

OPTCL



(Approved by OERC vide Letter No. OERC-Engg-5/98 (Vol.XXII)/ 1577 dt. 06.12.2021)

PERFORMANCE OF THE TRANSMISSION SYSTEM OF OPTCL FOR 2020-21

[This report is prepared in pursuance of Licence Condition 16.7 & Clause 13.7 of Appendix-4B of the OERC (Conduct of Business) Regulations, 2004]

PERFORMANCE OF TRANSMISSION SYSTEM OF OPTCL (AS REPORTED) DURING THE YEAR 2020-21.**1. Procurement of Power:**

Source	Commission's Approval (MU)	Actual Drawl for the State Consumption (MU)	Remarks
OHPC	5881.74	6277.96	State's Maximum and Minimum demand was 5048 MW and 2808 MW respectively
Thermal(TTPS+OPGC)	10,629.56	10844.63	
CPP & Co-generation Plants	0	533.80	
Renewable Generation	2236.8	861.28	
IPP	6230.85	4581.17	
EREB	4039.81	8702.92	
Deviation(Export)		-451.69	
Net Banking +IEX+ STOA+ Sale to the Utilities		-5902.40	
Total	29018.76	25447.68	

2. Voltages profile of Major Grid Sub-stations

Allowable Range (245-198 kV)			
Sl. No.	Name of the 220/132 kV Grid Sub-station	Maximum Voltage in kV	Minimum Voltage in kV
1	ATRI	241	212
2	Balasore	242	210
3	Bhadrak	244	197
4	Bhanjanagar	245	213
5	Bidanasi	242	210
6	Budhipadar	239	205
7	Chandaka	239	204
8	Duburi	238	214
9	Jaynagar	245	229
10	Joda	231	211
11	Katapalli	231	211
12	Lapanga	232	204
13	Laxmipur	244	228
14	Mendhasal	241	212
15	Meramundali	235	223
16	Narendrapur	242	211
17	Nayagarh	242	214
18	Paradeep	243	202
19	Sadeipali	236	195
20	Tarkera	240	217
21	Theruvali	243	222

Allowable Range (380 -420 kV)			
Sl. No.	Name of the 400 kV Grid Sub-station	Maximum Voltage in kV	Minimum Voltage in kV
1	Duburi (N)	431	394
2	Lapanga	418	386
3	Mendhasal	429	395
4	Meramundali	434	398

Allowable Range (145 -122 kV)			
Sl. No.	Name of the 132/33 kV Grid Sub-station	Maximum Voltage in kV	Minimum Voltage in kV
1	Cuttack	141	121
2	Berhampur	143	109
3	Puri	141	110
4	Khurda	140	123

3. System Interruptions due to Major Incident:

INTERRUPTION DUE TO MAJOR INCIDENT			
Incident Duration of Interruption No. of Interruption	Duration of Interruption (Hrs:Min:Sec)	No. of Interruption	Remarks
Snapping of Jumper / Conductor / Earth wire	33:57:00	45	The duration of interruption indicated above is the sum total of interruptions occurred at different areas(S/s) during the year. However there was no total blackout experienced for the State during the year 2020-21.
Insulator Failure	32:33:00	35	
Bursting of CT / PT	16:26:00	18	
Breaker Problem	0:08:00	1	
Major System Disturbance	6:37:00	6	
Failure of LA	7:21:00	17	
Others	160:23:00	379	

Note: Issued in the Public interest. Detailed report on Performance of Transmission System of OPTCL is available in SLDC website i.e., www.sldcorissa.org.in

**COMMISSION'S OBSERVATION ON THE PERFORMANCE OF THE
TRANSMISSION SYSTEM OF OPTCL FOR FY 2020-21**

The salient features of the performance of transmission system of OPTCL for the year 2020-21 is given below and the detail information in support to that is available in SLDC website i.e., www.sldcorissa.org.in

A. Procurement of Power:

The Commission had approved the purchase of power by GRIDCO from various sources in the ARR & Tariff order for 2020-21 against which the actual performance have been indicated in the following table:

Source	Commission's Approval (MU)	Actual Drawl for the State Consumption (MU)	Remarks
OHPC	5881.74	6277.96	State's Maximum and Minimum demand was 5048 MW and 2808 MW respectively
Thermal(TTPS+OPGC)	10,629.56	10844.63	
CPP & Co-generation Plants	0	533.80	
Renewable Generation	2236.8	861.28	
IPP	6230.85	4581.17	
EREB	4039.81	8702.92	
Deviation(Export)		-451.69	
Net Banking +IEX+ STOA+ Sale to the Utilities		-5902.40	
Total	29018.76	25447.68	

There is an import of 111.11 MU through power banking, open access, trading & IEX) and export of 6465.19 MU (156.51MU as sales to other utilities, 451.69 on account of deviation and 5856.99 through trading, OA, banking & IEX export) during the FY 2020-21. Hence, in the said financial year GRIDCO has an export of 6354.078 MU on this account.

2. During FY 2020-21 the daily peak demand touched at 5048 MW maximum on dt.19.10.2020 and a minimum of 2808 MW on dt.25.04.2020. The peak demand of 5048 MW in 2020-21 is about 103 MW lower than the peak demand experienced during the previous year 2019-20 (5151MW). The total energy drawl is 25448MU in FY 2020-21 against 25532 MU in 2019-20, which indicates the decrease in electricity consumption of around 84 MU in the State.

B. Line Interruption:

3. OPTCL's system has faced aggregated Annual interruptions varying from 6 hour to 34 hours at different locations on account of conductor/jumper/earth wire snapping, insulator failure, bursting of Current Transformer/Potential Transformer, breaker problem, system disturbance, Lightning Arrester failures etc. The duration as mentioned above is the sum total of interruptions occurred at different areas (s/s) during the FY 2020-21. However, OPTCL has claimed that it has arranged to maintain power supply (without resorting to total power failure due to non-availability of transmission capacity) from other nearby transmission facilities. The same effort has been made by OPTCL in maintaining uninterrupted power supply even in the event of generation failures. It has been reported that the load restriction has been imposed to curtail demand due to non-availability of generation/failure of generating stations. OPTCL claimed that there was no black out experienced in the State during the FY 2020-21. OPTCL should built over head transmission lines with latest technical methods for long term reliability, long service life of its transmission system and also upgrade the existing substation/ transmission lines and equipments to increase power transfer capacity and reliability. The transmission lines should have proper protection devices to ensure normal operation of the power system to reduce the risk of damage to the working equipments and to avoid all kinds of electrical accidents. Further, OPTCL should take the help of emerging techniques of control, monitoring, protection, communications, etc. for efficient operation of its transmission system in an optimal manner because of expected large scale integration of distributed renewable generation with their uncontrollable generation variability in coming years. OPTCL should have periodic O&M and R&M activities for efficient functioning of its transmission elements and also plan for a Disaster Resilient Transmission System to prevent the damage to a large extent during natural disaster.

C. Frequency Profile:

4. As per the provisions in Indian Electricity Grid Code Regulations, 2010, all users, SEBs, SLDCs, distribution licensee & bulk consumer shall take all possible measures to ensure that grid frequency always remains within 49.9 to 50.05 Hz band. OPTCL has experienced frequency as low as 49.62 Hz and as high as 50.32 Hz during the 1st quarter of FY 2020-21. DISCOMs should adhere to their drawl schedule in order to reduce their drawl from the grid during low frequency and maintain grid discipline. Further, integration of more renewable resources introduces a challenge in frequency control of future power system. Therefore, effective methods for recovery of fallen frequency may also be adopted to restore frequency in case of sudden changes in demand/generation and maintain the frequency within the acceptable limits.

D. Voltage Profile:

5. The EHT voltage, as per Regulations 3(1)(b) of Central Electricity Authority(Grid Standards) Regulations, 2010 should be in the range 122-145 kV for voltage at 132 kV, 198-245 kV for voltage at 220 kV and 380-420 kV for 400 kV level. OPTCL has however experienced 109 kV minimum & 143 KV maximum in its 132 KV system, 195 kV minimum & 245 kV maximum in its 220 KV system and 386 kV minimum & 434 kV maximum in its 400 kV system. As reported, the voltage levels at few 400 KV, 220 KV and 132 KV S/Ss have not been within the allowable limits. Therefore, OLTC of the power transformers should be in healthy condition and should be operated to maintain the voltage within the permissible limits. Further, OPTCL should conduct relevant studies and take steps for placement of Var compensators at suitable locations for a better voltage control and reliable operation of its transmission system. Also, the reactive drawl of DISCOMs from its grid S/S to be monitored regularly and wherever DISCOMs draw excessive reactive load at low voltage condition, OPTCL shall take up the matter with them for remedial measure.

