सत्यमेव जयते

तापीय विद्युत गृहों के कार्य निष्पादन का पुनर्विलोकन 2016-2017

REVIEW OF PERFORMANCE OF THERMAL POWER STATION 2016-17

भारत सरकार विद्युत मंत्रालय केन्द्रीय विद्युत प्राधिकरण

नई दिल्ली

GOVERNMENT OF INDIA MINISTRY OF POWER

CENTRAL ELECTRICITY AUTHORITY

NEW DELHI

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ACKNOWLEDGMENTS

The report on "Review of Performance of Thermal Power Stations 2016-17 is the forty one (41) publication of this series brought out by the Central Electricity Authority.

Successful completion of such a voluminous Report covering data from 649 thermal units in 187 thermal Stations would not have been possible without active cooperation of all.

I am thankful to all the Thermal Stations and utilities for furnishing operational data required for preparation of the Report and also responding timely to various queries/ clarifications etc.

I am thankful to various other divisions of CEA for inputs related to various chapters –Shri Hemant Jain Chief Engineer (Grid Management) and his team for inputs related to Grid operation and Shri Ramesh Kumar Chief Engineer (Grid Management) and his team for inputs related to fuel supplies. Support of Information Technology division of CEA is also gratefully acknowledged.

Preparation of this Report has become possible through painstaking and untiring efforts of dedicated team of officers of OPM division comprising of Shri Girdhari lal Director, Smt. Anita Verma, Deputy Director, Smt. Maya Kumari, Deputy Director, and Smt. Inderpreet Kaur, Kumari Ritika and Shri Ajay Kumar Data Entry Operators. Their contributions are appreciated and gratefully acknowledged.

Sanjay Sharma
Chief Engineer (OPM)

OBJECTIVE OF THERMAL PERFORMANCE REVIEW

Under section 73(i) & (j) of the electricity act 2003, responsibility has been vested on Central Electricity Authority to collect & record the data concerning the generation, distribution and utilization of power and carryout studies related to Cost, Efficiency, Loss, Benefits and such like matters and also make public from time information secured under this act and to provide for the publication of reports and investigation.

Central Electricity Authority has been publishing the report on the **'Review of Performance of Thermal Power Stations'** by collecting and recording various operational data, such as unit wise generation, auxiliary consumption, outages (day in, day out, time in, time out and reasons for outages) and partial loss data (including its reasons) and analyzing the data to make the power sector/ utility aware about the following: -

- Unit wise performance indices of thermal power station in the country, such as, Plant Load Factor, Planned Maintenance, Forced Outage, Operating Availability, Partial Loss, Reserve shut down. The performance of the thermal units considered in the review is also arranged capacity group wise/make wise, sector wise and region wise. These performance indices are available for last three years for comparison and investigation.

- The average duration (day) in respect of Boiler overhaul, Capital overhaul and Long duration forced outage. The unit-wise details of boiler overhaul, Capital and long duration forced outage (more than 25 days) is also available in the review.

- The station-wise/ organization wise coal and gas consumption and auxiliary power consumption.

- All India major Grid Disturbances and areas affected.

The above information enables different power utilities/ manufacturers and other concerned to improve upon the process of generation of power and manufacture of equipment related to power. Also, it helps them bench mark the performance with the other generation companies and manufactures for the same kind of equipment so as to investigate and develop methodology, for future needs.

OVERVIEW

PARTICULARS	2012-13	2013-14	2014-15	2015-16	2016-17
ALL INDIA GENERATION (BU)	912.06	967.150	1048.67	1107.82	1160.14
THERMAL GENERATION (BU)	760.68	792.48	878.32	943.79	994.23
NUCLEAR GENERATION (BU)*	32.87	34.228	36.102	37.41	37.92
HYDRO GENERATION (BU)	118.51	140.448	134.25	126.62	127.99
THERMAL PLANT LOAD FACTOR (%) **	69.93	65.57	64.29	61.06	59.06
NUCLEAR PLANT LOAD FACTOR (%)	78.49	81.74	80.74	73.69	74.38

* Hydro generation includes import from Bhutan
** Coal & lignite based stations reviewed

PERFORMANCE OF THERMAL STATIONS CONSIDERED IN THE REVIEW

PARTICULARS	2012-13	2013-14	2014-15	2015-16	2016-17
1. COAL & LIGNITE BASED UNITS REVIEWED					
(a) NUMBER OF UNITS	506	539	570	617	649
(b) CAPACITY (MW)	118024	132625	147297	173291.5	189946.5
(c) GROSS GENERATION (MU)	689036	746090	835830	894541.9	943579.7
2. FORCED OUTAGE (%)	13.59	17.64	19.05	21.9	24.52
3. PLANNED MAINTENANCE (%)	5.71	5.01	4.66	4.28	4.32
4. OPERATING AVAILABILITY FACTOR (%)	80.69	77.35	76.29	73.82	71.16
5. PARTIAL UNAVAILABILITY DUE TO INTERNAL AS WELL AS EXTERNAL PROBLEMS (%)	10.77	12.12	11.62	10.99	11.48
6. LOW SYSTEM DEMAND & RESERVE	2.24	8.57	4.48	7.95	8.51
7. PLANT LOAD FACTOR (%)	69.93	65.57	64.29	61.06	59.06
8. AUX. POWER CONSUMPTION (%)	8.15	8.16	8.02	7.95	7.70
9. (a) AVERAGE TIME TAKEN IN DAYS FOR BOILER OVERHAUL	30	33	31	29	30
9. (b) AVERAGE TIME TAKEN IN DAYS FOR CAPITAL MAINTENANCE	52	43	35	35	47

HIGHLIGHTS

- The review covers the performance analysis of 649 coal/lignite based thermal units (25 MW & above capacity) aggregating to **189,946.5** MW installed in 187 thermal power stations.
- All India electricity generation from conventional sources[1]in the country during 2016-17 has been **1160.14** BU as compared to the generation of 1107.82 BU during 2015-16 representing a growth rate of 4.72% %.
- Thermal generation stood at **994.23** BU representing a share of 85.70 % of total electricity generation from conventional sources in the country.
- Coal/ Lignite based plants continued to have major contribution with a major share of **95** % of the total thermal generation.
- During 2016-17, the total thermal generation achieved a growth rate of **5.34**%. Coal based generation recorded a growth rate of **5.58%.**
- The thermal generation in the country during 2016-17 was **99.52**% of its Programme fixed for the year.
- Operating Availability of 71.16% was achieved for the units considered in the Review during the year 2016-17 as against 73.82% achieved during 2015-16.
- Thirty-two (32) out of 187 thermal stations achieved an Operating Availability more than 90% during 2016-17.
- All India Plant load factor (PLF) of thermal power units considered in the Review, reduced to 59.06% during 2016-17, from 61.06% achieved during previous year. The Lower PLF was mainly due to increased generation loss due to Reserve Shut Down (RSD).
- Plant load factor (PLF) of Central Sector units was highest at 70.66%. However, the PLF of Private Utility reduced from 66.05% during 2015-16 to 58.49% during 2016-17.
- Plant load factor (PLF) of BHEL/BHEL make units (380 units aggregating to 109770MW) was 58.63%.
- Energy loss on account of planned maintenance was 4.32%[2] in 2016-17 as compared to 4.28% during 2015-16.
- The loss of generation due to forced outages during 2016-17 increased to 24.52% as compared to 21.9% during 2015-16. The increased forced outages were mainly due to higher RSD and coal/transmission constraints losses. The details are given in Section 4.
- The average duration of boiler overhaul and capital maintenance was achieved as 30 days and 47 days respectively.
- Following loss of generation due to various external constraints were reported by the utilities:

Sl. No.	Category	Energy (BU) (2015-16	Energy (BU) (2016-17)
1	Shortage of coal	1.62	6.22
2	Wet/poor coal quality	0.29	0.12

[1] Thermal, Hydro and nuclear stations of capacity 25 MW and above

[2] All losses referred are with respect to maximum possible generation of units considered-MWh from date of stabilization to end of year at rated capacity.

3	Reserve shut down	113.41	133.97
4	Transmission constraints	8.81	7.45
5.	Total	**124.13**	**147.76**

- The generation from gas based plants remained low on account of low schedules from the beneficiaries coupled with shortage of gas. During the year 2016-17, the generation from gas based plants (including liquid fuel, Diesel etc.) was **49.09** BU in comparison to **47.12** BU in 2015-16. The % PLF of gas turbine based Stations was 22.51 % during 2016-17 – which was almost same as to 22.51% during 2015-16.
- Energy loss due to partial unavailability of the thermal generating units operating in the country during 2016-17 had increased to 11.48% of the maximum possible generation of reviewed units during the year in comparison to the 10.99% in 2015-16.
- The All India average auxiliary power consumption by the thermal stations during 2016-17 decreased to 7.70% from 7.95% during 2015-16.

DEFINITIONS

The definitions of the different performance indices referred to in this review are as under: -

(i) **"Capacity"** means the installed or derated/uprated cap. accepted by CEA.

(ii) Forced Outage/Unavailability (F.O. %)

$$\frac{Cf1xHf1 + \ldots\ldots\ldots Cfn \times Hfn}{CxH} \times 100$$

Where Cf1 …….. Cfn are the capacities in MW of the units on Forced outage and

Hf1 …….. Hfn are the duration of each outage in hours. C is the total capacity in MW and H is the total hours in the period under review.

(iii) Planned Maintenance/Planned Unavailability (P.M. %)

$$= \frac{Cp1xHp1 \ldots\ldots Cpn \times Hpn}{CxH} \times 100$$

Where Cp1 …… Cpn are the capacities in MW of units on planned Shutdown and Hp1 ……. Hpn are the duration of each shutdown in Hours in the periods under review.

(iv) Operating Availability (Op Av.) % = 100 FO – PM

(v) **Plant Load Factor** : $\frac{\text{Energy generated during the period}}{CxH} \times 100$

(vi) **Partial Unavailability** : $\frac{Cr1\ Hr1 + \cdots \ldots C\ rn \times Hrn}{CxH} \times 100$

ABBREVIATIONS USED IN THE REPORT

Act.	Actual
ACQ	Annual Contracted Quantity
AM	Annual maintenance
AVB	ACC Vickers Babcock
B&W	Babcock & Wilcox
BEE	Bureau of Energy Efficiency
Cap.	Capacity
CCGT	Combined Cycle Gas Turbine
CEA	Central Electricity Authority
CBIP	Central Board of Irrigation and power
CM	Capital Maintenance
EEC	Excellence Enhancement Centre For Indian Power Sector
FO	Forced Outage
FW	Foster Wheeler
GCV	Gross Calorific Value
GTZ	Deutsche Gesellschaft Fur Internationale Zusammenarbeit
IGEN	Indo-German Efficiency Programme
HFHSD	Heavy-Fuel High Speed Diesel
HFO	Heavy Furnace Oil
HHS	Hot Heavy Stock
HPS	Heavy Petroleum Stock
HSD	High Speed Diesel
IC	Installed Capacity
IPP	Independent Power Producer
IGE	International General Electric
Kcal	Kilocalorie
Kg	Kilogram
KJ	Kilo Joule
KL	Kilo liter
KWh	Kilo Watt Hour
LDO	Light Diesel Oil
LSHS	Low Sulphur Heavy Stock
LNG	Liquefied Natural Gas
LSFO	Low Sulphur Furnace Oil
LSD	Low System Demand
MI	Milliliter
MMSCM	Million Metric Standard Cubic Metres
MMSCMD	Million Metric Standard Cubic Metres per Day
MOU	Memorandum of Understanding
MTBF	Mean Time Between Failure
MU	Million Units
MW	Megawatt
Op. Av.	Operating Availability
PLF	Plant Load Factor
PM	Planned Maintenance
Prog.	Program
PU	Partial Unavailability
RSD	Reserve Shutdown
SCM	Standard Cubic Meter
SEBs	State Electricity Boards
SHR	Station Rate Heat
SPL	Sasan Power Limited
STPS	Super Thermal Power Station
UHR	Unit Heat rate
ABAN POWR	Aban Power Company Limited
APL	Adani Power Company Limited
TOR. POW (SUGEN)	Torrent Power Limited (Sugen)
A&N ADM	Andaman and Nicobar Island Electricity Department
APGENCO	Andhra Pradesh Power Generation Corp. Limited

APCPL	Aravali Power Company Private Limited
APGPCL	Assam Power Generation Corporation Limited
APPDCL	Andhra Pradesh Power Distribution Company Ltd.
BSEB	Bihar State Electricity Board
BSES (c)	Bses Kerala Power Limited
BEPL	Baja Energy Pvt. Ltd.
CESC	Calcutta Electric Supply Co. Ltd.
CEPL	Coastal Energy Pvt. Ltd.
CSPGCL	Chhattisgarh State Power Generation Co. Ltd
DBPCL	D.B. Power Corp. Ltd.
DVC	Damodar Valley Corporation
DPSCLTD	Dishergarh Projects Limited
DPL	Durgapur Projects Limited
GCEL	GMR Chattisgarh Energy Ltd.
GAUTAMI	Gautami Power Limited
GMR ENERG	GMR Energy Limited
VASAVI	GMR Power Corporation Pvt. Ltd
VEMAGIRI	GMR Vemagiri Power Generation Limited
GIPCL	Gujarat Industries Power Company Limited
GMDCL	Gujarat Mineral Development Corporation Private Limited
GPEC	Gujarat Peguthan Energy Corporation Private Limited
GSECL	Gujarat State Energy Corporation Limited
GSEGL	Gujarat State Energy Generation Corp. Limited
GTE CORP	GTE Corporation Limited
GVKIL	Gvk Industries Limited
HNPC	Hinduja National Power Corp.
HPGCL	Haryana Power Generation Corporation Limited
HEL	Haldia Energy Ltd.
ITPCL	IL & FS Tamilnadu Power Company Ltd.
IPGPCL	Indraprastha Power Generation Company Limited
JITPL	Jindal India Thermal Power Ltd.
JKPDC	J&K State Power Development Corporation
JSEB	Jharkhand State Electricity Board
JPL	Jindal Power Limited
JPPVL	Jai Prakash Power Venture Ltd.
JSWEL	Jsw Energy Limited
K.B.U.N.L	Kanti Bijlee Utpadan Nigam Ltd.
KPCL	Karnataka Power Corporation Limited
KSEB	Kerala State Electricity Board
KONA	Konaseema Gas Power Limited
LANCO	Lanco Amarkantak Power Pvt. Ltd
LAPPL	Lanco Anpara Power Pvt. Ltd
LPGCL	Lalitpur Power Generation Co. Ltd.
KONDAPALI	Lanco Konadapallj Power Pvt. Ltd
LVSPOWER	Lvs Power Limited
MBPMPL	M B Power Madhya Pradesh Ltd.
MCCPL	Maruti Clean Coal & Power Ltd.
MPPGCL	M.P. Power Generating Corporation Limited
MADURAIP	Madurai Power Corporation Pvt. Limited
MAHAGENCO	Maharashtra State Power Generation Company Limited
MPDC	Manipur Electricity Department
MPL	Maithon Pvt. Ltd
NALCO	National Aluminum Corporation Ltd.
NPL	Nabha Power Ltd.
NLC	Neyveli Lignite Corporation Ltd.
NEEPCO	North-Eastern Electric Power Corporation Limited
NTPL	NLC Tamilnadu Power Corp.
NTPC Ltd.	NTPC Limited
NTECL	NTPC Tamil Nadu Energy Company Limited
NSPCL	NTPC-SAIL Power Co.Pvt. Ltd
OPGC	Orissa Power Generation Corporation Limited
PPGCL(Jaypee)	Prayagraj Power Generation Company Ltd.
PENNA	Penna Power Ltd.
PPNPGCL	Ppn Power Generation Company Pvt. Ltd.

PPCL	Pondicherry Power Corporation Ltd.
PSPCL	Punjab State Power Corp. Ltd.
RKMPPL	RKM Powergen Pvt. Ltd.
RWPL (JSW)	Raj West Power Ltd. (JSW)
RRVUNL	Rajasthan Rajya Vidyut Utpadan Nigam Limited
RGPPL	Ratnagiri Gas Power Projects Limited
RIL	Reliance Infrastructure Ltd.
RPSCL	Rosa Power Supply Co. Ltd
SAMALPATI	Samalpatti Power Company Private Limited
RAYALSEEMA	Shri Rayalaseema Pvt. Limited
SPL	Sasan Power Ltd.
SPGL	Spectrum Power Generation Limited
ST-CMSECP	ST-CMS ELECTRIC Company Private Limited
SEL	Sterlite Energy Limited
SEIL	Sembcorp Energy India Ltd.
SEPL	Simhapuri Energy Pvt.Ltd.
TNGDCL	Tamil Nadu Generation & Distribution Corp. Ltd.
TAT PCL	Tata Power Company Ltd.
TSPL	Talwandi Sabo Power Ltd.
TSGENCO	Telangana State Genco
TVNL	Tenughat Vidyut Nigam Limited
TOR. POW.	Torrent Power Ltd.
TRIPURA	Tripura State Electricity Corporation Limited
UPCL	Udupi Power Corp. Ltd.
UPRVUNL	Uttar Pradesh Rajya Vidyut Utpandan Nigam Limited
VESPL	Vanada Energy & Steel Pvt. Ltd.
WPCL	Wardha Power Company Ltd.
WBPDC	West Bengal Power Development Corp. Limited

SECTION-1
SCOPE OF THE REVIEW

1.1.SCOPE

The total installed capacity of thermal power stations in the country as on 31-03-2017 was **217460.31** MW comprising **191206.5** MW coal/lignite, **25274.88** MW gas turbines based stations and **978.93** MW diesel plants.

The Review 2016-17 covers the performance of 649 coal/lignite based thermal units (above 25 MW capacity) aggregating to 189946.5 MW in 187 utility thermal power stations. New units which attained stabilization and considered for computation of PLF during the year 2016-17 have been included in the Review for performance analysis.

The 649 coal/lignite based thermal units includes 617 number of units considered in the previous publication, 36 new units of capacity 17095.0 MW capacity, which were synchronized and reckoned for Plant Load Factor (PLF) calculation during the year 2016-17. However, it excludes 4 such units of capacity 440 MW, retired during 2015-16. Details of units covered in the review are as under:

S. No.	Unit Details	No. of Units	Capacity (MW)
1	Units considered in Review 2015-16	617	173,291.5
2	New units Synchronized during 2015-16 and 2016-17 and considered in the review and IPP units consider for the first time (details is given in the Annexure 1.1)	36	17,095.0
3	Units covered in Review of 2015-16 but not considered in the present review due to retirement (details is given in the Annexure 1.2)	04	-440.0
5.	Units Considered in the review (details is given in the Annexure 1.4)	649	**189,946.5**

Details of new units synchronized during 2015-16 and 2016-17 and considered in the review for the first time are given in Annexure-1.1.

Details of Units retired during 2015-16 and not considered in the present review are given in Annexure- 1.2.

Details of units retired during the year 2016-17 but considered in the review are given Annexure-1.3. These units will not be considered in subsequent publications.

Details of capacity changes in units during the year 2016-17 due to upration/deration are given Annexure-1.4.

The details of total units (different make) considered in the review are given at Annexure 1.5.

Details of new units which although commissioned during 2016-17 but not considered in the review as the stabilization was not achieved during this period are given at Annexure 1.6.

Annexure-1.1

DETAILS OF NEW UNITS SYNCHRONISED DURING 2015-16 & 2016-17 AND CONSIDERED IN THE REVIEW FOR THE FIRST TIME

S. No.	Name of Station	Unit No	System	Capacity (MW)	Make Boiler/Turbine	Date of Synchroniza-tion	Date of Stabilization
2015-2016							
1	ANPARA TPS	6	UPRVUNL	500.00	BHEL/BHEL	08-06-15	08-05-16
2	ANPARA TPS	7	UPRVUNL	500.00	BHEL/BHEL	06-03-16	18-10-16
3	ANUPPUR TPP	2	MBPMPL	600.00	CHINA/CHINA	30-03-16	07-04-16
4	BOKARO TPS `A` EXP	1	DVC	500.00	BHEL/BHEL	22-03-16	23-02-17
5	BONGAIGAON TPP	1	NTPC Ltd.	250.00	BHEL/BHEL	22-06-15	01-04-16
6	CHANDRAPUR STPS	9	MAHAGENCO	500.00	BHEL/BHEL	21-03-16	24-11-16
7	GOINDWAL SAHIB TPP	1	GPGSL (GVK)	270.00	BHEL/BHEL	14-02-16	06-04-16
8	GOINDWAL SAHIB TPP	2	GPGSL (GVK)	270.00	BHEL/BHEL	15-03-16	16-04-16
9	KORADI TPS	9	MAHAGENCO	660.00	Others/Others	15-03-16	22-11-16
10	LALITPUR TPS	2	LPGCL	660.00	BHEL/BHEL	08-01-16	14-10-16
11	MAUDA TPS	3	NTPC Ltd.	660.00	BHEL/BHEL	28-03-16	01-02-17
12	NABI NAGAR TPP	1	BRBCL	250.00	BHEL/BHEL	20-03-16	15-01-17
13	PARLI TPS	8	MAHAGENCO	250.00	BHEL/BHEL	30-03-16	30-11-16
14	RAIKHEDA TPP	2	GCEL	685.00	Others/Others	28-03-16	01-04-16
15	SAGARDIGHI TPS	3	WBPDC	500.00	BHEL/BHEL	14-12-15	07-01-16
16	SEIONI TPP	1	JHAPL	600.00	BHEL/BHEL	22-03-16	03-05-16
17	SINGARENI TPP	1	SCCL	600.00	BHEL/BHEL	13-03-16	25-09-16
18	UTKAL TPP (INDBARATH)	1	IBPIL	350.00	CHINA/CHINA	25-02-16	20-07-16
19	VIZAG TPP	2	HNPC	520.00	BHEL/BHEL	31-03-16	03-07-16
20	YERMARUS TPP	1	RPCL	800.00	BHEL/BHEL	29-03-16	07-03-17
	SUB TOTAL	**20**		**9925.00**			
2016-2017							
21	BHAVNAGAR CFBC TPP	1	BECL	250.00	BHEL/BHEL	16-05-16	16-05-16
22	BHAVNAGAR CFBC TPP	2	BECL	250.00	BHEL/BHEL	27-03-17	27-03-17
23	CHANDRAPURA STPS	8	MAHAGENCO	500.00	BHEL/BHEL	29-03-15	04-06-16
24	ITPCL TPP	2	ITPCL	600.00	CHINA/CHINA	18-04-16	30-04-16
25	KORADI TPS	10	MAHAGENCO	660.00	Others/Others	28-12-16	17-01-17
26	LALITPUR TPS	3	LPGCL	660.00	BHEL/BHEL	01-04-16	23-12-16
27	MARWA TPS	2	CSPGCL	500.00	BHEL/BHEL	15-07-16	31-07-16
28	MUZAFFARPUR TPS	3	K.B.U.N.L	195.00	BHEL/BHEL	31-03-15	18-03-17
29	NAWAPARA TPP	1	TRNE	300.00	CHINA/CHINA	14-08-16	19-08-16
30	PRAYAGRAJ TPP	2	PPGCL	660.00	BHEL/BHEL	06-09-16	10-09-16
31	RATIJA TPS	2	SCPL	50.00	BHEL/BHEL	10-11-16	09-12-16
32	SGPL TPP	1	SEIL	660.00	CHINA/CHINA	12-11-16	17-11-16
33	SGPL TPP	2	SEIL	660.00	CHINA/CHINA	15-02-17	21-02-17
34	SINGARENI TPP	2	SCCL	600.00	BHEL/BHEL	25-11-16	02-12-16
35	SWASTIK KORBA TPP	1	ACB	25.00	Others/Others	31-03-15	30-04-15
36	TAMNAR TPP	4	JPL	600.00	BHEL/BHEL	28-03-15	12-12-16
	SUB TOTAL	4		1320.00			
	TOTAL	36		**17095.00**			

Annexure-1.2

UNITS RETIRED DURING 2015-16 AND ARE NOT CONSIDERED IN THE REVIEW DUE TO RETIREMENT

S. No.	Name of Station	Unit No	Capacity	Make Boiler/Turbine	Date of Retirement
1	PANIPAT TPS	1	110	BHEL/BHEL	09-DEC-2015
2	PANIPAT TPS	2	110	BHEL/BHEL	09-DEC-2015
3	PANIPAT TPS	3	110	BHEL/BHEL	09-DEC-2015
4	PANIPAT TPS	4	110	BHEL/BHEL	09-DEC-2015
	SUB TOTAL	**4**	**440**		

Annexure-1.3

DETAILS OF UNITS RETIRED DURING THE YEAR 2016-17 BUT CONSIDERED IN THE REVIEW

S. NO.	NAME OF STATION	UNIT NO.	CAPACITY	MAKE BOILER/TURBINE	DATE OF RETIREMENT
1	GANDHI NAGAR TPS	1	120.00	BHEL/BHEL	12-01-17
2	GANDHI NAGAR TPS	2	120.00	BHEL/BHEL	12-01-17
3	KORADI TPS	1	105.00	ABLKolkata/Zamech,	02-08-16
4	KORADI TPS	2	105.00	ABLKolkata/Zamech,	02-08-16
5	KORADI TPS	3	105.00	ABLKolkata/Zamech,	02-08-16
6	KORADI TPS	4	105.00	ABLKolkata/Zamech,	02-08-16
7	KORADI TPS	5	200.00	BHEL/BHEL(LMW)	02-03-17
8	PARLI TPS	3	210.00	BHEL/BHEL	09-06-16
9	CHANDRAPUR(MAHARASHTRA) STPS	1	210.00	ABL/BHEL	09-06-16
10	CHANDRAPUR(MAHARASHTRA) STPS	2	210.00	ABL/BHEL	09-06-16
11	TROMBAY TPS	4	150.00	CE/IGE	08-02-17
12	ENNORE TPS	1	60.00	Skoda/Skoda	31-03-17
13	ENNORE TPS	2	60.00	Skoda/Skoda	31-03-17
14	ENNORE TPS	3	110.00	Skoda/Skoda	31-03-17
15	ENNORE TPS	4	110.00	Skoda/Skoda	31-03-17
16	ENNORE TPS	5	110.00	BHEL/BHEL	12-01-17
17	PATRATU TPS	1	40.00	USSR/USSR	29-07-16
18	PATRATU TPS	2	40.00	USSR/USSR	29-07-16
19	PATRATU TPS	3	40.00	USSR/USSR	29-07-16
20	PATRATU TPS	5	90.00	USSR/USSR	29-07-16
21	PATRATU TPS	8	105.00	BHEL/BHEL	29-07-16
22	CHANDRAPURA(DVC) TPS	1	130.00	CE/IGE	17-01-17
23	DURGAPUR TPS	3	130.00		21-10-16
24	SANTALDIH TPS	1	120.00	BHEL/ABL	26-12-16
25	SANTALDIH TPS	2	120.00	BHEL/ABL	26-12-16
26	SANTALDIH TPS	3	120.00	BHEL/ABL	26-12-16
27	SANTALDIH TPS	4	120.00	BHEL/ABL	26-12-16
28	D.P.L. TPS	3	70.00	BW USA/Siemens	20-02-17
29	D.P.L. TPS	4	75.00	BW USA/Siemens	20-02-17
30	D.P.L. TPS	5	75.00	Mitsubishi/Siemens	20-02-17
31	NEW COSSIPORE TPS	1	30.00	B & W UK/Parsons	04-04-16
32	NEW COSSIPORE TPS	2	30.00	B & W UK/Parsons	04-04-16
33	NEW COSSIPORE TPS	3	50.00	B & W UK/Parsons	04-04-16
34	NEW COSSIPORE TPS	4	50.00	B & W UK/Parsons	04-04-16
	SUB TOTAL	**34**	**3525.00**		

Annexure-1.4

DETAILS OF CAPACITY CHANGES IN UNITS DURING THE YEAR 2016-17 DUE TO UPRATIOB/DERATION

S. No.	Name of Station	Unit no.	Old Capacity(MW)	New Capacity(MW)	Make Boiler/Turbine
1	Sabarmati(D-F Stations)	2	110	121	BHEL/BHEL
2	Sabarmati(D-F Stations)	3	110	121	BHEL/BHEL
	Total	**2**	**220**	**242**	

Annexure-1.5

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
BHEL/ABL (TG /Boiler)						
1	BANDEL TPS	5	WEST BENGAL	WBPDC	STATE	210
2	BOKARO `B` TPS	1	JHARKHAND	DVC	CENTRAL	210
3	BOKARO `B` TPS	2	JHARKHAND	DVC	CENTRAL	210
4	CHANDRAPUR(MAHARASHTRA) STPS	1	MAHARASHTRA	MAHAGENCO	STATE	210
5	CHANDRAPUR(MAHARASHTRA) STPS	2	MAHARASHTRA	MAHAGENCO	STATE	210
6	D.P.L. TPS	6	WEST BENGAL	DPL	STATE	110
7	KOLAGHAT TPS	1	WEST BENGAL	WBPDC	STATE	210
8	KOLAGHAT TPS	2	WEST BENGAL	WBPDC	STATE	210
9	KOLAGHAT TPS	3	WEST BENGAL	WBPDC	STATE	210
10	KOLAGHAT TPS	4	WEST BENGAL	WBPDC	STATE	210
11	KORBA-III	1	CHHATTISGARH	CSPGCL	STATE	120
12	KORBA-WEST TPS	3	CHHATTISGARH	CSPGCL	STATE	210
13	KORBA-WEST TPS	4	CHHATTISGARH	CSPGCL	STATE	210
14	SANTALDIH TPS	1	WEST BENGAL	WBPDC	STATE	120
15	SANTALDIH TPS	2	WEST BENGAL	WBPDC	STATE	120
16	SANTALDIH TPS	3	WEST BENGAL	WBPDC	STATE	120
17	SANTALDIH TPS	4	WEST BENGAL	WBPDC	STATE	120
		17				**3020**
BHEL/BHEL (TG /Boiler)						
18	AMARAVATI TPS	2	MAHARASHTRA	RattanIndia	PVT	270
19	AMARAVATI TPS	3	MAHARASHTRA	RattanIndia	PVT	270
20	AMARAVATI TPS	4	MAHARASHTRA	RattanIndia	PVT	270
21	AMARAVATI TPS	5	MAHARASHTRA	RattanIndia	PVT	270
22	AMARKANTAK EXT TPS	3	MADHYA PRADESH	MPPGCL	STATE	210
23	ANPARA TPS	1	UTTAR PRADESH	UPRVUNL	STATE	210
24	ANPARA TPS	2	UTTAR PRADESH	UPRVUNL	STATE	210
25	ANPARA TPS	3	UTTAR PRADESH	UPRVUNL	STATE	210
26	ANPARA TPS	6	UTTAR PRADESH	UPRVUNL	STATE	500
27	ANPARA TPS	7	UTTAR PRADESH	UPRVUNL	STATE	500
28	AVANTHA BHANDAR	1	CHHATTISGARH	KWPCL	PVT	600
29	BADARPUR TPS	1	DELHI	NTPC Ltd.	CENTRAL	95
30	BADARPUR TPS	2	DELHI	NTPC Ltd.	CENTRAL	95
31	BADARPUR TPS	3	DELHI	NTPC Ltd.	CENTRAL	95
32	BADARPUR TPS	4	DELHI	NTPC Ltd.	CENTRAL	210
33	BADARPUR TPS	5	DELHI	NTPC Ltd.	CENTRAL	210
34	BAKRESWAR TPS	1	WEST BENGAL	WBPDC	STATE	210
35	BAKRESWAR TPS	2	WEST BENGAL	WBPDC	STATE	210
36	BAKRESWAR TPS	3	WEST BENGAL	WBPDC	STATE	210
37	BAKRESWAR TPS	4	WEST BENGAL	WBPDC	STATE	210
38	BAKRESWAR TPS	5	WEST BENGAL	WBPDC	STATE	210
39	BARADARHA TPS	1	CHHATTISGARH	DBPCL	PVT	600
40	BARADARHA TPS	2	CHHATTISGARH	DBPCL	PVT	600
41	BARAUNI TPS	6	BIHAR	NTPC Ltd.	CENTRAL	105
42	BARAUNI TPS	7	BIHAR	NTPC Ltd.	CENTRAL	105
43	BARH II	4	BIHAR	NTPC Ltd.	CENTRAL	660
44	BARH II	5	BIHAR	NTPC Ltd.	CENTRAL	660
45	BARSINGSAR LIGNITE	1	RAJASTHAN	NLC	CENTRAL	125
46	BARSINGSAR LIGNITE	2	RAJASTHAN	NLC	CENTRAL	125
47	BELA TPS	1	MAHARASHTRA	IEPL	PVT	270
48	BELLARY TPS	1	KARNATAKA	KPCL	STATE	500
49	BELLARY TPS	2	KARNATAKA	KPCL	STATE	500

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
50	BHAVNAGAR CFBC TPP	1	GUJARAT	BECL	STATE	250
51	BHAVNAGAR CFBC TPP	2	GUJARAT	BECL	STATE	250
52	BHILAI TPS	1	CHHATTISGARH	NSPCL	CENTRAL	250
53	BHILAI TPS	2	CHHATTISGARH	NSPCL	CENTRAL	250
54	BHUSAWAL TPS	2	MAHARASHTRA	MAHAGENCO	STATE	210
55	BHUSAWAL TPS	3	MAHARASHTRA	MAHAGENCO	STATE	210
56	BHUSAWAL TPS	4	MAHARASHTRA	MAHAGENCO	STATE	500
57	BHUSAWAL TPS	5	MAHARASHTRA	MAHAGENCO	STATE	500
58	BINA TPS	1	MADHYA PRADESH	JPPVL	PVT	250
59	BINA TPS	2	MADHYA PRADESH	JPPVL	PVT	250
60	BOKARO TPS `A` EXP	1	JHARKHAND	DVC	CENTRAL	500
61	BOKARO `B` TPS	3	JHARKHAND	DVC	CENTRAL	210
62	BONGAIGAON TPP	1	ASSAM	NTPC Ltd.	CENTRAL	250
63	BUDGE BUDGE TPS	3	WEST BENGAL	CESC	PVT	250
64	CHANDRAPUR(ASSAM) TPS	2	ASSAM	APGPCL	STATE	30
65	CHANDRAPUR(MAHARASHTRA) STPS	3	MAHARASHTRA	MAHAGENCO	STATE	210
66	CHANDRAPUR(MAHARASHTRA) STPS	4	MAHARASHTRA	MAHAGENCO	STATE	210
67	CHANDRAPUR(MAHARASHTRA) STPS	5	MAHARASHTRA	MAHAGENCO	STATE	500
68	CHANDRAPUR(MAHARASHTRA) STPS	6	MAHARASHTRA	MAHAGENCO	STATE	500
69	CHANDRAPUR(MAHARASHTRA) STPS	7	MAHARASHTRA	MAHAGENCO	STATE	500
70	CHANDRAPUR(MAHARASHTRA) STPS	8	MAHARASHTRA	MAHAGENCO	STATE	500
71	CHANDRAPUR(MAHARASHTRA) STPS	9	MAHARASHTRA	MAHAGENCO	STATE	500
72	CHANDRAPURA(DVC) TPS	7	JHARKHAND	DVC	CENTRAL	250
73	CHANDRAPURA(DVC) TPS	8	JHARKHAND	DVC	CENTRAL	250
74	CHHABRA TPP	1	RAJASTHAN	RRVUNL	STATE	250
75	CHHABRA TPP	2	RAJASTHAN	RRVUNL	STATE	250
76	CHHABRA TPP	3	RAJASTHAN	RRVUNL	STATE	250
77	CHHABRA TPP	4	RAJASTHAN	RRVUNL	STATE	250
78	D.P.L. TPS	8	WEST BENGAL	DPL	STATE	250
79	DADRI (NCTPP)	1	UTTAR PRADESH	NTPC Ltd.	CENTRAL	210
80	DADRI (NCTPP)	2	UTTAR PRADESH	NTPC Ltd.	CENTRAL	210
81	DADRI (NCTPP)	3	UTTAR PRADESH	NTPC Ltd.	CENTRAL	210
82	DADRI (NCTPP)	4	UTTAR PRADESH	NTPC Ltd.	CENTRAL	210
83	DADRI (NCTPP)	5	UTTAR PRADESH	NTPC Ltd.	CENTRAL	490
84	DADRI (NCTPP)	6	UTTAR PRADESH	NTPC Ltd.	CENTRAL	490
85	DAHANU TPS	1	MAHARASHTRA	RIL (DAHANU)	PVT	250
86	DAHANU TPS	2	MAHARASHTRA	RIL (DAHANU)	PVT	250
87	DERANG TPP	1	ORISSA	JITPL	PVT	600
88	DERANG TPP	2	ORISSA	JITPL	PVT	600
89	DSPM TPS	1	CHHATTISGARH	CSPGCL	STATE	250
90	DSPM TPS	2	CHHATTISGARH	CSPGCL	STATE	250
91	DURGAPUR STEEL TPS	1	WEST BENGAL	DVC	CENTRAL	500
92	DURGAPUR STEEL TPS	2	WEST BENGAL	DVC	CENTRAL	500
93	DURGAPUR TPS	4	WEST BENGAL	DVC	CENTRAL	210
94	Dr. N.TATA RAO TPS	1	ANDHRA PRADESH	APGENCO	STATE	210
95	Dr. N.TATA RAO TPS	2	ANDHRA PRADESH	APGENCO	STATE	210
96	Dr. N.TATA RAO TPS	3	ANDHRA PRADESH	APGENCO	STATE	210
97	Dr. N.TATA RAO TPS	4	ANDHRA PRADESH	APGENCO	STATE	210
98	Dr. N.TATA RAO TPS	5	ANDHRA PRADESH	APGENCO	STATE	210
99	Dr. N.TATA RAO TPS	6	ANDHRA PRADESH	APGENCO	STATE	210
100	Dr. N.TATA RAO TPS	7	ANDHRA PRADESH	APGENCO	STATE	500
101	ENNORE TPS	5	TAMIL NADU	TNGDCL	STATE	110

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
102	FARAKKA STPS	1	WEST BENGAL	NTPC Ltd.	CENTRAL	200
103	FARAKKA STPS	2	WEST BENGAL	NTPC Ltd.	CENTRAL	200
104	FARAKKA STPS	3	WEST BENGAL	NTPC Ltd.	CENTRAL	200
105	FARAKKA STPS	6	WEST BENGAL	NTPC Ltd.	CENTRAL	500
106	GANDHI NAGAR TPS	1	GUJARAT	GSECL	STATE	120
107	GANDHI NAGAR TPS	2	GUJARAT	GSECL	STATE	120
108	GANDHI NAGAR TPS	3	GUJARAT	GSECL	STATE	210
109	GANDHI NAGAR TPS	4	GUJARAT	GSECL	STATE	210
110	GANDHI NAGAR TPS	5	GUJARAT	GSECL	STATE	210
111	GH TPS (LEH.MOH.)	1	PUNJAB	PSPCL	STATE	210
112	GH TPS (LEH.MOH.)	2	PUNJAB	PSPCL	STATE	210
113	GH TPS (LEH.MOH.)	3	PUNJAB	PSPCL	STATE	250
114	GH TPS (LEH.MOH.)	4	PUNJAB	PSPCL	STATE	250
115	GIRAL TPS	1	RAJASTHAN	RRVUNL	STATE	125
116	GIRAL TPS	2	RAJASTHAN	RRVUNL	STATE	125
117	GND TPS(BHATINDA)	1	PUNJAB	PSPCL	STATE	110
118	GND TPS(BHATINDA)	2	PUNJAB	PSPCL	STATE	110
119	GND TPS(BHATINDA)	3	PUNJAB	PSPCL	STATE	110
120	GND TPS(BHATINDA)	4	PUNJAB	PSPCL	STATE	110
121	GOINDWAL SAHIB TPP	1	PUNJAB	GPGSL (GVK)	PVT	270
122	GOINDWAL SAHIB TPP	2	PUNJAB	GPGSL (GVK)	PVT	270
123	HARDUAGANJ TPS	5	UTTAR PRADESH	UPRVUNL	STATE	60
124	HARDUAGANJ TPS	7	UTTAR PRADESH	UPRVUNL	STATE	105
125	HARDUAGANJ TPS	8	UTTAR PRADESH	UPRVUNL	STATE	250
126	HARDUAGANJ TPS	9	UTTAR PRADESH	UPRVUNL	STATE	250
127	IB VALLEY TPS	1	ORISSA	OPGC	STATE	210
128	IB VALLEY TPS	2	ORISSA	OPGC	STATE	210
129	INDIRA GANDHI STPP	1	HARYANA	APCPL	CENTRAL	500
130	INDIRA GANDHI STPP	2	HARYANA	APCPL	CENTRAL	500
131	INDIRA GANDHI STPP	3	HARYANA	APCPL	CENTRAL	500
132	JOJOBERA TPS	2	JHARKHAND	TATA PCL	PVT	120
133	JOJOBERA TPS	3	JHARKHAND	TATA PCL	PVT	120
134	JOJOBERA TPS	4	JHARKHAND	TATA PCL	PVT	120
135	KAHALGAON TPS	5	BIHAR	NTPC Ltd.	CENTRAL	500
136	KAHALGAON TPS	6	BIHAR	NTPC Ltd.	CENTRAL	500
137	KAHALGAON TPS	7	BIHAR	NTPC Ltd.	CENTRAL	500
138	KAKATIYA TPS	1	TELANGANA	TSGENCO	STATE	500
139	KAKATIYA TPS	2	TELANGANA	TSGENCO	STATE	600
140	KHAPARKHEDA TPS	1	MAHARASHTRA	MAHAGENCO	STATE	210
141	KHAPARKHEDA TPS	2	MAHARASHTRA	MAHAGENCO	STATE	210
142	KHAPARKHEDA TPS	3	MAHARASHTRA	MAHAGENCO	STATE	210
143	KHAPARKHEDA TPS	4	MAHARASHTRA	MAHAGENCO	STATE	210
144	KHAPARKHEDA TPS	5	MAHARASHTRA	MAHAGENCO	STATE	500
145	KODARMA TPP	1	JHARKHAND	DVC	CENTRAL	500
146	KODARMA TPP	2	JHARKHAND	DVC	CENTRAL	500
147	KOLAGHAT TPS	5	WEST BENGAL	WBPDC	STATE	210
148	KOLAGHAT TPS	6	WEST BENGAL	WBPDC	STATE	210
149	KORADI TPS	5	MAHARASHTRA	MAHAGENCO	STATE	200
150	KORADI TPS	6	MAHARASHTRA	MAHAGENCO	STATE	210
151	KORADI TPS	7	MAHARASHTRA	MAHAGENCO	STATE	210
152	KORBA STPS	1	CHHATTISGARH	NTPC Ltd.	CENTRAL	200
153	KORBA STPS	2	CHHATTISGARH	NTPC Ltd.	CENTRAL	200
154	KORBA STPS	3	CHHATTISGARH	NTPC Ltd.	CENTRAL	200
155	KORBA STPS	4	CHHATTISGARH	NTPC Ltd.	CENTRAL	500
156	KORBA STPS	5	CHHATTISGARH	NTPC Ltd.	CENTRAL	500
157	KORBA STPS	6	CHHATTISGARH	NTPC Ltd.	CENTRAL	500
158	KORBA STPS	7	CHHATTISGARH	NTPC Ltd.	CENTRAL	500
159	KORBA-III	2	CHHATTISGARH	CSPGCL	STATE	120

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
160	KORBA-WEST TPS	1	CHHATTISGARH	CSPGCL	STATE	210
161	KORBA-WEST TPS	2	CHHATTISGARH	CSPGCL	STATE	210
162	KORBA-WEST TPS	5	CHHATTISGARH	CSPGCL	STATE	500
163	KOTA TPS	1	RAJASTHAN	RRVUNL	STATE	110
164	KOTA TPS	2	RAJASTHAN	RRVUNL	STATE	110
165	KOTA TPS	3	RAJASTHAN	RRVUNL	STATE	210
166	KOTA TPS	4	RAJASTHAN	RRVUNL	STATE	210
167	KOTA TPS	5	RAJASTHAN	RRVUNL	STATE	210
168	KOTA TPS	6	RAJASTHAN	RRVUNL	STATE	195
169	KOTA TPS	7	RAJASTHAN	RRVUNL	STATE	195
170	KOTHAGUDEM TPS	1	TELANGANA	TSGENCO	STATE	60
171	KOTHAGUDEM TPS	5	TELANGANA	TSGENCO	STATE	120
172	KOTHAGUDEM TPS	6	TELANGANA	TSGENCO	STATE	120
173	KOTHAGUDEM TPS	7	TELANGANA	TSGENCO	STATE	120
174	KOTHAGUDEM TPS	8	TELANGANA	TSGENCO	STATE	120
175	KOTHAGUDEM TPS (NEW)	1	TELANGANA	TSGENCO	STATE	250
176	KOTHAGUDEM TPS (NEW)	2	TELANGANA	TSGENCO	STATE	250
177	KOTHAGUDEM TPS (NEW)	3	TELANGANA	TSGENCO	STATE	500
178	KUTCH LIG. TPS	1	GUJARAT	GSECL	STATE	70
179	KUTCH LIG. TPS	2	GUJARAT	GSECL	STATE	70
180	KUTCH LIG. TPS	4	GUJARAT	GSECL	STATE	75
181	LALITPUR TPS	1	UTTAR PRADESH	LPGCL	PVT	660
182	LALITPUR TPS	2	UTTAR PRADESH	LPGCL	PVT	660
183	LALITPUR TPS	3	UTTAR PRADESH	LPGCL	PVT	660
184	MAHADEV PRASAD STPP	1	JHARKHAND	ADHUNIK	PVT	270
185	MAHADEV PRASAD STPP	2	JHARKHAND	ADHUNIK	PVT	270
186	MAITHON RB TPP	1	JHARKHAND	MPL	PVT	525
187	MAITHON RB TPP	2	JHARKHAND	MPL	PVT	525
188	MARWA TPS	1	CHHATTISGARH	CSPGCL	STATE	500
189	MARWA TPS	2	CHHATTISGARH	CSPGCL	STATE	500
190	MAUDA TPS	1	MAHARASHTRA	NTPC Ltd.	CENTRAL	500
191	MAUDA TPS	2	MAHARASHTRA	NTPC Ltd.	CENTRAL	500
192	MAUDA TPS	3	MAHARASHTRA	NTPC Ltd.	CENTRAL	660
193	MEJIA TPS	1	WEST BENGAL	DVC	CENTRAL	210
194	MEJIA TPS	2	WEST BENGAL	DVC	CENTRAL	210
195	MEJIA TPS	3	WEST BENGAL	DVC	CENTRAL	210
196	MEJIA TPS	4	WEST BENGAL	DVC	CENTRAL	210
197	MEJIA TPS	5	WEST BENGAL	DVC	CENTRAL	250
198	MEJIA TPS	6	WEST BENGAL	DVC	CENTRAL	250
199	MEJIA TPS	7	WEST BENGAL	DVC	CENTRAL	500
200	MEJIA TPS	8	WEST BENGAL	DVC	CENTRAL	500
201	METTUR TPS	1	TAMIL NADU	TNGDCL	STATE	210
202	METTUR TPS	2	TAMIL NADU	TNGDCL	STATE	210
203	METTUR TPS	3	TAMIL NADU	TNGDCL	STATE	210
204	METTUR TPS	4	TAMIL NADU	TNGDCL	STATE	210
205	MUZAFFARPUR TPS	1	BIHAR	K.B.U.N.L	CENTRAL	110
206	MUZAFFARPUR TPS	2	BIHAR	K.B.U.N.L	CENTRAL	110
207	MUZAFFARPUR TPS	3	BIHAR	K.B.U.N.L	CENTRAL	195
208	NABI NAGAR TPP	1	BIHAR	BRBCL	CENTRAL	250
209	NASIK (P) TPS	1	MAHARASHTRA	STPL	PVT	270
210	NASIK TPS	3	MAHARASHTRA	MAHAGENCO	STATE	210
211	NASIK TPS	4	MAHARASHTRA	MAHAGENCO	STATE	210
212	NASIK TPS	5	MAHARASHTRA	MAHAGENCO	STATE	210
213	NEYVELI TPS-II	4	TAMIL NADU	NLC	CENTRAL	210
214	NEYVELI TPS-II	5	TAMIL NADU	NLC	CENTRAL	210
215	NEYVELI TPS-II	6	TAMIL NADU	NLC	CENTRAL	210
216	NEYVELI TPS-II	7	TAMIL NADU	NLC	CENTRAL	210
217	NEYVELI TPS-II EXP	1	TAMIL NADU	NLC	CENTRAL	250

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
218	NEYVELI TPS-II EXP	2	TAMIL NADU	NLC	CENTRAL	250
219	NORTH CHENNAI TPS	1	TAMIL NADU	TNGDCL	STATE	210
220	NORTH CHENNAI TPS	2	TAMIL NADU	TNGDCL	STATE	210
221	NORTH CHENNAI TPS	3	TAMIL NADU	TNGDCL	STATE	210
222	NORTH CHENNAI TPS	4	TAMIL NADU	TNGDCL	STATE	600
223	NORTH CHENNAI TPS	5	TAMIL NADU	TNGDCL	STATE	600
224	OBRA TPS	7	UTTAR PRADESH	UPRVUNL	STATE	94
225	OBRA TPS	8	UTTAR PRADESH	UPRVUNL	STATE	94
226	OBRA TPS	9	UTTAR PRADESH	UPRVUNL	STATE	200
227	OBRA TPS	10	UTTAR PRADESH	UPRVUNL	STATE	200
228	OBRA TPS	11	UTTAR PRADESH	UPRVUNL	STATE	200
229	OBRA TPS	12	UTTAR PRADESH	UPRVUNL	STATE	200
230	OBRA TPS	13	UTTAR PRADESH	UPRVUNL	STATE	200
231	OP JINDAL TPS	1	CHHATTISGARH	JPL	PVT	250
232	OP JINDAL TPS	2	CHHATTISGARH	JPL	PVT	250
233	OP JINDAL TPS	3	CHHATTISGARH	JPL	PVT	250
234	OP JINDAL TPS	4	CHHATTISGARH	JPL	PVT	250
235	PANIPAT TPS	5	HARYANA	HPGCL	STATE	210
236	PANIPAT TPS	6	HARYANA	HPGCL	STATE	210
237	PANIPAT TPS	7	HARYANA	HPGCL	STATE	250
238	PANIPAT TPS	8	HARYANA	HPGCL	STATE	250
239	PANKI TPS	3	UTTAR PRADESH	UPRVUNL	STATE	105
240	PANKI TPS	4	UTTAR PRADESH	UPRVUNL	STATE	105
241	PARAS TPS	3	MAHARASHTRA	MAHAGENCO	STATE	250
242	PARAS TPS	4	MAHARASHTRA	MAHAGENCO	STATE	250
243	PARICHHA TPS	1	UTTAR PRADESH	UPRVUNL	STATE	110
244	PARICHHA TPS	2	UTTAR PRADESH	UPRVUNL	STATE	110
245	PARICHHA TPS	3	UTTAR PRADESH	UPRVUNL	STATE	210
246	PARICHHA TPS	4	UTTAR PRADESH	UPRVUNL	STATE	210
247	PARICHHA TPS	5	UTTAR PRADESH	UPRVUNL	STATE	250
248	PARICHHA TPS	6	UTTAR PRADESH	UPRVUNL	STATE	250
249	PARLI TPS	3	MAHARASHTRA	MAHAGENCO	STATE	210
250	PARLI TPS	4	MAHARASHTRA	MAHAGENCO	STATE	210
251	PARLI TPS	5	MAHARASHTRA	MAHAGENCO	STATE	210
252	PARLI TPS	6	MAHARASHTRA	MAHAGENCO	STATE	250
253	PARLI TPS	7	MAHARASHTRA	MAHAGENCO	STATE	250
254	PARLI TPS	8	MAHARASHTRA	MAHAGENCO	STATE	250
255	PATRATU TPS	7	JHARKHAND	PVUNL	CENTRAL	105
256	PATRATU TPS	8	JHARKHAND	PVUNL	CENTRAL	105
257	PATRATU TPS	9	JHARKHAND	PVUNL	CENTRAL	110
258	PATRATU TPS	10	JHARKHAND	PVUNL	CENTRAL	110
259	PRAYAGRAJ TPP	1	UTTAR PRADESH	PPGCL (Jaypee)	PVT	660
260	PRAYAGRAJ TPP	2	UTTAR PRADESH	PPGCL (Jaypee)	PVT	660
261	RAICHUR TPS	1	KARNATAKA	KPCL	STATE	210
262	RAICHUR TPS	2	KARNATAKA	KPCL	STATE	210
263	RAICHUR TPS	3	KARNATAKA	KPCL	STATE	210
264	RAICHUR TPS	4	KARNATAKA	KPCL	STATE	210
265	RAICHUR TPS	5	KARNATAKA	KPCL	STATE	210
266	RAICHUR TPS	6	KARNATAKA	KPCL	STATE	210
267	RAICHUR TPS	7	KARNATAKA	KPCL	STATE	210
268	RAICHUR TPS	8	KARNATAKA	KPCL	STATE	250
269	RAJGHAT TPS	1	DELHI	IPGPCL	STATE	67.5
270	RAJGHAT TPS	2	DELHI	IPGPCL	STATE	67.5
271	RAMAGUNDEM STPS	4	TELANGANA	NTPC Ltd.	CENTRAL	500
272	RAMAGUNDEM STPS	5	TELANGANA	NTPC Ltd.	CENTRAL	500
273	RAMAGUNDEM STPS	6	TELANGANA	NTPC Ltd.	CENTRAL	500
274	RAMAGUNDEM STPS	7	TELANGANA	NTPC Ltd.	CENTRAL	500
275	RATIJA TPS	2	CHHATTISGARH	SCPL	PVT	50

