

# ***OPTCL***



**(Approved by OERC vide Letter No. OERC-Engg-5/98 (Vol.XVIII)/ 1644 dt. 18.11.2017)**

## **PERFORMANCE OF THE TRANSMISSION SYSTEM OF OPTCL FOR 2016-2017**

[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 2016-17.****1. Procurement of Power:**

Source	Commission's Approval ( MU)	Actual Drawl for the State Consumption (MU)	Remarks
OHPC	5881.74	4623.53	State's Maximum and Minimum demand was 4105 MW and 3269 MW respectively
Thermal(TTPS+OPGC)	6011.90	6251.61	
CPP & Co-generation Plants	0	741.58	
Renewable Generation	665.00	618.34	
IPP	8034.16	4942.29	
EREB	4900.07	8308.45	
Net Banking +IEX+STOA		-1213.06	
<b>Total</b>	25492.87	24272.74	

**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	Jaynagar	246	219
2	Theruvali	246	199
3	Bhanjanagar	259	202
4	Chandaka	242	181
5	Narendrapur	267	166
6	Joda	242	212
7	Tarkera	238	211
8	Budhipadar	239	219
9	Duburi	239	197
10	Balasore	244	192
11	Meramundali	242	215
12	Bidanasi	241	195
13	Katapalli	233	192
14	Bhadrak	241	195
15	Paradeep	235	191
16	Bolangir	235	178
17	Mendhasal	238	182

**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	143	109
2	Berhampur	153	105
3	Puri	139	96
4	Khurda	152	93

**3. System Interruptions due to Major Incident:**

<b>INTERRUPTION DUE TO MAJOR INCIDENT</b>			
Incident Duration of Interruption No. of Interruption	Duration of Interruption (Hrs:Min:Sec)	No. of Interruption	Remarks
Snapping of Jumper / Conductor / Earth wire	24:15:00	54	The duration of interruption indicated 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 2016-17.
Insulator Failure	45:56:00	42	
Bursting of CT / PT	15:36:00	11	
Breaker Problem	1:13:00	3	
Major System Disturbance	4:00:00	7	
Failure of LA	17:55:00	27	
Others	95:46:00	129	

**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](http://www.sldcorissa.org.in)

**COMMISSION'S OBSERVATION ON THE PERFORMANCE OF THE  
TRANSMISSION SYSTEM OF OPTCL FOR 2016-17**

The salient features of the performance of transmission system of OPTCL for the year 2016-17 is given below and the detail information in support to that is available in SLDC website i.e., [www.sldcorissa.org.in](http://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 2016-17 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	4623.53	State's Maximum and Minimum demand was 4105 MW and 3269 MW respectively
Thermal(TTPS+OPGC)	6011.90	6251.61	
CPP & Co-generation Plants	0	741.58	
Renewable Generation	665.00	618.34	
IPP	8034.16	4942.29	
EREB	4900.07	8308.45	
Net Banking +IEX+STOA		-1213.06	
Total	25492.87	24272.74	

There is an import of 243.740 MU through power banking, open access, trading & IEX) and export of 1456.80MU (33.128 as sales to other utilities, 200.033 on account of deviation and 1223.639 through trading, OA, banking & IEX export) during the FY 2016-17. Hence, in the said financial year GRIDCO has an export of 1213.06 MU on this account.

2. During FY 2016-17 the daily peak demand touched at 4105 MW maximum on dt.29.08.2016 and a minimum of 3269 MW on dt.25.05.2016. The peak demand of 4105 MW in 2016-17 is about 70 MW less than the peak demand experienced during the previous year 2015-16 (4175 MW). The total energy drawl is 24273 MU in FY 2016-17 against 24615 MU in 2015-16, which indicates a reduction in electricity consumption of around 342 MU in the State.

**B. Line Interruption:**

3. OPTCL's system has faced aggregated Annual interruptions varying from 1 hour to 95 hours at different locations on account of conductor/jumper/earth wire snapping, insulator failure, bursting of Current Transformer/Potential Transformer, breaker problem, system disturbance, Lightening Arrester failures and others. 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 about 29 hours of load restriction in the second quarter of the FY 2016-17 on rotation basis 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 2016-17. OPTCL should find out latest technical methods for effective utilization of existing/proposed higher level transmission system by upgrading the existing substation/ transmission lines and equipments to increase power transfer capacity, reliability & to avoid RoW problem.

**C. Frequency Profile:**

4. As per Regulations 3(1)(a) of Central Electricity Authority(Grid Standards) Regulations, 2010, the frequency should not be allowed to go beyond the range 49.2 to 50.3 Hz, except during the transient period following tripping. 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, in 2016-17, has experienced frequency as low as 49.07 Hz and as high as 50.63 Hz during 2<sup>nd</sup> quarter. However, OPTCL does not have much control over the frequency parameter since it is dependant upon the National Grid. DISCOMs should adhere to their schedule drawl in order to reduce their drawl from the grid during low frequency and maintain grid discipline.

**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 166 kV minimum and 267 kV maximum in its 220 KV system and 93 KV minimum and 152 KV maximum in its 132 KV system. OPTCL is advised to take suitable measures to maintain the voltage profile within the allowable limit. OPTCL should also monitor the reactive drawl of DISCOMs from its grid S/S and wherever DISCOM draw

excessive reactive load at low voltage condition, the matter in grid S/S, it shall take up 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 2016-17 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 minimise system losses and should conduct comprehensive system study before proceeding for any network expansion plan.

**F. Efficient Operation of Transmission System:**

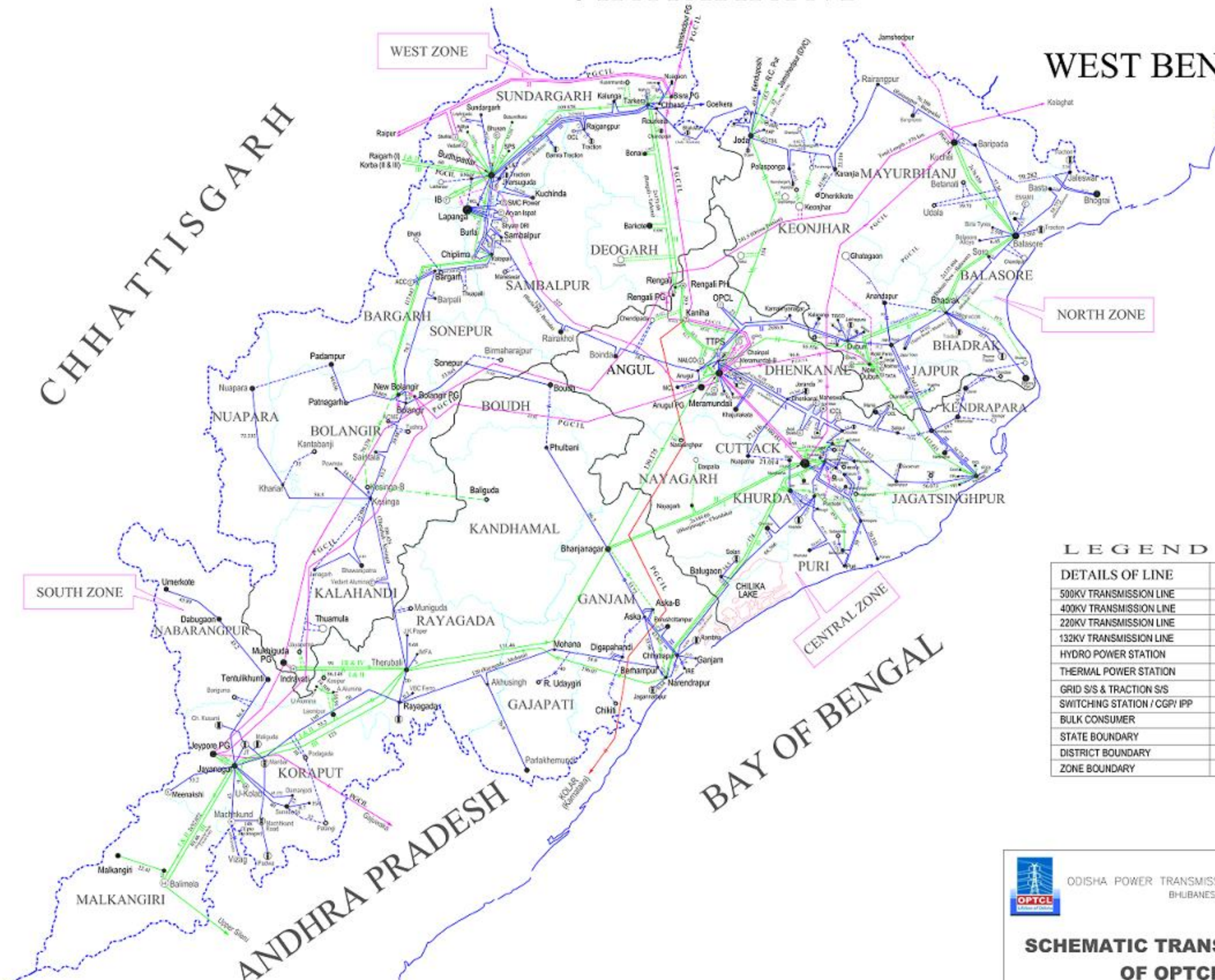
7. SLDC, being the nerve center of the electricity sector in Odisha should strengthen its IT, communication infrastructure etc. and train its staff's appropriately for efficient functioning. SLDC to act independently in accordance with law, while granting Open Access to the Users.

