SPEED POST

भारत सरकार
Government of India
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
पश्चिम क्षेत्रीय विद्युत समिति
Western Regional Power Committee
एफ -3, एमआयडीसी क्षेत्र, अंधेरी (पूर्व), मुंबई - 400 093
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आई एस ओ : 9001-2008
ISO : 9001-2008

सं :पक्षेविस /37वी पक्षेविस बैठक/ सहा सचिव/ 2018 दिनांक :
No. WRPC/37th WRPC Mtg./AS/2018/ 13180-269 Date : 07 DEC 2018

सेवा में, /To,

(संलग्न सूची के अनुसार)
(As per enclosed list)

विषय : पश्चिम क्षेत्रीय विद्युत समिति की 37 वीं बैठक की अतिरिक्त कार्यसूची
Sub.: Additional agenda of the 37th meeting of Western Regional Power Committee

महोदय/Sir,

इस पत्र के साथ 18 दिसम्बर 2018(मंगलवार), 10:30 बजे को कुमारकोम, केरला में आयोजित होने वाली पश्चिम क्षेत्रीय विद्युत समिति की 37 वीं बैठक एवं इससे पहले 17 दिसम्बर, 2018(सोमवार), 10:30 बजे को आयोजित होने वाली तकनिकी समन्वयन समिति की बैठक की **अतिरिक्त** कार्यसूची संलग्न है।

Please find enclosed herewith the **Additional** agenda of the 37th meeting of Western Regional Power Committee to be held on 18th December, 2018(Tuesday) at 10:30 hrs to be preceded by TCC meeting on 17th December, 2018(Monday) at 10:30 hrs at Kumarkom, Kerala for your needful.

भवदीय/Yours faithfully,

संलग्न :उपरोक्तानुसार

Encl: As Above

7/12/2018
(ए . बालन / A Balan)
सदस्य सचिव/Member Secretary

	List of members of WRPC	2018-19 FAX NUMBERS
1	Chairman, WRPC/ Principal Secretary,Dept. of Energy Govt.of	0755-2575666
	MP and Chairman, MPPTCL, Bhopal.	
2	Member (GO&D), CEA, New Delhi	011-26108834
3	Managing Director, CSPTCL,Raipur	0771-2262141
5	Managing Director, CSPGCL, Raipur.	0771-2262741
4	Managing Director, CSPDCL, Raipur.	0771-4066566
6	Chief Engineer (LD), SLDC, Raipur.	0771-2574174
7	Chairman,GUVNL,Vadodara.	0265-2340220
8	Managin Director, GSECL, Vadodara	0265-2344734
9	Managing Director, GETCO,Vadodara.	0265-2338152 Gen.2337918
10	Managing Director, Madhya Guj.Vij.Com.Ltd, Vadodara	0265-2338280 / 2338164
11	Chief Engineer (LD), SLDC, GETCO, Vadodara.	0265-2352019 / 2356469
12	Managing Director, MPPTCL, Jabalpur	0761-2664141
13	Managing Director, MPPGCL, Jabalpur.	0761-2665661
14	Director (Commercial) MP Paschim VV Nigam.Lindore,	0731-2424300
15	CE(LD), SLDC, MPPTCL, Jabalpur.	0761-2670119, 2664343
16	Chairman & Managing Director, MSETCL, Mumbai.	26598595
17	Chairman & Managing Director, MSPGCL, Mumbai.	26471060, 26581400
18	Chairman & Managing Director, MSEDCL, Mumbai.	26478672
19	Chief Engineer (LD), SLDC, MSETCL, Kalwa.	27601769
20	Chief Electrical Engineer, Electricity Dept., Goa	0832-2426986
21	Secretary(P), UT of Daman & Diu, Moti Daman.	0260-2230771/ 2230088
22	Secretary(P), UT of DNH, Silvassa.	0260-2630220
23	Director (HR.), NTPC Ltd., New Delhi.	011-24360912
24	Director (Finance), NPCIL, Mumbai.	022-25993332
25	Director (Operation), PGCIL, Gurgaon.	0124-2571922 / 2571802
26	Chief Executive Officer, NLDC, New Delhi.	011-26536901
27	Executive Director, POSOCO, WRLDC, Mumbai.	28202630
28	COO & Executive Director (O), Tata Power Com.L. Mumbai	66657966
29	Managing Director, RGPPL, Noida	0120-4148911, 13, 14
30	Chief Executive Director&MD, NHDC Ltd, Bhopal.	0755-4030003
31	Executive Director, Torrent Power Generation, Surat	02621-661151
32	COO(O&M), Adani Power Ltd, Ahmedabad	079-25557155, 25557176
33	COO,GMR Warora Energy Ltd,Chandrapur, Maharashtra.	
34	PTC India Ltd	
35	VP(Distribution), Torrent Power, Surat.	
36	Director & CEO, JSW Energy Ltd.,New Delhi.	011-48178740
37	EVP & Station Head,Jindal Power Ltd,Raigarh,Chhattisgarh.	07767-281995
38	CEO,Coastal Gujarat Power Ltd,Kutch.	02838-661181
39	Sr.Vice President (O),RattanIndia Power Ltd,Gurgaon	0124-6695868
40	President & Plant Head, Jaypee Nigrie STPP,Sigrauli,MP	
41	Project Head, D.B.Power Ltd, Raigarrh, Chhattisgarh.	
42	COO(O&M), Adani Power Maharashtra Ltd, Ahmedabad	079-25557155
43	Project Head, KSK Mahanadi Power Co.Ltd.,Bilaspur, C.G.	
44	President-Thermal,MB Power(M.P.) Ltd,New Delhi.	011-47624229
45	Project Head,Sasan UMPP,Sasan Power Ltd,Waidhan,M.P	

	List of members of TCC	2018-19
1	MD,MPPMCL/ Chairman,TCC of WRPC/MPPKVVCL,Jabalpur	0761-2664749
2	Chief Engineer (GM), CEA, New Delhi.	011-26109750
3	Executive Director (Comml.), CSPDCL, Raipur	0771-2574442
4	Executive Director(O&M:Gen), CSPGCL, Raipur	0771-2574425
5	Executive Director(Gen.), GSECL, Vadodara	0265- 2344537 / 252338848
6	Superintending Engineer (R & C), GETCO, Vadodara.	0265-2353086 / 2337918
7	Chief Engineer(Projects),Madhya Guj. Vij.Com.Ltd, Vadodara	0265-2337918
8	Executive Director (O&M-Gen), MPPGCL, Jabalpur.	0761-2664572
9	Director,(Technical),MP Paschim VV Nkigam Ltd,Indore.	0731-2426218
10	Director (Operation), MSETCL,Mumbai	022-26590383, 26591254
11	Director (Operation), MSPGCL, Mumbai.	26478852 / 26474190
12	Director (Operation), MSEDCL, Mumbai.	26581465 / 26472976
13	Executive Engineer, DD, Nani Daman	0260-2250889
14	Executive Engineer, DNH, Silvassa	0260-2642338
15	Regional ED, NTPC Ltd., WRHQ-I, Mumbai.	28259364
16	Regional ED, NTPC Ltd., WRHQ-II, Raipur	0771- 2544550 / 2544513
17	Associated Director (Trans), NPCIL, Mumbai.	25993664
18	Executive Director, WRTS-I, PGCIL, Nagpur.	0712-2641471
19	Executive Director, WRTS-II, PGCIL, Vadodara.	0265-2488564
20	Head, Tata Power Company Ltd, Chembur, Mumbai	67175385
21	General Manager (Power), RGPPL, Ratnagiri	02359-241071
22	Chief Engineer(Elect.), NHDC, Bhopal, M.P.	0755-4030130
23	Executive Director (O&M), Torrent Power, Surat	02621-661151
24	Asso. V. President(P&M),Adani Power Ltd,Ahmedabad	079-25557176
25	Head -O&M,GMR Warora Energy Ltd,Chandrapur Maharashtra.	
26	PTC India----------	
27	G.M.(EHV), Torrent Power, Surat.	
28	Director (Technical), JSW Energy Ltd., Bandra(E),Mumbai	022-42863000
29	General Manager-Power Control Jindal Power Ltd Chhattisgarh.	
30	Chief (O&M),Coastal Gujarat Power Ltd,Kutch. &	02838-661181
31	Sr.Vice President (O),RattanIndia Power Ltd,Gurgaon	0124-6695868
32	General Manager, Jaypee Nigrie STPP,Sigrauli,MP	
33	Project Head, D.B.Power Ltd, Raigarrh, Chhattisgarh.	
34	A. V. P(P&M),Adani Power Maharashtra Ltd,Ahmedabad	079-25557155
35	Project Head, KSK Mahanadi Power Co.Ltd.,Bilaspur, C.G.	
36	GM-Business Development, MB Power (M.P.)Ltd,New Delhi.	
37	Project Head,Sasan UMPP,Sasan Power Ltd,Waidhan,M.P	
38	Chief Engineer, NPC, New Delhi	011-26865206,26526361
	SPECIAL INVITEE	
1	CMD, MPPMCL Jabalpur.	0761-2664749, 2661245
2	Member (Power), NCA, Indore.	0731-2559888
	Copy to	
1	Member Secretary, ERPC, Kolkata	033-24239652, 24239653
2	Member Secretary, SRPC, Bengaluru	080-22259343
3	Member Secretary, NERPC, Shillong	0364-2534040
4	Member Secretary, NRPC, New Delhi	011-26868528, 26865206

भारत सरकार

Government of India

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

पश्चिम क्षेत्रीय विद्युत समिति मुंबई

Western Regional Power Committee
MUMBAI

त स स /प क्षे वि स की

दिनांक 17 एवं 18 दिसम्बर 2018 को

कुमारकोम, केरला में आयोजित होने वाली 37 वी बैठक की अतिरिक्त कार्यसूची

Additional Agenda of 37th Meeting of TCC/WRPC

to be held on

17th December 2018 & 18th December 2018

Kumarakom, KERALA

to be hosted by

NTPC

Contents

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Annexure

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Annexure OA-24-B	The PSDF detailed proposal received from MPMKVVCL
Annexure OA-24-C	The PSDF detailed proposal received from MPPsKVVCL
Annexure - C.16A	The summary of RTDA charges for the period January to July 2018
Annexure 17A	SEM Data discrepancy at Bhadrawti station-correspondences
Annexure- C.18A-1, Annexure- C.18A-2, Annexure- C.18A-3	Suo-moto schedule of URS power to Maharashtra from Solapur, Mouda-1 & Gandhar (RLNG) (from 23rd June to 24th July 2018)-correspondences

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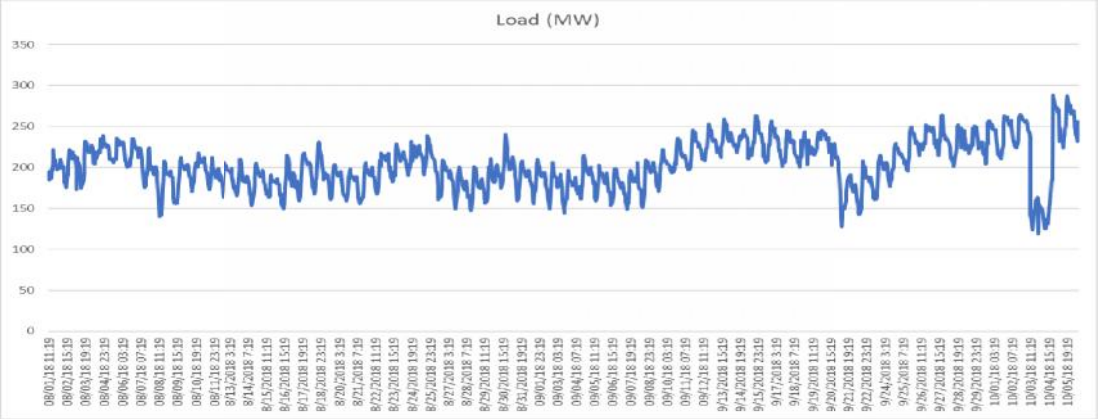
Additional Agenda
for 37th TCC/WRPC meeting
(17th & 18th December 2018)

A.1	**Confirmation**
	Confirmation of the Minutes of 36th Meeting of WRP Committee
	The minutes of 36th meeting of WRP Committee held on 23rd June 2018 at Ahmedabad were forwarded to the members vide letter No. WRPC/36th WRPC Mtg. /AS/2018/7867 dated 04.09.2018. Following comments on 36th TCC/WRPC MoM have been received from Associated Director, NPCIL vide email dated 18.09.2018 : **Comment –I** ***Item C.1 para (g) page 19:*** *In reply to the statements -* *"In similar type of case CERC has passed the order for Sujalpur-RAPS line for payment of transmission charges by RAPS and RAPS is paying the transmission charges of the line" -* *given by AGM, PGCIL in paragraph (g), the following paragraph may be recorded as comments from NPCIL:* *"CERC has passed an order for Sujalpur-RAPS D/C line for payment of transmission charges by RAPS for the period from the agreed date of commissioning of 400 kV bays at NPCIL RAPS switchyard till the actual date of commissioning of Sujalpur bays. The transmission charges for the Sujalpur-RAPS lines are being paid by the beneficiaries. NPCIL has filed an appeal in APTEL on CERC order regarding payment of transmission charges for the above period and the matter is subjudice."* **Comment – II** ***Item C.2 para(b) page 24:*** *In reply to the statements -* *"All other atomic plants wherever expansion has taken place in other parts of the India, there is an interconnection between 400 kV and 220 kV. Only at Kakrapar it is not there; it is already there in Kaiga and other project also".* *given by CE, SLDC, GETCO in paragraph (b), the following paragraph may be recorded as comments from NPCIL:* *"The 400 kV and 220 kV switchyards are not interconnected at Rawatbhata Site (RAPS) and Tarapur Maharastra Site (TMS) after expansion of these sites."*
	TCC/WRPC may like to note/discuss and confirm the same.

Operation

O.19A **High Loading of 2x315MVA , 400/220kV ICTs at 400 kV Bhatapara Sub-station of POWERGRID:**

PGCIL, vide email dated 26.11.2018 informed that it has been observed that ICT 1 & 2 at Bhatapara Substation are getting highly loaded continuously since last Aug-18. Average loading recorded for the same during the period August'2018 to October 6, 2018 was around 203 MW. For Sept month loading was more than 250MW for more than 50% and in October month it increased more than 270 MW and there are several hours where it has even crossed 285 MW.



In view of that, it is requested that WRLDC may look into the high loading issue of ICT at 400/220kv Bhatapara SS . Similar pattern was also observed in last year . Keeping in view of high loading additional ICT may be installed to reduce the loading of ICT.

512th OCC Discussion (23rd October, 2018; item no. 8.5)**:**

The issue was discussed during 512th OCC meeting& following are the outcome of the discussions:

- PGCIL representative informed briefly about high loading pattern of ICTs at 400 kV Bhatapara substation and he also informed that maintenance activities of transformer will be difficult. He explained the necessity of installing additional ICT to reduce the power flow in ICTs.
- Chhattisgarh representative informed that due to the addition of 220 KV substations downstream the load on ICTs have increased.
- WRPC representative informed that the issue may be put up to Standing Committee on Power System Planning for Western Region meeting of WR.

TCC/WRPC may like to discuss the same.

O.20A	**Frequent Switching operations of POWERGRID elements during high voltage**

PGCIL, vide email dated 26.11.2018 informed that in WRTS POWERGRID some of the lines and bus reactors are being switched on & off at high voltage for voltage regulation. 400kV Kolhapur -Mapusa are opened on daily basis at high voltages for voltage regulation.

For time span of 6 months from June'18 to Nov'18, the details of switching of 400kV Kolhapur-Mapusa lines are as follows:

SN	Name of Line	Monthly opening and Closing of line						Total Events (Jun to Nov)
		Jun	Jul	Aug	Sep	Oct	Nov	
1	400KV-KOLHAPUR GIS-MAPUSA-1	13	14	13	14	11	09	74
2	400KV-KOLHAPUR GIS-MAPUSA-2	11	13	14	12	11	10	71
	Total	**24**	**27**	**27**	**26**	**23**	**19**	**146**

It can be seen from the above that CB switching with fault current, the life will be reduced.

He requested that frequent switching operations at high voltages may please be reviewed to evade pre-mature failure of equipment.

511th OCC discussion (18th September, 2018; item no. 8.5):

The issue was discussed during 511th OCC meeting& following are the outcome of the discussions:

a) PGCIL representative informed that due to switching at high voltage and frequent switching operation equipments life is getting reduced and causing failure of the equipment.

b) WRLDC informed that all measures are being taken to control high voltage. Opening of transmission lines on high voltage is the last resort left with WRLDC to control high voltage. POWERGRID stated that to reduce switching operations, tripping of lines on high voltage may be allowed on 400 kV Kolhapur-Mapusa-I & II and 765 kV Sholapur-Pune S/C.

c) WRLDC informed that tripping of lines on high voltage may result in multiple trippings, particularly in case of 400 kV Kolhapur(PG)-Mapusa D/C tripping of one ckt may result in tripping of other ckt and may affect Goa power supply. To allow tripping of 400 kV Kolhapur-Mapusa on high voltage, over voltage setting of 400 kV Kolhapur-Mapusa-I may be changed to 112% and drop-off to pick-up ratio to 98%. As discussed in earlier OCC

	meetings all constituents and generators are advised to take necessary actions to control high voltage. d) SLDC, Maharashtra representative informed that circuit breaker failure observed while opening Aurangabad- Bhusawal circuit and it is a cause of concern to operate at high voltages. e) WRPC and WRLDC opined that more number of operations are happening because of system requirement. Transmission licensee is solely responsible for maintenance of transmission elements and cost for maintenance shall be borne by transmission licensee.
	TCC/WRPC may like to discuss the same.
O.21A	**Diversion of 315MVA ICT from Bhadrawati S/s and installation of 250MVA ICT diverted from Moga S/s.**
	PGCIL, vide email dated 26.11.2018 informed that 21st Meeting of WRPC has agreed for 315MVA ICT at Bhadrawati for aux. supply to HVDC station. However, the tariff for the asset was not allowed by CERC due insufficient utilization and CERC directed to divert the ICT to other place where it could be utilized and the same was diverted to Daltonganj. The matter was also discussed in 32nd SRPC Meeting in which POWERGRID has agreed to install De-capitalized ICT at Bhadrawati for maintaining system security. In the 34th SRPC meeting item no 18.13 sharing mechanism for the 250MVA ICT installed at Bhadrawati was discussed. *It was agreed that depreciated cost of ICT (as ICT was diverted from Moga S/S) along with bay equipment's shall be borne by the SR constituents.*
	TCC/WRPC may like to note the same.
O.22A	**Commissioning of elements under Western Region Strengthening Scheme-XVI**
	PGCIL, vide email dated 26.11.2018 informed that POWERGRID has commissioned following elements Under "Western Region Strengthening scheme –XVI" as per investment schedule: a) 2x500MVA ICT and associated bays and 4 No 220kV Bays at Parli (POWERGRID) Station charged on 31.07.2018, however, it is kept idle charged due to non-availability of downstream system. b) 2 No 220kV Bays at Mapusa S/s charged on 31.07.2018, however, it is kept idle charged due to non-availability of downstream system.

	POWERGRID shall approach the Central Commission (CERC) for tariff and commercial declaration of the elements. Committee may note the same.
	TCC/WRPC may like to note the same.
O.23A	**Review progress of REMCs:**
	CE, SLDC GETCO vide letter dated 03.12.2018 informed that the Ministry of Power entrusted the job of establishment of REMCs in western region (WRLDC, Gujarat SLDC, Maharashtra SLDC and Madhya Pradesh SLDC) to PGCIL. The key jobs assigns to PGCIL are: 1. Software modules for forecasting and scheduling of REs 2. SCADA hardware and software facilities. Accordingly, PGCIL has awarded contract to M/s SIEMENS. The FAT procedure of REMC project has been completed. It is utmost necessary that PGCIL should update the progress and future road map (in presentation) of REMC in each States of WR and at WRLDC to WRPC members.
	TCC/WRPC may like to discuss the same.
O.24A	**PSDF proposals submitted by MPPoKVVCL, MPMKVVCL and MPPsKVVCL for appraisal by WRPC**

The following proposals have been received from MPPoKVVCL, MPMKVVCL and MPPsKVVCL for appraisal of WRPC for funding from PSDF:

Sr No	Details of proposals	Estimated Cost of Project / Scheme / Activity
1	Installation of Capacitor Banks in 33/11 kV Substation for Reactive power Compensation under MPPoKVVCL(East discom) Jabalpur.	Rs. 5752.35 lacs
2	Installation of 1500 KVAR capacitor bank at 33/11 Sub-Stations for Reactive power Compensation under MPsPKVVCL (West discom) Indore.	Rs. 5218.94 Lakhs

	3	Installation of 2100 KVAr Automatic Capacitor Bank at 835 No. 33/11kV Power Transformer presently installed at existing and under construction 33/11kV S/s in Jurisdiction of MPMKVVCL, Bhopal	Rs. 20165 Lakhs

The detailed proposal received from MPPoKVVCL, MPMKVVCL and MPPsKVVCL are enclosed at **Annexure OA-24-A, OA-24-B & OA-24-C.**

They requested recommendation from WRPC for availing fund from PSDF.

TCC/WRPC may like to discuss the same.

Commercial

C.13A **Opening of Letter of Credit** (towards transmission charges)

PGCIL, vide email dated 26.11.2018 informed that BARC, Western Railway (RGPPL), West Central Railway (RGPPL) have not opened their LC towards transmission charges. Maharashtra and Chhattisgarh have not enhanced their LC for the requisite amount. The beneficiaries may open/renew LC for the requisite amount in favour of POWERGRID urgently.

TCC/WRPC may like to note the same.

C.14A **Default in payment of outstanding dues by beneficiaries** (towards transmission charges)

PGCIL, vide email dated 26.11.2018 informed that the details of outstanding dues for more than 60 days as on 12.11.2018 in respect of defaulting beneficiaries of POWERGRID are as under:

Sl No.	DIC	>60 Days dues (Rs. in Cr.)
1	Madhya Pradesh	26.93
2	Chhattisgarh	2.54
3	Goa	0.66
4	GMR Warora	15.40

5	Adani Power	29.59
6	SKS Power	34.79
7	RKM Power	8.10
8	Maruti Clean Coal	0.41
9	KSK Mahanadi	0.06

The concerned utilities may liquidate the outstanding dues on priority and update the status.

TCC/WRPC may like to note the same.

C.15A **Challenges and preparedness for implementation of fourth amendment of DSM regulations** (w.e.f. 01.01.19):

CE, SLDC GETCO vide letter dated 03.12.2018 informed that many changes have been introduced in fourth amendment of DSM regulations (to be effective from 01.01.19) by Hon'ble CERC.

There is indeed a need to adopt changes in operation as well as scheduling philosophy, addressing necessary changes in SCADA & IT softwares etc. for implementation of fourth amendment of DSM regulations to be effective from 01.01.19. Therefore, it is necessary to conduct mock exercise before implementation.

The RPC & RLDC should take the matter with Hon'ble CERC for allowing time for mock exercise.

TCC/WRPC may like to note/discuss the same.

C.16A **RTDA charges borne by the State on account of first 20% deviation by ISGS** (period Jan to Jul-2018)

CE, SLDC GETCO vide letter dated 03.12.2018 informed that it is observed that substantial amount are being paid by the State under the RTDA due to the deviation by ISGS. Presently, for the first 20% deviation in any time block the designated ISTS customer shall require to pay transmission charges for excess generation or demand at the same PoC rate.

