Reference PF' as per 'd' above, then its monthly kVAh shall be derived by using kWh recorded during lockdown period and 'Reference PF'.*
- g. *This relief is applicable only for the month of April and May 2020. Eligible consumer may get benefit for none or any 1 or all 2 months depending upon whether consumption during that month is lower than threshold limit specified in 'b' above. As monthly consumption is basis of eligibility, no additional certification from consumer of any sort be asked for.*
- h. *Distribution Licensees may revise electricity bills of eligible consumers based on above principle and credit the refund amount in equal instalments (equal to numbers of months eligible for relief) in upcoming electricity bills of consumers.*

In the opinion of the Commission, above dispensation will provide relief to consumers who have already installed equipment for PF correction but were not able to operate the same due to lockdown. The Commission also notes that these Petitions have been

filed by consumer association representing consumers of MSEDCL and hence other Distribution Licensees were not made party in these cases. However, because such relief is being granted to provide some relief to compliant consumers during the period of lockdown, same needs to be extended to consumers of other Distribution Licensees in the State. Accordingly, the Commission directs its secretariat to issue copy of this Order to all Distribution Licensees in the State with direction to provide relief to eligible consumers in their area as per methodology explained above.”

These directions are thus applicable to the consumers.

21. Hence following Order

ORDER

Case No 165 of 2020 is dismissed

**Sd/-
(Mukesh Khullar)
Member**

**Sd/-
(I.M. Bohari)
Member**