\*\*\*\*\*

# JHARKHAND

WEST BENGAL

CHHATTISGARH



## LEGEND

DETAILS OF LINE	Existing	Proposed / U/C
500KV TRANSMISSION LINE		
400KV TRANSMISSION LINE		
220KV TRANSMISSION LINE		
132KV TRANSMISSION LINE		
HYDRO POWER STATION		
THERMAL POWER STATION		
GRID S/S & TRACTION S/S		
SWITCHING STATION / CGPI IPP		
BULK CONSUMER		
STATE BOUNDARY		
DISTRICT BOUNDARY		
ZONE BOUNDARY		



ODISHA POWER TRANSMISSION CORPORATION LIMITED  
BHUBANESWAR

## SCHEMATIC TRANSMISSION MAP OF OPTCL

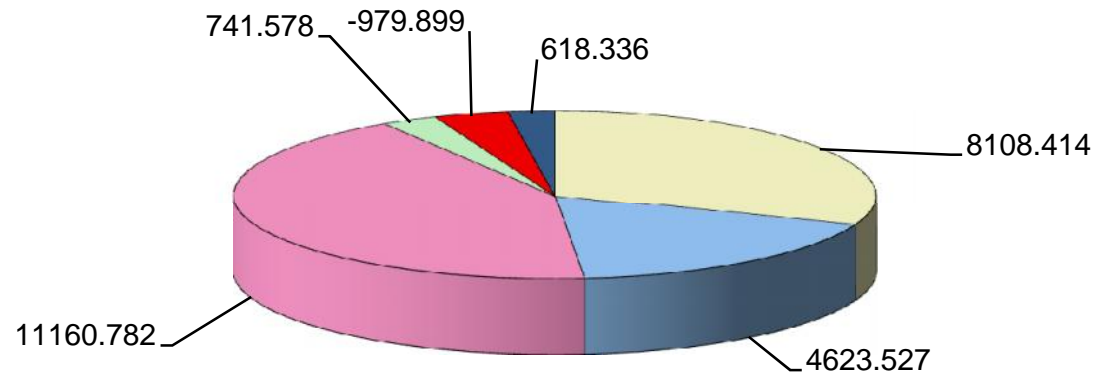
Length in kms.

NOT TO SCALE



## GRID DEMAND FOR THE YEAR 2016-17

[Total Drawal 24272.739 MU ]



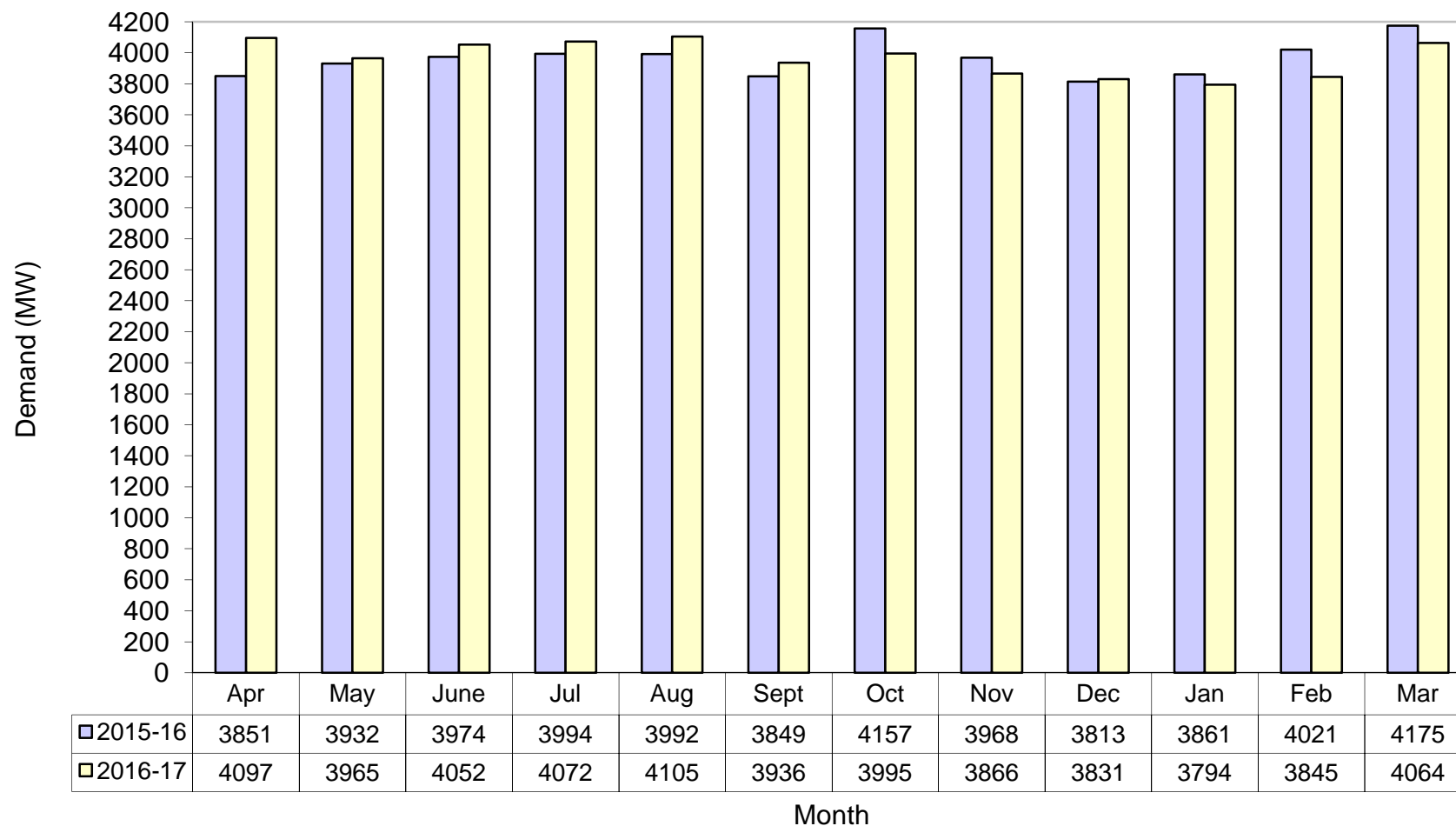
Net EREB Total Hydro NET Thermal (OPGC + TTPS+IPP) CPP Net (BankingPower+IEX+STOA) Renewable Energy