Further, such transmission charge due to first 20 % deviation by ISGS is passed on to the State. It is clear that beneficiary never insists ISGS to deviate for any of the reason. Moreover, there is no benefit to the beneficiary for such deviation. In other words, the entity responsible for deviation should pay the charges. i.e. ISGS. Further, the reasons for deviation are require to be discussed in order to minimize the deviation

	charges. The summary of RTDA charges for the period January to July 2018 is attached as **Annexure - C.16A .** **Background:** **34th TCC/WRPC** (27/28 Jul-2017; item no. Addl Agenda Item No. 4): • During the TCC discussion, WRPC representative stated that the calculation of RTDA is in accordance with the existing provision under the regulation. **For change in mechanism of RTDA calculation, Hon'ble CERC should be approached by the beneficiaries**. WRLDC informed to the forum that the deviations of the ISGS are normally in the range of 2-3%. WRLDC, further stated that the issue of Gujarat is noted and they are to share the data with Gujarat for detailed analysis. • Gujarat requested NTPC and ISGS to restrict the generation up to schedule to the extent possible and not to inject more to minimise RTDA impact on the state. **Issue**: 1. The reasons for deviation are require to be discussed in order to minimize the deviation charges. 2. It is required to discuss the way forward to amend the existing provision of the regulation (if required) or by means of mutual agreement in the matter.
	TCC/WRPC may like to discuss the same.
C.17A	**SEM Data discrepancy at Bhadrawti station leading to commercial loss**
	GMR(Warora) informed that • There is some critical discrepancy in SEM data (SEM Sr no-2648A) at PGCIL Bhadrawati end which has resulted into variations in the weekly DSM settlement. • It is observed that from 46th time block of 26thApr'18, there was sudden variation in the readings which continued till 46th block of 25th May'18. Total Line Loss has increased from 0.3% to 1.6% from 26th Apr'18 leading to loss in injection quantum in DSM calculations which is having direct commercial impact of approx. 3-4 Lacs/day. GMR(Warora) intimated to WRLDC vide mail dated 25th May'18. Followed by letter dated 1st June'18 & reply letter on 29th June'18 (**copy attached at Annexure 17A**). • Since check meter are not installed at PGCIL end, as per adopted

	procedure injection readings were computed based on the notional loss of 2% by WRLDC and incurred loss to the tune of 80 Lacs. • GMR(Warora) have dedicated 400KV D/C line of 33Kms length connected to Bhadrawati & considering generally adopted practice is penalizing us. • GMR(Warora) have raised this issue in both OCC & CCM and have been asked to approach CERC based on the precedence of Lanco Order (attached). Thereafter GMR(Warora) have taken the legal opinion which also concluded that the principle laid down in Lanco order is directly applicable in the instant factual scenario. **78th CCM Discussion** (19th Jul-2018; item no. 18.i): Committee discussed the above issue raised by GMR Warora. It was observed that there were no consensus on the issue. But the majority of the constituents were of the opinion that the matter shall be taken up with CERC by GMR. **Issue:** GMR(Warora) requested that in the absence of any alternate reliable data, the average loss for the dedicated line as per actual data for both ends of the transmission line for the last three months should be considered in order for arrive at a loss figure for that period.
	TCC/WRPC may like to discuss the same.
C.18A	**Suo-moto schedule of URS power to Maharashtra from Solapur, Mouda-1 & Gandhar (RLNG)** (from 23rd June to 24th July 2018)
	CE(PP), MSEDCL, vide letter dated 30.11.2018 informed that: • The demand of Maharashtra has substantial part of agricultural load. Hence normally Maharashtra peak Demand during monsoon period is on lower side as compared to rest of time period of year. During this year also, in the month of june-18, the demand was drastically reduced since 22nd June 2018 due to rainfall in all parts of Maharashtra & to maintain economic load generation balance, MSLDC had given zero schedule to some of the costlier intra state generating unit/s as per MOD stack prepared by MSLDC i.e. withdraw unit under RSD. • Similarly as per MOD stack of MSLDC, zero schedule requisition was also given for Solapur STPS, Mouda STPS stage-I. Further as per MOD stack, MSEDCL was also not scheduling power under RLNG either from Kawas or Gandhar gas based power Station. MSEDCL is having share of almost 48.83% in Solapur & 39.21% in Mouda-I (as per CS share allocation dated 01.07.2018). • As per clause, 5.5 & 5.6 of approved RSD procedure, if

beneficiary/ i.e. does not revise its day ahead requisition by 20.00 hrs of current day (D1), RLDC shall prepare revised injection schedule for the concerned generating station and if the scheduled injection is still less than technical minimum, RLDC shall review the anticipated demand pattern based on the demand forecast and grid conditions to decide on the requirement of providing technical minimum schedule to the generating station. Further as per clause 5.7 of approved RSD procedure & clause 6.5.14 and 6.5.20 of the Grid code RLDC has suo-moto power to schedule power under following specified condition to operate at or above technical minimum) in the interest of smooth system operation:

i. Extreme variation in Weather Conditions
ii. High Load Forecast
iii. To maintain reserves on regional or all India basis
iv. Network Congestion
v. Any other event which in the opinion of RLDC/NLDC shall affect the grid security.

However WRLDC without assigning any reason for keeping these units on bar, scheduled power from Solapur STPS, Mouda Stage-1 and Gandhar (RLNG) to MSEDCL from 23rd June 2018 to 24th July 2018 inspite of daily day ahead requisition for schedule of no power to MSEDCL through entitlement.

- MSEDCL vide its letter dtd 26.07.2018 requested WRLDC to specify the reason / situation for keeping generation form Solapur and Mouda Stage-1 on bar despite there was no requisition from MSEDCL which is having major share in these stations and also for schedule of power from Gandhar (RLNG). In receipt of said letter, WRLDC immediately withdrew Solapur Unit under RSD on 26.07.2018 but not submitted any reply to this letter (**Letter dtd 26.07.2018 Annexure- C.18A-1**).

- The total financial burden due to suo-moto schedule of such costly URS power from Solapur, Mouda Stage-1 and Gandhar to MSEDCL is of Rs. 47.77 Cr. In view of said financial durden, MSEDCL vide letter dtd 27.08.2018 has intimated M/s NTPC that MSEDCL shall not recommend the energy charges of above power as scheduled to MSEDCL for the payment (**Letter dtd 27.08.2018 Annexure- C.18A-2**).

- M/s NTPC, vide its letter dtd 3.08.2018 informed that as per regulatory and statutory provisions and provisions of PPA. MSEDCL should pay the bill amount. Since bill is not acceptable to MSEDCL, in view of terms & condition of PPA, MSEDCL paid 95% bill amount under the protest and in reply to this NTPC's letter dtd 3.08.2018, MSEDCL, vide letter dtd 01.10.2018

	informed NTPC that there was no such grid threat occurred to Western grid stability and there is no communication from WRLDC for its decision for schedule of suo-moto power. (Letter dtd 01.10.2018 **Annexure- C.18A-3**) • M/s WRLDC, vide its letter dtd 22.10.2018, has replied to MSEDCL in the subject matter which is not acceptable by MSEDCL and MSEDCL would like to point out its views in this regards and the same needs to be deliberated in 37th WRPC meeting. • It may be noted that as Solapur and Mouda units were not withdrawn from RSD during the subject period, MSEDCL was compelled to take its low cost in-state generation under RSD which has resulted into additional financial implications on MSEDCL which is to tune of Rs. 30 Crs. As MSEDCL had surplus power available including hydro generation from koyna of 1920 MW, it would have taken care of its load generation balance during this time. The average backdown during this time was to tune of 800 MW despite of average sale of 350 MW in exchange on account of surplus. Also in Maharashtra, besides MSEDCL there are other Discoms also viz TPC-D, AEML (Rinfra-D), BEST alongwith other deemed distribution licensees like Indian Railways, etc. So MSEDCL alone cannot be held responsible for overdrawl by Maharashtra within next maximum 3 time blocks during this period it is also observed that, WRLDC instead of scheduling these high cost power, could have scheduled low cost ISGS generation on suo-moto; which were under backdown state at those time. The suo-moto schedule of power also increased underdrawal of state on many occasions. **Issue:** 1. MSEDCL informed that due to Suo-moto URS power scheduled to MSEDCL from Solapur, Mouda stage-1 and Gandhar RLNG has to be recovered from the states / beneficiaries for whom WRLDC kept these units on bar and disbursed to MSEDCL. 2. MSEDCL demands the amount of Rs. 47.77 Cr towards financial implications to MSEDCL . 3. MSEDCL also request to review the RSD procedure in r/o ISGS station in view of the financial implication to be borne by beneficiaries.
	TCC/WRPC may like to discuss the same.

Protection

P.6A Raising the AULFS slab and slab-wise quantum of load shedding:

CE, SLDC GETCO vide letter dated 03.12.2018 informed that In para 8.3 of 7th NPC MoM, it was stated that RPCs may deliberate on addition slabs / stages of frequency as well as raising the set frequency for UFR operation. The views of RPCs would be put up in next meeting of NPC.

A special meeting was held on 13.03.18 at WRPC Mumbai to discuss the issue of raising AULFS slab and slab wise quantum of load shedding. In meeting, the representatives from Gujarat, Maharashtra, MP and Goa agreed to increase the first stage to 49.4 Hz from existing 49.2 Hz.

The proposed revised stage were:

AUFL Stage	Existing set point in Hz	Proposed set point in Hz	Load relief
Stage - 1	49.20	49.40	Same as per existing quantum
Stage - 2	49.00	49.20	
Stage - 3	48.80	49.00	
Stage - 4	48.60	48.80	

WRPC informed that the above views of WRPC regarding revision of under frequency slab would be taken up in ensuing NPC meeting for common consensuses.

During discussion held in 36th WRPC meeting (Point No. D-20 of 36th WRPC meeting MOM), SLDC – Gujarat informed that the issue is serious, since there are no reserves at regional level or State level. The grid has to be saved. Some automatic load-shedding tool should be available with RLDCs & SLDCs for security of grid.

SLDC – Gujarat also raised the said issue in 24th FOLD meeting (held on 02.07.18). During peak demand period, most of the States are deploying full schedules to their available resources. At that time there is no margin in on bar / off bar units. The plants under ancillary service are also getting full dispatch. Practically, it is not possible to curtail demand / to impose load shedding. In such condition, the available support for system security in terms of under frequency load shedding (i.e. at 49.20 Hz) is far away viz a viz normal operating frequency i.e. 50 Hz. Thereby, grid operator has no defence mechanism on hand and the drop of frequency from 50.00 Hz to 49.20 Hz means there is very serious contingency in the grid and there will be no scope to return grid in normal (secure) state.

	Therefore, it is strongly recommended that the first stage of under frequency should lie at 49.60 Hz to have sure support hand with grid operators to arrest frequency fall.
	TCC/WRPC may like to discuss the same.
P.7A	**To operationalize WAMS analytics supplied under URTDSM project by PGCIL:**
	CE, SLDC GETCO vide letter dated 03.12.2018 informed that Under URTDSM project, the following analytics of WAMS have been installed in Jan'18 at SLDC Gujarat: a) Linear state estimator b) Online vulnerability Analysis of distance relays c) Supervise Zone-3 distant protection scheme Above analytics are installed, but the development / Configuration of analytics are not carried out. The updation of substation database, configuration works & channel mapping (Analog / Digital) linked to the analytics are pending. To obtain fruitful results, hands on practice / training of all analytics module to SLDC team are essential, hence request to arrange the same so real objective of analytics can be obtain. Moreover, the following analytics are yet to be integrated in PDC installed at SLDC: a) Line Parameter Estimation b) CT/CVT Calibration c) Control Scheme for improving system security It is necessary that PGCIL should update the action plan to WRPC members to resolve all pending issues related to URTDSM. *PGCIL may update the status.*
	TCC/WRPC may like to discuss the same.
P.8A	**Development of software for Relay setting database at WRPC level :**
	CE, SLDC GETCO vide letter dated 03.12.2018 informed that; • Hon'ble CERC"s vide order dated 22.02.2014 in the matter of grid disturbance occurred on 30.07.2012 & 31.07.2012 in petition No. 167 / Suo-Motu /2012, have made certain observations and issued directions.

	• According to this order, all the RPCs have to maintain the relay settings data of all the ISTS lines and lines emanating from interface S/S of Utilities to ISTS (400 kV& above and 220 kV interfacing lines). • *There is need to develop software at WRPC level to validate protection settings and to have universal protection database of Western Region Power System.* *In light of the above TCC/WRPC may please like to discuss the issue.*
	TCC/WRPC may like to note/discuss the same.

****

ANNEXURES

MADHYA PRADESH POORV KSHETRA VIDYUT VITARAN CO. LTD.

SHAKTI BHAWAN RAMPUR, JABALPUR- 482 008

मध्यप्रदेश पूर्व क्षेत्र विद्युत वितरण कं. लि.

विद्युद् ब्रह्मेति

DETAILED PROJECT REPORT

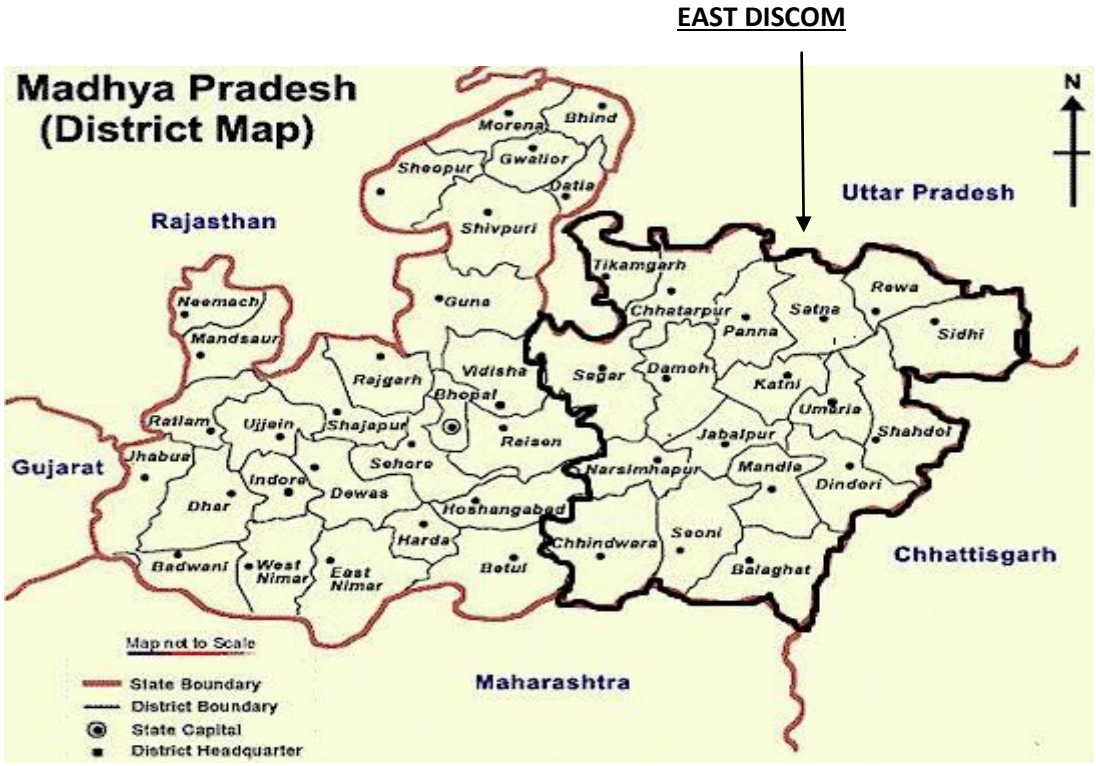
FOR

System Improvement Scheme: Installation of Capacitor Banks in 33/11 kV Substations for Reactive power Compensation under East Discom.

Estimated Cost Rs 57.52 Cr.

The Government of Madhya Pradesh (GoMP) incorporated Madhya Pradesh Poorv Kshetra Vidyut Vitran Company Limited (Eastern Discom) on 31st May 2002. Eastern Discom is a wholly-owned Government of Madhya Pradesh registered under the Companies Act, 1956. With the Gazette Notification dated 31st May 05, the company started functioning independently with effect from 1st June 05. As per notification the company is undertaking the business of distribution and retail supply of electricity in Jabalpur, Rewa, Shahdol and Sagar commissionaires.

1.1 GEOGRAPHICAL MAP OF MADHYA PRADESH



1.2 OPERATIONAL PROFILE

MPPKVVCL is responsible for operating the distribution assets within Jabalpur, Sagar and Rewa region of the company. Its network consists of around 2,67,253 kms of lines at voltages ranging from LT to 33kV, and includes 1033 substations (33/11 KV S/S). Total connected load is 6288.11 MW. Distribution network details are as under:

Status as on 31.03.2018

Particulars	Unit	Quantity
Region	No.	3
Circle	No.	16
Division	No.	54
Distribution centre	No.	390
33/11 kV Substations.	Nos.	1033
33 kV Lines.	Ckt - Km	18572
11 kV Lines.	Ckt - Km	137503
Distribution Transformers.	Nos.	185792
LT lines.	Ckt - Km	126078
No. of LT consumers.	No.	5317121

No of HT Consumers.	No.	1480
Total Domestic connections	No.	4018163

1.3 CUSTOMER PROFILE

The company currently serves about 5.3 million customers over an area of 1,37,659 sq. Km. Around 74% of consumers are domestic, spread between urban and rural areas, who consume only 30 % of the energy. Agricultural demand is noticeable, with 18 % of consumers in that sector consuming 38% of the total energy. Less than 1% of consumers are at high tension but consume up to 13 % of the total energy.

Category wise break-up of number of consumers, connected load and Annual sales during 2017-18 of Company are as follows:-

As on March 2018

S.N	Consumer Category	Number of Consumers	Connected load (MW)
	LT Consumers		
1	Domestic	4018163	2205
2	Non – Domestic	331242	716
3	Industrial	41510	410
4	Water Works / Street Light	16698	108
5	Agriculture	908577	2513
6	Other Agriculture	931	3.7
	Total LT	5317121	5958
	HT Consumers		
1	Industrial	789	537.5
2	Non Industrial	463	99.8
2	Water Works	75	25.8
3	Agriculture	27	13.5
4	Other HT	126	170.7
	Total HT	1480	847.31
	Total HT + LT	5318601	6805.35

2. PROJECTS CONSIDERED FOR LOSS REDUCTION WORKS

2.1 PROJECTS IN BRIEF

The objective of the instant project is to develop System Strengthening works to reliable power supply in the area under East Discom. East Discom operates over a large portion of the Madhya Pradesh state as a whole and has to maintain and upgrade the existing distribution system as well as erect new distribution infrastructure in order to supply reliable and quality power supply. In order to supply quality power supply, distribution infrastructure needs to be augmented and strengthened. In the instant proposal, locations for installation of capacitor banks in the Company area has been identified for Strengthening of distribution infrastructure and reduction of line loss.

AS IS SITUATION:-

MP Poorv Kshetra Vidyut Vitaran Company Jabalpur is operating the distribution assets within Jabalpur, Sagar, Rewa and Shahdol commissionaires. Its network consists of around 2,67,253 kms of lines at voltages ranging from LT to 33kV, and includes 1033 substations (33/11 kV S/S) which are supplying power to total 53.18 lacs consumers in 20 no Districts.

Amongst the three major layers of Power Sector i.e. Generation, Transmission and Distribution, the Distribution Sector has direct interface with the end consumers and is largely accountable for consumer satisfaction and also for flow of revenues in the entire value chain of Power Sector. Thus, Distribution Sector plays a significant role in sustenance as well as growth of the Power Sector.

In order to provide quality power supply and to meet increasing energy demand, distribution infrastructure needs to be augmented and strengthened regularly in a disciplined manner as well as measures to be taken for reduction of losses in the system.

All energy supplied to a distribution utility does not reach to the end consumer. A substantial amount of energy is lost in the Transmission and Distribution system by way of Technical and Non Technical Losses. The distribution system accounts for highest technical and non technical losses in the power system. To make the company sustainable and improve financial health, reduction of losses is utmost requirement. However, company has achieved loss reduction in previous years from 31.54% to 22.58% by exercising various steps in different schemes.

As the main objective of any distribution utility is to meet the connected load to the maximum extent with the available generation in a secure, economic and reliable manner. At present numerous works like commissioning of new 33/11 kV Substations, 33 kV, 11 kV and LT Lines, Separation of irrigation feeders,

electrification of villages, SCADA enabling etc are in progress under various central/state Govt. schemes for performance improvement & enhancement of power transfer, capacity of network.

In up gradation of distribution network, one major area is reactive power compensation planning and its addition. Since most of loads in modern electrical distribution systems are of inductive in nature and consist of both active (kW) and reactive (kVAR) power components. The Transmission of reactive power over transmission elements (Lines and Transformers etc) in a peak load condition further burdens the distribution as well as the transmission network and as result the voltage at the load end becomes further less.

Hence it is important and vital to monitor the flow of reactive power in the distribution system and accordingly meet the reactive power requirement locally. Therefore to maintain proper voltages in the grid and connected outgoing feeders within the safe and secure limits it is very necessary to carry out the planning of reactive power compensation every year.

2.2 HISTORY & SCOPE OF WORKS –

Presently, in company most of the area is having Agriculture crop and irrigation area. Since Agriculture loads in electrical distribution systems are of inductive in nature and consist of both active (kW) and reactive (kVAR) power components. The Transmission of reactive power over transmission elements (Lines and Transformers etc) in a peak load condition further burdens the distribution as well as the transmission network and as result the voltage at the load end becomes less than required. Therefore to strengthen system network and to meet out load growth, locations for installation of capacitor banks in the Company area has been identified under system strengthening works.

In the instant scheme, following quantum is covered under the scope of the proposed project:

- Installation of Capacitor bank 1500 kVAR - 351 nos.

2.3 Financial Analysis of Project:

The cost has been calculated as per the current SOR 2018-19 of the East Discom with provision of 10% price escalation. The benefits have been calculated using the following methodology:

i) On account of enhanced capacity of existing infra, new connections will be served resulting into enhanced revenue generation thus resulting in additional sales of energy.

ii) The saving is expected due to reduction in reactive energy charges.

2.4 THE MAJOR BENEFITS OF THE PROJECT ARE AS UNDER

I. Reliable and quality power supply to consumers.

II. Reduction in technical losses.

III. Reactive power compensation and improvement in Power factor.

IV. Development of sector due to better and improved availability of power supply.

V. Improved Voltage profile of the distribution network.

2.5 SUMMARY PROJECT COSTS

Proposed System Strengthening Works in Bundelkhand area					
S.No	**Item**	**Unit**	**Unit Rate**	**Qty**	**Total Amount in Rs. lacs**
1	Installation of 11 kV Capacitor Bank-1500 KVAR with all accessories and civil works.	No	14.92	351	5236.92
	Total (Rs. In lakhs)				**5236.92**
		Including 10% Price escalation			**5752.35**

*Substation wise details of proposed location is shown in Annexure II

2.6 SOURCE OF FINANCE

The financing for these projects is expected to come from following sources:

1. Financing from Financial Institutions- 90% of project cost from PSDF fund through grant.
2. Grant from GoMP/Internal sources/F.I - 10% of project cost.

2.7 COST BENEFIT ANALYSIS AND PAY BACK PERIOD:-

Total cost of the project	5752.35	Rs.Lakhs
Power purchase cost at DISCOM periphery	3.82	Rs./Unit
Total benefit from various system strengthening works	403.65	Lakhs unit
Total benefit from various system strengthening works	1541.94	Rs.Lakhs
Total benefit	1541.94	Rs.Lakhs

IRR CACLCULATION

(Amount in Rs Lakhs)

S. No.	Year	Investment (%)	Investment	O&M charges @3%	Benefits (%)	Financial Benefits	Net Financial Benefits
1	2	3	4	5	6	7	8
1	2018-19	40%	2301	34.514	0%	0.00	-2335.45
2	2019-20	60%	3451	120.799	70%	1079.36	-2492.85
3	2020-21			172.571	100%	1541.94	1369.37
4	2021-22			172.571	100%	1541.94	1369.37
5	2022-23			172.571	100%	1541.94	1369.37
6	2023-24			172.571	100%	1541.94	1369.37
7	2024-25			172.571	100%	1541.94	1369.37
8	2025-26			172.571	100%	1541.94	1369.37
9	2026-27			172.571	100%	1541.94	1369.37
10	2027-28			172.571	100%	1541.94	1369.37
11	2028-29			172.571	100%	1541.94	1369.37
12	2029-30			172.571	100%	1541.94	1369.37
13	2030-31			172.571	100%	1541.94	1369.37
14	2031-32			172.571	100%	1541.94	1369.37
15	2032-33			172.571	100%	1541.94	1369.37
16	2033-34			172.571	100%	1541.94	1369.37
17	2034-35			172.571	100%	1541.94	1369.37
18	2035-36			172.571	100%	1541.94	1369.37
19	2036-37			172.571	100%	1541.94	1369.37
20	2038-39			172.571	100%	1541.94	1369.37
21	2039-40			172.571	100%	1541.94	1369.37
22	2040-41			172.571	100%	1541.94	1369.37
23	2041-42			172.571	100%	1541.94	1369.37
24	2042-43			172.571	100%	1541.94	1369.37
25	2043-44			172.571	100%	1541.94	1369.37
						IRR=	**25.14%**
					Pay back period		**3.73**

2.8 Implementation responsibilities

The implementation of the entire project is envisaged in 24 months. During this period procurement of major materials and erection/ installation/ commissioning of equipment's etc. will take place.

- Works proposed in the scheme will be executed as per the proposed implementation plan, after sanction of scheme from funding agency.

The works under different activities being carried out will be looked after by the experienced Officers of the Company at the respective project area.

2.9 Contract Packaging

1.The execution of the project works shall be carried out by the Company, through TKC (turn-key contracts) on approved rates / departmentally.

2.In case of work done through departmentally, an independent construction unit headed by an Executive Engineer with requisite manpower, vehicles; T&P etc will look after the construction activities and supervision. This construction unit will be directly responsible for execution of the work involved in the project and the SE/EE of the concerned area would exercise the control and supervision of the works.

CONTENTS

1. BACKGROUND

1.1 INTRODUTCTION TO MPMKVVCL

The Government of Madhya Pradesh (GOMP) incorporated Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Limited (Central Discom) on 31st May 2002. The Central Discom is a wholly owned Government of Madhya Pradesh Company, registered under the Companies Act, 1956. With the Gazette Notification dated 31st May 2005, the Company started functioning independently with effect from 1st June, 2005. As per the notification, the Company is undertaking business of distribution and retail supply of electricity in the 16 districts of four commissionaires of Madhya Pradesh namely Bhopal, Hoshangabad, Gwalior and Chambal.

1.2 GEOGRAPHICAL MAP OF MPMKVVCL

Madhya Pradesh Madhya Kshetra Viduyat Vitran Company Limited (MPMKVVCL) has implemented the state government directives of supplying uninterrupted and reliable quality supply to all consumers. For this purpose various schemes are being implemented through financial assistance from financial institutions and external funding agencies.