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
276	RAYALASEEMA TPS	1	ANDHRA PRADESH	APGENCO	STATE	210
277	RAYALASEEMA TPS	2	ANDHRA PRADESH	APGENCO	STATE	210
278	RAYALASEEMA TPS	3	ANDHRA PRADESH	APGENCO	STATE	210
279	RAYALASEEMA TPS	4	ANDHRA PRADESH	APGENCO	STATE	210
280	RAYALASEEMA TPS	5	ANDHRA PRADESH	APGENCO	STATE	210
281	RIHAND STPS	3	UTTAR PRADESH	NTPC Ltd.	CENTRAL	500
282	RIHAND STPS	4	UTTAR PRADESH	NTPC Ltd.	CENTRAL	500
283	RIHAND STPS	5	UTTAR PRADESH	NTPC Ltd.	CENTRAL	500
284	RIHAND STPS	6	UTTAR PRADESH	NTPC Ltd.	CENTRAL	500
285	ROPAR TPS	1	PUNJAB	PSPCL	STATE	210
286	ROPAR TPS	2	PUNJAB	PSPCL	STATE	210
287	ROPAR TPS	3	PUNJAB	PSPCL	STATE	210
288	ROPAR TPS	4	PUNJAB	PSPCL	STATE	210
289	ROPAR TPS	5	PUNJAB	PSPCL	STATE	210
290	ROPAR TPS	6	PUNJAB	PSPCL	STATE	210
291	SABARMATI (D-F STATIONS)	1	GUJARAT	TOR. POW.	PVT	120
292	SABARMATI (D-F STATIONS)	2	GUJARAT	TOR. POW.	PVT	121
293	SABARMATI (D-F STATIONS)	3	GUJARAT	TOR. POW.	PVT	121
294	SAGARDIGHI TPS	3	WEST BENGAL	WBPDC	STATE	500
295	SANJAY GANDHI TPS	1	MADHYA PRADESH	MPPGCL	STATE	210
296	SANJAY GANDHI TPS	2	MADHYA PRADESH	MPPGCL	STATE	210
297	SANJAY GANDHI TPS	3	MADHYA PRADESH	MPPGCL	STATE	210
298	SANJAY GANDHI TPS	4	MADHYA PRADESH	MPPGCL	STATE	210
299	SANJAY GANDHI TPS	5	MADHYA PRADESH	MPPGCL	STATE	500
300	SANTALDIH TPS	5	WEST BENGAL	WBPDC	STATE	250
301	SANTALDIH TPS	6	WEST BENGAL	WBPDC	STATE	250
302	SATPURA TPS	6	MADHYA PRADESH	MPPGCL	STATE	200
303	SATPURA TPS	7	MADHYA PRADESH	MPPGCL	STATE	210
304	SATPURA TPS	8	MADHYA PRADESH	MPPGCL	STATE	210
305	SATPURA TPS	9	MADHYA PRADESH	MPPGCL	STATE	210
306	SATPURA TPS	11	MADHYA PRADESH	MPPGCL	STATE	250
307	SEIONI TPP	1	MADHYA PRADESH	JHAPL	PVT	600
308	SHREE SINGAJI TPP	1	MADHYA PRADESH	MPPGCL	STATE	600
309	SHREE SINGAJI TPP	2	MADHYA PRADESH	MPPGCL	STATE	600
310	SIKKA REP. TPS	1	GUJARAT	GSECL	STATE	120
311	SIKKA REP. TPS	2	GUJARAT	GSECL	STATE	120
312	SIKKA REP. TPS	3	GUJARAT	GSECL	STATE	250
313	SIKKA REP. TPS	4	GUJARAT	GSECL	STATE	250
314	SIMHADRI	1	ANDHRA PRADESH	NTPC Ltd.	CENTRAL	500
315	SIMHADRI	2	ANDHRA PRADESH	NTPC Ltd.	CENTRAL	500
316	SIMHADRI	3	ANDHRA PRADESH	NTPC Ltd.	CENTRAL	500
317	SIMHADRI	4	ANDHRA PRADESH	NTPC Ltd.	CENTRAL	500
318	SINGARENI TPP	1	TELANGANA	SCCL	STATE	600
319	SINGARENI TPP	2	TELANGANA	SCCL	STATE	600
320	SINGRAULI STPS	1	UTTAR PRADESH	NTPC Ltd.	CENTRAL	200
321	SINGRAULI STPS	2	UTTAR PRADESH	NTPC Ltd.	CENTRAL	200
322	SINGRAULI STPS	3	UTTAR PRADESH	NTPC Ltd.	CENTRAL	200
323	SINGRAULI STPS	4	UTTAR PRADESH	NTPC Ltd.	CENTRAL	200
324	SINGRAULI STPS	5	UTTAR PRADESH	NTPC Ltd.	CENTRAL	200
325	SINGRAULI STPS	6	UTTAR PRADESH	NTPC Ltd.	CENTRAL	500
326	SINGRAULI STPS	7	UTTAR PRADESH	NTPC Ltd.	CENTRAL	500
327	SIPAT STPS	4	CHHATTISGARH	NTPC Ltd.	CENTRAL	500
328	SIPAT STPS	5	CHHATTISGARH	NTPC Ltd.	CENTRAL	500
329	SOUTHERN REPL. TPS	1	WEST BENGAL	CESC	PVT	67.5
330	SOUTHERN REPL. TPS	2	WEST BENGAL	CESC	PVT	67.5
331	SURAT LIG. TPS	1	GUJARAT	GIPCL	PVT	125
332	SURAT LIG. TPS	2	GUJARAT	GIPCL	PVT	125
333	SURAT LIG. TPS	3	GUJARAT	GIPCL	PVT	125

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
334	SURAT LIG. TPS	4	GUJARAT	GIPCL	PVT	125
335	SURATGARH TPS	1	RAJASTHAN	RRVUNL	STATE	250
336	SURATGARH TPS	2	RAJASTHAN	RRVUNL	STATE	250
337	SURATGARH TPS	3	RAJASTHAN	RRVUNL	STATE	250
338	SURATGARH TPS	4	RAJASTHAN	RRVUNL	STATE	250
339	SURATGARH TPS	5	RAJASTHAN	RRVUNL	STATE	250
340	SURATGARH TPS	6	RAJASTHAN	RRVUNL	STATE	250
341	TALCHER (OLD) TPS	5	ORISSA	NTPC Ltd.	CENTRAL	110
342	TALCHER (OLD) TPS	6	ORISSA	NTPC Ltd.	CENTRAL	110
343	TALCHER STPS	3	ORISSA	NTPC Ltd.	CENTRAL	500
344	TALCHER STPS	4	ORISSA	NTPC Ltd.	CENTRAL	500
345	TALCHER STPS	5	ORISSA	NTPC Ltd.	CENTRAL	500
346	TALCHER STPS	6	ORISSA	NTPC Ltd.	CENTRAL	500
347	TAMNAR TPP	1	CHHATTISGARH	JPL	PVT	600
348	TAMNAR TPP	2	CHHATTISGARH	JPL	PVT	600
349	TAMNAR TPP	3	CHHATTISGARH	JPL	PVT	600
350	TAMNAR TPP	4	CHHATTISGARH	JPL	PVT	600
351	TANDA TPS	3	UTTAR PRADESH	NTPC Ltd.	CENTRAL	110
352	TANDA TPS	4	UTTAR PRADESH	NTPC Ltd.	CENTRAL	110
353	TENUGHAT TPS	1	JHARKHAND	TVNL	STATE	210
354	TENUGHAT TPS	2	JHARKHAND	TVNL	STATE	210
355	TORANGALLU TPS(SBU-I)	1	KARNATAKA	JSWEL	PVT	130
356	TORANGALLU TPS(SBU-I)	2	KARNATAKA	JSWEL	PVT	130
357	TROMBAY TPS	5	MAHARASHTRA	TATA PCL	PVT	500
358	TROMBAY TPS	6	MAHARASHTRA	TATA PCL	PVT	500
359	TROMBAY TPS	8	MAHARASHTRA	TATA PCL	PVT	250
360	TUTICORIN (JV) TPP	1	TAMIL NADU	NTPL	CENTRAL	500
361	TUTICORIN (JV) TPP	2	TAMIL NADU	NTPL	CENTRAL	500
362	TUTICORIN TPS	1	TAMIL NADU	TNGDCL	STATE	210
363	TUTICORIN TPS	2	TAMIL NADU	TNGDCL	STATE	210
364	TUTICORIN TPS	3	TAMIL NADU	TNGDCL	STATE	210
365	TUTICORIN TPS	4	TAMIL NADU	TNGDCL	STATE	210
366	TUTICORIN TPS	5	TAMIL NADU	TNGDCL	STATE	210
367	UKAI TPS	1	GUJARAT	GSECL	STATE	120
368	UKAI TPS	2	GUJARAT	GSECL	STATE	120
369	UKAI TPS	3	GUJARAT	GSECL	STATE	200
370	UKAI TPS	4	GUJARAT	GSECL	STATE	200
371	UKAI TPS	5	GUJARAT	GSECL	STATE	210
372	UKAI TPS	6	GUJARAT	GSECL	STATE	500
373	UNCHAHAR TPS	1	UTTAR PRADESH	NTPC Ltd.	CENTRAL	210
374	UNCHAHAR TPS	2	UTTAR PRADESH	NTPC Ltd.	CENTRAL	210
375	UNCHAHAR TPS	3	UTTAR PRADESH	NTPC Ltd.	CENTRAL	210
376	UNCHAHAR TPS	4	UTTAR PRADESH	NTPC Ltd.	CENTRAL	210
377	UNCHAHAR TPS	5	UTTAR PRADESH	NTPC Ltd.	CENTRAL	210
378	VALLUR TPP	1	TAMIL NADU	NTECL	CENTRAL	500
379	VALLUR TPP	2	TAMIL NADU	NTECL	CENTRAL	500
380	VALLUR TPP	3	TAMIL NADU	NTECL	CENTRAL	500
381	VINDHYACHAL STPS	7	MADHYA PRADESH	NTPC Ltd.	CENTRAL	500
382	VINDHYACHAL STPS	8	MADHYA PRADESH	NTPC Ltd.	CENTRAL	500
383	VINDHYACHAL STPS	9	MADHYA PRADESH	NTPC Ltd.	CENTRAL	500
384	VINDHYACHAL STPS	10	MADHYA PRADESH	NTPC Ltd.	CENTRAL	500
385	VINDHYACHAL STPS	11	MADHYA PRADESH	NTPC Ltd.	CENTRAL	500
386	VINDHYACHAL STPS	12	MADHYA PRADESH	NTPC Ltd.	CENTRAL	500
387	VINDHYACHAL STPS	13	MADHYA PRADESH	NTPC Ltd.	CENTRAL	500
388	VIZAG TPP	1	ANDHRA PRADESH	HNPC	PVT	520
389	VIZAG TPP	2	ANDHRA PRADESH	HNPC	PVT	520
390	WANAKBORI TPS	1	GUJARAT	GSECL	STATE	210
391	WANAKBORI TPS	2	GUJARAT	GSECL	STATE	210

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
392	WANAKBORI TPS	3	GUJARAT	GSECL	STATE	210
393	WANAKBORI TPS	4	GUJARAT	GSECL	STATE	210
394	WANAKBORI TPS	5	GUJARAT	GSECL	STATE	210
395	WANAKBORI TPS	6	GUJARAT	GSECL	STATE	210
396	WANAKBORI TPS	7	GUJARAT	GSECL	STATE	210
397	YERMARUS TPP	1	KARNATAKA	RPCL	STATE	800
		380				**109770**
CHINA/CHINA (TG /Boiler)						
398	AKALTARA TPS	3	CHHATTISGARH	WPCL	PVT	600
399	AKALTARA TPS	4	CHHATTISGARH	WPCL	PVT	600
400	ANPARA C TPS	1	UTTAR PRADESH	LAPPL	PVT	600
401	ANPARA C TPS	2	UTTAR PRADESH	LAPPL	PVT	600
402	ANUPPUR TPP	1	MADHYA PRADESH	MBPMPL	PVT	600
403	ANUPPUR TPP	2	MADHYA PRADESH	MBPMPL	PVT	600
404	BALCO TPS	1	CHHATTISGARH	BALCO	PVT	300
405	BALCO TPS	2	CHHATTISGARH	BALCO	PVT	300
406	BANDAKHAR TPP	1	CHHATTISGARH	MCCPL	PVT	300
407	BUTIBORI TPP	1	MAHARASHTRA	VIP	PVT	300
408	BUTIBORI TPP	2	MAHARASHTRA	VIP	PVT	300
409	D.P.L. TPS	7	WEST BENGAL	DPL	STATE	300
410	DHARIWAL TPP	1	MAHARASHTRA	DIPL	PVT	300
411	DHARIWAL TPP	2	MAHARASHTRA	DIPL	PVT	300
412	GEPL TPP Ph-I	1	MAHARASHTRA	GEPL	PVT	60
413	GEPL TPP Ph-I	2	MAHARASHTRA	GEPL	PVT	60
414	GMR WARORA TPS	1	MAHARASHTRA	GMR ENERG	PVT	300
415	GMR WARORA TPS	2	MAHARASHTRA	GMR ENERG	PVT	300
416	HALDIA TPP	1	WEST BENGAL	HEL	PVT	300
417	HALDIA TPP	2	WEST BENGAL	HEL	PVT	300
418	ITPCL TPP	1	TAMIL NADU	ITPCL	PVT	600
419	JALIPA KAPURDI TPP	1	RAJASTHAN	RWPL (JSW)	PVT	135
420	JALIPA KAPURDI TPP	2	RAJASTHAN	RWPL (JSW)	PVT	135
421	JALIPA KAPURDI TPP	3	RAJASTHAN	RWPL (JSW)	PVT	135
422	JALIPA KAPURDI TPP	4	RAJASTHAN	RWPL (JSW)	PVT	135
423	JALIPA KAPURDI TPP	5	RAJASTHAN	RWPL (JSW)	PVT	135
424	JALIPA KAPURDI TPP	6	RAJASTHAN	RWPL (JSW)	PVT	135
425	JALIPA KAPURDI TPP	7	RAJASTHAN	RWPL (JSW)	PVT	135
426	JALIPA KAPURDI TPP	8	RAJASTHAN	RWPL (JSW)	PVT	135
427	JSW RATNAGIRI TPP	1	MAHARASHTRA	JSWEL	PVT	300
428	JSW RATNAGIRI TPP	2	MAHARASHTRA	JSWEL	PVT	300
429	JSW RATNAGIRI TPP	3	MAHARASHTRA	JSWEL	PVT	300
430	JSW RATNAGIRI TPP	4	MAHARASHTRA	JSWEL	PVT	300
431	KALISINDH TPS	1	RAJASTHAN	RRVUNL	STATE	600
432	KALISINDH TPS	2	RAJASTHAN	RRVUNL	STATE	600
433	KAMALANGA TPS	1	ORISSA	GMR ENERG	PVT	350
434	KAMALANGA TPS	2	ORISSA	GMR ENERG	PVT	350
435	KAMALANGA TPS	3	ORISSA	GMR ENERG	PVT	350
436	KASAIPALLI TPP	1	CHHATTISGARH	ACB	PVT	135
437	KASAIPALLI TPP	2	CHHATTISGARH	ACB	PVT	135
438	KAWAI TPS	1	RAJASTHAN	APL	PVT	660
439	KAWAI TPS	2	RAJASTHAN	APL	PVT	660
440	MAHAN TPP	1	MADHYA PRADESH	ESSARPMPL	PVT	600
441	MAHATMA GANDHI TPS	1	HARYANA	JhPL(HR)	PVT	660
442	MAHATMA GANDHI TPS	2	HARYANA	JhPL(HR)	PVT	660
443	METTUR TPS - II	1	TAMIL NADU	TNGDCL	STATE	600
444	MIHAN TPS	1	MAHARASHTRA	AMNEPL	PVT	61.5
445	MIHAN TPS	2	MAHARASHTRA	AMNEPL	PVT	61.5
446	MIHAN TPS	3	MAHARASHTRA	AMNEPL	PVT	61.5

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
447	MIHAN TPS	4	MAHARASHTRA	AMNEPL	PVT	61.5
448	MUNDRA TPS	1	GUJARAT	APL	PVT	330
449	MUNDRA TPS	2	GUJARAT	APL	PVT	330
450	MUNDRA TPS	3	GUJARAT	APL	PVT	330
451	MUNDRA TPS	4	GUJARAT	APL	PVT	330
452	MUNDRA TPS	5	GUJARAT	APL	PVT	660
453	MUNDRA TPS	6	GUJARAT	APL	PVT	660
454	MUNDRA TPS	7	GUJARAT	APL	PVT	660
455	MUNDRA TPS	8	GUJARAT	APL	PVT	660
456	MUNDRA TPS	9	GUJARAT	APL	PVT	660
457	MUTHIARA TPP	1	TAMIL NADU	CEPL	PVT	600
458	MUTHIARA TPP	2	TAMIL NADU	CEPL	PVT	600
459	PAINAMPURAM TPP	1	ANDHRA PRADESH	SEIL	PVT	660
460	PAINAMPURAM TPP	2	ANDHRA PRADESH	SEIL	PVT	660
461	PATHADI TPP	1	CHHATTISGARH	LANCO	PVT	300
462	PATHADI TPP	2	CHHATTISGARH	LANCO	PVT	300
463	RAGHUNATHPUR TPP	1	WEST BENGAL	DVC	CENTRAL	600
464	RAGHUNATHPUR TPP	2	WEST BENGAL	DVC	CENTRAL	600
465	RAJIV GANDHI TPS	1	HARYANA	HPGCL	STATE	600
466	RAJIV GANDHI TPS	2	HARYANA	HPGCL	STATE	600
467	ROSA TPP Ph-I	1	UTTAR PRADESH	RPSCL	PVT	300
468	ROSA TPP Ph-I	2	UTTAR PRADESH	RPSCL	PVT	300
469	ROSA TPP Ph-I	3	UTTAR PRADESH	RPSCL	PVT	300
470	ROSA TPP Ph-I	4	UTTAR PRADESH	RPSCL	PVT	300
471	SAGARDIGHI TPS	1	WEST BENGAL	WBPDC	STATE	300
472	SAGARDIGHI TPS	2	WEST BENGAL	WBPDC	STATE	300
473	SALAYA TPP	1	GUJARAT	EPGL	PVT	600
474	SALAYA TPP	2	GUJARAT	EPGL	PVT	600
475	SALORA TPP	1	CHHATTISGARH	VVL	PVT	135
476	SASAN UMTPP	1	MADHYA PRADESH	SPL	PVT	660
477	SASAN UMTPP	2	MADHYA PRADESH	SPL	PVT	660
478	SASAN UMTPP	3	MADHYA PRADESH	SPL	PVT	660
479	SASAN UMTPP	4	MADHYA PRADESH	SPL	PVT	660
480	SASAN UMTPP	5	MADHYA PRADESH	SPL	PVT	660
481	SASAN UMTPP	6	MADHYA PRADESH	SPL	PVT	660
482	SIMHAPURI TPS	1	ANDHRA PRADESH	SEPL	PVT	150
483	SIMHAPURI TPS	2	ANDHRA PRADESH	SEPL	PVT	150
484	STERLITE TPP	1	ORISSA	SEL	PVT	600
485	STERLITE TPP	2	ORISSA	SEL	PVT	600
486	STERLITE TPP	3	ORISSA	SEL	PVT	600
487	STERLITE TPP	4	ORISSA	SEL	PVT	600
488	SVPL TPP	1	CHHATTISGARH	SVPPL	PVT	63
489	TALWANDI SABO TPP	1	PUNJAB	TSPL	PVT	660
490	TALWANDI SABO TPP	2	PUNJAB	TSPL	PVT	660
491	TALWANDI SABO TPP	3	PUNJAB	TSPL	PVT	660
492	TIRORA TPS	1	MAHARASHTRA	APL	PVT	660
493	TIRORA TPS	2	MAHARASHTRA	APL	PVT	660
494	TIRORA TPS	3	MAHARASHTRA	APL	PVT	660
495	TIRORA TPS	4	MAHARASHTRA	APL	PVT	660
496	TIRORA TPS	5	MAHARASHTRA	APL	PVT	660
497	TORANGALLU TPS(SBU-II)	3	KARNATAKA	JSWEL	PVT	300
498	TORANGALLU TPS(SBU-II)	4	KARNATAKA	JSWEL	PVT	300
499	TUTICORIN (P) TPP	1	TAMIL NADU	IBPIL	PVT	150
500	UCHPINDA TPP	1	CHHATTISGARH	RKMPPL	PVT	360
501	UCHPINDA TPP	2	CHHATTISGARH	RKMPPL	PVT	360
502	UDUPI TPP	1	KARNATAKA	UPCL	PVT	600
503	UDUPI TPP	2	KARNATAKA	UPCL	PVT	600
504	WARDHA WARORA TPP	1	MAHARASHTRA	WPCL	PVT	135

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
505	WARDHA WARORA TPP	2	MAHARASHTRA	WPCL	PVT	135
506	WARDHA WARORA TPP	3	MAHARASHTRA	WPCL	PVT	135
507	WARDHA WARORA TPP	4	MAHARASHTRA	WPCL	PVT	135
508	YAMUNA NAGAR TPS	1	HARYANA	HPGCL	STATE	300
509	YAMUNA NAGAR TPS	2	HARYANA	HPGCL	STATE	300
510	ITPCL TPP	2	TAMIL NADU	ITPCL	PVT	600
511	NAWAPARA TPP	1	CHHATTISGARH	TRNE	PVT	300
512	SGPL TPP	1	ANDHRA PRADESH	SEIL	PVT	660
513	SGPL TPP	2	ANDHRA PRADESH	SEIL	PVT	660
		116				**48114**
OTHERS/OTHERS (TG /Boiler)						
514	AKRIMOTA LIG TPS	1	GUJARAT	GMDCL	STATE	125
515	AKRIMOTA LIG TPS	2	GUJARAT	GMDCL	STATE	125
516	AMARAVATI TPS	1	MAHARASHTRA	RattanIndia	PVT	270
517	ANPARA TPS	4	UTTAR PRADESH	UPRVUNL	STATE	500
518	ANPARA TPS	5	UTTAR PRADESH	UPRVUNL	STATE	500
519	BANDEL TPS	1	WEST BENGAL	WBPDC	STATE	60
520	BANDEL TPS	2	WEST BENGAL	WBPDC	STATE	60
521	BANDEL TPS	3	WEST BENGAL	WBPDC	STATE	60
522	BANDEL TPS	4	WEST BENGAL	WBPDC	STATE	60
523	BARKHERA TPS	1	UTTAR PRADESH	BEPL	PVT	45
524	BARKHERA TPS	2	UTTAR PRADESH	BEPL	PVT	45
525	BUDGE BUDGE TPS	1	WEST BENGAL	CESC	PVT	250
526	BUDGE BUDGE TPS	2	WEST BENGAL	CESC	PVT	250
527	CHAKABURA TPP	2	CHHATTISGARH	ACB	PVT	30
528	CHANDRAPUR(ASSAM) TPS	1	ASSAM	APGPCL	STATE	30
529	CHANDRAPURA(DVC) TPS	1	JHARKHAND	DVC	CENTRAL	130
530	CHANDRAPURA(DVC) TPS	2	JHARKHAND	DVC	CENTRAL	130
531	CHANDRAPURA(DVC) TPS	3	JHARKHAND	DVC	CENTRAL	130
532	D.P.L. TPS	3	WEST BENGAL	DPL	STATE	70
533	D.P.L. TPS	4	WEST BENGAL	DPL	STATE	75
534	D.P.L. TPS	5	WEST BENGAL	DPL	STATE	75
535	DAMODARAM SANJEEVAIAH TPS	1	ANDHRA PRADESH	APPDCL	STATE	800
536	DAMODARAM SANJEEVAIAH TPS	2	ANDHRA PRADESH	APPDCL	STATE	800
537	DURGAPUR TPS	3	WEST BENGAL	DVC	CENTRAL	130
538	ENNORE TPS	1	TAMIL NADU	TNGDCL	STATE	60
539	ENNORE TPS	2	TAMIL NADU	TNGDCL	STATE	60
540	ENNORE TPS	3	TAMIL NADU	TNGDCL	STATE	110
541	ENNORE TPS	4	TAMIL NADU	TNGDCL	STATE	110
542	FARAKKA STPS	4	WEST BENGAL	NTPC Ltd.	CENTRAL	500
543	FARAKKA STPS	5	WEST BENGAL	NTPC Ltd.	CENTRAL	500
544	KATGHORA TPP	1	CHHATTISGARH	VESPL	PVT	35
545	KHAMBARKHERA TPS	1	UTTAR PRADESH	BEPL	PVT	45
546	KHAMBARKHERA TPS	2	UTTAR PRADESH	BEPL	PVT	45
547	KORADI TPS	1	MAHARASHTRA	MAHAGENCO	STATE	105
548	KORADI TPS	2	MAHARASHTRA	MAHAGENCO	STATE	105
549	KORADI TPS	3	MAHARASHTRA	MAHAGENCO	STATE	105
550	KORADI TPS	4	MAHARASHTRA	MAHAGENCO	STATE	105
551	KORADI TPS	8	MAHARASHTRA	MAHAGENCO	STATE	660
552	KORADI TPS	9	MAHARASHTRA	MAHAGENCO	STATE	660
553	KORADI TPS	10	MAHARASHTRA	MAHAGENCO	STATE	660
554	KOTHAGUDEM TPS	2	TELANGANA	TSGENCO	STATE	60
555	KOTHAGUDEM TPS	3	TELANGANA	TSGENCO	STATE	60
556	KOTHAGUDEM TPS	4	TELANGANA	TSGENCO	STATE	60
557	KUNDARKI TPS	1	UTTAR PRADESH	BEPL	PVT	45
558	KUNDARKI TPS	2	UTTAR PRADESH	BEPL	PVT	45
559	KUTCH LIG. TPS	3	GUJARAT	GSECL	STATE	75

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
560	MAQSOODPUR TPS	1	UTTAR PRADESH	BEPL	PVT	45
561	MAQSOODPUR TPS	2	UTTAR PRADESH	BEPL	PVT	45
562	MUNDRA UMTPP	1	GUJARAT	CGPL	PVT	800
563	MUNDRA UMTPP	2	GUJARAT	CGPL	PVT	800
564	MUNDRA UMTPP	3	GUJARAT	CGPL	PVT	800
565	MUNDRA UMTPP	4	GUJARAT	CGPL	PVT	800
566	MUNDRA UMTPP	5	GUJARAT	CGPL	PVT	800
567	NEW COSSIPORE TPS	1	WEST BENGAL	CESC	PVT	30
568	NEW COSSIPORE TPS	2	WEST BENGAL	CESC	PVT	30
569	NEW COSSIPORE TPS	3	WEST BENGAL	CESC	PVT	50
570	NEW COSSIPORE TPS	4	WEST BENGAL	CESC	PVT	50
571	NEYVELI (EXT) TPS	1	TAMIL NADU	NLC	CENTRAL	210
572	NEYVELI (EXT) TPS	2	TAMIL NADU	NLC	CENTRAL	210
573	NEYVELI TPS(Z)	1	TAMIL NADU	ST-CMSECP	PVT	250
574	NEYVELI TPS-II	1	TAMIL NADU	NLC	CENTRAL	210
575	NEYVELI TPS-II	2	TAMIL NADU	NLC	CENTRAL	210
576	NEYVELI TPS-II	3	TAMIL NADU	NLC	CENTRAL	210
577	NIGRI TPP	1	MADHYA PRADESH	JPPVL	PVT	660
578	NIGRI TPP	2	MADHYA PRADESH	JPPVL	PVT	660
579	NIWARI TPP	1	MADHYA PRADESH	BLAPPL	PVT	45
580	RAIKHEDA TPP	1	CHHATTISGARH	GCEL	PVT	685
581	RAIKHEDA TPP	2	CHHATTISGARH	GCEL	PVT	685
582	RAJPURA TPP	1	PUNJAB	NPL	PVT	700
583	RAJPURA TPP	2	PUNJAB	NPL	PVT	700
584	RAMAGUNDEM - B TPS	1	TELANGANA	TSGENCO	STATE	62.5
585	RAMAGUNDEM STPS	1	TELANGANA	NTPC Ltd.	CENTRAL	200
586	RAMAGUNDEM STPS	2	TELANGANA	NTPC Ltd.	CENTRAL	200
587	RAMAGUNDEM STPS	3	TELANGANA	NTPC Ltd.	CENTRAL	200
588	RATIJA TPS	1	CHHATTISGARH	SCPL	PVT	50
589	RIHAND STPS	1	UTTAR PRADESH	NTPC Ltd.	CENTRAL	500
590	RIHAND STPS	2	UTTAR PRADESH	NTPC Ltd.	CENTRAL	500
591	SABARMATI (C STATION)	15	GUJARAT	TOR. POW.	PVT	30
592	SABARMATI (C STATION)	16	GUJARAT	TOR. POW.	PVT	30
593	SATPURA TPS	10	MADHYA PRADESH	MPPGCL	STATE	250
594	SIMHAPURI TPS	3	ANDHRA PRADESH	SEPL	PVT	150
595	SIMHAPURI TPS	4	ANDHRA PRADESH	SEPL	PVT	150
596	SIPAT STPS	1	CHHATTISGARH	NTPC Ltd.	CENTRAL	660
597	SIPAT STPS	2	CHHATTISGARH	NTPC Ltd.	CENTRAL	660
598	SIPAT STPS	3	CHHATTISGARH	NTPC Ltd.	CENTRAL	660
599	SWASTIK KORBA TPP	1	CHHATTISGARH	ACB	PVT	25
600	TALCHER (OLD) TPS	1	ORISSA	NTPC Ltd.	CENTRAL	60
601	TALCHER (OLD) TPS	2	ORISSA	NTPC Ltd.	CENTRAL	60
602	TALCHER (OLD) TPS	3	ORISSA	NTPC Ltd.	CENTRAL	60
603	TALCHER (OLD) TPS	4	ORISSA	NTPC Ltd.	CENTRAL	60
604	TALCHER STPS	1	ORISSA	NTPC Ltd.	CENTRAL	500
605	TALCHER STPS	2	ORISSA	NTPC Ltd.	CENTRAL	500
606	TANDA TPS	1	UTTAR PRADESH	NTPC Ltd.	CENTRAL	110
607	TANDA TPS	2	UTTAR PRADESH	NTPC Ltd.	CENTRAL	110
608	THAMMINAPATNAM TPS	1	ANDHRA PRADESH	MEL	PVT	150
609	THAMMINAPATNAM TPS	2	ANDHRA PRADESH	MEL	PVT	150
610	TITAGARH TPS	1	WEST BENGAL	CESC	PVT	60
611	TITAGARH TPS	2	WEST BENGAL	CESC	PVT	60
612	TITAGARH TPS	3	WEST BENGAL	CESC	PVT	60
613	TITAGARH TPS	4	WEST BENGAL	CESC	PVT	60
614	TROMBAY TPS	4	MAHARASHTRA	TATA PCL	PVT	150
615	TUTICORIN (P) TPP	2	TAMIL NADU	IBPIL	PVT	150
616	UTKAL TPP (IND	1	ORISSA	IBPIL	PVT	350
617	UTRAULA TPS	1	UTTAR PRADESH	BEPL	PVT	45

DETAILS OF DIFFERENT MAKE OF UNITS CONSIDERED IN THE REVIEW 2016-17

Sl. No	NAME	UNIT NO	STATE	ORGANIZATION NAME	SECTOR	CAPACITY (MW)
618	UTRAULA TPS	2	UTTAR PRADESH	BEPL	PVT	45
		105				**25712.5**
RUSSIA/RUSSIA						
619	KAHALGAON TPS	1	BIHAR	NTPC Ltd.	CENTRAL	210
620	KAHALGAON TPS	2	BIHAR	NTPC Ltd.	CENTRAL	210
621	KAHALGAON TPS	3	BIHAR	NTPC Ltd.	CENTRAL	210
622	KAHALGAON TPS	4	BIHAR	NTPC Ltd.	CENTRAL	210
623	KORBA-II	1	CHHATTISGARH	CSPGCL	STATE	50
624	KORBA-II	2	CHHATTISGARH	CSPGCL	STATE	50
625	KORBA-II	3	CHHATTISGARH	CSPGCL	STATE	50
626	KORBA-II	4	CHHATTISGARH	CSPGCL	STATE	50
627	NEYVELI TPS- I	1	TAMIL NADU	NLC	CENTRAL	50
628	NEYVELI TPS- I	2	TAMIL NADU	NLC	CENTRAL	50
629	NEYVELI TPS- I	3	TAMIL NADU	NLC	CENTRAL	50
630	NEYVELI TPS- I	4	TAMIL NADU	NLC	CENTRAL	50
631	NEYVELI TPS- I	5	TAMIL NADU	NLC	CENTRAL	50
632	NEYVELI TPS- I	6	TAMIL NADU	NLC	CENTRAL	50
633	NEYVELI TPS- I	7	TAMIL NADU	NLC	CENTRAL	100
634	NEYVELI TPS- I	8	TAMIL NADU	NLC	CENTRAL	100
635	NEYVELI TPS- I	9	TAMIL NADU	NLC	CENTRAL	100
636	OBRA TPS	1	UTTAR PRADESH	UPRVUNL	STATE	40
637	OBRA TPS	2	UTTAR PRADESH	UPRVUNL	STATE	50
638	PATRATU TPS	1	JHARKHAND	PVUNL	CENTRAL	40
639	PATRATU TPS	2	JHARKHAND	PVUNL	CENTRAL	40
640	PATRATU TPS	3	JHARKHAND	PVUNL	CENTRAL	40
641	PATRATU TPS	4	JHARKHAND	PVUNL	CENTRAL	40
642	PATRATU TPS	5	JHARKHAND	PVUNL	CENTRAL	90
643	PATRATU TPS	6	JHARKHAND	PVUNL	CENTRAL	90
644	VINDHYACHAL STPS	1	MADHYA PRADESH	NTPC Ltd.	CENTRAL	210
645	VINDHYACHAL STPS	2	MADHYA PRADESH	NTPC Ltd.	CENTRAL	210
646	VINDHYACHAL STPS	3	MADHYA PRADESH	NTPC Ltd.	CENTRAL	210
647	VINDHYACHAL STPS	4	MADHYA PRADESH	NTPC Ltd.	CENTRAL	210
648	VINDHYACHAL STPS	5	MADHYA PRADESH	NTPC Ltd.	CENTRAL	210
649	VINDHYACHAL STPS	6	MADHYA PRADESH	NTPC Ltd.	CENTRAL	210
		31				**3330**

Annexure-1.6

DETAILS OF NEW UNITS COMMISSIONED BUT NOT CONSIDERED IN THE REVIEW 2016-17

S. No.	Name of Station	Unit No	Organization	Capacity (MW)	Make Boiler/Turbine	Date of Commissioning
1.	BELLARY TPS	3	KPCL	700.00	BHEL/BHEL	01-Mar-16
2	BONGAIGAON TPP	2	NTPC Ltd.	250.00	BHEL/BHEL	22-Mar-17
3	KUDGI STPP	1	NTPC Ltd	800.00	BHEL/BHEL	25-Dec-16
4	KUDGI STPP	2	NTPC Ltd	800.00	BHEL/BHEL	23-Mar-17
5	MAUDA TPS	4	NTPC Ltd	660.00	BHEL/BHEL	18-Mar-17
6	MUZAFFARPUR TPS	4	NTPC Ltd	195.00	BHEL/BHEL	24-Mar-17
7	NASIK(P) TPS	2	STPL	270.00	BHEL/BHEL	15-Feb-17
8	SAGARDIGHI TPS	4	WBPDC	500.00	BHEL/BHEL	15-Dec-16
9	UNCHAHAR TPS	6	NTPC Ltd	500.00	BHEL/BHEL	31-Mar-17
10	YERMARUS TPS	2	RPCL	800.00	BHEL/BHEL	29-Mar-17
		10		**5475.00**		

SECTION-2
GENERATION PERFORMANCE

2.1 OVERALL GENERATION PERFORMANCE

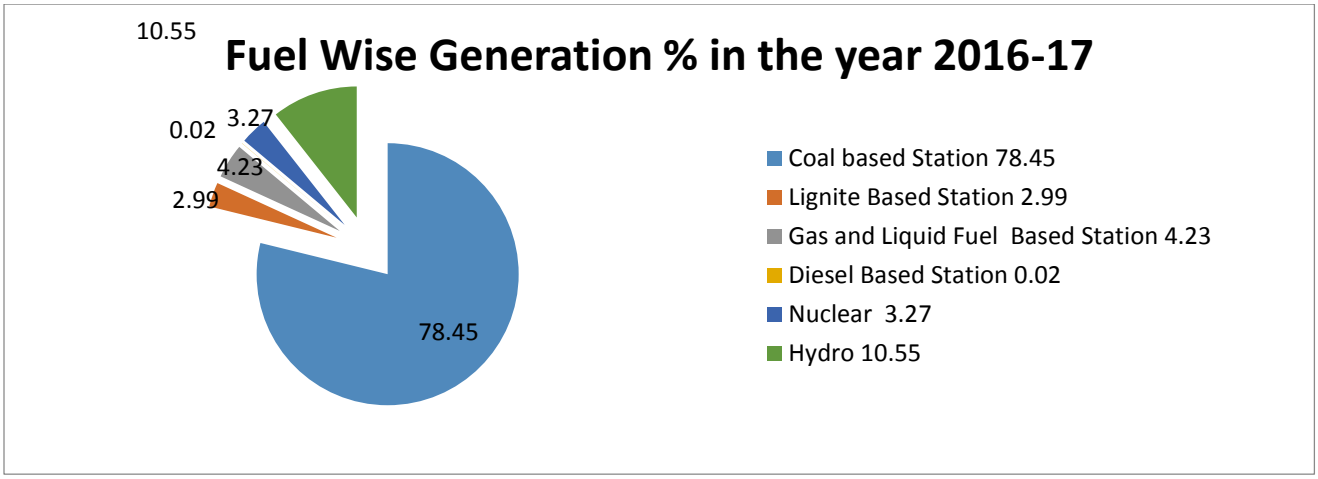
In making performance assessment, several indices like Forced Outage (FO), Planned Maintenance (PM), Operating Availability (Op. Av.), Partial unavailability (Partial loss) and the Plant Load Factor (PLF) have been considered for evaluating the overall performance of thermal power station for the purpose of analysis. No single performance index has been taken as the sole indication of overall performance. A detailed review of generation with reference to the program and PLF is brought out in this section while the other performance indices are covered in Sections 3 to 7.

All India program[3] for electricity generation for the year 2016-17 was fixed at **1178.00** BU and Generation achieved during the year was **1160.14** BU, which was 98.48% of the program; indicating a growth rate of 4.72% over the year 2015-16. Details of program and actual generation, are given below: -

Category	Program Generation (BU)	Actual Generation (BU)	Short fall (-) / Surplus (+) (BU)	% of Program 2016-17	Actual 2015-16 (%age of Program 2015-16)	Growth (%)
Thermal						
Coal based Stations	920.87	910.14	-10.73	98.83	105.58	5.58
Lignite based Stations	37.71	34.73	-2.99	92.08	101.40	1.40
Multi fuel based Stations	0.00	0.00	0.00			0.00
Gas based Stations	39.68	49.07	9.39	123.67	104.46	4.46
Liquid Fuel based Stations	0.50	0.03	-0.47	5.28	17.42	-82.58
Diesel based Stations	0.24	0.28	0.03	113.76	67.82	-32.18
Thermal(total)	**999.00**	**994.23**	**-4.77**	**99.52**	**105.34**	**5.34**
Nuclear	40.00	37.92	-2.08	94.79	101.34	1.34
Hydro	134.00	122.38	-11.62	91.33	100.82	0.82
Bhutan Import	5.00	5.62	0.62	112.35	107.12	7.12
Total	**1178.00**	**1160.14**	**-17.86**	**98.48**	**104.72**	**4.72**

Details of generation from various fuels and share in various fuels in total generation during the year 2016-17, are presented in the figure below

[3] All Program and Generation figures in this Review refer to generation from conventional sources (thermal/hydro/nuclear) of capacity greator than 25 MW in utiity stations



Salient observations on fuel wise performance of generating stations in the country during the year 2016-17 are as follows:

- Total thermal generation was lower by 4.77 BU than program estimation for the year - major contributors being coal and lignite based plants with short falls of 10.73 BU and 2.99 BU respectively vis-à-vis program. However, the gas based generation exceeded the programme by 9.39 BU
- Total thermal generation has achieved a growth rate of 5.34 % over the last year. Coal and lignite based generation recorded a growth rate of 5.58 % and 1.40% respectively.
- Nuclear generation achieved a growth of 1.34% while hydro generation achieved a growth

  of 0.82%.

2.2 PERFORMANCE OF THERMAL GENERATION AND REASONS FOR SHORTFALL

Region wise performance

Thermal generation in Northern, Eastern and North Eastern Regions remained below their respective program. However, the generation in Sourthern & Western Regions exceeded their respective program. Region-wise generation performance of thermal power stations during the year under review is given below: -

Region/ Category	Program(MU)	Actual (MU)	Short fall(-)/ Surplus(+) (MU)
NORTHERN	217270	208010	(-)9260
WESTERN	396701	394088	(-)2613
SOUTHERN	207627	208820	1193
EASTERN	167231	172942	5711
NORTH EASTERN	10171	10370	199
TOTAL THERMAL	**999000**	**994230**	**(-)4770**

Sector wise performance

Sector-wise generation performance during 2016-17 is given below. Thermal power stations in Central Sector and State Sector have generated 102.14% and 94.66% of their generation program. Generation in Private sector Stations was 108 % of the program.

Category / Sectors	Monitored Capacityas on 31.03.2017 (MW)	April 2016 - March 2017		Actual Generation 2015-16 (MU)	% of Program	Growth (%)
		Program (MU)	Actual (MU)			
CENTRAL SECTOR						
APCPL	1500	6500	5474	5798	84.21	(-)5.60
BRBCL	250	300	0	0	0.00	(-)100.00
DVC	7640	31000	33311	27853	107.45	19.59
K.B.U.N.L	610	1300	793	782	61.04	1.49
NEEPCO.	527	2975	2649	2650	89.05	(-)0.01
NLC	3240	21171	20913	19150	98.78	9.21
NSPCL	500	3754	3651	3550	97.26	2.86
NTECL	1500	8500	9211	7717	108.36	19.36
NTPC Ltd.	42112.23	240782	246684	239475	102.45	3.01
NTPL	1000	7000	6252	3558	89.31	75.71
ONGC	727	4000	4173	3479	104.33	19.93
PVUNL	455	700	386	594	55.13	(-)35.04
RGPPL	2220	3000	4558	1234	151.92	269.44
CENTRAL SEC.	**62280.83**	**330982**	**338055**	**315840**	**102.14**	**7.03**
STATE SEC.	**72152.38**	**316347**	**299456**	**291768**	**94.66**	**2.64**
IPP SEC.	**79550.1**	**331859**	**337769**	**316317**	**101.78**	**6.78**
PVT. UTL. SEC.	**3477**	**19812**	**18950**	**19863**	**95.65**	**(-)4.60**
TOTAL THERMAL	**217460.3**	**999000**	**994230**	**943788**	**99.52**	**5.34**

Month wise generation performance

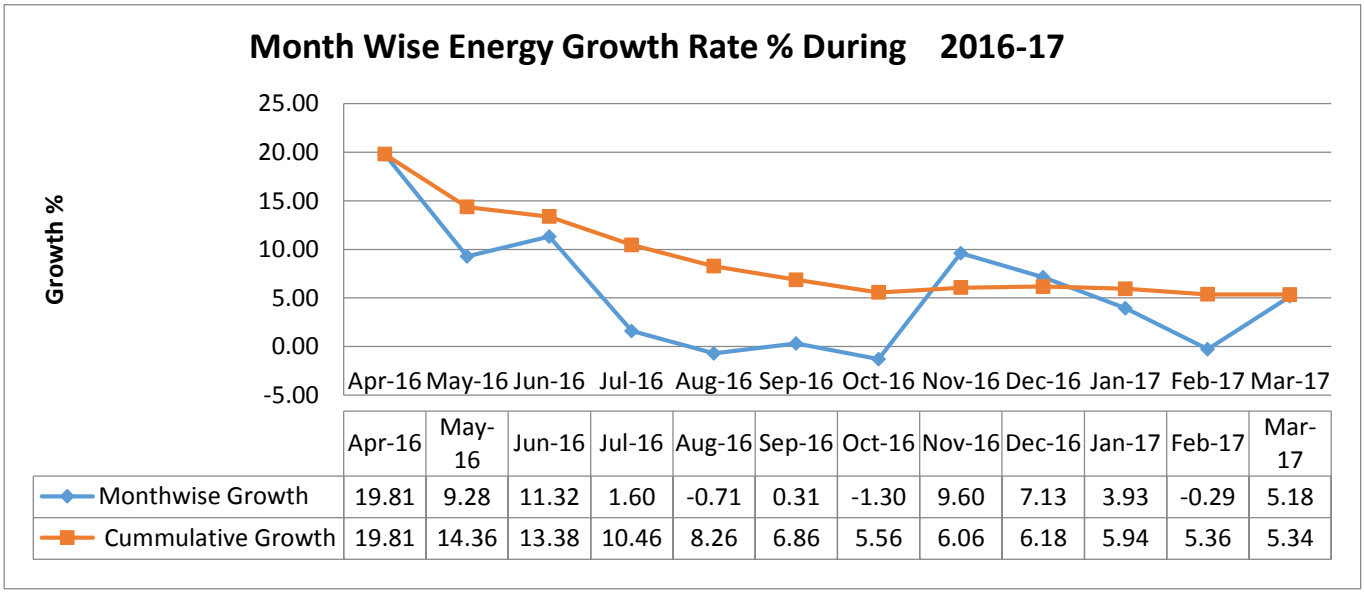
Month-wise and cumulative thermal generation performance vis-à-vis program generation is given below:-

Figures in MU

Month	Thermal Generation Program(2016-17		Actual Generation (2016-17)		Previous Year Generation (2015-16)	
	Monthly	Cumulative	Monthly	Cumulative	Monthly	Cumulative
April 2016	80518	80518	88106	88106	73,540	73,540
May 2016	85273	165791	85969	174075	78,671	152,211
June 2016	79876	245667	81600	255675	73,301	225,512
July 2016	80174	325841	75252	330927	74,069	299,582
August 2016	79677	405518	72991	403918	73,515	373,097
September 2016	79011	484529	79936	483855	79,685	452,781
October 2016	87191	571720	85045	568899	86,166	538,948
November 2016	81530	653250	83291	652190	75,992	614,940
December 2016	85590	738840	85956	738146	80,234	695,174
January 2017	89761	828601	86092	824239	82,835	778,009
February 2017	81624	910225	79661	903900	79,893	857,903

Month	Thermal Generation Program(2016-17		Actual Generation (2016-17)		Previous Year Generation (2015-16)	
	Monthly	Cumulative	Monthly	Cumulative	Monthly	Cumulative
March 2017	88775	999000	90330	994230	85,885	943,788

Month-wise and cumulative thermal generation growth during the year 2016-17 vis-à-vis last year 2015-16 is depicted in the following chart: -



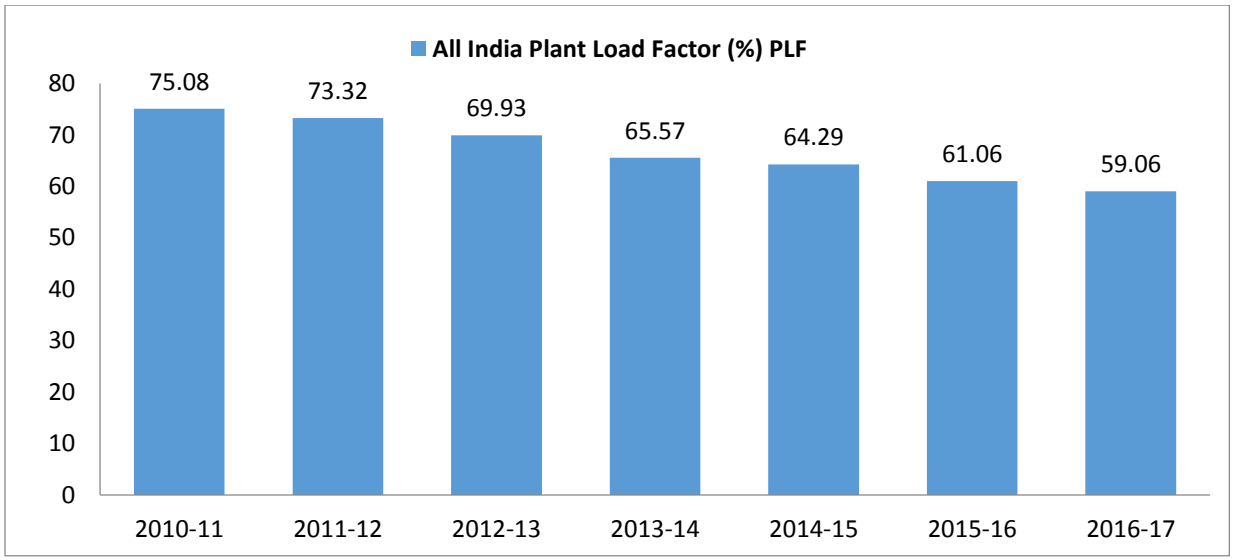
	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
Monthwise Growth	19.81	9.28	11.32	1.60	-0.71	0.31	-1.30	9.60	7.13	3.93	-0.29	5.18
Cummulative Growth	19.81	14.36	13.38	10.46	8.26	6.86	5.56	6.06	6.18	5.94	5.36	5.34

- Total monthly thermal generation varied from 72.99 BU in August'16 to the maximum of 90.33 BU in March'17.
- Thermal generation achieved a growth rate of 5.34% during the year 2016-17 and generation was less than the program by 4.77 BU.
- Unitswise and stationwise performance indices for the year 2016-17 are given in Annexure-2.1

2.3 PLANT LOAD FACTOR (PLF %) – for units considered in the Review

National average PLF of coal/lignite based plants during the financial year 2016-17 reduced to 59.06% against 61.06% during 2015-16.