E. Load Restriction:

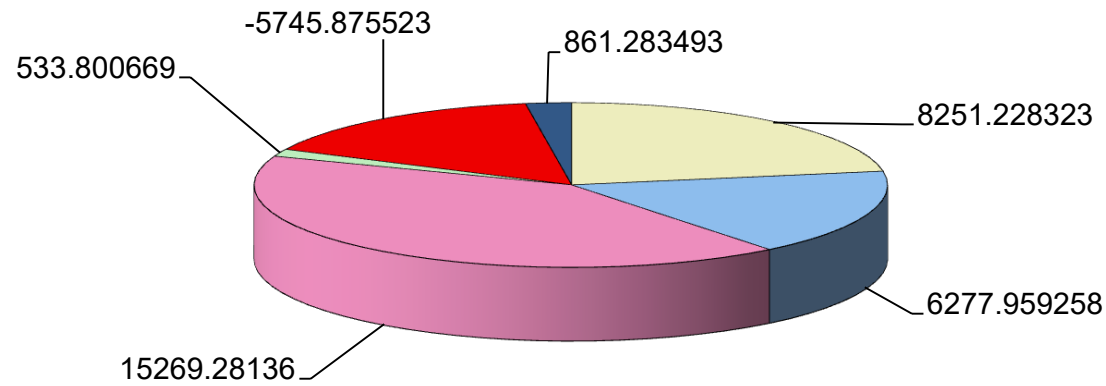
6. M/s. OPTCL has claimed that the load restriction due to non-availability of the transmission capacity as 'NIL' which in turn indicates that during FY 2020-21 that OPTCL system availability was 100%. The projects in the pipe-line already approved by the Commission should be completed by OPTCL within the time schedule to avoid cost & time over-run. Simultaneously, OPTCL needs to ensure avoidance of under loading of lines and substations to minimize system losses and should conduct comprehensive system study and take the approval of the investment before proceeding for any network expansion plan.

F. Efficient Operation of Transmission System:

7. SLDC, being the apex body to ensure integrated operation of the power system of the state on real time basis, should be responsible for optimum scheduling and dispatch of electricity within the state. Since, SLDC is responsible for carrying out real time operations, supervision and control of intra-state transmission system and dispatch of electricity through secure and economic operation of state grid in a transparent, neutral & non-discriminate manner, its staffs are to be appropriately trained for efficient functioning of the centre. Recommendation in the report on Scheduling, Accounting, Metering and Settlement of transaction in electricity ("SAMAST") should be implemented. SLDC operators need to be vigilant to initiate the desired action promptly in order to maintain grid security.

GRID DEMAND FOR THE YEAR 2020-21

[Total Drawal 25447.678 MU]

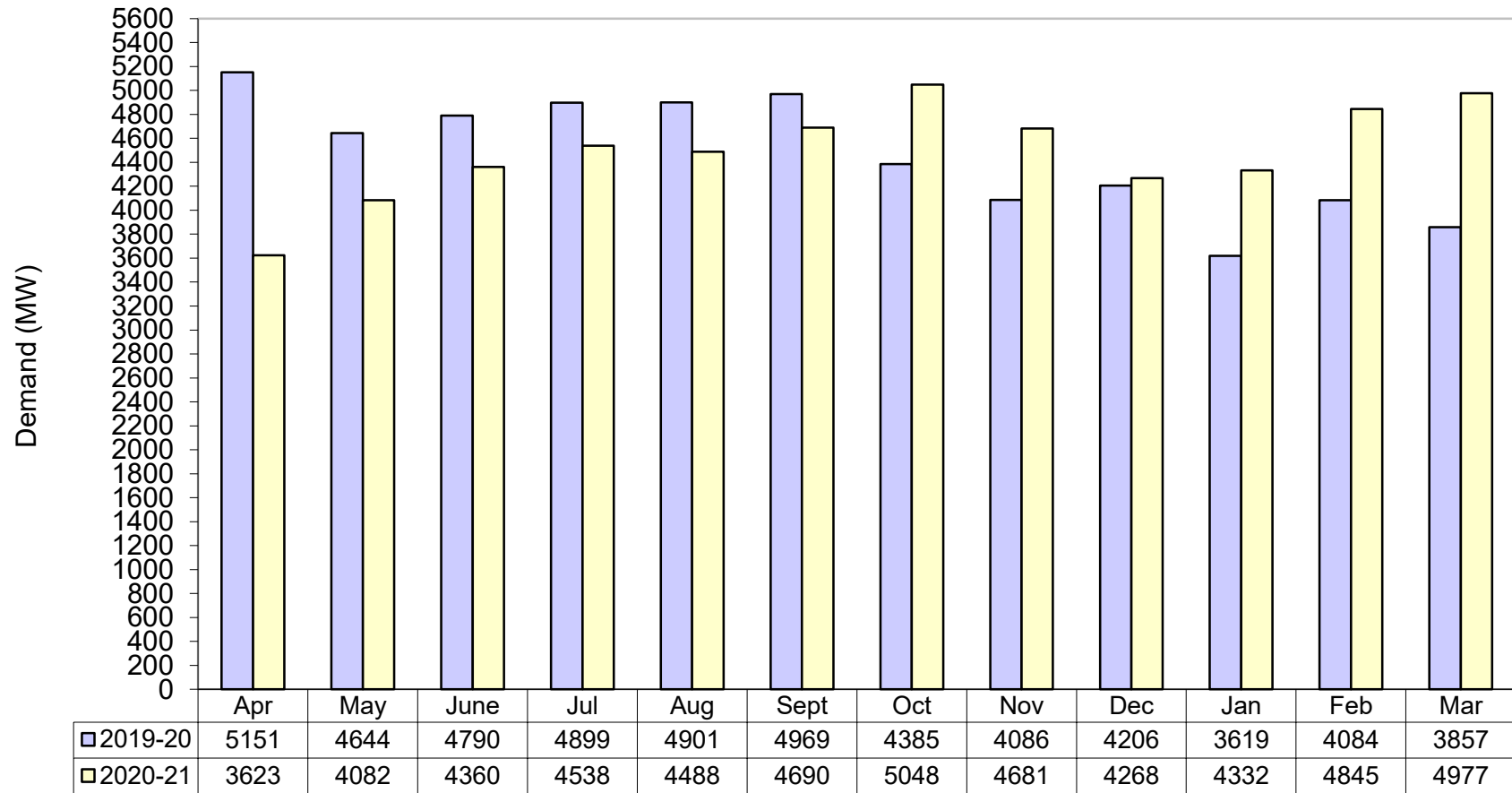


Net EREB Total Hydro NET Thermal (OPGC + TTPS+IPP) CPP Net (BankingPower+IEX+STOA) Renewable Energy

DAILY PEAK DEMAND (MW) EXCLUDING TRADING FOR THE YEAR 2020-21

Day	Apr.20	Mai.20	Jun.20	Jul.20	Aug.20	Sep.20	Okt.20	Nov.20	Dez.20	Jän.21	Feb.21	Mär.21	Max	Min
1	3387	3233	3820	4117	4059	3979	3995	4332	3807	3548	3765	4164	4332	3233
2	3330	3422	3481	4460	3935	4299	4389	4351	3642	3724	3737	4168	4460	3330
3	3281	3779	3550	4208	3799	4477	4272	4255	4095	3666	3778	4116	4477	3281
4	3175	3611	3694	4065	3605	4450	4338	4653	4028	3727	3887	4119	4653	3175
5	3258	3833	3950	3810	3750	4181	4451	4112	3588	4176	3745	3986	4451	3258
6	3290	3421	4360	3705	4009	4010	4300	4388	3442	4162	3738	4437	4437	3290
7	3073	3431	4129	3912	3829	4138	4428	4681	3593	4199	4713	4666	4713	3073
8	2809	3424	4011	3778	3826	3957	4359	4076	3530	4200	4845	4788	4845	2809
9	3171	3697	3842	3888	3827	3984	4587	4148	3485	3742	4842	4734	4842	3171
10	3185	3489	3854	3964	4050	3992	4223	3556	3524	3772	4405	4686	4686	3185
11	3372	3609	3899	3890	4170	4157	4410	3546	3552	4222	4290	4354	4410	3372
12	3432	3750	3793	4142	4107	4115	4337	3743	3629	4257	3988	4231	4337	3432
13	3470	3705	3774	4261	3789	4067	4143	3646	3586	3747	4384	4117	4384	3470
14	3623	3855	3606	3752	3874	4381	4306	3451	3689	3711	4232	4084	4381	3451
15	3596	3767	3455	3822	3619	4391	4353	3576	3780	3771	4525	4240	4525	3455
16	3536	3694	3622	3932	3648	4405	4481	3747	3862	3816	4375	4890	4890	3536
17	3542	3744	3681	4122	4236	4588	4631	3850	4268	3754	3826	4866	4866	3542
18	3400	3886	3785	4538	4348	4631	4635	3889	4109	4332	3832	4457	4635	3400
19	3480	3703	4284	4458	4033	4690	5048	3816	3509	4327	3777	4968	5048	3480
20	3593	2862	4178	4407	3914	4333	4864	3908	3519	3895	3759	4937	4937	2862
21	3349	3379	3918	4314	3908	4056	4462	3761	3611	3782	3747	4876	4876	3349
22	3181	3788	3794	4084	3823	4361	4543	3596	3690	3907	3818	4937	4937	3181
23	3096	3987	3933	4108	3859	4570	4461	3532	3672	3737	3960	4977	4977	3096
24	2825	3930	4228	4202	4029	4529	4471	3529	3571	3708	4642	4912	4912	2825
25	2808	3909	4207	3986	3621	4445	4160	3535	3621	3771	4813	4974	4974	2808
26	2829	4082	3958	4185	3620	4503	3968	3443	3614	3755	4292	4385	4503	2829
27	3063	4024	3821	4060	4336	4363	3972	3451	3526	3865	4292	4116	4363	3063
28	3145	3919	3648	4028	4488	4507	3968	3561	3709	3928	4122	4252	4507	3145
29	2966	3747	3752	4150	4038	4509	3986	3499	3742	3806	4845	4203	4845	2966
30	3398	3837	3964	4157	4049	3927	3924	3555	4161	3780		4507	4507	3398
31		3965		4130	4184		4171		4173	3679		4558	4558	3679
MAX	3623	4082	4360	4538	4488	4690	5048	4681	4268	4332	4845	4977	5048	3679
MIN	2808	2862	3455	3705	3605	3927	3924	3443	3442	3548	3737	3986	4332	2808