1.3 OPERATIONAL PROFILE

1.3.1The Central Discom is responsible for operating the distribution assests within the area of Bhopal, Hoshangabad, Gwalior and Chambal Commissionary. Its electricity network consists of infrastructure is as depicted below (fig as no 31.10.2018)

Table 1

Parameter	Central Discom
Consumer (Lakhs)	42.62
33kV Lines (km)	17219
33kV Feeders	730
33/11kV sub stations (No.)	1288
No of Power Transformer (No.)	2257
Total MVA capacity of 33/11kV Power Transformer	10743.15
11kV feeder (No.)	5202
11kV Lines (km)	128836
No. of Distribution Transformers (No.)	261801
Total. of Distribution Transformers capacity (MVA)	12510
Geographical area (km)	96069
Regions (No.)	2
Circles (No.)	15
Districts (No.)	16
Division (No.)	50
Distribution Centers (No.)	354
Load Profile (LV) based on MU	Agriculture & Domestic loads are predominating
Load profile (HV) based on MU	Industrial & Non Industrial, Coal mines, Agriculture, Residential and Commercial

1.3.2 In terms of electrical connectivity, the MPMKVVCL is connected to MPPTCL network at 33kV and 11kV levels also there are few interconnection points with other Discom. MPPTCL network connects the POWERGRID network, State sector generating and Discom networks.

1.4 CONSUMERS PROFILE

The Company currently serves about 4.26 million consumers over an area of 96069 Sq. Kms. There are only 2287 Nos. of HT consumers, which is less than of the total consumers, and also consume less amount of the total energy consumers in company area.

The category wise break-up of No. of consumers with connected Load as on 31.10.2018 is given below:-

Table 2			As on 31-10-18
S.No.	**Category**	**No. of Consumers (Nos.)**	**Connected Load (kW)**
LT CONSUMERS			
1	Domestic	3384703	3049656
2	Non-Domestic	277170	804306
3	Water Works/Street Light	13619	114856
4	LT Industrial	33774	324535
5	Agricultural	550873	2380404
LT (TOTAL)		**4260139**	**6673757**
HT CONSUMERS			
1	HT Ind.	1272	632939
2	HT Irrg.	35	8488
3	Non Ind.	852	170243
4	W/W	127	45684
5	Boarder Villages	1	1
HT (TOTAL)		**2287**	**857355**
G. TOTAL (LT+HT)		**4262426**	**7531112**

2. PROJECT OBJECTIVES

The Distribution system has suffered mainly from the following challenges:-

(1) Unbalanced load flow.
(2) High level of Technical losses.
(3) Low consumer satisfaction level.
(4) Less system stability.
(5) Less voltage profile at tail end.
(6) Low power factor.

Need for a consistent & long lasting solution aimed at improving & strengthening of the Power Distribution network with minimum losses in the long run through integrated planning for Power Distribution System has been felt for a long time. Now, Discom could take up Renovation & Modernization of distribution systems aimed at relieving congestion and improving the voltage profile. Hence, the Central Discom has prepared a vital plan for implementation of Power System Development.

This report aims to provide detailed information relating to the project for which Power System Development Fund for current year sought by the MPMKVVCo. Ltd. The key activity have been identified under this project to improve power distribution system of the company is **installation of 2100 KVAr 11kV Automatic Capacitor Bank.**

Government of India has finalized the scheme for operationlisation of the Power System Development Fund (PSDF). The fund consists of Unscheduled Interchange charge, Congestion charge, Market Splitting Congestion amount and Reactive Compensation charges, which is deposited with Government of India. These charges are settled between who pay and those who need to receive. After final settlement takes place, there are surplus amounts which are credited into a special fund called the Power System Development Fund (PSDF).

3. BENIFICIARIES.

Adequate reactive power compensation offered salient benefits to the power system which includes voltage regulation (Voltage control within acceptable limits), system power losses reduction brought about by power factor improvement and it increases the utilization of connected equipments at the consumer end, improves reliability of transmission system and more importantly efficiency of real power made available at the consumer end.

Hence the major beneficiaries are:-

(i) Madhya Pradesh Power Transmission Company Ltd.
(ii) Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Ltd.
(iii) 550 Lakhs of Agriculture consumer situated in 16 district which comes under the jurisdiction of MPMKVVCL, Bhopal.

4. ONGOING INITIATIVES.

In company area 15 Circles are working and the total 730 No. 33kV feeders radiated from 111No. EHV S/s are feeding the supply in 16 district. At present, 1288 No. 33/11kV S/s are existing and 2257 No. PTR are installed in these substations. The 686 No. 1200 KVAr capacitor banks and 795 No. 1500 KVAr Automatic Capacitor Banks are installed in these substation for management of the reactive power. The total installed capacity of capacitor bank is 2015.7 MVAr. The total installed capacity of power transformer is 10743.15 MVA and the load recorded on 25.11.2018 is 4876.93 MVA and 2040.37 MVAr in all 679 Nos. of 33kV feeders after excluding the dedicated feeder of consumers and industrial feeders **(List is enclosed as Annexure 'A')**. This MVAr recorded after compensation of 65% (1310.20 MVAr) of installed capacity (2015.7 MVAr) of capacitor bank installed at 33/11kV S/s of company area. The excessive drawl of reactive power is due to highly no. of (505873) agriculture pump connected in (connected load-2380404kW) system.

Therefore, it is propose to install 835 Nos. of 2100 KVAr 11kV Automatic 11kV Capacitor Bank in balance 776 existing power transformer and 59 No. 5 MVA 33/11kV S/s which are under construction in different scheme like DDUGJY, IPDS, RGGVY & SSTD and got completed up to 31st March 2019. After installation of 835 Nos. of 2100 KVAr Automatic 11kV Capacitor Banks of 1753.5 MVAr the only 899.37 MVAr will be left for compensation.

5. IDENTIFICATION OF PROJECT WORK:-

The Project is scattered in all Circles of MPMKVVCL Bhopal. The works included in the projects are installation commissioning and 5 year's annual maintenance contact of 835 Nos. of 2100KVAr Automatic 11kV Capacitor Bank.

6. TECHNOLOGY:-

1. For 11kV, 2100 KVAr Automatic 11kV Switched Capacitor Bank includes –(i) 21 No. 100KVAr capacitor units. (ii)11kV VCB's. (iii) Capacitor Switch. (iv)Reactor. (v) APFC. (v) LA. (vi) PT's. (vii)CT's. (viii) Power and control cables. (ix)Supports of various types channels. (x) Nut Bolts. (xi) Bus bar structure. (xii)Laying of cables. (xiii) Installation of energy meters. (xiv) Interconnection of VCB and C&R Panel.

2. The capacitor bank shall consist of 4 steps of 300KVAr, 600KVAr, 600KVAr and 600KVAr. All the capacitor unit shall be controlled through separate capacitor switch and complete capacitor bank shall be protected through a VCB suitable for capacitor duty.
3. The automatic power factor control unit shall continuously monitor power factor at 11kV side of power transformer and automatically switched ON/OFF capacitors units in steps of 300, 600, 900, 1200, 1500, 1800 KVAr, &2100KVAr according to the requirement of KVAr to maintain the Target Power Factor.
4. The automatic power factor control unit shall be programmable and have data downloading facility. Data Storage capacity of the control unit shall be at least for 45 days with every fifteen minutes data. The bidder shall have to provide two data downloading instrument for data download from control unit with necessary BCS in each Circles.
5. The all display meters provided in the control panel shall be digital meters, and shall be compatible for AMR.
6. There are no low voltage limit for tripping of capacitor bank main VCB or capacitor switch.
7. The power factor control unit and Relays provided for the protection of control unit shall be capable to store at least last five faults.

7. COST OF THE SCHEME & PAY BACK PERIOD:-

(a) The electrical distribution networks improvement proposal along with their cost is given below:-

Cost estimation of installation of 835 Nos. of 2100 KVAr Automatic 11kV Capacitor Bank under Power System Development Fund.

S.No.	Name of work	Unit	Quantity	Rate/Unit (In Rs.)	Amount (in Cr.)
1	2100 KVAr Automatic 11kV Capacitor Bank including installation, commissioning and AMC.	No.	835	24,15,000	201.65

Payback period:-

SAMPLE STUDY OF PAY BACK PERIOD OF RARUA RAI FEEDER AT 132 kV S/S INDERGARH		
Particulars	Present Status	After installation 03 Nos. of 2.1 MVAr
MW	7.46	7.46
MVA	8.79	7.61
MVAr	4.83	1.51
PF	0.848692	0.98
Amp.	153.78963	133.1836535
Loss (Units)	1254333.548	893836.944
SAVING OF UNITS PER ANNUM		360496.60
Cost of Supply as per ARR approved by MPERC for the year 2018-19		Rs. 5.88 per unit
Net Saving in terms of amount		Rs. 2119720.03 per year
Cost of Capacitor Bank		Rs. 72.45 Lakhs
Pay Back period		3.42 Years

8.BENEFIT OF THE SHCEME:-

1) Improvement of the availability, reliability, efficiency and safety of the equipment.
2) Regaining lost capacity.
3) Extend the useful life beyond designed life of 25 years of equipments.
4) Saving of investment on new equipment.
5) Improvement in Power Factor.
6) Improvement in Voltage Profile.
7) Commercial loss reduction
8) Improvement in quality and reliability of power supply
9) Increasing in billing & revenue collection efficiencies.
10) Power factor correction will enhance the electrical efficiency and longevity of inductive load.
11) By increasing the efficiency of electrical systems energy demand and it environmental impact is lessened.
12) Power factor correction assists company by reducing demand for electricity.
15) Voltage control and reactive power management improves reliability and facilitates commercial transactions across transmission network.
13) On an alternating current (AC) Power System Voltage is controlled by managing production and absorption of reactive powers.
14) Voltage management:-

(i) Both customer and power system equipment are designed to operate within a range of voltages, usually within ± 5% of the nominal voltage. At low voltages, many types of equipment perform poorly, light bulbs provide less illumination, induction motors can overheat and be damaged, and some electronic equipment will not operate at. High voltages can damage equipment and shorten their lifetimes.
(ii) Reactive power consumes transmission and generation resources. To maximize the amount of real power that can be transferred across a congested transmission interface, reactive power flows must be minimized. Similarly, reactive power production can limit a generator's real power capability.
(iii) Moving reactive power on the transmission system incurs real power losses. Both capacity and energy must be supplied to replace these losses.
18) By controlling and managing flow of reactive power and voltages we achieve the following objectives:-
(i) It must maintain adequate voltages throughout the transmission and distribution system for both current and contingency conditions.
(ii) It seeks to minimize congestion of real power flows.
(iii) It seeks to minimize real power losses.

09. MANAGEMENT ARRANGEMENT:-

The Implementation plan for the project is two year (24 month). The work proposed under the scheme shall be executed as per proposed implementation plan after approval from funding agency.

Works under different activities shall be carried out on turnkey basis through international competitive Bidding or national competitive Bidding as per the guidelines of funding agency.

The project shall be divided into parts depending upon the area, quantity and amount.

For implementation of the project a project management unit (PMU) shall be establish at corporate level. The PMU shall be responsible for preparation of tender documents, specification, issue of NIT, placing of order and monitoring of different activities. For smooth implementation in field nodal officer shall be appointed at circle level.

10.TIME FRAME:-

The time line of activities to be perform to execute the project is as shown below:-

Time Line Activities

S. no.	Particulars	2018-19	2019-20				2020-21				2021-22
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1	Project Approval										
2	Bid Preparation										
3	Bidding Period										
4	Evaluation, Contract Award & Mobilization										
5	1st Disbursement										
6	Project Status Report										
7	2nd Disbursement										
8	Project Status Report										
9	3rd Disbursement										
10	Project Status Report										
11	4th Disbursement										
12	Project Status Report										
13	Project Duration										

11.SUCCESS CRITERIA AND SUSTAINBILITY:-

The 686 No. 1200KVAr capacitor bank installed in Madhya Kshetra Company in between the year 2008-2010 by the Shreem Capacitor Company and the Annual maintenance Contract of 5 year was given along with installation and commissioning. At present, these Capacitor Banks are maintained by the officers of the company and all Capacitor Banks are functioning well excepts some maintenance is required likely the replacement of some defective units, current transformer parts of VCB etc and external fuse units.

Similarly, the 795 Nos. of 1500 KVAr Automatic 11kV Capacitor Banks were installed in Madhya Kshetra Company between the year 2012-2016 and the 5 year Annual maintenance Contract was given along with installation commissioning. All these Capacitor Banks are operational at present and if any defects is reported by the field officer, it is promptly attended by the representative.

The capacitor units are used in these capacitor banks are manufactured with the latest design and tested to meet or exceed the requirement of applicable IEC & IS Standards, it is rated in continuous KVAr, Voltage and frequency for operating within the -20^0C to $+50^0$C ambient temperature rage & designed to produce not less than rated KVA at rated voltage and frequency. Capacitors will operate safely at 135% of KVAr rating under following condition.

1) KVAr caused by excess at rated frequency.
2) KVAr added by the harmonic voltage superimposed on the power frequency voltage.
3) KVAr attributable to manufacturing tolerances.

The maximum recommended working voltage of capacitor is 110% of rated voltage. The capacitors include a safely factor that permits them to tolerate without damage momentary over voltage caused due to switching /load fluctuation.

Thus, it is quite successful and sustainable in the system.

Encl:-Annexure 'A'

EHV Sub-station wise Maximum Load (MW) of 33kV feeders with respective Maximum MVAr on dated 25/11/2018.					
Sr. No.	**EHV S/s Name**	**Feeder Name**	**Max MW**	**Max MVA**	**Max MVAr**
1	132kV AMLA	33KV AMLA TOWN	8.33	9	3.5
2		33KV JAMBADA	8.94	9.66	3.7
3		33KV JAMDEHI	8.83	10	4.9
4		33KV PARSODI	3.31	3.61	1.42
5	132kV AMRAWATKHURD	33KV AIIMS HOSPITAL	2.70	2.77	0.82
6		33KV AIIMS RESIDENTIAL	4.08	4.08	0.3
7		33KV AMRAWAT-I	4.58	4.68	1.2
8		33KV AMRAWAT-II	3.70	3.73	1.17
9		33KV C-21	0.54	1.1	1.02
10		33KV KATARA-II	5.47	5.77	1.81
11		33KV VALLABH NGR-I	1.11	1.2	0.4
12		33KV VALLABH NGR-II	2.22	2.26	0.5
13	132kV ARON	33KV ANANDPUR	7.70	8.6	4
14		33kV ARON	8.70	9.8	4.6
15		33KV BARKHEDA	8.10	9	4.5
16		33KV BAROD	6.50	8	4.7
17		33KV BHADORE	9.20	10.8	5.76
18		33KV PANWARI	13.00	14.5	6.5
19		33KV RAMPUR	4.34	5.15	2.9
20	132kV ASHTA	33KV ASHTA TOWN	4.60	4.8	1.71
21		33KV DODI	7.00	7.3	2.11
22		33kV ICHHAWAR	8.19	9.03	4
23		33KV JAWAR	9.90	10.6	3.9
24		33kV KHACHROD	13.80	14.6	5.2
25		33KV KILERAMA	12.00	12.8	4.8
26		33KV BLANK BAY	0.51	0.59	0.28
27	132kV AYODHYA NAGAR	33KV DAMKHEDA-I	4.88	4.98	1.6
28		33KV DAMKHEDA-II	5.70	5.8	0.98
29		33KV DGP	0.23	0.24	0.13
30		33KV I/C-I	11.40	11.6	1.8
31		33KV ISRO	0.30	0.3	0.02
32		33KV ISTRAC	0.20	0.2	0.03
33		33KV NARMADA BAY	2.80	2.9	0.9
34		33KV TIRUPATI	0.12	0.3	0.3

35	132kV BAGRODA	33KV AKVN -I	0.00	0.01	0.01
36		33KV AKVN -II	0.08	0.1	0.05
37		33KV RAMAKHEDI	7.43	8.07	3.13
38		33KV UMRAOGANJ	7.52	8.07	3.19
39	132kV BAIRAD	33KV BAIRAD	7.69	8.55	4.06
40		33KV BHATNAWAR	7.33	8.26	3.82
41		33KV GAZIGARH	1.99	2.31	1.18
42		33KV GOVARDHAN	8.06	9.28	4.61
43	132kV BANKHEDI	33KV ISHERPUR	11.70	12.7	5.65
44		33KV KARPA	9.60	10.8	5.2
45		33KV OLD BANKHEDI	7.65	8.14	3.25
46		33KV PANAGAR	5.73	6.92	3.94
47	132kV BANMORE	33/11KV X-MER-I(5MVA)	4.00	4.2	1.31
48		33/11KV X-MER-II(5MVA)	1.94	2.1	0.73
49		33KV BADPURA	4.00	4.04	1.1
50		33KV DELUX	2.20	2.4	1.1
51		33KV INDUSTRIAL	2.44	2.44	0.2
52		33KV MAGNUM	0.10	0.05	0.02
53		33KV NOORABAD	3.90	4.3	1.92
54		33KV TRIPTI	0.43	0.43	0.1
55	132kV BARELI	33KV BAGPIPARIYA	7.41	9.29	5.6
56		33kV BARELI	10.30	10.9	3.9
57		33KV BARNA	7.70	8.9	4.43
58		33KV BORAS	7.10	7.9	3.52
59		33KV GURARIYA	8.70	11	6.8
60		33KV HARSILY	4.61	5.32	3
61		33KV KHARGONE	12.60	13.9	5.9
62		33KV KUNDALI	10.40	11.4	4.6
63		33KV NAYAGAON KHURD	11.00	12.3	5.6
64		33KV THALA DIGHAWAN	5.80	7	3.82
65	132kV BARODA	33KV BARODA	10.00	11.8	6.49
66		33KV LALITPURA	4.47	6.62	4.88
67		33KV PANDOLA	5.82	7.12	4.1
68		33KV SALMANYA	2.00	2.5	1.6

69	132kV BAIRASIA	33kV BERASIA	7.00	7.5	2.74
70		33kV RAMGADA	11.63	13	5.85
71		33kV RATUA	14.77	15.99	6.11
72		33KV SAPAUA	5.40	5.87	2.3
73		33KV SONKATCH	8.90	9.9	4.41
74	132kV BETUL	33KV BHADUS	7.35	7.79	3.35
75		33KV HAMLAPUR	6.76	7.46	3.2
76		33KV HIWARKHEDI	4.00	4.51	2.4
77		33KV INDUSTRIAL	0.54	0.7	0.4
78		33KV PADHAR	9.69	11.38	5.97
79		33KV SOHAGPUR	7.90	9	4.32
80		33KV TIKARI	4.02	4.1	0.77
81	132kV BHANDER	33KV MELA GROUND	8.72	9.29	3.24
82		33KV TV TOWER	11.50	13	6.1
83	132kV BHIND	33KV AKODA	3.25	3.63	1.64
84		33KV BHAROLI	6.43	6.6	1.53
85		33KV BTI	10.14	10.48	2.65
86		33KV ETAWA ROAD	3.81	5.21	3.58
87		33KV INDUSTRIAL	0.60	0.6	0.14
88		33KV ITI	7.25	7.53	2.03
89		33KV ITI RURAL	5.60	6.53	3.5
90		33KV MASOORI	4.50	4.8	2.1
91		33KV PHOOP	11.53	13.1	6.3
92		33KV PRATAPPURA	5.30	6.2	3.22
93		33KV ROOR	3.87	4.23	1.7
94		33KV UMARI	7.76	8.85	4.4
95	132kV BHONRA	33KV BAMORI	11.20	12	4.9
96		33KV BHONRA	5.20	5.8	3
97		33KV COLONY	8.50	9	2.9
98		33KV FATEHGARH	3.60	3.96	2.24
99		33KV GADLA	7.00	8.5	5.1
100		33KV KALORA	12.60	14.5	7.1
101		33KV KAPASI	2.27	2.74	1.66
102		33KV PARANTH	9.30	10.2	4.2
103		33KV SAIN BOARD	4.60	4.95	3.08

104	132kV BIAORA	33KV BHOORA	13.90	15.3	6.6
105		33KV BIAORA	6.35	6.7	2.6
106		33KV DOODHI	13.60	15	6.3
107		33KV INDUSTRIAL	0.25	0.25	0.05
108		33KV KACHARI	11.90	13	5.4
109		33KV PAGARI BANGLOW	12.10	14.2	7.5
110		33KV SILPATI	13.10	14.1	5.6
111		33KV SUTHALIA	14.10	16.1	7.8
112		33KV WATER-WORKS	0.23	0.23	0.04
113	132kV BILKISGANJ	33KV BILKISGANJ	8.66	9.18	3.04
114		33KV KULAS	6.82	7.31	3.43
115		33KV NEEBUKHEDA	1.98	2.25	1.07
116		33KV RATIBAD	4.20	4.94	2.65
117	132kV CHAMBAL	33KV A.I.R.	6.00	6.1	1.4
118		33KV ANAND NAGAR	7.80	8.2	2.5
119		33KV BHEL	11.80	12	1.7
120		33KV D B MALL	1.82	1.9	0.4
121		33KV DRM	1.25	1.3	0.53
122		33KV GOVINDPURA	1.73	1.8	0.24
123		33KV H.O.D.	1.90	2	0.52
124		33KV HABIBGANJ-I	4.80	4.8	0.7
125		33KV HABIBGANJ-II	1.32	1.4	0.5
126		33KV HABIBGANJ-III	1.34	1.41	0.5
127		33KV I.S.B.T.	5.70	5.7	0.65
128		33KV INDUSTRIAL-I	0.10	0.1	0.1
129		33KV INDUSTRIAL-II	1.40	1.4	0.2
130		33KV KEELANDEV	4.88	4.89	0.6
131	132kV CHANDERI	33KV BAMORE	12.00	13.5	6.1
132		33KV CHANDERI	7.10	7.51	2.67
133		33KV RAJGHAT	0.12	0.12	0.03
134		33KV SEHRAI	2.38	2.61	1.08
135	132kV CHICHOLI	33KV BHIMPUR	8.20	8.5	2.2
136		33KV CHICHOLI	5.86	6.15	2.02
137		33KV CHIRAPATLA	4.70	5.1	1.9
138		33KV JEEN	5.90	6.6	2.9
139		33KV MALAJPUR	6.00	6.48	2.45
140		33KV SAHAPUR	8.40	8.8	2.9

141	132kV CHINORE	33KV BANWAR	3.10	3.82	2.57
142		33KV CHINOR	3.24	3.63	1.79
143		33KV GHARSONDI	1.82	2.27	1.37
144		33KV KARHIYA	5.26	5.46	1.84
145	132kV DABRA	33KV BHITARWAR	11.50	12.1	4
146		33KV CHIMAK	6.59	7.43	3.57
147		33KV DABRA	9.15	9.66	3.3
148		33KV LOHGARH	4.80	5.4	2.5
149		33KV MAGRORA	6.54	7.44	3.82
150		33KV MASUDPUR	5.70	7.2	4.5
151		33KV PICHHORE	7.40	8.1	3.5
152		33KV TEKANPUR	12.90	13.2	3.25
153	132kV DATIA	33KV DAGRAI	7.30	7.47	1.58
154		33KV DATIA	9.80	10.1	2.5
155		33KV INDUSTRIAL	1.10	1.1	0.1
156		33KV RAJGHAT	7.20	7.4	1.8
157	132kV DIMNI	33KV AJNODHA	3.54	4.29	2.43
158		33KV BADAGAON	8.14	9.39	4.67
159		33KV DIMNI	4.40	4.9	2.6
160		33KV KHADIYAHAR	4.22	4.91	3.28
161	132kV ENTKHEDI	33KV ENTKHEDI-II	6.50	7.3	3.38
162	132kV GAIRATGANJ	33KV BEGUMGANJ	14.20	15	6
163		33KV DEHGAON	9.40	9.9	3.6
164		33KV DHANDIYA	14.34	15.2	5.02
165		33KV GAIRATGANJ	7.62	7.69	1.8
166		33KV SAMNAPUR	11.10	11.9	4.4
167	132kV GOHAD	33KV SILWANI	10.97	11.41	3.71
168		33KV FEEDER -V (CHITORA)	7.86	9.56	5.45
169		33KV FEEDER-II (ENDORI)	8.00	8.8	3.7
170		33KV GOHAD CITY	8.26	8.71	3.14
171		33KV SERVA	1.86	2.04	1
172	132kV GOPALPUR	33KV AE PHE	0.40	0.45	0.19
173		33KV GILLORE	5.20	5.86	3.18
174		33KV GOPALPUR	7.92	9.16	4.6
175		33KV HAMEEDGANJ	6.04	7.12	3.8
176		33KV VASUDEV	4.30	5.1	2.75