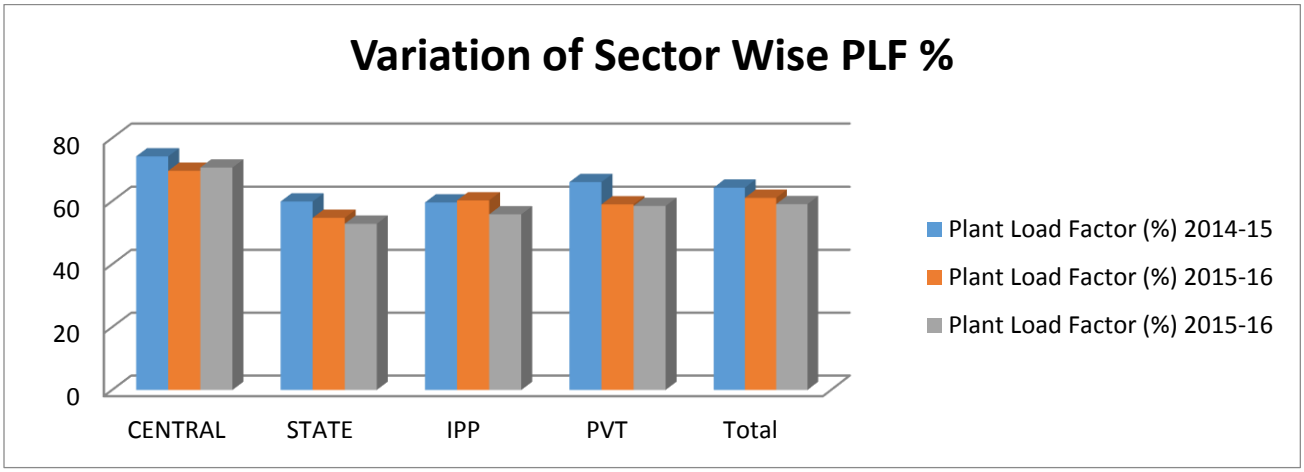
The details of PLF from financial year 2010-11 onwards are depicted in the following chart:



Sector-wise Plant Load Factor (PLF)

During 2016-17, Central Sector Stations achieved highest PLF of 70.66 % amongst all the Sectors. The overall PLF of thermal generating units was lower (59.06 %) as compared to previous year (61.06%). Sector wise PLF of thermal power plants during the last three years are given in the following table:

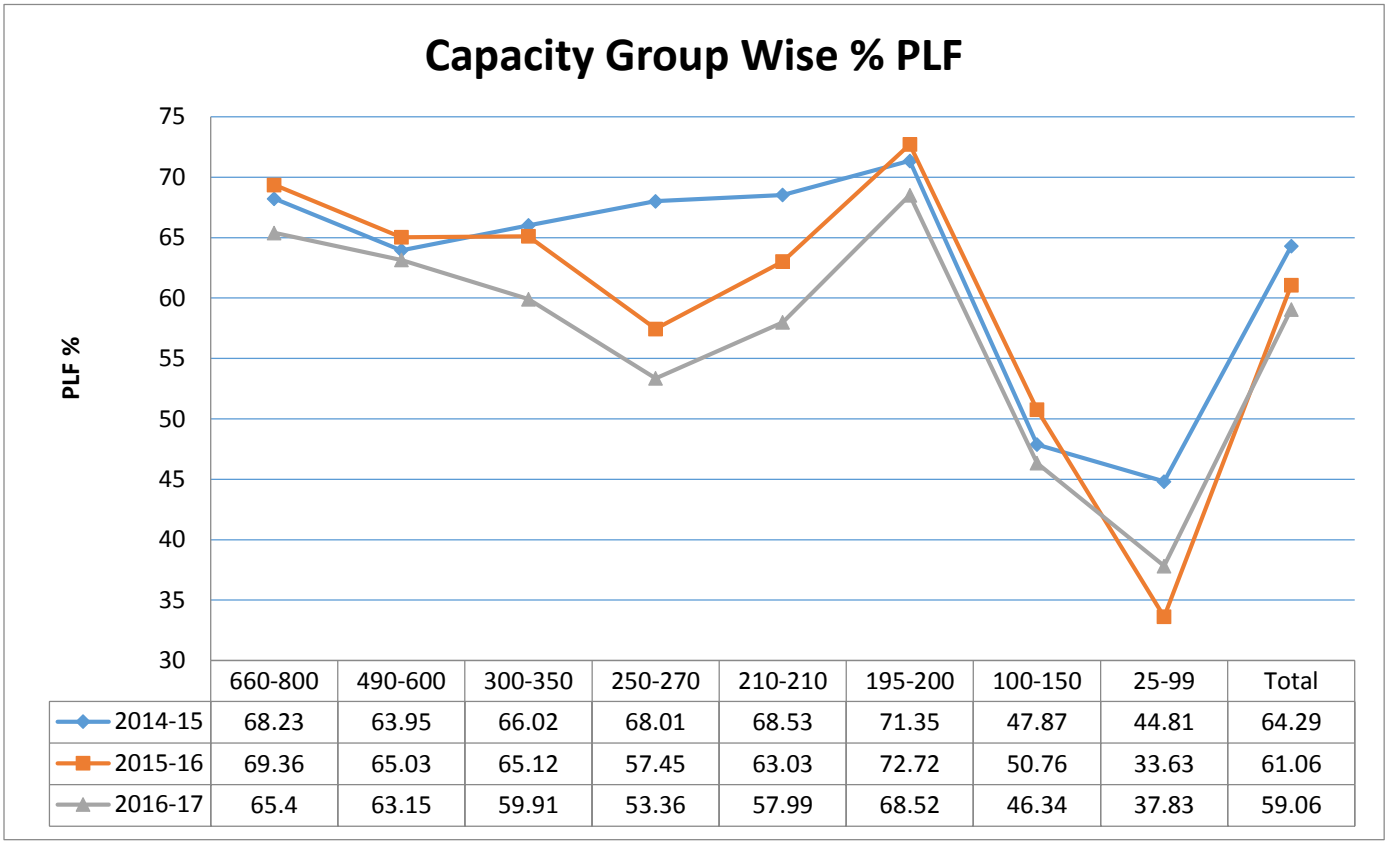
Sector	Capacity (MW)			Plant Load Factor (%)		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
CENTRAL	45,925	50,515.0	52370.0	74.2	69.63	70.66
STATE	54,543	57,820.5	64450.0	59.89	54.72	52.85
IPP	43,274	61,349.0	69519.0	59.59	60.26	55.82
PVT	3,585	3,607.0	3,607.0	66.05	59	58.49
Total	**147,297**	**173,291.5**	**189946.5**	**64.29**	**61.06**	**59.06**



Capacity group-wise Plant Load Factor

Details of PLF of thermal units under review falling under various capcity groups are given below. The 195-200 MW capacity group achieved the highest PF of 68.52 %, followed by the 660-800 MW Supercritical units capacity group which achieved a plant load factor of 65.4%

Capacity Group (MW)	Units commissioned as on 31-MAR-2017		Units Reviewed		PLF (%) of units Reviewed		
	No. of Units	Capacity (MW)	No. of Units	Capacity (MW)	2014-15	2015-16	2016-17
660-800	60	41310	55	37550	68.23	69.36	65.4
490-600	134	71370	132	70370	63.95	65.03	63.15
300-360	39	12140	39	12140	66.02	65.12	59.91
250-270	73	18490	71	17970	68.01	57.45	53.36
210-210	143	30030	143	30030	68.53	63.03	57.99
195-200	27	5380	26	5185	71.35	72.72	68.52
100-150	98	11922	98	11922	47.87	50.76	46.34
25-99	85	4779.5	85	4779.5	44.81	33.63	37.83
Total	**659**	**195421.5**	**649**	**189946.5**	**64.29**	**61.06**	**59.06**



	660-800	490-600	300-350	250-270	210-210	195-200	100-150	25-99	Total
2014-15	68.23	63.95	66.02	68.01	68.53	71.35	47.87	44.81	64.29
2015-16	69.36	65.03	65.12	57.45	63.03	72.72	50.76	33.63	61.06
2016-17	65.4	63.15	59.91	53.36	57.99	68.52	46.34	37.83	59.06

Make-wise PLF

The PLF of different makes wise units taken in the review during last three years is given as under. The PLF of BHEL/BHEL make units reduced from 60.68% during 2015-16 to 58.63 % during 2016-17. Reduction is also seen in PLF of China/China make units.

As may be seen, out of 649 units reviewed, the highest numbers of units (380 numbers with aggregate capacity 109770 MW) were of BHEL/BHEL make.

Make TG/Boiler	Units operating as on 31-03-2016		Reviewed during 2016-17		PLF Of units Reviewed		
	No. of units	Capacity (MW)	No. of units	Capacity (MW)	14-15	15-16	16-17
BHEL/BHEL	387	113045.0	379	109170.0	66.99	60.68	58.63
BHEL/ABL	17	3020.0	17	3020.0	40.57	29.49	36.28
RUSSIA/RUSSIA	31	3330.0	31	3330.0	68.19	60.12	64.24
CHINA/CHINA	112	45894.0	112	45894.0	63.94	64.32	58.54
OTHERS/OTHERS	112	30132.5	110	28532.5	61.57	63.44	63.71
TOTAL	**659**	**195421.5**	**649**	**189946.5**	**64.29**	**61.06**	**59.06**

Annexure-2.1

Unit Wise and Station Wise Performance Indices for 2016-17

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
NORTHERN									
BADARPUR TPS	1	95.0	0	0	100	0	0	0	0
BADARPUR TPS	2	95.0	0	0	100	0	0	0	0
BADARPUR TPS	3	95.0	0	0	100	0	0	0	0
BADARPUR TPS	4	210.0	846.04	0	44.34	55.66	40.55	9.67	46
BADARPUR TPS	5	210.0	858.81	0	46.39	53.61	0	6.93	46.7
BADARPUR TPS		**705.0**	**1704.85**	**0**	**67.45**	**32.55**	**12.08**	**4.94**	**0**
INDIRA GANDHI STPP	1	500.0	1897.65	9.88	29.29	60.82	17.45	17.5	43.3
INDIRA GANDHI STPP	2	500.0	1747.12	0	41.94	58.06	11.59	18.17	39.9
INDIRA GANDHI STPP	3	500.0	1829	0	38.78	61.22	1.05	19.46	41.8
INDIRA GANDHI STPP		**1500.0**	**5473.77**	**3.29**	**36.67**	**60.04**	**10.03**	**18.38**	**41.66**
BARSINGSAR LIGNITE	1	125.0	770.92	13.18	9.5	77.32	1.12	7.02	70.4
BARSINGSAR LIGNITE	2	125.0	692.33	18.04	15.5	66.46	0	3.24	63.2
BARSINGSAR LIGNITE		**250.0**	**1463.25**	**15.61**	**12.5**	**71.89**	**0.56**	**5.13**	**66.82**
SINGRAULI STPS	1	200.0	1668.44	0.54	1.34	98.12	0	3.35	95.2
SINGRAULI STPS	2	200.0	1687.48	0	1.89	98.11	0	2.46	96.3
SINGRAULI STPS	3	200.0	1683.34	0	1.07	98.93	0	3.1	96.1
SINGRAULI STPS	4	200.0	1527.01	6.78	2.44	90.78	0	3.8	87.2
SINGRAULI STPS	5	200.0	1359.49	7.76	0.77	91.47	0	13.88	77.6
SINGRAULI STPS	6	500.0	3531.77	12.88	2.39	84.73	0	4.1	80.6
SINGRAULI STPS	7	500.0	3761.53	7.41	2.98	89.61	0	3.73	85.9
SINGRAULI STPS		**2000.0**	**15219.06**	**6.58**	**2.09**	**91.33**	**0**	**4.62**	**86.87**
RIHAND STPS	1	500.0	3075.18	13.01	4.43	82.56	0	12.35	70.2
RIHAND STPS	2	500.0	3436.12	10.82	1.13	88.05	0	9.6	78.5
RIHAND STPS	3	500.0	4005.23	0	0.34	99.66	0	8.21	91.4
RIHAND STPS	4	500.0	3917.62	0	2.2	97.8	0	8.35	89.4
RIHAND STPS	5	500.0	3546.12	7.84	3.88	88.28	0	7.32	81
RIHAND STPS	6	500.0	3979.35	0	1.02	98.98	0	8.13	90.9
RIHAND STPS		**3000.0**	**21959.62**	**5.28**	**2.17**	**92.55**	**0**	**8.99**	**83.56**
UNCHAHAR TPS	1	210.0	1348.17	0	0	100	0	26.71	73.3
UNCHAHAR TPS	2	210.0	1340.33	8.11	2.42	89.47	0	16.61	72.9
UNCHAHAR TPS	3	210.0	1322.14	8.82	0.17	91.01	0	19.14	71.9
UNCHAHAR TPS	4	210.0	1508.96	0	0.8	99.2	0	17.17	82
UNCHAHAR TPS	5	210.0	1473.6	0	0.07	99.93	0	19.82	80.1
UNCHAHAR TPS		**1050.0**	**6993.2**	**3.39**	**0.69**	**95.92**	**0**	**19.89**	**76.03**
DADRI (NCTPP)	1	210.0	705.68	0	51.98	48.02	51.9	9.66	38.4
DADRI (NCTPP)	2	210.0	527.86	0	62.35	37.65	62.35	8.95	28.7
DADRI (NCTPP)	3	210.0	1114.75	0	26.13	73.87	25.72	13.28	60.6
DADRI (NCTPP)	4	210.0	957.26	0	36.18	63.82	35.82	11.78	52
DADRI (NCTPP)	5	490.0	2250.47	7.64	27.1	65.26	26.67	12.83	52.4
DADRI (NCTPP)	6	490.0	3209.44	1.92	4.46	93.62	4.18	18.85	74.8
DADRI (NCTPP)		**1820.0**	**8765.46**	**2.57**	**28.88**	**68.55**	**28.59**	**13.57**	**54.98**
TANDA TPS	1	110.0	803.32	0	2.98	97.02	0.87	13.66	83.4
TANDA TPS	2	110.0	750.76	12.02	1.03	86.95	0.9	9.04	77.9
TANDA TPS	3	110.0	852.78	0	3.53	96.47	0	7.97	88.5

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
TANDA TPS	4	110.0	834.56	6.2	1.73	92.07	0	5.67	86.6
TANDA TPS		**440.0**	**3241.42**	**4.55**	**2.32**	**93.13**	**0.44**	**9.08**	**84.1**
RAJGHAT TPS	1	67.5	0	0	100	0	100	0	0
RAJGHAT TPS	2	67.5	0	0	100	0	100	0	0
RAJGHAT TPS		**135.0**	**0**	**0**	**100**	**0**	**100**	**0**	**0**
PANIPAT TPS	5	210.0	169.22	0	89.33	10.67	67.64	1.48	9.2
PANIPAT TPS	6	210.0	219.55	0	86.91	13.09	72.35	1.15	11.9
PANIPAT TPS	7	250.0	1126.9	0	43.52	56.48	19.86	5.02	51.5
PANIPAT TPS	8	250.0	690.26	0	65.22	34.78	32.2	3.26	31.5
PANIPAT TPS		**920.0**	**2205.93**	**0**	**69.78**	**30.22**	**46.1**	**2.85**	**27.37**
YAMUNA NAGAR TPS	1	300.0	1841.45	0	20.26	79.74	14.47	9.67	70.1
YAMUNA NAGAR TPS	2	300.0	1582.79	7.76	23.79	68.45	12.51	8.22	60.2
YAMUNA NAGAR TPS		**600.0**	**3424.24**	**3.88**	**22.03**	**74.09**	**13.49**	**8.94**	**65.15**
RAJIV GANDHI TPS	1	600.0	2002.15	0	15.72	84.28	16.01	46.19	38.1
RAJIV GANDHI TPS	2	600.0	1854.6	13.77	22.11	64.12	4.86	28.84	35.3
RAJIV GANDHI TPS		**1200.0**	**3856.75**	**6.88**	**18.92**	**74.2**	**10.43**	**37.51**	**36.69**
GND TPS(BHATINDA)	1	110.0	84.92	0	89.85	10.15	90.66	1.34	8.8
GND TPS(BHATINDA)	2	110.0	69.61	0	91.75	8.25	92.12	1.03	7.2
GND TPS(BHATINDA)	3	110.0	251.66	0	72.2	27.8	73.49	1.69	26.1
GND TPS(BHATINDA)	4	110.0	292.39	0	63.21	36.79	59.27	6.45	30.3
GND TPS(BHATINDA)		**440.0**	**698.58**	**0**	**79.25**	**20.75**	**78.88**	**2.62**	**0**
GH TPS (LEH.MOH.)	1	210.0	681.03	0	59.64	40.36	61.91	3.22	37
GH TPS (LEH.MOH.)	2	210.0	348.34	0	79.64	20.36	80.62	1.42	18.9
GH TPS (LEH.MOH.)	3	250.0	1036.26	0	46.81	53.19	50.44	5.87	47.3
GH TPS (LEH.MOH.)	4	250.0	670.76	0	65.5	34.5	65.85	3.87	30.6
GH TPS (LEH.MOH.)		**920.0**	**2736.39**	**0**	**62.31**	**37.69**	**64.14**	**3.71**	**33.95**
ROPAR TPS	1	210.0	404.01	0	74.27	25.73	77.79	3.77	22
ROPAR TPS	2	210.0	400.62	0	75.22	24.78	59.97	3	21.8
ROPAR TPS	3	210.0	630.31	0	59.63	40.37	63.64	6.11	34.3
ROPAR TPS	4	210.0	318.53	0	80.18	19.82	78.21	2.51	17.3
ROPAR TPS	5	210.0	604.59	11.13	50.42	38.45	53.97	5.59	32.9
ROPAR TPS	6	210.0	418.3	13.54	61.91	24.55	62.34	1.81	22.7
ROPAR TPS		**1260.0**	**2776.36**	**4.11**	**66.94**	**28.95**	**65.99**	**3.8**	**17.86**
KOTA TPS	1	110.0	571.01	6.72	25.11	68.17	23.5	8.91	59.3
KOTA TPS	2	110.0	627.74	0	25.45	74.55	5.8	9.41	65.1
KOTA TPS	3	210.0	1246.31	0	24.2	75.8	23.33	8.05	67.7
KOTA TPS	4	210.0	1223.46	5.52	19.86	74.62	14.86	8.11	66.5
KOTA TPS	5	210.0	1154.5	5.8	24.89	69.31	17.96	6.55	62.8
KOTA TPS	6	195.0	1310.72	0	20.5	79.5	16.83	2.92	76.7
KOTA TPS	7	195.0	1353.05	6.39	13.44	80.17	6.5	1.46	79.2
KOTA TPS		**1240.0**	**7486.79**	**3.52**	**21.5**	**74.98**	**15.78**	**6.16**	**68.92**
SURATGARH TPS	1	250.0	740.23	57.84	4.75	37.41	4.3	3.61	33.8
SURATGARH TPS	2	250.0	909.31	0	52.32	47.68	56.29	6.16	41.5
SURATGARH TPS	3	250.0	931.76	0	51.4	48.6	30.36	6.06	42.5
SURATGARH TPS	4	250.0	825.56	0	56.62	43.38	54.57	5.69	37.7
SURATGARH TPS	5	250.0	501.52	0	73.43	26.57	74.59	3.67	22.9
SURATGARH TPS	6	250.0	566.61	0	71.34	28.66	68.75	2.78	25.9
SURATGARH TPS		**1500.0**	**4474.99**	**9.64**	**51.64**	**38.72**	**48.14**	**4.66**	**34.06**
GIRAL TPS	1	125.0	0	100	0	0	0	0	0
GIRAL TPS	2	125.0	0	100	0	0	0	0	0

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
GIRAL TPS		**250.0**	**0**	**100**	**0**	**0**	**0**	**0**	**0**
CHHABRA TPP	1	250.0	1732.7	0.83	9.42	89.75	10.63	10.63	79.1
CHHABRA TPP	2	250.0	1673.41	7.22	7.08	85.7	9.29	9.29	76.4
CHHABRA TPP	3	250.0	1679.5	9.61	6.01	84.38	6.49	7.69	76.7
CHHABRA TPP	4	250.0	1741.32	6.34	5.72	87.94	8.41	8.42	79.5
CHHABRA TPP		**1000.0**	**6826.93**	**6**	**7.06**	**86.94**	**8.71**	**9.01**	**77.93**
KALISINDH TPS	1	600.0	3669.81	0	16.07	83.93	21.64	14.11	69.8
KALISINDH TPS	2	600.0	2274.31	0	48.35	51.65	6.92	8.38	43.3
KALISINDH TPS		**1200.0**	**5944.12**	**0**	**32.21**	**67.79**	**14.28**	**11.25**	**56.55**
OBRA TPS	1	40.0	47.56	0	79.54	20.46	0	6.89	13.6
OBRA TPS	2	50.0	119.72	0	51.26	48.74	1.96	18.46	27.3
OBRA TPS	7	94.0	0	100	0	0	0	0	0
OBRA TPS	8	94.0	0	0	100	0	0	0	0
OBRA TPS	9	200.0	1418.69	0.33	6.13	93.54	0.72	12.56	81
OBRA TPS	10	200.0	663.97	5.24	49.41	45.35	2.08	7.45	37.9
OBRA TPS	11	200.0	234.48	79.6	4.75	15.65	1.04	2.27	13.4
OBRA TPS	12	200.0	413.39	49.7	3.86	46.44	0	22.84	23.6
OBRA TPS	13	200.0	944.25	0	16.65	83.35	4.6	29.46	53.9
OBRA TPS		**1278.0**	**3842.06**	**28.46**	**24.5**	**47.04**	**1.4**	**12.61**	**32.82**
PANKI TPS	3	105.0	362.79	0	41.02	58.98	30.31	19.54	39.4
PANKI TPS	4	105.0	399.81	0.29	41.4	58.31	29.67	14.85	43.5
PANKI TPS		**210.0**	**762.6**	**0.14**	**41.21**	**58.65**	**29.99**	**17.19**	**0**
HARDUAGANJ TPS	5	60.0	0	0	100	0	0	0	0
HARDUAGANJ TPS	7	105.0	497.62	0	41.47	58.53	22.62	4.48	54.1
HARDUAGANJ TPS	8	250.0	1580.47	0	17.46	82.54	23.99	10.38	72.2
HARDUAGANJ TPS	9	250.0	1747.02	0	7.71	92.29	15.39	12.52	79.8
HARDUAGANJ TPS		**665.0**	**3825.11**	**0**	**25.03**	**74.97**	**18.38**	**9.31**	**65.66**
PARICHHA TPS	1	110.0	97.92	73.22	10.81	15.97	4.05	5.81	10.2
PARICHHA TPS	2	110.0	401.41	0	50.56	49.44	37.77	8.31	41.7
PARICHHA TPS	3	210.0	1281.13	0	18.94	81.06	23.48	11.41	69.6
PARICHHA TPS	4	210.0	1312.71	0	17.04	82.96	19.36	11.6	71.4
PARICHHA TPS	5	250.0	1502.74	1.12	17.63	81.25	23.37	12.64	68.6
PARICHHA TPS	6	250.0	1543.2	0	15.35	84.65	22.08	14.18	70.5
PARICHHA TPS		**1140.0**	**6139.11**	**7.31**	**19.78**	**72.91**	**21.9**	**11.48**	**61.47**
ANPARA TPS	1	210.0	1301.79	8.09	10.08	81.84	0	11.14	70.8
ANPARA TPS	2	210.0	1275.18	0	10.91	89.09	2.94	19.77	69.3
ANPARA TPS	3	210.0	944.51	0.16	38.18	61.66	0.56	10.32	51.3
ANPARA TPS	4	500.0	3879.31	0.82	1.22	97.96	0	9.39	88.6
ANPARA TPS	5	500.0	3775.8	0	4.48	95.52	0	9.32	86.2
ANPARA TPS	6	500.0	2261.25	0	27.89	72.11	0.26	19.08	50.2
ANPARA TPS	7	500.0	1781.57	0	38.37	61.63	0	36.87	57.1
ANPARA TPS		**2630.0**	**15219.41**	**0.93**	**15.69**	**83.38**	**0.37**	**14.98**	**71.62**
MAHATMA GANDHI TPS	1	660.0	1489.51	0	62.94	37.06	52.22	11.29	25.8
MAHATMA GANDHI TPS	2	660.0	1406.19	16.21	48.3	35.48	23.71	11.16	24.3
MAHATMA GANDHI TPS		**1320.0**	**2895.7**	**8.11**	**55.62**	**36.27**	**37.96**	**11.23**	**25.04**
GOINDWAL SAHIB TPP	1	270.0	85.78	0	94.56	5.44	0	0.66	2.4
GOINDWAL SAHIB TPP	2	270.0	138.13	0	98.57	1.43	0	1.05	5.1
GOINDWAL SAHIB TPP		**540.0**	**223.91**	**0**	**96.48**	**3.52**	**0**	**0.84**	**4.32**
RAJPURA TPP	1	700.0	4522.54	8.99	1.69	89.32	12.63	15.57	73.8
RAJPURA TPP	2	700.0	4919.22	2.45	0.86	96.69	13.21	16.46	80.2

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
RAJPURA TPP		**1400.0**	**9441.76**	**5.72**	**1.27**	**93.01**	**12.92**	**16.02**	**76.99**
TALWANDI SABO TPP	1	660.0	1527.35	0	40.25	59.75	30.84	22.02	41.5
TALWANDI SABO TPP	2	660.0	2350.06	9.43	27.34	63.23	30.81	22.58	40.6
TALWANDI SABO TPP	3	660.0	3201.43	0	20.11	79.89	30.16	24.52	55.4
TALWANDI SABO TPP		**1980.0**	**7078.84**	**3.65**	**27.44**	**68.9**	**30.57**	**23.21**	**46.55**
JALIPA KAPURDI TPP	1	135.0	810.48	0	16.38	83.62	0	15.09	68.5
JALIPA KAPURDI TPP	2	135.0	787.36	0	16.55	83.45	0	16.87	66.6
JALIPA KAPURDI TPP	3	135.0	869.25	0	11.77	88.23	0	14.72	73.5
JALIPA KAPURDI TPP	4	135.0	795.62	0	18.23	81.77	0	14.49	67.3
JALIPA KAPURDI TPP	5	135.0	876.16	0	6.37	93.63	0	19.55	74.1
JALIPA KAPURDI TPP	6	135.0	841.83	0	13.9	86.1	0	14.92	71.2
JALIPA KAPURDI TPP	7	135.0	867.99	0	11.51	88.49	0	15.09	73.4
JALIPA KAPURDI TPP	8	135.0	773.8	0	17.63	82.37	0	16.94	65.4
JALIPA KAPURDI TPP		**1080.0**	**6622.49**	**0**	**14.04**	**85.96**	**0**	**15.96**	**70**
KAWAI TPS	1	660.0	4186.1	0	14.15	85.85	2.91	13.44	72.4
KAWAI TPS	2	660.0	4103.17	0	17.95	82.05	2.28	11.08	71
KAWAI TPS		**1320.0**	**8289.27**	**0**	**16.05**	**83.95**	**2.6**	**12.26**	**71.69**
PRAYAGRAJ TPP	1	660.0	2997.84	0	36.03	63.97	0	12.3	51.9
PRAYAGRAJ TPP	2	660.0	1470.64	0	28.15	71.85	0	15.36	43.8
PRAYAGRAJ TPP		**1320.0**	**4468.48**	**0**	**33.13**	**66.87**	**0**	**13.42**	**48.89**
LALITPUR TPS	1	660.0	1982.59	0	50.47	49.53	54.24	15.24	34.3
LALITPUR TPS	2	660.0	1174.88	0	45.33	54.67	48.5	12.53	31
LALITPUR TPS	3	660.0	796.04	0	35	65	28.8	30.91	48.9
LALITPUR TPS		**1980.0**	**3953.51**	**0**	**46.81**	**53.19**	**49.01**	**16.68**	**37.83**
ANPARA C TPS	1	600.0	4088.95	5.31	5.44	89.25	0	11.45	77.8
ANPARA C TPS	2	600.0	4362.41	0	4.63	95.37	0	12.38	83
ANPARA C TPS		**1200.0**	**8451.36**	**2.65**	**5.04**	**92.31**	**0**	**11.91**	**80.4**
ROSA TPP Ph-I	1	300.0	2048.5	5.24	7.58	87.18	9.23	9.23	77.9
ROSA TPP Ph-I	2	300.0	1942.3	0	17.55	82.45	9.6	8.54	73.9
ROSA TPP Ph-I	3	300.0	2070.6	0	10.78	89.22	10.43	10.43	78.8
ROSA TPP Ph-I	4	300.0	1852.5	11.88	7.5	80.62	11.18	10.13	70.5
ROSA TPP Ph-I		**1200.0**	**7913.9**	**4.28**	**10.85**	**84.87**	**10.11**	**9.58**	**75.28**
MAQSOODPUR TPS	1	45.0	214.89	18.69	15.35	65.96	18.51	11.44	54.5
MAQSOODPUR TPS	2	45.0	202.35	21.61	15.66	62.73	19.64	11.4	51.3
MAQSOODPUR TPS		**90.0**	**417.24**	**20.15**	**15.51**	**64.35**	**19.07**	**11.42**	**52.92**
KHAMBARKHERA TPS	1	45.0	197.51	0	40.11	59.89	44.39	9.78	50.1
KHAMBARKHERA TPS	2	45.0	177.79	0	45.26	54.74	39.55	9.64	45.1
KHAMBARKHERA TPS		**90.0**	**375.3**	**0**	**42.69**	**57.31**	**41.97**	**9.71**	**47.6**
BARKHERA TPS	1	45.0	198.42	0	38.9	61.1	40.93	10.77	50.3
BARKHERA TPS	2	45.0	193.5	20.04	20.49	59.47	22.19	10.38	49.1
BARKHERA TPS		**90.0**	**391.92**	**10.02**	**29.69**	**60.29**	**31.56**	**10.57**	**49.71**
KUNDARKI TPS	1	45.0	238.17	18.69	8.85	72.46	15.95	12.04	60.4
KUNDARKI TPS	2	45.0	222.63	21.61	9.52	68.87	18.78	12.39	56.5
KUNDARKI TPS		**90.0**	**460.8**	**20.15**	**9.18**	**70.66**	**17.37**	**12.21**	**58.45**
UTRAULA TPS	1	45.0	204.05	20.45	17.23	62.32	17.78	10.56	51.8
UTRAULA TPS	2	45.0	210.97	18.73	17.06	64.21	18.11	10.69	53.5
UTRAULA TPS		**90.0**	**415.02**	**19.59**	**17.15**	**63.27**	**17.95**	**10.63**	**52.64**
WESTERN									
KORBA STPS	1	200.0	1634.84	0	3.58	96.42	0	3.92	93.3
KORBA STPS	2	200.0	1579.96	0.77	0.39	98.84	0	8.92	90.2

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
KORBA STPS	3	200.0	1400.82	6.56	0.37	93.07	0	13.11	80
KORBA STPS	4	500.0	3778.08	7.44	1.23	91.33	0	5.27	86.3
KORBA STPS	5	500.0	4015.17	0.53	2.42	97.05	0	5.46	91.7
KORBA STPS	6	500.0	3779.71	7.43	0.48	92.09	0	5.85	86.3
KORBA STPS	7	500.0	4176.3	0	0.56	99.44	0	4.15	95.3
KORBA STPS		**2600.0**	**20364.88**	**3.53**	**1.23**	**95.24**	**0**	**5.98**	**89.41**
SIPAT STPS	1	660.0	5569.02	0	1.39	98.61	0	2.41	96.3
SIPAT STPS	2	660.0	4764.08	8.61	6.97	84.42	0	2.06	82.4
SIPAT STPS	3	660.0	5315.46	0	4.24	95.76	0	3.82	91.9
SIPAT STPS	4	500.0	3927.14	6.61	0.6	92.79	0	3.14	89.7
SIPAT STPS	5	500.0	4203.23	0	1.38	98.62	0	2.73	96
SIPAT STPS		**2980.0**	**23778.93**	**3.02**	**3.12**	**93.86**	**0**	**2.82**	**91.09**
VINDHYACHAL STPS	1	210.0	1362	6.91	5.06	88.03	3.47	13.99	74
VINDHYACHAL STPS	2	210.0	1321.68	9.66	7.62	82.72	7.25	10.99	71.8
VINDHYACHAL STPS	3	210.0	1265.03	0.89	10.56	88.56	9.82	19.79	68.8
VINDHYACHAL STPS	4	210.0	1402.71	0	10.45	89.55	9.98	13.29	76.3
VINDHYACHAL STPS	5	210.0	1217.69	1.11	15.27	83.62	14.98	17.43	66.2
VINDHYACHAL STPS	6	210.0	1418.57	0	9.93	90.07	8.97	12.95	77.1
VINDHYACHAL STPS	7	500.0	3478.93	0	9.45	90.55	8.47	11.12	79.4
VINDHYACHAL STPS	8	500.0	2985.87	17.6	3.49	78.91	0	10.74	68.2
VINDHYACHAL STPS	9	500.0	3463.81	8.68	1.87	89.45	1.61	10.37	79.1
VINDHYACHAL STPS	10	500.0	3701.41	0	3.03	96.97	2.21	12.47	84.5
VINDHYACHAL STPS	11	500.0	3439.39	0.93	5.94	93.14	4.59	14.61	78.5
VINDHYACHAL STPS	12	500.0	3661.2	0	3.68	96.32	2.42	12.73	83.6
VINDHYACHAL STPS	13	500.0	3488.65	7.34	1.49	91.17	0	11.52	79.6
VINDHYACHAL STPS		**4760.0**	**32206.94**	**4.45**	**5.64**	**89.91**	**4.43**	**12.68**	**77.24**
BHILAI TPS	1	250.0	1845.26	1.58	0.1	98.32	4.95	14.06	84.3
BHILAI TPS	2	250.0	1805.93	0	0.39	99.61	6.09	17.15	82.5
BHILAI TPS		**500.0**	**3651.19**	**0.79**	**0.25**	**98.96**	**5.52**	**15.6**	**83.36**
MAUDA TPS	1	500.0	1936.47	0	41.95	58.05	40.65	13.84	44.2
MAUDA TPS	2	500.0	1754.11	2.47	44.96	52.58	31.05	12.53	40
MAUDA TPS	3	660.0	612.33	0	37.91	62.09	31.49	30.47	46.6
MAUDA TPS		**1660.0**	**4302.91**	**1.11**	**42.92**	**55.97**	**35.43**	**14.85**	**42.56**
UKAI TPS	1	120.0	17.41	0	97.32	2.68	2.26	1.02	1.7
UKAI TPS	2	120.0	0	0	74.04	25.96	2.21	25.96	0
UKAI TPS	3	200.0	743.83	27.22	22.79	49.99	1.85	7.53	42.5
UKAI TPS	4	200.0	790.34	32.65	14.68	52.67	1.97	7.56	45.1
UKAI TPS	5	210.0	722.98	30.76	23.49	45.75	10.25	6.45	39.3
UKAI TPS	6	500.0	3021.59	0	16.33	83.67	0.54	14.68	69
UKAI TPS		**1350.0**	**5296.15**	**13.66**	**30.48**	**55.86**	**2.76**	**11.08**	**44.64**
GANDHI NAGAR TPS	1	120.0	0	0	93.79	6.21	93.79	0	0
GANDHI NAGAR TPS	2	120.0	0	0	93.79	6.21	93.79	0	0
GANDHI NAGAR TPS	3	210.0	298.1	18.71	61.17	20.12	37.82	3.91	16.2
GANDHI NAGAR TPS	4	210.0	460.4	0	68.76	31.24	39.67	6.22	25
GANDHI NAGAR TPS	5	210.0	1413.83	0	11.72	88.28	2.47	11.42	76.9
GANDHI NAGAR TPS		**630.0**	**2172.33**	**4.73**	**58.49**	**36.78**	**42.9**	**5.45**	**29.83**
WANAKBORI TPS	1	210.0	504.54	27.65	38.14	34.21	15.83	6.78	27.4
WANAKBORI TPS	2	210.0	468.91	0	68.28	31.72	34.88	6.23	25.5
WANAKBORI TPS	3	210.0	513.26	0	65.38	34.62	38.32	6.72	27.9
WANAKBORI TPS	4	210.0	641.46	5.86	51.37	42.77	28.68	7.9	34.9

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
WANAKBORI TPS	5	210.0	527.26	0	65.45	34.55	26.6	5.88	28.7
WANAKBORI TPS	6	210.0	358.28	22.79	53.5	23.72	41.58	4.24	19.5
WANAKBORI TPS	7	210.0	915.91	0	40.75	59.25	7.88	9.46	49.8
WANAKBORI TPS		**1470.0**	**3929.62**	**8.04**	**54.7**	**37.26**	**27.68**	**6.75**	**30.52**
SIKKA REP. TPS	1	120.0	50.65	0	93.36	6.64	91.05	1.82	4.8
SIKKA REP. TPS	2	120.0	45.93	0	93.56	6.44	41.73	2.07	4.4
SIKKA REP. TPS	3	250.0	865.44	0	48.65	51.35	52.44	11.83	39.5
SIKKA REP. TPS	4	250.0	1186.2	0	29.48	70.52	29.67	16.35	54.2
SIKKA REP. TPS		**740.0**	**2148.22**	**0**	**56.71**	**43.29**	**49.27**	**10.15**	**31.65**
BHAVNAGAR CFBC TPP	1	250.0	52.22	0	42.3	57.7	0	18.08	2.9
BHAVNAGAR CFBC TPP	2	250.0	3.25	0	0	100	0	0	0
BHAVNAGAR CFBC TPP		**500.0**	**55.47**	**0**	**42.3**	**57.7**	**0**	**18.08**	**2.86**
KUTCH LIG. TPS	1	70.0	380.75	6.43	17.68	75.89	13.66	13.8	62.1
KUTCH LIG. TPS	2	70.0	331.32	7.5	27.89	64.6	19.92	10.57	54
KUTCH LIG. TPS	3	75.0	398.29	9.11	21.73	69.16	13.15	8.53	60.6
KUTCH LIG. TPS	4	75.0	373.56	4.2	24.47	71.33	6.36	14.47	56.9
KUTCH LIG. TPS		**290.0**	**1483.92**	**6.8**	**22.95**	**70.25**	**13.15**	**11.83**	**58.41**
AKRIMOTA LIG TPS	1	125.0	698.13	2.94	7.37	89.69	3.22	25.93	63.8
AKRIMOTA LIG TPS	2	125.0	694.77	3.21	8.81	87.98	0	24.53	63.4
AKRIMOTA LIG TPS		**250.0**	**1392.9**	**3.07**	**8.09**	**88.84**	**1.61**	**25.23**	**63.6**
SATPURA TPS	6	200.0	522.42	24.22	39.02	36.76	38.47	6.94	29.8
SATPURA TPS	7	210.0	410.79	6.04	64.26	29.7	57.57	7.37	22.3
SATPURA TPS	8	210.0	182.46	0	87.05	12.95	87.08	3.03	9.9
SATPURA TPS	9	210.0	165.33	0	87.68	12.32	65.47	3.34	9
SATPURA TPS	10	250.0	1036.08	10.93	25.4	63.67	21.23	16.36	47.3
SATPURA TPS	11	250.0	1327.82	0	29.9	70.1	10.92	9.47	60.6
SATPURA TPS		**1330.0**	**3644.9**	**6.65**	**54**	**39.35**	**45.01**	**8.07**	**31.28**
SHREE SINGAJI TPP	1	600.0	1143.6	9.28	59.07	31.65	58.71	9.9	21.8
SHREE SINGAJI TPP	2	600.0	1331.05	16.88	46.94	36.18	52.59	10.86	25.3
SHREE SINGAJI TPP		**1200.0**	**2474.65**	**13.08**	**53**	**33.92**	**55.65**	**10.38**	**23.54**
KORBA-II	1	50.0	207.87	13.03	22.4	64.57	1.25	17.11	47.5
KORBA-II	2	50.0	230.47	9.68	15.29	75.03	1.4	22.41	52.6
KORBA-II	3	50.0	177.87	30.69	14.1	55.21	0.84	14.6	40.6
KORBA-II	4	50.0	277.43	0	16.19	83.81	1.61	20.47	63.3
KORBA-II		**200.0**	**893.64**	**13.35**	**16.99**	**69.65**	**1.27**	**18.65**	**51.01**
KORBA-III	1	120.0	720.7	2.49	5.39	92.11	0	23.55	68.6
KORBA-III	2	120.0	676.29	7.62	4.68	87.7	0	23.37	64.3
KORBA-III		**240.0**	**1396.99**	**5.05**	**5.04**	**89.91**	**0**	**23.46**	**66.45**
DSPM TPS	1	250.0	2091.51	0	2.19	97.81	0.65	2.31	95.5
DSPM TPS	2	250.0	1890.89	6.3	5.38	88.32	0.31	1.98	86.3
DSPM TPS		**500.0**	**3982.4**	**3.15**	**3.78**	**93.07**	**0.48**	**2.14**	**90.92**
KORBA-WEST TPS	1	210.0	1573.95	0	3.87	96.13	0.36	10.57	85.6
KORBA-WEST TPS	2	210.0	1598.81	0	4.1	95.9	0.43	8.99	86.9
KORBA-WEST TPS	3	210.0	1310.7	9.17	5.57	85.26	0.38	14.01	71.2
KORBA-WEST TPS	4	210.0	1450.09	0	5.84	94.16	0.17	15.34	78.8
KORBA-WEST TPS	5	500.0	3302.31	10.31	3.84	85.85	0.08	10.46	75.4
KORBA-WEST TPS		**1340.0**	**9235.86**	**5.28**	**4.47**	**90.25**	**0.24**	**11.57**	**78.68**
MARWA TPS	1	500.0	293.38	0	89.83	10.17	0	3.48	6.7
MARWA TPS	2	500.0	2261.29	0	15.29	84.71	0	4.48	71.1
MARWA TPS		**1000.0**	**2554.67**	**0**	**60.03**	**39.97**	**0**	**3.88**	**32.42**

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
AMARKANTAK EXT TPS	3	210.0	1481.04	10.97	6.37	82.66	4.39	2.24	80.5
AMARKANTAK EXT TPS		**210.0**	**1481.04**	**10.97**	**6.37**	**82.66**	**4.39**	**2.24**	**80.51**
SANJAY GANDHI TPS	1	210.0	669.26	28.71	23.13	48.16	19.41	11.78	36.4
SANJAY GANDHI TPS	2	210.0	906.52	6.41	25.43	68.16	21.52	18.88	49.3
SANJAY GANDHI TPS	3	210.0	694.97	0	50.47	49.53	45.74	11.75	37.8
SANJAY GANDHI TPS	4	210.0	920.41	0	35.49	64.51	26.75	14.47	50
SANJAY GANDHI TPS	5	500.0	3652.09	0	4.88	95.12	7.19	11.74	83.4
SANJAY GANDHI TPS		**1340.0**	**6843.25**	**5.5**	**22.9**	**71.6**	**20.46**	**13.3**	**58.3**
NASIK TPS	3	210.0	1137.93	0.77	25.19	74.04	23.68	12.18	61.9
NASIK TPS	4	210.0	1111.73	11.24	15.84	72.92	22.76	12.48	60.4
NASIK TPS	5	210.0	1079.05	0.19	29	70.82	30.49	12.16	58.7
NASIK TPS		**630.0**	**3328.71**	**4.06**	**23.34**	**72.59**	**25.64**	**12.28**	**60.32**
KORADI TPS	1	105.0	0	0	101.64	-1.64	0	0	0
KORADI TPS	2	105.0	0	0	101.64	-1.64	0	0	0
KORADI TPS	3	105.0	0	0	101.64	-1.64	0	0	0
KORADI TPS	4	105.0	0	0	101.64	-1.64	0	0	0
KORADI TPS	5	200.0	134.4	0	79.59	20.41	36.67	4.79	7.7
KORADI TPS	6	210.0	0	100	0	0	0	0	0
KORADI TPS	7	210.0	516.45	0	60.66	39.34	62.25	11.27	28.1
KORADI TPS	8	660.0	3219.57	12.06	10.96	76.98	9.96	21.29	55.7
KORADI TPS	9	660.0	1720.2	0	8.45	91.55	5.23	33.96	57.6
KORADI TPS	10	660.0	263.23	0	37.28	62.72	22.34	24.97	7.1
KORADI TPS		**2600.0**	**5853.85**	**16.59**	**32.07**	**51.35**	**17.47**	**15.74**	**32.96**
KHAPARKHEDA TPS	1	210.0	978.02	0	32.42	67.58	19.07	14.41	53.2
KHAPARKHEDA TPS	2	210.0	1110.69	0	24.39	75.61	27.9	15.23	60.4
KHAPARKHEDA TPS	3	210.0	1143.16	0	26.4	73.6	27.38	11.46	62.1
KHAPARKHEDA TPS	4	210.0	1039.81	0	31.6	68.4	26.27	11.88	56.5
KHAPARKHEDA TPS	5	500.0	3443.09	3.25	6.57	90.18	8.38	11.57	78.6
KHAPARKHEDA TPS		**1340.0**	**7714.77**	**1.21**	**20.44**	**78.34**	**18.9**	**12.62**	**65.72**
PARAS TPS	3	250.0	1094.41	38.89	5.85	55.27	6.89	5.29	50
PARAS TPS	4	250.0	1894.41	0	3.67	96.33	7.79	9.82	86.5
PARAS TPS		**500.0**	**2988.82**	**19.44**	**4.76**	**75.8**	**7.34**	**7.56**	**68.24**
BHUSAWAL TPS	2	210.0	220.73	0	82.45	17.55	70.36	5.55	12
BHUSAWAL TPS	3	210.0	447.57	0	69.1	30.9	67.58	6.57	24.3
BHUSAWAL TPS	4	500.0	2690.29	6.93	21.11	71.96	20.11	9.98	61.4
BHUSAWAL TPS	5	500.0	2761.97	0	26.14	73.86	27.68	10.37	63.1
BHUSAWAL TPS		**1420.0**	**6120.56**	**2.44**	**39.05**	**58.51**	**37.23**	**8.96**	**49.2**
PARLI TPS	3	210.0	0	0	76.92	23.08	0	0	0
PARLI TPS	4	210.0	0	0	99.79	0.21	0	0.21	0
PARLI TPS	5	210.0	0	0	100	0	0	0	0
PARLI TPS	6	250.0	751.97	0	59.83	40.17	7.69	5.84	34.3
PARLI TPS	7	250.0	810.4	0	57.49	42.51	10.86	5.51	37
PARLI TPS	8	250.0	64.72	0	92.63	7.37	2.91	4.21	4
PARLI TPS		**1170.0**	**1627.09**	**0**	**78.65**	**21.35**	**4.62**	**3.06**	**17.22**
CHANDRAPUR(MAHARASHTRA) STPS	1	210.0	0	0	76.92	23.08	0	0	0
CHANDRAPUR(MAHARASHTRA) STPS	2	210.0	0	0	76.92	23.08	76.92	0	0
CHANDRAPUR(MAHARASHTRA) STPS	3	210.0	1471.33	0	5.87	94.13	7.32	14.15	80
CHANDRAPUR(MAHARASHTRA) STPS	4	210.0	1446.64	0	6.19	93.81	4.54	15.17	78.6
CHANDRAPUR(MAHARASHTRA) STPS	5	500.0	3221.12	0	7	93	5.72	19.46	73.5
CHANDRAPUR(MAHARASHTRA) STPS	6	500.0	2946.33	0	16.08	83.92	5.61	16.66	67.3

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
CHANDRAPUR(MAHARASHTRA) STPS	7	500.0	2548.86	17.86	5.81	76.33	3.06	18.14	58.2
CHANDRAPUR(MAHARASHTRA) STPS	8	500.0	2160.02	0	21.12	78.88	0	20.67	57.8
CHANDRAPUR(MAHARASHTRA) STPS	9	500.0	1147.47	0	21.46	78.54	0	42.14	66.5
CHANDRAPUR(MAHARASHTRA) STPS		**2920.0**	**14941.77**	**3.43**	**14.34**	**82.24**	**5.26**	**18.75**	**64.64**
SABARMATI (C STATION)	15	30.0	0	0	100	0	100	0	0
SABARMATI (C STATION)	16	30.0	0	0	100	0	100	0	0
SABARMATI (C STATION)		**60.0**	**0**	**0**	**100**	**0**	**100**	**0**	**0**
SALAYA TPP	1	600.0	2854.41	8.46	17.82	73.72	2.19	19.41	54.3
SALAYA TPP	2	600.0	2358.8	8.85	29.13	62.02	0.06	17.14	44.9
SALAYA TPP		**1200.0**	**5213.21**	**8.65**	**23.48**	**67.87**	**1.13**	**18.27**	**49.59**
SABARMATI (D-F STATIONS)	1	120.0	887	5.64	2.04	92.31	7.02	7.93	84.4
SABARMATI (D-F STATIONS)	2	121.0	920.41	2.34	2.74	94.92	6.34	8.09	86.8
SABARMATI (D-F STATIONS)	3	121.0	951.69	2.55	1.37	96.07	4.32	6.29	89.8
SABARMATI (D-F STATIONS)		**362.0**	**2759.1**	**3.5**	**2.05**	**94.44**	**5.89**	**7.43**	**87.01**
SURAT LIG. TPS	1	125.0	781.5	9.81	7.38	82.81	1.75	11.44	71.4
SURAT LIG. TPS	2	125.0	745.16	4.47	14.79	80.73	1.32	12.68	68.1
SURAT LIG. TPS	3	125.0	882.77	0	8.15	91.85	1.29	11.23	80.6
SURAT LIG. TPS	4	125.0	768.79	5.98	12.22	81.8	1.05	11.59	70.2
SURAT LIG. TPS		**500.0**	**3178.22**	**5.07**	**10.64**	**84.3**	**1.35**	**11.74**	**72.56**
MUNDRA TPS	1	330.0	1898.58	0	23.24	76.76	0.88	11.09	65.7
MUNDRA TPS	2	330.0	1646.32	9.13	25.99	64.88	0.97	7.93	57
MUNDRA TPS	3	330.0	2083.26	0	17.65	82.35	0.5	10.29	72.1
MUNDRA TPS	4	330.0	2518.46	0	0	100	0	12.88	87.1
MUNDRA TPS	5	660.0	4470.27	12.77	0.87	86.37	0	9.05	77.3
MUNDRA TPS	6	660.0	3982.54	0	23.84	76.16	0	7.28	68.9
MUNDRA TPS	7	660.0	4510.78	0	6.35	93.65	0	15.63	78
MUNDRA TPS	8	660.0	4698.52	0	3.08	96.92	0	15.65	81.3
MUNDRA TPS	9	660.0	4489.7	7.18	1.87	90.95	0	13.29	77.7
MUNDRA TPS		**4620.0**	**30298.43**	**3.5**	**9.92**	**86.58**	**0.17**	**11.71**	**74.86**
MUNDRA UMTPP	1	800.0	5149.94	0	20.71	79.29	1.55	5.83	73.5
MUNDRA UMTPP	2	800.0	6392.08	0	7.24	92.76	0.45	2.26	91.2
MUNDRA UMTPP	3	800.0	5816.62	1.64	8.08	90.28	3.34	7.28	83
MUNDRA UMTPP	4	800.0	5982.84	0	9.62	90.38	1.54	5.02	85.4
MUNDRA UMTPP	5	800.0	4118.76	25.74	12.36	61.9	0.5	3.43	58.8
MUNDRA UMTPP		**4000.0**	**27460.24**	**5.48**	**11.6**	**82.92**	**1.48**	**4.77**	**78.37**
BINA TPS	1	250.0	317.99	0	76.6	23.4	61.15	8.88	14.5
BINA TPS	2	250.0	494.86	0	64.57	35.43	56.07	12.83	22.6
BINA TPS		**500.0**	**812.85**	**0**	**70.58**	**29.42**	**58.61**	**10.86**	**18.56**
MAHAN TPP	1	600.0	2629.2	0.82	20.13	79.06	0	29.03	50
MAHAN TPP		**600.0**	**2629.2**	**0.82**	**20.13**	**79.06**	**0**	**29.03**	**50.02**
SASAN UMTPP	1	660.0	4923.27	0	7.62	92.38	3.57	7.23	85.2
SASAN UMTPP	2	660.0	4989.06	0	6.13	93.87	2.96	7.61	86.3
SASAN UMTPP	3	660.0	5045.81	0	5.35	94.65	2.48	7.43	87.3
SASAN UMTPP	4	660.0	4889.52	0	7.1	92.9	3.97	8.33	84.6
SASAN UMTPP	5	660.0	4917.6	0	8.51	91.49	1.98	6.5	85.1
SASAN UMTPP	6	660.0	4649.46	0	12.37	87.63	2.36	7.21	80.4
SASAN UMTPP		**3960.0**	**29414.72**	**0**	**7.85**	**92.15**	**2.89**	**7.38**	**84.79**
NIWARI TPP	1	45.0	237.26	0	15.53	84.47	34.51	24.29	60.2
NIWARI TPP		**45.0**	**237.26**	**0**	**15.53**	**84.47**	**34.51**	**24.29**	**60.19**
SEIONI TPP	1	600.0	311.25	2.25	86.86	10.88	50.52	6.51	3.4

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
SEIONI TPP		**600.0**	**311.25**	**2.25**	**86.86**	**10.88**	**50.52**	**6.51**	**5.4**
NIGRI TPP	1	660.0	3714.23	0	10.86	89.14	24.9	24.9	64.2
NIGRI TPP	2	660.0	3552.73	1.93	15.67	82.4	20.93	20.95	61.4
NIGRI TPP		**1320.0**	**7266.96**	**0.97**	**13.26**	**85.77**	**22.92**	**22.93**	**62.85**
ANUPPUR TPP	1	600.0	3634.09	0	15.93	84.07	0	14.93	69.1
ANUPPUR TPP	2	600.0	126.07	0	94.58	5.42	0	2.79	2
ANUPPUR TPP		**1200.0**	**3760.16**	**0**	**55.25**	**44.75**	**0**	**8.86**	**35.77**
OP JINDAL TPS	1	250.0	1339.78	1.05	30.3	68.65	20.1	7.47	61.2
OP JINDAL TPS	2	250.0	997.2	0	48.89	51.11	19.87	5.58	45.5
OP JINDAL TPS	3	250.0	773.56	9.73	51.25	39.01	45.91	3.69	35.3
OP JINDAL TPS	4	250.0	1372.25	0	29	71	10.47	8.34	62.7
OP JINDAL TPS		**1000.0**	**4482.79**	**2.7**	**39.86**	**57.44**	**24.09**	**6.27**	**51.17**
PATHADI TPP	1	300.0	2147.77	6.31	3.51	90.19	1.88	8.95	81.7
PATHADI TPP	2	300.0	2300.84	0	6.78	93.22	0	5.8	87.6
PATHADI TPP		**600.0**	**4448.61**	**3.15**	**5.14**	**91.7**	**0.94**	**7.37**	**84.64**
KASAIPALLI TPP	1	135.0	919.31	7.62	13.36	79.01	0	1.39	77.7
KASAIPALLI TPP	2	135.0	1093.12	0	6.87	93.13	0	1.43	92.4
KASAIPALLI TPP		**270.0**	**2012.43**	**3.81**	**10.11**	**86.07**	**0**	**1.41**	**85.08**
RATIJA TPS	1	50.0	316.01	0	18.91	81.09	0	9.1	72.1
RATIJA TPS	2	50.0	116.02	2.96	16.39	80.64	0	11.95	68
RATIJA TPS		**100.0**	**432.03**	**0.74**	**18.28**	**80.98**	**0**	**9.81**	**73.35**
SWASTIK KORBA TPP	1	25.0	0	0	100	0	0	0	0
SWASTIK KORBA TPP		**25.0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**
CHAKABURA TPP	2	30.0	242.94	0	6.01	93.99	0.03	2.72	92.4
CHAKABURA TPP		**30.0**	**242.94**	**0**	**6.01**	**93.99**	**0.03**	**2.72**	**92.44**
SVPL TPP	1	63.0	303.06	1.46	31.26	67.28	0	12.37	54.9
SVPL TPP		**63.0**	**303.06**	**1.46**	**31.26**	**67.28**	**0**	**12.37**	**54.91**
RAIKHEDA TPP	1	685.0	577.08	0	85.17	14.83	5.22	5.22	9.6
RAIKHEDA TPP	2	685.0	186.26	0	95.71	4.29	1.19	1.19	3.1
RAIKHEDA TPP		**1370.0**	**763.34**	**0**	**90.44**	**9.56**	**3.2**	**3.2**	**6.36**
KATGHORA TPP	1	35.0	0	0	100	0	0	0	0
KATGHORA TPP		**35.0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**
BALCO TPS	1	300.0	1573.76	0	21.72	78.28	0	18.4	59.9
BALCO TPS	2	300.0	1619.62	0	19.76	80.24	0	18.61	61.6
BALCO TPS		**600.0**	**3193.38**	**0**	**20.74**	**79.26**	**0**	**18.5**	**60.76**
SALORA TPP	1	135.0	0	0	100	0	0	0	0
SALORA TPP		**135.0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**
AKALTARA TPS	3	600.0	3562.2	0	12.11	87.89	0	20.12	67.8
AKALTARA TPS	4	600.0	3170.29	0	25.02	74.98	0	14.66	60.3
AKALTARA TPS		**1200.0**	**6732.49**	**0**	**18.56**	**81.44**	**0**	**17.39**	**64.05**
BARADARHA TPS	1	600.0	3689.74	2.89	3.23	93.88	0	23.68	70.2
BARADARHA TPS	2	600.0	3498.65	0	9.71	90.29	3.97	23.73	66.6
BARADARHA TPS		**1200.0**	**7188.39**	**1.44**	**6.47**	**92.09**	**1.98**	**23.7**	**68.38**
AVANTHA BHANDAR	1	600.0	2819.44	0	31.9	68.1	9.64	14.46	53.6
AVANTHA BHANDAR		**600.0**	**2819.44**	**0**	**31.9**	**68.1**	**9.64**	**14.46**	**53.64**
TAMNAR TPP	1	600.0	1782.02	0	62.84	37.16	21.43	3.25	33.9
TAMNAR TPP	2	600.0	2432.83	0	49.28	50.72	25.93	4.44	46.3
TAMNAR TPP	3	600.0	478.68	0	89.02	10.98	89.67	1.87	9.1
TAMNAR TPP	4	600.0	104.17	0	90.91	9.09	0	0	0
TAMNAR TPP		**2400.0**	**4797.7**	**0**	**69.42**	**30.58**	**41.13**	**2.87**	**27.2**