COMPARISON OF MONTHLY PEAK DEMAND (MW) EXCLUDING TRADING FOR THE YEAR ENDING 2019-20 & 2020-21

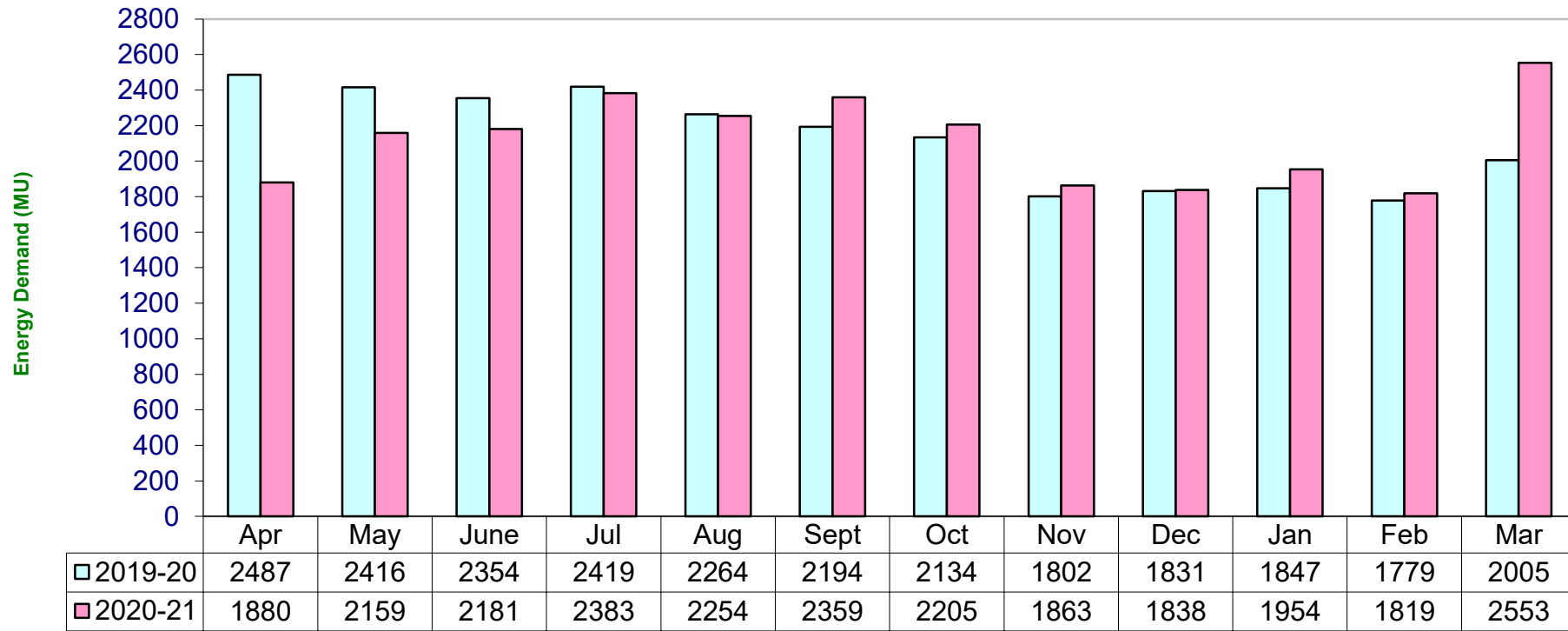


Month

Annual Peak Demand : 2019-20 - 5151 MW 2020-21 - 5048 MW

■ 2019-20 ■ 2020-21

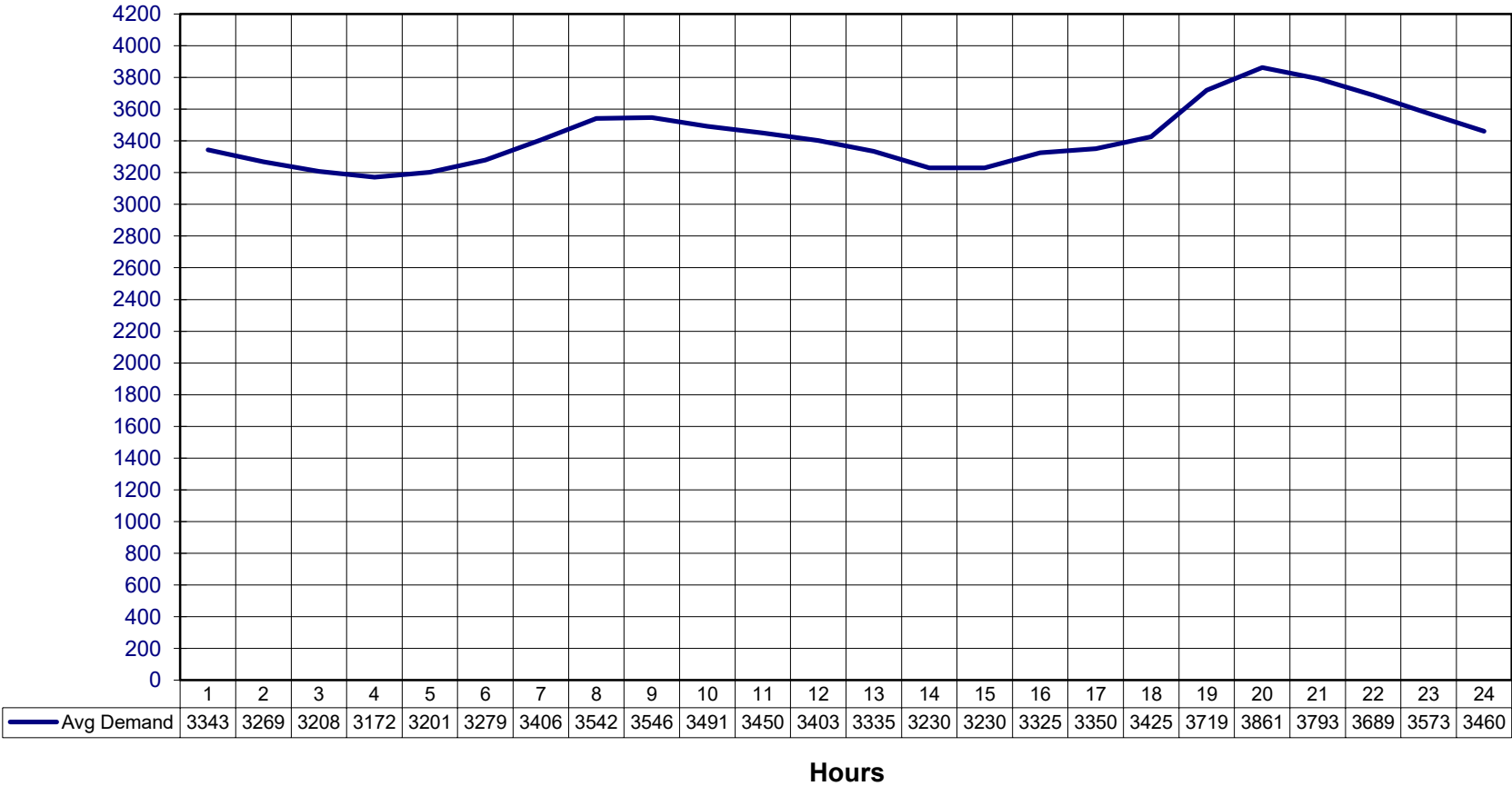
COMPARISON OF MONTHLY ENERGY DEMAND (MU) EXCLUDING TRADING & RETURN BANKING POWER FOR THE YEAR ENDING 2019-20 & 2020-21