177	132kV GUDGAON	33KV BHAINSDEHI	12.93	13.81	4.86
178		33KV CHANDU	9.30	10.3	4.44
179		33KV GUDGAON	6.40	6.5	2
180		33KV HIDLI	6.90	7.4	3
181		33KV SAWALMENDA	4.60	5.1	2.3
182	132kV HARDA	33KV ABGAON KHURD	4.00	4.2	2.2
183		33KV CHHOTI HARDA	3.23	3.71	2.23
184		33KV GWAL NAGAR	2.80	3.1	1.31
185		33KV HANDIA	9.50	10.4	4.4
186		33kV HARDA	4.70	4.9	1.3
187		33kV KANKARIA	4.40	5.36	3.15
188		33KV KARTANA	10.90	12.3	5.73
189		33KV REHATGAON	15.65	17.46	7.73
190		33KV SONTALAI	15.10	17.4	8.7
191		33KV TIMARNI	12.80	13.4	5.4
192		33kV VXL	0.43	0.43	0.03
193	132kV HASTINAPUR	33KV BADERA	1.01	1.2	0.6
194		33KV DABKA	4.70	5.7	3.21
195		33KV HASTINAPUR	7.90	9.19	4.9
196		33KV SUKALIYARI	13.50	15	6.7
197	132kV ICHHAWRAR	33KV BHAUKHEDI	14.20	15.88	7.26
198		33KV BRAJESH NAGAR	8.40	8.6	3
199		33KV DEWARIYA	10.40	11.3	4.6
200		33KV ICHHAWAR-I	3.60	4	1.62
201		33KV ICHHAWAR-II	4.38	4.99	2.38
202	132kV INDERGARH	33KV INDERGARH	7.95	8.9	4.27
203		33KV LANCH	5.57	6.52	3.58
204		33KV RARUA RAI	7.46	8.79	4.83
205		33KV THARET	0.00	0.05	0.05
206	132kV ISAGARH	33KV DHAKONI	8.14	9.25	4.43
207		33KV ISAGARH	7.98	9.42	5.49
208		33KV NAI SARAI	7.17	8.83	5.15
209		33KV PARSOL	7.50	9.04	5.06
210	132kV JEERAPUR	33KV JAITPURA	10.00	11	5.06
211		33KV JEERAPUR	8.45	9.2	4.2
212		33KV JHADMAU	13.23	13.88	4.85
213		33KV MACHALPUR	16.50	17.8	6.6

214	132kV JOURA	33KV BAGCHINI	10.20	10.9	3.7
215		33KV CHINNONI	2.80	3.3	1.6
216		33KV JOURA CITY	1.80	1.8	0.4
217		33KV JOURA-II	7.30	7.7	3.2
218		33KV KUMHERI	3.70	4.33	2.24
219		33KV NAVODAYA	5.89	6.32	3
220		33KV SHANKARA	3.88	4.62	2.49
221		33KV SOMAOLI	9.62	10.11	3.62
222	132kV KAILARAS	33KV DEEPERA	3.89	4.31	1.84
223		33KV KAILARAS	7.43	7.96	3.05
224		33KV PAHADGARH	6.20	6.64	2.65
225	132kV KAPASI	33KV FATEHGARH	8.56	9.53	4.19
226		33KV KALORA	4.19	5.16	3.18
227		33KV KAPASI	1.08	1.56	1.29
228		33KV MANA	8.12	9.11	4.82
229	132kV KARERA	33KV BEHGANWA	5.90	6.11	1.7
230		33kV DINARA	6.85	7.06	1.78
231		33KV KARERA	4.54	4.69	1.22
232		33KV NARAUA	9.60	10.3	3.9
233	132kV KHILCHIPUR	33KV BHOJPUR	5.25	5.45	1.5
234		33kV BIORAKALA	10.10	11.45	5.56
235		33KV KHAJLA	3.85	4	1.2
236		33KV KHILCHIPUR	8.00	8.3	3.2
237		33KV LAKHONI	17.70	20.8	11
238		33KV SANDAWATA	9.60	11.2	5.9
239	132kV KHIRKIYA	33KV CHARUA	9.80	11.3	5.5
240		33KV KHIRKIYA-II	5.93	7.12	3.94
241		33KV KILLOD	9.17	9.61	3.98
242		33KV TEMLAWADI	2.83	3.55	2.2
243	132kV KHUJNER	33KV FEEDER-III(PADLIYA KHEDI)	6.68	7.09	2.52
244		33KV KALIYA KHEDI	2.40	2.95	1.77
245		33KV KHUJNER	7.06	7.64	3.2
246	132kV KOLARAS	33KV CHANDORIYA	8.63	10.34	5.75
247		33KV KAILDHAR	16.40	18.5	8.6
248		33KV KOLARAS	8.50	9.8	5.02
249		33KV LUKWASA	6.30	7	3
250		33KV RAI	4.19	5.28	3.2
251		33KV RAMTALA	9.90	11.93	6.67
252		33KV ACHHAROHI	11.88	13.43	7.07

253	132kV KURAWAR	33KV INDUSTRIAL	2.60	2.6	0.6
254		33KV JHADLA	7.20	8.85	5.16
255		33KV KHARDONKALAN	10.27	12.2	6.57
256		33KV KHOKRAKALAN	10.10	12.2	7
257		33KV KOTRA	2.11	2.5	1.33
258		33KV KURAWAR	9.10	10	4.2
259		33KV LAPP INDIA	0.50	0.5	0.04
260		33KV LASUDIYA BHAMA	7.50	8.4	3.98
261		33KV NARSINGHGARH	7.20	7.6	2.6
262		33KV OSWAL DENIM	8.56	8.57	0.7
263		33KV UMRI	13.20	15.8	8.76
264	132kV LAHAR	33KV DABOH	6.90	7.4	2.74
265		33KV LAHAR	9.97	10.63	3.7
266		33KV MADORI	3.40	3.7	1.31
267		33KV SHYAMPURA	2.20	2.37	1.01
268	132kV LALGHATI	33KV BADA BAAG	4.70	4.7	0.5
269		33KV BHADBHADA-I	5.25	5.29	0.68
270		33KV BHADBHADA-II	6.70	6.73	0.65
271		33KV I/C-I	5.12	5.2	0.93
272		33KV I/C-II	8.69	8.71	1.3
273		33KV KAMLA NEHRU	3.20	3.3	0.92
274		33KV KHAJURI SADAK	0.00	0.1	0.1
275		33KV LALGHATI-I	3.60	3.61	0.69
276		33KV LALGHATI-II	7.00	7.06	1.14
277		33KV LALGHATI-III	6.10	6.16	1.02
278		33KV MES(NEORI)	2.49	2.57	0.65
279		33KV TELEPHONE EX.	4.58	4.64	0.8
280	132kV LATERI	33KV ALIGARH KOTRA	2.10	2.43	1.3
281		33KV ANANDPUR	13.40	14.9	6.5
282		33KV LATERI	6.40	6.6	1.7
283		33KV MADAN KHEDI	8.64	9.38	3.65
284	132kV MACT	33KV BADJHIRI	3.00	3.4	2
285		33KV BAIRAGARH CHICHLI-I	4.47	4.72	1.7
286		33KV BAIRAGARH CHICHLI-II	8.50	9.4	4
287		33KV CHAMBAL-I	6.30	6.6	2.2
288		33KV CHAMBAL-II	6.53	6.86	2.4
289		33KV DANISH HILLS	0.70	0.74	0.4
290		33KV KOLAR	4.32	4.6	1.43
291		33KV KOTRA-I	5.68	5.72	0.7

292	132kV MACT	33KV KOTRA-II	8.39	8.44	0.93
293		33KV KOTRA-III	3.48	3.5	0.5
294		33KV NJA	4.23	4.25	0.59
295		33KV RATIBAD	0.13	0.13	0.05
296		33KV REVERA TOWN	6.07	6.27	2.5
297		33KV SHAHPURA-I	5.14	5.32	1.4
298		33KV SHAHPURA-II	3.30	3.53	1.42
299	132kV MADA	33KV KHAREIH	5.40	6.7	4.24
300		33KV KHATORA	5.70	6.63	4.03
301		33KV MADA	7.62	8	3.74
302	132kV MANDIDEEP	33KV BANSAL	10.20	10.2	2
303		33KV BHASKAR	7.56	7.56	0.7
304		33KV BHOPAL-I	2.20	2.54	1.4
305		33KV BHOPAL-II	4.15	4.67	2.3
306		33KV GODREJ	6.50	6.6	0.7
307		33KV INDUSTRIAL-III	2.80	2.8	0.6
308		33KV RAMAKHEDI	1.20	1.2	0.21
309		33KV SUCHITA	10.35	11.3	4.6
310	132kV MOHANA	33KV GHATIGAON	6.60	7.4	3.5
311		33KV MOHANA	5.51	6.05	2.7
312		33KV SAHASRAM	11.44	12.83	5.8
313	132kV MORAR	33KV BHADROLI	8.20	8.6	3.22
314		33KV DD NAGAR	7.31	7.6	2.2
315		33KV IIITM	0.30	0.31	0.1
316		33KV KALPI BRIDGE	2.10	2.21	0.95
317		33KV MAHARAJPURA	9.00	9.3	2.4
318		33KV RAIRU	0.90	1.1	0.7
319		33KV READYMADE GARMENT	4.30	4.5	1.5
320		33KV SAGARTAAL	7.10	7.2	1.5
321		33KV SHARMA FARM	9.80	10.1	2.3

322	132kV MOTIJHEEL	33KV CARMEL CONVENT	1.23	1.23	0.16
323		33KV GOL PAHADIA	7.93	8.47	3.11
324		33KV J C MILL	3.60	3.7	1
325		33KV LAXMI GANJ	7.70	8.16	3.1
326		33KV MORAR	4.30	4.4	1.14
327		33KV STONE PARK	6.00	6.3	2.2
328		33KV TRANSPORT NAGAR	4.10	4.1	1
329		33KV VINAY NAGAR	5.27	5.61	2.2
330		33KV WATER WORKS	2.00	2.25	1.02
331	132kV MULTAI	33KV BARAI	9.44	10.61	5.06
332		33KV DAHUA	4.24	4.64	1.9
333		33KV DUNAWA	7.00	7.4	2.4
334		33KV INDUSTRIAL	0.55	0.56	0.13
335		33KV KHEDLI BAZAR	11.90	12.5	3.8
336		33KV MOHI	11.26	12.08	4.4
337		33KV MULTAI	6.17	7.19	3.72
338		33KV PRABHAT PATTAN	5.90	6.46	2.7
339		33KV RAI AMLA	8.71	9.52	4
340	132kV MUNGAWALI	33KV BAHADURPUR	7.36	7.44	2.34
341		33KV MUNGAWALI	7.30	8.1	3.6
342		33KV PIPRAI	6.60	7	2.72
343		33KV SAHRAI	7.57	8.54	3.96
344	132kV NASRULLAGANJ	33KV CHAKALDI	4.60	5.31	2.7
345		33KV KANKARIA	8.44	9.35	4.01
346		33KV LADKUI	11.10	12.73	6.3
347		33KV NASRULLAGANJ	3.24	3.4	1.1
348		33KV NASRULLAGANJ-II	8.34	9.87	5.27
349		33KV NEELKANTH	6.50	7.4	4.2
350		33KV REHTI	9.31	9.56	2.22
351		33KV SEMAL PANI	5.84	6.49	3.09

352	132kV PACHORE	33KV BODA	11.06	12.83	6.49
353		33KV INDUSTRIAL	0.50	0.53	0.25
354		33KV KACHNARIYA	8.80	9.8	4.3
355		33KV KARANWAS	9.75	11.11	5.32
356		33KV PACHORE	6.50	6.9	2.4
357		33KV PIPLIYA RASODA	9.73	11.54	6.22
358		33KV TALEN	9.40	9.72	5.3
359	132kV PICHHORE	33KV KARARKHEDA	2.51	2.6	0.5
360		33KV KHOD	11.00	11.5	3.2
361		33KV NAYA CHOURAHA	7.80	8.02	1.88
362		33KV PADRA	9.90	10.1	2.2
363		33KV PICHHORE TOWN	2.90	3	0.8
364	132kV PIPARIA	33KV HT CONSUMER	1.40	1.64	0.85
365		33KV KANWAR	5.30	5.81	2.8
366		33KV PIPARIA TOWN	6.52	6.81	2.8
367		33KV SANDIYA	14.20	15.8	7.1
368		33KV SHANKHINI	6.62	7.5	4.1
369		33KV SHOBHAPUR	9.49	10.4	4.9
370		33KV SOHAGPUR	7.00	7.3	2.8
371	132kV PORSA	33KV DONDRI	10.20	12	6.38
372		33KV KHEDLI	4.90	5.7	2.88
373		33KV MANPUR	7.50	7.9	3.1
374		33KV PORSA	10.14	10.87	3.92
375	132kV PRATAPPURA	33KV ATER	1.14	1.31	0.65
376		33KV CHAUMHO	4.30	5.04	2.87
377		33KV PRATAPPURA	8.49	9.62	4.69
378		33KV SURPURA	6.06	6.99	4.15
379	132kV RAGHOGARH	33KV AWAN	10.20	11.1	4.3
380		33KV DHARNAWADA	7.48	8.45	4.43
381		33KV IOCL	0.10	0.1	0.1
382		33KV JAMNER I	12.50	13.6	5.2
383		33KV JP INSTITUTE	0.60	0.6	0.1
384		33KV KUMBHRAJ-I	9.70	10.7	5
385		33KV KUMBHRAJ-II	12.60	13.6	5.6
386		33KV RAGHOGARH	7.20	7.8	2.9
387		33KV RUTHIYAI	7.28	7.97	3.86
388		33KV SAKATPUR	10.50	12.3	6.1

389	132kV RAISEN	33KV BARLA	6.10	7.2	3.8
390		33KV GAIRATGANJ	7.82	8.47	3.26
391		33KV NAKTARA	6.10	7.2	4.58
392		33KV NEEMKHEDA	8.30	9.6	4.9
393		33KV PAGNESHWAR	0.56	0.56	0.3
394		33KV PEMAD	10.20	11.3	5.19
395		33KV RAISEN	4.25	4.25	0.4
396		33KV SULTANPUR	9.30	10	3.71
397	132kV ROUN	33KV MACHHAND	4.45	5.02	2.32
398		33KV MEHONA	7.55	8.29	3.5
399		33KV NAYAGAON	5.56	6.3	2.96
400		33KV ROUN	6.60	7.4	3.2
401	132kV RUNAHA	33KV FEEDER-V(SAWASI)	6.90	7.92	3.87
402		33KV NAYSAMAND	4.12	4.34	1.38
403		33KV NAZIRABAD	8.04	9.19	4.64
404		33KV RAMGARHA	8.87	9.51	3.46
405		33KV RUNAHA	7.60	8.85	4.84
406	132kV SALAMATPUR	33KV AMKHEDA	8.21	8.43	2.86
407		33KV DEEWANGANJ	7.76	9.2	4.94
408	132kV SARANGPUR	33KV ASARETA	5.10	5.6	2.4
409		33KV KILODA	12.67	15.37	8.7
410		33KV MANGLAJ	7.00	8.3	4.4
411	132kV SARANGPUR	33KV MAU	10.20	11.4	5
412		33KV PADLIYAMATA-I	6.60	7.2	2.9
413		33KV PADLIYAMATA-II	13.50	14.3	4.8
414		33KV SARANGPUR	8.20	8.8	3.2
415	132kV SEHORE	33KV BARKHEDI	6.73	7.35	2.98
416		33KV BHAUKHEDI	6.60	7	2.2
417		33KV BHOPAL NAKA	3.45	3.6	1.01
418		33KV BIJORI	8.55	8.86	3.53
419		33KV CHANDBAD	13.20	15.7	8.4
420		33KV DASHERABAGH	13.60	14	3.5
421		33KV DEEPAK FASTNER	3.46	3.48	0.88
422		33KV INDUSTRIAL	2.00	2.2	0.8
423		33KV THOONA	5.00	5.4	2.2
424		33KV VAISHALI NAGAR	1.42	1.5	0.5

425	132kV SEMRIHARCHAND	33KV BABAI	4.30	4.8	2
426		33KV BAGRA	10.90	12.7	7.2
427		33KV M.A.F.	6.70	7.3	3.8
428		33KV MOHASA-I	0.07	0.07	0.03
429		33KV RAMNAGAR	12.40	14.3	7.1
430		33KV SEMRIHARCHAND	12.60	13.4	5.7
431	132kV SEONDHA	33KV ALAMPUR	9.40	10.2	4.1
432		33KV BHAGUAPURA	8.40	9.7	5.03
433		33KV LANCH	7.70	8.4	3.33
434		33KV MANGROL	4.72	5.6	2.93
435		33KV SEONDHA	6.77	7.36	3.02
436	132kV SEONI MALWA	33KV BABRI	4.40	5.4	3.21
437		33KV DHARAMKUNDI	9.40	10.6	4.9
438		33KV SEONIMALWA	3.66	4.22	2.1
439		33KV SHIVPUR	9.21	11	6.02
440		33KV SURAJPUR	14.30	15.4	5.6
441	132kV SHAHARWASA	33KV PATHARI	11.90	12.3	3
442		33KV SHAHARWASA	5.53	5.68	1.29
443		33KV UDAIPUR	3.73	3.98	1.4
444		33KV DIGWAD	13.10	15.7	8.7
445	132kV SHAHGANJ	33KV DOBI	6.20	7.4	4.6
446		33KV NANDNER	8.83	10.11	4.93
447		33KV SHAHGANJ	4.40	4.9	2.7
448	132kV SHAMSHABAD	33KV GOLNA	12.31	13.39	5.28
449		33KV SHAMSHABAD	7.35	7.53	2.6
450		33KV TINSIYAI	11.60	12.2	3.9
451	132kV SHEOPUR	33KV BAGDUWA	13.10	15.8	8.9
452		33KV BARODA	11.50	13.8	7.6
453		33KV BHOGIKA	10.90	13.4	7.8
454		33KV DHAN MILL	4.80	5.2	2.1
455		33KV DHONTI	6.83	8.87	5.66
456		33KV GORUS	17.00	19.6	9.7
457		33KV JAIDA	9.30	11.2	6.55
458		33KV JANPURA	6.46	8.59	5.66
459		33KV KALARNA	8.20	10	5.8
460		33KV PALI ROAD	6.90	8	4.43
461		33KV PANDOLA	4.70	5.6	3.25
462		33KV RAMBADI	1.38	1.83	1.21
463		33KV SOINKALAN	16.20	18.1	8.1

464	132kV SHIVPURI	33/11KV X-MER-I	3.27	3.86	2.05
465		33KV BHAGORA	17.80	20.7	10.5
466		33KV FOOD PRAK	0.70	0.93	0.63
467		33KV HOME GUARD	10.90	11.5	3.8
468		33KV PADORA	9.50	10.8	5
469		33KV PARIKSHA	3.80	4.2	2.2
470		33KV POHRI	9.50	10.7	4.8
471		33KV RATOR	8.50	10.1	5.5
472		33KV SHARDA SOLVENT	0.60	0.62	0.2
473	132kV SHYAMPUR	33KV AHMADPUR	7.12	7.86	3.34
474		33KV DORAHA	7.80	8	2.49
475		33KV KHAIKHEDA	5.00	5.5	2.31
476		33KV KHAJURIKALAN	5.66	6.24	2.86
477		33KV MUNGAWALI	5.70	6.4	3.1
478		33KV SHYAMPUR	9.60	10.3	4.3
479		33KV SONKATCH	6.91	7.9	3.8
480	132kV SIRONJ	33KV CHHAPU	1.50	1.6	0.65
481		33KV FEEDER-I(LATERI)	0.00	0.1	0.1
482		33KV MURWAS-I	9.30	10.5	5
483		33KV MURWAS-II	3.21	3.33	1.5
484		33KV SHAHPUR	11.90	12.8	4.5
485		33KV SIRONJ	8.70	9.05	3
486		33KV UHAR	3.18	3.36	1.24
487	132kV SULTANPUR	33KV GAHAL	10.50	11.3	4.6
488		33KV MUHALKALA	8.30	9.5	4.77
489		33KV REHTA KALA	5.80	6.7	3.4
490		33KV SIRALI	10.12	11.22	5
491	132kV TAMOT	33KV AKVN-I	0.25	0.27	0.16
492		33KV AKVN-II	0.03	0.16	0.16
493		33KV GOHARGANJ	7.76	9.02	4.6
494		33KV OBEDULLAGANJ	0.71	0.71	0.08
495	132kV TIGHARA	33KV BARAI	14.63	16.31	7.21
496		33KV DWARKAPURI	10.74	12.35	6.1
497		33KV GOLPAHADIA	12.30	13	4.28
498		33KV P.T.C. TIGHARA	1.73	1.93	0.86

499	132kV UDAIPURA	33KV BORAS	0.16	0.24	0.18
500		33KV THALA DIGHAWAN	8.33	9.57	4.71
501	132kV VIJAYPUR	33KV AGARA	4.71	5.07	1.86
502		33KV BEERPUR	12.90	14.7	7
503		33KV DORD	4.80	5.6	2.95
504		33KV VIJAYPUR	7.20	7.4	1.86
505	220kV ASHOKNAGAR	33kV ASHOKNAGAR	5.50	6	2.3
506		33kV ATHAI-KHEDA	5.80	6.6	3.1
507		33KV ESHAGARH	9.40	10.1	3.9
508		33KV IMLA	15.30	17.1	7.6
509		33KV KHAJURIYAKALA	2.50	2.9	1.5
510		33kV MAHIDPUR	9.40	11	5.8
511		33KV MATHNER	5.50	6.5	3.6
512		33KV SEMRAHAT	15.30	18.1	9.6
513		33KV SHADORA	6.10	6.9	3.4
514		33kV TUMEN	6.20	7.1	3.4
515	220kV ASHTA	33KV AMLA MAJJU	13.50	15.1	6.9
516		33KV AMLAHA	12.00	13	5.3
517		33KV CHINOTHA	8.00	8.6	4.2
518		33KV JAWAR	4.71	4.8	1.92
519		33KV KAJLAS	3.10	3.61	2
520		33KV KOTHARI	11.80	12.9	6
521		33KV MAINA	12.50	13.9	6.1
522		33KV SEWADA	10.90	11.8	5.2
523	220kV BAIRAGARH	33KV AKVN-I	0.06	0.07	0.04
524		33KV AKVN-II	0.01	0.02	0.02
525		33KV CHANDUKHEDI	0.04	0.04	0.01
526		33KV EME	2.70	2.81	1.12
527		33KV IISER-I	1.38	1.4	0.11
528		33KV ITKHEDI	5.90	6.3	2.7
529		33KV NTRO	0.10	0.48	0.47
530		33KV PARWALIA	8.72	10	5

531	220kV BAIRAGARH	33KV RAJABHOJ AIRPORT	0.93	0.93	0.2
532		33KV RAKSHAVIHAR	1.30	1.6	0.85
533		33KV TARA SEWANIA	3.50	4.1	2.11
534	220kV BETUL	33KV AMDAR	5.80	6	2.9
535		33KV BADORA-II	5.00	5.4	2.2
536		33KV JAWRA	4.60	5.3	2.6
537		33KV JUNAWANI	10.00	10.8	4.2
538		33KV MANDAVI	5.50	6.2	3
539		33KV PGCIL	0.07	0.07	0.01
540	220kV BHOPAL	33KV AKVN-I	5.61	5.83	1.6
541		33KV AKVN-II	4.30	4.3	1
542		33KV BERASIA	12.78	13.54	4.49
543		33KV BHOPAL-I	8.40	8.4	0.71
544		33KV BHOPAL-II	6.40	6.42	1.28
545		33KV BHOPAL-III	7.33	7.4	0.9
546	220kV DATIA	33KV BADONI	8.40	9.27	4.1
547		33KV GAUTAM NAGAR	3.71	3.8	1
548		33KV GORAGHAT	10.90	13	7.4
549		33KV SITAPUR	7.40	8.89	5.05
550	220kV GANJBASODA	33KV BANWA JAGIR	4.50	4.9	1.9
551		33KV GANJBASODA	9.10	9.1	1.4
552		33KV JAIL	3.40	3.5	0.8
553		33KV KANJANA PATHAR	7.30	8	3.9
554		33KV SOMBARA	13.50	14.5	5.5
555		33KV UDAYPUR	9.70	10.4	4
556	220kV GUNA	33KV AIR	10.40	11.3	4.4
557		33KV BAJRANGGARH	13.80	14.9	6.2
558		33KV BEHTAGHAT	4.50	5.4	3.06
559		33KV BHADORA	8.02	9.19	4.48
560		33KV GARHA	8.20	9.6	5.27
561		33KV GUNA	1.90	2.15	1.01
562		33KV HARIPUR	13.52	16.03	8.69
563		33KV K.S.OIL	5.70	6.84	3.81
564		33KV KUSMODA	0.30	0.32	0.2
565		33KV MURADPUR	7.04	7.85	4.1
566		33KV NANAKHEDI	7.71	7.89	2.6
567		33KV NAVODAYA	3.64	3.82	1.15
568		33KV RUCHI SOYA	0.01	0.02	0.02
569		33KV SINGWASA	7.40	7.9	2.9
570		33KV UMRI	18.40	22	11.9
571		33KV WATER WORKS	6.27	6.51	2.02