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
BANDAKHAR TPP	1	300.0	1405.4	0	31.85	68.15	0	14.89	53.5
BANDAKHAR TPP		**300.0**	**1405.4**	**0**	**31.85**	**68.15**	**0**	**14.89**	**53.48**
NAWAPARA TPP	1	300.0	714.27	0	40.79	59.21	0	20.33	44.6
NAWAPARA TPP		**300.0**	**714.27**	**0**	**40.79**	**59.21**	**0**	**20.33**	**44.57**
UCHPINDA TPP	1	360.0	117.82	0	94.71	5.29	7.85	1.55	3.7
UCHPINDA TPP	2	360.0	19.77	0	3.55	96.45	0	45.41	0.6
UCHPINDA TPP		**720.0**	**137.59**	**0**	**49.13**	**50.87**	**3.93**	**23.48**	**2.18**
TROMBAY TPS	4	150.0	0	0	102.61	-2.61	0	0	0
TROMBAY TPS	5	500.0	3116.3	8.53	1.22	90.25	0	19.1	71.1
TROMBAY TPS	6	500.0	0.06	0	100	0	0	0	0
TROMBAY TPS	8	250.0	1864.57	4.76	0.04	95.19	0	10.05	85.1
TROMBAY TPS		**1250.0**	**4980.93**	**3.97**	**46.17**	**49.86**	**0**	**8.77**	**41.33**
DAHANU TPS	1	250.0	1947.89	0	0.34	99.66	10.71	10.71	88.9
DAHANU TPS	2	250.0	1794.66	0	7.07	92.93	10.98	10.98	81.9
DAHANU TPS		**500.0**	**3742.55**	**0**	**3.71**	**96.29**	**10.85**	**10.85**	**85.45**
JSW RATNAGIRI TPP	1	300.0	1713.54	0	32.63	67.37	1.84	2.18	65.2
JSW RATNAGIRI TPP	2	300.0	1398.07	4.7	33.2	62.1	0	9.26	53.2
JSW RATNAGIRI TPP	3	300.0	1776.82	10.47	3.72	85.81	0.37	18.2	67.6
JSW RATNAGIRI TPP	4	300.0	1793.43	0	1.83	98.17	0	29.93	68.2
JSW RATNAGIRI TPP		**1200.0**	**6681.86**	**3.79**	**17.84**	**78.36**	**0.55**	**14.89**	**63.56**
WARDHA WARORA TPP	1	135.0	0	0	100	0	0	0	0
WARDHA WARORA TPP	2	135.0	0	0	100	0	0	0	0
WARDHA WARORA TPP	3	135.0	708.94	0	13.94	86.06	0	26.12	59.9
WARDHA WARORA TPP	4	135.0	685.96	8.51	7.47	84.02	0	26.01	58
WARDHA WARORA TPP		**540.0**	**1394.9**	**2.13**	**55.35**	**42.52**	**0**	**13.03**	**29.49**
MIHAN TPS	1	61.5	0	0	100	0	0	0	0
MIHAN TPS	2	61.5	0	0	100	0	0	0	0
MIHAN TPS	3	61.5	0	0	100	0	0	0	0
MIHAN TPS	4	61.5	0	0	100	0	0	0	0
MIHAN TPS		**246.0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**
TIRORA TPS	1	660.0	2191.75	0	49.99	50.01	5.16	12.1	37.9
TIRORA TPS	2	660.0	4365.72	0	14.67	85.33	4.99	9.82	75.5
TIRORA TPS	3	660.0	4071.61	0	20.04	79.96	25.47	9.54	70.4
TIRORA TPS	4	660.0	3432.12	0	22.45	77.55	5.28	18.18	59.4
TIRORA TPS	5	660.0	3581.36	0	19.99	80.01	7.26	18.07	61.9
TIRORA TPS		**3300.0**	**17642.56**	**0**	**25.43**	**74.57**	**9.63**	**13.54**	**61.03**
BELA TPS	1	270.0	0	0	100	0	0	0	0
BELA TPS		**270.0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**
GMR WARORA TPS	1	300.0	1802.32	1.55	14.49	83.96	0	15.38	68.6
GMR WARORA TPS	2	300.0	1901.1	0	12.15	87.85	0	15.51	72.3
GMR WARORA TPS		**600.0**	**3703.42**	**0.78**	**13.32**	**85.9**	**0**	**15.44**	**70.46**
AMARAVATI TPS	1	270.0	390.45	0	79.26	20.74	83.45	4.23	16.5
AMARAVATI TPS	2	270.0	497.17	0	74.77	25.23	78.82	4.21	21
AMARAVATI TPS	3	270.0	280.16	0	85.24	14.76	88.11	2.92	11.8
AMARAVATI TPS	4	270.0	464.44	0	75.3	24.7	80.24	5.07	19.6
AMARAVATI TPS	5	270.0	242.48	0	87.47	12.53	89.72	2.28	10.3
AMARAVATI TPS		**1350.0**	**1874.7**	**0**	**80.41**	**19.59**	**84.07**	**3.74**	**15.85**
NASIK (P) TPS	1	270.0	0	0	100	0	0	0	0
NASIK (P) TPS		**270.0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**
GEPL TPP Ph-I	1	60.0	0	0	100	0	0	0	0

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
GEPL TPP Ph-I	2	60.0	0	0	100	0	0	0	0
GEPL TPP Ph-I		**120.0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**
BUTIBORI TPP	1	300.0	1747.85	0.03	20.22	79.74	12.24	13.23	66.5
BUTIBORI TPP	2	300.0	1994.67	6.1	1.66	92.24	10.48	16.34	75.9
BUTIBORI TPP		**600.0**	**3742.52**	**3.07**	**10.94**	**85.99**	**11.36**	**14.79**	**71.2**
DHARIWAL TPP	1	300.0	0	0	100	0	0	0	0
DHARIWAL TPP	2	300.0	1541.71	0	1.81	98.19	32.3	39.52	58.7
DHARIWAL TPP		**600.0**	**1541.71**	**0**	**50.91**	**49.09**	**16.15**	**19.76**	**29.33**
SOUTHERN									
RAMAGUNDEM STPS	1	200.0	1617.2	0	1.32	98.68	0	6.38	92.3
RAMAGUNDEM STPS	2	200.0	1613.77	0	1.28	98.72	0	6.61	92.1
RAMAGUNDEM STPS	3	200.0	1630.89	0	0.73	99.27	0	6.18	93.1
RAMAGUNDEM STPS	4	500.0	3875.81	0	2.65	97.35	0	8.86	88.5
RAMAGUNDEM STPS	5	500.0	3583.19	9.82	2.24	87.94	0	6.13	81.8
RAMAGUNDEM STPS	6	500.0	3627.37	8.76	1.83	89.41	0	6.6	82.8
RAMAGUNDEM STPS	7	500.0	3649.29	9.52	0.37	90.12	0	6.85	83.3
RAMAGUNDEM STPS		**2600.0**	**19597.52**	**5.4**	**1.62**	**92.98**	**0**	**6.94**	**86.04**
SIMHADRI	1	500.0	3465.17	7.95	1.96	90.09	0	10.98	79.1
SIMHADRI	2	500.0	3746.86	0	1.84	98.16	0.11	12.61	85.5
SIMHADRI	3	500.0	3585.03	0	1.88	98.12	0	16.27	81.9
SIMHADRI	4	500.0	3376.43	6.88	0.19	92.94	0	15.85	77.1
SIMHADRI		**2000.0**	**14173.49**	**3.71**	**1.47**	**94.83**	**0.03**	**13.93**	**80.9**
NEYVELI TPS- I	1	50.0	338.92	3.45	4.53	92.02	0	14.64	77.4
NEYVELI TPS- I	2	50.0	313.1	8.84	6.38	84.78	0	13.3	71.5
NEYVELI TPS- I	3	50.0	324.99	5.73	4.25	90.03	0	15.83	74.2
NEYVELI TPS- I	4	50.0	329.2	5.87	5.58	88.55	0	13.39	75.2
NEYVELI TPS- I	5	50.0	347.65	3.96	3.26	92.79	0	13.41	79.4
NEYVELI TPS- I	6	50.0	354.66	2.06	2.16	95.78	0	14.81	81
NEYVELI TPS- I	7	100.0	568.57	7.85	1.39	90.76	0	25.85	64.9
NEYVELI TPS- I	8	100.0	622.75	10.49	0.72	88.79	0	17.69	71.1
NEYVELI TPS- I	9	100.0	496.68	5.77	6.96	87.28	0	30.58	56.7
NEYVELI TPS- I		**600.0**	**3696.52**	**6.51**	**3.69**	**89.8**	**0**	**19.47**	**59.51**
NEYVELI TPS-II	1	210.0	1619.47	4.91	1.43	93.66	2.61	5.63	88
NEYVELI TPS-II	2	210.0	1621.03	4.58	2.86	92.56	1.47	4.49	88.1
NEYVELI TPS-II	3	210.0	1631.62	6.05	2.49	91.46	1.29	2.81	88.7
NEYVELI TPS-II	4	210.0	1560.98	7.15	1.52	91.34	2.68	6.48	84.9
NEYVELI TPS-II	5	210.0	1577.92	4.14	2.5	93.36	2.94	7.58	85.8
NEYVELI TPS-II	6	210.0	1526.99	10.18	1.52	88.3	1.43	5.3	83
NEYVELI TPS-II	7	210.0	1514.07	8.28	2.69	89.03	2.74	6.73	82.3
NEYVELI TPS-II		**1470.0**	**11052.08**	**6.47**	**2.14**	**91.39**	**2.16**	**5.57**	**85.83**
NEYVELI (EXT) TPS	1	210.0	1653.19	3.55	1.9	94.55	4.29	4.78	89.9
NEYVELI (EXT) TPS	2	210.0	1675.14	3.9	0.6	95.5	4.23	4.45	91.1
NEYVELI (EXT) TPS		**420.0**	**3328.33**	**3.73**	**1.25**	**95.03**	**4.26**	**4.62**	**90.46**
NEYVELI TPS-II EXP	1	250.0	714.47	0	48.92	51.08	1.57	18.46	32.6
NEYVELI TPS-II EXP	2	250.0	658.78	0	56.07	43.93	2.01	13.85	30.1
NEYVELI TPS-II EXP		**500.0**	**1373.25**	**0**	**52.49**	**47.51**	**1.79**	**16.15**	**31.35**
VALLUR TPP	1	500.0	2897.95	8.12	9.14	82.74	2.05	16.58	66.2
VALLUR TPP	2	500.0	3407.75	1.14	6.92	91.94	2.66	14.14	77.8
VALLUR TPP	3	500.0	2905.16	17.87	4.4	77.73	1.19	11.4	66.3
VALLUR TPP		**1500.0**	**9210.86**	**9.04**	**6.82**	**84.14**	**1.97**	**14.04**	**70.1**

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
TUTICORIN (JV) TPP	1	500.0	3069.26	4.68	9.7	85.62	0	15.55	70.1
TUTICORIN (JV) TPP	2	500.0	3182.78	4.64	9.51	85.85	0	13.19	72.7
TUTICORIN (JV) TPP		**1000.0**	**6252.04**	**4.66**	**9.6**	**85.74**	**0**	**14.37**	**71.37**
KOTHAGUDEM TPS	1	60.0	336.28	11.26	2.87	85.88	0	21.9	64
KOTHAGUDEM TPS	2	60.0	352.49	10.73	3.31	85.96	2.29	18.89	67.1
KOTHAGUDEM TPS	3	60.0	367.35	4.82	2.53	92.65	0	22.76	69.9
KOTHAGUDEM TPS	4	60.0	407.79	3.76	1.49	94.75	0	17.17	77.6
KOTHAGUDEM TPS	5	120.0	639.63	12.41	2.22	85.37	0	24.52	60.8
KOTHAGUDEM TPS	6	120.0	652.87	4.53	5.49	89.99	2.32	27.88	62.1
KOTHAGUDEM TPS	7	120.0	624.14	5.59	8.64	85.77	2.66	26.39	59.4
KOTHAGUDEM TPS	8	120.0	583.56	6.03	5.84	88.13	0	32.62	55.5
KOTHAGUDEM TPS		**720.0**	**3964.11**	**7.31**	**4.55**	**88.15**	**1.02**	**25.3**	**37.42**
KOTHAGUDEM TPS (NEW)	1	250.0	1823.7	0	5.9	94.1	0	11.42	83.3
KOTHAGUDEM TPS (NEW)	2	250.0	1406.23	12.6	15.34	72.07	0	7.86	64.2
KOTHAGUDEM TPS (NEW)	3	500.0	3356.23	0	2.9	97.1	0.45	20.47	76.6
KOTHAGUDEM TPS (NEW)		**1000.0**	**6586.16**	**3.15**	**6.76**	**90.09**	**0.22**	**15.06**	**75.18**
Dr. N.TATA RAO TPS	1	210.0	1383.28	4.67	3	92.33	1.3	17.13	75.2
Dr. N.TATA RAO TPS	2	210.0	1150.39	5.72	17.63	76.65	0.98	14.12	62.5
Dr. N.TATA RAO TPS	3	210.0	1487.57	4.68	0.68	94.64	1.1	13.77	80.9
Dr. N.TATA RAO TPS	4	210.0	1239.87	20.09	1.39	78.51	1.1	11.11	67.4
Dr. N.TATA RAO TPS	5	210.0	1415.7	0	9.41	90.59	1.08	13.63	77
Dr. N.TATA RAO TPS	6	210.0	1436.5	5.01	1.39	93.6	2.04	15.51	78.1
Dr. N.TATA RAO TPS	7	500.0	3539.07	0	6.27	93.73	3.12	12.92	80.8
Dr. N.TATA RAO TPS		**1760.0**	**11652.38**	**4.79**	**5.78**	**89.43**	**1.79**	**13.85**	**75.58**
DAMODARAM SANJEEVAIAH TPS	1	800.0	4276.02	10.79	6.37	82.84	0	21.82	61
DAMODARAM SANJEEVAIAH TPS	2	800.0	4528.63	5.95	13.6	80.44	0	15.82	64.6
DAMODARAM SANJEEVAIAH TPS		**1600.0**	**8804.65**	**8.37**	**9.99**	**81.64**	**0**	**18.82**	**62.82**
RAMAGUNDEM - B TPS	1	62.5	453.7	5.16	4.83	90.01	0.55	7.14	82.9
RAMAGUNDEM - B TPS		**62.5**	**453.7**	**5.16**	**4.83**	**90.01**	**0.55**	**7.14**	**82.87**
KAKATIYA TPS	1	500.0	3282.7	0	5.33	94.67	19.73	19.73	74.9
KAKATIYA TPS	2	600.0	3295.82	0	22.8	77.2	14.49	14.49	62.7
KAKATIYA TPS		**1100.0**	**6578.52**	**0**	**14.86**	**85.14**	**16.87**	**16.87**	**68.27**
SINGARENI TPP	1	600.0	2503.57	0	11.56	88.44	0	10.71	79.3
SINGARENI TPP	2	600.0	1595.76	0	8.28	91.72	0	7.9	66.5
SINGARENI TPP		**1200.0**	**4099.33**	**0**	**10.25**	**89.75**	**0**	**9.59**	**80.67**
RAYALASEEMA TPS	1	210.0	1278.38	0	16.83	83.17	6.89	13.68	69.5
RAYALASEEMA TPS	2	210.0	1420.63	0	8.26	91.74	5.54	14.51	77.2
RAYALASEEMA TPS	3	210.0	1365.22	0	10.9	89.1	9.38	14.88	74.2
RAYALASEEMA TPS	4	210.0	1263.48	3.49	14.06	82.45	3.46	13.77	68.7
RAYALASEEMA TPS	5	210.0	1383.93	0	8.07	91.93	6.08	16.7	75.2
RAYALASEEMA TPS		**1050.0**	**6711.64**	**0.7**	**11.63**	**87.68**	**6.27**	**14.71**	**72.97**
RAICHUR TPS	1	210.0	1537.49	6.24	4.85	88.91	5.97	5.34	83.6
RAICHUR TPS	2	210.0	1366.08	6.82	14.59	78.59	12.7	4.33	74.3
RAICHUR TPS	3	210.0	1575.69	0	9.94	90.06	11.54	4.41	85.7
RAICHUR TPS	4	210.0	1283.95	0	26.98	73.02	24.24	3.22	69.8
RAICHUR TPS	5	210.0	1371.78	11.5	9.11	79.39	3.91	4.82	74.6
RAICHUR TPS	6	210.0	1314.42	0	23.95	76.05	3.89	4.6	71.5
RAICHUR TPS	7	210.0	1301.27	5.59	20.25	74.16	19.08	3.43	70.7
RAICHUR TPS	8	250.0	1744.99	0	15.51	84.49	16.59	4.81	79.7
RAICHUR TPS		**1720.0**	**11495.67**	**3.68**	**15.64**	**80.68**	**12.34**	**4.38**	**76.3**

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
BELLARY TPS	1	500.0	3412.39	0	6.2	93.8	0	15.89	77.9
BELLARY TPS	2	500.0	2476.13	0	35.41	64.59	23.58	8.05	56.5
BELLARY TPS		**1000.0**	**5888.52**	**0**	**20.81**	**79.19**	**11.79**	**11.97**	**67.22**
YERMARUS TPP	1	800.0	232.8	0	74.36	25.64	0	0	
YERMARUS TPP		**800.0**	**232.8**	**0**	**74.36**	**25.64**	**0**	**0**	**20.18**
ENNORE TPS	1	60.0	0	0	100	0	0	0	0
ENNORE TPS	2	60.0	0	0	100	0	0	0	0
ENNORE TPS	3	110.0	141.37	0.57	62.2	37.23	0	22.56	14.7
ENNORE TPS	4	110.0	50.62	37.03	48.94	14.04	0	8.78	5.3
ENNORE TPS	5	110.0	0	0	93.79	6.21	0	0	0
ENNORE TPS		**340.0**	**191.99**	**9.57**	**76.06**	**14.37**	**0**	**7.98**	**5.07**
TUTICORIN TPS	1	210.0	889.6	6.95	34.64	58.42	10.02	10.06	48.4
TUTICORIN TPS	2	210.0	959.81	12.67	26.15	61.18	10.96	9	52.2
TUTICORIN TPS	3	210.0	1322.69	9.96	11.61	78.43	9.66	6.53	71.9
TUTICORIN TPS	4	210.0	1173.04	0	26.9	73.1	10.32	9.34	63.8
TUTICORIN TPS	5	210.0	1202.45	17.97	7.76	74.28	7.47	8.91	65.4
TUTICORIN TPS		**1050.0**	**5547.59**	**9.51**	**21.41**	**69.08**	**9.69**	**8.77**	**60.31**
METTUR TPS	1	210.0	1575.62	4.25	3.82	91.93	2.27	6.3	85.7
METTUR TPS	2	210.0	1424.58	12.33	5.77	81.9	2.74	4.48	77.4
METTUR TPS	3	210.0	1317.88	3.96	16.07	79.97	9.12	8.33	71.6
METTUR TPS	4	210.0	1412.74	0	14.3	85.7	7.69	8.91	76.8
METTUR TPS		**840.0**	**5730.82**	**5.14**	**9.99**	**84.88**	**5.45**	**7**	**77.88**
METTUR TPS - II	1	600.0	3446.61	12.8	3.82	83.38	3.73	17.8	65.6
METTUR TPS - II		**600.0**	**3446.61**	**12.8**	**3.82**	**83.38**	**3.73**	**17.8**	**65.57**
NORTH CHENNAI TPS	1	210.0	1050.98	5.88	28.06	66.07	0.2	8.93	57.1
NORTH CHENNAI TPS	2	210.0	1128.94	20.65	8.59	70.76	0.04	9.39	61.4
NORTH CHENNAI TPS	3	210.0	1530.53	4.3	3.21	92.49	0.31	9.29	83.2
NORTH CHENNAI TPS	4	600.0	3036.56	11.23	15.07	73.7	3.45	15.92	57.8
NORTH CHENNAI TPS	5	600.0	3345.29	9.2	10.98	79.82	1.92	16.18	63.6
NORTH CHENNAI TPS		**1830.0**	**10092.3**	**10.24**	**13.11**	**76.65**	**1.82**	**13.69**	**62.96**
SIMHAPURI TPS	1	150.0	432.22	1.61	57.18	41.2	55.69	8.31	32.9
SIMHAPURI TPS	2	150.0	262.55	0	77.37	22.63	76.44	2.83	20
SIMHAPURI TPS	3	150.0	444.1	0	61.17	38.83	61.14	5.03	33.8
SIMHAPURI TPS	4	150.0	478.85	0	57.36	42.64	55.84	6.2	36.4
SIMHAPURI TPS		**600.0**	**1617.72**	**0.4**	**63.27**	**36.33**	**62.28**	**5.59**	**30.78**
THAMMINAPATNAM TPS	1	150.0	642.68	0	32.64	67.36	38.41	18.44	48.9
THAMMINAPATNAM TPS	2	150.0	730.95	0	25.76	74.24	33.9	18.68	55.6
THAMMINAPATNAM TPS		**300.0**	**1373.63**	**0**	**29.2**	**70.8**	**36.15**	**18.56**	**52.27**
VIZAG TPP	1	520.0	1921.43	2.89	39.72	57.39	3.95	15.21	42.2
VIZAG TPP	2	520.0	1361.1	0	54.03	45.97	2.92	9.83	30.2
VIZAG TPP		**1040.0**	**3282.53**	**1.65**	**45.86**	**52.49**	**3.51**	**12.9**	**38.61**
PAINAMPURAM TPP	1	660.0	4949.7	5.47	1.57	92.96	0	7.35	85.6
PAINAMPURAM TPP	2	660.0	4109.7	0	22.78	77.22	0	5.12	71.1
PAINAMPURAM TPP		**1320.0**	**9059.4**	**2.73**	**12.17**	**85.09**	**0**	**6.24**	**78.35**
SGPL TPP	1	660.0	1370.47	0	19.84	80.16	0	4.29	63.7
SGPL TPP	2	660.0	288.13	0	30.21	69.79	0	0	58.7
SGPL TPP		**1320.0**	**1658.6**	**0**	**21.95**	**78.05**	**0**	**3.41**	**62.7**
TORANGALLU TPS(SBU-I)	1	130.0	1000.63	3.79	5.85	90.35	7.77	2.68	87.9
TORANGALLU TPS(SBU-I)	2	130.0	714.32	0	29.93	70.07	34.17	7.54	62.7
TORANGALLU TPS(SBU-I)		**260.0**	**1714.95**	**1.9**	**17.89**	**80.21**	**20.97**	**5.11**	**75.3**

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
TORANGALLU TPS(SBU-II)	3	300.0	1366.41	0	32.09	67.91	42.95	16.09	52
TORANGALLU TPS(SBU-II)	4	300.0	1333.98	11.42	18.64	69.94	31.34	19.18	50.8
TORANGALLU TPS(SBU-II)		**600.0**	**2700.39**	**5.71**	**25.37**	**68.92**	**37.15**	**17.64**	**51.38**
UDUPI TPP	1	600.0	4352.46	0	5.44	94.56	0	11.75	82.8
UDUPI TPP	2	600.0	3522.96	13.55	9.58	76.87	2.01	9.85	67
UDUPI TPP		**1200.0**	**7875.42**	**6.77**	**7.51**	**85.72**	**1.01**	**10.8**	**74.92**
TUTICORIN (P) TPP	1	150.0	4.48	0	99.45	0.55	0	0.21	0.3
TUTICORIN (P) TPP	2	150.0	19.14	0	97.22	2.78	1.26	1.32	1.5
TUTICORIN (P) TPP		**300.0**	**23.62**	**0**	**98.33**	**1.67**	**0.63**	**0.77**	**0.9**
MUTHIARA TPP	1	600.0	2539.98	0	30.92	69.08	33.66	20.76	48.3
MUTHIARA TPP	2	600.0	1209.12	15.83	49.19	34.98	15.82	11.98	23
MUTHIARA TPP		**1200.0**	**3749.1**	**7.92**	**40.05**	**52.03**	**24.74**	**16.37**	**35.66**
NEYVELI TPS(Z)	1	250.0	1078.69	0	17.98	82.02	33.67	32.76	49.3
NEYVELI TPS(Z)		**250.0**	**1078.69**	**0**	**17.98**	**82.02**	**33.67**	**32.76**	**49.26**
ITPCL TPP	1	600.0	2744.03	0	33.38	66.62	23.42	11.12	52.2
ITPCL TPP	2	600.0	2231.67	0	39.53	60.47	28.49	10.6	46.1
ITPCL TPP		**1200.0**	**4975.7**	**0**	**36.32**	**63.68**	**25.85**	**10.87**	**49.29**
EASTERN									
PATRATU TPS	1	40.0	0	0	98.36	1.64	0	0	0
PATRATU TPS	2	40.0	0	0	98.36	1.64	0	0	0
PATRATU TPS	3	40.0	0	0	98.36	1.64	0	0	0
PATRATU TPS	4	40.0	0.6	0	99.82	0.18	0	0	0.2
PATRATU TPS	5	90.0	0	0	98.36	1.64	0	0	0
PATRATU TPS	6	90.0	0.01	0	100	0	0	0	0
PATRATU TPS	7	105.0	0	0	100	0	0	0	0
PATRATU TPS	8	105.0	0	0	98.36	1.64	0	0	0
PATRATU TPS	9	110.0	0	0	100	0	0	0	0
PATRATU TPS	10	110.0	385.27	0	34	66	1.56	0	40
PATRATU TPS		**455.0**	**385.88**	**0**	**86.72**	**13.28**	**0.31**	**0**	**7.86**
BARAUNI TPS	6	105.0	0	100	0	0	0	0	0
BARAUNI TPS	7	105.0	131.42	65.67	15.49	18.84	0	4.55	14.3
BARAUNI TPS		**210.0**	**131.42**	**82.84**	**7.74**	**9.42**	**0**	**2.28**	**7.14**
MUZAFFARPUR TPS	1	110.0	382.18	12.75	43.59	43.66	0	4	39.7
MUZAFFARPUR TPS	2	110.0	370.29	0	55.12	44.88	0	6.45	38.4
MUZAFFARPUR TPS	3	195.0	41.02	0	0	100	0	0	0
MUZAFFARPUR TPS		**415.0**	**793.49**	**6.38**	**51.15**	**42.48**	**0**	**5.22**	**39.04**
BARH II	4	660.0	3720.22	8.69	9.03	82.28	0	17.93	64.3
BARH II	5	660.0	3921.79	0	12.86	87.14	0	19.31	67.8
BARH II		**1320.0**	**7642.01**	**4.35**	**10.95**	**84.71**	**0**	**18.62**	**66.09**
NABI NAGAR TPP	1	250.0	0	0	84.44	15.56	0	0	0
NABI NAGAR TPP		**250.0**	**0**	**0**	**84.44**	**15.56**	**0**	**0**	**0**
KAHALGAON TPS	1	210.0	1530.26	0	1.49	98.51	0	15.33	83.2
KAHALGAON TPS	2	210.0	1554.22	0.34	1.1	98.55	0	14.07	84.5
KAHALGAON TPS	3	210.0	1394.76	9.64	0.96	89.4	0	13.58	75.8
KAHALGAON TPS	4	210.0	1462.39	3.12	0.53	96.35	0	16.86	79.5
KAHALGAON TPS	5	500.0	3353.26	6.98	0.57	92.45	0	15.89	76.6
KAHALGAON TPS	6	500.0	3488.85	0	2.17	97.83	0	18.17	79.7
KAHALGAON TPS	7	500.0	3164.19	10.4	0.82	88.78	0	16.54	72.2
KAHALGAON TPS		**2340.0**	**15947.93**	**4.89**	**1.13**	**93.98**	**0**	**16.18**	**77.8**
CHANDRAPURA(DVC) TPS	1	130.0	546.7	0	18.01	81.99	2.53	18.52	57.3

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
CHANDRAPURA(DVC) TPS	2	130.0	725.08	2.21	19.21	78.57	0	14.9	63.7
CHANDRAPURA(DVC) TPS	3	130.0	626.08	13.77	19.67	66.56	0	11.58	55
CHANDRAPURA(DVC) TPS	7	250.0	1781.4	0	14.04	85.96	0	4.62	81.3
CHANDRAPURA(DVC) TPS	8	250.0	1963.44	0	4.14	95.86	0	6.2	89.7
CHANDRAPURA(DVC) TPS		**760.0**	**5642.7**	**2.39**	**13.31**	**84.3**	**0.32**	**9.4**	**64.6**
DURGAPUR TPS	3	130.0	0	0	14.02	85.98	0	0	0
DURGAPUR TPS	4	210.0	592.72	0	62.32	37.68	5.46	5.46	32.2
DURGAPUR TPS		**210.0**	**592.72**	**0**	**49.46**	**50.54**	**4.01**	**4.01**	**23.64**
BOKARO `B` TPS	1	210.0	625.57	0	58.87	41.13	6.5	7.12	34
BOKARO `B` TPS	2	210.0	425.14	0	68.03	31.97	21.87	7.77	23.1
BOKARO `B` TPS	3	210.0	405.97	0	72.63	27.37	2.98	5.3	22.1
BOKARO `B` TPS		**630.0**	**1456.68**	**0**	**66.51**	**33.49**	**10.45**	**6.73**	**7.36**
BOKARO TPS `A` EXP	1	500.0	208	9.09	1117.56	-1026.65	0	0	55.9
BOKARO TPS `A` EXP		**500.0**	**208**	**9.09**	**1117.56**	**-1026.65**	**0**	**0**	**55.91**
MEJIA TPS	1	210.0	831.16	0	49.94	50.06	41.71	4.88	45.2
MEJIA TPS	2	210.0	484.25	0	70.84	29.16	73.65	2.84	26.3
MEJIA TPS	3	210.0	1060.52	0	35.39	64.61	40.78	6.96	57.6
MEJIA TPS	4	210.0	355.8	0	77.64	22.36	77.98	3.02	19.3
MEJIA TPS	5	250.0	1900.98	2.27	1.06	96.67	9.87	9.87	86.8
MEJIA TPS	6	250.0	1793.5	0	8.87	91.13	9.24	9.24	81.9
MEJIA TPS	7	500.0	3594.21	0.03	4.19	95.77	12.65	13.71	82.1
MEJIA TPS	8	500.0	2916.36	16.86	5.28	77.86	11.28	11.28	66.6
MEJIA TPS		**2340.0**	**12936.78**	**3.85**	**24.07**	**72.08**	**28.16**	**8.97**	**63.11**
KODARMA TPP	1	500.0	873.72	0	76.69	23.31	3.01	3.36	19.9
KODARMA TPP	2	500.0	2928.05	1.44	21.56	77	9.95	10.15	66.9
KODARMA TPP		**1000.0**	**3801.77**	**0.72**	**49.12**	**50.16**	**6.48**	**6.76**	**43.4**
DURGAPUR STEEL TPS	1	500.0	3101.57	9.01	6.72	84.27	13.46	13.46	70.8
DURGAPUR STEEL TPS	2	500.0	3554.2	2.31	1.95	95.74	14.59	14.59	81.1
DURGAPUR STEEL TPS		**1000.0**	**6655.77**	**5.66**	**4.34**	**90**	**14.02**	**14.02**	**75.98**
RAGHUNATHPUR TPP	1	600.0	1059.75	9.86	60.17	29.96	0	9.8	20.2
RAGHUNATHPUR TPP	2	600.0	956.76	39.95	33.09	26.96	0	8.76	18.2
RAGHUNATHPUR TPP		**1200.0**	**2016.51**	**24.91**	**46.63**	**28.46**	**0**	**9.28**	**19.18**
TALCHER (OLD) TPS	1	60.0	520.16	3.87	1.27	94.86	0	0	99
TALCHER (OLD) TPS	2	60.0	505.63	4.1	1.26	94.64	0	0.37	96.2
TALCHER (OLD) TPS	3	60.0	512.06	3.99	2.04	93.97	0	0	97.4
TALCHER (OLD) TPS	4	60.0	473.73	11.18	1.73	87.09	0	0.19	90.1
TALCHER (OLD) TPS	5	110.0	904.43	4.87	1.07	94.06	0	0.52	93.9
TALCHER (OLD) TPS	6	110.0	843.52	9.65	2.4	87.94	0	0.68	87.5
TALCHER (OLD) TPS		**460.0**	**3759.53**	**6.49**	**1.65**	**91.86**	**0**	**0.36**	**93.3**
TALCHER STPS	1	500.0	3963.59	0	4.96	95.04	0	4.55	90.5
TALCHER STPS	2	500.0	3663.05	9.77	2.1	88.13	0	4.5	83.6
TALCHER STPS	3	500.0	4003.68	0	2.1	97.9	0	6.49	91.4
TALCHER STPS	4	500.0	4017.04	0	2.08	97.92	0	6.21	91.7
TALCHER STPS	5	500.0	3749.26	7.87	1.05	91.08	0	5.48	85.6
TALCHER STPS	6	500.0	3450.86	16.18	0.35	83.46	0	4.72	78.8
TALCHER STPS		**3000.0**	**22847.48**	**5.64**	**2.11**	**92.26**	**0**	**5.33**	**86.94**

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
FARAKKA STPS	1	200.0	1334.78	4.68	2.79	92.53	0	16.34	76.2
FARAKKA STPS	2	200.0	1294.31	7.12	4.4	88.47	0	14.6	73.9
FARAKKA STPS	3	200.0	1388.77	0	6.66	93.34	0	14.07	79.3
FARAKKA STPS	4	500.0	3194.04	0	10.93	89.07	0	16.14	72.9
FARAKKA STPS	5	500.0	3104.77	0.8	8.9	90.3	0	19.41	70.9
FARAKKA STPS	6	500.0	3427.31	0	0.79	99.21	0	21.02	78.2
FARAKKA STPS		**2100.0**	**13743.98**	**1.32**	**6.23**	**92.45**	**0**	**17.76**	**74.71**
TENUGHAT TPS	1	210.0	892.09	29.1	9.81	61.09	0	12.6	48.5
TENUGHAT TPS	2	210.0	531.21	0	63.9	36.1	39.56	7.22	28.9
TENUGHAT TPS		**420.0**	**1423.3**	**14.55**	**36.85**	**48.6**	**19.78**	**9.91**	**38.69**
IB VALLEY TPS	1	210.0	1663.61	0	1.73	98.27	0.24	7.83	90.4
IB VALLEY TPS	2	210.0	1572.06	6.01	0.78	93.21	0.13	7.76	85.5
IB VALLEY TPS		**420.0**	**3235.67**	**3**	**1.26**	**95.74**	**0.19**	**7.79**	**87.94**
BANDEL TPS	1	60.0	199.63	20.36	18.35	61.3	1.09	23.31	38
BANDEL TPS	2	60.0	293.53	0	7.56	92.44	1.7	36.6	55.8
BANDEL TPS	3	60.0	120.58	0	57	43	16.72	20.06	22.9
BANDEL TPS	4	60.0	186.82	0	42.77	57.23	25.5	21.69	35.5
BANDEL TPS	5	210.0	1084.46	0	23.64	76.36	1.01	17.41	59
BANDEL TPS		**450.0**	**1885.02**	**2.71**	**27.79**	**69.5**	**6.47**	**21.68**	**47.82**
SANTALDIH TPS	1	120.0	0	0	110.66	-10.66	0	0	0
SANTALDIH TPS	2	120.0	0	0	110.66	-10.66	0	0	0
SANTALDIH TPS	3	120.0	0	0	110.66	-10.66	0	0	0
SANTALDIH TPS	4	120.0	0	0	110.66	-10.66	0	0	0
SANTALDIH TPS	5	250.0	1977.53	0	2.37	97.63	2.3	7.33	90.3
SANTALDIH TPS	6	250.0	1689.8	12.31	3.21	84.49	1.04	7.33	77.2
SANTALDIH TPS		**500.0**	**3667.33**	**3.75**	**44.95**	**51.3**	**1.02**	**4.46**	**51**
KOLAGHAT TPS	1	210.0	641.27	1.28	41.31	57.4	2.64	22.54	34.9
KOLAGHAT TPS	2	210.0	897.1	0	16.87	83.13	3.63	34.36	48.8
KOLAGHAT TPS	3	210.0	922.56	2.69	17.4	79.9	4.18	29.75	50.2
KOLAGHAT TPS	4	210.0	1063.98	0	21.38	78.62	4.82	20.79	57.8
KOLAGHAT TPS	5	210.0	1126.88	0	29.02	70.98	6.75	9.72	61.3
KOLAGHAT TPS	6	210.0	1386.21	0	11.2	88.8	4.41	13.45	75.4
KOLAGHAT TPS		**1260.0**	**6038**	**0.66**	**22.86**	**76.47**	**4.4**	**21.77**	**54.7**
BAKRESWAR TPS	1	210.0	1566.94	0	1.04	98.96	6.5	13.78	85.2
BAKRESWAR TPS	2	210.0	1440.14	7.33	1.08	91.6	8.23	13.31	78.3
BAKRESWAR TPS	3	210.0	1133.24	14.39	12.14	73.47	9.8	11.87	61.6
BAKRESWAR TPS	4	210.0	1346.38	0	16.99	83.01	14.68	9.82	73.2
BAKRESWAR TPS	5	210.0	1563.84	0	2.33	97.67	5.25	12.66	85
BAKRESWAR TPS		**1050.0**	**7050.54**	**4.34**	**6.71**	**88.94**	**8.89**	**12.29**	**76.65**
SAGARDIGHI TPS	1	300.0	1930.32	0	10.82	89.18	1.51	15.73	73.5
SAGARDIGHI TPS	2	300.0	1842.61	0	14.92	85.08	11.65	14.96	70.1
SAGARDIGHI TPS	3	500.0	1039.74	0	59.36	40.64	11.57	16.9	23.7
SAGARDIGHI TPS		**1100.0**	**4812.67**	**0**	**34**	**66**	**8.85**	**16.05**	**45.26**
D.P.L. TPS	3	70.0	0	0	106.54	-6.54	0	0	0
D.P.L. TPS	4	75.0	0	0	106.54	-6.54	0	0	0
D.P.L. TPS	5	75.0	0	0	106.54	-6.54	0	0	0
D.P.L. TPS	6	110.0	0	0	100	0	0	0	0
D.P.L. TPS	7	300.0	993.5	0	49.83	50.17	28.69	12.37	37.8
D.P.L. TPS	8	250.0	1149.91	0	42.04	57.96	13.18	5.45	52.5
D.P.L. TPS		**660.0**	**2143.41**	**0**	**66.44**	**33.56**	**14.1**	**6.01**	**28.98**

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
JOJOBERA TPS	2	120.0	788.15	5.74	0.77	93.49	17.74	18.51	75
JOJOBERA TPS	3	120.0	775.15	8.68	0.14	91.18	16.56	17.44	73.7
JOJOBERA TPS	4	120.0	710.72	8.46	2.08	89.47	13.42	21.86	67.6
JOJOBERA TPS		**360.0**	**2274.02**	**7.63**	**1**	**91.38**	**15.91**	**19.27**	**49.57**
MAHADEV PRASAD STPP	1	270.0	1578.06	7.43	17.51	75.06	1.06	8.34	66.7
MAHADEV PRASAD STPP	2	270.0	1679.41	6.75	13.57	79.68	1.13	8.67	71
MAHADEV PRASAD STPP		**540.0**	**3257.47**	**7.09**	**15.54**	**77.37**	**1.1**	**8.51**	**68.86**
MAITHON RB TPP	1	525.0	3837.71	0	4.2	95.8	0	12.35	83.4
MAITHON RB TPP	2	525.0	3518.92	8.09	3.39	88.52	0.27	12	76.5
MAITHON RB TPP		**1050.0**	**7356.63**	**4.04**	**3.8**	**92.16**	**0.14**	**12.18**	**79.98**
STERLITE TPP	1	600.0	1803.61	0	47.88	52.12	4.54	17.8	34.3
STERLITE TPP	2	600.0	2341.2	20.36	16.19	63.45	0	18.91	44.5
STERLITE TPP	3	600.0	1488.96	0	24.16	75.84	9.03	28.25	31
STERLITE TPP	4	600.0	2167.76	0.01	12.41	87.57	1.37	42.6	45.1
STERLITE TPP		**1200.0**	**7801.53**	**5.32**	**25.47**	**69.22**	**3.67**	**26.51**	**38.75**
KAMALANGA TPS	1	350.0	2237.19	6.91	7.97	85.12	0.07	12.15	73
KAMALANGA TPS	2	350.0	2011.12	0	22.43	77.57	0	11.97	65.6
KAMALANGA TPS	3	350.0	1684.48	8.25	3.35	88.4	0	33.46	54.9
KAMALANGA TPS		**1050.0**	**5932.79**	**5.06**	**11.25**	**83.69**	**0.02**	**19.19**	**64.5**
DERANG TPP	1	600.0	3570.87	0	16.42	83.58	16.28	15.64	67.9
DERANG TPP	2	600.0	2944.43	0	30.66	69.34	13.32	13.32	56
DERANG TPP		**1200.0**	**6515.3**	**0**	**23.54**	**76.46**	**14.8**	**14.48**	**61.98**
UTKAL TPP (IND	1	350.0	0	0	150.21	-50.21	0	0	0
UTKAL TPP (IND		**350.0**	**0**	**0**	**150.21**	**-50.21**	**0**	**0**	**0**
NEW COSSIPORE TPS	1	30.0	0	0	0	100	0	0	0
NEW COSSIPORE TPS	2	30.0	0	0	0	100	0	0	0
NEW COSSIPORE TPS	3	50.0	0	0	0	100	0	0	0
NEW COSSIPORE TPS	4	50.0	0	0	0	100	0	0	0
NEW COSSIPORE TPS		**160.0**	**0**	**0**	**0**	**100**	**0**	**0**	
TITAGARH TPS	1	60.0	145.81	0	63.37	36.63	0	8.89	27.7
TITAGARH TPS	2	60.0	13.89	0	92.76	7.24	39.08	4.6	2.6
TITAGARH TPS	3	60.0	37.42	0	84.89	15.11	37.52	7.99	7.1
TITAGARH TPS	4	60.0	35.69	0	68.19	31.81	0	25.02	6.8
TITAGARH TPS		**240.0**	**232.81**	**0**	**77.3**	**22.7**	**19.15**	**11.63**	**11.07**
SOUTHERN REPL. TPS	1	67.5	260.96	0	25.06	74.94	0	30.81	44.1
SOUTHERN REPL. TPS	2	67.5	149.72	5.62	38.91	55.47	0.04	30.15	25.3
SOUTHERN REPL. TPS		**135.0**	**410.68**	**2.81**	**31.98**	**65.21**	**0.02**	**30.48**	**34.73**
BUDGE BUDGE TPS	1	250.0	1378.78	0	35.15	64.85	0	1.89	63
BUDGE BUDGE TPS	2	250.0	1962.21	4.2	1.61	94.2	0	4.6	89.6
BUDGE BUDGE TPS	3	250.0	2069.76	2.4	1.01	96.6	0	2.3	94.5
BUDGE BUDGE TPS		**750.0**	**5410.75**	**2.2**	**12.59**	**85.21**	**0**	**2.93**	**82.36**
HALDIA TPP	1	300.0	2027.66	4.13	0.11	95.77	16.48	18.61	77.2
HALDIA TPP	2	300.0	1987.83	4.18	0.76	95.07	16.34	19.42	75.6
HALDIA TPP		**600.0**	**4015.49**	**4.15**	**0.43**	**95.42**	**16.41**	**19.02**	**76.4**
NORTH EASTERN									
BONGAIGAON TPP	1	250.0	1656.46	0	3.83	96.17	0	20.54	75.6
BONGAIGAON TPP		**250.0**	**1656.46**	**0**	**3.83**	**96.17**	**0**	**20.54**	**75.64**
CHANDRAPUR(ASSAM) TPS	1	30.0	0	0	100	0	0	0	0

NAME OF UNIT/ SYSTEM	UNIT NO.	CAPACITY (MW)	GENERATION (MW)	P.M. (%)	F.O. (%)	Op.Av. (%)	R.S.D. + L.S.D (%)	P.U. incl. LSD (%)	PLF (%)
CHANDRAPUR(ASSAM) TPS	2	30.0	0	0	100	0	0	0	0
CHANDRAPUR(ASSAM) TPS		**60.0**	**0**	**0**	**100**	**0**	**0**	**0**	**0**
Grand Total		**189946.5**	**943579.7**	**4.32**	**24.52**	**71.16**	**11.24**	**11.57**	**59.06**

Note: Generation shown in the above table is from the date of reckoning of PLF of the new units.

SECTION-3
PLANNED MAINTENANCE

3.1 Planned Maintenance covers maintenance works that are planned/scheduled in advance (before the beginning of the year). The Planned Maintenance works carried out can be broadly classified as – Annual Maintenance (generally covers boiler and auxiliaries) and Capital Maintenance which covers both Boiler and Turbine Generator. The Capital Maintenance is generally carried out once in 5 to 6 years. Generally, a five/six year rolling plan is followed for Planned Maintenance which leads to an average annual outage of 28 days for units of 200/210/500 MW capacity. Other Planned Maintenance works include Boiler inspection/recertification, Renovation & Modernization and Other activities like Performance Guarantee (PG) Test of new units & Residual Life Assessment (RLA) studies on old units.

3.2 During 2016-17, the total duration for carrying out various Planned Maintenance works was **2275463.58** hours. Out of total 649 units analyzed for the year, Capital Maintenance was carried out on **29** generating units and Annual Maintenance was carried out on **200** generating units. The All India energy loss during the year, on account of Planned Maintenance actually carried out was **4.32%** (of the maximum possible generation) against a program of **4.38% (**considering all units scheduled for Planned Maintenance)**.** The average duration of unit outage for Boiler inspection/ Re-Certification was 6 days, which was less than the [4]Scheduled Duration of 24 days. The average duration of unit outage for Capital Maintenance was 47 days which was less than the schedule duration of 49 days. The details of Planned Maintenance of thermal stations for the year 2016-17 are shown below:

Work	No. of Units	Capacity of the units involved (MW)	Average duration (Days)	Energy Loss (MU)	Energy loss as % of max possible generation of Overall Capacity
1. Annual Maintenance					
i) Programme	233	66162.00	23	37152.72	2.36
ii) Actual	200	57397.00	33	43452.70	2.76
2. Capital Maintenance					
i) Programme	50	12040.00	49	12180.60	0.77
ii) Actual	29	7405.00	47	8654.21	0.55
3. Total Annual and Capital Maintenance					
i) Programme	283	78202.00	27	49333.32	3.13
ii) Actual	229	64802.00	34	52106.91	3.31
4. R&M Works					
i) Programme	7	1550.00	127	2994.00	0.19
ii) Actual	10	1934.00	207	7219.92	0.46
5. Boiler Inspection/ Re-Certification					
i) Programme	92	29772.50	24	16704.30	1.06

[4] **Scheduled/Programme/ durations are based on average of Schedule/Programme durations for individual units furnished by Stations.**

Work	No. of Units	Capacity of the units involved (MW)	Average duration (Days)	Energy Loss (MU)	Energy loss as % of max possible generation of Overall Capacity
ii) Actual	29	9710.00	6	1815.40	0.12
6. Other Planned Maintenance including PG Test of new units & RLA studies					
ii) Actual	24	7788.00	106	6887.06	0.43
7. Grand Total					
i) Programme	382	109524.50	28	69031.62	4.38
ii) Actual	292	84234.00	39	68029.29	4.32

* Other maintenance work includes miscellaneous Preventative Maintenance, short duration Planned Maintenance and R&M works.

3.3 Annual Maintenance was carried out on **200** units, out of **233** units scheduled for Annual Maintenance during 2016-17, - thus **85.84%** of the thermal units scheduled for Annual Maintenance actually carried out Annual Maintenance. Capital Maintenance was carried out on **29** units out of total **50** units scheduled - thus only 58% units scheduled for Capital Maintenance actually carried out Capital Maintenance. Actual Planned Maintenance figures include all such units, which first went under forced outage, & subsequently Annual /Capital Maintenance was taken up on them. Details of units scheduled/programmed for Annual Maintenance and Capital Maintenance and the numbers actually taken out during 2016-17 are given below :-

Particulars	Annual Maintenance				Capital Maintenance			
	2013-14	2014-15	2015-16	2016-17	2013-14	2014-15	2015-16	2016-17
Nos. Programmed for overhaul	282	242	283	233	43	84	65	50
Nos. actually taken out including those taken unscheduled	209	205	226	200	17	18	22	29
Percentage of Program	74.11%	84.71%	79.86%	85.84%	39.53%	21.43%	33.85%	58%

The Unit wise details of Planned Maintenance durations during 2016-17 are given in **Annexure 3.1**. The maintenance duration mentioned are the duration during the year 2016-17 though maintenance works on certain units had started in the previous year (before 1-4-2016) or have continued beyond the current year (beyond 31-03-2017) thus indicating very low maintenance durations for some of the units. However, for computing the average actual maintenance durations, the total duration of Planned Maintenance for such

units have been taken. Also certain units taken exceptionally long to complete maintenance have been excluded while working out average duration.