# DAILY PEAK DEMAND (MW) EXCLUDING TRADING FOR THE YEAR 2016-17

Day	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Max	Min
1	3291	3660	3590	3807	3708	3936	3947	3866	3456	3584	3629	3769	3947	3291
2	3759	3745	3484	3832	3710	3726	3841	3835	3602	3653	3495	3781	3841	3484
3	3682	3815	3488	3773	3765	3557	3715	3623	3569	3707	3581	3884	3884	3488
4	3743	3582	3747	3725	3798	3873	3995	3578	3464	3794	3577	3901	3995	3464
5	3824	3868	3786	3855	3691	3686	3564	3686	3546	3713	3456	3755	3868	3456
6	3595	3643	3935	3938	3796	3839	3367	3560	3611	3670	3634	3706	3938	3367
7	3757	3773	3861	3819	3749	3785	3622	3463	3698	3538	3691	3547	3861	3463
8	3667	3412	3572	3823	3900	3913	3624	3402	3577	3453	3700	3751	3913	3402
9	3797	3819	3377	3891	3339	3715	3610	3457	3585	3492	3472	3614	3891	3339
10	3878	3535	3874	3774	3710	3641	3616	3495	3624	3444	3531	3271	3878	3271
11	3882	3384	3664	3802	3737	3693	3674	3494	3528	3479	3560	3623	3882	3384
12	3934	3751	3805	3961	3838	3722	3752	3500	3417	3718	3457	3750	3961	3417
13	3793	3653	3753	4031	3994	3759	3807	3534	3286	3695	3516	3493	4031	3286
14	3830	3694	3804	3975	3900	3826	3698	3557	3398	3479	3479	3767	3975	3398
15	3802	3745	3768	3733	3748	3840	3715	3678	3490	3540	3480	3800	3840	3480
16	3822	3780	3482	3907	3547	3775	3990	3454	3419	3614	3559	3810	3990	3419
17	3762	3943	3615	3763	3657	3813	3844	3395	3490	3444	3546	3674	3943	3395
18	3571	3965	3644	4024	3799	3849	3804	3464	3476	3467	3572	3898	4024	3464
19	3849	3582	3771	3972	3906	3919	3689	3522	3403	3557	3469	3662	3972	3403
20	3808	3420	3884	3892	3950	3934	3726	3471	3342	3615	3797	3966	3966	3342
21	3849	3337	3909	4017	3941	3858	3610	3612	3417	3516	3772	3942	4017	3337
22	3859	3648	3959	4012	3747	3854	3804	3560	3418	3510	3766	3884	4012	3418
23	3748	3445	3680	4072	4099	3821	3711	3525	3465	3407	3845	3955	4099	3407
24	3886	3626	4052	4003	3941	3773	3790	3610	3477	3713	3653	3874	4052	3477
25	4003	3269	4046	3970	3711	3613	3789	3630	3520	3423	3814	3861	4046	3269
26	3810	3522	3761	3724	3876	3715	3710	3592	3492	3546	3744	3879	3879	3492
27	4097	3402	3917	3961	3908	3657	3696	3537	3516	3606	3670	4013	4097	3402
28	3980	3658	3938	4027	3992	3783	3783	3541	3518	3518	3670	3994	4027	3518
29	3755	3962	3951	3939	4105	3740	3800	3445	3476	3523	3845	4064	4105	3445
30	3884	3626	3959	3756	3994	3841	3598	3590	3624	3549		3905	3994	3549
31		3815		3762	3867		3823		3831	3713		3906	3906	3713
MAX	4097	3965	4052	4072	4105	3936	3995	3866	3831	3794	3845	4064	4105	3713
MIN	3291	3269	3377	3724	3339	3557	3367	3395	3286	3407	3456	3271	3840	3269



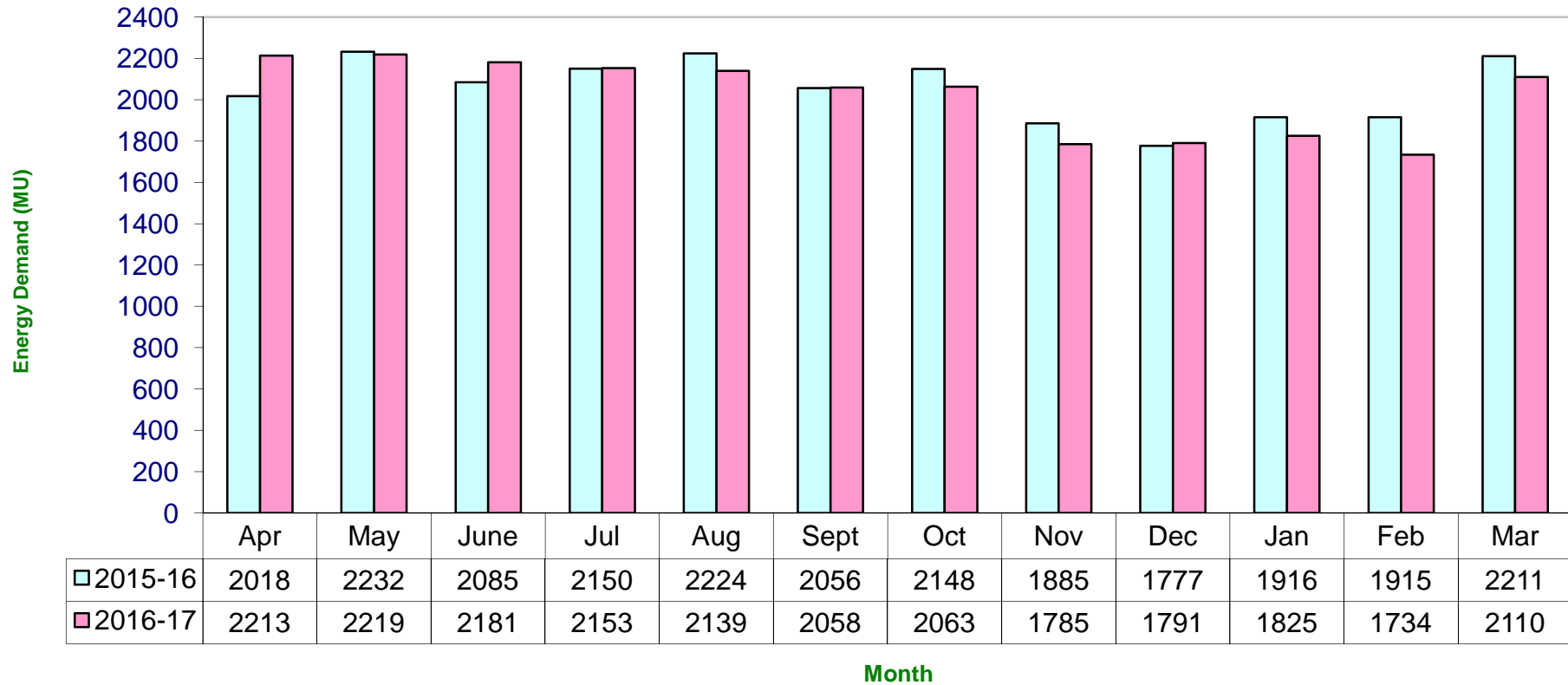
### COMPARISON OF MONTHLY PEAK DEMAND (MW) EXCLUDING TRADING FOR THE YEAR ENDING 2015-16 & 2016-17