572	220kV GWALIOR	33KV BARAGHATA(CITY-I)	9.30	10.4	4.6
573		33KV DIG NAYAGAON	0.20	0.2	0.1
574		33KV INDUSTRIAL CRUSHER	8.10	8.3	2.1
575		33KV S.A.F.(CITY-II)	7.60	8	2.6
576	220kV HOSHANGABAD	33KV ANAND NAGAR	4.80	4.9	1.13
577		33KV BUDNI	7.20	8	3.55
578		33KV DOLARIYA	6.50	7.8	4.5
579		33KV HOSANGABAD	3.50	3.84	1.9
580		33KV MILK DAIRY	3.75	3.75	0.34
581		33KV SANGAKHEDA	6.70	7.43	3.3
582	220kV ITARSI	33KV AKVN	0.21	0.21	0.01
583		33kV GURRA (TAWA)	4.60	4.71	1.32
584		33kV ITARSI - I	4.79	4.82	0.68
585		33kV ITARSI - II	5.20	5.6	2.01
586		33kV JAMANI	8.64	9	2.7
587		33kV KESLA	3.30	3.42	1.3
588		33kV PATHROTA	5.52	5.7	2.1
589		33KV PGCIL-I	0.10	0.13	0.1
590		33KV PGCIL-II	0.00	0.01	0.01
591		33kV PROPLENE - I	0.00	0.02	0.02
592		33kV PROPLENE - II	1.80	1.8	0.4
593		33kV RAILWAY	1.14	1.14	0.2
594		33kV SPM	1.50	1.7	0.8
595		33kV TAKU	0.10	0.1	0.03
596	220kV MAHALGAON	33KV AIR FORCE	1.90	2	0.34
597		33KV BANDHOLI	11.40	12.8	6.2
598		33KV C.S.S.	7.19	8.07	3.66
599		33KV DARPAN COLONY-I	7.68	8.39	3.4
600		33KV DARPAN COLONY-II	1.40	1.62	0.9
601		33KV HIGH COURT	0.10	0.1	0.04
602		33KV HURAWALI	10.60	11.2	3.7
603		33KV LAKHNOTI	4.00	4.6	2.4
604		33KV M.E.S.	6.40	6.7	2
605		33KV MELA	9.00	9.6	3.6
606		33KV POLYTECHNIC	0.80	0.82	0.33
607		33KV SINDHIA NAGAR	3.84	4.2	1.7
608		33KV STADIUM	9.60	10.4	4.3

609	220kV MALANPUR	33KV FEEDER-III	6.32	6.4	0.86
610		33KV FEEDER-IV	12.80	15	7.8
611		33KV FEEDER-IX	2.70	2.7	0.44
612		33KV FEEDER-V	5.80	5.84	0.87
613	220kV MALANPUR	33KV FEEDER-VIII	5.20	5.2	0.2
614		33KV FEEDER-X	8.27	8.28	0.5
615		33KV HARI RAM KI KUIYA	2.10	2.3	1.1
616		33KV MONTAGE	1.93	1.95	0.3
617		33KV S.R.F	9.10	9.2	1.4
618	220kV MANDIDEEP	33KV ARJUN NAGAR	11.06	11.25	4.1
619		33KV BAY-11	13.88	13.93	2.06
620		33KV DAWAT	3.87	3.89	0.37
621		33KV I/C-I	5.45	5.53	1.2
622		33KV I/C-III	6.93	7	1.05
623		33KV INDUSTRIAL-IV	3.70	4.2	2
624		33KV MAHAPET	3.90	3.9	0.72
625		33KV RELIANCE	0.26	0.26	0.04
626		33KV SAGAR	0.00	0.02	0.02
627		33KV SATRANG	9.71	9.7	0.9
628		33KV SIMARAI	5.70	6.2	3.1
629	220kV MEHGAON	33KV BHIND	6.20	6.6	2.3
630		33KV GATA	12.20	13.7	6.2
631		33KV GINGARKHI	6.17	6.44	1.85
632		33KV GOHAD	0.12	0.14	0.1
633		33KV GORMI	16.20	18.3	8.4
634		33KV MAU	8.84	10.01	4.7
635		33KV MEHGAON CITY	4.35	4.35	0.4
636		33KV PIDORA	2.92	3.33	1.7
637	220kV MORENA	33KV FEEDER-IV	0.00	0.02	0.02
638		33KV JADERUA	4.26	4.69	2.05
639	220kV MUNGALIYA CHHAP	33KV KHAJURI	7.92	9.59	5.62
640		33KV PREMPURA	3.73	4	1.46
641		33KV RATIBAD	2.22	2.51	1.31
642		33KV TEELAKHEDI	2.48	2.96	1.65

643	220kV PIPARIA	33KV AKVN	8.20	8.68	2.86
644		33KV KALLUKHAPA	18.70	20.5	8.5
645		33KV MAHALANWARA	0.00	0.1	0.1
646		33KV PACHMARHI	2.30	2.4	0.9
647		33KV PIPARPANI	12.07	13.98	7.05
648	220kV RAJGARH	33KV CHATUKHEDA	4.50	5.1	2.5
649		33KV KAREDI	1.60	1.8	0.8
650		33KV PIPLODI	7.64	8.07	2.61
651		33KV RAJGARH	3.40	3.57	1.3
652		33KV WATER WORKS(A.I.R.)	0.40	0.4	0.11
653	220kV SABALGARH	33KV BADDPURA	2.90	3.4	1.7
654		33KV JHUNDPURA	6.27	6.95	3.01
655		33KV KAILARAS	7.94	8.72	3.6
656		33KV MAMCHONE	3.10	3.5	1.8
657		33KV RAMPUR	7.10	7.6	2.7
658		33KV SABALGARH	7.20	7.53	2.6
659	220kV SARNI	33KV AMLA	3.40	3.7	1.54
660		33KV GHODADONGRI	11.93	12.32	3.2
661		33KV NCDC	5.27	5.4	1.4
662		33KV POWER HOUSE	0.10	0.1	0.05
663		33KV SHOBHAPUR	2.58	2.78	1.07
664	220kV SHIVPURI	33KV BALAJI	2.32	2.46	1
665		33KV BANGANGA	8.70	9.2	2.9
666		33KV BHESANA	6.30	7.5	4.12
667		33KV DAK BUNGLOW	2.52	2.7	0.95
668		33KV JASRAJPUR	15.00	17.1	8.2
669		33KV NOHARI	4.40	5.2	2.9
670		33KV SATANWARA	11.10	12	4.93
671	220kV GUNA	33KV AHMADPUR	2.70	3	1.3
672		33KV BAN	11.10	11.8	4
673		33KV BRITANIA	1.81	1.9	0.42
674		33KV HASUA	6.10	6.8	3.1
675		33KV HT CONSUMER	3.68	3.86	1.2
676		33KV KARARIA	9.50	10.1	3.4
677		33KV MANORA	14.30	15.9	7
678		33KV SANCHI	2.98	3.41	1.7
679		33KV VIDISHA(TOWN)	7.04	7.67	3.04
Total			**4429.28**	**4876.93**	**2040.37**

MADHYA PRADESH PASCHIM KSHETRA VIDYUT VITARAN COMPANY LIMITED
Indore

Detailed Project Reports- Work for installation of Auto Switched 1500 KVAR capacitor bank at 33/11 KV Substation to improve reactive power in Electrical Network

WEST DISCOM

TABLE OF CONTENTS

1. INTRODUCTION TO MPPKVVCL INDORE

The Government of Madhya Pradesh (GoMP) has incorporated Madhya Pradesh Paschim Kshetra Vidyut Vitran Company Limited (MPPKVVCo Ltd) in other words west Discom. On 31st May 2002. West Discom is a Company wholly owned by the Government of Madhya Pradesh and registered under the Companies Act, 1956. With the Gazette Notification dated 31st May 05, the company started its functioning independently with effect from 1st June 05. As per notification, the company is looking after the Sub-transmission & Distribution of Electricity in the area of Indore and Ujjain commissionaires.

1.1 GEOGRAPHICAL MAP

1.2 OPERATIONAL PROFILE

The West Discom is responsible for operation and maintenance of Sub-transmission & Distribution of Electricity under the area of Indore & Ujjain Commissionaires. The sub-transmission and Distribution network details as on 31.03.2018 are as under:-

Particulars	Unit	Quantity
Region	No.	2
Circle	No.	15
Division	No.	55
Distribution centre/Zone	No.	432
33/11 KV Substations.	Nos.	1332
33 KV Lines.	Ckt - Km	16407
11 KV Lines.	Ckt - Km	118785
Distribution Transformers.	Nos.	222215
LT lines.	Ckt - Km	162512
No. of LT consumers.	No.	5093871
No of HT Consumers.	No.	3312
Total No. of agricultural pump connection	No.	1153409
Total connections	No.	5097183

1.3 CONSUMER'S PROFILE

The company currently serving about 5097183 consumers over an area of 77021 Sq. Km spread in urban and rural areas. Consumer wise details are given in following table.
As on 31-03-2018

S.N	Consumer Category	Number of Consumers	Connected load (MW)
	LT Consumers		
1	Domestic	3501289	3106
2	Non – Domestic	367355	1007
3	Industrial	45159	572
4	Water Works / Street Light	26443	158
5	Agriculture	1153409	4148
6	Other Agriculture	216	1.6
		5093871	8993
	HT Consumers		
1	Industrial	2163	806
2	Non Industrial	834	156
2	Water Works	131	93
3	Agriculture	29	58
4	Other HT	155	15
	Total HT	3312	1128
	Total HT + LT	5097183	10122

2. DETAIL OF PROJECT

2.1 OJBECTIVE OF SCHEME:-

The State Government has prioritized that adequate quantities of high quality electricity should be provided to the general public, especially the farming sector. Most of agriculture load is situated in the western part of the State which part comes under MPPKVVCL Indore. Reactive power compensation by installation of capacitor banks has became a need of the hour as West Discom is having predominantly agriculture load which is inductive in nature.

By adding the no. of Capacitor Banks in the System, it increases system active current-carrying Capacity. & raising the power factor of line and reduces KVA of line in system without altering the KVA.

In order to fulfil the power demand, the existing power network system is currently being developed in strong manner so that system stands technically healthy on a regular load and peak load also.

2.2 AS IS SITUATION:

Under the geographical area of Madhya Pradesh West Discom ,there are two regions having total 15 districts. The responsibility of keeping the entire electrical system in a smooth manner is being discharged by the company.

There are 50.97lakhs connections including HT & LT in 15 districts under the West Discom, which are being fed through 1332 No 33/11 KV Ss, 2397 No. Power Transformer, 16407 KM of 33 KV line, 118785 KM of 11 KV line, 162512 KM of LT line and 222215 No. DTR network set up in the power supply.

West Discom has added following electrical infrastructure in previous three Years as given under:-

Description	Unit	2015-16	2016-17	2017-18
33/11 KV New Sub Stations	No.	64	40	45
Additional Power Transformers	No.	23	63	31
33 KV Line	KM	858	731	451
11 KV line	KM	6231	4750	7077
LT line	KM	3933	3607	5170
Distribution Transformers	No.	14723	10448	16250

The proposed work of capacitor installation is in view of our commitment to reduce reactive energy charges by maintaining high power factor so as to provide quality power supply to each consumer. The reduction in reactive energy charges for last four years is given below:-

S.No	Financial Year	Reactive energy Charges (Rs in Lacs)
1	2014-15	-27.81
2	2015-16	-41.29
3	2016-17	-114.42
4	2017-18	-162.41

Presently, there are 1946 Nos. capacitors banks installed in company area. Capacity wise details are as shown below:-

WZ Installed Capacitor Banks as on sept-18	
Capacity of Capacitor Bank	Nos.
600 KVAR	666
1200 KVAR	557
1500 KVAR	714
2400 KVAR	9
Total banks	1946

2.3 SCOPE OF WORK

Scope of Work is planned with due consideration of the works already sanctioned under various schemes in West Discom.

The scope of this project is based on the selection of suitable place for capacitor bank installation, installing capacitor bank at the selected place and comparative study between installation cost and all the benefits obtained at various levels of transmission and distribution from consumer end to source station on installation of auto switched 1500 KVAR capacitor bank at various end

Following works have been included under instant project:-

Region wise / Circle wise installation of 1500 KVAR capacitor bank at 33/11 Sub-Stations			
S.No	**Circle**	**Number of 1500 KVAR capacitor bank to be installed**	**Amt. (Rs in lakh.)**
1	Indore City Circle	24	334.91
2	Indore (O&M)	24	310.10
3	Khandwa	22	284.26
4	Burhanpur	19	245.49
5	Khargone	10	129.21
6	Badwani	6	77.52
7	Dhar	40	516.83
8	Jhabua	10	129.21
Indore Region		**155**	**2027.52**
7	Ujjain	74	956.13
8	Dewas	19	245.49
9	Shajapur	38	490.99
10	Agar	19	245.49
11	Ratlam	26	335.94
12	Mandsaur	43	555.59
13	Neemuch	28	361.78
Ujjain Region		**247**	**3191.42**
West Discom		**402**	**5218.94**

Estimated Cost of the Project-5218.94 Lakhs

2.4 FINANCIAL ANALYSIS OF PROJECT:-

Cost benefit analysis involves in comparing the total expected cost of each option against the total expected benefits, to see whether the benefits outweighs the cost and by how much i.e. to determine whether it is a sound investment/decision. In case of the instant project, the installation of switched capacitor bank provides some saving as mentioned earlier. There are basically two types of saving:

1. Saving due to capacity augmentation, which is one time savings in capital expenditure.
2. Saving due to reduction of I^2R losses, which is recurring savings on revenue expenditure.

On the other hand, automatic power factor correction system makes the installation cost more due to requirement of different components such as controller, contactor, relay, capacitor etc. Thus, here the comparative study on the basis of total approximated cost of installation and benefits in terms of money is discussed and finally a decision is taken whether the project is viable.

The cost has been calculated as per the current SOR 2018-19 of the west Discom. The benefits have been calculated using the following methodology:

i) Expected additional sales of energy with same network capacity.
ii) The saving is expected due to reduction in losses as improved capacity of System and reduced overloading network.
iii) On account of new capacity addition, new connections will be served resulting enhanced revenue generation
iv) The expected savings from reduction of losses due to implementation of these plan.

2.5 SOURCE OF FINANCE

The financing for this project is expected to come from following sources:

1. Financing from Financial Institutions- 100% of project cost from PSDF fund through grant.

Detail Of financing amount-

S.N.	Particulars	Amount in Rs. Cr
1.	Total cost of the project	52.1894

The schedule of total financing requirement (for Base Capital expenditure plus Physical Contingency) is as follows:

Sr. No.	Project Name	Proposed financing Cost in INR Cr	2018-19	2019-20
1	INSTALLATION OF 1500 KVAR CAPACITOR BANK AT 33/11 KV SS	52.1894	5.22	46.9694
Total (Rs. Cr.)		52.1894	5.22	46.9694

2.6 THE MAJOR BENEFITS OF THE PROJECT ARE AS UNDER

Power factor correction directly related to the technical Management of transmission and distribution network. As the loads are basically inductive in nature so to reduce VAR demand capacitors should be connected in parallel to the load.

For any distribution utility it is important to maintain the voltage within a specified limit. So if we assume that the supply voltage is constant then it is clear from the expression of $P = VI\cos\phi$ that by increasing power factor we can reduce the load Current to supply the same power.

a) This reduction of load current will in turn reduce the I^2R losses at different levels of transmission and distribution line.

b) The copper losses of transformers at different level are also getting reduced .Reduction in the load current through improved power factor will put the requirement of various generation and Distribution equipment to a lower level thereby rendering the installed capacity free to cater to further active power.

c) Switching ON of capacitor bank to cater to the reactive power requirement of various load equipment as and when demanded not only reduces the load current but also improves regulation of the network thereby improving the voltage profile at the load end. It is obvious that connecting the capacitor bank in parallel the load and closest to the load is going to yield maximum benefit.

    I. The energy purchased by the utility is charged based on KWH registration and KVA demand. Therefore, in case of improved power factor situation as the KVA demand of the consumers load will be reduced the utility will generate wealth due to reduction in cost of energy.

2.7 PAYBACK PERIOD OF SCHEME & IRR CALCULATION

Total cost of the project	**5218.94**	**Rs.Lakhs**
Power purchase cost at DISCOM periphery	**4.18**	**Rs./Unit**
Reactive Power (Per kVARh) compensation Cost in Rs as per SLDC	**0.14**	**Rs./kVARh**
Total benefit in terms of kWh	**608.88**	**Lakhs unit**
Total benefit in terms of kVARh	**5788.80**	**Lakhs unit**
Total benefit	**3355.54**	**Rs.Lakhs**

IRR CACLCULATION

(Amount in Rs Lakhs)

S. No.	Year	Investment (%)	Investment	O&M charges @3%	Benefits (%)	Financial Benefits	Net Financial Benefits
1	2	3	4	5	6	7	8
1	2018-19	10%	522	7.828	0%	0.00	-529.72
2	2019-20	75%	3914	74.370	15%	503.33	-3485.24
3	2020-21			133.083	35%	1174.44	1041.36
4	2021-22			133.083	100%	3355.54	3222.46
5	2022-23			133.083	100%	3355.54	3222.46
6	2023-24			133.083	100%	3355.54	3222.46
7	2024-25			133.083	100%	3355.54	3222.46
8	2025-26			133.083	100%	3355.54	3222.46
9	2026-27			133.083	100%	3355.54	3222.46
10	2027-28			133.083	100%	3355.54	3222.46
11	2028-29			133.083	100%	3355.54	3222.46
12	2029-30			133.083	100%	3355.54	3222.46
13	2030-31			133.083	100%	3355.54	3222.46
14	2031-32			133.083	100%	3355.54	3222.46
15	2032-33			133.083	100%	3355.54	3222.46
16	2033-34			133.083	100%	3355.54	3222.46
17	2034-35			133.083	100%	3355.54	3222.46
18	2035-36			133.083	100%	3355.54	3222.46
19	2036-37			133.083	100%	3355.54	3222.46
20	2037-38			133.083	100%	3355.54	3222.46
21	2038-39			133.083	100%	3355.54	3222.46
22	2039-40			133.083	100%	3355.54	3222.46
23	2040-41			133.083	100%	3355.54	3222.46
24	2041-42			133.083	100%	3355.54	3222.46
25	2043-44			133.083	100%	3355.54	3222.46
						IRR=	56.45%
					Pay back period		1.56

2.8 IMPLEMENTATION RESPONSIBILITIES

The implementation plan for the project is two years.. Works proposed in the scheme will be executed as per the proposed implementation plan, after sanction of scheme from funding agency. The works under different activities being carried out will be looked after by the experienced Executive Officers of the Company at the respective project area

2.9 CONTRACT PACKAGING

The execution of the projected works shall be executed by the Company, on turnkey contract on approved rates. In the Company, an independent construction unit headed by an Engineer in the rank of EE with requisite manpower, vehicles, T&P etc is existing to look after the construction activities. This construction unit is directly responsible for execution of the work involved in the project and the SE/ EE of the concerned area would exercise the over- all control, supervision and execution of the works.

Addl. Chief Engineer (Works)
O/o Managing Director(WZ)
MPPKVVCo. Ltd, Indore

Annexure					
Statement of financial burden on Gujarat (in Rs.)					
RTDA Summary (January to July 2018) due to ISGS deviation up to 20%					
Sr No.	**Name of ISGS**	**Apr-18**	**May-18**	**Jun-18**	**Jul-18**
1	ACBIL	486997.00	12395.00	0.00	0.00
2	KSTPS	156468.00	127868.00	29081.00	0.00
3	KSTPS7	34636.00	3877.00	387.00	191.00
4	MOUDA1	0.00	0.00	0.00	0.00
5	MOUDA2	0.00	0.00	0.00	0.00
6	CGPL	0.00	0.00	0.00	0.00
7	SIPAT	176168.00	259325.00	211591.00	141687.00
8	SIPAT1	1029605.00	1062560.00	465222.00	0.00
9	TAPS34	77494.00	3536.00	65471.00	161434.00
10	VSTPS1	209.00	0.00	0.00	453.00
11	VSTPS2	86429.00	130373.00	27828.00	15941.00
12	VSTPS3	516703.00	634589.00	374932.00	546475.00
13	VSTPS4	0.00	102.00	165.00	0.00
14	VSTPS5	0.00	54.00	0.00	0.00
	TOTAL	**2564709.00**	**2234679.00**	**1174677.00**	**866181.00**

GMR Warora Energy Limited

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Ref: GMR/Warora/WRLDC/DSM/18-19/50

Date: 1st June '18

To

General Manager
Power System Operation Corporation Limited
F-3, Central road, MIDC Area
Marol, Andheri (East)
Mumbai - 400093

Sub: SEM Data discrepancy in SEM Sr no-2648A at Bhadrawti station leading to commercial loss

Ref: PGCIL Mail dated 25th May'18

Dear Sir,

We would like to appraise you regarding a critical discrepancy in SEM data (SEM Sr no-2648A) at PGCIL Bhadrawati end which has resulted into variations in the weekly DSM settlement. While verifying the anomaly, it was observed that R-Ph & Y-Ph terminals of CT were found short in the Terminal Box. The necessary rectification was undertaken by PGCIL on 25th May'18 which was communicated to WRLDC vide their mail dated 25th May'18 with an information to GWEL.

While this discrepancy was there in CVT terminals in the connector terminal box at PGCIL (which was not in our control), it is observed by us that from 46th time block of 26thApr'18, there was sudden variation in the readings which continued till 46th block of 25th May'18. Line Loss increased from 0.3% to 1.5% from 26th Apr'18 leading to loss in injection quantum in DSM calculations which is having direct commercial impact of approx. 3-4 Lacs/day.

Further, as you are aware that the generation at our GWEL station is almost constant due to long term PPAs tie-up for capacity of 550MW RTC and hence we would request you to kindly consider historical data to address this issue as a solution to address considering commercial impact which is very high on

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New Udaan Bhawan Complex
Opp. Terminal-3, IGI Airport, New Delhi - 110 037

GWEL with present financial situation. As per workings at our end the variation in DSM will be to the tune of Rs.70-80 lacs which will create strain on our cash flows resulting in further difficulties at our end in situation where the anomaly was beyond our control.

In view of the above, we would humbly request you to advice further to the concerned team to consider check SEM meter reading installed at our 400KV switchyard for this settlement.

We look forward to have your positive & early response in this matter.

Thanking you.

Yours Faithfully

For & On Behalf of GMR Warora Energy Limited

(Dhananjay Deshpande)
COO
Encl: As above

GMR WARORA ENERGY LIMITED

GMR Warora Energy Limited

Site Office:
Plot No. B1 & B7
Mohabala MIDC Growth Centre
Post and Tehsil Warora, Dist. Chandrapur
Maharashtra - 442 907
CIN U40100MH2005PLC155140
T +91 7176 267009 F +91 7176 267008
W www.gmrgroup.in

Ref: GMR/Warora/WRLDC/DSM/18-19/70

Date: 29th June '18

To

General Manager
Power System Operation Corporation Limited
F-3, Central road, MIDC Area
Marol, Andheri (East)
Mumbai - 400093

Sub: SEM Data discrepancy in SEM Sr no-2648A at Bhadrawti station leading to commercial loss

Ref: Your letter WRLDC/SO/Metering/734 dated 21st June'18

Dear Sir,

We are in receipt of your letter mentioned under reference for SEM discrepancy in GWEL line -1 at PGCIL Bhadrawati end.

You have indicated that in the absence of Check meter at Bhadrawati end, procedure as agreed in WRPC adopted and Injection was computed based on the standby meter readings (GWEL end) after applying notional losses of 2%. Request WRLDC to please share the relevant document or regulation under which above procedure is explained for our understanding.

We would like to differ with WRLDC on taking notional 2% losses, firstly as our actual line losses are coming far less than this notional value. You may consider referring to the previous & post correction line loss readings (Refer attached annexure-1). Secondly after notifying this issue to PGCIL by WRLDC on 3rd May'18 and follow up thereon, rectification of problem was done by PGCIL only after a delay of 22 days by PGCIL. This delay is in no way attributable to GWEL (being external to this issue) as in entire communications, GWEL was not in loop and hence could have even followed up with related entities for necessary action & corrections.

Main reason for discrepancy in the meter reading was due to looseness in CT terminal of R & Y ph at Terminal box. Photograph of the same is attached for your reference.

Registered Office:
Plot No. 301, G Block, 7th floor, Naman Centre
Bandra Kurla Complex (Opp. Dena Bank)
Bandra (East), Mumbai - 400 051
Corporate Office:
Building No. 302, New Shakti Bhawan
New Udaan Bhawan Complex
Opp. Terminal-3, IGI Airport, New Delhi - 110 037

We would like to bring to your notice that this delay has resulted in huge loss to the tune of 3-4 lacs per day totaling to 80-85 lacs in DSM.

In view of above, the resolution suggested by WRLDC, would be an injustice to GWEL for a reason which are beyond their control and action. Hence, we once again request WRLDC to examine the matter and compute the injection readings taking line losses of 2nd line as reference or suggest such solution in this case to avoid above stated commercial loss by taking up appropriate revision in the DSM bills of the discrepancy period.

We also would like to take this issue in upcoming OCC meeting which is scheduled on 17th July'18 as may be necessary.

We look forward to have your positive & early response in this matter.

Thanking you.