3.4 CAPACITY GROUPWISE MAINTENANCE (NUMBER OF UNITS)

3.4.1 The All India capacity group wise, Planned Maintenance details in terms of number of units Scheduled for Planned Maintenance and actually taken out for Planned Maintenance during the year 2016-17 are given below:

Particulars	660-800 MW	490-600 MW	300-360 MW	250-270 MW	210-210 MW	195-200 MW	100-150 MW	25-99 MW	Total
A. Annual Maintenance									
No. Programmed for Overhaul	16	41	15	34	55	8	38	26	**233**
No. Actually taken out	12	49	12	13	44	11	31	28	**200**
B. Capital Maintenance									
No. Programmed for Overhaul	3	5	1	6	18	2	8	7	**50**
No. Actually taken out	1	3	3	3	14	0	2	3	**29**

3.4.2 Region-wise details of Units taken for Planned Maintenance during 2016-17 are furnished below:

No. of Units taken for Maintenance in the Region													
Capacity Group (MW)	**AM/ CM**	**Northern**		**Western**		**Southern**		**Eastern**		**North -East**		**All India**	
		Program	**Actual**	**Program**	**Actual**	**Program**	**Actual**	**Program**	**Actual**	**Program**	**Actual**	**Program**	**Actual**
660-800	A.M.	1	4	11	4	4	3	0	1	0	0	16	12
	C.M.	1	0	2	1	0	0	0	0	0	0	3	1
490-600	A.M.	10	9	9	16	18	15	4	9	0	0	41	49
	C.M.	1	1	2	1	2	0	0	1	0	0	5	3
300-360	A.M.	3	4	5	4	1	0	6	4	0	0	15	12
	C.M.	1	0	0	2	0	1	0	0	0	0	1	3
250-270	A.M.	12	4	13	5	5	0	4	4	0	0	34	13
	C.M.	3	0	1	1	1	1	1	1	0	0	6	3
210	A.M.	6	5	19	10	22	25	8	4	0	0	55	44
	C.M.	5	2	3	5	8	4	2	3	0	0	18	14
195-200	A.M.	4	4	3	5	1	0	0	2	0	0	8	11
	C.M.	1	0	1	0	0	0	0	0	0	0	2	0
100-150	A.M.	13	5	14	12	8	9	3	5	0	0	38	31
	C.M.	2	0	0	1	2	0	3	1	0	0	7	2
25-99	A.M.	0	7	10	7	9	9	7	5	0	0	26	28
	C.M.	0	0	0	0	2	2	5	1	0	0	7	3
Overall Capacity	**A.M.**	**49**	**42**	**84**	**63**	**68**	**61**	**32**	**34**	**0**	**0**	**233**	**200**
	C.M.	**14**	**3**	**9**	**11**	**15**	**8**	**12**	**7**	**0**	**0**	**50**	**29**

A.M. – Annual Maintenance (Boiler Overhaul) C.M. – Capital Maintenance (Boiler and Turbine-Generator)

3.5 Duration of Annual Maintenance / Capital Maintenance

3.5.1 Capacity group wise Maintenance duration

Capacity Group wise details of average duration of Annual Maintenance and Capital Maintenance vis-à-vis program for the years 2016-17 at national level are given below:-

Average Duration (in days)				
Capacity Group (MW)	Annual Maintenance		Capital Maintenance	
	Program	Actual	Program	Actual
	2016-17		2016-17	
660-800	22	37	33	47
490-600	25	34	33	63
300-360	28	18	15	38
250-270	22	45	42	42
210-210	23	31	45	48
195-200	26	41	73	**
100-150	20	25	62	28
25-99	17	38	72	52
OVERALL CAPACITY	**23**	**33**	**49**	**47**

**** - No Maintenance Undertaken**

3.5.2 Region-wise actual duration of Annual Maintenance & Capital Maintenance against programmed duration for the year 2016-17 is indicated in the following tables:

Average Duration of Annual Maintenance (in days) in the Region during 2016-17								
Capacity in MW	Northern Region		Western Region		Southern Region		Eastern Region	
	Program	Actual	Program	Actual	Program	Actual	Program	Actual
660-800	13	19	30	38	15	**	**	**
490-600	24	20	25	30	17	35	30	42
300-360	38	30	19	26	**	**	20	**
250-270	22	61	19	19	22	20	15	36
210-210	30	31	24	31	20	23	23	28
195-200	28	25	20	49	26	25	**	**
100-150	21	39	19	39	16	23	22	19
25-99	22	27	22	43	19	18	15	15
OVERALL CAPACITY	**24**	**31**	**23**	**33**	**19**	**25**	**22**	**31**
Average Duration of Capital Maintenance (in days) in the Region during 2016-17								
Capacity in MW	**Northern Region**		**Western Region**		**Southern Region**		**Eastern Region**	
	Program	**Actual**	**Program**	**Actual**	**Program**	**Actual**	**Program**	**Actual**
660-800	46	**	45	**	**	**	**	**
490-600	60	**	43	38	45	0	60	0
300-360	0	**	34	35	40	43	35	0
250-270	43	39	30	33	46	**	**	30
210-210	40	**	40	**	56	42	37	36
195-200	45	**4**	60	**	**	**	**	**
100-150	50	27	21	**	47	**	62	32
25-99	32	137	41	37	45	40	0	79
OVERALL CAPACITY	**42**	**46**	**39**	**36**	**50**	**42**	**45**	**39**

**** - No Maintenance Undertaken**

3.5.3 SECTOR WISE MAINTENANCE DURATION

The average duration of Annual Maintenance and Capital Maintenance during last four years in different sectors in the country are shown below:

Sector	Average Duration (Days)				
	AM/CM	16-17	15-16	14-15	13-14
		Actual	Actual	Actual	Actual
CENTRAL	A.M.	27	28	33	40
	C.M.	**	33	52	36
PVT IPP	A.M.	35	29	28	31
	C.M.	41	54	25	33
PVT UTILITY	A.M.	14	49	27	21
	C.M.	**	**	**	**
STATE Sector	A.M.	39	29	31	38
	C.M.	49	37	38	47

3.5.4 REGION WISE MAINTENANCE DURATION

Region wise details of the number of units, aggregate capacity and Planned Maintenance of thermal generating units carried out during the year 2016-17 is given below:

REGION	Units considered in the review		Planned Maintenance carried out on units				
	No.	Capacity (MW)	No	Capacity (MW)	Duration (Hrs.)	Energy Loss(MU)	Energy Loss as % of Max. Poss. gen of Total Region Capacity Reviewed
NORTHERN	151	41143.00	62	17439.00	893632.09	17528.63	5.08
WESTERN	238	77871.00	95	30165.00	77724.05	22437.38	3.47
SOUTHERN	122	36462.50	73	19802.50	50620.26	14370.04	4.86
EASTERN	135	34160.00	62	17557.50	57487.18	13693.17	4.82
NORTH EASTERN	3	310.00	0	0.00	0.00	0.00	0.00
ALL INDIA	**649**	**189946.50**	**292**	**84964.00**	**275463.58**	**68029.21**	**4.32**

The average duration of Annual Maintenance and Capital Maintenance during the last four years in different Regions in the country are shown below:

Region	Average Region wise maintenance duration (Days)				
	AM/CM	16-17	15-16	14-15	13-14
Northern Region	A.M.	41	31	32	29
	C.M.	47	46	25	44
Western Region	A.M.	36	33	33	45
	C.M.	39	36	42	51
Southern Region	A.M.	25	25	25	25
	C.M.	51	42	38	32

Region	Average Region wise maintenance duration (Days)				
	AM/CM	16-17	15-16	14-15	13-14
Eastern Region	A.M.	30	31	39	57
	C.M.	53	39	40	41
All India	A.M.	33	29	31	37
	C.M.	47	40	35	43

3.5.5 UTILITY / ORGANISATION WISE MAINTENANCE DURATION

Sector wise/utility/Organization-wise Planned Maintenance duration of thermal generating units and energy loss due to it during the year 2016-17 is furnished below:

Sl. No.	Organization/ Utility	No. of Units	Capacity (MW)	Planned Maintenance				
				No. of Units	Capacity (MW)	Duration (Hrs.)	Energy Loss (MU)	Energy Loss as % of Max. Poss. gen. of Total Utility Capacity Reviewed
CENTRAL SECTOR								
1	NTPC Ltd.	102	35295.00	61	21195.00	47053.71	13884.33	4.56
2	DVC	25	7640.00	12	4840.00	8747.33	4182.35	6.48
3	NLC	20	2990.00	18	2490.00	9351.47	1312.34	5.01
4	APCPL	3	1500.00	1	500.00	865.75	432.88	3.29
5	NTECL	3	1500.00	3	1500.00	2376.48	1188.24	9.04
6	NTPL	2	1000.00	3	1500.00	816.16	408.08	4.66
7	NSPCL	2	500.00	1	250.00	138.43	34.61	0.79
8	PVUNL	10	455.00	0	0.00	0.00	0.00	0.00
9	K.B.U.N.L	3	415.00	2	220.00	1117.12	122.88	6.38
10	BRBCL	1	250.00	0	0.00	0.00	0.00	0.00
11	NLC	2	250.00	2	250.00	2734.64	341.83	15.61
CENTRAL SECTOR		**173**	**51795.00**	**103**	**32745.00**	**73201.09**	**21907.53**	**4.93**
STATE SECTOR								
NORTHERN REGION								
1	HPGCL	8	2720.00	2	900.00	1885.69	927.53	3.89
2	IPGPCL	2	135.00	0	0.00	0.00	0.00	0.00
3	PSPCL	14	2620.00	2	420.00	2161.01	453.81	1.98
4	RRVUNL	21	5190.00	11	2225.00	26828.76	4364.34	9.60
5	UPRVUNL	28	5923.00	11	2279.00	27906.01	4106.66	8.39
WESTERN REGION								
6	BECL	2	500.00	0	0.00	0.00	0.00	0.00
7	CSPGCL	15	3280.00	8	1350.00	7822.04	1098.29	4.03
8	GMDCL	2	250.00	2	250.00	538.71	67.34	3.07
9	GSECL	26	4480.00	13	2150.00	16896.31	3167.54	7.72
10	MAHAGENCO	39	10580.00	10	3460.00	16747.51	4841.02	5.94
11	MPPGCL	14	4080.00	9	3090.00	9938.00	2997.65	8.39
SOUTHERN REGION								
12	APGENCO	12	2810.00	6	1260.00	3824.82	803.21	3.26
13	APPDCL	2	1600.00	2	1600.00	1466.94	1173.55	8.37
14	KPCL	10	2720.00	4	840.00	2640.81	554.57	2.33
15	RPCL	1	800.00	0	0.00	0.00	0.00	0.00
16	SCCL	2	1200.00	0	0.00	0.00	0.00	0.00
17	TNGDCL	20	4660.00	15	4120.00	14868.59	3928.49	9.44
18	TSGENCO	14	2882.50	10	1032.50	6735.16	765.00	3.03
EASTERN REGION								
19	DPL	6	660.00	0	0.00	0.00	0.00	0.00
20	OPGC	2	420.00	1	210.00	526.40	110.54	3.00
21	TVNL	2	420.00	2	420.00	2549.23	535.34	14.55

Sl. No.	Organization/ Utility	No. of Units	Capacity (MW)	Planned Maintenance				
				No. of Units	Capacity (MW)	Duration (Hrs.)	Energy Loss (MU)	Energy Loss as % of Max. Poss. gen. of Total Utility Capacity Reviewed
22	WBPDC	25	4360.00	7	1360.00	5112.01	849.17	2.07
NORTH -EASTERN REGION								
23	APGPCL	2	60.00	0	0.00	0.00	0.00	0.00
STATE SECTOR		269	62350.50	115	26966.50	148448.00	30744.06	5.88
PVT UTILITIES								
WESTERN REGION								
1	RIL (DAHANU)	2	500.00	0	0.00	0.00	0.00	0.00
2	TATA PCL	4	1250.00	2	750.00	1164.56	477.94	3.97
3	TOR. POW. (UNOSUGEN)	5	422.00	3	362.00	922.36	111.11	3.01
EASTERN REGION								
4	CESC	13	1125.00	4	817.50	1069.63	177.58	1.80
PVT UTILITY		24	3297.00	9	1929.50	3156.55	766.62	2.56
IPPs								
NORTHERN REGION								
1	APL	2	1320.00	0	0.00	0.00	0.00	0.00
2	BEPL	10	450.00	7	315.00	12248.29	551.17	13.98
3	GPGSL (GVK)	2	540.00	0	0.00	0.00	0.00	0.00
4	JhPL(HR)	2	1320.00	1	660.00	1420.40	937.46	8.11
5	LAPPL	2	1200.00	1	600.00	465.13	279.08	2.65
6	LPGCL	3	1980.00	0	0.00	0.00	0.00	0.00
7	NPL	2	1400.00	2	1400.00	1002.20	701.54	5.72
8	PPGCL(Jaype)	2	1320.00	0	0.00	0.00	0.00	0.00
9	RPSCL	4	1200.00	3	900.00	1500.01	450.00	4.28
10	RWPL (JSW)	8	1080.00	0	0.00	0.00	0.00	0.00
11	TSPL	3	1980.00	1	660.00	825.67	544.94	3.65
WESTERN REGION								
11	ACB	4	325.00	2	270.00	667.93	90.17	3.17
12	AMNEPL	4	246.00	0	0.00	0.00	0.00	0.00
12	APL	14	7920.00	3	1650.00	2547.07	1417.13	2.04
13	BALCO	2	600.00	0	0.00	0.00	0.00	0.00
14	BLAPPL	1	45.00	0	0.00	0.00	0.00	0.00
15	CGPL	5	4000.00	2	1600.00	2398.83	1919.06	5.48
16	DBPCL	2	1200.00	1	600.00	252.87	151.72	1.44
17	DIPL	2	600.00	0	0.00	0.00	0.00	0.00
18	EPGL	2	1200.00	4	2400.00	1516.25	909.75	8.65
19	ESSARPMPL	1	600.00	1	600.00	71.55	42.93	0.82
20	GCEL	2	1370.00	0	0.00	0.00	0.00	0.00
21	GEPL	2	120.00	0	0.00	0.00	0.00	0.00
22	GIPCL	4	500.00	3	375.00	1775.05	221.88	5.07
23	GMR ENERG	2	600.00	1	300.00	135.83	40.75	0.78
24	IEPL	1	270.00	0	0.00	0.00	0.00	0.00
25	JHAPL	1	600.00	1	600.00	181.18	108.71	2.25
26	JPL	8	3400.00	2	500.00	944.44	236.11	0.90
27	JPPVL	4	1820.00	1	660.00	169.30	111.74	0.70
28	JSWEL	4	1200.00	2	600.00	1329.55	398.86	3.79
29	KWPCL	1	600.00	0	0.00	0.00	0.00	0.00
30	LANCO	2	600.00	2	600.00	552.37	165.71	3.15
31	MBPMPL	2	1200.00	0	0.00	0.00	0.00	0.00
32	MCCPL	1	300.00	0	0.00	0.00	0.00	0.00
33	RKMPPL	2	720.00	0	0.00	0.00	0.00	0.00
34	RattanIndia	5	1350.00	0	0.00	0.00	0.00	0.00
35	SCPL	2	100.00	1	50.00	1409.75	4.30	0.74
36	SPL	6	3960.00	0	0.00	0.00	0.00	0.00
37	STPL	1	270.00	0	0.00	0.00	0.00	0.00
38	SVPPL	1	63.00	1	63.00	127.47	8.03	1.46
39	TRNE	1	300.00	0	0.00	0.00	0.00	0.00

Sl. No.	Organization/ Utility	No. of Units	Capacity (MW)	Planned Maintenance				
				No. of Units	Capacity (MW)	Duration (Hrs.)	Energy Loss (MU)	Energy Loss as % of Max. Poss. gen. of Total Utility Capacity Reviewed
40	VESPL	1	35.00	0	0.00	0.00	0.00	0.00
41	VIP	2	600.00	2	600.00	537.33	161.20	3.07
	VVL	1	135.00	0	0.00	0.00	0.00	0.00
	WPCL	6	1740.00	1	135.00	745.47	100.64	0.66
SOUTHERN REGION								
42	CEPL	2	1200.00	1	600.00	1386.88	832.13	7.92
43	HNPC	2	1040.00	1	520.00	252.87	131.49	1.65
44	IBPIL	2	300.00	0	0.00	0.00	0.00	0.00
45	ITPCL	2	1200.00	0	0.00	0.00	0.00	0.00
45	JSWEL	4	860.00	2	430.00	1332.32	343.23	4.56
46	MEL	2	300.00	0	0.00	0.00	0.00	0.00
47	SEIL	4	2640.00	1	660.00	479.05	316.17	2.26
48	SEPL	4	600.00	1	150.00	141.47	21.22	0.40
49	ST-CMSECP	1	250.00	0	0.00	0.00	0.00	0.00
50	UPCL	2	1200.00	1	600.00	1186.90	712.14	6.77
EASTERN REGION								
51	ADHUNIK	2	540.00	2	540.00	1241.98	335.33	7.09
51	GMR ENERG	3	1050.00	2	700.00	1328.64	465.02	5.06
52	HEL	2	600.00	3	900.00	727.71	218.31	4.15
53	IBPIL	1	350.00	0	0.00	0.00	0.00	0.00
54	JITPL	2	1200.00	0	0.00	0.00	0.00	0.00
55	MPL	2	1050.00	1	525.00	708.60	372.02	4.04
56	SEL	4	1200.00	2	1200.00	7043.66	1070.56	5.32
	TATA PCL	3	360.00	3	360.00	2003.92	240.47	7.63
PVT IPP		**183**	**68319.00**	**65**	**23323.00**	**50657.94**	**14611.00**	**2.52**
ALL INDIA		**649**	**189946.5**	**292**	**84964.00**	**275463.58**	**68029.21**	**4.32**

DETAILS OF PLANNED MAINTAINANCE IN 2016-17									Annex-3.1
Name Of Station	**Unit No.**	**Cap (in MW)**	**Date Of Outage**	**Date Of Return**	**Outage hrs**	**Outage days**	**MU Loss**	**Energy loss as % of Pos. Gen.**	**MW_HR**
ANNUAL MAINTENANCE									
NORTHERN									
YAMUNA NAGAR TPS	2	300.00	27-Apr-2016	25-May-2016	679.62	28	203.89	7.76	203886.00
INDIRA GANDHI STPP	1	500.00	01-Apr-2016	07-May-2016	865.75	36	432.88	9.88	432875.00
MAHATMA GANDHI TPS	2	660.00	31-Jan-2017	31-Mar-2017	1420.40	59	937.46	16.21	937464.00
RAJPURA TPP	1	700.00	20-Nov-2016	22-Dec-2016	787.30	33	551.11	8.99	551110.00
RAJPURA TPP	2	700.00	01-Apr-2016	09-Apr-2016	214.90	9	150.43	2.45	150430.00
TALWANDI SABO TPP	2	660.00	09-May-2016	13-Jun-2016	825.67	34	544.94	9.43	544942.20
KOTA TPS	1	110.00	16-Jul-2016	09-Aug-2016	588.63	25	64.75	6.72	64749.30
KOTA TPS	4	210.00	01-Jul-2016	21-Jul-2016	483.33	20	101.50	5.52	101499.30
KOTA TPS	5	210.00	19-Apr-2016	10-May-2016	508.22	21	106.73	5.80	106726.20
KOTA TPS	7	195.00	08-May-2016	01-Jun-2016	559.60	23	109.12	6.39	109122.00
SURATGARH TPS	1	250.00	01-Apr-2016	29-Oct-2016	5066.97	211	1266.74	57.84	1266742.50
BARSINGSAR LIGNITE	1	125.00	01-Jul-2016	18-Aug-2016	1154.27	48	144.28	13.18	144283.75
BARSINGSAR LIGNITE	2	125.00	17-Apr-2016	22-Jun-2016	1580.37	66	197.55	18.04	197546.25
CHHABRA TPP	2	250.00	18-Jun-2016	14-Jul-2016	632.33	26	158.08	7.22	158082.50
CHHABRA TPP	3	250.00	03-Aug-2016	07-Sep-2016	841.53	35	210.38	9.61	210382.50
CHHABRA TPP	4	250.00	24-May-2016	17-Jun-2016	555.68	23	138.92	6.34	138920.00
ANPARA TPS	1	210.00	01-Apr-2016	30-Apr-2016	708.42	30	148.77	8.09	148768.20
ANPARA C TPS	1	600.00	20-Feb-2017	11-Mar-2017	465.13	19	279.08	5.31	279078.00
SINGRAULI STPS	1	200.00	30-Mar-2017	31-Mar-2017	47.37	2	9.47	0.54	9474.00
SINGRAULI STPS	4	200.00	07-Feb-2017	03-Mar-2017	593.92	25	118.78	6.78	118784.00
SINGRAULI STPS	5	200.00	19-Aug-2016	17-Sep-2016	679.37	28	135.87	7.76	135874.00
SINGRAULI STPS	6	500.00	01-Apr-2016	16-May-2016	1090.68	45	545.34	12.45	545340.00
SINGRAULI STPS	7	500.00	01-Apr-2016	28-Apr-2016	649.17	27	324.58	7.41	324585.00
RIHAND STPS	1	500.00	26-Jan-2017	02-Mar-2017	855.95	36	427.98	9.77	427975.00
RIHAND STPS	1	500.00	05-Jan-2017	07-Jan-2017	60.05	3	30.02	0.69	30025.00
RIHAND STPS	2	500.00	23-May-2016	01-Jul-2016	948.20	40	474.10	10.82	474100.00
RIHAND STPS	5	500.00	30-Sep-2016	28-Oct-2016	686.92	29	343.46	7.84	343460.00
UNCHAHAR TPS	2	210.00	18-Sep-2016	18-Oct-2016	710.60	30	149.23	8.11	149226.00
UNCHAHAR TPS	3	210.00	05-Apr-2016	07-May-2016	772.35	32	162.19	8.82	162193.50
DADRI (NCTPP)	5	490.00	01-Apr-2016	28-Apr-2016	669.03	28	327.82	7.64	327824.70
TANDA TPS	2	110.00	07-Nov-2016	16-Dec-2016	959.75	40	105.57	10.96	105572.50
TANDA TPS	4	110.00	15-Jul-2016	06-Aug-2016	542.82	23	59.71	6.20	59710.20
ROSA TPP Ph-I	1	300.00	17-Nov-2016	06-Dec-2016	459.03	19	137.71	5.24	137709.00
ROSA TPP Ph-I	4	300.00	10-Mar-2017	31-Mar-2017	519.00	22	155.70	5.92	155700.00
ROSA TPP Ph-I	4	300.00	19-Jul-2016	10-Aug-2016	521.98	22	156.59	5.96	156594.00
MAQSOODPUR TPS	1	45.00	22-Jan-2017	31-Mar-2017	1637.10	68	73.67	18.69	73669.50
MAQSOODPUR TPS	2	45.00	10-Jan-2017	30-Mar-2017	1892.80	79	85.18	21.61	85176.00
BARKHERA TPS	2	45.00	17-Jan-2017	31-Mar-2017	1755.88	73	79.01	20.04	79014.60
KUNDARKI TPS	1	45.00	22-Jan-2017	31-Mar-2017	1637.68	68	73.70	18.69	73695.60
KUNDARKI TPS	2	45.00	10-Jan-2017	30-Mar-2017	1893.22	79	85.19	21.61	85194.90
UTRAULA TPS	1	45.00	15-Jan-2017	30-Mar-2017	1791.13	75	80.60	20.45	80600.85
UTRAULA TPS	2	45.00	22-Jan-2017	31-Mar-2017	1640.48	68	73.82	18.73	73821.60
WESTERN									
UKAI TPS	3	200.00	01-Apr-2016	27-Apr-2016	644.80	27	128.96	7.36	128960.00
UKAI TPS	3	200.00	07-Dec-2016	17-Feb-2017	1740.08	73	348.02	19.86	348016.00
UKAI TPS	4	200.00	02-Dec-2016	31-Mar-2017	2860.18	119	572.04	32.65	572036.00
UKAI TPS	5	210.00	06-Dec-2016	29-Mar-2017	2694.95	112	565.94	30.76	565939.50
GANDHI NAGAR TPS	3	210.00	28-Jan-2017	22-Feb-2017	612.37	26	128.60	6.99	128597.70
WANAKBORI TPS	1	210.00	01-Dec-2016	11-Mar-2017	2422.02	101	508.62	27.65	508624.20
WANAKBORI TPS	4	210.00	07-Nov-2016	28-Nov-2016	513.00	21	107.73	5.86	107730.00
WANAKBORI TPS	6	210.00	07-Jan-2017	31-Mar-2017	1996.08	83	419.18	22.79	419176.80
KUTCH LIG. TPS	1	70.00	27-Sep-2016	21-Oct-2016	563.17	23	39.42	6.43	39421.90
KUTCH LIG. TPS	2	70.00	19-Feb-2017	19-Mar-2017	657.35	27	46.01	7.50	46014.50
KUTCH LIG. TPS	3	75.00	28-Oct-2016	30-Nov-2016	798.02	33	59.85	9.11	59851.50
KUTCH LIG. TPS	4	75.00	12-Sep-2016	27-Sep-2016	367.62	15	27.57	4.20	27571.50
AKRIMOTA LIG TPS	1	125.00	04-Aug-2016	14-Aug-2016	257.38	11	32.17	2.94	32172.50
AKRIMOTA LIG TPS	2	125.00	07-Nov-2016	18-Nov-2016	281.33	12	35.17	3.21	35166.25
SALAYA TPP	1	600.00	01-Apr-2016	01-Apr-2016	3.08	0	1.85	0.04	1848.00

DETAILS OF PLANNED MAINTAINANCE IN 2016-17									Annex-3.1
Name Of Station	**Unit No.**	**Cap (in MW)**	**Date Of Outage**	**Date Of Return**	**Outage hrs**	**Outage days**	**MU Loss**	**Energy loss as % of Pos. Gen.**	**MW_HR**
SALAYA TPP	1	600.00	01-Mar-2017	31-Mar-2017	738.07	31	442.84	8.43	442842.00
SALAYA TPP	2	600.00	16-Mar-2017	31-Mar-2017	369.25	15	221.55	4.22	221550.00
SALAYA TPP	2	600.00	01-Apr-2016	17-Apr-2016	405.85	17	243.51	4.63	243510.00
SABARMATI (D-F STATIONS)	1	120.00	11-Nov-2016	01-Dec-2016	494.15	21	59.30	5.64	59298.00
SABARMATI (D-F STATIONS)	2	121.00	03-Dec-2016	11-Dec-2016	204.63	9	24.76	2.34	24760.23
SABARMATI (D-F STATIONS)	3	121.00	31-Oct-2016	09-Nov-2016	223.58	9	27.05	2.55	27053.18
SURAT LIG. TPS	2	125.00	27-Aug-2016	12-Sep-2016	391.82	16	48.98	4.47	48977.50
SURAT LIG. TPS	4	125.00	11-Sep-2016	02-Oct-2016	524.08	22	65.51	5.98	65510.00
MUNDRA TPS	9	660.00	26-Nov-2016	22-Dec-2016	628.95	26	415.11	7.18	415107.00
MUNDRA UMTPP	5	800.00	08-Apr-2016	11-Jul-2016	2255.05	94	1804.04	25.74	1804040.00
SATPURA TPS	6	200.00	03-May-2016	31-Jul-2016	2122.00	88	424.40	24.22	424400.00
SATPURA TPS	7	210.00	04-Aug-2016	26-Aug-2016	529.42	22	111.18	6.04	111178.20
SATPURA TPS	10	250.00	20-Aug-2016	28-Sep-2016	957.83	40	239.46	10.93	239457.50
SHREE SINGAJI TPP	1	600.00	02-Aug-2016	04-Sep-2016	812.65	34	487.59	9.28	487590.00
SHREE SINGAJI TPP	2	600.00	18-Jul-2016	14-Sep-2016	1408.40	59	845.04	16.08	845040.00
KORBA-II	1	50.00	07-Feb-2017	27-Mar-2017	1141.85	48	57.09	13.03	57092.50
KORBA-II	2	50.00	22-May-2016	27-Jun-2016	847.98	35	42.40	9.68	42399.00
KORBA-II	3	50.00	09-Dec-2016	31-Mar-2017	2688.65	112	134.43	30.69	134432.50
KORBA-III	1	120.00	22-Mar-2017	31-Mar-2017	218.42	9	26.21	2.49	26210.40
KORBA-III	2	120.00	08-Jan-2017	05-Feb-2017	667.17	28	80.06	7.62	80060.40
DSPM TPS	2	250.00	08-Mar-2017	31-Mar-2017	552.17	23	138.04	6.30	138042.50
KORBA-WEST TPS	5	500.00	15-Aug-2016	22-Sep-2016	902.87	38	451.44	10.31	451435.00
SANJAY GANDHI TPS	1	210.00	13-Jun-2016	26-Sep-2016	2514.98	105	528.15	28.71	528145.80
KORBA STPS	3	200.00	14-Oct-2016	06-Nov-2016	574.83	24	114.97	6.56	114966.00
KORBA STPS	4	500.00	07-Jul-2016	03-Aug-2016	651.92	27	325.96	7.44	325960.00
KORBA STPS	6	500.00	01-Dec-2016	28-Dec-2016	650.57	27	325.28	7.43	325285.00
SIPAT STPS	2	660.00	27-Jun-2016	28-Jul-2016	754.17	31	497.75	8.61	497752.20
SIPAT STPS	4	500.00	06-Aug-2016	30-Aug-2016	578.95	24	289.48	6.61	289475.00
VINDHYACHAL STPS	1	210.00	29-Apr-2016	24-May-2016	605.75	25	127.21	6.91	127207.50
VINDHYACHAL STPS	2	210.00	01-Apr-2016	06-May-2016	846.37	35	177.74	9.66	177737.70
VINDHYACHAL STPS	3	210.00	19-Sep-2016	22-Sep-2016	77.68	3	16.31	0.89	16312.80
VINDHYACHAL STPS	8	500.00	03-Jul-2016	05-Sep-2016	1542.10	64	771.05	17.60	771050.00
VINDHYACHAL STPS	9	500.00	18-Sep-2016	19-Oct-2016	760.80	32	380.40	8.68	380400.00
VINDHYACHAL STPS	13	500.00	07-Feb-2017	03-Mar-2017	581.25	24	290.62	6.64	290625.00
OP JINDAL TPS	1	250.00	01-Apr-2016	04-Apr-2016	91.82	4	22.96	1.05	22955.00
PATHADI TPP	1	300.00	20-Aug-2016	09-Sep-2016	484.50	20	145.35	5.53	145350.00
PATHADI TPP	1	300.00	10-Oct-2016	13-Oct-2016	67.87	3	20.36	0.77	20361.00
KASAIPALLI TPP	1	135.00	13-Mar-2017	31-Mar-2017	434.35	18	58.64	4.96	58637.25
KASAIPALLI TPP	1	135.00	01-Apr-2016	10-Apr-2016	233.58	10	31.53	2.67	31533.30
BHILAI TPS	1	250.00	01-Apr-2016	06-Apr-2016	138.43	6	34.61	1.58	34607.50
BARADARHA TPS	1	600.00	21-Aug-2016	31-Aug-2016	252.87	11	151.72	2.89	151722.00
KORADI TPS	8	660.00	12-Dec-2016	26-Jan-2017	1056.67	44	697.40	12.06	697402.20
KHAPARKHEDA TPS	5	500.00	01-Apr-2016	12-Apr-2016	284.67	12	142.34	3.25	142335.00
PARAS TPS	3	250.00	26-Oct-2016	16-Mar-2017	3406.48	142	851.62	38.89	851620.00
BHUSAWAL TPS	4	500.00	19-Jul-2016	13-Aug-2016	607.02	25	303.51	6.93	303510.00
WARDHA WARORA TPP	4	135.00	03-May-2016	03-Jun-2016	745.47	31	100.64	8.51	100638.45
BUTIBORI TPP	1	300.00	18-Sep-2016	18-Sep-2016	3.00	0	0.90	0.03	900.00
BUTIBORI TPP	2	300.00	15-Jul-2016	06-Aug-2016	534.33	22	160.30	6.10	160299.00
SOUTHERN									
KOTHAGUDEM TPS	3	60.00	25-Sep-2016	13-Oct-2016	422.25	18	25.34	4.82	25335.00
KOTHAGUDEM TPS	4	60.00	03-Nov-2016	17-Nov-2016	329.33	14	19.76	3.76	19759.80
KOTHAGUDEM TPS	5	120.00	28-Nov-2016	13-Jan-2017	1087.35	45	130.48	12.41	130482.00
KOTHAGUDEM TPS	6	120.00	11-Nov-2016	27-Nov-2016	396.63	17	47.60	4.53	47595.60
KOTHAGUDEM TPS	7	120.00	20-Nov-2016	10-Dec-2016	489.60	20	58.75	5.59	58752.00
KOTHAGUDEM TPS	8	120.00	20-Nov-2016	12-Dec-2016	528.57	22	63.43	6.03	63428.40
Dr. N.TATA RAO TPS	1	210.00	22-Jul-2016	08-Aug-2016	409.07	17	85.90	4.67	85904.70
Dr. N.TATA RAO TPS	2	210.00	03-Jun-2016	24-Jun-2016	500.67	21	105.14	5.72	105140.70
Dr. N.TATA RAO TPS	3	210.00	16-Sep-2016	03-Oct-2016	409.95	17	86.09	4.68	86089.50

DETAILS OF PLANNED MAINTAINANCE IN 2016-17									Annex-3.1
Name Of Station	**Unit No.**	**Cap (in MW)**	**Date Of Outage**	**Date Of Return**	**Outage hrs**	**Outage days**	**MU Loss**	**Energy loss as % of Pos. Gen.**	**MW_HR**
Dr. N.TATA RAO TPS	6	210.00	30-Aug-2016	17-Sep-2016	438.78	18	92.14	5.01	92143.80
DAMODARAM SANJEEVAIAH TPS	1	800.00	30-Jun-2016	08-Aug-2016	945.37	39	756.30	10.79	756296.00
DAMODARAM SANJEEVAIAH TPS	2	800.00	08-Aug-2016	30-Aug-2016	521.57	22	417.26	5.95	417256.00
RAMAGUNDEM - B TPS	1	62.50	02-Nov-2016	21-Nov-2016	452.18	19	28.26	5.16	28261.25
RAYALASEEMA TPS	4	210.00	04-Jul-2016	17-Jul-2016	306.08	13	64.28	3.49	64276.80
SIMHAPURI TPS	1	150.00	01-Apr-2016	06-Apr-2016	141.47	6	21.22	1.61	21220.50
PAINAMPURAM TPP	1	660.00	24-Dec-2016	13-Jan-2017	479.05	20	316.17	5.47	316173.00
RAMAGUNDEM STPS	5	500.00	11-Jun-2016	16-Jul-2016	860.62	36	430.31	9.82	430310.00
RAMAGUNDEM STPS	6	500.00	22-Jul-2016	22-Aug-2016	766.97	32	383.48	8.76	383485.00
RAMAGUNDEM STPS	7	500.00	20-Oct-2016	23-Nov-2016	833.72	35	416.86	9.52	416860.00
SIMHADRI	1	500.00	15-Nov-2016	14-Dec-2016	696.70	29	348.35	7.95	348350.00
SIMHADRI	4	500.00	20-Dec-2016	14-Jan-2017	602.33	25	301.16	6.88	301165.00
RAICHUR TPS	1	210.00	13-Feb-2017	08-Mar-2017	546.50	23	114.76	6.24	114765.00
RAICHUR TPS	2	210.00	18-Jan-2017	12-Feb-2017	597.25	25	125.42	6.82	125422.50
RAICHUR TPS	5	210.00	29-Jun-2016	10-Aug-2016	1007.73	42	211.62	11.50	211623.30
RAICHUR TPS	7	210.00	27-Sep-2016	17-Oct-2016	489.33	20	102.76	5.59	102759.30
TORANGALLU TPS(SBU-I)	1	130.00	31-May-2016	14-Jun-2016	332.17	14	43.18	3.79	43182.10
UDUPI TPP	2	600.00	20-Jul-2016	07-Sep-2016	1186.90	49	712.14	13.55	712140.00
TUTICORIN TPS	1	210.00	19-Jun-2016	14-Jul-2016	608.62	25	127.81	6.95	127810.20
TUTICORIN TPS	3	210.00	20-Jun-2016	26-Jul-2016	872.08	36	183.14	9.96	183136.80
TUTICORIN TPS	5	210.00	16-Oct-2016	21-Dec-2016	1573.92	66	330.52	17.97	330523.20
METTUR TPS	1	210.00	05-Jun-2016	20-Jun-2016	371.87	15	78.09	4.25	78092.70
METTUR TPS	3	210.00	07-Aug-2016	21-Aug-2016	347.32	14	72.94	3.96	72937.20
METTUR TPS - II	1	600.00	26-May-2016	11-Jul-2016	1121.47	47	672.88	12.80	672882.00
NORTH CHENNAI TPS	1	210.00	21-Aug-2016	12-Sep-2016	515.00	21	108.15	5.88	108150.00
NORTH CHENNAI TPS	3	210.00	31-Jul-2016	16-Aug-2016	376.28	16	79.02	4.30	79018.80
NORTH CHENNAI TPS	4	600.00	10-Jul-2016	20-Aug-2016	984.02	41	590.41	11.23	590412.00
NORTH CHENNAI TPS	5	600.00	27-Aug-2016	30-Sep-2016	805.83	34	483.50	9.20	483498.00
MUTHIARA TPP	2	600.00	29-May-2016	25-Jul-2016	1386.88	58	832.13	15.83	832128.00
NEYVELI TPS- I	1	50.00	17-Aug-2016	29-Aug-2016	302.00	13	15.10	3.45	15100.00
NEYVELI TPS- I	2	50.00	15-Jun-2016	18-Jul-2016	774.20	32	38.71	8.84	38710.00
NEYVELI TPS- I	3	50.00	31-May-2016	20-Jun-2016	501.58	21	25.08	5.73	25079.00
NEYVELI TPS- I	4	50.00	19-Jul-2016	09-Aug-2016	514.50	21	25.72	5.87	25725.00
NEYVELI TPS- I	5	50.00	26-Nov-2016	10-Dec-2016	346.62	14	17.33	3.96	17331.00
NEYVELI TPS- I	6	50.00	21-Dec-2016	29-Dec-2016	180.78	8	9.04	2.06	9039.00
NEYVELI TPS- I	7	100.00	03-Nov-2016	01-Dec-2016	687.70	29	68.77	7.85	68770.00
NEYVELI TPS- I	8	100.00	03-Sep-2016	11-Oct-2016	919.10	38	91.91	10.49	91910.00
NEYVELI TPS- I	9	100.00	08-Dec-2016	29-Dec-2016	505.23	21	50.52	5.77	50523.00
NEYVELI TPS-II	1	210.00	05-Oct-2016	22-Oct-2016	429.92	18	90.28	4.91	90283.20
NEYVELI TPS-II	2	210.00	13-Jul-2016	30-Jul-2016	401.53	17	84.32	4.58	84321.30
NEYVELI TPS-II	3	210.00	24-Nov-2016	16-Dec-2016	530.25	22	111.35	6.05	111352.50
NEYVELI TPS-II	4	210.00	16-Dec-2016	12-Jan-2017	626.05	26	131.47	7.15	131470.50
NEYVELI TPS-II	5	210.00	04-Aug-2016	20-Aug-2016	362.43	15	76.11	4.14	76110.30
NEYVELI TPS-II	6	210.00	01-Jun-2016	09-Jul-2016	891.65	37	187.25	10.18	187246.50
NEYVELI TPS-II	7	210.00	23-Oct-2016	23-Nov-2016	725.20	30	152.29	8.28	152292.00
NEYVELI (EXT) TPS	1	210.00	25-Apr-2016	08-May-2016	311.00	13	65.31	3.55	65310.00
NEYVELI (EXT) TPS	2	210.00	05-Dec-2016	19-Dec-2016	341.73	14	71.76	3.90	71763.30
VALLUR TPP	1	500.00	05-Oct-2016	04-Nov-2016	711.18	30	355.59	8.12	355590.00
VALLUR TPP	3	500.00	20-May-2016	24-Jul-2016	1565.40	65	782.70	17.87	782700.00
TUTICORIN (JV) TPP	1	500.00	01-Jun-2016	19-Jun-2016	409.87	17	204.94	4.68	204935.00
TUTICORIN (JV) TPP	2	500.00	18-Jul-2016	04-Aug-2016	402.92	17	201.46	4.60	201460.00
TUTICORIN (JV) TPP	2	500.00	18-Jul-2016	18-Jul-2016	3.37	0	1.68	0.04	1685.00
EASTERN									
MUZAFFARPUR TPS	1	110.00	28-Aug-2016	05-Oct-2016	931.57	39	102.47	10.63	102472.70
BARH II	4	660.00	26-Aug-2016	27-Sep-2016	761.27	32	502.44	8.69	502438.20
KAHALGAON TPS	3	210.00	21-Aug-2016	25-Sep-2016	844.43	35	177.33	9.64	177330.30
KAHALGAON TPS	4	210.00	01-Apr-2016	12-Apr-2016	273.07	11	57.34	3.12	57344.70
KAHALGAON TPS	5	500.00	05-Jul-2016	30-Jul-2016	611.48	25	305.74	6.98	305740.00
KAHALGAON TPS	7	500.00	03-Jan-2017	10-Feb-2017	910.95	38	455.48	10.40	455475.00

DETAILS OF PLANNED MAINTAINANCE IN 2016-17									Annex-3.1
Name Of Station	**Unit No.**	**Cap (in MW)**	**Date Of Outage**	**Date Of Return**	**Outage hrs**	**Outage days**	**MU Loss**	**Energy loss as % of Pos. Gen.**	**MW_HR**
JOJOBERA TPS	3	120.00	08-Apr-2016	10-May-2016	760.73	32	91.29	8.68	91287.60
JOJOBERA TPS	4	120.00	06-Jan-2017	06-Feb-2017	740.77	31	88.89	8.46	88892.40
MAHADEV PRASAD STPP	1	270.00	09-Oct-2016	05-Nov-2016	650.83	27	175.72	7.43	175724.10
MAHADEV PRASAD STPP	2	270.00	27-Jan-2017	20-Feb-2017	591.15	25	159.61	6.75	159610.50
MEJIA TPS	7	500.00	18-Oct-2016	18-Oct-2016	3.03	0	1.52	0.03	1515.00
DURGAPUR STEEL TPS	1	500.00	30-Jul-2016	31-Aug-2016	789.03	33	394.52	9.01	394515.00
TALCHER (OLD) TPS	1	60.00	19-Oct-2016	02-Nov-2016	338.98	14	20.34	3.87	20338.80
TALCHER (OLD) TPS	2	60.00	01-Apr-2016	15-Apr-2016	359.10	15	21.55	4.10	21546.00
TALCHER (OLD) TPS	3	60.00	18-Sep-2016	02-Oct-2016	349.93	15	21.00	3.99	20995.80
TALCHER (OLD) TPS	4	60.00	05-Jun-2016	15-Jul-2016	979.08	41	58.74	11.18	58744.80
TALCHER (OLD) TPS	5	110.00	27-Jul-2016	13-Aug-2016	426.55	18	46.92	4.87	46920.50
TALCHER (OLD) TPS	6	110.00	04-Dec-2016	08-Jan-2017	845.75	35	93.03	9.65	93032.50
IB VALLEY TPS	2	210.00	12-May-2016	02-Jun-2016	526.40	22	110.54	6.01	110544.00
TALCHER STPS	2	500.00	21-Nov-2016	26-Dec-2016	855.70	36	427.85	9.77	427850.00
TALCHER STPS	5	500.00	20-Oct-2016	17-Nov-2016	689.77	29	344.88	7.87	344885.00
TALCHER STPS	6	500.00	10-Aug-2016	09-Oct-2016	1417.72	59	708.86	16.18	708860.00
STERLITE TPP	4	600.00	24-Aug-2016	31-Mar-2017	5260.38	219	0.59	0.01	3156228.00
KAMALANGA TPS	1	350.00	10-Jul-2016	05-Aug-2016	605.62	25	211.97	6.91	211967.00
KAMALANGA TPS	3	350.00	07-Sep-2016	07-Oct-2016	723.02	30	253.06	8.25	253057.00
BAKRESWAR TPS	2	210.00	06-Sep-2016	02-Oct-2016	641.83	27	134.78	7.33	134784.30
SOUTHERN REPL. TPS	2	67.50	01-Dec-2016	21-Dec-2016	492.23	21	33.23	5.62	33225.52
BUDGE BUDGE TPS	2	250.00	01-Feb-2017	16-Feb-2017	351.68	15	87.92	4.01	87920.00
BUDGE BUDGE TPS	3	250.00	22-Jan-2017	30-Jan-2017	209.87	9	52.47	2.40	52467.50
HALDIA TPP	1	300.00	25-Dec-2016	07-Jan-2017	318.30	13	95.49	3.63	95490.00
HALDIA TPP	2	300.00	12-Jan-2017	27-Jan-2017	366.08	15	109.82	4.18	109824.00
FARAKKA STPS	1	200.00	14-Mar-2017	31-Mar-2017	409.98	17	82.00	4.68	81996.00
FARAKKA STPS	2	200.00	02-Apr-2016	27-Apr-2016	623.98	26	124.80	7.12	124796.00
FARAKKA STPS	5	500.00	29-Mar-2017	31-Mar-2017	70.30	3	35.15	0.80	35150.00
Sub Total	**200**	**57997.00**			**156845.50**	**6536.00**	**43452.63**	**8.56**	**46608268.58**
BOILER INSPECTION/ RE-CERTIFICATION									
NORTHERN									
OBRA TPS	9	200.00	10-Feb-2017	11-Feb-2017	29.25	1	5.85	0.33	5850.00
PANKI TPS	4	105.00	06-Oct-2016	07-Oct-2016	25.15	1	2.64	0.29	2640.75
PARICHHA TPS	5	250.00	19-Oct-2016	24-Oct-2016	98.13	4	24.53	1.12	24532.50
ANPARA TPS	3	210.00	15-Jul-2016	16-Jul-2016	13.58	1	2.85	0.16	2851.80
ANPARA TPS	4	500.00	11-Aug-2016	13-Aug-2016	71.80	3	35.90	0.82	35900.00
RIHAND STPS	1	500.00	20-Jul-2016	29-Jul-2016	223.80	9	111.90	2.55	111900.00
DADRI (NCTPP)	6	490.00	25-Mar-2017	31-Mar-2017	167.98	7	82.31	1.92	82310.20
TANDA TPS	2	110.00	26-Aug-2016	30-Aug-2016	92.97	4	10.23	1.06	10226.70
WESTERN									
MUNDRA UMTPP	3	800.00	05-Nov-2016	11-Nov-2016	143.78	6	115.02	1.64	115024.00
SEIONI TPP	1	600.00	13-May-2016	20-May-2016	181.18	8	108.71	2.25	108708.00
KORBA STPS	2	200.00	01-Jan-2017	03-Jan-2017	67.47	3	13.49	0.77	13494.00
KORBA STPS	5	500.00	26-Sep-2016	28-Sep-2016	46.62	2	23.31	0.53	23310.00
VINDHYACHAL STPS	5	210.00	27-Mar-2017	31-Mar-2017	96.90	4	20.35	1.11	20349.00
VINDHYACHAL STPS	11	500.00	02-Jul-2016	05-Jul-2016	81.10	3	40.55	0.93	40550.00
NASIK TPS	3	210.00	15-Jun-2016	18-Jun-2016	67.17	3	14.11	0.77	14105.70
NASIK TPS	4	210.00	18-May-2016	20-May-2016	39.03	2	8.20	0.45	8196.30
NASIK TPS	5	210.00	30-Jun-2016	01-Jul-2016	16.33	1	3.43	0.19	3429.30
TROMBAY TPS	5	500.00	03-Jan-2017	04-Feb-2017	747.18	31	373.59	8.53	373590.00
TROMBAY TPS	8	250.00	03-Dec-2016	21-Dec-2016	417.38	17	104.34	4.76	104345.00
GMR WARORA TPS	1	300.00	03-Feb-2017	08-Feb-2017	135.83	6	40.75	1.55	40749.00
SOUTHERN									
VALLUR TPP	2	500.00	01-Feb-2017	06-Feb-2017	99.90	4	49.95	1.14	49950.00
EASTERN									
MUZAFFARPUR TPS	1	110.00	15-Jun-2016	22-Jun-2016	185.55	8	20.41	2.12	20410.50
MEJIA TPS	5	250.00	20-Dec-2016	28-Dec-2016	198.68	8	49.67	2.27	49670.00
DURGAPUR STEEL TPS	2	500.00	30-Jul-2016	07-Aug-2016	202.47	8	101.24	2.31	101235.00
MAITHON RB TPP	2	525.00	26-Aug-2016	24-Sep-2016	708.60	30	372.02	8.09	372015.00
KOLAGHAT TPS	3	210.00	22-Jul-2016	31-Jul-2016	235.83	10	49.52	2.69	49524.30

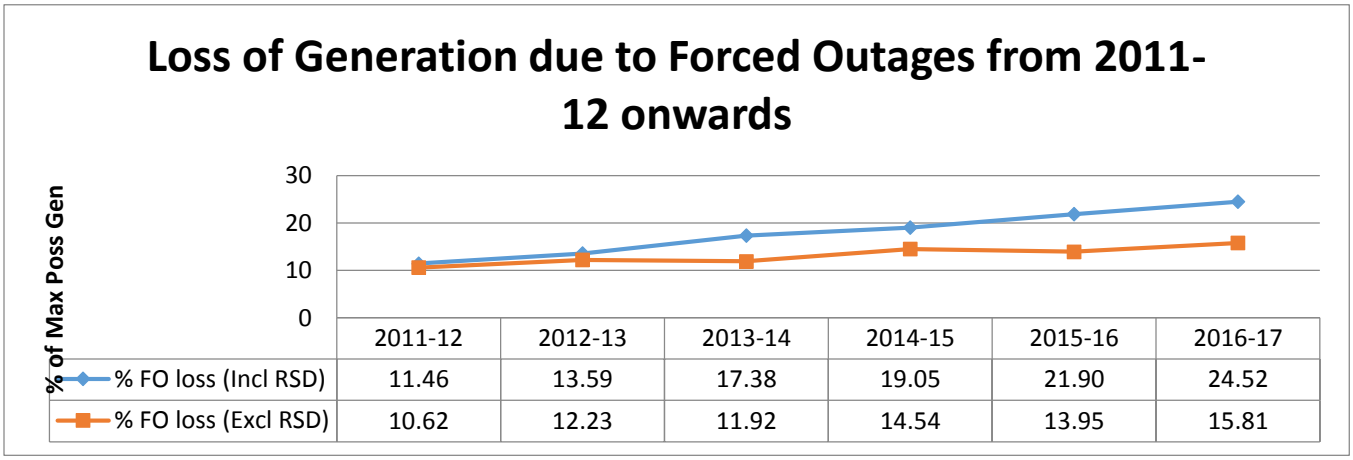
DETAILS OF PLANNED MAINTAINANCE IN 2016-17									Annex-3.1
Name Of Station	**Unit No.**	**Cap (in MW)**	**Date Of Outage**	**Date Of Return**	**Outage hrs**	**Outage days**	**MU Loss**	**Energy loss as % of Pos. Gen.**	**MW_HR**
BAKRESWAR TPS	3	210.00	30-May-2016	02-Jun-2016	64.58	3	13.56	0.74	13561.80
BUDGE BUDGE TPS	2	250.00	11-Dec-2016	11-Dec-2016	15.85	1	3.96	0.18	3962.50
HALDIA TPP	1	300.00	12-Nov-2016	13-Nov-2016	43.33	2	13.00	0.49	12999.00
Sub Total	**29**	**9710.00**			**4517.42**	**190.00**	**1815.39**	**2.15**	**1815390.35**
CAPITAL MAINTENANCE									
NORTHERN									
RAJIV GANDHI TPS	2	600.00	04-Feb-2017	27-Mar-2017	1206.07	50	723.64	13.77	723642.00
ROPAR TPS	5	210.00	01-Oct-2016	10-Nov-2016	974.58	41	204.66	11.13	204661.80
ROPAR TPS	6	210.00	06-Nov-2016	25-Dec-2016	1186.43	49	249.15	13.54	249150.30
WESTERN									
GANDHI NAGAR TPS	3	210.00	03-Apr-2016	15-May-2016	1026.67	43	215.60	11.72	215600.70
SURAT LIG. TPS	1	125.00	14-Jul-2016	18-Aug-2016	859.15	36	107.39	9.81	107393.75
MUNDRA TPS	2	330.00	29-Jul-2016	31-Aug-2016	799.80	33	263.93	9.13	263934.00
MUNDRA TPS	5	660.00	04-Apr-2016	20-May-2016	1118.32	47	738.09	12.77	738091.20
KORBA-WEST TPS	3	210.00	15-Nov-2016	19-Dec-2016	802.93	33	168.62	9.17	168615.30
AMARKANTAK EXT TPS	3	210.00	15-Jul-2016	24-Aug-2016	961.32	40	201.88	10.97	201877.20
SANJAY GANDHI TPS	2	210.00	01-Aug-2016	24-Aug-2016	561.23	23	117.86	6.41	117858.30
OP JINDAL TPS	3	250.00	06-Nov-2016	11-Dec-2016	852.62	36	213.16	9.73	213155.00
NASIK TPS	4	210.00	19-Jun-2016	28-Jul-2016	945.67	39	198.59	10.80	198590.70
CHANDRAPUR(MAHARASHTRA) STPS	7	500.00	25-Jan-2017	31-Mar-2017	1564.47	65	782.24	17.86	782235.00
JSW RATNAGIRI TPP	3	300.00	21-Jun-2016	29-Jul-2016	917.58	38	275.27	10.47	275274.00
SOUTHERN									
KOTHAGUDEM TPS	1	60.00	11-Dec-2016	22-Jan-2017	986.15	41	59.17	11.26	59169.00
KOTHAGUDEM TPS	2	60.00	10-Jan-2017	18-Feb-2017	939.77	39	56.39	10.73	56386.20
KOTHAGUDEM TPS (NEW)	2	250.00	26-Jul-2016	10-Sep-2016	1103.33	46	275.83	12.60	275832.50
Dr. N.TATA RAO TPS	4	210.00	02-Jun-2016	14-Aug-2016	1760.27	73	369.66	20.09	369656.70
TORANGALLU TPS(SBU-II)	4	300.00	08-Jun-2016	19-Jul-2016	1000.15	42	300.04	11.42	300045.00
TUTICORIN TPS	2	210.00	09-Feb-2017	27-Mar-2017	1109.80	46	233.06	12.67	233058.00
METTUR TPS	2	210.00	02-Dec-2016	16-Jan-2017	1080.25	45	226.85	12.33	226852.50
NORTH CHENNAI TPS	2	210.00	23-Nov-2016	07-Feb-2017	1808.88	75	379.86	20.65	379864.80
EASTERN									
TENUGHAT TPS	1	210.00	22-Oct-2016	23-Oct-2016	24.23	1	5.09	0.28	5088.30
TENUGHAT TPS	1	210.00	09-Jul-2016	22-Oct-2016	2525.00	105	530.25	28.82	530250.00
JOJOBERA TPS	2	120.00	11-Mar-2017	31-Mar-2017	502.42	21	60.29	5.74	60290.40
STERLITE TPP	2	600.00	23-Jun-2016	05-Sep-2016	1783.28	74	1069.97	20.36	1069968.00
BANDEL TPS	1	60.00	16-Oct-2016	29-Dec-2016	1783.17	74	106.99	20.36	106990.20
SANTALDIH TPS	6	250.00	21-Jul-2016	04-Sep-2016	1077.98	45	269.50	12.31	269495.00
BAKRESWAR TPS	3	210.00	01-Nov-2016	21-Dec-2016	1196.07	50	251.17	13.65	251174.70
Sub Total	**29**	**7405.00**			**32457.59**	**1350.00**	**8654.20**	**13.34**	**8654200.55**
OTHER PLANNED MAINTENANCE INCLUDING PG TEST OF NEW UNITS AND RLA STUDIES ETC.									
WESTERN									
SHREE SINGAJI TPP	2	600.00	01-Mar-2017	04-Mar-2017	70.17	3	42.10	0.80	42102.00
NIGRI TPP	2	660.00	07-Jul-2016	14-Jul-2016	169.30	7	111.74	1.93	111738.00
VINDHYACHAL STPS	13	500.00	21-Nov-2016	24-Nov-2016	61.43	3	30.72	0.70	30715.00
MAUDA TPS	2	500.00	16-Aug-2016	24-Aug-2016	215.98	9	107.99	2.47	107990.00
SOUTHERN									
VIZAG TPP	1	520.00	12-Mar-2017	22-Mar-2017	252.87	11	131.49	2.89	131492.40
ENNORE TPS	3	110.00	01-Sep-2016	03-Sep-2016	49.77	2	5.47	0.57	5474.70
EASTERN									
KODARMA TPP	2	500.00	31-Dec-2016	05-Jan-2017	126.08	5	63.04	1.44	63040.00
RAGHUNATHPUR TPP	1	600.00	06-Dec-2016	11-Jan-2017	863.95	36	518.37	9.86	518370.00
RAGHUNATHPUR TPP	2	600.00	01-Apr-2016	24-Aug-2016	3499.42	146	2099.65	39.95	2099652.00
Sub Total	**9**	**4590.00**			**5308.97**	**222.00**	**3110.57**	**7.74**	**3110574.10**
OTHER PLANNED MAINTENANCE WORKS									
NORTHERN									
GIRAL TPS	1	125.00	01-Apr-2016	31-Mar-2017	8760.00	365	1095.00	100.00	1095000.00
GIRAL TPS	2	125.00	01-Apr-2016	31-Mar-2017	8760.00	365	1095.00	100.00	1095000.00

DETAILS OF PLANNED MAINTAINANCE IN 2016-17									Annex-3.1
Name Of Station	**Unit No.**	**Cap (in MW)**	**Date Of Outage**	**Date Of Return**	**Outage hrs**	**Outage days**	**MU Loss**	**Energy loss as % of Pos. Gen.**	**MW_HR**
CHHABRA TPP	1	250.00	03-Sep-2016	06-Sep-2016	72.47	3	18.12	0.83	18117.50
WESTERN									
MAHAN TPP	1	600.00	14-May-2016	16-May-2016	71.55	3	42.93	0.82	42930.00
RATIJA TPS	2	50.00	01-Feb-2017	31-Mar-2017	1409.75	59	4.30	2.96	70487.50
SVPL TPP	1	63.00	17-Jan-2017	22-Jan-2017	127.47	5	8.03	1.46	8030.61
JSW RATNAGIRI TPP	2	300.00	01-Jun-2016	18-Jun-2016	411.97	17	123.59	4.70	123591.00
SOUTHERN									
ENNORE TPS	4	110.00	16-Nov-2016	31-Mar-2017	3243.48	135	356.78	37.03	356782.80
EASTERN									
BARAUNI TPS	7	105.00	12-Feb-2017	05-Mar-2017	521.42	22	54.75	5.95	54749.10
CHANDRAPURA(DVC) TPS	1	130.00	13-Jan-2017	17-Jan-2017	119.75	5	0.00	0.00	15567.50
CHANDRAPURA(DVC) TPS	2	130.00	12-Mar-2017	20-Mar-2017	193.92	8	25.21	2.21	25209.60
CHANDRAPURA(DVC) TPS	3	130.00	14-Jun-2016	03-Aug-2016	1206.38	50	156.83	13.77	156829.40
BOKARO TPS `A` EXP	1	500.00	13-Mar-2017	16-Mar-2017	67.60	3	33.80	9.09	33800.00
MEJIA TPS	8	500.00	02-Sep-2016	03-Nov-2016	1477.02	62	738.51	16.86	738510.00
KOLAGHAT TPS	1	210.00	24-Oct-2016	28-Oct-2016	112.55	5	23.64	1.28	23635.50
Sub Total	**15**	**3328.00**			**26555.33**	**1107.00**	**3776.49**	**15.31**	**3858240.51**
R AND M WORKS									
NORTHERN									
OBRA TPS	7	94.00	01-Apr-2016	31-Mar-2017	8760.00	365	823.44	100.00	823440.00
OBRA TPS	10	200.00	01-Apr-2016	20-Apr-2016	459.05	19	91.81	5.24	91810.00
OBRA TPS	11	200.00	01-Apr-2016	16-Jan-2017	6972.63	291	1394.53	79.60	1394526.00
OBRA TPS	12	200.00	01-Oct-2016	31-Mar-2017	4353.98	181	870.80	49.70	870796.00
PARICHHA TPS	1	110.00	07-Jul-2016	31-Mar-2017	6414.02	267	705.54	73.22	705542.20
SINGRAULI STPS	6	500.00	28-Sep-2016	30-Sep-2016	37.60	2	18.80	0.43	18800.00
WESTERN									
KORADI TPS	6	210.00	01-Apr-2016	31-Mar-2017	8760.00	365	1839.60	100.00	1839600.00
EASTERN									
BARAUNI TPS	6	105.00	01-Apr-2016	31-Mar-2017	8760.00	365	919.80	100.00	919800.00
BARAUNI TPS	7	105.00	01-Apr-2016	04-Nov-2016	5231.47	218	549.30	59.72	549304.35
KAHALGAON TPS	2	210.00	02-Jul-2016	03-Jul-2016	30.02	1	6.30	0.34	6304.20
Sub Total	**10**	**1934.00**			**49778.77**	**2074.00**	**7219.92**	**42.62**	**7219922.75**
Total	**292**	**84964.00**			**275463.58**	**11479.00**	**68029.21**	**4.32**	71266596.84

SECTION-4
FORCED OUTAGES

4.1 Based on the analysis carried out for 649 thermal power generating units, it is seen that forced outages of generating units were due to various problems in generating equipment, auxiliary systems and also due to external reasons viz., shortage of fuel, system constraints, lower demand/ schedules etc.