Annual Peak Demand :      2015-16 - 4175 MW      2016-17 - 4105 MW

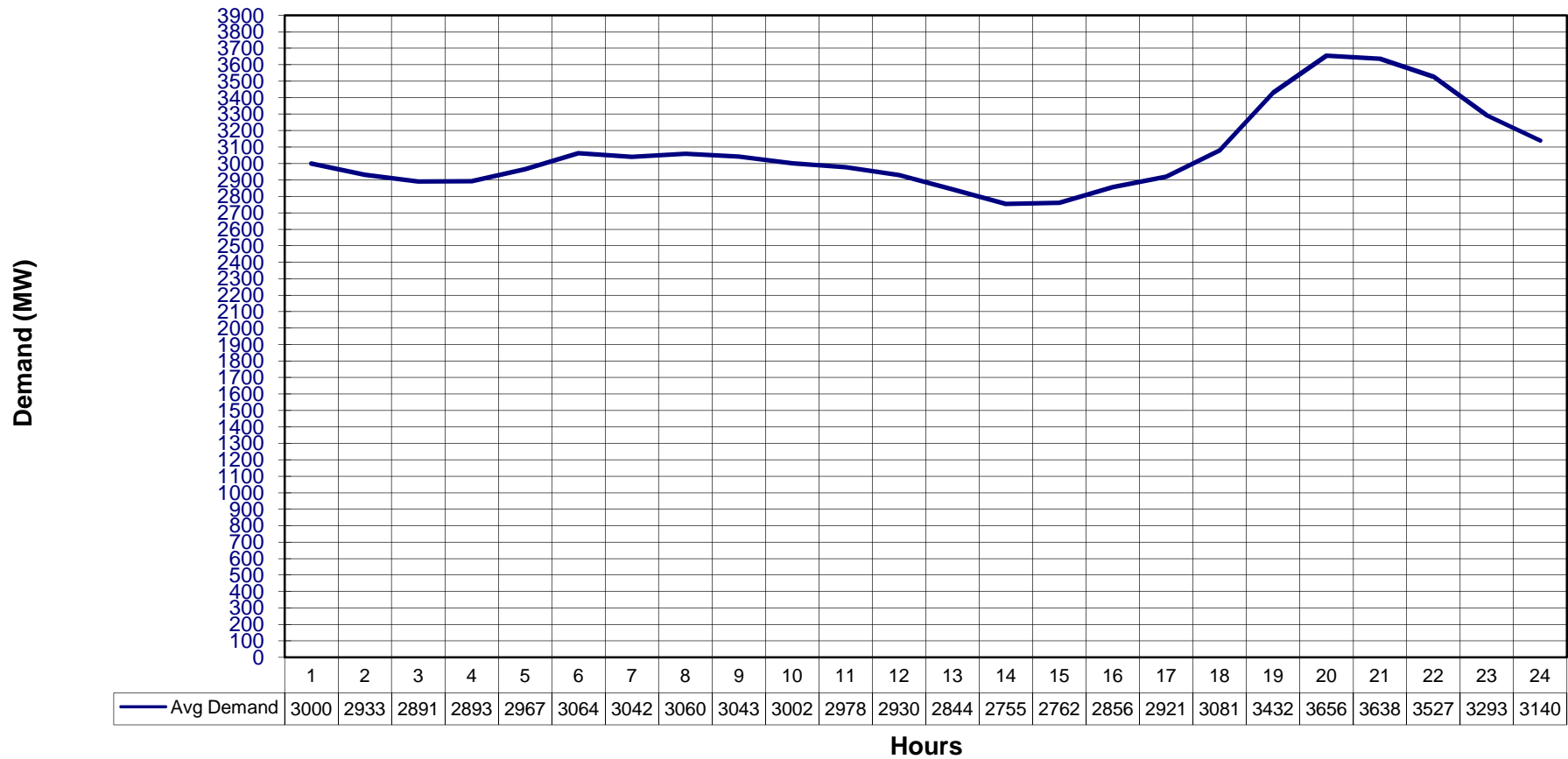
■ 2015-16    ■ 2016-17

## COMPARISON OF MONTHLY ENERGY DEMAND (MU) EXCLUDING TRADING & RETURN BANKING POWER FOR THE YEAR ENDING 2015-16 & 2016-17



Annual Energy Demand :      **2015-16 - 24615 MU**      **2016-17 - 24273 MU**

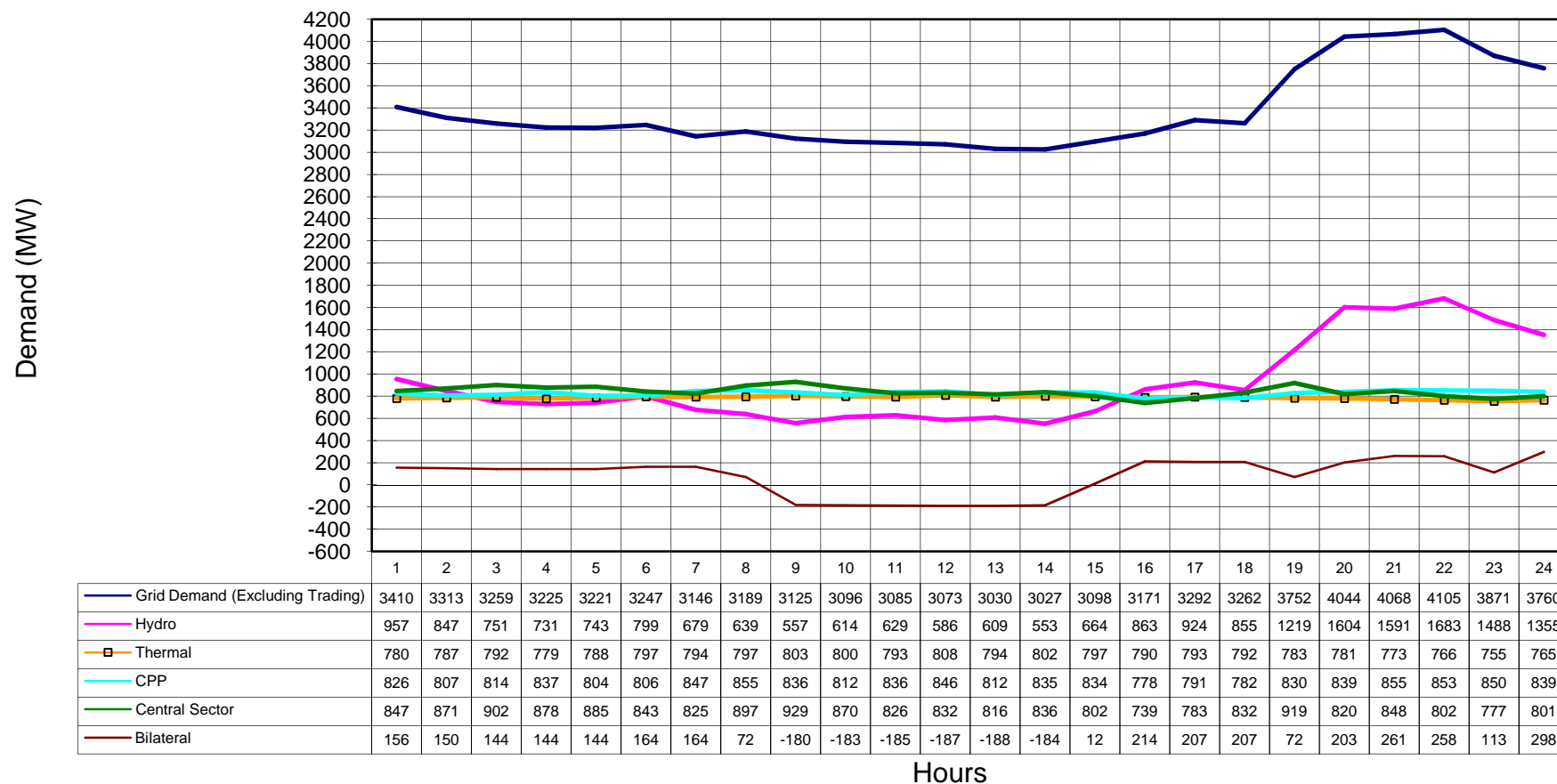
# DEMAND CURVE FOR HOURLY AVERAGE DEMAND EXCLUDING TRADING FOR YEAR ENDING MARCH 2017