Month

Annual Energy Demand : 2019-20 - 25531.525 MU 2020-21 - 25447.678 MU

DEMAND CURVE FOR HOURLY AVERAGE DEMAND EXCLUDING TRADING FOR YEAR ENDING MARCH 2021

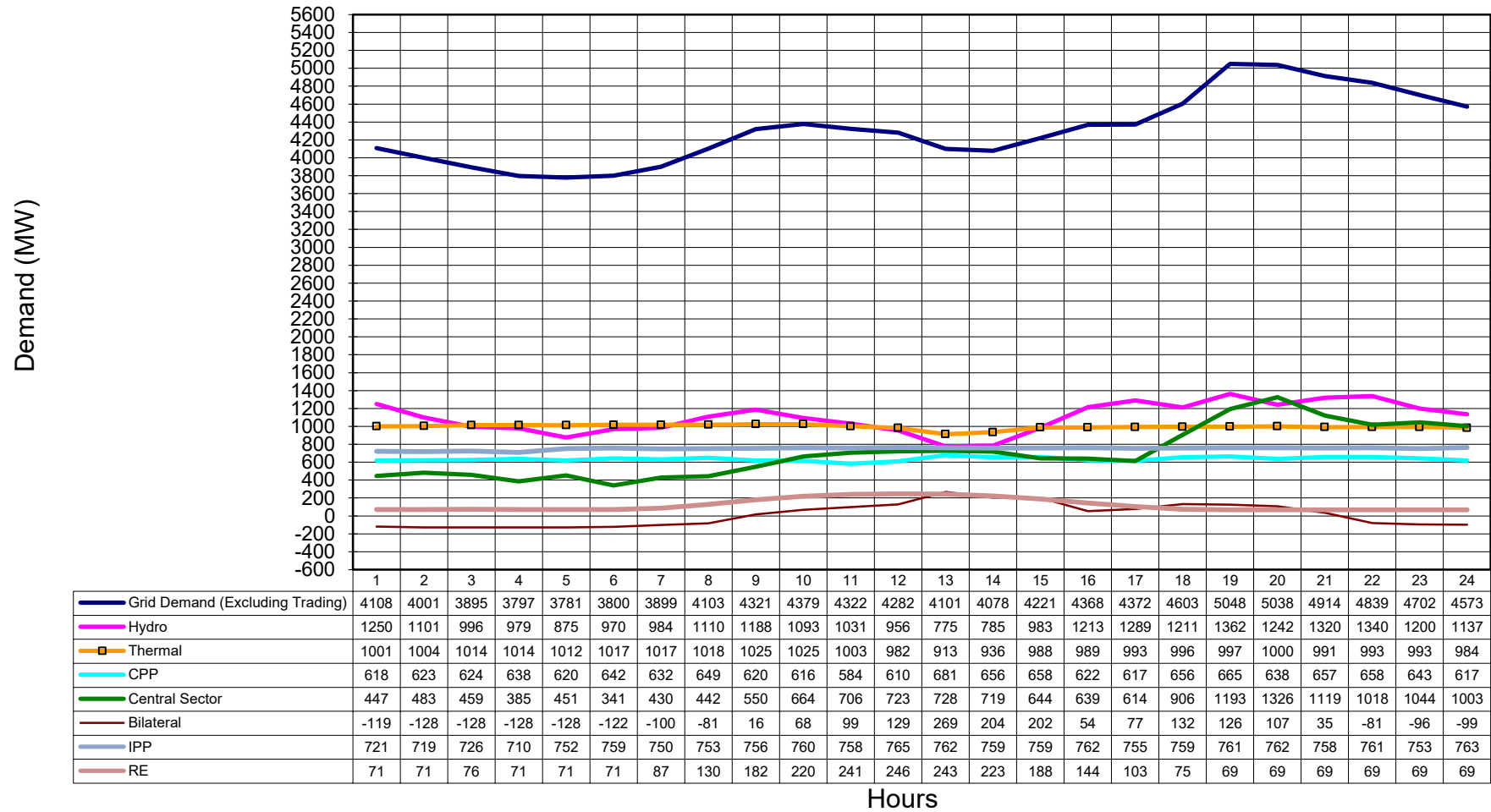


Hourly Average Demand (Month wise) in support of Page-6

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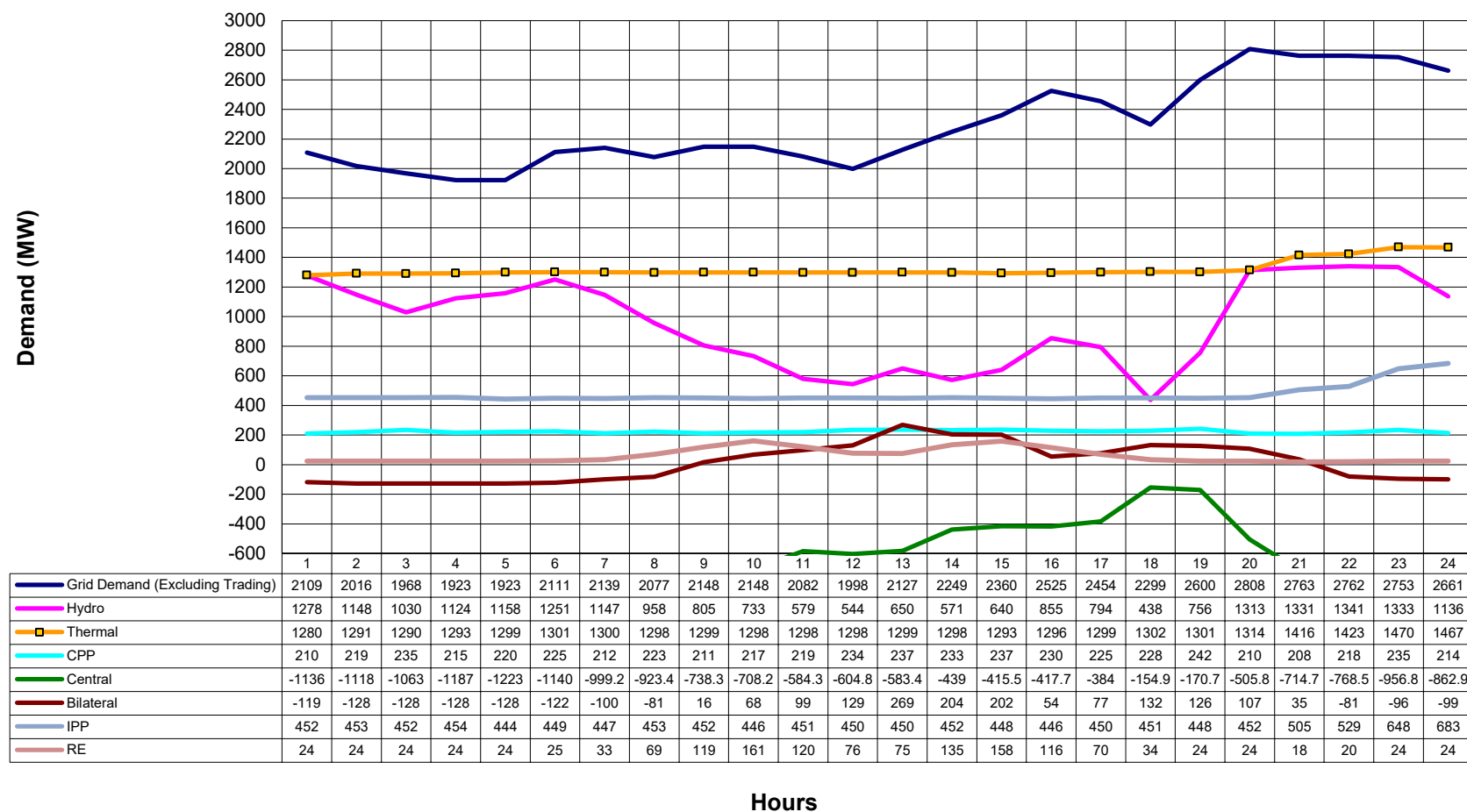
Hours---->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Apr.20	2916	2865	2789	2742	2757	2799	2813	2845	2839	2858	2840	2847	2851	2843	2914	2952	2821	2617	2855	3081	3051	3048	3093	3031
Mai.20	3383	3280	3205	3116	3087	3023	2998	3042	3049	3064	3106	3157	3212	3257	3340	3404	3264	3001	3072	3442	3500	3537	3578	3541
Jun.20	3640	3549	3480	3429	3407	3334	3323	3363	3418	3452	3474	3478	3484	3459	3468	3469	3360	3183	3289	3677	3748	3778	3804	3702
Jul.20	3802	3707	3631	3574	3564	3519	3496	3558	3593	3581	3574	3563	3564	3523	3573	3639	3543	3414	3557	3996	4036	4038	4026	3946
Aug.20	3583	3487	3410	3358	3353	3362	3369	3484	3537	3543	3530	3492	3433	3369	3410	3466	3418	3347	3638	3911	3883	3837	3788	3707
Sep.20	3929	3801	3746	3699	3699	3683	3668	3730	3756	3744	3734	3749	3735	3700	3746	3814	3738	3681	4123	4295	4249	4195	4131	4048
Okt.20	3687	3624	3563	3521	3523	3587	3696	3809	3817	3761	3732	3666	3579	3469	3470	3602	3670	3917	4337	4293	4168	4050	3916	3798
Nov.20	2861	2799	2754	2743	2847	3055	3305	3450	3399	3300	3241	3147	3007	2813	2773	2916	3111	3577	3839	3700	3516	3289	3065	2919
Dez.20	2523	2498	2467	2480	2602	2869	3269	3565	3532	3383	3268	3133	2941	2696	2586	2746	2986	3451	3714	3603	3403	3134	2817	2626
Jän.21	2725	2688	2639	2637	2729	2975	3384	3754	3757	3580	3427	3274	3100	2855	2726	2865	3078	3450	3862	3787	3597	3336	3019	2833
Feb.21	3092	3040	2997	2995	3073	3298	3669	3957	3939	3756	3593	3480	3319	3096	3019	3158	3328	3572	4059	4084	3941	3695	3401	3235
Mär.21	3975	3893	3810	3764	3777	3847	3886	3947	3916	3870	3880	3845	3794	3685	3737	3866	3889	3895	4283	4469	4428	4331	4238	4136
Avg. Annual	3343	3269	3208	3172	3201	3279	3406	3542	3546	3491	3450	3403	3335	3230	3230	3325	3350	3425	3719	3861	3793	3689	3573	3460

HOURLY DEMAND CURVE FOR 19.10.2020 (MAX PEAK DEMAND OF THE YEAR (2020-21))



— Grid Demand (Excluding Trading)
 — Hydro
 —■— Thermal
 — CPP
 — Central Sector
 — Bilateral
 — IPP
 — RE

HOURLY DEMAND CURVE FOR 25.04.2020 (MIN PEAK DEMAND OF THE YEAR 2020-21)



— Grid Demand (Excluding Trading)
 — Hydro
 —■— Thermal
 — CPP
 — Central
 — Bilateral
 — IPP
 — RE

INSTALLED CAPACITY (AS ON 31.3.2020) ENERGY GENERATION / ENERGY DRAWAL BY OPTCL

SECTOR	Installed capacity (MW)	Energy Generation (incl. Aux) (MU)	Energy Drawal by GRIDCO (MU)
A. STATE SECTOR			
OHPC(Hydro)*	2063.5	6356.889	6277.959
OPGC (Thermal)	1740	6527.080	7828.009
TTPS (Thermal)	460	3317.151	3040.814
TTPS (UI-OD)			24.191
IPPs			4581.171
CPP (Synchronised to OPTCL System)			533.801
Renewable Energy Including Co-gen	-		861.283
B. CENTRAL SECTOR (Orissa Share)			
Hydro	189.40		
Thermal	1585.65	-	8702.916
C. Banking Power+OA+Trading+IEX (Import)			111.110
TOTAL DRAWAL			31912.871
D. Banking Power+OA+Trading+IEX (Export)			5856.985
E. Deviation(Export)			451.688
F. Sold to Other Utilities			156.520
Net GRIDCO demand			25447.678

Export to ICCL

15.564

Export to NALCO

66.455

* Includes Orissa share from Machhkund.