During the financial year 2016-17, the loss of generation on account of forced outages of units increased to 386.18 BU from 312.42 BU in 2015-16. Forced outages loss increased to 24.52% during 2016-17 from 21.90% during 2015-16.The All India energy loss due to forced outage of units considered in the review as the percentage of their maximum possible generation[5] calculated on the basis of rated capacity of the units from year 2011-12 onwards are depicted below:



	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
% FO loss (Incl RSD)	11.46	13.59	17.38	19.05	21.90	24.52
% FO loss (Excl RSD)	10.62	12.23	11.92	14.54	13.95	15.81

As may be seen from the chart, the losses on account of RSD (Reserve Shutdown - when units remain out of operation due to lack of schedule/dispatch) have increased constantly and significantly. The FO loss due to RSD was less than 1 % in 2011-12 and increased to around 9 % in 2016-17.

4.2 Forced outages due to the main equipment faults accounted for **24.20 %** of the total forced outages loss as per details given in the table below:

[5] calculated on the basis of rated capacity of the units

Sl. No.	Cause of Outage		Percentage of total forced outage losses including losses due to reserve shut down				
		2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
I.	**Main Equipment**						
a)	Boiler	29.87	29.04	19.91	19.68	14.96	**17.25**
b)	Turbine	15.84	12.49	10.33	6.9	4.33	**4.55**
c)	Generator	8.65	4.38	5.33	9.99	4.17	**2.39**
	Sub Total	**54.37**	**45.91**	**35.57**	**36.57**	**23.45**	**24.20**
II.	**Auxiliaries**						
a)	Boiler Aux.	5.57	10.84	5.83	4.86	3.09	**1.93**
b)	Turbine Aux.	2.49	3.53	1.27	2.11	1.65	**1.76**
	Sub-Total	**8.06**	14.37	7.1	6.97	4.74	**3.69**
III.	Boiler & Boiler Aux.	35.44	39.88	25.75	24.54	18.04	**19.18**
IV.	Turbine & Turbine Aux.	18.33	16.01	11.6	9.01	5.98	**6.31**
V.	Generator	8.65	4.38	5.33	9.99	4.17	**2.39**
VI.	Others	37.58	39.72	57.33	56.46	71.81	**72.12**
VII.	Generation loss due to Reserve Shut Down (RSD) – included in Others	**7.04**	**9.97**	**30.63**	**23.52**	**36.31**	**35.13**

4.3 EQUIPMENT OUTAGES :

A. Boiler

The generation loss due to Boiler problems increased from **3.28%** of maximum possible generation during 2015-16 to **4.23%** during 2016-17. Tube leakages and air preheater problems were the main cause of boiler forced outages. A comparison of area/causes of outages in boiler during 2014-15, 2015-16 and 2016-17 is given below:

Sl. No.	Area/ cause of outages	No. of outages			Loss (MU)			% age of Max. possible gen.		
		2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
1	Water wall tube leakage	1120	838	780	26537.29	19873.85	26480.62	2.1	**1.39**	**1.68**
2	Super heater tube leakage	115	146	195	3320.09	3246.10	4581.42	0.26	**0.23**	**0.29**
3	Re-heater tube leakage	74	144	143	2344.08	2418.12	7608.51	0.19	**0.17**	**0.48**
4	Economizer tube leakage	236	258	229	3302.18	5620.78	3492.17	0.26	**0.39**	**0.22**
5	Air pre-heater problems	74	112	120	1620.14	5096.97	8688.31	0.13	**0.36**	**0.55**
6	Furnace trouble	12	10	11	379.2	211.26	127.53	0.03	**0.01**	**0.01**
7	Boiler operational problems									
	(a) Furnace fire out/flame failure	489	386	333	2904.98	1446.81	1310.12	0.23	**0.10**	**0.08**
	(b) Furnace draft abnormal	281	272	218	1568.07	1049.34	5778.59	0.12	**0.07**	**0.37**
	(c) Drum level high/ low	155	161	176	1636.56	676.82	549.34	0.13	**0.05**	**0.03**
	(d)Miscellaneous	3	2	279	400.09	304.06	7910.84	0.03	**0.02**	**0.50**
8	Others boiler misc. Problem	126	291	4	3331.71	6785.94	103.48	0.26	**0.48**	**0.01**
TOTAL BOILER		**2685**	**2620**	**2488**	**47344.38**	**46730.05**	**66630.92**	**3.75**	**3.28**	**4.23**

B. Turbine

The generation loss due to Turbine problems increased from **0.95%** of maximum possible generation during 2015-16 to **1.12%** during 2016-17. Turbine bearings and eccentricity/vibrations, main steam line problem and condenser tube leakages were major causes for turbine forced outages. A comparison of area/causes of outages in turbine during 2014-15, 2015-16 and 2016-17 is given below:

Sl. No.	Area/ cause of outages	No. of Outages			Loss (MU)			% age of Max. possible gen.		
		2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
1	Turbine Bearing problems	17	37	23	1112.29	2119.55	2005.10	0.09	0.15	0.13
2	Governing /Oil System Failures	32	64	77	286.96	1217.02	688.99	0.02	0.09	0.04
3	Turbine differential expansion problem	12	17	19	43.74	32.23	142.16	0	0	0.01
4	Axial shift/thrust pad problem	24	11	9	1304.25	690.04	156.76	0.1	0.05	0.01
5	Turbine eccentricity / high vibrations	101	90	74	4673.74	2602.85	4997.42	0.37	0.18	0.32
6	Turbine rotor failure/ damaged	0	4	3		67.78	132.03		0	0.01
7	Turbine control valve problem	16	20	33	1012.07	258.14	895.05	0.08	0.02	0.06
8	Condenser tube leakage/ cleaning	71	63	60	1882.5	2044.91	1880.09	0.15	0.14	0.12
9	Main Steam line problem	50	46	97	911.88	835.02	1765.05	0.07	0.06	0.11
10	Emergency Stop Valve (ESV) closure	6	6	18	458.34	113.40	120.91	0.04	0.01	0.01
11	Condenser low vacuum	109	134	125	631.61	716.91	1344.35	0.05	0.05	0.09
12	H.P.&L.P bypass system	12	19	22	409.07	679.41	346.12	0.03	0.05	0.02
13	Other Misc. Problems	111	123	68	3880.46	2144.30	3107.1	0.31	0.15	0.20
Total Turbine		**561**	**634**	**628**	**16606.91**	**13521.58**	**17581.13**	**1.32**	**0.95**	**1.12**

C. Generator

The generation loss due to Generator problems decreased from **0.91%** of maximum possible generation during 2015-16 to **0.59%** during 2016-17. Earth fault, Generator transformer tripping and generator protection/relay operation were the main causes of generator outages. A comparison of areas/causes of outages in generator during 2014-15, 2015-16 and 2016-17 is given below:

Sl. No.	Area/ cause of outages	No. of Outages			Loss (MU)			% age of Max. possible gen.		
		2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
1.	Stator/ Stator Earth fault	44	77	53	2494.05	2720.50	1571.87	0.2	0.19	0.10
2.	Rotor/ Rotor Earth Fault	11	36	20	349.27	1014.17	334.01	0.03	0.07	0.02
3	Gen. Transformer Tripping/ Damaged	29	25	27	3155.66	2658.88	2310.20	0.25	0.19	0.15
4.	Excitation Problem	51	47	54	125.66	1423.77	1206.52	0.01	0.10	0.08
5.	Gen. Cooling System Failure	1	14	16	2.25	324.11	212.31	0	0.02	0.01
6.	Seal Oil System Problem	10	3	6	57.66	46.93	94.33	0	0	0.01
7.	Generator Bearing Problem	7	5	5	975.93	878.40	7.05	0.08	0.06	0.00
8.	Fire In Turbo Gen. Bushing/ Bushing Failure	5	8	8	3752.88	215.23	68.51	0.3	0.02	0.00
9.	A.V.R. Problem	17	22	20	644.92	367.33	35.02	0.05	0.03	0.00
10.	Generator Protection/ Relay Operation Problem	241	158	172	7473	3027.68	2264.55	0.59	0.21	0.14
11.	Hydrogen Pressure Problem	23	10	18	4030.84	131.32	996.43	0.32	0.01	0.06
12.	Generator Miscellaneous Maintenance	36	41	29	957.13	218.31	133.00	0.08	0.02	0.01
Total Generator		**475**	**446**	**428**	**24019.25**	**13026.62**	**9233.80**	**1.9**	**0.91**	**0.59**

D. OTHER ELECTRICAL PROBLEMS

Details of loss of generation during 2014-15, 2015-16 and 2016-17 due to various electrical problems including switchyard area and other instruments etc. are as under:

Sl. No.	Area/ cause of outages	No. of Outages			Loss (MU)			% age of Max. possible gen.		
		2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
1.	Unit Aux. Transformer problem / Station Transformer	66	56	74	376.62	922.22	3492.67	0.03	0.06	0.22
2.	Generator Transformer problem	67	80	65	1091.91	4283.51	587.76	0.09	0.30	0.04
3.	H.T./L.T. supply problem	27	32	18	98.19	128.60	114.54	0.01	0.01	0.01
4.	DC supply problem	39	46	43	149.01	973.08	154.85	0.01	0.07	0.01
5.	Switchyard/ Bus Bar problems	58	164	384	739.26	1159.39	1023.37	0.06	0.08	0.06
6.	Breaker/isolator	19	18	23	799.81	290.88	633.49	0.06	0.02	0.04
7	Misc. fire hazards / fire in cable gallery	7	6	7	158.38	634.74	38.31	0.01	0.04	0
8.	Instrument fault	3	3	10	20.43	2738.2	11.59	0	0	0
9.	Mal-operation of relays	7	0	10	19.63	0	17.49	0	0	0
10.	Air supply problem	_	12	4	_	32.98	4.92	_	0	0
11.	Other electrical problems	497	401	392	3521.84	3158.82	3605.41	0.28	0.22	0.23
Total		**790**	**818**	**1030**	**6975.08**	**14322.5**	**9621.40**	**0.55**	**0.81**	**0.61**

E. FUEL SUPPLY AND OTHER MISC. PROBLEMS:

There was a sharp increase in generation loss on account of shutdown of thermal units due to Coal and Lignite shortage to **6218.47 MU** in 2016-17 from **1623.25 MU** in the previous year. Withdrawal of units from operation due to being uneconomical or vintage units also contributed significantly to losses- over **21,000 MU**.

Sl. No.	Area/ cause of outages	No. of outages			Loss (MU)			% age of Max. possible gen.		
		2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
1	Coal Shortage	76	24	29	3495.2	1623.25	6218.47	0.28	0.08	0.39
2	Coal Feeding Problem	192	93	67	21468	14511.45	5256.16	1.7	1.04	0.34
3	Wet/ Poor Quality Coal/Lignite	19	21	14	237.38	287.93	120.39	0.05	0.003	0.01
4	Fuel Supply & Other Misc. Problem	-	72	90	-	9238.42	7492.47	-	0.52	0.48
5	Fuel Oil Problem	29	26	4	60.84	201.31	98.57	0	0.01	0.01
6	Ash Handling System Problem	43	69	54	6564.1	7460.51	1.46	0.52	0.52	0.00
7	Raw Water Problem	11	17	24	3009.9	4151.54	2875.79	0.24	0.29	0.18
8	D.M. Water Problem	4	0	2	190.06	0	5866.09	0.02	0	0.37
9	Cooling Tower Problem	3	3	1	39.8	182.75	104.30	0	0.01	0.006
10	E.S.P. Problem	13	31	18	2226.8	3280.74	5438.47	0.18	0.23	0.35
11	Non-Readiness Of Residual Work Of New Unit	6	7	3	875.72	1124.35	1378.29	0.07	0.08	0.09
12	Vintage Unit Withdrawn And Closed For Operation	5	27	28	3686.9	19166.71	13878.39	0.29	1.34	0.88
13	Uneconomical Operation	-	6	5	-	5344.99	7433.73	0.54	0.37	0.47
14	Other Misc. Problems	79	36	264	15606	5609.26	28861.12	0.73	0.19	1.83
	TOTAL MISCELLANEOUS	**480**	**432**	**603**	**57461**	**72183.21**	**85023.70**	**4.62**	**4.68**	**5.41**

F. GRID SYSTEM AND LOW SYSTEM DEMAND

Over one third of total Forced outage losses occurred on account of low system demand and transmission/grid related constraints. Energy loss due to Reserve shutdown increased from **113,413.88 MU** in 2015-16 to **133975.17 MU** during 2016-17 and the generation loss due to transmission constraints decreased from **8,814.94** MU to **7450.97** MU.

Details of generation losses due to transmission constraints/ grid system problems and reserve shut down during 2014-15,2015-16 and 2016-17are given below:-

Sl. No.	Area/ cause of outages	No. of Outages			Loss (MU)			% age of Max. possible gen.		
		2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
1.	Transmission constraints/grid system problems	194	261	244	13,339	8,814.94	7450.97	1.06	0.62	0.47
2.	Reserve Shut Down	676	934	1028	56,573.77	113,413.88	133975.17	4.48	7.95	8.51
3.	NO Power purchase agreement	_	16	24	_	15,602.30	32685.98	_	1.09	2.08
4.	Other Commercial Reason	-	-	2			467.75			0.03
	Total	**870**	**1211**	**1298**	**69,912.77**	**137,831.12**	**174579.87**	**5.54**	**9.66**	**11.08**

4.4 OUTAGE & ENERGY LOSS DUE TO PROBLEMS IN AUXILIARY SYSTEMS

4.4.1 Details of losses due to problems in boiler & turbine auxiliaries systems during the years 2014-15,2015-16 and 2016-17 are given below: -

Sl. No.	Area/ cause of outages	No. of Outages			Loss (MU)			% age of Max. possible gen.		
		2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
I.	**Boiler Aux**.									
	a) I.D. Fans	100	96	97	3602.77	2161.50	2221.65	0.29	0.15	0.14
	b) F.D. Fans	31	37	30	91.2	254.84	193.74	0.01	0.02	0.01
	c) P.A. Fans	151	127	135	1489.4	2026.35	951.70	0.12	0.14	0.06
	d) Milling System / RC feeder problems	40	106	55	2733.55	1590.23	887.20	0.22	0.11	0.06
	e) Pipe and valves	69	76	62	444.55	775.15	325.52	0.04	0.05	0.02
	f) Boiler Aux. Misc. Problems	63	61	50	3332.39	2835.30	2865.39	0.26	0.20	0.18
	Total Boiler Aux.	**454**	**503**	**429**	**11693.86**	**9643.38**	**7445.20**	**0.93**	**0.68**	**0.47**
II.	**Turbine Aux**.									
	a) Boiler feed pump problems	67	105	87	625.8	961.68	967.84	0.05	0.07	0.06
	b) Condensate pump problems	6	8	6	7.03	31.40	31.59	0	0	0.00
	c) C.W. pump problems	29	51	57	462.07	1160.77	3554.80	0.04	0.08	0.23
	d) Regenerative System problem	3	9	4	880.58	1178.01	377.06	0.07	0.08	0.02
	e) Pipe and valve	11	4	11	174.22	68.57	101.34	0.01	0	0.01
	f) De-aerator Problem	0	3	3	0	27.54	49.23	0	0	0.00
	g)Turbine Misc.	89	97	100	2914.81	1731.99	1706.58	0.23	0.12	0.11
	Total Turbine Aux.	**205**	**277**	**268**	**5064.5**	**5159.95**	**6788.43**	**0.4**	**0.36**	**0.43**

Sl. No.	Area/ cause of outages	No. of Outages			Loss (MU)			% age of Max. possible gen.		
		2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
Total Boiler & Turbine Aux.		**659**	**780**	**697**	**16758.36**	**14803.33**	**14233.63**	**1.33**	**1.04**	**0.90**

4.5 FREQUENCY OF OUTAGES AND ENERGY LOSS

4.5.1 Region-wise frequency of outages/ tripping of equipment and related energy loss during 2015-16 and 2016-17 are shown in the **Annexure 4.1**.

4.5.2 Details of Average loss per outage (in MU) due to failure of equipment and auxiliaries from the years 2011-12 to 2016-17 is shown below: -

Sl. No.	Outages	Average Loss/Outage (MU)					
		2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
I.	**Equipment**						
	Boiler	9.02	11.85	13	17.63	17.84	26.78
	Turbine	21.52	19.17	26.59	29.6	21.33	28.00
	Generator	21.5	10.79	24.19	50.57	29.21	21.57
	Total Equipment	12.22	13.09	16.62	23.64	19.80	26.37
II.	**Auxiliaries**						
	Boiler Aux.	12.83	24.87	21.41	25.76	19.17	17.35
	Turbine Aux.	11.29	14.21	7.61	24.7	18.63	25.33
	Total Aux.	12.31	21	16.18	25.43	18.98	20.42
III	**Boiler & Aux.**	**9.46**	**13.82**	**14.27**	**18.81**	**18.05**	**25.39**
IV.	**Turbine & Aux.**	**19.16**	**17.8**	**20.89**	**28.29**	**20.51**	**27.20**
V.	**Generator**	**21.5**	**10.79**	**24.19**	**50.57**	**29.21**	**21.57**
VI.	**Other Misc. Problems**	**14.83**	**17.76**	**42.84**	**63.08**	**89.02**	**94.60**
	Total (Excl. RSD)	**13.36**	**14.82**	**19.67**	**31.41**	**32.77**	**40.51**
VII.	**Reserve Shut Down**	**10.4**	**28.29**	**78.23**	**83.69**	**122.24**	**131.07**
	Total (Incl. RSD)	**13.09**	**15.56**	**25.53**	**36.82**	**44.63**	**53.75**

The Average losses per Outage increased from 44.63 MU during 2015-16 to 53.75 MU during 2016-17. This was mainly due to considerable increase in RSD loss in 2016-17.

4.6 DURATION PATTERN OF FORCED OUTAGES

4.6.1 There were a total of about **7185** forced outages / tripping with aggregate duration of **2,017,784** outage hours during the year 2016-17. The duration of

individual outage varied from few hours to the maximum of full year. The duration pattern of forced outages of thermal units during the year 2016-17 in the country is given at **Annexure-4.2**.

4.7 LONG DURATION FORCED OUTAGES

4.7.1 Energy loss (in MUs) due to forced outages of more than 25 days during the year 2016-17 contributed to 67.48% of total forced outage losses. Details of units which under forced outages for more than 25 days are given in Annexure 4.3. Western Region has maximum loss (180087.85 MU) due to long forced outage and North Eastern Region had minimum MU loss (609.40 MU).

4.8 DURATION PATTERN OF BOILER TUBE LEAKAGE

4.8.1 WATER WALL TUBE LEAKAGE

Duration pattern of forced outages due to water wall tube leakage during last three years is shown below: -

Period in days	2014-15(571 Units)			2015-16 (617 units)			2016-17 (649 units)		
	No. of Units	No. of Outage	Loss (MU)	No. of Units	No. of Outage	Loss (MU)	No. of Units	No. of Outage	Loss (MU)
Upto-2 days	255	562	4158.7	208	379	3000.04	186	346	3237.36
>2 & up to 3	147	247	3873.04	123	179	2805.39	122	185	3365.12
>3 & up to 4	88	113	2478.49	74	100	2626.75	65	86	2352.61
>4 & up to 5	47	57	1620.36	50	61	1872.31	40	42	1306.90
>5 & up to 6	28	29	1294.67	20	23	624.21	21	22	888.96
>6 & up to 7	18	20	810.23	18	18	793.86	14	15	903.01
>7 & up to 14	44	56	2850.84	34	41	2676.47	29	38	2118.83
>14 & up to 21	15	15	1774.75	10	14	768.28	14	15	1849.14
>21& up to 28	5	5	1038.73	2	2	546.24	6	6	1277.21
>28 & up to 30	0	0	-	1	1	141.16	0	-	-
> 30 days	14	16	6637.47	12	20	4019.15	18	25	9181.49
Total	**374**	**1120**	**26,537.29**	**324**	**838**	**19,873.85**	**313**	**780**	**26480.62**

As may be seen, the number of Water wall tube leakages have come down significantly over the years and the outages in 2016-17 were lower despite higher number of units reviewed. Also most of the WW leakages involved outages of less than 4 days and almost half of the outages have been for less than 2 days' duration.

4.8.2 SUPERHEATER TUBE LEAKAGE

Duration pattern of forced outages due to super heater tube leakage problems during last three years is shown below.

Period in days	2014-15(571 Units)			2015-16 (617 units)			2016-17 (649 units)		
	No. of Units	No. of Outage	Loss (MU)	No. of Units	No. of Outage	Loss (MU)	No. of Units	No. of Outage	Loss (MU)
Upto-2 days	31	51	211.07	45	78	464.36	49	91	520.65
>2 & up to 3	19	20	238.57	29	30	430.32	33	37	683.59
>3 & up to 4	16	20	351.08	9	10	164.65	13	21	285.90
>4 & up to 5	9	9	265.24	7	7	232.66	8	10	118.01
>5 & up to 6	3	3	48.78	3	4	57.10	3	3	35.35
>6 & up to 7	2	2	117.69	4	4	207.61	3	3	109.01
>7 & up to 14	3	3	52.31	7	8	388.50	13	17	1160.54
>14 & up to 21	4	4	442.94	1	1	52.13	4	5	665.93
>21& up to 28	0	0		1	1	110.34	2	2	99.74
>28 & up to 30	0	0		1	1	453.60	0	0	
> 30 days	3	3	1592.41	2	2	684.81	3	3	814.72
Total	**69**	**115**	**3320.09**	**87**	**146**	**3246.10**	**100**	**195**	**4581.42**

4.8.3 REHEATER TUBE LEAKAGE

Duration pattern of forced outages due to Re-heater tube leakage problems during last three years is shown below.

Period in days	2014-15(571 Units)			2015-16 (617 units)			2016-17 (649 units)		
	No. of Units	No. of Outage	Loss (MU)	No. of Units	No. of Outage	Loss (MU)	No. of Units	No. of Outage	Loss (MU)
Upto-2 days	33	40	218.78	56	89	811.87	50	76	621.01
>2 & up to 3	13	16	235.15	20	26	531.61	28	32	511.37
>3 & up to 4	4	4	86.19	12	12	342.87	12	14	417.63
>4 & up to 5	2	2	78.66	4	4	77.94	5	5	253.79
>5 & up to 6	3	3	123.39	5	5	158.23	2	2	102.65
>6 & up to 7	3	3	151.31	0	0	0	1	1	46.71
>7 & up to 14	3	3	142.42	3	3	216.76	5	6	301.78
>14 & up to 21	1	1	129.68	0	0	0	0	0	0
>21& up to 28	0	0	0	2	2	214.92	0	0	0
>28 & up to 30	0	0	0	0	0	0	0	0	0
0> 30 days	2	2	1178.52	2	2	29.59	6	7	5353.56
Total	**52**	**74**	**2344.08**	**86**	**144**	**2418.12**	**88**	**143**	**7608.51**

4.8.4 ECONOMISER TUBE LEAKAGE

Duration pattern of forced outages due to Economizer tube leakage problems during the last three years is shown below:

Period in days	2014-15(571 Units)			2015-16 (617 units)			2016-17 (649 units)		
	No. *of* Units	No. of Outage	Loss (MU)	No. of Units	No. of Outage	Loss (MU)	No. of Units	No. of Outage	Loss (MU)
Upto-2 days	83	140	666.87	91	164	948.96	95	152	989.22
>2 & up to 3	37	41	654.91	36	44	626.94	29	36	571.94
>3 & up to 4	19	23	447.39	14	17	230.15	15	15	468.44
>4 & up to 5	9	9	242.05	5	5	137.67	6	6	240.26
>5 & up to 6	4	4	205.36	6	8	137.62	6	6	174.18
>6 & up to 7	4	4	118.34	2	2	40.25	0	0	0
>7 & up to 14	6	6	201.07	4	4	228.10	8	9	423.02
>14 & up to 21	2	3	157.8	8	8	759.48	1	1	43.48
>21& up to 28	0	0		1	1	28.76	0	0	0
>28 & up to 30	0	0		1	1	34.74	0	0	0
> 30 days	2	2	415.43	3	3	2413.15	3	4	581.62
Total	**129**	**236**	**3302.18**	**131**	**258**	**5620.78**	**132**	**229**	**3492.17**

4.9 BOILER TUBE LEAKAGE DURATION PATTERN (CAPACITY GROUPWISE)

Capacity group-wise details of boiler tube leakage problems during the year 2016-17 are given below:

Capacity (MW)	No. of Units Reviewed	Water Wall		Super heater		Economizer		Re-heater		Total	
		No. of Units involved	No. of Outages	No. of Units involved	No. of Outages	No. of Units involved	No. of Outages	No. of Units involved	No. of Outages	No. of Units involved	No. of Outages
660-800	55	20	49	6	8	4	4	4	5	25	66
490-600	132	94	229	27	32	34	42	25	40	108	343
300-360	39	11	20	4	5	1	2	2	4	15	31
250-270	71	35	79	5	8	10	12	5	5	40	104
210-210	143	76	150	25	50	47	102	36	64	108	366
195-200	26	18	34	9	11	8	11	6	9	21	65
100-150	98	33	126	11	28	13	22	9	15	39	191
25-99	85	26	93	13	53	15	34	1	1	32	181
Total	**649**	**313**	**780**	**100**	**195**	**132**	**229**	**88**	**143**	**388**	**1347**

It is seen that the incidences of tube failures have been significantly lower in the supercritical units (660-800 MW group) amongst all capacity groups.

4.10 FORCED OUTAGE – UTILITY WISE

The forced outages of thermal generating units under various Central Sector Utilities, Private Sector and State Electricity Boards- /-Power Generating Corporations, is given below:

Sl. No.	Organization/ Utility	No. of Units under Review	Capacity (MW)	FORCED OUTAGE				
				No. of Units	Capacity (MW)	Duration (Hrs.)	Energy Loss(MU)	Loss as % of Max. Possible generation of review capacity
CENTRAL SECTOR								
1	NTPC Ltd.	102	35295	100	34980	84448.1	21582.3	7.09
2	DVC	25	7640	25	7900	102123	24599.4	38.11
3	NLC	20	2990	20	2990	13816.1	2815.27	10.75
4	APCPL	3	1500	3	1500	9637.05	4818.52	36.67
5	NTECL	3	1500	3	1500	1792.21	896.1	6.82
6	NTPL	2	1000	2	1000	1682.65	841.32	9.6
7	NSPCL	2	500	2	500	43.1	10.78	0.25
8	PVUNL	10	455	10	770	52402.3	4256.37	86.72
9	K.B.U.N.L	3	415	3	415	8824.14	985.72	51.15
10	BRBCL	1	250	1	250	1824	456	84.44
10	NLC	2	250	2	250	2189.63	273.7	12.5
3CENTRAL SECTOR TOTAL		**173**	**51795**	**171**	**52055**	**278783**	**61536**	**13.86**
STATE SECTOR								
NORTHERN REGION								
1	HPGCL	8	2720	8	2720	32138	8769.84	36.81
2	IPGPCL	2	135	2	135	17520	1182.6	100
3	PSPCL	14	2620	14	2620	84991.1	15464.7	67.38
4	RRVUNL	21	5190	19	4940	48701.2	13125.2	28.87
5	UPRVUNL	28	5923	27	5829	69846.8	10088.8	20.61
WESTERN REGION								
6	BECL	2	500	2	500	31605.4	771.49	42.3
7	CSPGCL	15	3280	15	3280	63253	5474.09	20.07
8	GMDCL	2	250	2	250	1417.34	177.17	8.09
9	GSECL	26	4480	26	4720	112764	19166.5	46.74
10	MAHAGENCO	39	10580	38	11420	106215	24202.7	29.71
11	MPPGCL	14	4080	14	4080	51252.3	14668.1	41.04
SOUTHERN REGION								
12	APGENCO	12	2810	12	2810	8577.55	1960.69	7.97
13	APPDCL	2	1600	2	1600	1749.52	1399.62	9.99
14	KPCL	10	2720	10	2720	14611	4179.92	17.54
15	RPCL	1	800	1	800	553.27	442.62	74.36
16	SCCL	2	1200	2	1200	21266.6	447.33	10.25
17	TNGDCL	20	4660	20	4770	53129.6	7887.25	18.95
18	TSGENCO	14	2882.5	14	2882.5	7837.91	2337.09	9.26
EASTERN REGION								
19	DPL	6	660	6	880	40279.4	4914.96	66.44
20	OPGC	2	420	2	420	219.99	46.2	1.26
21	TVNL	2	420	2	420	6456.91	1355.95	36.85
22	WBPDC	25	4360	25	4840	61902.1	10745.9	26.21
NORTH EASTERN REGION								
23	APGPCL	2	60	2	60	17520	525.6	100
STATE SECTOR TOTAL		**269**	**62350.5**	**265**	**63897**	**853808**	**149334**	**28.58**
PVT SECTOR								
WESTERN REGION								
1	RIL (DAHANU)	2	500	2	500	649.37	162.34	3.71
2	TATA PCL	4	1250	4	1400	16406.4	5564.7	46.17

Sl. No.	Organization/ Utility	No. of Units under Review	Capacity (MW)	FORCED OUTAGE				
				No. of Units	Capacity (MW)	Duration (Hrs.)	Energy Loss(MU)	Loss as % of Max. Possible generation of review capacity
3	TOR. POW. (UNOSUGEN)	5	422	5	422	18059.9	590.75	15.98
EASTERN REGION								
4	CESC	13	1125	13	1125	36381.9	2830.47	28.72
PVT TOTAL		**24**	**3297**	**24**	**3447**	**71498**	**9148.3**	**30.51**
IPPs								
NORTHERN REGION								
1	APL	2	1320	2	1320	2812.15	1856.02	16.05
2	BEPL	10	450	10	450	20011.1	900.5	22.84
3	GPGSL (GVK)	2	540	2	540	16208.2	4376.21	96.48
4	JhPL(HR)	2	1320	2	1320	9745.35	6431.93	55.62
5	LAPPL	2	1200	2	1200	882.18	529.31	5.04
6	LPGCL	3	1980	3	1980	7157.06	4723.66	46.81
7	NPL	2	1400	2	1400	223.26	156.28	1.27
8	PPGCL (Jaypee)	2	1320	2	1320	31810.6	3028.11	33.13
9	RPSCL	4	1200	4	1200	3803.15	1140.94	10.85
10	RWPL (JSW)	8	1080	8	1080	9840.65	1328.49	14.04
11	TSPL	3	1980	3	1980	6204.63	4095.06	27.44
WESTERN REGION								
12	ACB	4	325	4	325	11058.6	474.03	16.65
13	AMNEPL	4	246	4	246	35040	2154.96	100
13	APL	14	7920	13	7590	20149.9	11365.6	16.38
14	BALCO	2	600	2	600	3633.72	1090.12	20.74
15	BLAPPL	1	45	1	45	1360.01	61.2	15.53
16	CGPL	5	4000	5	4000	5081.15	4064.92	11.6
17	DBPCL	2	1200	2	1200	1133.46	680.08	6.47
18	DIPL	2	600	2	600	8918.91	2675.67	50.91
19	EPGL	2	1200	2	1200	4113.48	2468.09	23.48
20	ESSARPMPL	1	600	1	600	1763.09	1057.85	20.13
21	GCEL	2	1370	2	1370	15844.6	10853.6	90.44
22	GEPL	2	120	2	120	17520	1051.2	100
23	GIPCL	4	500	4	500	3727.13	465.89	10.64
24	GMR ENERG	2	600	2	600	2333.98	700.19	13.32
25	IEPL	1	270	1	270	8760	2365.2	100
26	JHAPL	1	600	1	600	6983.83	4190.3	86.86
27	JPL	8	3400	8	3400	34226.9	15647.6	59.56
28	JPPVL	4	1820	4	1820	14689.4	4624.86	29.01
29	JSWEL	4	1200	4	1200	6252.48	1875.74	17.84
30	KWPCL	1	600	1	600	2794.46	1676.68	31.9
31	LANCO	2	600	2	600	901.37	270.41	5.14
32	MBPMPL	2	1200	2	1200	9680.55	5808.33	55.25
33	MCCPL	1	300	1	300	2790.49	837.15	31.85
34	RKMPPL	2	720	2	720	8607.98	3098.87	49.13
35	RattanIndia	5	1350	5	1350	35219.1	9509.16	80.41
36	SCPL	2	100	2	100	5539.6	106.63	18.28
37	SPL	6	3960	6	3960	4125.27	2722.68	7.85
38	STPL	1	270	1	270	8760	2365.2	100
39	SVPPL	1	63	1	63	2738.7	172.54	31.26
40	TRNE	1	300	1	300	42016.8	622.59	40.79
41	VESPL	1	35	1	35	8760	306.6	100
42	VIP	2	600	2	600	1916.82	575.05	10.94
43	VVL	1	135	1	135	8760	1182.6	100
44	WPCL	6	1740	6	1740	22647.5	4569.65	29.98
SOUTHERN REGION								
45	CEPL	2	1200	2	1200	7017.17	4210.3	40.05
46	HNPC	2	1040	2	1040	7033.13	3657.23	45.86
47	IBPIL	2	300	2	300	17228.1	2584.21	98.33
48	ITPCL	2	1200	2	1200	6102.16	3661.3	36.32

Sl. No.	Organization/ Utility	No. of Units under Review	Capacity (MW)	FORCED OUTAGE				
				No. of Units	Capacity (MW)	Duration (Hrs.)	Energy Loss(MU)	Loss as % of Max. Possible generation of review capacity
48	JSWEL	4	860	4	860	7579.46	1740.86	23.11
49	MEL	2	300	2	300	5116.33	767.45	29.2
50	SEIL	4	2640	4	2640	9809.73	1936.28	13.86
51	SEPL	4	600	4	600	22169.8	3325.47	63.27
52	ST-CMSECP	1	250	1	250	1575.21	393.8	17.98
53	UPCL	2	1200	2	1200	1315.54	789.32	7.51
EASTERN REGION								
54	ADHUNIK	2	540	2	540	2722.77	735.15	15.54
54	GMR ENERG	3	1050	3	1050	2956.41	1034.74	11.25
55	HEL	2	600	2	600	75.49	22.65	0.43
55	IBPIL	1	350	1	350	8760	3066	150.21
56	JITPL	2	1200	2	1200	4123.69	2474.21	23.54
57	MPL	2	1050	2	1050	665.32	349.29	3.8
58	SEL	4	1200	4	2400	232636	5126.73	25.47
59	TATA PCL	3	360	3	360	261.66	31.4	1
IPPs TOTAL		**183**	**68319**	**182**	**69189**	**813695**	**166164**	**28.71**
ALL INDIA		**649**	**189946.5**	**642**	**188588**	**2E+06**	**386182**	**24.52**

4.11 REGION WISE PERFORMACNE

Southern Region had the lowest energy loss due to forced outages (15.85%) & Western region showed highest energy loss due to forced outages (27.84%). The region wise summary of forced outages of thermal generating units is given below:

Sl. No.	REGION	No. of Units	Capacity (MW)	FORCED OUTAGE				
				No. of Units	Capacity (MW)	Duration (Hrs.)	Energy Loss(MU)	Energy Loss as % of Max. Possible generation OF Regional capacity
1	NORTHERN	151	41143	147	40589	429570.7	92149.1	26.7
2	WESTERN	238	77871	236	77331	787426.8	180088	27.84
3	SOUTHERN	122	36462.5	122	36462.5	211388.5	46898.8	15.85
4	EASTERN	135	34160	134	33895	571542.6	66436.9	23.36
5	NORTH EASTERN	3	310	3	310	17855.2	609.4	22.44
	ALL INDIA	**649**	**189946.5**	**642**	**188588**	**2017784**	**386182**	**24.52**

Annexure 4.1

REGION-WISE FREQUENCY OF OUTAGES/ TRIPPING OF EQUIPMENT AND RELATED ENERGY LOSS

DURING 2015-16 AND 2016-17

Particulars of outages	Northern Region		Western Region		Southern Region		Eastern Region		North- Eastern Region		All India	
	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17
I. Boiler												
1. No. of outages	703	615	746	796	570	544	601	525	0	8	2620	**2488.00**
2. MU Loss	11997.72	10463.85	15785.64	26921.49	8817.56	11762.79	10129.12	17428.92	0	53.88	46730.05	**66630.92**
3. % age of total F.O	15.86	11.36	10.85	14.95	28.31	25.08	17.01	26.23	0	8.84	14.96	**17.25**
II. Turbine												
1. No. of outages	143	150	205	206	189	144	97	126	0	2	634	628
2. MU Loss	1494.73	1893.41	5161.24	7819.4	3276.38	1722.79	3589.23	6128.92	0	16.64	13521.58	**17581.13**
3. % age of total F.O	1.98	2.06	3.55	5.30	10.52	25.08	6.03	26.23	0	2.73	4.33	**4.55**
III. Generator												
1. No. of outages	122	115	107	119	127	96	90	94	0	4	446	**428.00**
2. MU Loss	3913.94	1464.21	3510.4	3480.66	2076.12	2426.71	3526.16	1856.58	0	5.97	13026.62	**9233.80**
3. % age of total F.O	5.17	1.59	2.41	1.93	6.66	7.31	5.92	4.06	0	0.98	4.17	**2.39**
IV. Boiler Auxiliary												
1. No. of outages	142	132	154	116	95	102	112	77	0	2	503	**429.00**
2. MU Loss	1312.94	1559.12	5112.19	3269.79	1410.83	1505.67	1807.42	1109.29	0	1.99	9643.38	**7445.20**
3. % age of total F.O	1.74	1.69	3.51	2.26	4.53	5.42	3.04	2.62	0	0.33	3.09	**1.93**
V. Turbine Auxiliary												
1. No. of outages	55	80	93	90	77	73	52	76	0	1	277	**268.00**
2. MU Loss	530.6	974.41	2272.65	2948.93	745.51	1497.39	1611.19	1366.9	0	1.4	5159.95	**6788.43**
3. % age of total F.O	0.7	0.51	1.56	1.23	2.39	3.11	2.71	0.54	0	0.23	1.65	**1.76**
VI. Miscellaneous (including RSD)												
1. No. of outages	941	1106	735	985	421	411	421	426	2	3	2520	**2931**
2. MU Loss	56414.9	68293.73	113704.9	125852.6	14823.6	32549.7	38871	41998.4	527.04	529.53	224341.4	**269224**
3. % age of total F.O	74.56	82.79	78.12	74.33	47.59	4.79	65.29	2.78	100	86.89	71.81	**72.12**
VII. Total excluding RSD												

Particulars of outages	Northern Region		Western Region		Southern Region		Eastern Region		North- Eastern Region		All India	
	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17
1. No. of outages	1703	1794	1752	1839	1367	1285	1248	1219	2	20	6072	**6157**
2. MU Loss	30103.38	44218.02	93198.4	121546.59	27456.1	31214.1	47724.2	54618.8	527.04	609.4	199009.2	**252206.9**
3. FO Loss as % of Max. Possible Gen.	10.21	12.90	17.35	18.92	11.52	54.29	18.28	63.77	100	24.03	13.91	**16.13**
VIII. Reserve Shutdown												
1. No. of outages	403	392	301	461	102	100	128	75	0		934	**1028**
2. MU Loss	45561.52	47931.098	52348.57	58541.262	3693.94	15684.73	11809.83	11818.08	0		113413.88	**133975.17**
3. % age of total F.O	60.21	65.11	35.97	41.68	11.86	11.28	19.84	20.49	0.00		36.31	**42.09**
IX. Total including RSD												
1. No. of outages	2106	2186	2053	2300	1469	1385	1376	1293	2	20	7006	**7185**
2. MU Loss	75664.9	92149.12	145547.0	180087.85	31150.01	46898.8	59534.06	66436.9	527.04	609.40	312423.04	**386182.04**
3. FO Loss as % of Max. Possible Gen.	**24.3**	**26.70**	**24.46**	**27.84**	**12.14**	**33.44**	**22.62**	**17.79**	**100**	**22.44**	**21.9**	**24.52**

Annexure-4.2

DURATION PATTERN OF FORCED OUTAGES

All India:-

Number of units considered	:	649	
Number of units involved	:	629	
All India possible generation	:	1575195.90	MU
All India energy loss on account of forced outage	:	386182.04	MU

DURATION	No. of units	No. of Outages	MU loses	% OF All India F.O. Loss	% All India Poss. gen
Upto 3 Hrs	376	1321	661.85	0.17	0.04
>3 & up to 6 Hrs	373	1023	1367.62	0.35	0.09
>6 & up to 12 Hrs	300	561	1402.67	0.36	0.09
>12 & up to 18 Hrs	177	274	1205.85	0.31	0.08
>18 & up to 24 Hrs	151	240	1305.20	0.34	0.08
>1 & up to 2 Days	373	921	8754.67	2.27	0.56
>2 & up to 3 Days	328	618	11003.14	2.85	0.70
>3 & up to 4 Days	229	343	9152.37	2.37	0.58
>4 & up to 5 Days	167	237	7873.44	2.04	0.50
>5 & up to 6 Days	126	155	6441.70	1.67	0.41
>6 & up to 7 Days	91	108	5144.81	1.33	0.33
>7 & up to 8 Days	83	101	5613.52	1.45	0.36
>8 & up to 9 Days	89	104	6690.79	1.73	0.42
>9 & up to 10 Days	75	87	5521.48	1.43	0.35
>10 & up to 11 Days	73	82	5941.22	1.54	0.38
>11 & up to 12 Days	50	53	3766.49	0.98	0.24
>12 & up to 13 Days	42	48	4811.94	1.25	0.31
>13 & up to 14 Days	30	32	3199.98	0.83	0.20
>14 & up to 15 Days	26	26	2716.31	0.70	0.17
>15 & up to 16 Days	24	25	2771.34	0.72	0.18
>16 & up to 17 Days	30	32	4271.08	1.11	0.27
>17 & up to 18 Days	20	20	2880.73	0.75	0.18
>18 & up to 19 Days	25	29	2571.08	0.67	0.16
>19 & up to 20 Days	30	30	3026.25	0.78	0.19
>20 & up to 21 Days	26	27	3639.12	0.94	0.23
>21 & up to 22 Days	28	31	4792.67	1.24	0.30
>22 & up to 23 Days	24	24	4175.70	1.08	0.27
>23 & up to 24 Days	19	19	3344.95	0.87	0.21
>24 & up to 25 Days	11	13	1524.63	0.39	0.10
Over 25 Days	312	601	260609.43	67.48	16.54
Total	**629**	**7185**	**386182.04**	**100.00**	**24.52**

Annexure-4.2

Northern Region

Number of units in the Region	:	151
Number of units involved	:	151
Regional possible generation	:	345188.52 MU
Regional energy loss on account of forced	:	92149.12 MU

Duration	No of units	No of outages	Loss (MU)	% age of Regional F.O. loss	% age of Regional possible generation	% of All India F.O. loss	% of possible All India generation
Upto 3 Hrs	107	568	207.75	0.23	0.06	0.05	0.01
>3 & up to 6 Hrs	103	319	381.99	0.41	0.11	0.10	0.02
>6 & up to 12 Hrs	86	173	419.46	0.46	0.12	0.11	0.03
>12 & up to 18 Hrs	38	55	267.74	0.29	0.08	0.07	0.02
>18 & up to 24 Hrs	43	56	328.62	0.36	0.10	0.09	0.02
>1 & up to 2 Days	96	225	2091.24	2.27	0.61	0.54	0.13
>2 & up to 3 Days	85	149	2614.18	2.84	0.76	0.68	0.17
>3 & up to 4 Days	62	95	2600.47	2.82	0.75	0.67	0.17
>4 & up to 5 Days	44	64	1869.71	2.03	0.54	0.48	0.12
>5 & up to 6 Days	40	49	1639.03	1.78	0.47	0.42	0.10
>6 & up to 7 Days	28	30	1090.81	1.18	0.32	0.28	0.07
>7 & up to 8 Days	18	21	1197.16	1.30	0.35	0.31	0.08
>8 & up to 9 Days	25	31	2097.11	2.28	0.61	0.54	0.13
>9 & up to 10 Days	31	36	1753.43	1.90	0.51	0.45	0.11
>10 & up to 11 Days	26	30	1936.95	2.10	0.56	0.50	0.12
>11 & up to 12 Days	17	18	1029.14	1.12	0.30	0.27	0.07
>12 & up to 13 Days	13	16	1628.87	1.77	0.47	0.42	0.10
>13 & up to 14 Days	11	12	1196.51	1.30	0.35	0.31	0.08
>14 & up to 15 Days	8	8	872.36	0.95	0.25	0.23	0.06
>15 & up to 16 Days	8	8	798.26	0.87	0.23	0.21	0.05
>16 & up to 17 Days	10	11	1751.80	1.90	0.51	0.45	0.11
>17 & up to 18 Days	4	4	733.19	0.80	0.21	0.19	0.05
>18 & up to 19 Days	14	17	1171.05	1.27	0.34	0.30	0.07
>19 & up to 20 Days	7	7	572.78	0.62	0.17	0.15	0.04
>20 & up to 21 Days	7	8	662.43	0.72	0.19	0.17	0.04
>21 & up to 22 Days	5	5	528.20	0.57	0.15	0.14	0.03
>22 & up to 23 Days	11	11	2126.26	2.31	0.62	0.55	0.13
>23 & up to 24 Days	8	8	1433.35	1.56	0.42	0.37	0.09
>24 & up to 25 Days	3	3	417.87	0.45	0.12	0.11	0.03
Over 25 Days	76	149	56731.40	61.56	16.43	14.69	3.60
Total	**151**	**2186**	**92149.12**	**100.00**	**26.70**	**23.86**	**5.85**

Annexure-4.2

Western Region

Number of units in the Region : 238
Number of units involved : 229
Regional possible generation : 646962.36 MU
Regional energy loss on account of forced : 180087.85 MU

Duration	No of units	No of outages	Loss (MU)	% age of Regional F.O. loss	% age of Regional possible generation	% of All India F.O. loss	% of possible All India generation
Upto 3 Hrs	118	326	213.83	0.12	0.03	0.06	0.01
>3 & up to 6 Hrs	118	278	406.26	0.23	0.06	0.11	0.03
>6 & up to 12 Hrs	92	151	400.51	0.22	0.06	0.10	0.03
>12 & up to 18 Hrs	67	115	507.77	0.28	0.08	0.13	0.03
>18 & up to 24 Hrs	48	86	483.87	0.27	0.07	0.13	0.03
>1 & up to 2 Days	116	279	2617.69	1.45	0.40	0.68	0.17
>2 & up to 3 Days	114	233	4002.37	2.22	0.62	1.04	0.25
>3 & up to 4 Days	83	133	3626.78	2.01	0.56	0.94	0.23
>4 & up to 5 Days	61	85	2929.07	1.63	0.45	0.76	0.19
>5 & up to 6 Days	43	57	2970.49	1.65	0.46	0.77	0.19
>6 & up to 7 Days	33	41	2338.99	1.30	0.36	0.61	0.15
>7 & up to 8 Days	34	39	2055.44	1.14	0.32	0.53	0.13
>8 & up to 9 Days	35	38	2328.74	1.29	0.36	0.60	0.15
>9 & up to 10 Days	20	23	1654.17	0.92	0.26	0.43	0.11
>10 & up to 11 Days	23	25	2074.19	1.15	0.32	0.54	0.13
>11 & up to 12 Days	19	21	1723.36	0.96	0.27	0.45	0.11
>12 & up to 13 Days	19	19	2123.87	1.18	0.33	0.55	0.13
>13 & up to 14 Days	11	12	1260.40	0.70	0.19	0.33	0.08
>14 & up to 15 Days	11	11	1194.99	0.66	0.18	0.31	0.08
>15 & up to 16 Days	6	6	751.17	0.42	0.12	0.19	0.05
>16 & up to 17 Days	11	11	1266.44	0.70	0.20	0.33	0.08
>17 & up to 18 Days	9	9	1701.59	0.94	0.26	0.44	0.11
>18 & up to 19 Days	3	3	298.21	0.17	0.05	0.08	0.02
>19 & up to 20 Days	12	12	1246.27	0.69	0.19	0.32	0.08
>20 & up to 21 Days	11	11	1888.17	1.05	0.29	0.49	0.12
>21 & up to 22 Days	12	15	2819.99	1.57	0.44	0.73	0.18
>22 & up to 23 Days	7	7	1147.95	0.64	0.18	0.30	0.07
>23 & up to 24 Days	6	6	1107.42	0.61	0.17	0.29	0.07
>24 & up to 25 Days	7	8	1104.38	0.61	0.17	0.29	0.07
Over 25 Days	130	240	131843.46	73.21	20.38	34.14	8.37
Total	**229**	**2300**	**180087.85**	**100.00**	**27.84**	**46.63**	**11.43**