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

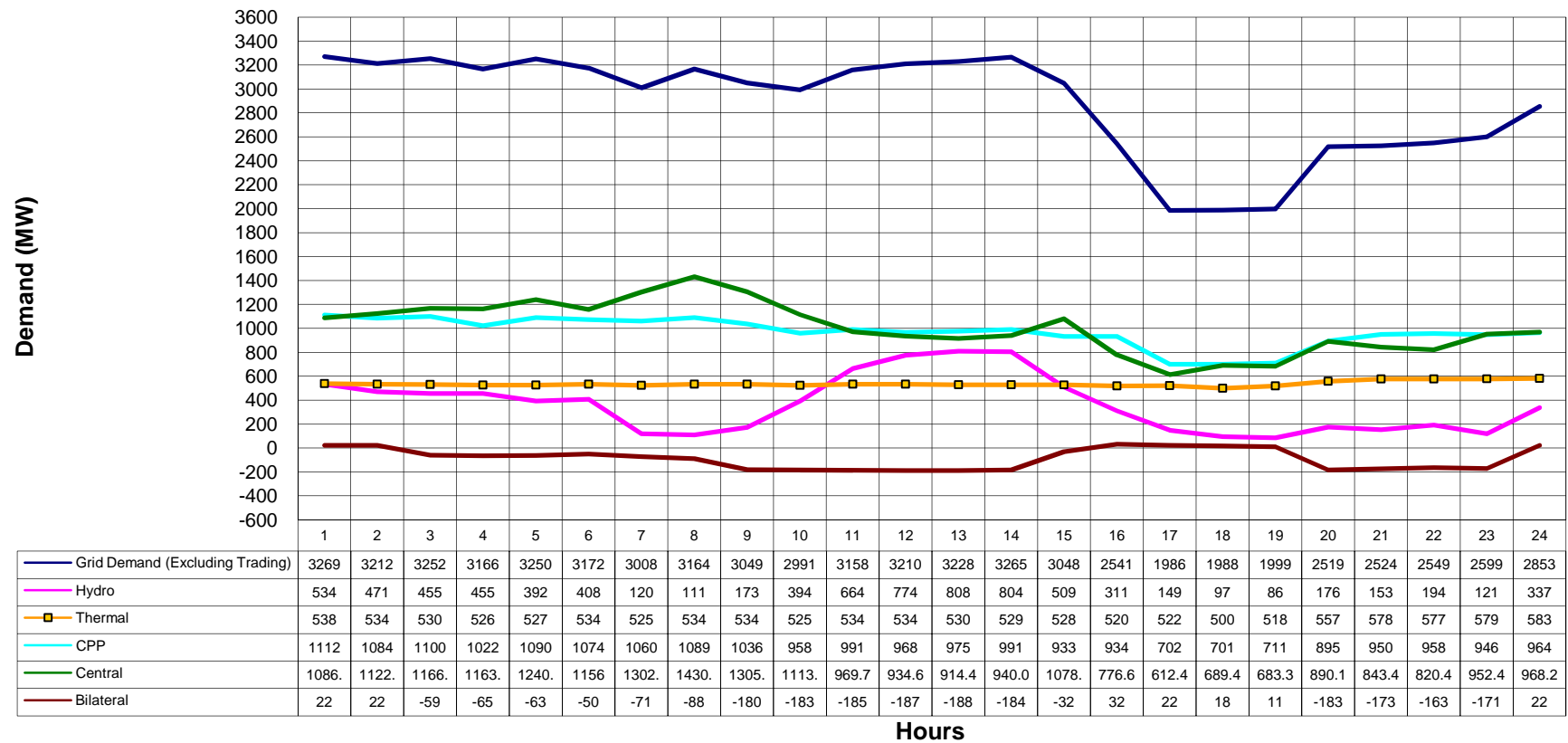
Hours---->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Apr-16	3022	2945	2907	2877	2942	2979	2864	2833	2853	2882	2912	2914	2869	2825	2838	2881	2828	2747	3136	3495	3489	3450	3283	3149
May-16	3289	3218	3187	3170	3201	3170	3001	3003	3002	3060	3137	3179	3186	3133	3164	3215	3138	2945	3141	3549	3608	3587	3501	3395
Jun-16	3258	3161	3107	3075	3110	3082	2989	3023	3012	3043	3052	3053	2991	2937	2984	3076	3087	2969	3164	3628	3678	3630	3475	3375
Jul-16	3167	3089	3037	3025	3060	3114	3090	3148	3122	3068	3017	2968	2928	2859	2852	2939	2973	2955	3231	3651	3687	3663	3451	3288
Aug-16	3295	3224	3168	3156	3183	3260	3214	3250	3217	3179	3141	3082	3040	2915	2942	3059	3101	3105	3449	3755	3754	3709	3535	3404
Sep-16	3235	3166	3155	3142	3187	3271	3006	3031	3042	2968	2925	2925	2859	2842	2824	2934	2959	3077	3386	3564	3514	3497	3367	3411
Oct-16	3233	3156	3093	3089	3149	3219	2991	2988	3008	2973	2904	2909	2859	2838	2849	2948	3027	3341	3700	3790	3721	3644	3445	3362
Nov-16	2657	2618	2588	2590	2739	2960	3018	3001	2963	2862	2749	2666	2573	2425	2418	2582	2772	3360	3702	3673	3526	3323	2959	2756
Dec-16	2363	2310	2279	2295	2448	2732	2950	2987	2954	2822	2729	2584	2455	2291	2220	2407	2637	3192	3512	3492	3371	3115	2724	2483
Jan-17	2429	2378	2339	2364	2513	2803	3071	3166	3139	2988	2862	2694	2540	2358	2332	2504	2724	3197	3586	3630	3485	3176	2789	2518
Feb-17	2795	2776	2758	2842	2942	3015	3126	3134	3127	3034	3180	3102	2787	2733	2788	2741	2793	2925	3639	3766	3969	3839	3487	3134
Mar-17	3253	3152	3079	3093	3126	3159	3181	3149	3082	3142	3123	3089	3041	2903	2935	2990	3011	3154	3531	3878	3854	3697	3503	3406
Avg. Annual	3000	2933	2891	2893	2967	3064	3042	3060	3043	3002	2978	2930	2844	2755	2762	2856	2921	3081	3432	3656	3638	3527	3293	3140

## HOURLY DEMAND CURVE FOR 29.08.2016 (MAX PEAK DEMAND OF THE YEAR (2016-17))



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

## HOURLY DEMAND CURVE FOR 25.05.2016 (MIN PEAK DEMAND OF THE YEAR 2016-17)



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

**1 INSTALLED CAPACITY (AS ON 31.3.2017) ENERGY GENERATION / ENERGY  
DRAWAL BY OPTCL**

	Installed capacity (MW)	Energy Generation (incl. Aux) (MU)	Energy Drawal by GRIDCO (MU)
<b>A. STATE SECTOR</b>			
OHPC(Hydro)*	2084.875	4669.763	4623.527
OPGC (Thermal)	420	3179.840	2890.764
TTPS (Thermal)	460	3690.736	3355.215
TTPS (UI-OD)			5.638
IPPs			4942.294
CPP (Synchronised to OPTCL System)			741.578
Renewable Energy Including Co-gen	-		618.336
<b>B. CENTRAL SECTOR</b>			
Orissa Share			
Hydro	<b>189.40</b>		
Thermal	<b>1075.26</b>	-	8308.447
C. Banking Power+OA+Trading+IEX (Import)			243.740
<b>TOTAL DRAWAL</b>			<b>25729.539</b>
D. Banking Power+OA+Trading+IEX (Export)			1223.639
E. Deviation(Export)			200.033
F. Sold to Other Utilities			33.128
<b>Net GRIDCO demand</b>			<b>24272.739</b>

Export to ICCL 5.997  
Export to NALCO 0.004

\* Includes Orissa share from Machhkund.

**2 TRANSMISSION LINES AND SUBSTATIONS**

	As on <u>31.03.2016</u>	Capacity Addition <u>in 2016-2017</u>	As on <u>1.4.2017</u>	Remark
A. 400 kV line (ckt.km)	1129.434	0.000	1129.434	
B. 220kV line (ckt.km)	5868.34*	42.868	5911.208	*220kV Lapanga DC line KM corrected
C. 132kV line (ckt.km)	5821.057*	209.764	6030.821	*132kV Lapanga DC line KM corrected
<b>D. Substations</b>				
400 / 220 /132kV (nos.)	2	0	2	
400 / 220 (nos.)	1	0	1	
220/132/33kV (nos.)	18	2	20	Chandaka-B added and Cuttack( upgraded from 132/33 to 220/132/33kV Grid)
220/33kV (nos.)	5	2	7	Infocity-B and Malkangiri added.
132/33 kV (nos.)	76	3	79	Bangiriposhi, Khajuriakata, Bhogarai, Olavar added and Cuttack exluded.
132/33/25 kV (nos.)	1	0	1	
132/33/11 kV (nos.)	2	0	2	
132/11 kV (nos.)	0	0	0	
132kV Switching Stations (OPTCL)	4	0	4	
132kV LILO Switching Stations of Industries	16	0	16	
<b>Total</b>	<b>125</b>	<b>7</b>	<b>132</b>	

Note: 1. (The above data in (2) are received from O & M branch of OPTCL system.)