2 TRANSMISSION LINES AND SUBSTATIONS

A. CIRCUIT LINES	As on 31.03.2020	Capacity Addition in 2020-2021	As on 1.4.2021	Remark
400 kV line (ckt.km)	1196.872	0.000	1196.872	
220kV line (ckt.km)	6183.406	30.956	6214.362	-
132kV line (ckt.km)	6979.138	413.561	7392.699	-
B. SUBSTATIONS				New Substation
400 / 220 / 132kV (nos.)	3	0	3	-
400 / 220 (nos.)	1	0	1	-
220/132/33kV (nos.)	22	1	23	Goda
220/33kV (nos.)	11	1	12	Govindpalli
132/33 kV (nos.)	97	4	101	Satasankha, Brajbiharipur, Maneswar, G. Udaygiri
132/33/25 kV (nos.)	1	0	1	-
132/33/11 kV (nos.)	1	0	1	-
132kV Switching Stations (OPTCL)	3	0	3	-
132kV LILO Switching Stations of Industries	17	2	19	Global, RAMCO
Total	156	8	164	-

Note:

Capacity addition details for 220kV:

- 220 kV Goda LILO DC (On 220 kV Meramundali - Duburi Old Ckt -I)-12.056 ckm
- 220 kV New Bolangir-Bolangir PG Ckt-II SC on DC-2.7 ckm
- 220 kV Narendrapur - TATA Steel Gopalpur DC-16.2 ckm

Capacity addition details for 132kV:

132 kV Kendrapara RTSS(from 13233 kV Marshaghai S/s)	14.08 k.m.
132 kV Goda LILO DC(on 132kV Kalarangi 'T')	1.6 k.m.
132 kV Samagara - Satasankha DC	56.946 k.m.
132 kV Global LILO DC(on Chainpal - FCI ckt-I)	4.614 k.m.
132 kV Brajrajnagar -Kechobahal RTSS SC (in DC Towers)	11.752 k.m.
132 kV Atri LILO MC on (132 kV Khurda - Chandpur) and on (132 kV Khurda - Shamuka)	42.842 k.m.
132 kV Deogaon Road RTSS (from 132/33 kV Tusura S/s)	9.991 k.m.
132 kV RAMCO LILO DC(on Jajpur Road-Kendrapada ckt-II)	8.25 k.m.
132 kV Bhawanipatna- Lanjigarh RTSS SC (on DC Towers)	34.584 k.m.
132 kV Brajabiharipur LILO DC(on 132 kV Bidanasi - Chandaka SC at Loc No. 14-15)	8.26 k.m.
132 kV Jayapatna - Dabugaon SC on DC	66.39 k.m.
132 kV from Bhubaneswar GSS to Mancheswar – B GIS SC UG cable	5.18 k.m.
132 kV Maneswar LILO DC (Sambalpur - Rairakhol SC)	5.74 k.m.
132 kV Jayanagar - Tentulikhunti SC on DC Ckt-II	58.29 k.m.
132 kV Shree Cements Ltd. SC on DC line (From Khuntuni GIS)	6.45 k.m.
132 kV Bargarh New LILO DC (Bargarh-Barpali SC line)	9.6 k.m.
132 kV RTSS Godabhaga SC on DC	10.656 k.m.
132 kV RTSS Maneswar SC on DC	5.26 k.m.
132 kV G. Udaygiri LILO DC (from 132 kV Bhanjanagar-Phulbani SC line)	23 k.m.
132 kV Pratapsasan - Phulnakhara DC	30.076 k.m.

3 **PERFORMANCE OF OPTCL DURING 2020-21**

3 A. **POWER SUPPLY SECURITY**

3 A.1 Load Restriction due to non-availability of Generation / Failure of generating Stations.

Duration	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>	<u>Annual</u>
(In Hrs)	0.00	0.00	0.00	0.00	0.00
Percentage(%)	0.00	0.00	0.00	0.00	0.00

* —▶ Load restriction imposed in the State on rotation basis to curtail the demand.

3 B. **TRANSMISSION SECURITY**

3 B.1 Load Restriction due to non-availability of Transmission capacity

Duration	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>	<u>Annual</u>
(In Hrs)	0	0	0.00	0	0
Percentage(%)	0.00	0.00	0.00	0.00	0.00

3 B.2 Rescheduling of Generation due to non- availability of Transmission capacity

Duration	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>	<u>Annual</u>
(In Hrs)	0	0	0	0	0
Percentage(%)	0	0	0	0	0

3 C **OVERALL PERFORMANCE**

3 C-1 **FREQUENCY**

(i) Above 50.05 Hz

Duration	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>	<u>Annual</u>
(In Hrs)	466.15	325.77	344.33	384.73	1520.98
Percentage(%)	21.34	14.75	15.59	17.81	17.36

(ii) Maximum continous period beyond 50.05 Hz

Duration	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>	<u>Annual</u>
(In Hrs)	2.32	2.07	1.03	1.73	2.32
Percentage(%)	0.10	0.09	0.05	0.08	0.03

(iii) Maximum Frequency occurrence

Duration	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>	<u>Annual</u>
Hz	50.30	50.32	50.17	50.18	50.32
Date/Time	<u>21.06.20</u> 09:57 hr	<u>05.07.20</u> 03:30 hr	<u>16.11.20</u> 00:00 hr	<u>06.01.21</u> 13:00hr	<u>05.07.20</u> 03:30 hr

(iv) Below 49.9 Hz

Duration	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>	<u>Annual</u>
(In Hrs)	93.17	120.23	105.00	148.15	466.55
Percentage(%)	4.27	5.45	4.76	6.86	5.33

(v) Maxm. Continous period below 49.9 Hz

Duration	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>	<u>Annual</u>
(In Hrs)	0.70	1.03	0.77	0.72	1.03
Percentage(%)	0.03	0.05	0.03	0.03	0.01

(vi) Lowest Frequency Occurrence

Duration	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>	<u>Annual</u>
Hz	49.62	49.69	49.72	49.70	49.62
Date/Time	<u>01.04.20</u> 22:09 hr	<u>19.09.20</u> 18:15 hr	<u>05.11.20</u> 17:15 hr	<u>25.02.21</u> 06:45 hr	<u>01.04.20</u> 22:09 hr

3. C - 2 VOLTAGE PROFILE (2020-21)

MAXIMUM VOLTAGES OF MAJOR GRID SUB-STATIONS. (400kV)

Sl. No.	Name of the Sub-station	Quarter - 1			Quarter - 2			Quarter - 3			Quarter - 4			ANNUAL		
		Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.
1	Duburi (N)	431.454	20.05.20	10:15	423.544	20.08.20	05:15	424.93	30.12.20	03:45	425.854	02.01.21	03:00	431.45	20.05.20	10:15
2	Lapanga	417.19	29.05.20	04:00	417.655	15.08.20	14:15	415.923	05.10.20	04:00	414.54	02.01.21	03:30	417.66	15.08.20	14:15
3	Mendhasal	428.74	20.05.20	10:15	418.637	15.08.20	06:00	425.05	20.12.20	03:15	426.37	02.01.21	03:00	428.74	20.05.20	10:15
4	Meramundali	431.05	08.05.20	19:00	424.12	15.08.20	12:15	432.031	20.12.20	03:15	433.59	04.02.21	02:00	433.59	04.02.21	02:00

MINIMUM VOLTAGES OF MAJOR GRID SUB-STATIONS. (400kV)

Sl. No.	Name of the Sub-station	Quarter - 1			Quarter - 2			Quarter - 3			Quarter - 4			ANNUAL		
		Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.
1	Duburi (N)	394.157	30.06.20	20:15	396.00	01.07.20	00:30	406.34	09.10.20	19:30	402.529	23.03.21	21:00	394.16	30.06.20	20:15
2	Lapanga	385.728	01.05.20	15:00	408.59	28.09.20	12:45	407.67	17.10.20	20:30	404.61	25.03.21	15:45	385.73	01.05.20	15:00
3	Mendhasal	394.503	05.06.20	15:00	396.755	17.07.20	22:45	402.99	09.10.20	18:30	395.889	16.03.21	15:00	394.50	05.06.20	15:00
4	Meramundali	398.20	06.06.20	19:30	409.86	13.09.20	22:45	408.76	03.12.20	10:45	413.152	23.03.21	10:15	398.20	06.06.20	19:30