Eastern Region

Number of units in the Region	:	135	
Number of units involved	:	119	
Regional possible generation	:	284358.48	MU
Regional energy loss on account of forced	:	66436.88	MU

Duration	No of units	No of outages	Loss (MU)	% age of Regional F.O. loss	% age of Regional possible generation	% of All India F.O. loss	% of possible All India generation
Upto 3 Hrs	74	226	125.77	0.19	0.04	0.03	0.01
>3 & up to 6 Hrs	74	230	292.39	0.44	0.10	0.08	0.02
>6 & up to 12 Hrs	62	120	315.57	0.47	0.11	0.08	0.02
>12 & up to 18 Hrs	37	49	188.47	0.28	0.07	0.05	0.01
>18 & up to 24 Hrs	32	42	247.91	0.37	0.09	0.06	0.02
>1 & up to 2 Days	70	151	1643.11	2.47	0.58	0.43	0.10
>2 & up to 3 Days	62	112	2069.17	3.11	0.73	0.54	0.13
>3 & up to 4 Days	50	69	1612.59	2.43	0.57	0.42	0.10
>4 & up to 5 Days	30	37	1030.55	1.55	0.36	0.27	0.07
>5 & up to 6 Days	25	28	867.95	1.31	0.31	0.22	0.06
>6 & up to 7 Days	13	16	568.22	0.86	0.20	0.15	0.04
>7 & up to 8 Days	17	25	1071.54	1.61	0.38	0.28	0.07
>8 & up to 9 Days	9	10	757.38	1.14	0.27	0.20	0.05
>9 & up to 10 Days	12	14	1065.19	1.60	0.37	0.28	0.07
>10 & up to 11 Days	14	17	1194.56	1.80	0.42	0.31	0.08
>11 & up to 12 Days	4	4	140.96	0.21	0.05	0.04	0.01
>12 & up to 13 Days	3	5	224.34	0.34	0.08	0.06	0.01
>13 & up to 14 Days	2	2	263.45	0.40	0.09	0.07	0.02
>14 & up to 15 Days	4	4	323.82	0.49	0.11	0.08	0.02
>15 & up to 16 Days	4	4	407.87	0.61	0.14	0.11	0.03
>16 & up to 17 Days	7	8	752.43	1.13	0.26	0.19	0.05
>17 & up to 18 Days	1	1	25.07	0.04	0.01	0.01	0.00
>18 & up to 19 Days	4	5	560.43	0.84	0.20	0.15	0.04
>19 & up to 20 Days	4	4	366.82	0.55	0.13	0.09	0.02
>20 & up to 21 Days	6	6	928.65	1.40	0.33	0.24	0.06
>21 & up to 22 Days	7	7	828.25	1.25	0.29	0.21	0.05
>22 & up to 23 Days	4	4	659.34	0.99	0.23	0.17	0.04
>23 & up to 24 Days	2	2	105.80	0.16	0.04	0.03	0.01
>24 & up to 25 Days	0	0					
Over 25 Days	64	138	47799.29	71.95	16.81	12.38	3.03
Total	**119**	**1340**	**66436.88**	**100.00**	**23.36**	**17.20**	**4.22**

Southern Region

Number of units in the Region	:	122	
Number of units involved	:	122	
Regional possible generation	:	295970.94	MU
Regional energy loss on account of forced	:	46898.79	MU

Duration	No of units	No of outages	Loss (MU)	% age of Regional F.O. loss	% age of Regional possible generation	% of All India F.O. loss	% of possible All India generation
Upto 3 Hrs	76	199	113.29	0.24	0.04	0.03	0.01
>3 & up to 6 Hrs	77	187	276.36	0.59	0.09	0.07	0.02
>6 & up to 12 Hrs	59	116	264.40	0.56	0.09	0.07	0.02
>12 & up to 18 Hrs	34	53	233.87	0.50	0.08	0.06	0.01
>18 & up to 24 Hrs	28	56	244.80	0.52	0.08	0.06	0.02
>1 & up to 2 Days	90	264	2387.60	5.09	0.81	0.62	0.15
>2 & up to 3 Days	66	123	2302.25	4.91	0.78	0.60	0.15
>3 & up to 4 Days	34	46	1312.54	2.80	0.44	0.34	0.08
>4 & up to 5 Days	32	51	2044.10	4.36	0.69	0.53	0.13
>5 & up to 6 Days	17	20	933.20	1.99	0.32	0.24	0.06
>6 & up to 7 Days	17	21	1146.79	2.45	0.39	0.30	0.07
>7 & up to 8 Days	14	16	1289.38	2.75	0.44	0.33	0.08
>8 & up to 9 Days	20	25	1507.56	3.21	0.51	0.39	0.10
>9 & up to 10 Days	12	14	1048.69	2.24	0.35	0.27	0.07
>10 & up to 11 Days	10	10	735.53	1.57	0.25	0.19	0.05
>11 & up to 12 Days	10	10	873.02	1.86	0.29	0.23	0.06
>12 & up to 13 Days	7	8	834.86	1.78	0.28	0.22	0.05
>13 & up to 14 Days	6	6	479.62	1.02	0.16	0.12	0.03
>14 & up to 15 Days	3	3	325.14	0.69	0.11	0.08	0.02
>15 & up to 16 Days	6	7	814.05	1.74	0.28	0.21	0.05
>16 & up to 17 Days	2	2	500.41	1.07	0.17	0.13	0.03
>17 & up to 18 Days	6	6	420.88	0.90	0.14	0.11	0.03
>18 & up to 19 Days	4	4	541.39	1.15	0.18	0.14	0.03
>19 & up to 20 Days	7	7	840.38	1.79	0.28	0.22	0.05
>20 & up to 21 Days	2	2	159.86	0.34	0.05	0.04	0.01
>21 & up to 22 Days	4	4	616.24	1.31	0.21	0.16	0.04
>22 & up to 23 Days	2	2	242.14	0.52	0.08	0.06	0.02
>23 & up to 24 Days	3	3	698.38	1.49	0.24	0.18	0.04
>24 & up to 25 Days	1	2	2.37	0.01	0.00	0.00	0.00
Over 25 Days	40	72	23709.69	50.56	8.01	6.14	1.51
Total	**125**	**1339**	**46898.79**	**100.00**	**15.85**	**12.14**	**2.98**

North Eastern Region

Number of units in the Region : 3
Number of units involved : 3
Regional possible generation : 2715.60 MU
Regional energy loss on account of forced : 609.40 MU

Duration	No of units	No of outages	Loss (MU)	% age of Regional F.O. loss	% age of Regional possible generation	% of All India F.O. loss	% of possible All India generation
Upto 3 Hrs	1	2	1.20	0.20	0.04	0.00	0.00
>3 & up to 6 Hrs	1	9	10.62	1.74	0.39	0.00	0.00
>6 & up to 12 Hrs	1	1	2.74	0.45	0.10	0.00	0.00
>12 & up to 18 Hrs	1	2	8.01	1.31	0.30	0.00	0.00
>18 & up to 24 Hrs	0	0					
>1 & up to 2 Days	1	2	15.04	2.47	0.55	0.00	0.00
>2 & up to 3 Days	1	1	15.17	2.49	0.56	0.00	0.00
>3 & up to 4 Days	0	0					
>4 & up to 5 Days	0	0					
>5 & up to 6 Days	1	1	31.02	5.09	1.14	0.01	0.00
>6 & up to 7 Days	0	0					
>7 & up to 8 Days	0	0					
>8 & up to 9 Days	0	0					
>9 & up to 10 Days	0	0					
>10 & up to 11 Days	0	0					
>11 & up to 12 Days	0	0					
>12 & up to 13 Days	0	0					
>13 & up to 14 Days	0	0					
>14 & up to 15 Days	0	0					
>15 & up to 16 Days	0	0					
>16 & up to 17 Days	0	0					
>17 & up to 18 Days	0	0					
>18 & up to 19 Days	0	0					
>19 & up to 20 Days	0	0					
>20 & up to 21 Days	0	0					
>21 & up to 22 Days	0	0					
>22 & up to 23 Days	0	0					
>23 & up to 24 Days	0	0					
>24 & up to 25 Days	0	0					
Over 25 Days	2	2	525.60	86.25	19.35	0.14	0.03
Total	**4**	**20**	**609.40**	**100.00**	**22.44**	**0.16**	**0.04**

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
NORTHERN REGION									
MAHATMA GANDHI TPS	1	660	01-Apr-2016	27-Apr-2016	27	637.70	RSD/LOW SCHEDULE	420.88	7.28
MAHATMA GANDHI TPS	1	660	01-Jul-2016	10-Aug-2016	39	946.45	RESERVE SHUT DOWN / STANDBY UNIT	624.66	10.80
MAHATMA GANDHI TPS	1	660	08-Oct-2016	11-Nov-2016	34	806.92	RSD/LOW SCHEDULE	532.57	9.21
MAHATMA GANDHI TPS	2	660	01-Apr-2016	01-May-2016	31	741.63	RSD/LOW SCHEDULE	489.48	8.47
MAHATMA GANDHI TPS	2	660	01-Jul-2016	10-Aug-2016	41	973.23	RESERVE SHUT DOWN / STANDBY UNIT	642.33	11.11
MAHATMA GANDHI TPS	2	660	13-Sep-2016	12-Nov-2016	59	1426.75	RESERVE SHUT DOWN / STANDBY UNIT	941.66	16.29
TALWANDI SABO TPP	1	660	25-Oct-2016	28-Nov-2016	34	806.97	RAW WATER SHORTAGE	532.60	15.86
KAWAI TPS	2	660	05-Nov-2016	25-Dec-2016	50	1191.83	Coal Transportation Problems	786.61	13.61
PRAYAGRAJ TPP	2	660	02-Jan-2017	31-Mar-2017	88	2118.92	WATER WALL TUBE LEAKAGE	65.64	1.95
PRAYAGRAJ TPP	2	660	03-Mar-2017	31-Mar-2017	29	686.13	C&I PROBLEM	2.46	0.07
PRAYAGRAJ TPP	2	660	04-Dec-2016	31-Mar-2017	117	2809.62	GENERATOR PROTECTION RELAY OPERATION	3.07	0.09
PRAYAGRAJ TPP	2	660	05-Feb-2017	31-Mar-2017	54	1307.58	GRID DISTURBANCE	1.88	0.06
PRAYAGRAJ TPP	2	660	07-Dec-2016	31-Mar-2017	114	2737.57	BOILER FEED PUMP/MOTOR PROBLEM	15.23	0.45
PRAYAGRAJ TPP	2	660	10-Nov-2016	31-Mar-2017	142	3397.17	BOILER MISC. PROBLEM	11.66	0.35
PRAYAGRAJ TPP	2	660	10-Sep-2016	31-Mar-2017	203	4863.38	TEST RUN SUBSEQ.TO MAJ. REPAIR	394.39	11.74
PRAYAGRAJ TPP	2	660	15-Feb-2017	31-Mar-2017	44	1067.83	ELECTRICAL MISCELLANEOUS PROBLEMS	244.57	7.28
PRAYAGRAJ TPP	2	660	17-Dec-2016	31-Mar-2017	104	2507.63	GRID MISCELLANEOUS	2.18	0.06
PRAYAGRAJ TPP	2	660	23-Dec-2016	31-Mar-2017	98	2358.00	WATER WALL TUBE LEAKAGE	129.03	3.84
PRAYAGRAJ TPP	2	660	25-Jan-2017	31-Mar-2017	65	1567.95	WATER WALL TUBE LEAKAGE	65.64	1.95
PRAYAGRAJ TPP	2	660	25-Nov-2016	31-Mar-2017	126	3026.62	GENERATOR PROTECTION RELAY OPERATION	2.71	0.08
LALITPUR TPS	1	660	08-Nov-2016	30-Jan-2017	83	1991.12	RSD/LOW SCHEDULE	1314.14	22.73
LALITPUR TPS	1	660	16-Jul-2016	23-Aug-2016	38	923.23	RSD/LOW SCHEDULE	609.33	10.54
LALITPUR TPS	2	660	26-Nov-2016	22-Jan-2017	57	1361.95	RSD/LOW SCHEDULE	898.89	31.18
RAJIV GANDHI TPS	1	600	09-Feb-2017	31-Mar-2017	51	1215.98	RSD/LOW SCHEDULE	729.59	13.88
RAJIV GANDHI TPS	2	600	11-Nov-2016	07-Jan-2017	57	1361.10	RESERVE SHUT DOWN / STANDBY UNIT	816.66	15.54
KALISINDH TPS	2	600	04-Jun-2016	19-Nov-2016	168	4038.25	UNIT AUX. TRANSFORMER PROBLEM	2422.95	46.10
INDIRA GANDHI STPP	1	500	04-Oct-2016	11-Nov-2016	37	894.52	RSD/LOW SCHEDULE	447.26	10.21
INDIRA GANDHI STPP	1	500	07-Jan-2017	09-Feb-2017	32	774.30	RESERVE SHUT DOWN / STANDBY UNIT	387.15	8.84
INDIRA GANDHI STPP	2	500	07-Jan-2017	11-Feb-2017	35	847.73	RESERVE SHUT DOWN / STANDBY UNIT	423.87	9.68
INDIRA GANDHI STPP	2	500	26-Oct-2016	21-Nov-2016	26	615.30	RSD/LOW SCHEDULE	307.65	7.02

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
INDIRA GANDHI STPP	3	500	22-Dec-2016	31-Mar-2017	99	2379.65	RESERVE SHUT DOWN / STANDBY UNIT	1189.83	27.17
ANPARA TPS	6	500	29-Jul-2016	10-Sep-2016	44	1049.43	MAIN STEAM LINE PROBLEM	524.72	13.05
DADRI (NCTPP)	5	490	28-Dec-2016	23-Mar-2017	85	2049.22	RSD/LOW SCHEDULE	1004.12	23.39
YAMUNA NAGAR TPS	1	300	11-May-2016	09-Jun-2016	29	703.10	RSD/LOW SCHEDULE	210.93	8.03
GOINDWAL SAHIB TPP	1	270	19-Aug-2016	31-Mar-2017	225	5388.48	COAL SHORTAGE	1454.89	61.51
GOINDWAL SAHIB TPP	1	270	22-Apr-2016	09-Aug-2016	109	2624.90	MINOR MAINTENANCE WORKS	708.72	29.96
GOINDWAL SAHIB TPP	2	270	06-Aug-2016	31-Mar-2017	237	5691.25	REHEATER TUBE LEAKAGE	1536.64	70.79
GOINDWAL SAHIB TPP	2	270	16-Apr-2016	16-Jul-2016	92	2201.65	MINOR MAINTENANCE WORKS	594.45	27.38
PANIPAT TPS	7	250	15-May-2016	13-Jun-2016	29	705.52	RSD/LOW SCHEDULE	176.38	8.05
PANIPAT TPS	8	250	08-Jan-2017	09-Feb-2017	32	766.73	RESERVE SHUT DOWN / STANDBY UNIT	191.68	8.75
PANIPAT TPS	8	250	10-Aug-2016	25-Sep-2016	45	1087.12	RESERVE SHUT DOWN / STANDBY UNIT	271.78	12.41
PANIPAT TPS	8	250	13-Oct-2016	16-Dec-2016	63	1519.82	RSD/LOW SCHEDULE	379.96	17.35
PANIPAT TPS	8	250	15-May-2016	13-Jun-2016	29	696.90	RSD/LOW SCHEDULE	174.23	7.96
GH TPS (LEH.MOH.)	3	250	01-Apr-2016	02-May-2016	31	743.95	RSD/LOW SCHEDULE	185.99	8.49
GH TPS (LEH.MOH.)	3	250	16-Oct-2016	05-Dec-2016	50	1197.33	RSD/LOW SCHEDULE	299.33	13.67
GH TPS (LEH.MOH.)	3	250	25-Jan-2017	23-Mar-2017	57	1366.55	RSD/LOW SCHEDULE	341.64	15.60
GH TPS (LEH.MOH.)	4	250	02-Nov-2016	01-Dec-2016	29	697.32	RSD/LOW SCHEDULE	174.33	7.96
GH TPS (LEH.MOH.)	4	250	15-Dec-2016	21-Jan-2017	36	870.95	RSD/LOW SCHEDULE	217.74	9.94
GH TPS (LEH.MOH.)	4	250	17-Aug-2016	14-Sep-2016	28	661.30	RSD/LOW SCHEDULE	165.33	7.55
GH TPS (LEH.MOH.)	4	250	23-Jan-2017	31-Mar-2017	68	1631.33	RSD/LOW SCHEDULE	407.83	18.62
SURATGARH TPS	2	250	04-Mar-2017	31-Mar-2017	27	651.97	RSD/LOW SCHEDULE	162.99	7.44
SURATGARH TPS	2	250	15-Nov-2016	15-Dec-2016	30	718.82	RSD/LOW SCHEDULE	179.71	8.21
SURATGARH TPS	2	250	30-Dec-2016	02-Mar-2017	62	1477.42	RSD/LOW SCHEDULE	369.36	16.87
SURATGARH TPS	3	250	14-Jul-2016	28-Aug-2016	44	1067.53	RSD/LOW SCHEDULE	266.88	12.19
SURATGARH TPS	3	250	29-Dec-2016	31-Mar-2017	93	2226.62	RESERVE SHUT DOWN / STANDBY UNIT	556.66	25.42
SURATGARH TPS	4	250	05-Nov-2016	13-Dec-2016	38	902.02	RSD/LOW SCHEDULE	225.51	10.30
SURATGARH TPS	4	250	29-Dec-2016	31-Mar-2017	93	2230.72	RSD/LOW SCHEDULE	557.68	25.46
SURATGARH TPS	4	250	29-Jul-2016	23-Aug-2016	25	607.50	RSD/LOW SCHEDULE	151.88	6.94
SURATGARH TPS	5	250	11-Nov-2016	31-Mar-2017	140	3371.47	RSD/LOW SCHEDULE	842.87	38.49
SURATGARH TPS	5	250	29-Jul-2016	13-Sep-2016	46	1095.27	RSD/LOW SCHEDULE	273.82	12.50
SURATGARH TPS	6	250	19-Nov-2016	31-Mar-2017	133	3191.48	RSD/LOW SCHEDULE	797.87	36.43
SURATGARH TPS	6	250	28-Jul-2016	27-Aug-2016	30	719.32	RSD/LOW SCHEDULE	179.83	8.21
HARDUAGANJ TPS	8	250	27-Jan-2017	01-Mar-2017	33	800.73	RSD/LOW SCHEDULE	200.18	9.14
PARICHHA TPS	5	250	23-Jan-2017	20-Mar-2017	56	1350.67	RSD/LOW SCHEDULE	337.67	15.42
PARICHHA TPS	6	250	23-Jan-2017	10-Mar-2017	45	1091.12	RSD/LOW SCHEDULE	272.78	12.46

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
BADARPUR TPS	4	210	06-Nov-2016	08-Jan-2017	62	1494.77	RSD/LOW SCHEDULE	313.90	17.06
BADARPUR TPS	4	210	08-Jan-2017	31-Mar-2017	82	1977.77	RSD/LOW SCHEDULE	415.33	22.58
BADARPUR TPS	5	210	17-Oct-2016	31-Mar-2017	165	3962.82	RESERVE SHUT DOWN / STANDBY UNIT	832.19	45.24
PANIPAT TPS	5	210	01-Apr-2016	01-May-2016	31	734.00	RSD/LOW SCHEDULE	154.14	8.38
PANIPAT TPS	5	210	09-May-2016	19-Jun-2016	41	978.05	RSD/LOW SCHEDULE	205.39	11.16
PANIPAT TPS	5	210	12-Jul-2016	29-Sep-2016	79	1888.42	RESERVE SHUT DOWN / STANDBY UNIT	396.57	21.56
PANIPAT TPS	5	210	13-Oct-2016	31-Mar-2017	169	4060.37	RSD/LOW SCHEDULE	852.68	46.35
PANIPAT TPS	6	210	01-Apr-2016	01-May-2016	30	721.33	RSD/LOW SCHEDULE	151.48	8.23
PANIPAT TPS	6	210	10-May-2016	19-Jun-2016	39	944.78	RSD/LOW SCHEDULE	198.40	10.78
PANIPAT TPS	6	210	13-Oct-2016	31-Mar-2017	169	4059.87	RSD/LOW SCHEDULE	852.57	46.35
PANIPAT TPS	6	210	14-Jul-2016	31-Aug-2016	48	1152.58	RESERVE SHUT DOWN / STANDBY UNIT	242.04	13.16
GH TPS (LEH.MOH.)	1	210	06-Oct-2016	06-Dec-2016	61	1465.23	RSD/LOW SCHEDULE	307.70	16.73
GH TPS (LEH.MOH.)	1	210	25-Jan-2017	31-Mar-2017	65	1562.67	RSD/LOW SCHEDULE	328.16	17.84
GH TPS (LEH.MOH.)	2	210	01-Apr-2016	10-May-2016	39	947.00	RSD/LOW SCHEDULE	198.87	10.81
GH TPS (LEH.MOH.)	2	210	02-Jul-2016	01-Aug-2016	30	723.95	RSD/LOW SCHEDULE	152.03	8.26
GH TPS (LEH.MOH.)	2	210	19-Dec-2016	21-Jan-2017	33	791.90	RSD/LOW SCHEDULE	166.30	9.04
GH TPS (LEH.MOH.)	2	210	20-Aug-2016	04-Dec-2016	106	2543.38	RSD/LOW SCHEDULE	534.11	29.03
GH TPS (LEH.MOH.)	2	210	23-Jan-2017	31-Mar-2017	68	1631.63	RSD/LOW SCHEDULE	342.64	18.63
ROPAR TPS	1	210	01-Apr-2016	10-May-2016	40	948.20	RSD/LOW SCHEDULE	199.12	10.82
ROPAR TPS	1	210	08-Oct-2016	31-Mar-2017	174	4181.17	RSD/LOW SCHEDULE	878.05	47.73
ROPAR TPS	2	210	01-Apr-2016	01-Jun-2016	61	1475.50	RESERVE SHUT DOWN / STANDBY UNIT	309.86	16.84
ROPAR TPS	2	210	11-Oct-2016	04-Dec-2016	54	1300.67	RSD/LOW SCHEDULE	273.14	14.85
ROPAR TPS	2	210	18-Dec-2016	31-Mar-2017	103	2473.25	RSD/LOW SCHEDULE	519.38	28.23
ROPAR TPS	3	210	01-Apr-2016	02-May-2016	31	754.83	RSD/LOW SCHEDULE	158.51	8.62
ROPAR TPS	3	210	03-Nov-2016	01-Dec-2016	29	685.50	RSD/LOW SCHEDULE	143.96	7.83
ROPAR TPS	3	210	18-Dec-2016	31-Mar-2017	103	2476.08	RSD/LOW SCHEDULE	519.98	28.27
ROPAR TPS	4	210	01-Apr-2016	01-Jun-2016	61	1468.58	RSD/LOW SCHEDULE	308.40	16.76
ROPAR TPS	4	210	05-Oct-2016	31-Mar-2017	177	4260.00	RSD/LOW SCHEDULE	894.60	48.63
ROPAR TPS	4	210	06-Aug-2016	07-Sep-2016	31	750.83	RSD/LOW SCHEDULE	157.67	8.57
ROPAR TPS	5	210	18-Aug-2016	14-Sep-2016	27	643.83	RSD/LOW SCHEDULE	135.20	7.35
ROPAR TPS	5	210	26-Dec-2016	25-Mar-2017	89	2130.63	RSD/LOW SCHEDULE	447.43	24.32
ROPAR TPS	6	210	01-Apr-2016	13-May-2016	42	1015.42	RSD/LOW SCHEDULE	213.24	11.59
ROPAR TPS	6	210	07-Jan-2017	31-Mar-2017	84	2007.63	RSD/LOW SCHEDULE	421.60	22.92
ROPAR TPS	6	210	10-Aug-2016	07-Sep-2016	28	669.83	RSD/LOW SCHEDULE	140.66	7.65
KOTA TPS	3	210	29-Jul-2016	08-Sep-2016	40	962.92	RSD/LOW SCHEDULE	202.21	10.99

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
PARICHHA TPS	3	210	23-Jan-2017	23-Mar-2017	59	1405.93	RSD/LOW SCHEDULE	295.25	16.05
PARICHHA TPS	4	210	26-Jan-2017	10-Mar-2017	42	1013.60	RSD/LOW SCHEDULE	212.86	11.57
ANPARA TPS	3	210	20-Aug-2016	29-Dec-2016	131	3142.98	ROTOR/ ROTOR EARTH FAULT	660.03	35.88
DADRI (NCTPP)	1	210	09-Oct-2016	03-Feb-2017	117	2797.17	RSD/LOW SCHEDULE	587.41	31.93
DADRI (NCTPP)	2	210	07-May-2016	03-Jun-2016	27	657.17	RSD/LOW SCHEDULE	138.01	7.50
DADRI (NCTPP)	2	210	21-Oct-2016	31-Mar-2017	161	3867.75	RSD/LOW SCHEDULE	812.23	44.15
DADRI (NCTPP)	3	210	09-Dec-2016	17-Jan-2017	38	920.70	RSD/LOW SCHEDULE	193.35	10.51
DADRI (NCTPP)	3	210	25-Jan-2017	22-Mar-2017	56	1332.35	RSD/LOW SCHEDULE	279.79	15.21
DADRI (NCTPP)	4	210	03-Nov-2016	30-Nov-2016	28	669.25	RSD/LOW SCHEDULE	140.54	7.64
DADRI (NCTPP)	4	210	11-Jun-2016	06-Aug-2016	56	1350.42	RSD/LOW SCHEDULE	283.59	15.42
DADRI (NCTPP)	4	210	25-Feb-2017	28-Mar-2017	32	764.18	RSD/LOW SCHEDULE	160.48	8.72
OBRA TPS	10	200	06-Jul-2016	01-Dec-2016	148	3555.22	WATER WALL TUBE LEAKAGE	711.04	40.58
KOTA TPS	6	195	30-Aug-2016	29-Sep-2016	29	704.80	RSD/LOW SCHEDULE	137.44	8.05
JALIPA KAPURDI TPP	6	135	01-Mar-2017	31-Mar-2017	31	741.45	BOILER MISC. PROBLEM	100.10	8.46
JALIPA KAPURDI TPP	8	135	19-Apr-2016	15-May-2016	27	640.42	BOILER MISC. PROBLEM	86.46	7.31
GND TPS(BHATINDA)	1	110	01-Apr-2016	15-Jun-2016	76	1815.75	RSD/LOW SCHEDULE	199.73	20.73
GND TPS(BHATINDA)	1	110	21-Aug-2016	31-Mar-2017	223	5343.67	RSD/LOW SCHEDULE	587.80	61.00
GND TPS(BHATINDA)	2	110	02-Jul-2016	05-Aug-2016	34	821.28	RSD/LOW SCHEDULE	90.34	9.38
GND TPS(BHATINDA)	2	110	03-Apr-2016	16-Jun-2016	74	1766.95	RSD/LOW SCHEDULE	194.36	20.17
GND TPS(BHATINDA)	2	110	06-Aug-2016	12-Sep-2016	36	873.73	RSD/LOW SCHEDULE	96.11	9.97
GND TPS(BHATINDA)	2	110	22-Sep-2016	31-Mar-2017	190	4565.67	RSD/LOW SCHEDULE	502.22	52.12
GND TPS(BHATINDA)	3	110	01-Apr-2016	19-May-2016	49	1168.77	RSD/LOW SCHEDULE	128.56	13.34
GND TPS(BHATINDA)	3	110	10-Oct-2016	31-Mar-2017	173	4140.08	RSD/LOW SCHEDULE	455.41	47.26
GND TPS(BHATINDA)	4	110	07-Oct-2016	31-Mar-2017	175	4204.50	RSD/LOW SCHEDULE	462.50	48.00
KOTA TPS	1	110	26-Jan-2017	25-Feb-2017	31	732.08	RSD/LOW SCHEDULE	80.53	8.36
KOTA TPS	2	110	08-Aug-2016	11-Sep-2016	33	800.63	P.A. FANS PROBLEM	88.07	9.14
PARICHHA TPS	2	110	07-Nov-2016	24-Dec-2016	47	1118.67	RSD/LOW SCHEDULE	123.05	12.77
PARICHHA TPS	2	110	18-Jan-2017	30-Mar-2017	70	1690.73	RSD/LOW SCHEDULE	185.98	19.30
PARICHHA TPS	2	110	18-Jul-2016	23-Aug-2016	36	855.15	WATER WALL TUBE LEAKAGE	94.07	9.76
PANKI TPS	3	105	18-Jan-2017	29-Mar-2017	71	1703.93	RSD/LOW SCHEDULE	178.91	19.45
PANKI TPS	4	105	18-Jan-2017	30-Mar-2017	70	1686.08	RSD/LOW SCHEDULE	177.04	19.25
HARDUAGANJ TPS	7	105	03-Nov-2016	01-Dec-2016	28	676.78	FURNACE FIRE OUT /FLAME FAILURE	71.06	7.73
HARDUAGANJ TPS	7	105	12-Feb-2017	29-Mar-2017	45	1086.37	RSD/LOW SCHEDULE	114.07	12.40
BADARPUR TPS	1	95	01-Apr-2016	31-Mar-2017	365	8760.00	POLLUTION PROBLEM	832.20	100.00
BADARPUR TPS	2	95	01-Apr-2016	31-Mar-2017	365	8760.00	POLLUTION PROBLEM	832.20	100.00
BADARPUR TPS	3	95	01-Apr-2016	31-Mar-2017	365	8760.00	POLLUTION PROBLEM	832.20	100.00
OBRA TPS	8	94	01-Apr-2016	31-Mar-2017	365	8760.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	823.44	100.00

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
RAJGHAT TPS	1	67.5	01-Apr-2016	31-Mar-2017	365	8760.00	RSD/LOW SCHEDULE	591.30	100.00
RAJGHAT TPS	2	67.5	01-Apr-2016	31-Mar-2017	365	8760.00	RSD/LOW SCHEDULE	591.30	100.00
HARDUAGANJ TPS	5	60	01-Apr-2016	31-Mar-2017	365	8760.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	525.60	100.00
OBRA TPS	2	50	10-Sep-2016	19-Oct-2016	40	952.42	ELECTRICAL MISCELLANEOUS PROBLEMS	47.62	10.87
OBRA TPS	2	50	18-Jul-2016	05-Sep-2016	49	1179.02	MILLING SYSTEM /RC FEEDER PROBLEM	58.95	13.46
OBRA TPS	2	50	23-May-2016	30-Jun-2016	37	890.90	MILLING SYSTEM /RC FEEDER PROBLEM	44.55	10.17
KHAMBARKHERA TPS	1	45	22-Jan-2017	31-Mar-2017	68	1638.68	RSD/LOW SCHEDULE	73.74	18.71
KHAMBARKHERA TPS	2	45	07-Feb-2017	30-Mar-2017	51	1224.08	RSD/LOW SCHEDULE	55.08	13.97
KHAMBARKHERA TPS	2	45	24-Dec-2016	07-Feb-2017	45	1083.50	GENERATOR ROTOR DAMAGED	48.76	12.37
BARKHERA TPS	1	45	22-Jan-2017	30-Mar-2017	67	1614.95	RSD/LOW SCHEDULE	72.67	18.43
OBRA TPS	1	40	03-Jul-2016	29-Jul-2016	26	626.83	MILLING SYSTEM /RC FEEDER PROBLEM	25.07	7.15
OBRA TPS	1	40	06-Aug-2016	31-Mar-2017	237	5698.72	WATER WALL TUBE LEAKAGE	227.95	65.05
SUB TOTAL	**149**	**41869.0**			**12504**	**300227.22**		**56731.48**	
WESTERN REGION									
MUNDRA UMTPP	5	800	05-Nov-2016	02-Dec-2016	26	634.48	CONDENSER TUBE LEAKAGE/ CLEANING	507.58	7.24
RAIKHEDA TPP	1	685	27-May-2016	20-Feb-2017	268	6438.00	NO Power purchase agreement	4410.03	73.49
RAIKHEDA TPP	2	685	01-Apr-2016	14-Jul-2016	105	2516.78	NON STABLISED UNIT	1723.99	28.73
RAIKHEDA TPP	2	685	02-Aug-2016	31-Mar-2017	242	5806.83	NO Power purchase agreement	3977.68	66.29
MUNDRA TPS	6	660	03-Dec-2016	31-Dec-2016	28	678.98	AIR PREHEATERS PROBLEM	448.13	7.75
MUNDRA TPS	6	660	03-Mar-2017	31-Mar-2017	28	675.23	HYDROGEN PRESSURE PROBLEM	445.65	7.71
NIGRI TPP	2	660	04-Dec-2016	02-Jan-2017	29	697.72	TURBINE MISC. PROBLEM	460.50	7.96
KORADI TPS	10	660	07-Feb-2017	31-Mar-2017	53	1271.88	MINOR MAINTENANCE WORKS	348.40	37.28
KORADI TPS	10	660	17-Jan-2017	31-Mar-2017	74	1776.00	WATER WALL TUBE LEAKAGE	0.00	0.00
KORADI TPS	10	660	28-Jan-2017	31-Mar-2017	62	1496.08	BOILER FEED PUMP/MOTOR PROBLEM	0.00	0.00
TIRORA TPS	1	660	06-Nov-2016	15-Feb-2017	101	2431.90	GRID MISCELLANEOUS	1605.05	27.76
TIRORA TPS	1	660	13-May-2016	30-Jun-2016	48	1147.30	RAW WATER SHORTAGE	757.22	13.10
TIRORA TPS	2	660	25-May-2016	30-Jun-2016	36	854.63	RAW WATER SHORTAGE	564.06	9.76
TIRORA TPS	3	660	20-Apr-2016	01-Jul-2016	72	1736.97	RSD/LOW SCHEDULE	1146.40	19.83
TIRORA TPS	4	660	13-Jul-2016	21-Aug-2016	40	957.12	RESERVE SHUT DOWN / STANDBY UNIT	631.70	10.93
TIRORA TPS	5	660	05-May-2016	01-Jul-2016	56	1352.23	RAW WATER SHORTAGE	892.47	15.44
SALAYA TPP	2	600	28-Oct-2016	11-Dec-2016	43	1042.38	MISC. SHORT DURATION MAINTENANCE	625.43	11.90
SHREE SINGAJI TPP	1	600	11-Sep-2016	18-Oct-2016	37	893.00	RSD/LOW SCHEDULE	535.80	10.19

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
SHREE SINGAJI TPP	1	600	20-May-2016	01-Aug-2016	73	1757.80	RSD/LOW SCHEDULE	1054.68	20.07
SHREE SINGAJI TPP	1	600	26-Jan-2017	27-Mar-2017	60	1440.03	RSD/LOW SCHEDULE	864.02	16.44
SHREE SINGAJI TPP	2	600	01-Apr-2016	17-Jul-2016	108	2591.98	RSD/LOW SCHEDULE	1555.19	29.59
SHREE SINGAJI TPP	2	600	19-Sep-2016	24-Oct-2016	34	822.65	RSD/LOW SCHEDULE	493.59	9.39
MAHAN TPP	1	600	01-Apr-2016	30-Apr-2016	29	705.95	COAL FEEDING PROBLEM IN PLANT	423.57	8.06
SEIONI TPP	1	600	16-Aug-2016	12-Nov-2016	88	2108.32	RSD/LOW SCHEDULE	1264.99	26.22
SEIONI TPP	1	600	19-Nov-2016	21-Dec-2016	32	768.15	Other Commercial Reason	460.89	9.55
SEIONI TPP	1	600	27-Jun-2016	16-Aug-2016	51	1214.58	RSD/LOW SCHEDULE	728.75	15.11
SEIONI TPP	1	600	31-Dec-2016	30-Mar-2017	89	2146.92	TURBINE BEARING PROBLEM	1288.15	26.70
ANUPPUR TPP	2	600	16-May-2016	31-Mar-2017	319	7659.78	FURNACE DRAFT ABNORMAL	4595.87	87.44
AKALTARA TPS	3	600	14-Oct-2016	10-Nov-2016	26	633.67	COAL FEEDING PROBLEM IN PLANT	380.20	7.23
AKALTARA TPS	4	600	10-Nov-2016	31-Dec-2016	51	1226.40	BOILER MISC. PROBLEM	735.84	14.00
AVANTHA BHANDAR	1	600	02-Jul-2016	01-Sep-2016	61	1463.87	TURBINE VIBRATIONS HIGH	878.32	16.71
AVANTHA BHANDAR	1	600	03-Oct-2016	07-Nov-2016	35	844.53	RSD/LOW SCHEDULE	506.72	9.64
TAMNAR TPP	1	600	01-Apr-2016	20-May-2016	50	1199.18	COAL FEEDING SYSTEM FAILURE.	719.51	13.69
TAMNAR TPP	1	600	01-Sep-2016	30-Nov-2016	90	2165.08	AIR PREHEATERS PROBLEM	1299.05	24.72
TAMNAR TPP	1	600	04-Jun-2016	10-Aug-2016	67	1602.05	RSD/LOW SCHEDULE	961.23	18.29
TAMNAR TPP	2	600	29-Apr-2016	16-Jun-2016	49	1172.85	RSD/LOW SCHEDULE	703.71	13.39
TAMNAR TPP	2	600	30-Nov-2016	10-Mar-2017	100	2408.25	AIR PREHEATERS PROBLEM	1444.95	27.49
TAMNAR TPP	3	600	17-Jun-2016	31-Mar-2017	288	6902.10	RSD/LOW SCHEDULE	4141.26	78.79
TAMNAR TPP	4	600	12-Dec-2016	31-Mar-2017	110	2640.00	NO Power purchase agreement	1584.00	90.91
UKAI TPS	6	500	06-Apr-2016	19-May-2016	43	1023.72	STATOR/ STATOR EARTH FAULT	511.86	11.69
MARWA TPS	1	500	02-May-2016	12-Mar-2017	314	7526.00	WATER WALL TUBE LEAKAGE	3763.00	85.91
MARWA TPS	2	500	02-Mar-2017	31-Mar-2017	30	709.45	PIPES and VALVES BOILER SIDE	1.55	0.05
MARWA TPS	2	500	02-Nov-2016	31-Mar-2017	150	3589.30	P.A. FANS PROBLEM	1.61	0.06
MARWA TPS	2	500	03-Jan-2017	31-Mar-2017	88	2106.47	DRUM LEVEL LOW	1.65	0.06
MARWA TPS	2	500	03-Mar-2017	31-Mar-2017	28	679.68	P.A. FANS PROBLEM	1.54	0.05
MARWA TPS	2	500	06-Sep-2016	31-Mar-2017	206	4952.53	WATER WALL TUBE LEAKAGE	117.19	4.02
MARWA TPS	2	500	10-Feb-2017	31-Mar-2017	49	1178.88	WATER WALL TUBE LEAKAGE	80.46	2.76
MARWA TPS	2	500	10-Jan-2017	31-Mar-2017	81	1941.80	P.A. FANS PROBLEM	2.11	0.07
MARWA TPS	2	500	10-Nov-2016	31-Mar-2017	142	3399.05	GEN. TRANSORMER PROTECTION RELAY OPERATION PROBLEM	88.11	3.02
MARWA TPS	2	500	11-Oct-2016	31-Mar-2017	171	4114.60	WATER WALL TUBE LEAKAGE	51.96	1.78
MARWA TPS	2	500	17-Nov-2016	31-Mar-2017	134	3217.52	HYDROGEN PRESSURE PROBLEM	9.71	0.33
MARWA TPS	2	500	20-Feb-2017	31-Mar-2017	40	954.13	WATER WALL TUBE LEAKAGE	80.46	2.76
MARWA TPS	2	500	20-Sep-2016	31-Mar-2017	193	4622.17	FURNACE FIRE OUT /FLAME FAILURE	1.19	0.04

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
MARWA TPS	2	500	29-Aug-2016	31-Mar-2017	214	5136.10	BOILER MISC. PROBLEM	4.78	0.16
MARWA TPS	2	500	30-Jan-2017	31-Mar-2017	61	1454.20	TURBINE MISC. PROBLEMS	2.09	0.07
MARWA TPS	2	500	30-Nov-2016	31-Mar-2017	121	2912.22	PIPES and VALVES BOILER SIDE	0.00	0.00
MARWA TPS	2	500	30-Sep-2016	31-Mar-2017	182	4379.83	I.D. FANS PROBLEM	0.00	0.00
MAUDA TPS	1	500	18-Jul-2016	26-Aug-2016	39	947.65	RSD/LOW SCHEDULE	473.83	10.82
MAUDA TPS	1	500	25-Dec-2016	23-Jan-2017	28	680.12	RSD/LOW SCHEDULE	340.06	7.76
MAUDA TPS	2	500	04-Oct-2016	21-Nov-2016	48	1150.18	RESERVE SHUT DOWN / STANDBY UNIT	575.09	13.13
MAUDA TPS	2	500	17-Jul-2016	15-Aug-2016	30	719.60	RSD/LOW SCHEDULE	359.80	8.21
MAUDA TPS	2	500	28-Jan-2017	27-Feb-2017	30	724.10	RSD/LOW SCHEDULE	362.05	8.27
BHUSAWAL TPS	4	500	15-Sep-2016	20-Oct-2016	35	835.08	RSD/LOW SCHEDULE	417.54	9.53
BHUSAWAL TPS	5	500	01-Jul-2016	23-Aug-2016	53	1263.28	RSD/LOW SCHEDULE	631.64	14.42
BHUSAWAL TPS	5	500	17-Sep-2016	23-Oct-2016	36	856.80	RSD/LOW SCHEDULE	428.40	9.78
TROMBAY TPS	6	500	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	4380.00	100.00
UCHPINDA TPP	1	360	01-Apr-2016	12-Feb-2017	317	7608.63	NO Power purchase agreement	2739.11	86.86
UCHPINDA TPP	1	360	03-Mar-2017	31-Mar-2017	29	688.03	RSD/LOW SCHEDULE	247.69	7.85
MUNDRA TPS	1	330	05-Mar-2017	31-Mar-2017	26	629.03	FUEL SUPPLY & OTHER MISC. PROBLEMS	207.58	7.18
MUNDRA TPS	2	330	13-Nov-2016	22-Dec-2016	39	937.60	TURBINE MISC. PROBLEMS	309.41	10.70
MUNDRA TPS	3	330	13-Nov-2016	15-Dec-2016	31	748.15	CONDENSER LOW VACCUM	246.89	8.54
BALCO TPS	1	300	17-Sep-2016	25-Oct-2016	38	923.68	E.S.P.MISCELLANEOUS	277.10	10.54
BALCO TPS	2	300	21-Jul-2016	24-Aug-2016	35	828.22	I.D. FANS PROBLEM	248.47	9.45
BANDAKHAR TPP	1	300	01-Apr-2016	15-May-2016	44	1056.00	BOILER MISC. PROBLEM	316.80	12.05
BANDAKHAR TPP	1	300	17-Jun-2016	16-Jul-2016	29	703.20	I.D. FANS PROBLEM	210.96	8.03
NAWAPARA TPP	1	300	06-Oct-2016	31-Mar-2017	176	4226.45	F.D. FANS PROBLEM	47.41	3.11
NAWAPARA TPP	1	300	13-Feb-2017	31-Mar-2017	47	1126.50	I.D. FANS PROBLEM	65.66	4.30
NAWAPARA TPP	1	300	14-Dec-2016	31-Mar-2017	107	2579.23	ECONOMISER TUBE LEAKAGE	32.09	2.10
NAWAPARA TPP	1	300	15-Oct-2016	31-Mar-2017	168	4029.65	GEN. COOLING SYSTEM FAILURE	0.54	0.04
NAWAPARA TPP	1	300	17-Sep-2016	31-Mar-2017	195	4687.38	MILLING SYSTEM /RC FEEDER PROBLEM	26.48	1.73
NAWAPARA TPP	1	300	19-Aug-2016	31-Mar-2017	225	5400.00	NON STABLISED UNIT	108.52	7.11
NAWAPARA TPP	1	300	21-Sep-2016	31-Mar-2017	191	4593.70	DRUM LEVEL HIGH/ low	1.54	0.10
NAWAPARA TPP	1	300	23-Sep-2016	31-Mar-2017	190	4558.18	TURBINE CONTROL VALVE PROBLEM	14.18	0.93
NAWAPARA TPP	1	300	24-Dec-2016	31-Mar-2017	98	2350.67	GENERATOR MISCLLANEOUS MAINTENANCE	56.44	3.70
NAWAPARA TPP	1	300	25-Sep-2016	31-Mar-2017	188	4509.83	BOILER MISC. PROBLEM	16.27	1.07

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
NAWAPARA TPP	1	300	31-Oct-2016	31-Mar-2017	152	3647.63	ECONOMISER TUBE LEAKAGE	161.18	10.56
JSW RATNAGIRI TPP	1	300	16-Nov-2016	03-Mar-2017	107	2567.03	C.W. PUMP PROBLEM	770.11	29.30
JSW RATNAGIRI TPP	2	300	01-Dec-2016	31-Mar-2017	121	2904.00	RESERVE SHUT DOWN / STANDBY UNIT	871.20	33.15
GMR WARORA TPS	1	300	15-Apr-2016	01-Jun-2016	47	1123.35	RAW WATER SHORTAGE	337.01	12.82
GMR WARORA TPS	2	300	19-Apr-2016	27-May-2016	38	913.47	RAW WATER SHORTAGE	274.04	10.43
BUTIBORI TPP	1	300	03-Jan-2017	14-Mar-2017	70	1691.28	TURBINE BEARING FAILURE.	507.38	19.31
DHARIWAL TPP	1	300	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	2628.00	100.00
BELA TPS	1	270	01-Apr-2016	31-Mar-2017	365	8760.00	UNECONOMICAL OPERATION	2365.20	100.00
AMARAVATI TPS	1	270	01-Jul-2016	09-Sep-2016	70	1671.47	RSD/LOW SCHEDULE	451.30	19.08
AMARAVATI TPS	1	270	14-Sep-2016	24-Oct-2016	39	940.52	RSD/LOW SCHEDULE	253.94	10.74
AMARAVATI TPS	1	270	17-Nov-2016	27-Mar-2017	130	3109.88	RSD/LOW SCHEDULE	839.67	35.50
AMARAVATI TPS	2	270	12-Sep-2016	07-Nov-2016	56	1350.35	RSD/LOW SCHEDULE	364.59	15.41
AMARAVATI TPS	2	270	16-Nov-2016	28-Mar-2017	131	3152.63	RSD/LOW SCHEDULE	851.21	35.99
AMARAVATI TPS	2	270	18-Jun-2016	09-Sep-2016	83	1999.87	RSD/LOW SCHEDULE	539.96	22.83
AMARAVATI TPS	3	270	20-Apr-2016	17-May-2016	27	649.88	RSD/LOW SCHEDULE	175.47	7.42
AMARAVATI TPS	3	270	29-Jun-2016	29-Mar-2017	273	6557.98	RSD/LOW SCHEDULE	1770.65	74.86
AMARAVATI TPS	4	270	15-Sep-2016	24-Oct-2016	39	930.70	RSD/LOW SCHEDULE	251.29	10.62
AMARAVATI TPS	4	270	16-Nov-2016	30-Mar-2017	133	3200.98	RSD/LOW SCHEDULE	864.26	36.54
AMARAVATI TPS	4	270	30-Jun-2016	08-Sep-2016	70	1679.62	RSD/LOW SCHEDULE	453.50	19.17
AMARAVATI TPS	5	270	15-Nov-2016	27-Mar-2017	132	3165.97	RSD/LOW SCHEDULE	854.81	36.14
AMARAVATI TPS	5	270	24-May-2016	07-Nov-2016	167	4016.32	RSD/LOW SCHEDULE	1084.41	45.85
NASIK (P) TPS	1	270	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	2365.20	100.00
SIKKA REP. TPS	3	250	21-May-2016	10-Oct-2016	142	3398.10	RSD/LOW SCHEDULE	849.53	38.79
SIKKA REP. TPS	4	250	28-Jul-2016	08-Sep-2016	42	1011.62	RSD/LOW SCHEDULE	252.91	11.55
BHAVNAGAR CFBC TPP	1	250	01-Jan-2017	31-Mar-2017	90	2159.98	BOILER MISC. PROBLEM	130.43	7.15
BHAVNAGAR CFBC TPP	1	250	03-Feb-2017	31-Mar-2017	57	1366.22	LIGNITE FEEDING MISC.	21.71	1.19
BHAVNAGAR CFBC TPP	1	250	10-Feb-2017	31-Mar-2017	49	1177.58	COAL FEEDING PROBLEM IN PLANT	108.40	5.94
BHAVNAGAR CFBC TPP	1	250	16-Jul-2016	31-Mar-2017	259	6213.17	NON STABLISED UNIT	223.26	12.24
BHAVNAGAR CFBC TPP	1	250	21-Nov-2016	31-Mar-2017	131	3138.10	F.D. FANS PROBLEM	0.91	0.05
BHAVNAGAR CFBC TPP	1	250	21-Nov-2016	31-Mar-2017	131	3143.20	ELECTRICAL MISCELLANEOUS PROBLEMS	0.80	0.04
BHAVNAGAR CFBC TPP	1	250	22-Nov-2016	31-Mar-2017	129	3099.25	PIPES and VALVES BOILER SIDE	4.46	0.24
BHAVNAGAR CFBC TPP	1	250	24-Nov-2016	31-Mar-2017	128	3061.30	PIPES and VALVES BOILER SIDE	4.46	0.24
BHAVNAGAR CFBC TPP	1	250	26-Dec-2016	31-Mar-2017	95	2285.67	LIGNITE FEEDING PROBLEM IN PLANT	5.74	0.31
BHAVNAGAR CFBC TPP	1	250	28-Nov-2016	31-Mar-2017	124	2964.53	PIPES and VALVES BOILER SIDE	4.46	0.24
BHAVNAGAR CFBC TPP	1	250	29-Nov-2016	31-Mar-2017	123	2948.28	NON STABLISED UNIT	266.88	14.63

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
SATPURA TPS	10	250	02-Jul-2016	19-Aug-2016	49	1164.25	RSD/LOW SCHEDULE	291.06	13.29
SATPURA TPS	11	250	04-Jul-2016	10-Sep-2016	69	1648.78	RESERVE SHUT DOWN / STANDBY UNIT	412.20	18.82
BINA TPS	1	250	01-Apr-2016	20-May-2016	49	1182.48	RSD/LOW SCHEDULE	295.62	13.50
BINA TPS	1	250	05-Mar-2017	31-Mar-2017	27	641.17	ROTOR/ ROTOR EARTH FAULT	160.29	7.32
BINA TPS	1	250	06-Jan-2017	01-Feb-2017	26	631.35	BOILER MISC. PROBLEM	157.84	7.21
BINA TPS	1	250	22-May-2016	20-Sep-2016	121	2906.88	RSD/LOW SCHEDULE	726.72	33.18
BINA TPS	1	250	26-Sep-2016	12-Nov-2016	47	1136.65	RSD/LOW SCHEDULE	284.16	12.98
BINA TPS	2	250	01-Apr-2016	17-Sep-2016	170	4074.73	RSD/LOW SCHEDULE	1018.68	46.52
BINA TPS	2	250	26-Sep-2016	26-Oct-2016	31	740.10	RSD/LOW SCHEDULE	185.03	8.45
OP JINDAL TPS	1	250	06-Jul-2016	01-Aug-2016	26	632.60	RSD/LOW SCHEDULE	158.15	7.22
OP JINDAL TPS	1	250	17-May-2016	19-Jun-2016	33	780.63	RSD/LOW SCHEDULE	195.16	8.91
OP JINDAL TPS	1	250	24-Dec-2016	23-Jan-2017	31	732.17	RESERVE SHUT DOWN / STANDBY UNIT	183.04	8.36
OP JINDAL TPS	2	250	14-Apr-2016	17-May-2016	33	798.97	RSD/LOW SCHEDULE	199.74	9.12
OP JINDAL TPS	2	250	19-Nov-2016	20-Mar-2017	121	2907.37	AIR PREHEATERS PROBLEM	726.84	33.19
OP JINDAL TPS	3	250	03-May-2016	02-Oct-2016	152	3647.25	RSD/LOW SCHEDULE	911.81	41.64
OP JINDAL TPS	3	250	06-Oct-2016	04-Nov-2016	29	691.42	AIR PREHEATERS PROBLEM	172.86	7.89
OP JINDAL TPS	4	250	23-Jan-2017	28-Feb-2017	36	870.92	ASH HANDLING SYSTEM PROBLEM	217.73	9.94
PARLI TPS	6	250	01-Apr-2016	30-Sep-2016	183	4389.83	BOILER AUX. MISC. PROMLEMS	1097.46	50.11
PARLI TPS	7	250	01-Apr-2016	22-Sep-2016	175	4189.45	RAW WATER SHORTAGE	1047.36	47.82
PARLI TPS	7	250	22-Sep-2016	18-Oct-2016	26	623.70	RSD/LOW SCHEDULE	155.93	7.12
PARLI TPS	8	250	30-Nov-2016	18-Mar-2017	108	2593.22	NON-READINESS OF RESIDUAL WORK OF NEW UNIT	648.31	89.30
DAHANU TPS	2	250	01-Apr-2016	26-Apr-2016	26	615.43	STATOR/ STATOR EARTH FAULT	153.86	7.03
UKAI TPS	5	210	16-May-2016	18-Jun-2016	33	798.22	WATER WALL TUBE LEAKAGE	167.63	9.11
GANDHI NAGAR TPS	3	210	12-Jun-2016	13-Sep-2016	93	2223.42	RSD/LOW SCHEDULE	466.92	25.38
GANDHI NAGAR TPS	4	210	04-Oct-2016	21-Nov-2016	48	1147.38	RSD/LOW SCHEDULE	240.95	13.10
GANDHI NAGAR TPS	4	210	07-Jul-2016	16-Aug-2016	40	951.25	RESERVE SHUT DOWN / STANDBY UNIT	199.76	10.86
GANDHI NAGAR TPS	4	210	13-Dec-2016	19-Jan-2017	36	873.50	RESERVE SHUT DOWN / STANDBY UNIT	183.44	9.97
GANDHI NAGAR TPS	4	210	24-Jan-2017	31-Mar-2017	66	1579.63	RSD/LOW SCHEDULE	331.72	18.03
WANAKBORI TPS	1	210	27-Jul-2016	08-Sep-2016	43	1024.03	RESERVE SHUT DOWN / STANDBY UNIT	215.05	11.69
WANAKBORI TPS	2	210	01-Jan-2017	20-Feb-2017	49	1184.92	RESERVE SHUT DOWN / STANDBY UNIT	248.83	13.53
WANAKBORI TPS	2	210	01-Oct-2016	07-Nov-2016	36	872.22	RESERVE SHUT DOWN / STANDBY UNIT	183.17	9.96
WANAKBORI TPS	2	210	28-Jun-2016	12-Sep-2016	76	1827.12	RSD/LOW SCHEDULE	383.70	20.86