**Capacity addition details for 220kV:**

- 220 kV Bolangir PG LILO DC (220 kV Katapalli - New Bolangir Ckt-II)– 1.800 ckm
- 220 kV Bidanasi - Cuttack DC– 18.600 ckm
- 220 kV Balimela - Malkangiri SC (in DC Towers)– 22.410 ckm
- 220 kV Chandaka-B LILO DC (220kV Mendhasal - Chandaka Ckt-IV)– 0.058 ckm

**Capacity addition details for 132kV:**

- (a) 132 kV Atri - Arugul Ckt-I with Additional Portion from earlier charged 'T' connection– 15.540 ckm
- (b) 132 kV Atri - Arugul Ckt-II – 19.400 ckm
- 132 kV Bangiriposi LILO DC ( 132 kV Kuchei - Rairangpur ) – 1.400 ckm
- 132 kV Katapali LILO DC (Chiplima PH - Bburla PH Tie-I)– 2.660 ckm
- 132 kV Rayagada - Rayagada Traction SC– 2.646 ckm
- 132 kV Chainpal - Talcher Traction SC– 0.448 ckm
- 132 kV Khajuriakata LILO DC (on 132 kV Meramundali - Arati Ckt) – 31.060 ckm
- 132 kV Jajpur Road- Anandpur upgraded from SC to DC -30.0 ckm.
- 132 kV Kuchei - Jaleswar DC (Charged a portion from Bhogarai LILO to Jaleswar Loc 284 to Loc. 301)– 31.060 ckm
- 132 kV Bhogarai LILO DC– 53.434 ckm
- 132 kV Pattamundai - Olavar DC– 48.676 ckm



### 3 **PERFORMANCE OF OPTCL DURING 2016 - 17**

#### 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)	2.00	27.20	0.00	0.00	29.20
Percentage(%)	0.09	1.23	0.00	0.00	0.33

\* —→ 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)	239.25	329.00	428.98	397.65	1394.88
Percentage(%)	10.95	14.90	19.43	18.41	15.92

(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)	0.97	1.15	0.95	1.80	1.80
Percentage(%)	0.04	0.05	0.04	0.08	0.02

(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	50.41	50.63	50.30	50.36	50.63
Date/Time	<u>18.05.16</u> 17:32hr	<u>16.07.16</u> 15:41hr	<u>27.12.16</u> 06:04hr	<u>25.01.17</u> 15:17hr	<u>16.07.16</u> 15:41hr

(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)	303.22	162.00	204.87	167.48	837.57
Percentage(%)	13.88	7.34	9.28	7.75	9.56

(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)	2.03	1.47	0.92	0.47	2.03
Percentage(%)	0.09	0.07	0.042	0.022	0.023

(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	49.56	49.07	49.51	49.67	49.07
Date/Time	<u>26.05.16</u> 22:12 hr	<u>16.07.16</u> 16:14 hr	<u>30.11.16</u> 17:44hr	<u>27.03.17</u> 18:58hr	<u>16.07.16</u> 16:14 hr

### 3. C - 2 VOLTAGE PROFILE ( 2016-2017 )

#### 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	Jaynagar	245.83	19.06.16	04:15	243.98	31.07.16	12:00	243.52	18.11.16	11:45	243.46	02.01.17	02:15	245.83	19.06.16	04:15
2	Theruvai	246.35	15.04.16	13:15	238.67	05.08.16	09:45	236.94	19.12.16	23:15	235.32	02.01.17	02:15	246.35	15.04.16	13:15
3	Bhanjanagar	259.16	19.06.16	11:30	237.92	31.07.16	14:45	241.38	13.11.16	02:30	242.08	29.03.17	14:30	259.16	19.06.16	11:30
4	Chandaka	241.556	12.04.16	12:30	233.59	31.07.16	14:45	236.19	13.12.16	02:45	236.71	02.01.17	02:15	241.56	12.04.16	12:30
5	Narendrapur	267.07	15.04.16	13:30	229.09	01.08.16	15:45	231.40	29.10.16	08:15	232.55	08.03.17	14:30	267.07	15.04.16	13:30
6	Joda	237.65	15.05.16	08:30	242.28	18.08.16	06:15	239.13	20.12.16	14:00	238.95	02.01.17	04:15	242.28	18.08.16	06:15
7	Tarkera	238.32	21.05.16	19:15	235.78	17.08.16	16:45	237.17	12.12.16	03:45	237.23	16.01.17	03:15	238.32	21.05.16	19:15
8	Budhipadar	233.70	24.06.16	05:45	235.96	14.07.16	17:00	238.90	11.11.16	02:30	234.46	16.01.17	03:30	238.90	11.11.16	02:30
9	Duburi	238.554	29.05.16	01:30	237.51	10.08.16	14:00	237.00	13.12.16	13:00	236.36	06.01.17	01:45	238.55	29.05.16	01:30
10	Balasore	244.27	25.05.16	16:45	236.24	16.07.16	16:45	236.82	24.11.16	13:00	237.86	20.03.17	03:00	244.27	25.05.16	16:45
11	Meramundali	229.49	08.05.16	17:45	233.18	11.07.16	07:15	241.67	13.12.16	12:30	235.26	04.01.17	03:00	241.67	13.12.16	12:30
12	Bidanasi	238.67	01.06.16	15:00	239.36	31.07.16	14:45	240.52	12.12.16	03:45	239.36	02.01.17	02:15	240.52	12.12.16	03:45
13	Katapalli	231.68	21.05.16	19:00	232.38	06.06.16	05:00	232.32	11.11.16	02:30	233.01	03.01.17	01:30	233.01	03.01.17	01:30
14	Bhadrak	239.59	23.05.16	21:00	238.38	16.07.16	16:30	240.57	24.11.16	12:45	238.90	06.01.17	01:45	240.57	24.11.16	12:45
15	Paradeep	233.70	21.05.16	21:30	232.84	03.08.16	13:45	234.69	19.12.16	03:15	233.07	22.01.17	01:45	234.69	19.12.16	03:15
16	Bolangir	233.99	06.04.16	10:15	235.49	12.09.16	05:15	231.28	19.12.16	00:15	233.24	20.02.17	05:00	235.49	12.09.16	05:15
17	Mendhasal	237.34	01.06.16	15:00	234.69	31.07.16	14:45	237.00	31.12.16	03:30	238.27	02.01.17	02:15	238.27	02.01.17	02:15

#### 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	Jaynagar	219.44	17.04.16	16:30	221.23	23.08.16	14:45	221.29	07.10.16	17:30	220.48	01.03.17	13:30	219.44	17.04.16	16:30
2	Theruvai	198.60	14.04.16	18:45	208.65	29.08.16	13:30	206.74	07.10.16	17:30	207.67	23.02.17	10:15	198.60	14.04.16	18:45
3	Bhanjanagar	202.18	14.04.16	18:45	212.52	27.08.16	18:45	216.10	05.10.16	18:00	216.73	22.02.17	18:45	202.18	14.04.16	18:45
4	Chandaka	181.283	30.06.16	19:45	199.931	27.08.16	18:45	200.68	10.11.16	17:45	207.55	06.02.17	17:45	181.28	30.06.16	19:45
5	Narendrapur	166.39	07.04.16	18:30	179.15	23.08.16	18:30	181.17	07.10.16	17:30	183.30	26.02.17	18:45	166.39	07.04.16	18:30
6	Joda	212.36	15.04.16	12:30	220.31	15.09.16	20:15	218.71	05.10.16	19:30	221.57	29.03.17	19:45	212.36	15.04.16	12:30
7	Tarkera	211.07	19.04.16	09:30	223.14	29.08.16	19:30	223.49	28.10.16	18:30	223.95	30.03.17	19:45	211.07	19.04.16	09:30
8	Budhipadar	218.58	21.04.16	21:00	219.27	29.08.16	12:15	226.31	21.10.16	19:00	221.35	30.03.17	19:30	218.58	21.04.16	21:00
9	Duburi	197.16	23.05.16	17:30	217.71	27.08.16	19:15	215.46	05.10.16	18:45	218.41	29.03.17	20:15	197.16	23.05.16	17:30
10	Balasore	192.194	14.05.16	00:00	211.82	29.08.16	18:45	211.53	20.10.16	18:00	213.50	29.03.17	19:45	192.19	23.05.16	17:30
11	Meramundali	215.29	24.05.16	19:00	217.54	29.08.16	19:15	217.60	05.10.16	18:15	219.85	30.03.17	10:30	215.29	23.05.16	17:30
12	Bidanasi	195.02	30.05.16	06:04	217.02	29.08.16	18:45	205.93	05.10.16	18:30	213.32	05.03.17	19:00	195.02	23.05.16	17:30
13	Katapalli	192.48	17.05.16	15:45	200.45	25.08.16	18:45	213.09	12.12.16	13:15	201.32	10.03.17	12:15	192.48	23.05.16	17:30
14	Bhadrak	194.85	11.06.16	21:00	210.84	21.07.16	21:00	209.17	05.10.16	12:30	212.34	29.03.17	19:45	194.85	11.06.16	21:00
15	Paradeep	190.52	11.06.16	21:15	203.22	29.08.16	20:15	199.99	05.10.16	18:45	210.03	25.03.17	21:00	190.52	11.06.16	21:15
16	Bolangir	177.70	04.05.16	16:30	206.05	24.08.16	11:45	201.66	03.10.16	15:30	209.05	25.03.17	07:15	177.70	04.05.16	16:30
17	Mendhasal	182.44	30.06.16	20:00	200.74	27.08.16	18:45	200.28	10.11.16	17:45	212.23	28.01.17	18:30	182.44	30.06.16	20:00