MAXIMUM VOLTAGES OF MAJOR GRID SUB-STATIONS. (220kV)

Sl. No.	Name of the Sub-station	Quarter - 1			Quarter - 2			Quarter - 3			Quarter - 4			ANNUAL		
		Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.
1	ATRI	240.75	24.04.20	18:15	232.608	15.08.20	05:30	240.844	10.12.20	02:30	235.841	02.01.21	03:15	240.84	10.12.20	02:30
2	Balasore	241.67	21.04.20	21:15	233.647	26.08.20	06:00	237.69	20.12.20	01:45	238.496	02.01.21	03:00	241.67	21.04.20	21:15
3	Bhadrak	243.866	21.04.20	21:00	233.762	26.08.20	06:00	237.63	26.12.20	04:15	234.859	11.01.21	02:15	243.87	21.04.20	21:00
4	Bhanjanagar	244.616	01.05.20	15:45	236.938	26.08.20	16:00	241.845	20.12.20	01:45	237.284	04.01.21	03:30	244.62	01.05.20	15:45
5	Bidanasi	241.152	20.05.20	10:15	232.723	26.08.20	06:00	238.323	10.12.20	02:30	241.556	02.01.21	03:15	241.56	02.01.21	03:15
6	Budhipadar	232.839	07.05.20	05:15	232.03	05.07.20	03:45	231.973	12.12.20	04:15	239.362	02.01.21	03:00	239.36	02.01.21	03:00
7	Chandaka	239.478	20.05.20	10:15	231.568	26.08.20	05:45	235.783	20.12.20	01:45	230.933	03.01.21	03:15	239.48	20.05.20	10:15
8	Duburi	238.323	20.05.20	10:15	233.647	26.08.20	06:00	235.898	26.12.20	04:15	235.956	02.01.21	03:15	238.32	20.05.20	10:15
9	Jaynagar	244.963	03.06.20	15:30	241.094	15.08.20	11:30	241.383	26.11.20	03:45	242.769	20.01.21	03:30	244.96	03.06.20	15:30
10	Joda	230.645	07.05.20	05:15	228.739	27.08.20	05:45	230.298	05.12.20	03:00	229.317	02.01.21	03:15	230.64	07.05.20	05:15
11	Katapalli	230.587	07.05.20	05:15	228.624	27.08.20	05:45	230.241	05.12.20	02:45	229.201	02.01.21	03:15	230.59	07.05.20	05:15
12	Lapanga	232.03	30.05.20	02:00	231.337	05.07.20	03:45	231.164	27.11.20	03:15	230.356	02.01.21	03:30	232.03	30.05.20	02:00
13	Laxmipur	242.884	20.05.20	05:30	241.27	20.08.20	06:45	242.94	30.11.20	09:45	244.39	20.01.21	03:30	244.39	20.01.21	03:30
14	Mendhasal	241.04	24.04.20	18:15	233.53	15.08.20	05:30	238.50	20.12.20	01:45	239.48	02.01.21	03:00	241.04	24.04.20	18:15
15	Meramundali	232.03	21.06.20	13:15	232.377	15.08.20	14:00	234.628	26.12.20	02:30	235.263	23.02.21	01:45	235.26	23.02.21	01:45
16	Narendrapur	241.73	06.05.20	08:30	235.321	16.08.20	17:00	240.863	29.12.20	03:30	241.441	02.01.21	01:45	241.73	06.05.20	08:30
17	Nayagarh	242.08	20.05.20	10:15	236.649	26.08.20	16:15	239.07	20.12.20	01:45	239.305	02.01.21	03:00	242.08	20.05.20	10:15
18	Paradeep	242.538	20.05.20	10:15	234.51	26.08.20	06:00	237.11	30.12.20	05:45	236.24	11.01.21	02:15	242.54	20.05.20	10:15
19	Sadeipali	236.48	07.05.20	03:30	232.15	27.08.20	05:45	229.26	27.10.20	04:15	229.49	02.01.21	03:30	236.48	07.05.20	03:30
20	Tarkera	239.77	01.05.20	13:45	235.78	01.09.20	22:00	232.55	10.11.20	05:00	232.38	05.02.21	04:15	239.77	01.05.20	13:45
21	Theruvuli	239.71	21.04.20	16:30	238.61	05.08.20	06:45	242.31	30.11.20	09:45	242.71	20.01.21	13:45	242.71	20.01.21	13:45

MINIMUM VOLTAGES OF MAJOR GRID SUB-STATIONS. (220kV)

Sl. No.	Name of the Sub-station	Quarter - 1			Quarter - 2			Quarter - 3			Quarter - 4			ANNUAL		
		Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.
1	ATRI	216.27	05.06.20	15:30	211.824	31.07.20	13:30	221.638	09.10.20	18:30	217.655	23.03.21	12:15	211.82	31.07.20	13:30
2	Balasore	211.77	29.06.20	21:45	210.092	03.07.20	15:15	216.327	09.10.20	12:15	212.516	31.03.21	11:15	210.09	03.07.20	15:15
3	Bhadrak	202.471	18.06.20	11:45	197.275	09.08.20	21:15	210.438	09.10.20	12:15	215.057	23.03.21	19:15	197.27	09.08.20	21:15
4	Bhanjanagar	218.059	26.05.20	14:15	212.516	08.07.20	18:00	224.814	16.12.20	08:30	223.543	23.03.21	16:15	212.52	08.07.20	18:00
5	Bidanasi	211.766	05.06.20	15:00	210.034	31.07.20	13:30	219.675	09.10.20	18:30	213.613	23.03.21	14:30	210.03	31.07.20	13:30
6	Budhipadar	215.114	29.04.20	11:30	224.06	08.09.20	18:45	204.78	10.12.20	18:30	222.793	13.02.21	14:45	204.78	10.12.20	18:30
7	Chandaka	212.75	05.06.20	15:00	209.11	31.07.20	13:15	218.867	07.10.20	18:15	204.261	23.03.21	12:15	204.26	23.03.21	12:15
8	Duburi	213.729	30.06.20	22:00	214.941	01.07.20	00:30	223.139	10.10.20	19:00	219.964	23.03.21	21:00	213.73	30.06.20	22:00
9	Jaynagar	230.298	27.05.20	15:15	231.049	24.09.20	18:30	231.973	21.11.20	09:00	229.317	24.03.21	12:00	229.32	24.03.21	12:00
10	Joda	218.232	06.04.20	17:00	210.78	02.09.20	14:30	219.04	28.12.20	07:45	217.597	16.03.21	18:30	210.78	02.09.20	14:30
11	Katapalli	218.2	06.04.20	17:00	210.842	02.09.20	14:30	218.925	28.12.20	07:45	217.597	16.03.21	18:30	210.84	02.09.20	14:30
12	Lapanga	221.35	08.05.20	16:00	203.683	29.09.20	17:30	224.64	24.11.20	11:45	222.562	16.03.21	10:30	203.68	29.09.20	17:30
13	Laxmipur	227.87	27.05.20	15:15	230.18	03.09.20	19:00	232.03	09.10.20	18:15	227.99	24.03.21	12:00	227.87	27.05.20	15:15
14	Mendhasal	215.81	05.06.20	15:00	211.71	31.07.20	13:30	222.22	09.10.20	18:30	218.12	23.03.21	12:15	211.71	31.07.20	13:30
15	Meramundali	223.08	05.04.20	20:30	224.236	26.07.20	23:15	226.372	01.10.20	01:30	223.428	23.03.21	16:30	223.08	05.04.20	20:30
16	Narendrapur	211.59	27.05.20	15:15	215.172	31.07.20	13:30	219.791	09.10.20	11:45	210.496	17.03.21	08:45	210.50	17.03.21	08:45
17	Nayagarh	215.923	10.06.20	12:30	214.36	31.07.20	13:30	222.851	20.10.20	18:15	219.444	31.03.21	22:30	214.36	31.07.20	13:30
18	Paradeep	202.182	30.06.20	22:00	203.68	01.07.20	00:30	216.04	06.11.20	17:30	204.90	31.03.21	14:45	202.18	30.06.20	22:00
19	Sadeipali	194.85	02.04.20	09:45	195.72	29.07.20	09:45	207.44	28.12.20	07:45	210.32	16.03.21	18:30	194.85	02.04.20	09:45
20	Tarkera	224.12	18.04.20	15:45	223.54	28.09.20	11:00	217.48	10.12.20	16:30	222.50	28.01.21	11:00	217.48	10.12.20	16:30
21	Theruvuli	224.29	09.06.20	14:00	223.49	03.09.20	18:45	226.66	09.10.20	18:00	222.04	23.03.21	16:15	222.04	23.03.21	16:15

MAXIMUM VOLTAGES OF MAJOR GRID SUB-STATIONS. (132kV)