Yours Faithfully

For & On Behalf of GMR Warora Energy Limited

(Dhananjay Deshpande)
COO

GMR WARORA ENERGY LIMITED

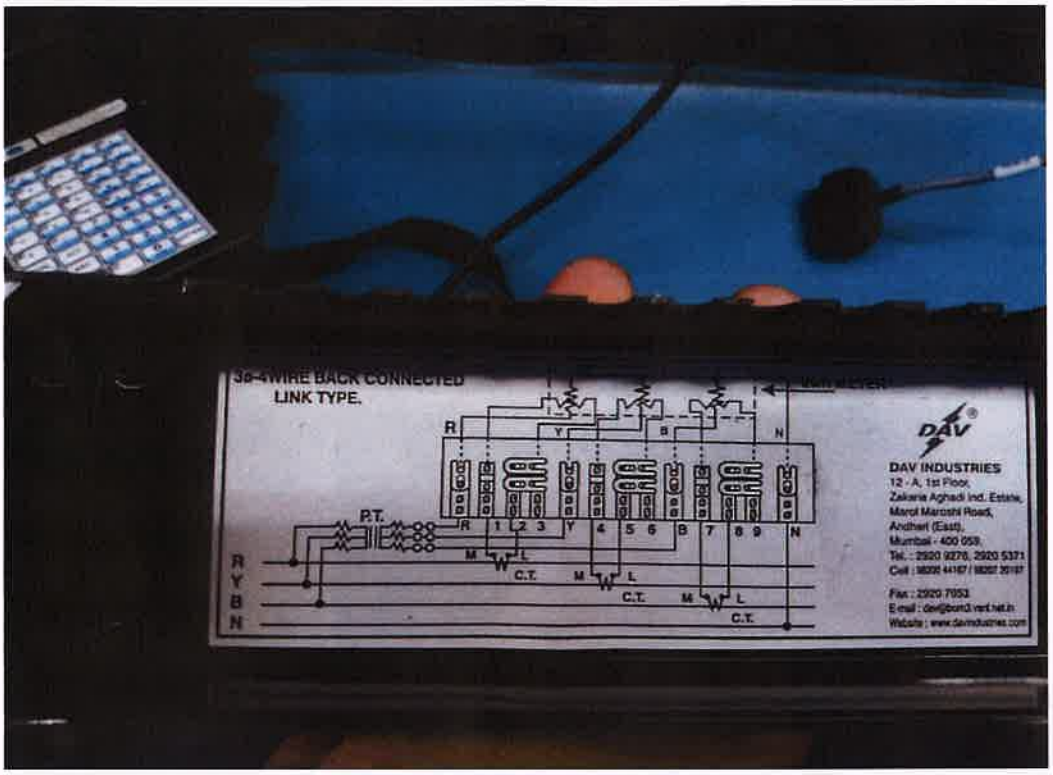
CC: 1) SE (Commercial), WRPC, Mumbai for information
2) GM (AM), WRTS-1, Nagpur for information

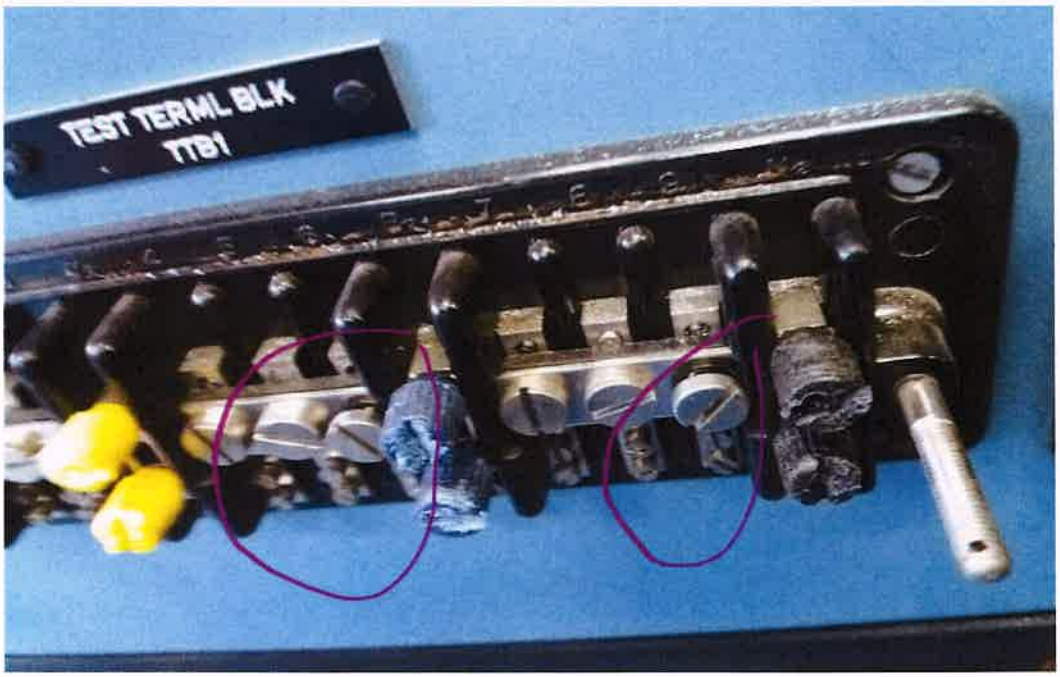
Annexure-1

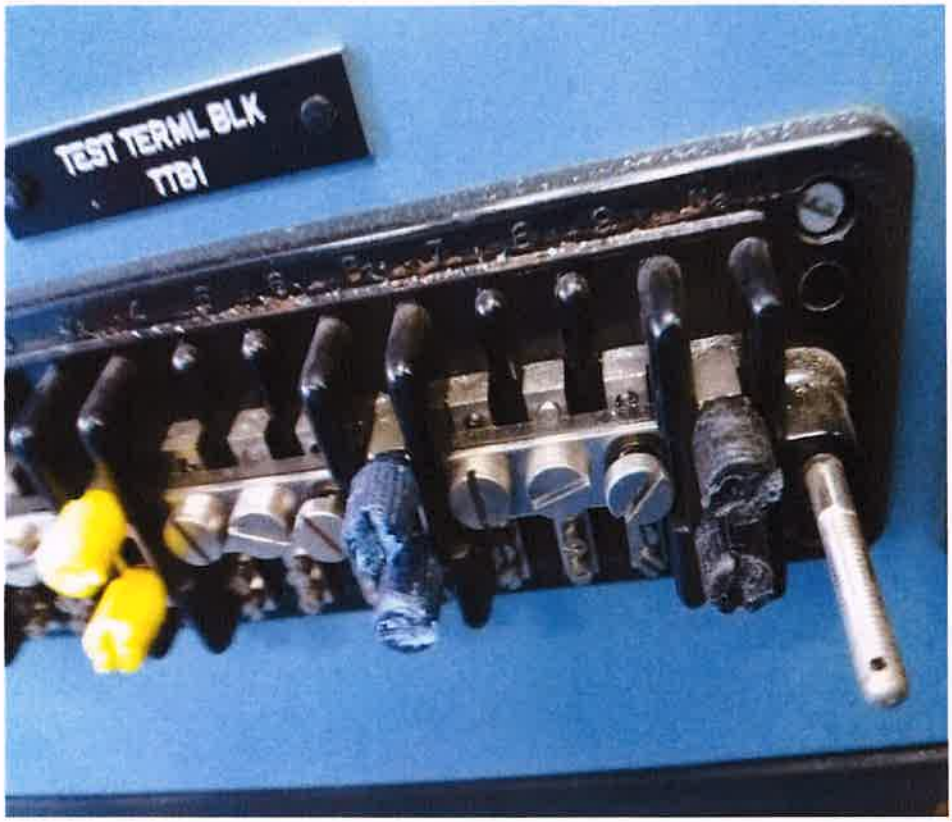
	Comparision of GWEL & Bhadrawati								
	Bhadrawati			GWEL			Line Loss in %		
	Total	2648 Line-1	2649 Line-2	2803 Line-1 Main Meter	2805 Line-2 Main Meter	Total Main	Line-1	Line-2	Total
	MWh						%		
24-04-18	11701.672	5859.56	5842.11	5819.64	5906.18	11725.82	-0.69	1.08	0.21
25-04-18	10904.363	5460.00	5444.36	5423.27	5504.73	10928.00	-0.68	1.10	0.22
26-04-18	11436.781	5649.29	5787.49	5764.36	5850.18	11614.55	2.00	1.07	1.53
27-04-18	12309.72	6080.77	6228.95	6205.09	6297.45	12502.54	2.00	1.09	1.54
28-04-18	12522.461	6187.04	6335.42	6313.45	6407.27	12720.73	2.00	1.12	1.56
29-04-18	12399.162	6120.62	6278.55	6245.82	6347.64	12593.45	2.00	1.09	1.54
30-04-18	12250.423	6049.91	6200.51	6173.09	6269.82	12442.91	2.00	1.11	1.55
01-05-18	12582.676	6215.69	6366.98	6342.55	6437.09	12779.64	2.00	1.09	1.54
02-05-18	12784.5	6315.19	6469.31	6444.36	6541.82	12986.18	2.00	1.11	1.55
03-05-18	12666.307	6258.74	6407.56	6386.18	6481.45	12867.64	2.00	1.14	1.56
04-05-18	13173.923	6509.20	6664.73	6642.18	6739.64	13381.82	2.00	1.11	1.55
05-05-18	13217.116	6530.93	6686.18	6664.00	6760.00	13424.00	2.00	1.09	1.54
06-05-18	13193.067	6519.03	6674.04	6652.36	6746.91	13399.27	2.00	1.08	1.54
07-05-18	13212.32	6527.16	6685.16	6660.36	6759.27	13419.64	2.00	1.10	1.54
08-05-18	11567.653	5715.22	5852.44	5832.00	5918.55	11750.55	2.00	1.12	1.56
09-05-18	9844.425	4861.37	4983.05	4960.00	5031.27	9991.27	1.99	0.96	1.47
10-05-18	6684.11	3301.64	3382.47	3369.45	3418.91	6788.36	2.01	1.07	1.54
11-05-18	10755.597	5315.31	5440.29	5423.27	5504.00	10927.27	1.99	1.16	1.57
12-05-18	12035.501	5947.21	6088.29	6069.09	6161.45	12230.54	2.01	1.19	1.59
13-05-18	11796.48	5827.97	5968.51	5946.91	6034.18	11981.09	2.00	1.09	1.54
14-05-18	11663.4209	5762.33	5901.09	5880.00	5968.00	11848.00	2.00	1.12	1.56
15-05-18	12212.57324	6033.66	6178.91	6156.36	6248.73	12405.09	1.99	1.12	1.55
16-05-18	12246.98633	6050.91	6196.07	6174.55	6266.18	12440.73	2.00	1.12	1.56
17-05-18	11876.09082	5868.53	6007.56	5988.36	6076.36	12064.73	2.00	1.13	1.56
18-05-18	11965.68555	5911.36	6054.33	6032.00	6120.73	12152.73	2.00	1.08	1.54
19-05-18	12176.93848	6015.77	6161.16	6138.18	6231.27	12369.45	1.99	1.13	1.56
20-05-18	10047.43848	4963.07	5084.36	5064.73	5138.91	10203.64	2.01	1.06	1.53
21-05-18	8665.23	4280.21	4385.02	4367.27	4434.91	8802.18	1.99	1.12	1.56
22-05-18	8639.875	4268.24	4371.64	4355.64	4421.09	8776.73	2.01	1.12	1.56
23-05-18	9082.533	4487.19	4595.35	4578.91	4648.00	9226.91	2.00	1.13	1.56
24-05-18	10759.546	5314.24	5445.31	5422.55	5505.45	10928.00	2.00	1.09	1.54
25-05-18	11073.514	5470.82	5602.69	5582.55	5666.18	11248.73	2.00	1.12	1.56
26-05-18	11643.927	5829.82	5814.11	5790.55	5880.00	11670.55	-0.68	1.12	0.23
27-05-18	11474.618	5745.53	5729.09	5703.27	5788.36	11491.64	-0.74	1.02	0.15
28-05-18	11059.34473	5537.53	5521.82	5500.36	5584.73	11085.09	-0.68	1.13	0.23
29-05-18	11089.60107	5552.44	5537.16	5515.64	5599.27	11114.91	-0.67	1.11	0.23
30-05-18	11515.92871	5765.46	5750.47	5731.64	5818.18	11549.82	-0.59	1.16	0.29
31-05-18	12164.29053	6148.29	6016.00	6112.00	6086.55	12198.54	-0.59	1.16	0.28
01-06-18	11011.20166	5506.69	5504.51	5481.45	5568.73	11050.18	-0.46	1.15	0.35
02-06-18	10957.74463	5486.62	5471.13	5446.55	5533.09	10979.64	-0.74	1.12	0.20
03-06-18	11411.12647	5712.73	5698.40	5672.73	5759.27	11432.00	-0.71	1.06	0.18
04-06-18	11709.89014	5862.18	5847.71	5825.45	5914.91	11740.36	-0.63	1.14	0.26
05-06-18	11319.19971	5665.53	5653.67	5630.55	5717.82	11348.36	-0.62	1.12	0.26
06-06-18	10633.8916	5323.13	5310.76	5287.27	5372.36	10659.64	-0.68	1.15	0.24
07-06-18	10568	5289.96	5278.04	5255.27	5336.73	10592.00	-0.66	1.10	0.23
08-06-18	9362.910156	4686.40	4676.51	4658.91	4731.64	9390.55	-0.59	1.17	0.29
09-06-18	8427.271972	4217.38	4209.89	4189.09	4256.00	8445.09	-0.68	1.08	0.21
10-06-18	8700.800781	4353.60	4347.20	4329.45	4402.18	8731.64	-0.56	1.25	0.35

Incident Period & losses have increased.

Photographs of SEM 2864A terminal box – Connections found lose






TEST TERML BLK
TTB1

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)

पश्चिम क्षेत्रीय भार प्रेषण केन्द्र
एफ-3, सेन्ट्रल रोड, एम्.आई.डी.सी. एरिया, मरोल, अन्धेरी (पूर्व), मुंबई - 400 093.
दुरभाष : 022-28202690 • फैक्स : 022-28235434, 28202630 • ई-मेल : wrldc@posoco.in
WESTERN REGIONAL LOAD DESPATCH CENTRE
F-3, Central Road, MIDC Area, Marol, Andheri (East), Mumbai – 400 093.
Phone : 022-28202690 • Telefax : 28235434, 28202630 • E-mail : wrldc@posoco.in
CIN : U40105DL2009GOI188682

संदर्भ संख्या / Ref. No. WRLDC/SO/Metering/784 21 June 2018

To
COO
GMR Warora Energy Limited,
Plot no. B1 & B7,
Mohabala MIDC Growth Centre,
Tehsil Warora, Dist. Chandrapur
Maharashtra – 442907

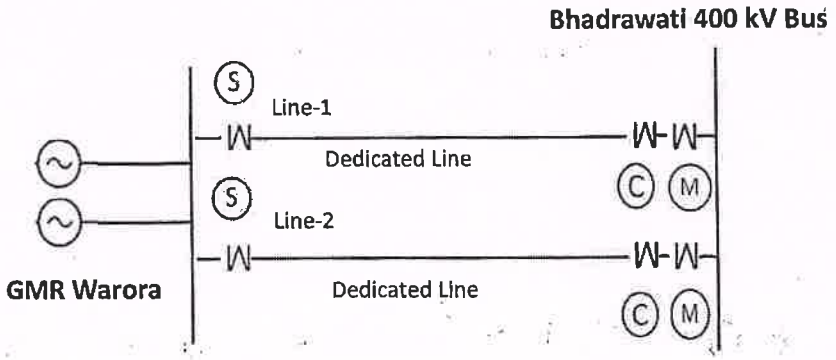
Subject: SEM data discrepancy in SEM at Bhadrawati s/s and loss application in the opposite end SEM data.

Sir,

Vide letter ref. no. GMR/Warora/WRLDC/DSM/18-19/50, GMR Warora Energy Private Limited (GWEL) claimed discrepancy in the DSM accounts for the period 26.04.18 to 25.05.18. The matter was examined and the observations are as under:

1. GMR Warora is connected to ISTS at 400/220 kV Bhadravati by a dedicated 400 kV D/C line. The GWEL injection is computed from the readings of the Main meters installed on the 400 kV GWEL-Bhadrawati D/C at Bhadrawati end.
2. For the week 23.04.18 to 29.04.18, the main meter of line-1 at Bhadravati end, when compared to the standby meter at GWEL end, was found under-recording from 26.04.2018 onwards. The check meters are not installed at Bhadrawati end. Therefore as per the procedure agreed in WRPC, the injection was computed by using the standby meter (at GMR end) reading of line-1 after applying notional losses of 2 %.
3. The energy statements for the week 23.04.18 to 29.04.18 was prepared on 04.05.2018 (Friday). The replacement as above was mentioned in the discrepancy report sent to WRPC secretariat. The meter data along with the discrepancy report was uploaded on the WRLDC website on the same day for validation and follow up actions by concerned utilities. The under-recording issue was also e-mailed to Powergrid Bhadrawati on 03.05.18 (email attached as Annex-I).
4. The issue persisted in the subsequent weeks also. Hence the discrepancy was highlighted in the discrepancy reports issued from WLRDC in the subsequent weeks also for follow up actions by POWERGRID/GWEL. The reports are collectively attached as Annex-II.
5. WRLDC followed up with Bhadrawati s/s on telephone as well. The issue was rectified by Bhadrawati s/s on 25.05.18 as confirmed in their email dtd. 25.05.18 (email attached as Annex-III).

6. The email from GWEL requesting WRLDC to use check meter at GMR Warora end to compute the injection, was received at WRLDC on 28.05.2018. However the check meter at GMR end (with notional loss) could be used only if the standby meter at GMR Warora end would have been faulty.
7. In view of the above, no revision in energy statement for 26.04.2018 to 25.05.2018 is required. However in order to take care of such discrepancies in future, it is advised that the two (2) check meters installed on the 400 kV GMR Warora-Bhadravati D/C lines at GMR end shall be got shifted to Bhadravati end (with help of POWERGRID) so that the same could be used in case of discrepancy in the main meter in future. The revised metering location is as under:



Thanking you,

Yours sincerely,

(Abhimanyu Gartia)
General Manager
21/6/18

Copy to:

1) Head -Technical Services, GMR Warora Energy Limited
2) SE (Commercial), WRPC, Mumbai
3) General Manager (AM), WRTS-1, Nagpur, Maharashtra |With a request to shift the check meter from GMR Warora to Bhadravati

Annexure- C.A17- 10

Gmail

WRLDC SEM <wrsemdata1@gmail.com>

SEM data discrepancy in SEM S.No.2648A at Bhadrawati Station

Ranjith Kumar Panigrahi {रंजीत कुमार पाणिग्रही} <ranjith@powergridindia.com> Fri, May 25, 2018 at 1:15 PM
To: "wrsemdata@gmail.com" <wrsemdata@gmail.com>, "semdata@rediffmail.com" <semdata@rediffmail.com>
Cc: Raj Kishor Dash {राज किशोर दाश} <R.K.Dash@powergridindia.com>, Naval Kishor Meena {Naval Kishor Meena} <naval@powergridindia.com>

Dear sir,
It is to inform you that the SEM data discrepancy in energy Meter S.No.2648A (Bhadrawati-EMCO ckt # 1) is attended.
While attending the above issue, it is observed that the CT currents R-Ph & Y-Ph are not reporting the SEM meter and the same is corrected in the TTB connections.
At present the CT,PT values are reporting healthy to the SEM meter.

Regards,
Ranjith K panigrahi,
Jr Engineer,
8275039152

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)

पश्चिम क्षेत्रीय भार प्रेषण केन्द्र
एफ-3, सेन्ट्रल रोड, एम्.आई.डी.सी. एरिया, मरोल, अन्धेरी (पूर्व), मुंबई - 400 093.
दुरभाष : 022-28202690 • फैक्स : 022-28235434, 28202630 • ई-मेल : wrldc@posoco.in
WESTERN REGIONAL LOAD DESPATCH CENTRE
F-3, Central Road, MIDC Area, Marol, Andheri (East), Mumbai – 400 093.
Phone : 022-28202690 • Telefax : 28235434, 28202630 • E-mail : wrldc@posoco.in
CIN : U40105DL2009GOI188682

संदर्भ संख्या / Ref. No WRLDC/SO/Metering/3734-90

03 July 2018

To

As per distribution list

Sub: Installation of check meter at interface point of ISGS evacuating through dedicated lines

Sir,

The redundancy of interface energy metering of ISGS evacuating through dedicated lines was reviewed. It was noted that even after removal of interim LILO of ISTS lines / commissioning of dedicated lines, the check meters are yet to be shifted from the remote end (generating station) to the interface points (at POWERGRID substation). The list of generating stations where the relocation of meters is advised is enclosed as Annex-I. This relocation is essential for ensuring redundancy of measurement and for better validation of main meter data (at the interface point) used in energy accounting.

You are requested to coordinate with POWERGRID for relocation of check meters as per Annex-I. In line with Section-2(i) of Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, check meters shall be connected to the same core of the Current Transformer (CT) and Voltage Transformer (VT) to which main meter is connected.

Thanking you.

Yours sincerely

(Vivek Pandey) 03/07
Chief Manager

Copy to:

1. DGM (Asset Management), WRTS-1, POWERGRID, Nagpur
2. DGM (Asset Management), WRTS-2, POWERGRID, Vadodara
3. SE (Comml), WRPC, F/3, Marol, Mumbai-400053

With a request to permit and facilitate the concerned generators for relocation and installation of check meters at the interface points in series with main meters in POWERGRID substation.

DISTRIBUTION LIST :

Sr. GM (O&M) ACB India Ltd., 2*135 MW Kasaipali Power Project, Kasaipali, P.O.- Jawali, Tehsil-Katghora, Korba, Chhatisgarh-495445	General Manager, LANCO Power Ltd., Plot No. 397, Phase-III, Udyog Vihar, Gurgaon, Haryana - 122016
GM (O&M) Bharat Aluminium Co. Ltd (BALCO), P.O. Balco Nagar, Distt. Korba -495684 Chhattisgarh	Head Electrical, Jhabua Power Ltd, Vill. Berela, Post Attariya, Tehsil Ghansore, Dist-Seoni Madhya Pradesh- 480997
Head (O&M) D B Power Ltd., 3rd floor, Naman Corporate link, C-31, G-block, BKC Bandra east Mumbai-400051	GM (Electrical & Instrumentation) Jaypee Nigrie Super Thermal Power Project (A Unit of Jaiprakash Power Ventures Limited) Vill- Nigrie, Tehsil- Sarai Distt.- Singrauli, MP-486669
AGM (Commercial) DGEN Mega power project, Plot no Z-9, Dahej SEZ area (Eastern side) Taluka Vagra, Dist. Bharuch, Gujarat-392130	Chief General Manager, RKM Powergen Pvt. Ltd, Village Uchpinda, PO Dhurkot, Via chandrapur, Tehsil- Dabra, Janjgir-Champa dist, Chhattisgarh-495692
GM (Commercial) SKS Power generation ltd 501 B Elegant Business park Andheri kurla road, JB Nagar Mumbai-400059	DGM (Electrical) TRN Energy Pvt Ltd, 18, Vasant enclave, Rao Tula Ram Marg New Delhi-110057
COO GMR Warora Energy Limited, Plot No. B1 and B7, Mohabala MIDC Growth Center, Tehsil Waorora, Dist. Chandrapur Maharashtra-442907	General Manager (Electrical) GMR Chattisgarh Energy Limited Village : Raikheda, Block : Tilda District : Raipur, Pin : 493225 Chattisgarh

2/5

Engineer In-charge (Shift), Korba West Power Company Limited Village – Chote Bhandar, PO-Bade Bhandar, Distt. -Raigarh, Chattisgarh-496100	AVP (Operation) Jindal Power Ltd., OP Jindal Super Thermal Power Plant Tamnar, Raigarh Chattisgarh- 496107