**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	141.27	16.06.16	06:30	136.25	30.07.16	15:15	143.06	10.10.16	16:45	140.64	11.03.16	02:30	143.06	10.10.16	16:45
2	Berhampur	152.88	21.05.16	22:45	142.14	05.08.16	12:15	142.25	12.12.16	01:45	143.06	01.01.16	03:45	152.88	21.05.16	22:45
3	Puri	139.48	01.06.16	15:30	134.81	03.07.16	01:15	138.56	12.12.16	02:00	135.79	02.01.17	02:15	139.48	01.06.16	15:30
4	Khurda	152.19	01.06.16	15:45	138.04	31.07.16	15:30	138.21	11.12.16	22:15	138.85	06.03.17	16:30	152.19	01.06.16	15:45

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

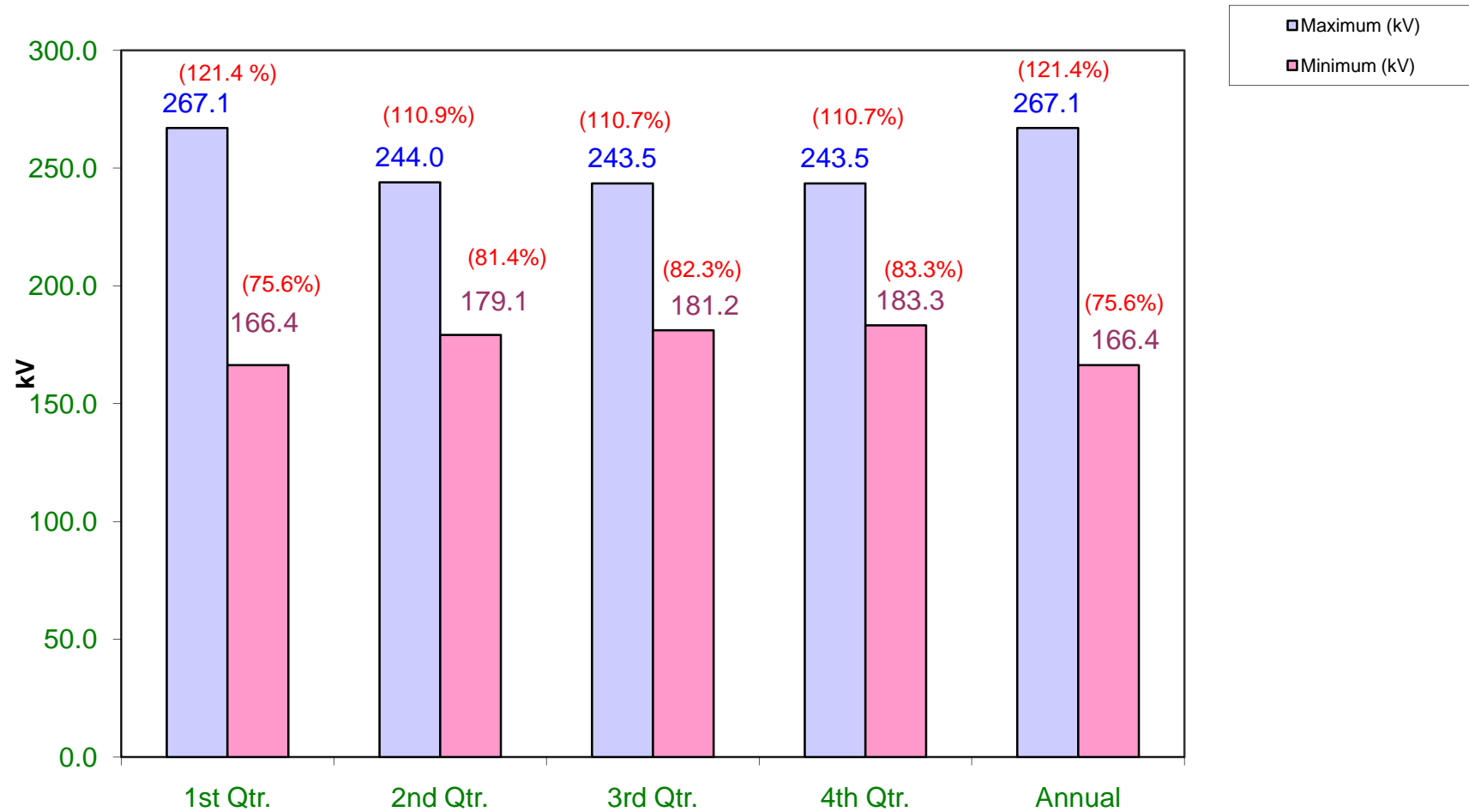
Sl. No.	Name of the Sub-station	Quarter - 1			Quarter - 2			Quarter - 3			Quarter - 4			ANNUAL		
		Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.	Voltage in kV	Date	Time in Hrs.
1	Cuttack	109.809	12.04.16	15:00	112.81	27.08.16	19:00	111.89	05.10.16	19:00	108.71	28.03.17	11:15	108.71	28.03.17	11:15
2	Berhampur	105.02	30.06.16	21:00	113.45	14.07.16	20:30	110.27	07.10.16	17:30	114.43	26.02.17	18:45	105.02	30.06.16	21:00
3	Puri	95.90	30.05.16	14:30	110.39	12.08.16	09:30	113.39	10.11.16	17:45	118.41	23.02.17	18:30	95.90	30.05.16	14:30
4	Khurda	93.12	07.04.16	18:30	93.64	01.08.16	19:30	112.46	23.12.16	17:45	99.59	27.02.17	18:30	93.12	07.04.16	18:30