Sl. No.	Name of the Sub-station	Quarter - 1			Quarter - 2			Quarter - 3			Quarter - 4			ANNUAL		
		Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.
1	Cuttack	140.812	24.04.20	18:15	138.73	23.08.20	17:45	139.02	03.10.20	14:00	138.906	27.03.21	18:00	140.81	24.04.20	18:15
2	Berhampur	143.35	08.04.20	19:00	136.828	08.08.20	16:00	139.6	29.12.20	03:30	139.60	02.01.21	01:30	143.35	08.04.20	19:00
3	Puri	140.81	20.06.20	06:00	133.884	26.08.20	05:45	136.31	24.11.20	01:15	136.71	08.01.21	03:00	140.81	20.06.20	06:00
4	Khurda	139.95	20.06.20	05:45	136.135	15.08.20	05:30	138.68	25.11.20	02:30	137.81	02.01.21	03:00	139.95	20.06.20	05:45

MINIMUM VOLTAGES OF MAJOR GRID SUB-STATIONS. (132kV)

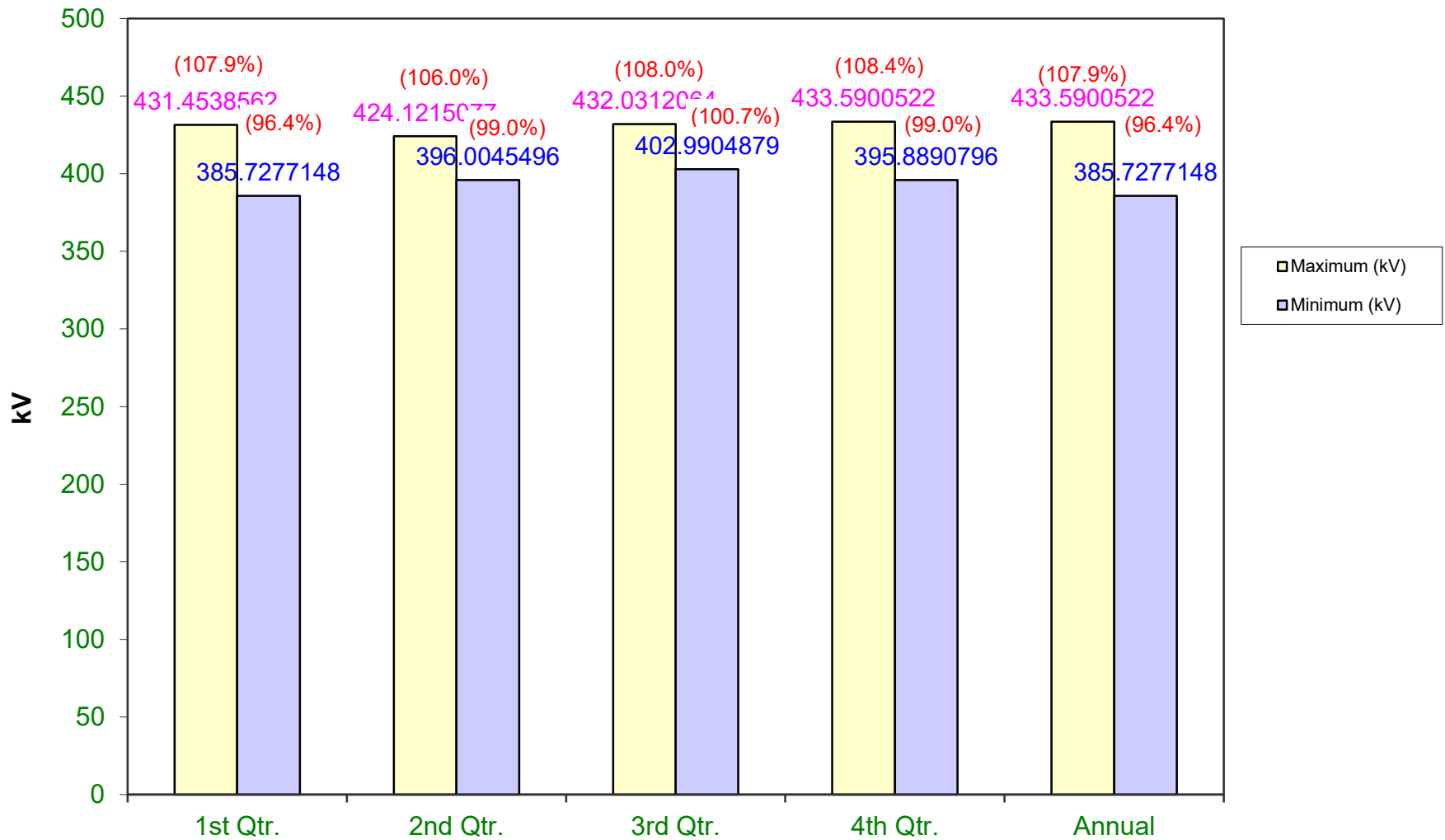
Sl. No.	Name of the Sub-station	Quarter - 1			Quarter - 2			Quarter - 3			Quarter - 4			ANNUAL		
		Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.
1	Cuttack	123.318	05.06.20	14:30	123.09	31.07.20	13:15	123.09	16.12.20	17:30	120.663	31.03.21	12:30	120.66	31.03.21	12:30
2	Berhampur	120.836	26.05.20	14:15	108.65	08.07.20	11:15	124.93	16.12.20	08:30	120.78	17.03.21	08:45	108.65	08.07.20	11:15
3	Puri	115.64	23.05.20	22:45	113.677	31.07.20	13:30	116.62	17.10.20	19:30	109.578	08.03.21	11:30	109.58	08.03.21	11:30
4	Khurda	123.549	26.05.20	14:30	122.91	31.07.20	13:30	128.86	09.10.20	18:00	125.455	16.03.21	12:15	122.91	31.07.20	13:30

Note:

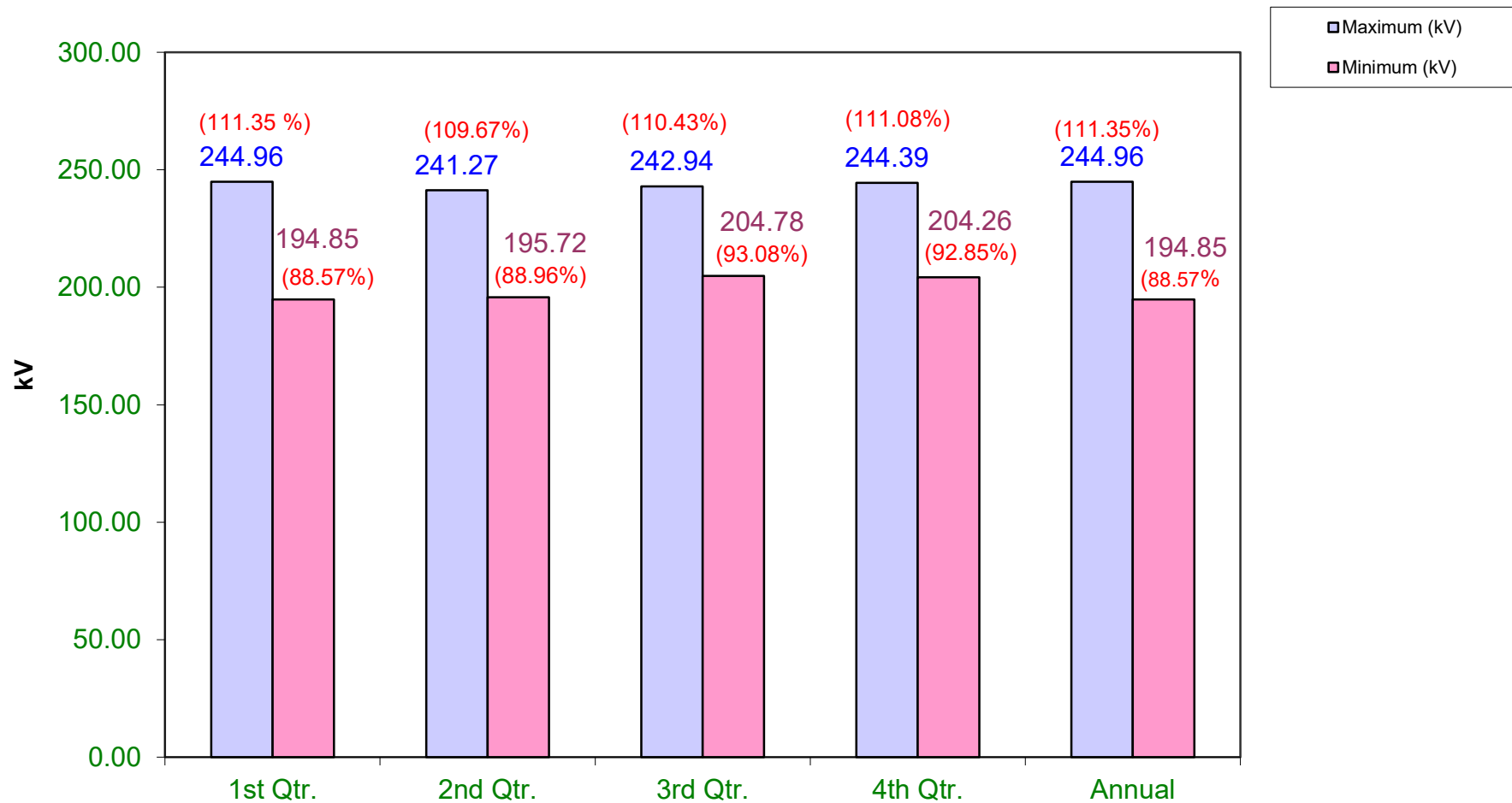
The bus voltages are recorded from 15min block voltage from meter data .

Further, low voltages during contingency conditions are also recorded as minimum voltages excluding disturbance period and any PT failure period.