3/5

Annex-I

List of ISGS evacuating through dedicated lines upto the CTU sub-station

S. No	Name of Generating Station	Evacuation Path	Interface point	Remote end		Recommendation
			Main	Standby	Check	
1	Lanco	400kV Lanco-Bilaspur line-1	Bilaspur	Lanco	Lanco	Check meter to be shifted from Lanco to Bilaspur
2	Lanco	400kV Lanco-Bilaspur line-1	Bilaspur	Lanco	Lanco	Check meter to be shifted from Lanco to Bilaspur
3	ACBIL	400kV ACBIL-Bilaspur line	Bilaspur	ACBIL	ACBIL	Check meter to be shifted from ACBIL to Bilaspur
4	MCCPL	400kV MCCPL-Bilaspur line	Bilaspur	MCCPL	MCCPL	Check meter to be shifted from MCCPL to Bilaspur
5	BALCO	400kV BALCO-Dharamjaygarh line-1	Dharamjaygarh	BALCO	BALCO	Check meter to be shifted from Balco to Dharamjaygarh
6	BALCO	400kV BALCO-Dharamjaygarh line-2	Dharamjaygarh	BALCO	BALCO	Check meter to be shifted from Balco to Dharamjaygarh
7	Jhabua Power	400kV Jhabua-Jabalpur(PS) line-1	Jabalpur (PS)	Jhabua	Jhabua	Check meter to be shifted from Jhabua to Jabalpur(PS)
8	Jhabua Power	400kV Jhabua-Jabalpur(PS) line-1	Jabalpur (PS)	Jhabua	Jhabua	Check meter to be shifted from Jhabua to Jabalpur(PS)
9	DB Power	400kV DB Power-Kotra(PS) line-1	Kotra (PS)	DB Power	DB Power	Check meter to be shifted from DB Power to Kotra(PS)
10	DB Power	400kV DB Power-Kotra(PS) line-2	Kotra (PS)	DB Power	DB Power	Check meter to be shifted from DB Power to Kotra(PS)
11	KWPCL	400kV KWPCL-Kotra(PS) line-1	Kotra (PS)	KWPCL	KWPCL	Check meter to be shifted from KWPCL to Kotra (PS)
12	KWPCL	400kV KWPCL-Kotra(PS) line-2	Kotra (PS)	KWPCL	KWPCL	Check meter to be shifted from KWPCL to Kotra (PS)
13	RKM	400kV RKM-Kotra(PS) line-1	Kotra(PS)	RKM	RKM	Check meter to be shifted from RKM to Kotra(PS)
14	RKM	400kV RKM-Kotra(PS) line-2	Kotra(PS)	RKM	RKM	Check meter to be shifted from RKM to Kotra(PS)
15	SKS	400kV SKS-Kotra(PS) line-1	Kotra(PS)	SKS	SKS	Check meter to be shifted from SKS to Kotra(PS)
16	SKS	400kV SKS-Kotra(PS) line-2	Kotra(PS)	SKS	SKS	Check meter to be shifted from SKS to Kotra(PS)
17	Jaypee Nigrie	400kV Jaypee Nigrie-Satna line-1	Satna	Jaypee Nigrie	Jaypee Nigrie	Check meter to be shifted from Jaypee Nigrie to Satna
18	Jaypee Nigrie	400kV Jaypee Nigrie-Satna line-2	Satna	Jaypee Nigrie	Jaypee Nigrie	Check meter to be shifted from Jaypee Nigrie to Satna
19	DGEN	400kV DGEN-Navsari line-1	Navsari	DGEN	DGEN	Check meter to be shifted from Dgen to Navsari
20	DGEN	400kV DGEN-Navsari line-2	Navsari	DGEN	DGEN	Check meter to be shifted from Dgen to Navsari
21	GMR Chhattisgarh	400kV GMR Chhattisgarh-Durg(PS) line-1	Durg(PS)	GMR Chhattisgarh	GMR Chhattisgarh	Check meter to be shifted from GMR Chhattisgarh to Durg (PS)
22	GMR Chhattisgarh	400kV GMR Chhattisgarh-Durg(PS) line-1	Durg(PS)	GMR Chhattisgarh	GMR Chhattisgarh	Check meter to be shifted from GMR Chhattisgarh to Durg (PS)

03/07/2018

4/5

S. No	Name of Generating Station	Evacuation Path	Interface point	Remote end		Remarks
			Main	Standby	Check	
23	TRN	400kV TRN-Tamnar(PS) line-1	Tamnar(PS)	TRN	TRN	Check meter to be shifted from TRN to Tamnar(PS)
24	TRN	400kV TRN-Tamnar(PS) line-2	Tamnar(PS)	TRN	TRN	Check meter to be shifted from TRN to Tamnar(PS)
25	Jindal Stage-II	400kV JPL Stage-II-Tamnar(PS) line-1	Tamnar(PS)	JPL Stage-II	Not installed	New Check meter to be installed at Tamnar(PS)
26	Jindal Stage-II	400kV JPL Stage-II-Tamnar(PS) line-2	Tamnar(PS)	JPL Stage-II	Not installed	New Check meter to be installed at Tamnar(PS)
27	Jindal Stage-II	400kV JPL Stage-II-Tamnar(PS) line-3	Tamnar(PS)	JPL Stage-II	Not installed	New Check meter to be installed at Tamnar(PS)
28	Jindal Stage-II	400kV JPL Stage-II-Tamnar(PS) line-4	Tamnar(PS)	JPL Stage-II	Not installed	New Check meter to be installed at Tamnar(PS)
29	GMR Warora	400 kV GMR Warora – Bhadrawati line-1	Bhadrawati	GMR Warora	GMR Warora	Check meter to be shifted from GMR Warora to Bhadrawati
30	GMR Warora	400 kV GMR Warora – Bhadrawati line-2	Bhadrawati	GMR Warora	GMR Warora	Check meter to be shifted from TRN to Bhadrawati

03/07/2018

विवेक पाण्डेय. / Vivek Pandey
मुख्य प्रबंधक / Chief Manager
पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
POWER SYSTEMS OPERATION CORPORATION LTD.
प.क्षे.भा.प्रे. केन्द्र मुंबई / WRLDC MUMBAI - 93.

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Memorandum on queries raised by GMR Warora Energy Limited relating to Energy Meter Data discrepancy at Bhadrawati station

1. This Memorandum addresses the queries raised GMR Warora Energy Limited ("**GWEL**") in relation to Energy Meter Data discrepancy at Bhadrawati station leading to commercial losses to GWEL. This Memorandum is divided into the following sections: -

I. Queries

II. Factual background

III. Analysis and response

I. Queries

2. GWEL sought our opinion vide e-mail dated 27.10.2018 on queries relating to Energy Meter Data discrepancy at Bhadrawati station leading to commercial loss for GWEL which are as follows: -

(a) In terms of the factual background narrated below and the Central Electricity Regulatory Commission ("**CERC**") order dated 05.12.2017 in *Lanco Amarkantak Power Ltd v Power Grid Corporation of India Ltd* ("**Lanco Order**"), whether there is a strong case for GWEL?

(b) Whether the decision in Lanco Order to compute transmission losses based on actual meter data of last three months is applicable in the present factual scenario?

II. Factual background

3. GWEL is connected to ISTS at 400/200 kV Bhadravati by a dedicated 400 kV D/C line. The GWEL injection is computed from the readings of the main meters installed on the 400 kV GWEL-Bhadrawati D/C at Bhadrawati end.

4. For the week starting from 23.04.2018 to 29.04.2018, the meter readings of Special Energy Meter ("**SEM**") at line-1 at Bhadrawati end (PGCIL-end) in

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comparison with the standby meter at GWEL end, was found to be under-recording from 26.04.2018 onwards. The energy statements for the week starting from 23.04.2018 to 29.04.2018 was prepared on 04.05.2018. As admitted by Western Regional Load Despatch Centre ("**WRLDC**") itself in communication dated 21.06.2018, the issue persisted in the subsequent weeks and was resolved only on 25.05.2018.

5. Therefore, for the period from 46th Block of 26.04.2018 to 46th Block of 25.05.2018, notional transmission loss of 2% has been applied.

6. It is important to note that there are no check meters installed at Bhadrawati end. Thus, the injection was computed by WRLDC using the standby meter readings of line 1 at GWEL end after applying notional losses of 2%. However, the notional loss of 2% applied by WRLDC is 0.3% to 1.5% higher than the actual transmission loss during the Relevant Period.

7. Consequently, the Western Regional Power Committee ("**WRPC**") prepared its DSM accounts in accordance with calculation of 2% transmission losses. As a result of this, GWEL incurred major losses of approximately Rs. 3-4 lakhs daily, aggregating to Rs. 85 lakhs for the Relevant Period.

III. Analysis

8. We have reviewed the documents including correspondences exchanged between WRLDC, PGCIL and GWEL. It appears that on account of equipment malfunction, SEMs were unable to record the correct data.

9. We have also reviewed the transmission loss data for the past three (3) months. As per the data provided, the transmission loss has been in the range of 0.15% to 1.59%.

10. It also appears that on account of unavailability of reliable data, transmission losses are being considered as 2%.

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11. A similar issue came up in the Lanco Order before CERC. While considering the issue, CERC held that in case PGCIL did not have requisite data to determine transmission losses, transmission losses would be considered on the basis of average loss for the last three (3) months. The operative portion is reproduced below:

> *"25. It is noted that PGCIL has not provided the data of the LANCO bays for the period from 19.7.2016 to 30.8.2016. As per Regulation 6.4.21 of the Grid Code, PGCIL was required to take weekly meter readings and send the same to respective RLDCs. However, PGCIL has submitted the data of other bays stating that WRLDC can establish data for the Petitioners bays through the data of other bays. We have perused the SLD of the Bilaspur Sub-station which is annexed as Annexure.* ***Accordingly, WRLDC is directed to consider the data of other bays provided by PGCIL for the same period to estimate the data for the Petitioner's bays. If WRLDC has not received the data for other bays as claimed by PGCIL, then the average loss for the dedicated transmission line as per actual meter data for both ends of the transmission line for last three (3) months shall be considered by RLDC for arriving at loss figure for the disputed period.*** *We are constrained to state that not providing data by PGCIL for the aforesaid period is untenable and would not be tolerated in future. PGCIL is directed to comply with the provisions of the Grid Code and send the weekly energy accounting readings from the SEMS installed at Bilaspur, sub-station to the WRLDC and the Petitioner."*

12. We are of the considered view that the Lanco Order is squarely applicable in the present case in as much as actual transmission loss data is not available. In any event, assuming a notional transmission loss of 2% is not permitted for the purposes of DSM accounting statement. The generating station cannot be compelled to pay an excess amount in the form of DSM charges due to negligence on PGCIL's part.

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13. In the instant factual scenario, though PGCIL did supply SEM readings to GWEL, the readings were admittedly based on faulty metering. As a result of this, GWEL is being forced to pay an excess amount based on notional transmission losses of 2% when the actual transmission losses are significantly lower.

14. A scenario where SEM data is not available is similar to a scenario SEM data is being supplied based on an incorrect reading. In both the scenarios, reliance on notional transmission loss is contrary to the Lanco Order.

15. Thus, in our considered opinion, the principle laid down in the Lanco Order is directly applicable in the instant factual scenario. We are of the view that in the absence of any alternate reliable data, the average loss for the dedicated transmission line as per actual data for both ends of the transmission line for the last three months should be considered in order for arrive at a loss figure for that period.

For **J. Sagar Associates**

Vishrov Mukerjee
Partner

Disclaimer: For the purpose of the analysis, we have relied on the facts/pleadings/documents provided to us. For the avoidance of doubt, we do not assume responsibility for advising of any changes with respect to any matters described in this Memorandum that may occur subsequent to the date of this Memorandum or from the discovery subsequent to the date of this Memorandum of information not previously known to us pertaining to the events occurring on or prior to the date of this Memorandum. This

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Memorandum is strictly limited to the matters stated herein and is not to be read as extending by implication to any other matter. It is given as at today's date solely for the benefit of the addressees at the date hereof. This Memorandum is based on our understanding of documents and applicable legal framework. It is also given on the basis that we assume no obligation to advise anyone of any change in law which might affect its contents.

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)

पश्चिम क्षेत्रीय भार प्रेषण केन्द्र
एफ-3, सेन्ट्रल रोड, एम्.आई.डी.सी. एरिया, मरोल, अन्धेरी (पूर्व), मुंबई - 400 093.
दुरभाष : 022-28202690 • फैक्स : 022-28235434, 28202630 • ई-मेल : wrldc@posoco.in
WESTERN REGIONAL LOAD DESPATCH CENTRE
F-3, Central Road, MIDC Area, Marol, Andheri (East), Mumbai – 400 093.
Phone : 022-28202690 • Telefax : 28235434, 28202630 • E-mail : wrldc@posoco.in
CIN : U40105DL2009GOI188682

संदर्भ संख्या / Ref. No. WRLDC/SO/Metering/734

21 June 2018

To
COO
GMR Warora Energy Limited,
Plot no. B1 & B7,
Mohabala MIDC Growth Centre,
Tehsil Warora, Dist. Chandrapur
Maharashtra – 442907

Subject: SEM data discrepancy in SEM at Bhadrawati s/s and loss application in the opposite end SEM data.

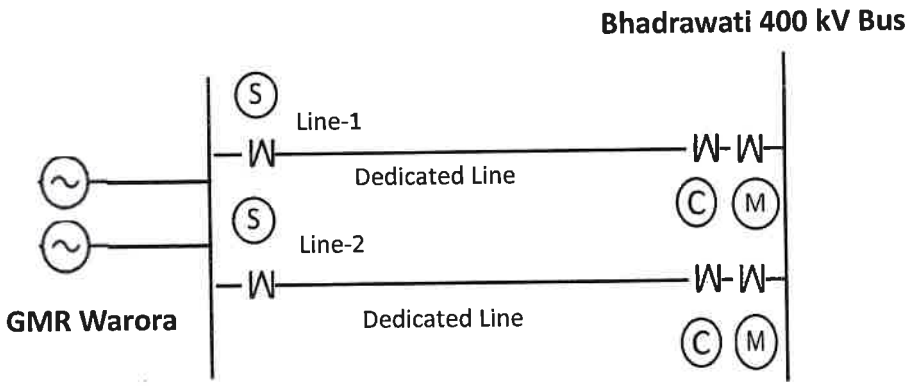
Sir,

Vide letter ref. no. GMR/Warora/WRLDC/DSM/18-19/50, GMR Warora Energy Private Limited (GWEL) claimed discrepancy in the DSM accounts for the period 26.04.18 to 25.05.18. The matter was examined and the observations are as under:

1. GMR Warora is connected to ISTS at 400/220 kV Bhadravati by a dedicated 400 kV D/C line. The GWEL injection is computed from the readings of the Main meters installed on the 400 kV GWEL-Bhadrawati D/C at Bhadrawati end.
2. For the week 23.04.18 to 29.04.18, the main meter of line-1 at Bhadravati end, when compared to the standby meter at GWEL end, was found under-recording from 26.04.2018 onwards. The check meters are not installed at Bhadrawati end. Therefore as per the procedure agreed in WRPC, the injection was computed by using the standby meter (at GMR end) reading of line-1 after applying notional losses of 2 %.
3. The energy statements for the week 23.04.18 to 29.04.18 was prepared on 04.05.2018 (Friday). The replacement as above was mentioned in the discrepancy report sent to WRPC secretariat. The meter data along with the discrepancy report was uploaded on the WRLDC website on the same day for validation and follow up actions by concerned utilities. The under-recording issue was also e-mailed to Powergrid Bhadrawati on 03.05.18 (email attached as Annex-I).
4. The issue persisted in the subsequent weeks also. Hence the discrepancy was highlighted in the discrepancy reports issued from WLRDC in the subsequent weeks also for follow up actions by POWERGRID/GWEL. The reports are collectively attached as Annex-II.
5. WRLDC followed up with Bhadrawati s/s on telephone as well. The issue was rectified by Bhadrawati s/s on 25.05.18 as confirmed in their email dtd. 25.05.18 (email attached as Annex-III).

6. The email from GWEL requesting WRLDC to use check meter at GMR Warora end to compute the injection, was received at WRLDC on 28.05.2018. However the check meter at GMR end (with notional loss) could be used only if the standby meter at GMR Warora end would have been faulty.

7. In view of the above, no revision in energy statement for 26.04.2018 to 25.05.2018 is required. However in order to take care of such discrepancies in future, it is advised that the two (2) check meters installed on the 400 kV GMR Warora-Bhadravati D/C lines at GMR end shall be got shifted to Bhadravati end (with help of POWERGRID) so that the same could be used in case of discrepancy in the main meter in future. The revised metering location is as under:



Thanking you,

Yours sincerely,

(Abhimanyu Garitia)
General Manager
21/6/18

Copy to:

1) Head -Technical Services, GMR Warora Energy Limited
2) SE (Commercial), WRPC, Mumbai
3) General Manager (AM), WRTS-1, Nagpur, Maharashtra |With a request to shift the check meter from GMR Warora to Bhadravati

Gmail

WRLDC SEM <wrsemdata1@gmail.com>

UNDER- RECORDING by SEM meter at Bhadrawati

1 message

POSOCO WRLDC Metering <wrsemdata@gmail.com> Thu, May 3, 2018 at 5:35 PM
To: Ranjith Kumar Panigrahi {रंजीत कुमार पाणिग्रही} <ranjith@powergridindia.com>, naval@powergridindia.com

Sir/Madam,

Following meter is Under Recording at Bhadrawati from 26.04.18 onwards.

NP-2648-A - 400KV GME EMCO line-1 at Bhadrawati

Kindly rectify the above issue at the earliest.

--

Regards

Metering
WRLDC POSOCO
Mumbai
P.No:02228202689

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)

पश्चिम क्षेत्र भार प्रेषण केन्द्र
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दूरभाष : 022-28202691 • फैक्स : 022-28235434, 28202630 • ई-मेल : wrldc@posoco.in
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CIN : U40105DL2009GOI188682

संदर्भ : प०क्षे०भा०प्रे०के०/ एस ओ-1 /1531 /2018/ सप्ताह संख्या-04 दिनांक: 04.05.2018

सेवा में
अधीक्षण अभियंता (वाणिज्य)
प० क्षे० वि० स०, मुंबई

विषय : सप्ताह 23.04.2018 से 29.04.2018 के 'अंतर–राज्यीय ऊर्जा मीटर अभिलेख'

महोदय,

दिनांक 23.04.2018 से 29.04.2018 वाले सप्ताह के 'अंतर–राज्यीय ऊर्जा मीटर अभिलेख' व अन्य विवरण एक ज़िप फाइल में क्षेत्रीय ऊर्जा लेखांकन हेतु संलग्न हैं । ज़िप फाइल में उपलब्ध अंतर्वस्तु निम्नलिखित है ।

1। मीटर क्रम संख्या, मीटर प्रकार, विवरण, सी० टी० / पी० टी० के अनुपात
2। अंतर–राज्यीय सीमा पर लगे ऊर्जा मीटर के अनिर्मित अभिलेख
3। अंतर–राज्यीय सीमा पर लगे सभी ऊर्जा मीटर के संसाधित अभिलेख –MWH, प्रति 15 खंड के लिए
4। प्रत्येक क्षेत्रीय घटक द्वारा ग्रिड से क्रियाशील ऊर्जा विनिमय (अन्तः क्षेपण / आहरण) - MWH, प्रति 15 खंड के लिए
5। 5 क्षेत्रीय घटक द्वारा ग्रिड से प्रतिक्रियाशील ऊर्जा विनिमय – संचित MVARh
6। अभिलेखों को संसाधित करते समय पायी गई विसंगतियों का विवरण, उन मुख्य मीटरों का विवरण जिनके अभिलेख रक्षित मीटरों के अभिलेख से प्रतिस्थापित किए गए और नए मीटरों का विवरण

धन्यवाद,

भवदीय,
विवेक पाण्डेय
(मुख्य प्रबन्धक)
आखिल मुद्गा
(व० अभियंता)

संलग्नक : यथोपरि

DISCREPANCY REPORT FOR WEEK- 04 (2018-19)
(23.04.2018 to 29.04.2018)

I. Active Energy Accounting

1. Following main meter readings were replaced with Standby/Check meter readings due to non availability of main meter readings.

Sl.no	Loc.ID & SEM ID	Date	Location	Feeder/ICT	Replaced with LOC.ID& SEM Sl.no	Remarks
1	(MM-49) NP-8716-A	23.04.18 TO 29.04.18	AURANGABAD (PG)	400 kV Side OF ICT-2	(MM-50) NP-8715-A	Faulty Meter Action: Aurangabad

2. Following main meter readings were replaced with Standby/Check meter readings due to discrepancies in main meter readings.

Sl.no	Loc.ID& SEM ID	Date	Location	Feeder/ICT	Replaced with LOC.ID & SEM Sl.no	Remarks
1	(MM-22) NP-2648-A	26.04.18 TO 29.04.18	BHADRAVATI	400KV GME EMCO line-1	(EM-11) NP-2803-A	Under- recording Action: Bhadravati(PG)
2	(MP-65) NP-4229-A	23.04.18 TO 29.04.18	NAGDA	400KV SHUJALPUR LINE-1	(MB-21) NP-6369-A	Under- recording Action: Nagda (MPPTCL)
3	(MP-66) NP-2282-A	24.04.18 TO 26.04.18	NAGDA	400KV SHUJALPUR LINE-2	(MB-22) NP-6355-A	Under- recording Action: Nagda (MPPTCL)
4	(MP-13) NP-5748-A	25.04.18 & 28.04.18	GWALIOR (PG)	400KV SIDE OF ICT-1	(MP-14) NP-5749-A	Under- recording Action: Gwalior (PG)
5	(MB-13) NP-5754-A	25.04.18 & 27.04.18	GWALIOR (PG)	400KV SIDE OF ICT-3	(MB-14) NP-5756-A	Under- recording Action: Gwalior (PG)
6	(CS-71) NP-2631-A	27.04.18	BILASPUR	400KV ACBIL LINE-1	(AC-23) NP-6739-A	Under- recording Action: Bilsapur (PG)
7	(GG-13) NP-6419-A	28.04.18	PIRANA (PG)	400KV SIDE OF ICT-2	(GG-15) NP-6421-A	Meter Testing at Pirana
8	(CS-11) NP-6312-A	28.04.18	BHATAPARA (PG)	400KV SIDE OF ICT-1	(CS-12) NP-6760-A	Under- recording Action: Bhatapara (PG)
9	(CS-15) NP-5720-A	28.04.18	BHATAPARA (PG)	400KV SIDE OF ICT-2	(CS-16) NP-6306-A	Under- recording Action: Bhatapara (PG)

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)

पश्चिम क्षेत्र भार प्रेषण केन्द्र
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दूरभाष : 022-28202691 • फैक्स : 022-28235434, 28202630 • ई-मेल : wrldc@posoco.in
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CIN : U40105DL2009GOI188682

संदर्भ : प०क्षे०भा०प्रे०के०/ एस ओ-1 /1531 /2018/ सप्ताह संख्या-05 दिनांक: 11.05.2018

सेवा में
अधीक्षण अभियंता (वाणिज्य)
प० क्षे० वि० स०, मुंबई

विषय : सप्ताह 30.04.2018 से 06.05.2018 के 'अंतर-राज्यीय ऊर्जा मीटर अभिलेख'

महोदय,

दिनांक 30.04.2018 से 06.05.2018 वाले सप्ताह के 'अंतर-राज्यीय ऊर्जा मीटर अभिलेख' व अन्य विवरण एक ज़िप फाइल में क्षेत्रीय ऊर्जा लेखांकन हेतु संलग्न हैं । ज़िप फाइल में उपलब्ध अंतर्वस्तु निम्नलिखित है ।

1। मीटर क्रम संख्या, मीटर प्रकार, विवरण, सी० टी० / पी० टी० के अनुपात
2। अंतर-राज्यीय सीमा पर लगे ऊर्जा मीटर के अनिर्मित अभिलेख
3। अंतर-राज्यीय सीमा पर लगे सभी ऊर्जा मीटर के संसाधित अभिलेख –MWH, प्रति 15 खंड के लिए
4। प्रत्येक क्षेत्रीय घटक द्वारा ग्रिड से क्रियाशील ऊर्जा विनिमय (अन्तः क्षेपण / आहरण) - MWH, प्रति 15 खंड के लिए
5। 5 क्षेत्रीय घटक द्वारा ग्रिड से प्रतिक्रियाशील ऊर्जा विनिमय – संचित MVARh
6। अभिलेखों को संसाधित करते समय पायी गई विसंगतियों का विवरण, उन मुख्य मीटरों का विवरण जिनके अभिलेख रक्षित मीटरों के अभिलेख से प्रतिस्थापित किए गए और नए मीटरों का विवरण

धन्यवाद,

भवदीय,
विवेक पाण्डेय
(मुख्य प्रबन्धक)
CH JAGADEESH
Sr. Engineer

संलग्नक : यथोपरि

DISCREPANCY REPORT FOR WEEK- 05 (2018-19)
(30.04.2018 to 06.05.2018)

I. Active Energy Accounting

1. Following main meter readings were replaced with Standby/Check meter readings due to non availability of main meter readings.

Sl.no	Loc.ID & SEM ID	Date	Location	Feeder/ICT	Replaced with LOC.ID& SEM Sl.no	Remarks
1	(MM-49) NP-8716-A	30.04.18 TO 06.05.18	AURANGABAD (PG)	400 kV Side OF ICT-2	(MM-50) NP-8715-A	Faulty Meter Action: Aurangabad
2	(MM-29) NP-6712-A	30.04.18 TO 06.05.18	Kolhapur	400KV Solapur(PG) line-1	(MM-26) NP-8885-A	Data not received Action: Kolhapur

2. Following main meter readings were replaced with Standby/Check meter readings due to discrepancies in main meter readings.