**Note:**

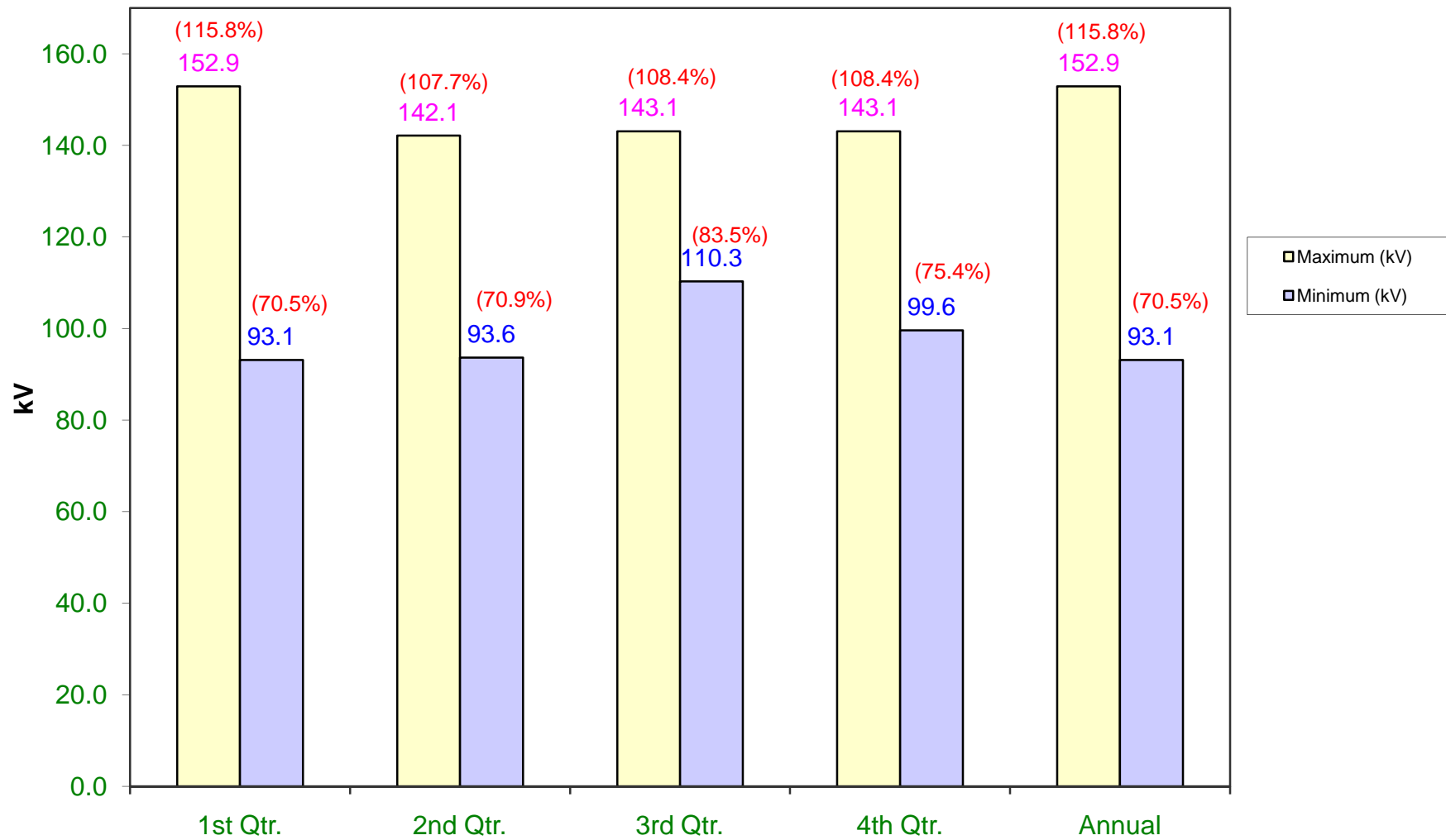
The bus voltages are recorded from 15min block voltage from meter data .

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

## OVERALL PERFORMANCE VOLTAGE AT 220kV

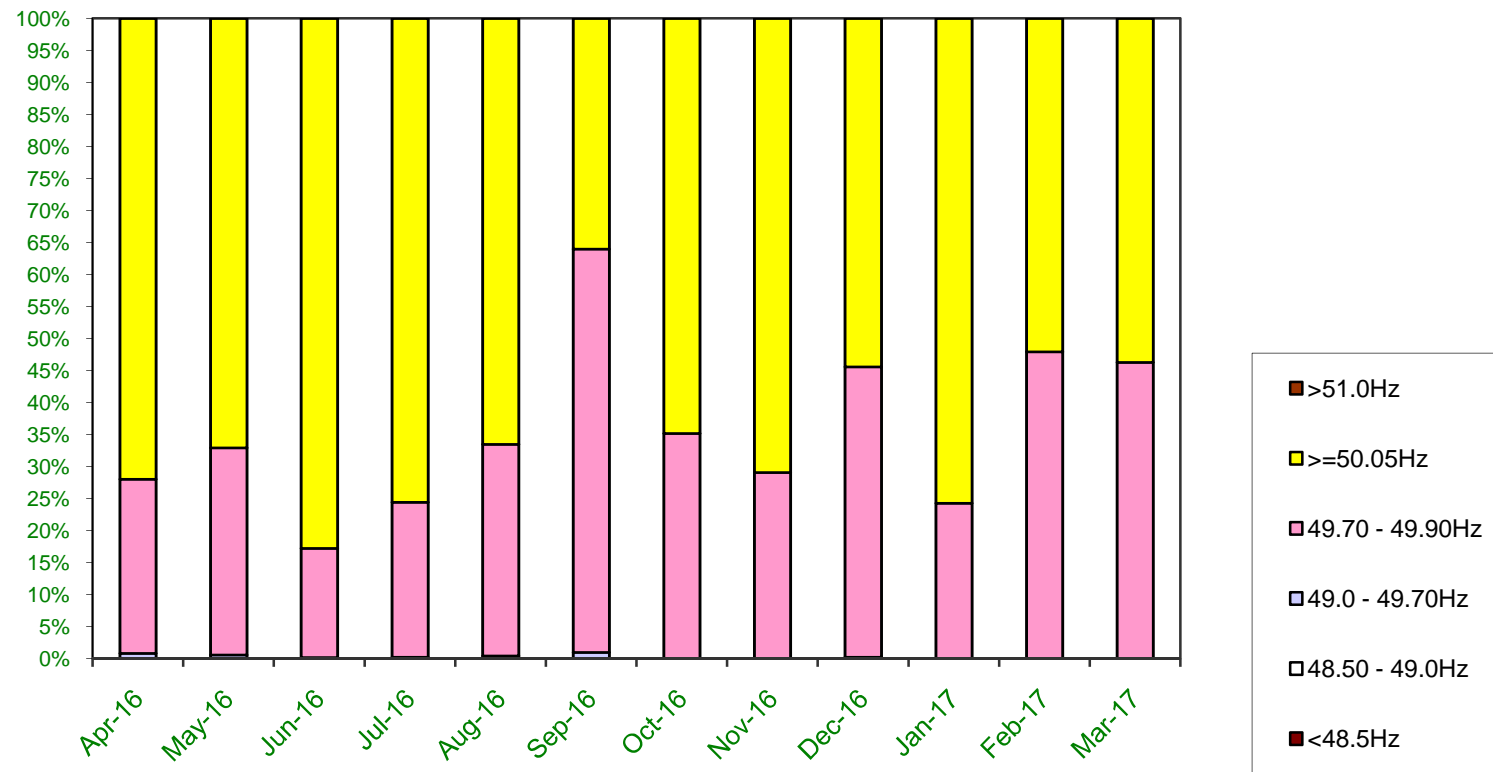


## OVERALL PERFORMANCE VOLTAGE AT 132 kV



## Frequency Performance

Percentage time occurrence



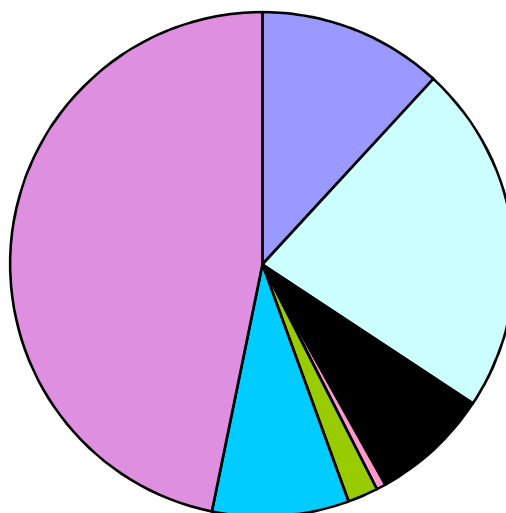
	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
>51.0Hz	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>=50.05Hz	31.02	25.34	34.04	25.69	22.23	14.03	21.51	24.94	18.35	25.05	12.97	14.25
49.70 - 49.90Hz	11.74	12.23	7.00	8.22	11.04	24.55	11.64	10.21	15.30	8.04	11.92	12.27
49.0 - 49.70Hz	0.36	0.22	0.09	0.09	0.14	0.38	0.03	0.03	0.08	0.00	0.02	0.02
48.50 - 49.0Hz	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<48.5Hz	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Months

### INTERRUPTION DUE TO MAJOR INCIDENT

Incident	Duration of Interruption	No. of Interruption
Snapping of Jumper / Conductor / Earth wire	24:15:00	54
Insulator Failure	45:56:00	42
Bursting of CT / PT	15:36:00	11
Breaker Problem	1:13:00	3
Major System Disturbance	4:00:00	7
Failure of LA	17:55:00	27
Others	95:46:00	129
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 2016-17.		

### INTERRUPTION (HRS) DUE TO MAJOR INCIDENT DURING 2016-17



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





# पावर मैप

## POWER MAP OF EASTERN REGION