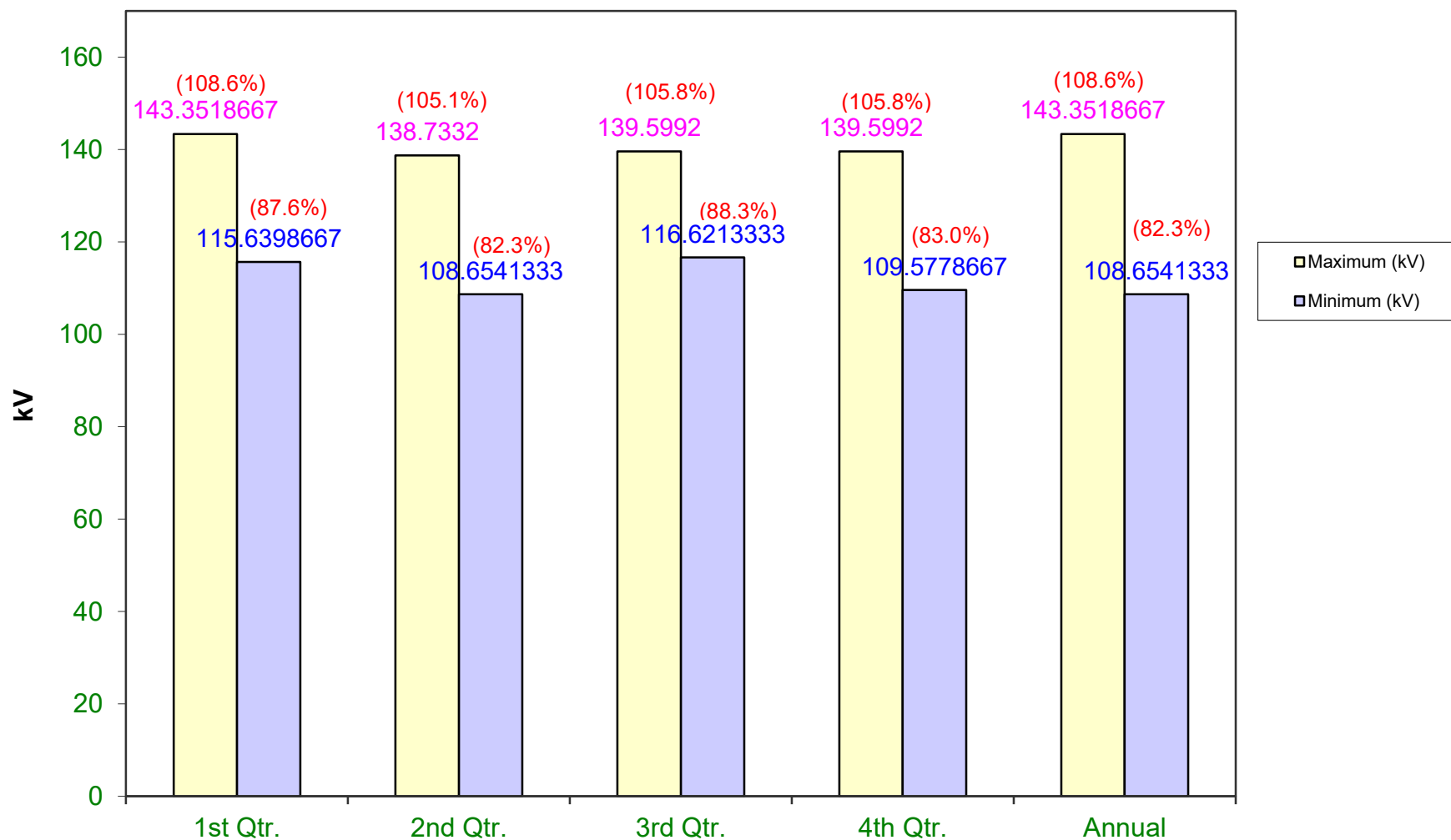
OVERALL PERFORMANCE VOLTAGE AT 400 kV



OVERALL PERFORMANCE VOLTAGE AT 220kV

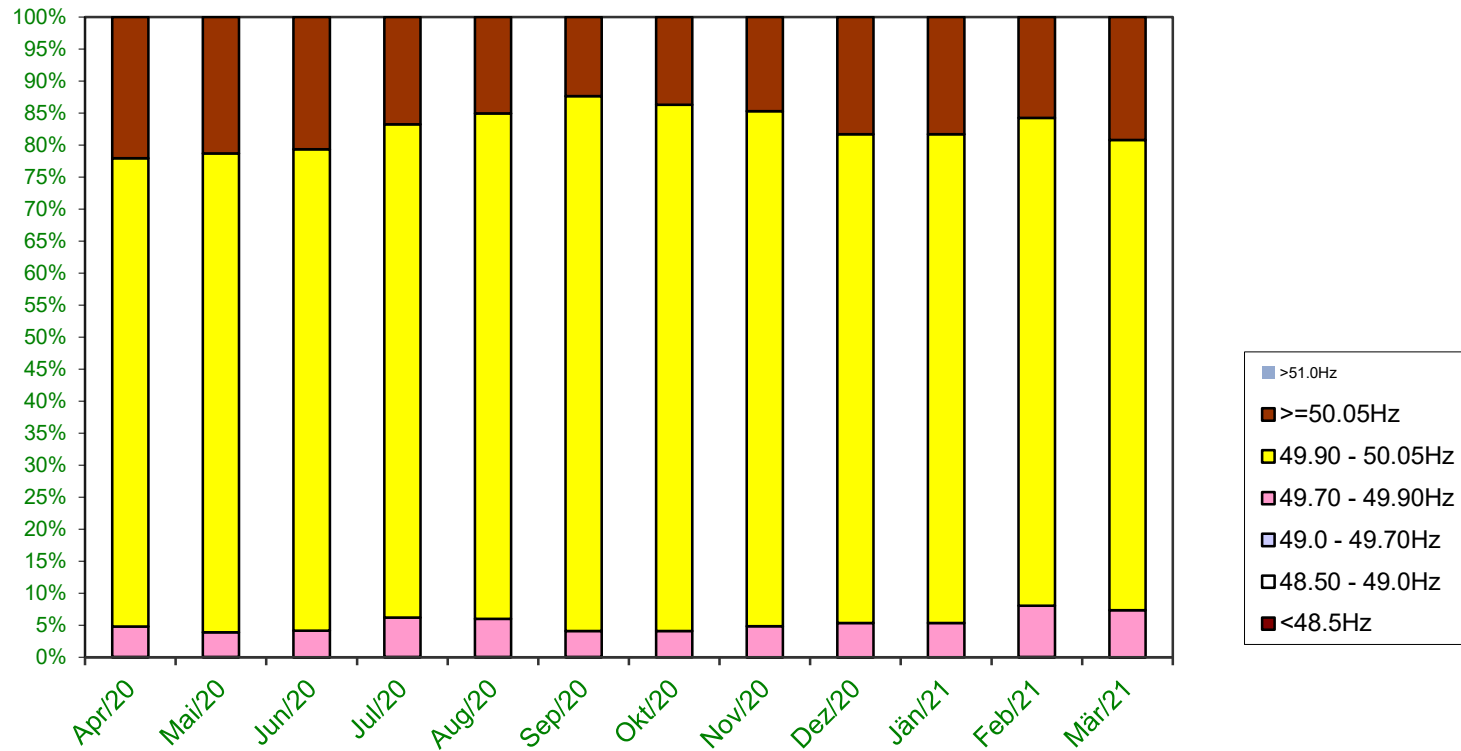


OVERALL PERFORMANCE VOLTAGE AT 132 kV



Frequency Performance FOR FY 2020-21

Percentage time occurrence

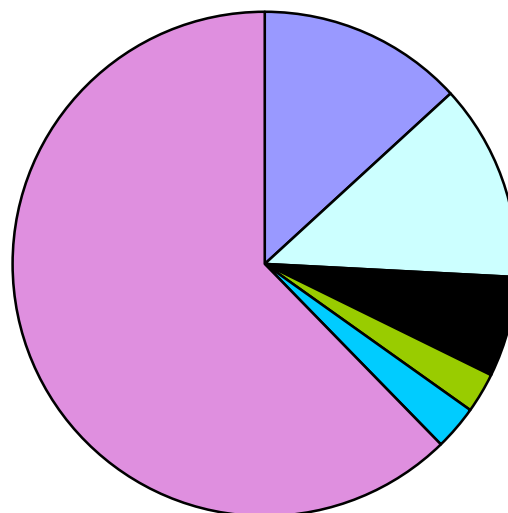


Months

INTERRUPTION DUE TO MAJOR INCIDENT

Incident	Duration of Interruption	No. of Interruption
Snapping of Jumper / Conductor / Earth wire	33:57:00	45
Insulator Failure	32:33:00	35
Bursting of CT / PT	16:26:00	18
Breaker Problem	0:08:00	1
Major System Disturbance*	6:37:00	6
Failure of LA	7:21:00	17
Others	160:23:00	379
The duration of interruption indicated above is the sum total of interruptions occurred at different areas(S/s) during the year. However there was no total blackout experienced for the State during the year 2020-21.		

INTERRUPTION (HRS) DUE TO MAJOR INCIDENT DURING 2020-21



- Snapping of Jumper / Conductor / Earth wire
- Insulator Failure
- Bursting of CT / PT
- Breaker Problem
- Major System Disturbance*
- Failure of LA
- Others