Sl.no	Loc.ID& SEM ID	Date	Location	Feeder/ICT	Replaced with LOC.ID & SEM Sl.no	Remarks
1	(MM-22) NP-2648-A	30.04.18 TO 06.05.18	BHADRAVATI	400KV GME EMCO line-1	(EM-11) NP-2803-A	Under- recording Action: Bhadravati(PG)
2	(MP-65) NP-4229-A	30.04.18 TO 06.05.18	NAGDA	400KV SHUJALPUR LINE-1	(MB-21) NP-6369-A	Under- recording Action: Nagda (MPPTCL)
3	(IT-03) NP-6222-A	30.04.18 TO 06.05.18	ITARSI(PG)	400kV side of 400/220kV ICT-2	(IT-04) NP-6217-A	Under- recording Action: Itarsi(PG)
4	(MP-13) NP-5748-A	01.05.18	Gwalior(PG)	400kV side of ICT-1	(MP-14) NP-5749-A	Under- recording Action: Gwalior(PG)
5	(GG-09) NP-6432-A	01.05.18	PIRANA(PG)	400KV PIRANA(TPL) LINE-2	(GG-07) GJ-0851-A	Meter calibration was done
6	(GG-08) NP-6431-A	02.05.18	PIRANA(PG)	400KV PIRANA(TPL) LINE-1	(GG-06) GJ-0850-A	Meter calibration was done

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)

पश्चिम क्षेत्र भार प्रेषण केन्द्र
एफ-3, सेन्ट्रल रोड, एम्.आई.डी.सी. एरिया, मरोल, अन्धेरी (पूर्व), मुंबई - 400 093.
दूरभाष : 022-28202691 • फैक्स : 022-28235434, 28202630 • ई-मेल : wrldc@posoco.in
WESTERN REGIONAL LOAD DESPATCH CENTRE
F-3, Central Road, MIDC Area, Marol, Andheri (East), Mumbai – 400 093.
Phone : 022-28202691 • Telefax : 28235434, 28202630 • E-mail : wrldc@posoco.in
CIN : U40105DL2009GOI188682

संदर्भ : प०क्षे०भा०प्रे०के०/ एस ओ-1 /1531 /2018/ सप्ताह संख्या-06 दिनांक: 18.05.2018

सेवा में
अधीक्षण अभियंता (वाणिज्य)
प० क्षे० वि० स०, मुंबई

विषय : सप्ताह 07.05.2018 से 13.05.2018 के 'अंतर-राज्यीय ऊर्जा मीटर अभिलेख'

महोदय,

दिनांक 07.05.2018 से 13.05.2018 वाले सप्ताह के 'अंतर-राज्यीय ऊर्जा मीटर अभिलेख' व अन्य विवरण एक ज़िप फाइल में क्षेत्रीय ऊर्जा लेखांकन हेतु संलग्न हैं । ज़िप फाइल में उपलब्ध अंतर्वस्तु निम्नलिखित है ।

1। मीटर क्रम संख्या, मीटर प्रकार, विवरण, सी० टी० / पी० टी० के अनुपात
2। अंतर-राज्यीय सीमा पर लगे ऊर्जा मीटर के अनिर्मित अभिलेख
3। अंतर-राज्यीय सीमा पर लगे सभी ऊर्जा मीटर के संसाधित अभिलेख –MWH, प्रति 15 खंड के लिए
4। प्रत्येक क्षेत्रीय घटक द्वारा ग्रिड से क्रियाशील ऊर्जा विनिमय (अन्तः क्षेपण / आहरण) - MWH, प्रति 15 खंड के लिए
5। 5 क्षेत्रीय घटक द्वारा ग्रिड से प्रतिक्रियाशील ऊर्जा विनिमय – संचित MVARh
6। अभिलेखों को संसाधित करते समय पायी गई विसंगतियों का विवरण, उन मुख्य मीटरों का विवरण जिनके अभिलेख रक्षित मीटरों के अभिलेख से प्रतिस्थापित किए गए और नए मीटरों का विवरण

धन्यवाद,

भवदीय,
विवेक पाण्डेय
(मुख्य प्रबन्धक)
आशुल गुप्ता
(स. अभियंता)

संलग्नक : यथोपरि

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)

पश्चिम क्षेत्र भार प्रेषण केन्द्र
एफ-3, सेन्ट्रल रोड, एम.आई.डी.सी. एरिया, मरोल, अन्धेरी (पूर्व), मुंबई - 400 093.
दूरभाष : 022-28202691 • फैक्स : 022-28235434, 28202630 • ई-मेल : wrldc@posoco.in
WESTERN REGIONAL LOAD DESPATCH CENTRE
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Phone : 022-28202691 • Telefax : 28235434, 28202630 • E-mail : wrldc@posoco.in
CIN : U40105DL2009GOI188682

संदर्भ : प०क्षे०भा०प्रे०के०/ एस ओ-1 /1531 /2018/ सप्ताह संख्या-07 दिनांक: 25.05.2018

सेवा में
अधीक्षण अभियंता (वाणिज्य)
प० क्षे० वि० स०, मुंबई

विषय : सप्ताह 14.05.2018 से 20.05.2018 के 'अंतर–राज्यीय ऊर्जा मीटर अभिलेख'

महोदय,

दिनांक 14.05.2018 से 20.05.2018 वाले सप्ताह के 'अंतर–राज्यीय ऊर्जा मीटर अभिलेख' व अन्य विवरण एक ज़िप फाइल में क्षेत्रीय ऊर्जा लेखांकन हेतु संलग्न हैं । ज़िप फाइल में उपलब्ध अंतर्वस्तु निम्नलिखित है ।

1। मीटर क्रम संख्या, मीटर प्रकार, विवरण, सी० टी० / पी० टी० के अनुपात
2। अंतर–राज्यीय सीमा पर लगे ऊर्जा मीटर के अनिर्मित अभिलेख
3। अंतर–राज्यीय सीमा पर लगे सभी ऊर्जा मीटर के संसाधित अभिलेख –MWH, प्रति 15 खंड के लिए
4। प्रत्येक क्षेत्रीय घटक द्वारा ग्रिड से क्रियाशील ऊर्जा विनिमय (अन्तः क्षेपण / आहरण) – MWH, प्रति 15 खंड के लिए
5। 5 क्षेत्रीय घटक द्वारा ग्रिड से प्रतिक्रियाशील ऊर्जा विनिमय – संचित MVARh
6। अभिलेखों को संसाधित करते समय पायी गई विसंगतियों का विवरण, उन मुख्य मीटरों का विवरण जिनके अभिलेख रक्षित मीटरों के अभिलेख से प्रतिस्थापित किए गए और नए मीटरों का विवरण

धन्यवाद,

भवदीय,
विवेक पाण्डेय 25/5/18
(मुख्य प्रबन्धक)

संलग्नक : यथोपरि

DISCREPANCY REPORT FOR WEEK- 07 (2018-19)
(14.05.2018 to 20.05.2018)

I. Active Energy Accounting

1. Following main meter readings were replaced with Standby/Check meter readings due to non availability of main meter readings.

Sl.no	Loc.ID & SEM ID	Date	Location	Feeder/ICT	Replaced with LOC.ID& SEM Sl.no	Remarks
1	(MM-49) NP-8716-A	14.05.18 TO 20.05.18	AURANGABAD (PG)	400 KV SIDE OF ICT-2	(MM-50) NP-8715-A	Faulty Meter Action: Aurangabad
2	(PC-89) NP-5541-A	14.05.18	SATNA(PG)	400KV SIDE OF 400/220KV ICT-4	(PC-90) NP-5540-A	File received on Monday was corrupted. Again file was sent on Thursday, so one day data was lost.

2. Following main meter readings were replaced with Standby/Check meter readings due to discrepancies in main meter readings.

Sl. no	Loc.ID& SEM ID	Date	Location	Feeder/ICT	Replaced with LOC.ID & SEM Sl.no	Remarks
1	(MM-22) NP-2648-A	14.05.18 TO 20.05.18	BHADRAVATI	400KV GMR EMCO LINE-1	(EM-11) NP-2803-A	Under- recording Action: Bhadravati(PG)
2	(MP-65) NP-4229-A	14.05.18 TO 20.05.18	NAGDA	400kV SHUJALPUR LINE-1	(MB-21) NP-6369-A	Under- recording Action: Nagda (MPPTCL)
3	(PR-27) NP-5511-A	14.05.18 TO 20.05.18	BOISAR (PG)	400KV SIDE OF ICT-4	(PR-28) NP-5512-A	Wrong date in meter. Action: Boisar(PG)
4	(GG-43) NP-6226-A	14.05.18	ZERDA(KANSARI)	400KV VADAVI LINE-1	(GG-95) GJ-2971-A	Under- recording Action: GETCO
5	(GG-44) NP-6348-A	15.05.18	ZERDA(KANSARI)	400KV VADAVI LINE-2	(GG-49) NP-6346-A	Under- recording Action: GETCO

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
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पश्चिम क्षेत्र भार प्रेषण केन्द्र
एफ-3, सेन्ट्रल रोड, एम्.आई.डी.सी. एरिया, मरोल, अन्धेरी (पूर्व), मुंबई - 400 093.
दूरभाष : 022-28202691 • फैक्स : 022-28235434, 28202630 • ई-मेल : wrldc@posoco.in
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Phone : 022-28202691 • Telefax : 28235434, 28202630 • E-mail : wrldc@posoco.in
CIN : U40105DL2009GOI188682

संदर्भ : प०क्षे०भा०प्रे०के०/ एस ओ-1 /1531 /2018/ सप्ताह संख्या-08 दिनांक: 01.06.2018

सेवा में
अधीक्षण अभियंता (वाणिज्य)
प० क्षे० वि० स०, मुंबई

विषय : सप्ताह 21.05.2018 से 27.05.2018 के 'अंतर-राज्यीय ऊर्जा मीटर अभिलेख'

महोदय,

दिनांक 21.05.2018 से 27.05.2018 वाले सप्ताह के 'अंतर-राज्यीय ऊर्जा मीटर अभिलेख' व अन्य विवरण एक ज़िप फाइल में क्षेत्रीय ऊर्जा लेखांकन हेतु संलग्न हैं । ज़िप फाइल में उपलब्ध अंतर्वस्तु निम्नलिखित है ।

1। मीटर क्रम संख्या, मीटर प्रकार, विवरण, सी० टी० / पी० टी० के अनुपात
2। अंतर-राज्यीय सीमा पर लगे ऊर्जा मीटर के अनिर्मित अभिलेख
3। अंतर-राज्यीय सीमा पर लगे सभी ऊर्जा मीटर के संसाधित अभिलेख –MWH, प्रति 15 खंड के लिए
4। प्रत्येक क्षेत्रीय घटक द्वारा ग्रिड से क्रियाशील ऊर्जा विनिमय (अन्तः क्षेपण / आहरण) – MWH, प्रति 15 खंड के लिए
5। 5 क्षेत्रीय घटक द्वारा ग्रिड से प्रतिक्रियाशील ऊर्जा विनिमय – संचित MVARh
6। अभिलेखों को संसाधित करते समय पायी गई विसंगतियों का विवरण, उन मुख्य मीटरों का विवरण जिनके अभिलेख रक्षित मीटरों के अभिलेख से प्रतिस्थापित किए गए और नए मीटरों का विवरण

धन्यवाद,

भवदीय,
विवेक पाण्डेय 01/06/18
(मुख्य प्रबन्धक)

संलग्नक : यथोपरि

DISCREPANCY REPORT FOR WEEK- 08 (2018-19)
(21.05.2018 to 27.05.2018)

I. Active Energy Accounting

1. Following main meter readings were replaced with Standby/Check meter readings due to non availability of main meter readings.

Sl.no	Loc.ID & SEM ID	Date	Location	Feeder/ICT	Replaced with LOC.ID& SEM Sl.no	Remarks
1	(MM-49) NP-8716-A	21.05.18 TO 27.05.18	AURANGABAD (PG)	400 KV SIDE OF ICT-2	(MM-50) NP-8715-A	Faulty Meter Action: Aurangabad

2. Following main meter readings were replaced with Standby/Check meter readings due to discrepancies in main meter readings.

Sl. no	Loc.ID& SEM ID	Date	Location	Feeder/ICT	Replaced with LOC.ID & SEM Sl.no	Remarks
1	(MP-65) NP-4229-A	21.05.18 TO 27.05.18	NAGDA	400KV SHUJALPUR LINE-1	(MB-21) NP-6369-A	Under- recording Action: Nagda (MPPTCL)
2	(MH-21) NP-2412-A	21.05.18 TO 27.05.18	CHANDRAPUR	400KV BHADRAVATI LINE-1	(MH-23) NP-2119-A	Under- recording Action: Chandrapur
3	(MM-22) NP-2648-A	21.05.18 TO 25.05.18	BHADRAVATI	400KV GMR EMCO LINE-1	(EM-11) NP-2803-A	Under- recording Rectified on 25.05.18
4	(OR-58) NP-5944-A	25.05.18 TO 27.05.18	BUDHIPADAR	220kV Korba line-3	(CS-55) NP-2133-A	Under- recording Action: Budhipadar (ER)
5	(KW-13) NP-5526-A	26.05.18	KAWAS	220KV ICCHAPUR LINE-1	(GU-58) NP-4168-A	Meter Testing at Kawas
6	(VI-51) NP-2147-A	23.05.18	VINDHYACHAL STPS	400KV SIDE OF ICT-3	(VI-52) NP-2209-A	Under- recording
7	(PC-69) NP-5620-A	23.05.18	BETUL GIS	400KV SIDE OF ICT-1	(PC-70) NP-5617-A	Zero recording Action: Betul(PG)
8	(PC-71) NP-5539-A	23.05.18	BETUL GIS	400KV SIDE OF ICT-2	(PC-72) NP-5539-A	Zero recording Action: Betul(PG)
9	(GG-63) NP-2732-A	23.05.18	VAV	220KV KAWAS LINE-1	(KW-17) NP-5533-A	Meter Testing at VAV end

Gmail

WRLDC SEM <wrsemdata1@gmail.com>

SEM data discrepancy in SEM S.No.2648A at Bhadrawati Station

Ranjith Kumar Panigrahi {रंजीत कुमार पाणिग्रही} <ranjith@powergridindia.com> Fri, May 25, 2018 at 1:15 PM
To: "wrsemdata@gmail.com" <wrsemdata@gmail.com>, "semdata@rediffmail.com" <semdata@rediffmail.com>
Cc: Raj Kishor Dash {राज किशोर दाश} <R.K.Dash@powergridindia.com>, Naval Kishor Meena {Naval Kishor Meena} <naval@powergridindia.com>

Dear sir,
It is to inform you that the SEM data discrepancy in energy Meter S.No.2648A (Bhadrawati-EMCO ckt # 1) is attended.
While attending the above issue, it is observed that the CT currents R-Ph & Y-Ph are not reporting the SEM meter and the same is corrected in the TTB connections.
At present the CT,PT values are reporting healthy to the SEM meter.

Regards,
Ranjith K panigrahi,
Jr Engineer,
8275039152

MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

Maharashtra State Electricity Distribution Co. Ltd.
Prakashgad, Plot No.G-9, Bandra (East), Mumbai – 400 051
(P) 26476843, (O) 26474211 / 26472131, Fax- 26475012, Website: www.mahadiscom.in

Ref. No:Dir/**Comml/RSD/** No 17979 DATE: 26 JUL 2018

To,
General Manager,
Western Regional Load Despatch Centre,
F-3, M.I.D.C. Area, Marol,
Andheri(East), Mumbai-400093

Subject: Scheduling of suo-moto power to Maharashtra for Solapur Mouda-I&Gandhar (RLNG) and withdrawal of unit under RSD thereof.

Ref : 1) Day ahead entitlement from Maharashtra for Solapur, Mouda-I &Gandhar(RLNG)
2) Email from SE, LM Kalwafor Solapurdated 22nd July 2018.
3) Email from SE, LM Kalwa for Gandhar (RLNG) for dated 11, 18, 20, 21,24 & 25th July 2018

Dear Sir,

Presently MSEDCL is allocated 48.83% share under Solapur station and 39.2% under Gandhar station. In view of rainfall in all parts of Maharashtra since 22ndJune 2018, the demand has drastically reduced & to economic load generation balance, MSEDCL has given zero schedule to some of intra state generating unit/s as per MOD stack prepared by MSLDC. Similarly as per MOD stack of SLDC, zero schedule requisition is also given for Solapur, Mouda-I. Further as per MOD, we are not scheduling power under RLNG either from Kawas or Gandhar.

However it is observed that power is being schedule to Maharashtra from GandharRLNG by RLDC, so as to ensure technical Minimum to unit ;inspite of email correspondences made from SE, LM Kalwa. On the similar ground, Power is also being scheduled from Solapur&Mouda-I station by RLDC. Due to such schedule of high cost power to MSEDCL, there is direct financial loss to MSEDCL which is work out to be tune of Rs. 30 Crs. The Power scheduled by RLDC to Maharashtra for ensuring technical minimum since 22nd June 2018 is as under:

	Power scheduled to ensure Technical Minimum to unit		
Name of Station	From 23rd June to 30th June	1st July 2018 to 24th July 2018	Total from 23rd June till 24th July 2018
Solapur	14.82	55.45	70.27
Mouda-I	11.33	40.37	51.70
Gandhar RLNG	0.00	1.34	1.34

1

In this regard, your kind attention is invited to following importantprovision (5.7 and 5.8) stipulated in "Detailed Operating Procedure for taking units under Reserve Shut Down" regarding taking unit/s under RSD

*"**5.7.** RLDC shall suo-moto revise the schedule of any generating station as per clauses 6.5.14 and 6.5.20 of the Grid Code to operate at or above technical minimum in the ratio of under-requisitioned quantum (with respect to technical minimum) in the interest of smooth system operation under the following conditions:*

i. Extreme variation in Weather Conditions

ii. High Load Forecast

iii. To maintain reserves on regional or all India basis.

iv. Network Congestion

v. Any other event which in the opinion of RLDC/NLDC shall affect the grid security"

And

*" **5.8.** If the grid conditions do not demand for providing technical minimum to a generating station, the concerned RLDC shall issue R-1 schedule based on the requisitions received. Under such situation, the generating station shall have the option to go for RSD with intimation to RLDC latest by 2100 hrs."*

Maharashtra has major share in both Solapur(48.83%) &Mouda-I (39.2%) and there was no requirement from Maharashtra since 23rd June 2018. Further due to monsoon, demand of other major share holders has also reduced. It is also noticed that from URS power that some beneficiaries of other region having marginal share in these station i.e less than 2% are using URS power of station; particularly during evening peak period as per its requirement to tune of 200 to 300MW from these stations. In view of same, inspite of no requirement from beneficiaries having major share in unit/s, RLDC may please specify the situation (given in clause 5.7 of DOP of RSD) under which units of Solapur&Mouda-I are kept on bar. Moreover, there is no requirement of Power under Gandhar(RLNG) from Maharashtra , even then GandharGas power station is being run on RLNG and is being scheduled to Maharashtra without its any requisition / requirement.

In view of above, it is requested that while deciding necessity of unit to be kept on bar, requirement of atleastbeneficiaries having major share shall be considered and in case RLDC is of opinion to keep unit on bar as per provision of 5.7 of DOP on Reserve Shutdown, the technical minimum must be ensure from beneficiaries for whom unit/s is/are kept on bar and no power to be scheduled to other beneficiaries.

Thanking You

Yours faithfully,

(Satish Chavan)
Director (Commercial)

Copy s.w.r.to:

1. Chairman & Managing Director, MSEDCL, Corporate office, Mumbai.

Copy to :

1. Chief Engineer, State Load Despatch Center, Kalwa, Navi Mumbai.
2. Chief Engineer (Power Purchase), MSEDCL
3. OSD to CMD, MSEDCL, Corporate office Mumbai.
4. Superintending Engineer(LM), MSEDCL, Kalwa, Navi Mumbai.

MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

(A Government of Maharashtra Undertaking)

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION CO. LTD.

CIN: U40109MH200SSGC153645

No. CE/PP/NTPC/ 20621 Date: 27-08-2018.

To,
The General Manager (Commercial),
NTPC Bhawan,
Scope Complex,
7, Institutional Area,
Lodhi Road, New Delhi – 110 003

Sub.: - Regarding Scheduling of suo-moto power to MSEDCL from NTPC's generating unit Solapur STPS, Mouda Unit 01 &Gandhar (RLNG) and disallowance of payment for such un-requisite power for the period from 23rd June to 24th July 2018 thereof.

Ref.: Dir/Comml/RSD/17979 dated 26.07.2018.

Dear Sir,

This is reference to above cited subject. Considering the rainfall in all parts of Maharashtra since 22nd June 2018, the demand of MSEDCL has drastically reduced & to economic load generation balance, MSEDCL had not given consent to schedule power from NTPC's Solapur STPS, Mouda STPS Unit – I and Gandhar RLNG as per the state MOD stack. However it is observed that this un-requisite power was scheduled to MSEDCL from Solapur STPS, Mouda STPS Stage I and Gandhar (RLNG) by WRLDC to ensure technical Minimum to the generating unit/s from 23rd June to 24th July 2018. Due to this, there is additional financial burden on MSEDCL which will be ultimately passed on the consumers.The details are as under:

Name of Station	Energy Scheduled in June 2018			Energy Scheduled in July 2018		
	from 23rd June to 30th June 2018	Energy Rate	Amount	from 1st July 2018 to 24th July 2018	Energy Rate	Amount
	Mus	Rs./kWh	Rs. Crs.	Mus	Rs./kWh	Rs. Crs.
Solapur STPS	14.82	3.84	5.7	55.45	4.55	25.24
Mouda STPS Stage -I	11.33	2.91	3.29	40.37	3.1	12.51
Gandhar RLNG	0	7.31	0	1.34	7.7	1.03
Total	**26.15**		**8.99**	**97.16**		**38.78**

Maharashtra State Electricity Distribution Company Limited
5th floor, Prakashgad, Plot No.G-9, Bandra (East), Mumbai – 400 051 ☎ (P) 26478643, ☎ (O) 26474211,
Fax- 26475012Email: cepp@mahadiscom.in Website: www.mahadiscom.in

Due to this un-requisite power, there is additional financial burden of Rs. 47.77 Crs, on MSEDCL. In view of above, MSEDCL is not recommending the energy charge for this un-requisite power.

Thanking you,

Yours faithfully,

Chief Engineer (Power Purchase)

Copy s.w.r.to.-
The Director (Commercial), MSEDCL, Mumbai.

Maharashtra State Electricity Distribution Company Limited
5th floor, Prakashgad, Plot No.G-9, Bandra (East), Mumbai – 400 051 ☎ (P) 26478643, ☎ (O) 26474211,
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MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.
Maharashtra State Electricity Distribution Co. Ltd.
Prakashgad, Plot No.G-9, Bandra (East), Mumbai – 400 051
(P) 26476843, (O) 26474211 / 26472131, Fax- 26475012, Website: www.mahadiscom.in

Ref. No: CE/PP/NTPC/ No 23281 Date: 01 OCT 2018

To,
General Manager (Commercial),
NTPC Bhavan, Scope Complex,
7, Institutional Area,
Loadhi Raod, New Delhi-110003

Subject: Regarding Scheduling of suo-moto power to Maharashtra for Solapur, Mouda-1 & Gandhar (RLNG) and disallowance of payment for such un-requisite power for the period 23rd June to 24th July 2018 thereof.

Ref: 1. Dir/Comml/RSD/17979 dated 26.07.2018
2. T.O.L No. CE/PP/NTPC/ 20621 dated 27.08.2018
3. Y.O.L. No. NTPC WR-1HQ/COMML/402 dated 30.08.2018

Dear Sir,

This is reference to above cited subject, it is requested to kindly note the para wise reply to your office letter as mentioned in ref. no. 03:

As per the Section 29(1) of the Electricity Act 2003, RLDC can give schedule to a generating station for ensuring stability of grid operations and for achieving the maximum economy and efficiency in the operation of the power system in the region under its control. However, during the period from 23.06.2018 to 24.07.2018, as such there was no risk to the western grid stability and there is no such communication from WRLDC regarding what maximum economy and efficiency in operation of power system in Western Region has been achieved by scheduling Solapur STPS, Mouda Stage I and Gandhar (RLNG) during the lean demand period from 23.06.2018 to 24.07.2018, which are actually the costlier generating stations.

As per clauses 6.5.14 and 6.5.20 of the Grid Code; RLDC may suo-moto revise the schedule of any generating station to operate at or above technical minimum in the ratio of under-requisitioned quantum (with respect to technical minimum) in the interest of smooth system operation under the following conditions:

i. *Extreme variation in Weather Conditions*
ii. *High Load Forecast*
iii. *To maintain reserves on regional or all India basis.*
iv. *Network Congestion*
v. *Any other event which in the opinion of RLDC/NLDC shall affect the grid* security"

In this regard, please kindly note that there was as such no condition occurred during the above mentioned period which constrained WRLDC to give schedule to ensure technical minimum for costly Solapur STPS, Mouda Stage I and Gandhar (RLNG). Furthermore, on

raising the objection by MSEDCL regarding this issue vide letter under ref. no. 01, WRLDC had immediately stopped scheduling power from these costly generating stations.

As mentioned above, MSEDCL had not given any schedule to Solapur STPS, Mouda Stage I and Gandhar (RLNG) during the period from 23.06.2018 to 24.07.2018 as these units were not coming in the State MOD stack. However, WRLDC had given schedule to these costly generating units for the reason known to them and the same un-requisite power is reflected in the REA.

In view of above, it is requested to take up this issue with WRLDC for suo-moto Scheduling of un-requisite power to Maharashtra from Solapur, Mouda-1 & Gandhar (RLNG) for the period 23rd June to 24th July 2018.

Thanking You

Yours faithfully,

Chief Engineer (Power Purchase)

Copy s.w.c.to:

1. The Director (Commercial), MSEDCL, Corporate office, Mumbai.

Copy f.w.c.to:

1. The Chief Engineer, State Load Despatch Center, Kalwa, Navi Mumbai.

Copy to:

1. The OSD to CMD, MSEDCL, Corporate office Mumbai.
2. The Superintending Engineer (LM), MSEDCL, Kalwa, Navi Mumbai.