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
WANAKBORI TPS	3	210	07-Jul-2016	13-Sep-2016	68	1622.65	RSD/LOW SCHEDULE	340.76	18.52
WANAKBORI TPS	3	210	17-Dec-2016	23-Jan-2017	36	868.97	RESERVE SHUT DOWN / STANDBY UNIT	182.48	9.92
WANAKBORI TPS	4	210	04-Oct-2016	06-Nov-2016	34	806.92	RESERVE SHUT DOWN / STANDBY UNIT	169.45	9.21
WANAKBORI TPS	4	210	08-Feb-2017	06-Mar-2017	25	609.47	RSD/LOW SCHEDULE	127.99	6.96
WANAKBORI TPS	4	210	19-Jul-2016	10-Sep-2016	53	1265.90	RESERVE SHUT DOWN / STANDBY UNIT	265.84	14.45
WANAKBORI TPS	5	210	25-Jun-2016	12-Sep-2016	78	1883.23	RESERVE SHUT DOWN / STANDBY UNIT	395.48	21.50
WANAKBORI TPS	5	210	31-Dec-2016	30-Jan-2017	30	711.12	RSD/LOW SCHEDULE	149.34	8.12
WANAKBORI TPS	6	210	24-Jun-2016	12-Sep-2016	80	1923.93	RSD/LOW SCHEDULE	404.03	21.96
WANAKBORI TPS	7	210	11-Aug-2016	09-Sep-2016	29	698.67	RESERVE SHUT DOWN / STANDBY UNIT	146.72	7.98
WANAKBORI TPS	7	210	18-May-2016	10-Aug-2016	83	2000.98	GENERATOR PROTECTION RELAY OPERATION	420.21	22.84
SATPURA TPS	7	210	04-May-2016	04-Aug-2016	91	2187.08	RSD/LOW SCHEDULE	459.29	24.97
SATPURA TPS	7	210	24-Jan-2017	21-Feb-2017	28	664.58	RSD/LOW SCHEDULE	139.56	7.59
SATPURA TPS	8	210	02-Oct-2016	22-Dec-2016	81	1941.17	RSD/LOW SCHEDULE	407.65	22.16
SATPURA TPS	8	210	04-May-2016	20-Sep-2016	139	3339.10	RSD/LOW SCHEDULE	701.21	38.12
SATPURA TPS	8	210	27-Dec-2016	31-Mar-2017	95	2268.30	RSD/LOW SCHEDULE	476.34	25.89
SATPURA TPS	9	210	07-Oct-2016	24-Dec-2016	78	1868.13	RESERVE SHUT DOWN / STANDBY UNIT	392.31	21.33
SATPURA TPS	9	210	09-May-2016	24-Sep-2016	138	3312.40	RSD/LOW SCHEDULE	695.60	37.81
SATPURA TPS	9	210	27-Dec-2016	31-Mar-2017	95	2268.27	RSD/LOW SCHEDULE	476.34	25.89
SANJAY GANDHI TPS	1	210	17-Oct-2016	29-Nov-2016	42	1016.47	RSD/LOW SCHEDULE	213.46	11.60
SANJAY GANDHI TPS	2	210	09-Oct-2016	06-Nov-2016	28	662.25	RSD/LOW SCHEDULE	139.07	7.56
SANJAY GANDHI TPS	3	210	10-Oct-2016	14-Dec-2016	65	1549.42	RSD/LOW SCHEDULE	325.38	17.69
SANJAY GANDHI TPS	3	210	11-Jun-2016	30-Aug-2016	80	1926.42	RSD/LOW SCHEDULE	404.55	21.99
SANJAY GANDHI TPS	4	210	13-Jun-2016	12-Sep-2016	90	2171.62	RSD/LOW SCHEDULE	456.04	24.79
VINDHYACHAL STPS	3	210	02-Aug-2016	28-Aug-2016	27	638.03	RSD/LOW SCHEDULE	133.99	7.28
NASIK TPS	3	210	11-Dec-2016	30-Jan-2017	50	1206.00	RSD/LOW SCHEDULE	253.26	13.77
NASIK TPS	3	210	28-Aug-2016	07-Oct-2016	40	952.00	RESERVE SHUT DOWN / STANDBY UNIT	199.92	10.87
NASIK TPS	5	210	07-Oct-2016	03-Nov-2016	27	641.00	RESERVE SHUT DOWN / STANDBY UNIT	134.61	7.32
NASIK TPS	5	210	24-Feb-2017	25-Mar-2017	29	685.92	RSD/LOW SCHEDULE	144.04	7.83
KORADI TPS	7	210	01-Apr-2016	13-May-2016	43	1027.90	RSD/LOW SCHEDULE	215.86	11.73
KORADI TPS	7	210	01-Jul-2016	23-Aug-2016	53	1275.05	RSD/LOW SCHEDULE	267.76	14.56
KORADI TPS	7	210	15-Feb-2017	24-Mar-2017	37	891.92	RSD/LOW SCHEDULE	187.30	10.18
KORADI TPS	7	210	16-Sep-2016	19-Oct-2016	34	810.67	RSD/LOW SCHEDULE	170.24	9.25

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
KHAPARKHEDA TPS	1	210	17-Sep-2016	16-Oct-2016	29	689.75	RSD/LOW SCHEDULE	144.85	7.87
KHAPARKHEDA TPS	1	210	25-Jun-2016	23-Aug-2016	58	1396.82	RESERVE SHUT DOWN / STANDBY UNIT	293.33	15.95
KHAPARKHEDA TPS	2	210	05-Jul-2016	23-Aug-2016	48	1156.95	RSD/LOW SCHEDULE	242.96	13.21
KHAPARKHEDA TPS	2	210	17-Sep-2016	16-Oct-2016	29	694.78	RSD/LOW SCHEDULE	145.90	7.93
KHAPARKHEDA TPS	3	210	05-Jul-2016	25-Aug-2016	50	1204.92	RSD/LOW SCHEDULE	253.03	13.75
KHAPARKHEDA TPS	4	210	08-Jul-2016	23-Aug-2016	46	1108.40	RSD/LOW SCHEDULE	232.76	12.65
KHAPARKHEDA TPS	4	210	17-Sep-2016	15-Oct-2016	28	661.63	RSD/LOW SCHEDULE	138.94	7.55
BHUSAWAL TPS	2	210	14-Jun-2016	18-Jul-2016	34	820.40	ECONOMISER TUBE LEAKAGE	172.28	9.37
BHUSAWAL TPS	2	210	19-Jul-2016	31-Mar-2017	256	6144.00	RSD/LOW SCHEDULE	1290.24	70.14
BHUSAWAL TPS	3	210	11-Jul-2016	14-Sep-2016	65	1561.58	RSD/LOW SCHEDULE	327.93	17.83
BHUSAWAL TPS	3	210	16-Sep-2016	15-Feb-2017	152	3658.28	RSD/LOW SCHEDULE	768.24	41.76
PARLI TPS	3	210	01-Apr-2016	09-Jun-2016	70	1680.00	RAW WATER NOT AVAILABLE/LOW INTAKE CANAL LEVEL	352.80	76.92
PARLI TPS	4	210	01-Apr-2016	31-Mar-2017	364	8741.57	UNECONOMICAL OPERATION	1835.73	99.79
PARLI TPS	5	210	01-Apr-2016	31-Mar-2017	365	8760.00	UNECONOMICAL OPERATION	1839.60	100.00
CHANDRAPUR(MAHARASHTRA) STPS	1	210	01-Apr-2016	09-Jun-2016	70	1680.00	UNECONOMICAL OPERATION	352.80	76.92
CHANDRAPUR(MAHARASHTRA) STPS	2	210	01-Apr-2016	09-Jun-2016	70	1680.00	RSD/LOW SCHEDULE	352.80	76.92
UKAI TPS	3	200	02-Aug-2016	29-Aug-2016	28	669.43	RESERVE SHUT DOWN / STANDBY UNIT	133.89	7.64
SATPURA TPS	6	200	03-Aug-2016	24-Sep-2016	52	1259.92	RSD/LOW SCHEDULE	251.98	14.38
SATPURA TPS	6	200	23-Feb-2017	31-Mar-2017	36	869.98	RSD/LOW SCHEDULE	174.00	9.93
SATPURA TPS	6	200	24-Oct-2016	21-Nov-2016	28	666.25	RSD/LOW SCHEDULE	133.25	7.61
KORADI TPS	5	200	01-Apr-2016	16-May-2016	46	1098.70	RSD/LOW SCHEDULE	219.74	12.54
KORADI TPS	5	200	01-Jul-2016	24-Aug-2016	55	1314.65	RSD/LOW SCHEDULE	262.93	15.01
KORADI TPS	5	200	18-Oct-2016	02-Mar-2017	136	3263.98	TURBINE MISC. PROBLEMS	652.80	37.26
KORADI TPS	5	200	22-Sep-2016	18-Oct-2016	26	623.98	RSD/LOW SCHEDULE	124.80	7.12
TROMBAY TPS	4	150	01-Apr-2016	08-Feb-2017	314	7536.00	UNECONOMICAL OPERATION	1130.40	102.61
SALORA TPP	1	135	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	1182.60	100.00
WARDHA WARORA TPP	1	135	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	1182.60	100.00
WARDHA WARORA TPP	2	135	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	1182.60	100.00
UKAI TPS	1	120	07-May-2016	31-Mar-2017	329	7892.70	EXCITATION PROBLEM	947.12	90.10
UKAI TPS	2	120	12-Jul-2016	31-Mar-2017	262	6292.00	RESERVE SHUT DOWN / STANDBY UNIT	755.04	71.83
GANDHI NAGAR TPS	1	120	09-Apr-2016	12-Jan-2017	279	6694.50	RSD/LOW SCHEDULE	803.34	91.16
GANDHI NAGAR TPS	2	120	09-Apr-2016	12-Jan-2017	279	6694.50	RSD/LOW SCHEDULE	803.34	91.16

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
SIKKA REP. TPS	1	120	01-May-2016	22-Sep-2016	143	3443.75	RSD/LOW SCHEDULE	413.25	39.31
SIKKA REP. TPS	1	120	26-Sep-2016	31-Mar-2017	186	4470.00	RSD/LOW SCHEDULE	536.40	51.03
SIKKA REP. TPS	2	120	01-Apr-2016	07-May-2016	37	882.92	RSD/LOW SCHEDULE	105.95	10.08
SIKKA REP. TPS	2	120	20-May-2016	13-Sep-2016	116	2772.83	RSD/LOW SCHEDULE	332.74	31.65
SIKKA REP. TPS	2	120	24-Sep-2016	31-Mar-2017	188	4522.92	ASH HANDLING SYSTEM PROBLEM	542.75	51.63
KORADI TPS	1	105	01-Apr-2016	02-Aug-2016	124	2976.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	312.48	101.64
KORADI TPS	2	105	01-Apr-2016	02-Aug-2016	124	2976.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	312.48	101.64
KORADI TPS	3	105	01-Apr-2016	02-Aug-2016	124	2976.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	312.48	101.64
KORADI TPS	4	105	01-Apr-2016	02-Aug-2016	124	2976.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	312.48	101.64
SVPL TPP	1	63	01-Apr-2016	07-May-2016	36	857.83	EXCITATION PROBLEM	54.04	9.79
SVPL TPP	1	63	07-Jun-2016	15-Jul-2016	39	930.05	RAW WATER SHORTAGE	58.59	10.62
MIHAN TPS	1	61.5	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	538.74	100.00
MIHAN TPS	2	61.5	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	538.74	100.00
MIHAN TPS	3	61.5	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	538.74	100.00
MIHAN TPS	4	61.5	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	538.74	100.00
GEPL TPP Ph-I	1	60	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	525.60	100.00
GEPL TPP Ph-I	2	60	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	525.60	100.00
RATIJA TPS	1	50	10-Jun-2016	07-Jul-2016	28	667.62	RAW WATER SHORTAGE	33.38	7.62
RATIJA TPS	2	50	04-Mar-2017	31-Mar-2017	27	657.05	SWITCH YARD/TRIPPING OF TRANSMISSION LINES/BUS BAR PROBLEM	1.45	1.00
RATIJA TPS	2	50	09-Dec-2016	31-Mar-2017	113	2712.00	NON STABLISED UNIT	22.28	15.34
KATGHORA TPP	1	35	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	306.60	100.00
SABARMATI (C STATION)	15	30	01-Apr-2016	31-Mar-2017	365	8760.00	RSD/LOW SCHEDULE	262.80	100.00
SABARMATI (C STATION)	16	30	01-Apr-2016	31-Mar-2017	365	8760.00	RSD/LOW SCHEDULE	262.80	100.00
SWASTIK KORBA TPP	1	25	01-Apr-2016	31-Mar-2017	365	8760.00	NO Power purchase agreement	219.00	100.00
SUB TOTAL	**240**	**75482.0**			**26474**	**635413.39**		**131843.56**	
SOUTHERN REGION									
PAINAMPURAM TPP	2	660	04-Apr-2016	18-May-2016	44	1051.23	ELECTRICAL MISCELLANEOUS PROBLEMS	693.81	12.00
SGPL TPP	1	660	14-Feb-2017	31-Mar-2017	46	1103.75	BOILER MISC. PROBLEM	1.01	0.05
SGPL TPP	1	660	14-Jan-2017	31-Mar-2017	77	1842.10	CONDENSER TUBE LEAKAGE/ CLEANING	84.55	4.41
SGPL TPP	1	660	28-Nov-2016	31-Mar-2017	123	2953.87	WATER WALL TUBE LEAKAGE	244.52	12.76
SGPL TPP	2	660	21-Feb-2017	31-Mar-2017	39	936.00	NON STABLISED UNIT	91.86	18.71
KAKATIYA TPS	2	600	17-Aug-2016	30-Sep-2016	44	1046.50	STATOR/ STATOR EARTH FAULT	627.90	11.95

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
SINGARENI TPP	2	600	07-Jan-2017	31-Mar-2017	83	2001.00	FURNACE FIRE OUT /FLAME FAILURE	4.73	0.27
SINGARENI TPP	2	600	11-Feb-2017	31-Mar-2017	48	1159.07	ELECTRICAL MISCELLANEOUS PROBLEMS	1.43	0.08
SINGARENI TPP	2	600	15-Dec-2016	31-Mar-2017	107	2566.60	TURB. DIFF. EXPANSION PROBLEM	1.22	0.07
SINGARENI TPP	2	600	19-Jan-2017	31-Mar-2017	72	1725.45	FURNACE FIRE OUT /FLAME FAILURE	4.73	0.27
SINGARENI TPP	2	600	21-Jan-2017	31-Mar-2017	70	1679.22	PIPES and VALVES BOILER SIDE	0.86	0.05
SINGARENI TPP	2	600	21-Jan-2017	31-Mar-2017	69	1658.72	STATION TRANSFORMER PROBLEM	17.34	1.00
SINGARENI TPP	2	600	22-Dec-2016	31-Mar-2017	100	2395.70	WATER WALL TUBE LEAKAGE	66.09	3.79
SINGARENI TPP	2	600	27-Dec-2016	31-Mar-2017	95	2269.75	F.D. FANS PROBLEM	1.19	0.07
SINGARENI TPP	2	600	29-Dec-2016	31-Mar-2017	92	2210.97	FURNACE CLINKER FORMATION	4.52	0.26
SINGARENI TPP	2	600	29-Jan-2017	31-Mar-2017	62	1486.83	WATER WALL TUBE LEAKAGE	38.14	2.19
MUTHIARA TPP	1	600	11-Jan-2017	08-Feb-2017	28	660.52	WATER WALL TUBE LEAKAGE	396.31	7.54
MUTHIARA TPP	1	600	30-Jul-2016	06-Sep-2016	38	903.33	RSD/LOW SCHEDULE	542.00	10.31
MUTHIARA TPP	2	600	06-Feb-2017	30-Mar-2017	52	1243.10	AIR PREHEATERS PROBLEM	745.86	14.19
MUTHIARA TPP	2	600	12-Nov-2016	27-Dec-2016	45	1080.33	AIR PREHEATERS PROBLEM	648.20	12.33
ITPCL TPP	1	600	01-Jul-2016	22-Aug-2016	52	1248.27	RSD/LOW SCHEDULE	748.96	14.25
ITPCL TPP	2	600	02-Aug-2016	28-Sep-2016	57	1358.22	RSD/LOW SCHEDULE	814.93	16.89
ITPCL TPP	2	600	08-Nov-2016	09-Dec-2016	31	743.75	TURBINE VIBRATIONS HIGH	446.25	9.25
ITPCL TPP	2	600	10-Jun-2016	06-Jul-2016	25	606.30	RSD/LOW SCHEDULE	363.78	7.54
VIZAG TPP	1	520	01-Apr-2016	19-May-2016	49	1169.10	OTHER FUEL FEEDING PROBLEM	607.93	13.35
VIZAG TPP	1	520	10-Nov-2016	07-Jan-2017	58	1393.38	C.W. PUMP PROBLEM	724.56	15.91
VIZAG TPP	2	520	22-Jul-2016	04-Nov-2016	105	2517.37	COAL SHORTAGE	1309.03	38.28
BELLARY TPS	2	500	12-Jun-2016	22-Aug-2016	71	1694.60	RSD/LOW SCHEDULE	847.30	19.34
TORANGALLU TPS(SBU-II)	3	300	04-Jul-2016	20-Aug-2016	47	1126.02	RSD/LOW SCHEDULE	337.81	12.85
TORANGALLU TPS(SBU-II)	3	300	21-Sep-2016	26-Oct-2016	35	834.93	RSD/LOW SCHEDULE	250.48	9.53
TORANGALLU TPS(SBU-II)	4	300	20-Jul-2016	27-Aug-2016	37	895.27	RSD/LOW SCHEDULE	268.58	10.22
KOTHAGUDEM TPS (NEW)	2	250	05-Dec-2016	06-Jan-2017	31	749.50	GENERATOR PROTECTION RELAY OPERATION	187.38	8.56
RAICHUR TPS	8	250	24-May-2016	16-Jul-2016	52	1250.22	RSD/LOW SCHEDULE	312.56	14.27
NEYVELI TPS-II EXP	1	250	04-Aug-2016	31-Aug-2016	27	653.13	BOILER MISC. PROBLEM	163.28	7.46
NEYVELI TPS-II EXP	1	250	04-Mar-2017	30-Mar-2017	26	626.87	FBHE (FLUIDISED BED HEAT EXCHANGER) PROBLEM	156.72	7.16
NEYVELI TPS-II EXP	1	250	16-Apr-2016	17-May-2016	31	753.00	BOILER AUX. MISC. PROMLEMS	188.25	8.60
NEYVELI TPS-II EXP	1	250	22-Oct-2016	19-Dec-2016	57	1373.25	BOILER AUX. MISC. PROMLEMS	343.31	15.68
NEYVELI TPS-II EXP	2	250	06-Oct-2016	05-Nov-2016	30	716.33	MINOR MAINTENANCE WORKS	179.08	8.18
NEYVELI TPS-II EXP	2	250	10-May-2016	17-Jun-2016	39	927.20	BOILER AUX. MISC. PROMLEMS	231.80	10.58
NEYVELI TPS-II EXP	2	250	11-Feb-2017	20-Mar-2017	37	886.05	SUPER HEATER TUBE LEAKAGE	221.51	10.11
Dr. N.TATA RAO TPS	2	210	23-Jan-2017	19-Mar-2017	55	1317.58	TURBINE VIBRATIONS HIGH	276.69	15.04

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
RAICHUR TPS	2	210	11-Jun-2016	15-Jul-2016	34	816.88	RSD/LOW SCHEDULE	171.54	9.32
RAICHUR TPS	4	210	30-Jul-2016	19-Sep-2016	51	1229.95	RSD/LOW SCHEDULE	258.29	14.04
RAICHUR TPS	6	210	11-Jul-2016	20-Sep-2016	70	1690.42	WATER WALL TUBE LEAKAGE	354.99	19.30
RAICHUR TPS	7	210	24-May-2016	21-Jul-2016	58	1389.43	RSD/LOW SCHEDULE	291.78	15.86
TUTICORIN TPS	1	210	25-Jan-2017	10-Mar-2017	44	1048.85	RAW WATER SHORTAGE	220.26	11.97
TUTICORIN TPS	4	210	25-Jan-2017	06-Mar-2017	39	940.80	TURBINE VIBRATIONS HIGH	197.57	10.74
NORTH CHENNAI TPS	1	210	05-Jan-2017	10-Mar-2017	63	1521.45	GENERATOR PROTECTION RELAY OPERATION	319.50	17.37
SIMHAPURI TPS	1	150	14-Jan-2017	07-Mar-2017	52	1251.00	RSD/LOW SCHEDULE	187.65	14.28
SIMHAPURI TPS	1	150	20-Oct-2016	09-Jan-2017	81	1946.70	RSD/LOW SCHEDULE	292.01	22.22
SIMHAPURI TPS	2	150	01-Jun-2016	04-Jul-2016	34	813.83	RSD/LOW SCHEDULE	122.07	9.29
SIMHAPURI TPS	2	150	20-Jul-2016	24-Aug-2016	34	823.45	RSD/LOW SCHEDULE	123.52	9.40
SIMHAPURI TPS	2	150	27-Dec-2016	31-Mar-2017	94	2256.88	RSD/LOW SCHEDULE	338.53	25.76
SIMHAPURI TPS	2	150	30-Aug-2016	24-Dec-2016	116	2772.35	RSD/LOW SCHEDULE	415.85	31.65
SIMHAPURI TPS	3	150	01-Jun-2016	12-Jul-2016	42	1007.00	RSD/LOW SCHEDULE	151.05	11.50
SIMHAPURI TPS	3	150	15-Sep-2016	28-Nov-2016	75	1797.92	RSD/LOW SCHEDULE	269.69	20.52
SIMHAPURI TPS	3	150	24-Dec-2016	31-Mar-2017	98	2351.93	RSD/LOW SCHEDULE	352.79	26.85
SIMHAPURI TPS	4	150	05-Jul-2016	23-Aug-2016	48	1160.42	RSD/LOW SCHEDULE	174.06	13.25
SIMHAPURI TPS	4	150	29-Nov-2016	27-Mar-2017	118	2834.13	RSD/LOW SCHEDULE	425.12	32.35
SIMHAPURI TPS	4	150	31-Aug-2016	29-Sep-2016	29	699.42	RSD/LOW SCHEDULE	104.91	7.98
THAMMINAPATNAM TPS	1	150	09-Jul-2016	07-Aug-2016	30	710.17	RSD/LOW SCHEDULE	106.53	8.11
THAMMINAPATNAM TPS	2	150	01-Sep-2016	23-Oct-2016	52	1251.20	RSD/LOW SCHEDULE	187.68	14.28
TUTICORIN (P) TPP	1	150	03-Apr-2016	31-Mar-2017	363	8711.48	NO Power purchase agreement	1306.72	99.45
TUTICORIN (P) TPP	2	150	15-Apr-2016	31-Mar-2017	350	8405.85	NO Power purchase agreement	1260.88	95.96
TORANGALLU TPS(SBU-I)	2	130	27-Jun-2016	15-Oct-2016	109	2619.88	RSD/LOW SCHEDULE	340.58	29.91
ENNORE TPS	3	110	01-Oct-2016	31-Oct-2016	30	725.43	WATER WALL TUBE LEAKAGE	79.80	8.28
ENNORE TPS	3	110	14-Nov-2016	31-Mar-2017	138	3311.92	CONDENSER LOW VACCUM	364.31	37.81
ENNORE TPS	4	110	18-Jun-2016	30-Aug-2016	74	1769.10	BOILER FEED PUMP/MOTOR PROBLEM	194.60	20.20
ENNORE TPS	4	110	30-Aug-2016	04-Oct-2016	35	837.08	GENERATOR PROTECTION RELAY OPERATION	92.08	9.56
ENNORE TPS	5	110	01-Apr-2016	12-Jan-2017	287	6888.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	757.68	93.79
ENNORE TPS	1	60	01-Apr-2016	31-Mar-2017	365	8760.00	NON AVAILABILITY OF MAN POWER	525.60	100.00
ENNORE TPS	2	60	01-Apr-2016	31-Mar-2017	365	8760.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	525.60	100.00
SUB TOTAL	**72**	**24790**			**5664**	**135917.30**		**23709.70**	
EASTERN REGION									
RAGHUNATHPUR TPP	1	600	01-Apr-2016	01-May-2016	31	735.02	SUPER HEATER TUBE LEAKAGE	441.01	8.39

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
RAGHUNATHPUR TPP	1	600	11-Aug-2016	08-Nov-2016	89	2136.38	ESP PROBLEM	1281.83	24.39
RAGHUNATHPUR TPP	1	600	27-Jan-2017	31-Mar-2017	63	1519.67	C&I PROBLEM	911.80	17.35
RAGHUNATHPUR TPP	2	600	06-Nov-2016	07-Feb-2017	92	2213.60	REHEATER TUBE LEAKAGE	1328.16	25.27
STERLITE TPP	1	600	15-Dec-2016	31-Mar-2017	106	2544.12	out from installed capacity/plf calculation	1526.47	29.04
STERLITE TPP	3	600	01-Apr-2016	31-Mar-2017	365	8760.00	RSD/LOW SCHEDULE	432.00	8.98
STERLITE TPP	3	600	01-Jul-2016	31-Mar-2017	274	6575.98	RAW WATER SUPPLY MISC.	78.20	1.63
STERLITE TPP	3	600	01-Mar-2017	31-Mar-2017	31	744.00	out from installed capacity/plf calculation	0.00	0.00
STERLITE TPP	3	600	01-Sep-2016	31-Mar-2017	211	5064.42	COAL FEEDING PROBLEM IN PLANT	10.64	0.22
STERLITE TPP	3	600	04-Sep-2016	31-Mar-2017	208	4997.72	BOILER AUX. MISC. PROMLEMS	2.32	0.05
STERLITE TPP	3	600	06-Jul-2016	31-Mar-2017	268	6442.25	TURBINE MISC.	1.20	0.02
STERLITE TPP	3	600	09-Jul-2016	31-Mar-2017	265	6363.40	BOILER MISC. PROBLEM	76.15	1.58
STERLITE TPP	3	600	10-Oct-2016	31-Mar-2017	172	4135.35	ELECTRICAL MISCELLANEOUS PROBLEMS	0.51	0.01
STERLITE TPP	3	600	12-Sep-2016	31-Mar-2017	201	4818.52	BOILER AUX. MISC. PROMLEMS	2.32	0.05
STERLITE TPP	3	600	17-Nov-2016	31-Mar-2017	135	3232.87	BOILER MISC. PROBLEM	402.94	8.38
STERLITE TPP	3	600	21-Jul-2016	31-Mar-2017	254	6084.28	BOILER MISC. PROBLEM	76.15	1.58
STERLITE TPP	3	600	22-Sep-2016	31-Mar-2017	190	4568.57	GRID DISTURBANCE	0.98	0.02
STERLITE TPP	3	600	25-Aug-2016	31-Mar-2017	219	5256.00	WATER WALL TUBE LEAKAGE	56.64	1.18
STERLITE TPP	3	600	29-Oct-2016	31-Mar-2017	153	3683.92	ELECTRICAL MISCELLANEOUS PROBLEMS	0.20	0.00
STERLITE TPP	3	600	30-Aug-2016	31-Mar-2017	214	5136.00	COAL FEEDING PROBLEM IN PLANT	21.85	0.45
STERLITE TPP	4	600	01-Mar-2017	31-Mar-2017	31	744.00	out from installed capacity/plf calculation	0.00	0.00
STERLITE TPP	4	600	02-Jun-2016	31-Mar-2017	303	7261.70	PIPES and VALVES BOILER SIDE	0.77	0.02
STERLITE TPP	4	600	04-Apr-2016	31-Mar-2017	362	8676.37	ELECTRICAL MISCELLANEOUS PROBLEMS	0.20	0.00
STERLITE TPP	4	600	04-Aug-2016	31-Mar-2017	239	5747.25	C.W. PUMP PROBLEM	0.60	0.01
STERLITE TPP	4	600	04-May-2016	31-Mar-2017	331	7952.17	GRID MISCELLANEOUS	0.35	0.01
STERLITE TPP	4	600	04-Sep-2016	31-Mar-2017	208	4998.65	GRID DISTURBANCE	5.56	0.12
STERLITE TPP	4	600	05-Apr-2016	31-Mar-2017	361	8653.65	ELECTRICAL MISCELLANEOUS PROBLEMS	0.20	0.00
STERLITE TPP	4	600	05-Sep-2016	31-Mar-2017	208	4989.92	COAL FEEDING PROBLEM IN PLANT	41.31	0.86
STERLITE TPP	4	600	06-Nov-2016	31-Mar-2017	146	3499.95	ASH HANDLING SYSTEM PROBLEM	130.35	2.71
STERLITE TPP	4	600	10-May-2016	31-Mar-2017	325	7806.95	BOILER MISC. PROBLEM	0.86	0.02
STERLITE TPP	4	600	10-Oct-2016	31-Mar-2017	172	4135.43	UNIT AUX. TRANSFORMER PROBLEM	1.92	0.04
STERLITE TPP	4	600	12-Jul-2016	31-Mar-2017	263	6307.80	REGENERATIVE SYSTEM PROBLEM	132.42	2.75
STERLITE TPP	4	600	15-Apr-2016	31-Mar-2017	351	8414.50	TURBINE OIL SYSTEM PROBLEM	0.98	0.02
STERLITE TPP	4	600	17-Nov-2016	31-Mar-2017	135	3234.80	EXCITATION PROBLEM	0.48	0.01

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
STERLITE TPP	4	600	17-Oct-2016	31-Mar-2017	166	3977.38	AIR PREHEATERS PROBLEM	112.45	2.34
STERLITE TPP	4	600	21-May-2016	31-Mar-2017	315	7552.20	SWITCH YARD MAINTENANCE	0.13	0.00
STERLITE TPP	4	600	22-May-2016	31-Mar-2017	314	7535.97	RSD/LOW SCHEDULE	65.86	1.37
STERLITE TPP	4	600	22-Sep-2016	31-Mar-2017	190	4568.57	GRID DISTURBANCE	5.56	0.12
STERLITE TPP	4	600	23-Jun-2016	31-Mar-2017	281	6751.42	RAW WATER SUPPLY MISC.	0.07	0.00
STERLITE TPP	4	600	25-Aug-2016	31-Mar-2017	219	5251.80	H.P. AND L.P. bypass system	2.93	0.06
STERLITE TPP	4	600	25-Aug-2016	31-Mar-2017	219	5246.90	ELECTRICAL MISCELLANEOUS PROBLEMS	1.58	0.03
STERLITE TPP	4	600	27-May-2016	31-Mar-2017	308	7399.90	H.P. AND L.P. bypass system	0.68	0.01
STERLITE TPP	4	600	30-Apr-2016	31-Mar-2017	335	8041.97	ELECTRICAL MISCELLANEOUS PROBLEMS	0.00	0.00
STERLITE TPP	4	600	30-Apr-2016	31-Mar-2017	335	8041.90	C&I PROBLEM	0.00	0.00
STERLITE TPP	4	600	30-Sep-2016	31-Mar-2017	182	4368.63	COAL FEEDING PROBLEM IN PLANT	91.77	1.91
DERANG TPP	2	600	23-Dec-2016	14-Feb-2017	53	1264.87	COAL SHORTAGE	758.92	14.44
BOKARO TPS `A` EXP	1	500	01-Apr-2016	13-Mar-2017	346	8314.68	NON STABLISED UNIT	4157.34	1117.56
KODARMA TPP	1	500	19-Jan-2017	31-Mar-2017	71	1714.12	TURBINE MISC.	857.06	19.57
KODARMA TPP	1	500	22-Apr-2016	27-Jul-2016	97	2317.88	WATER WALL TUBE LEAKAGE	1158.94	26.46
KODARMA TPP	1	500	28-Sep-2016	12-Jan-2017	106	2545.32	REHEATER TUBE LEAKAGE	1272.66	29.06
KODARMA TPP	2	500	26-Jul-2016	28-Sep-2016	65	1553.90	WATER WALL TUBE LEAKAGE	776.95	17.74
SAGARDIGHI TPS	3	500	01-Apr-2016	11-Jun-2016	71	1705.92	NON STABLISED UNIT	852.96	19.47
SAGARDIGHI TPS	3	500	04-Mar-2017	31-Mar-2017	28	662.60	TURBINE VIBRATIONS HIGH	331.30	7.56
SAGARDIGHI TPS	3	500	08-Oct-2016	19-Nov-2016	42	1013.13	RSD/LOW SCHEDULE	506.57	11.57
SAGARDIGHI TPS	3	500	17-Aug-2016	19-Sep-2016	33	792.52	FURNACE DRAFT ABNORMAL	396.26	9.05
KAMALANGA TPS	2	350	09-Jan-2017	12-Feb-2017	34	815.50	COAL SHORTAGE	285.43	9.31
KAMALANGA TPS	2	350	22-Feb-2017	19-Mar-2017	26	619.97	COAL SHORTAGE	216.99	7.08
UTKAL TPP (IND	1	350	01-Apr-2016	31-Mar-2017	365	8760.00	TRANSMISSION CONSTRAINTS	3066.00	150.21
D.P.L. TPS	7	300	21-Feb-2017	31-Mar-2017	39	936.00	RSD/LOW SCHEDULE	280.80	10.68
D.P.L. TPS	7	300	28-Nov-2016	30-Dec-2016	32	772.13	RSD/LOW SCHEDULE	231.64	8.81
D.P.L. TPS	7	300	29-Sep-2016	29-Oct-2016	30	723.23	REHEATER TUBE LEAKAGE	216.97	8.26
D.P.L. TPS	7	300	30-Apr-2016	03-Jun-2016	34	805.47	RSD/LOW SCHEDULE	241.64	9.19
NABI NAGAR TPP	1	250	15-Jan-2017	31-Mar-2017	76	1824.00	NO Power purchase agreement	456.00	84.44
CHANDRAPURA(DVC) TPS	7	250	24-Jul-2016	03-Sep-2016	42	1003.23	ROTOR/ ROTOR EARTH FAULT	250.81	11.45
D.P.L. TPS	8	250	03-Jul-2016	02-Oct-2016	91	2185.42	NON-READINESS OF RESIDUAL WORK OF NEW UNIT	546.36	24.95
D.P.L. TPS	8	250	30-Dec-2016	02-Feb-2017	34	810.73	RSD/LOW SCHEDULE	202.68	9.25
BUDGE BUDGE TPS	1	250	27-Sep-2016	20-Jan-2017	115	2755.65	TURBINE VIBRATIONS HIGH	688.91	31.46
TENUGHAT TPS	2	210	07-Nov-2016	31-Mar-2017	144	3465.82	RSD/LOW SCHEDULE	727.82	39.56

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
TENUGHAT TPS	2	210	20-Apr-2016	26-Jun-2016	66	1594.63	ROTOR/ ROTOR EARTH FAULT	334.87	18.20
DURGAPUR TPS	4	210	30-Apr-2016	18-Sep-2016	141	3379.23	ROTOR/ ROTOR EARTH FAULT	709.64	38.58
DURGAPUR TPS	4	210	31-Oct-2016	02-Dec-2016	32	763.45	REHEATER TUBE LEAKAGE	160.32	8.71
BOKARO `B` TPS	1	210	09-Apr-2016	21-May-2016	41	993.02	RESERVE SHUT DOWN / STANDBY UNIT	208.53	11.34
BOKARO `B` TPS	1	210	13-Feb-2017	31-Mar-2017	46	1106.00	WATER WALL TUBE LEAKAGE	232.26	12.63
BOKARO `B` TPS	1	210	20-Dec-2016	11-Feb-2017	54	1292.25	WATER WALL TUBE LEAKAGE	271.37	14.75
BOKARO `B` TPS	2	210	03-Jul-2016	10-Sep-2016	69	1661.42	RSD/LOW SCHEDULE	348.90	18.97
BOKARO `B` TPS	2	210	15-Apr-2016	07-Jun-2016	53	1281.42	RESERVE SHUT DOWN / STANDBY UNIT	269.10	14.63
BOKARO `B` TPS	2	210	27-Oct-2016	19-Dec-2016	54	1291.53	WATER WALL TUBE LEAKAGE	271.22	14.74
BOKARO `B` TPS	3	210	10-Aug-2016	09-Sep-2016	30	724.75	SUPER HEATER TUBE LEAKAGE	152.20	8.27
BOKARO `B` TPS	3	210	10-Sep-2016	08-Nov-2016	59	1426.32	REHEATER TUBE LEAKAGE	299.53	16.28
BOKARO `B` TPS	3	210	15-Dec-2016	31-Mar-2017	107	2568.00	REHEATER TUBE LEAKAGE	539.28	29.32
MEJIA TPS	1	210	07-Aug-2016	13-Oct-2016	67	1608.00	RSD/LOW SCHEDULE	337.68	18.36
MEJIA TPS	1	210	21-Oct-2016	03-Dec-2016	43	1028.95	ECONOMISER TUBE LEAKAGE	216.08	11.75
MEJIA TPS	2	210	08-May-2016	03-Aug-2016	87	2090.48	RSD/LOW SCHEDULE	439.00	23.86
MEJIA TPS	2	210	29-Aug-2016	06-Dec-2016	100	2393.73	RSD/LOW SCHEDULE	502.68	27.33
MEJIA TPS	2	210	30-Dec-2016	08-Feb-2017	40	949.80	RSD/LOW SCHEDULE	199.46	10.84
MEJIA TPS	3	210	04-Dec-2016	29-Dec-2016	25	603.23	RSD/LOW SCHEDULE	126.68	6.89
MEJIA TPS	3	210	05-May-2016	09-Jul-2016	64	1547.92	RSD/LOW SCHEDULE	325.06	17.67
MEJIA TPS	4	210	01-Apr-2016	03-Oct-2016	186	4456.05	RSD/LOW SCHEDULE	935.77	50.87
MEJIA TPS	4	210	05-Nov-2016	03-Jan-2017	60	1433.78	RSD/LOW SCHEDULE	301.09	16.37
BANDEL TPS	5	210	17-Jun-2016	17-Jul-2016	31	738.25	MISC. SHORT DURATION MAINTENANCE WORKS	155.03	8.43
KOLAGHAT TPS	1	210	07-Nov-2016	31-Mar-2017	144	3456.45	ESP PROBLEM	725.85	39.46
KOLAGHAT TPS	2	210	24-Feb-2017	31-Mar-2017	35	846.40	POLLUTION PROBLEM	177.74	9.66
KOLAGHAT TPS	3	210	22-Feb-2017	31-Mar-2017	38	906.92	POLLUTION PROBLEM	190.45	10.35
KOLAGHAT TPS	4	210	26-Nov-2016	25-Jan-2017	60	1431.52	TURBINE MISC. PROBLEM	300.62	16.34
KOLAGHAT TPS	5	210	23-Oct-2016	09-Jan-2017	79	1884.23	TURBINE VIBRATIONS HIGH	395.69	21.51
BAKRESWAR TPS	4	210	06-Dec-2016	17-Jan-2017	41	994.57	RSD/LOW SCHEDULE	208.86	11.35
CHANDRAPURA(DVC) TPS	1	130	01-Apr-2016	17-Jan-2017	292	7008.00	RSD/LOW SCHEDULE	24.13	2.53
CHANDRAPURA(DVC) TPS	1	130	01-Aug-2016	17-Jan-2017	169	4064.75	ELECTRICAL MISCELLANEOUS PROBLEMS	0.42	0.04
CHANDRAPURA(DVC) TPS	1	130	03-Aug-2016	17-Jan-2017	167	4011.58	GRID FREQ. HIGH/LOW	55.66	5.83
CHANDRAPURA(DVC) TPS	1	130	23-Aug-2016	17-Jan-2017	147	3529.75	WATER WALL TUBE LEAKAGE	76.52	8.01
CHANDRAPURA(DVC) TPS	1	130	29-Sep-2016	17-Jan-2017	110	2644.33	I.D. FANS PROBLEM	15.21	1.59
CHANDRAPURA(DVC) TPS	2	130	18-Dec-2016	13-Jan-2017	26	612.25	BREAKER/ISOLATOR PROBLEM	79.59	6.99

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
DURGAPUR TPS	3	130	01-Apr-2016	21-Oct-2016	204	4896.00	RESERVE SHUT DOWN / STANDBY UNIT	93.60	14.02
SANTALDIH TPS	1	120	01-Apr-2016	26-Dec-2016	270	6480.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	777.60	110.66
SANTALDIH TPS	2	120	01-Apr-2016	26-Dec-2016	270	6480.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	777.60	110.66
SANTALDIH TPS	3	120	01-Apr-2016	26-Dec-2016	270	6480.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	777.60	110.66
SANTALDIH TPS	4	120	01-Apr-2016	26-Dec-2016	270	6480.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	777.60	110.66
PATRATU TPS	9	110	01-Apr-2016	31-Mar-2017	365	8760.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	963.60	100.00
PATRATU TPS	10	110	23-Jan-2017	31-Mar-2017	68	1622.47	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	178.47	18.52
MUZAFFARPUR TPS	1	110	14-Jan-2017	12-Feb-2017	29	700.88	TEST RUN SUBSEQ.TO MAJ. REPAIR	77.10	8.00
MUZAFFARPUR TPS	2	110	11-Dec-2016	31-Mar-2017	111	2664.00	Coal Transportation Problems	293.04	30.41
D.P.L. TPS	6	110	01-Apr-2016	31-Mar-2017	365	8760.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	963.60	100.00
PATRATU TPS	7	105	01-Apr-2016	31-Mar-2017	365	8760.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	919.80	100.00
PATRATU TPS	8	105	01-Apr-2016	29-Jul-2016	120	2880.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	302.40	98.36
PATRATU TPS	5	90	01-Apr-2016	29-Jul-2016	120	2880.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	259.20	98.36
PATRATU TPS	6	90	01-Apr-2016	31-Mar-2017	365	8760.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	788.40	100.00
D.P.L. TPS	4	75	01-Apr-2016	20-Feb-2017	326	7824.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	586.80	106.54
D.P.L. TPS	5	75	01-Apr-2016	20-Feb-2017	326	7824.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	586.80	106.54
D.P.L. TPS	3	70	01-Apr-2016	20-Feb-2017	326	7824.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	547.68	106.54
SOUTHERN REPL. TPS	1	67.5	11-Jan-2017	24-Feb-2017	44	1046.50	RESERVE SHUT DOWN / STANDBY UNIT	70.64	11.95
SOUTHERN REPL. TPS	1	67.5	24-Nov-2016	03-Jan-2017	40	948.47	RESERVE SHUT DOWN / STANDBY UNIT	64.02	10.83
SOUTHERN REPL. TPS	2	67.5	17-Jan-2017	24-Feb-2017	38	906.87	RESERVE SHUT DOWN / STANDBY UNIT	61.21	10.35
SOUTHERN REPL. TPS	2	67.5	17-Jun-2016	05-Sep-2016	80	1913.82	RESERVE SHUT DOWN / STANDBY UNIT	129.18	21.85
BANDEL TPS	3	60	06-Dec-2016	31-Jan-2017	55	1331.02	RSD/LOW SCHEDULE	79.86	15.19
BANDEL TPS	4	60	26-Nov-2016	18-Feb-2017	84	2004.57	RSD/LOW SCHEDULE	120.27	22.88
TITAGARH TPS	1	60	10-Oct-2016	31-Mar-2017	173	4147.05	RESERVE SHUT DOWN / STANDBY UNIT	248.82	47.34

Annexure-4.3

DETAILS OF LONG DURATION FORCED OUTAGES (25 DAYS & ABOVE) DURING 2016-17

Station	Unit No.	Capacity (MW)	Date Of Outage	Date of Return	Outage DAYS	Outage Hours	Reason	MU Loss	% of Unit Max Possible(Gen)
TITAGARH TPS	1	60	20-Jul-2016	16-Sep-2016	58	1392.97	RESERVE SHUT DOWN / STANDBY UNIT	83.58	15.90
TITAGARH TPS	2	60	09-Oct-2016	31-Mar-2017	174	4171.05	RESERVE SHUT DOWN / STANDBY UNIT	250.26	47.61
TITAGARH TPS	2	60	16-May-2016	06-Oct-2016	143	3422.02	RSD/LOW SCHEDULE	205.32	39.06
TITAGARH TPS	3	60	10-Oct-2016	31-Mar-2017	173	4147.70	RESERVE SHUT DOWN / STANDBY UNIT	248.86	47.35
TITAGARH TPS	3	60	20-May-2016	04-Oct-2016	137	3286.67	RSD/LOW SCHEDULE	197.20	37.52
TITAGARH TPS	4	60	09-Oct-2016	31-Mar-2017	174	4170.40	RESERVE SHUT DOWN / STANDBY UNIT	250.22	47.61
TITAGARH TPS	4	60	21-Jul-2016	04-Oct-2016	75	1794.45	RESERVE SHUT DOWN / STANDBY UNIT	107.67	20.49
PATRATU TPS	1	40	01-Apr-2016	29-Jul-2016	120	2880.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	115.20	98.36
PATRATU TPS	2	40	01-Apr-2016	29-Jul-2016	120	2880.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	115.20	98.36
PATRATU TPS	3	40	01-Apr-2016	29-Jul-2016	120	2880.00	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	115.20	98.36
PATRATU TPS	4	40	01-Apr-2016	11-Nov-2016	225	5390.12	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	215.60	61.53
PATRATU TPS	4	40	12-Nov-2016	31-Mar-2017	140	3353.82	VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	134.15	38.28
SUB TOTAL	**138**	**45310.0**			**20920**	**501999.75**		**47799.25**	
NORTH EASTERN REGION									
CHANDRAPUR(ASSAM) TPS	1	30	01-Apr-2016	31-Mar-2017	365	8760.00	UNECONOMICAL OPERATION	262.80	100.00
CHANDRAPUR(ASSAM) TPS	2	30	01-Apr-2016	31-Mar-2017	365	8760.00	UNECONOMICAL OPERATION	262.80	100.00
SUB TOTAL	**2**	**60**			**730**	**17520.00**		**525.60**	
GRAND TOTAL	**601**	**187511.0**			**66292**	**1591077.66**		**260609.59**	

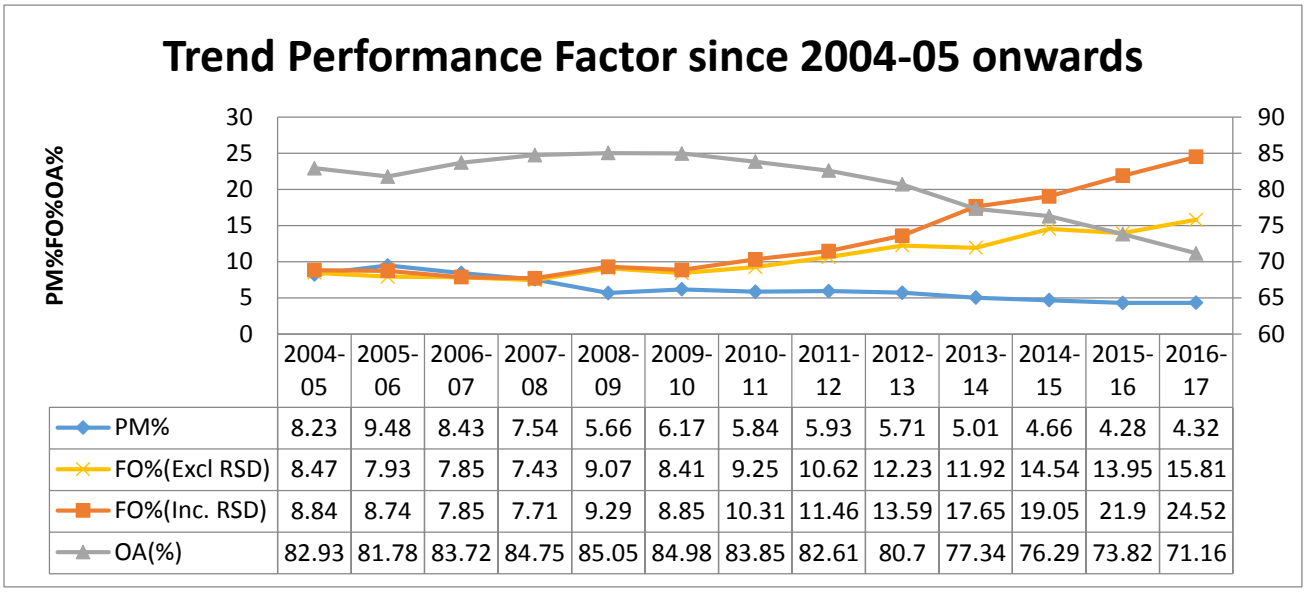
SECTION-5
OPERATING AVAILABILITY

5.1 Based on the Planned Maintenance undertaken and Forced Outages occurred as brought out in Section 3 and 4 respectively, the Operating Availability for the 649 Thermal Generating Units aggregating to **1,89,946.5 MW**, covered in the Review, has been computed in this section.

During the year 2016-17, the overall Operating Availability of **71.16%** has been achieved by the generating units under review. It was lower than the overall Operating Availability of 73.82% achieved during last year. Main reasons for lower Operating Availability vis-à-vis 2015-16 is the increase in losses due to Reserve Shut Down, No Power Purchase Agreement and coal shortages. Slightly higher losses on account of equipment outages were also seen in 2016-17and the planned maintenance was also slightly higher as compared to 2015-16. Details of various components of Forced outage/shutdown and losses have been detailed in Section 4.

Forced and planned shutdown and corresponding Operating Availability of units reviewed from 2004-05 onwards are shown below:

OPERATING AVAILABILITY				
YEAR	Unavailability (%)			Operating Availability (%)
	Planned	Forced	Total	
2004-05	8.23	8.84	17.07	82.93
2005-06	9.48	8.74	18.22	81.78
2006-07	8.43	7.85	16.28	83.72
2007-08	7.54	7.71	15.23	83.72
2008-09	5.66	9.29	14.95	85.05
2009-10	6.17	8.25	14.42	85.58
2010-11	5.84	10.31	16.15	83.85
2011-12	5.93	11.46	17.39	82.61
2012-13	5.71	13.6	19.31	80.70
2013-14	5.01	17.65	22.66	77.34
2014-15	4.66	19.05	23.71	76.29
2015-16	4.28	21.90	26.18	73.82
2016-17	4.32	24.52	28.84	71.16



	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
PM%	8.23	9.48	8.43	7.54	5.66	6.17	5.84	5.93	5.71	5.01	4.66	4.28	4.32
FO%(Excl RSD)	8.47	7.93	7.85	7.43	9.07	8.41	9.25	10.62	12.23	11.92	14.54	13.95	15.81
FO%(Inc. RSD)	8.84	8.74	7.85	7.71	9.29	8.85	10.31	11.46	13.59	17.65	19.05	21.9	24.52
OA(%)	82.93	81.78	83.72	84.75	85.05	84.98	83.85	82.61	80.7	77.34	76.29	73.82	71.16

5.2 UNITWISE/ STATIONWISE OPERATING AVAILABILITY

The details of the stations/units showing highest Operating Availability during the year 2016-17 are highlighted below.

- Thirty-Two Thermal Power stations achieved Operating Availability between 99% to more than 90%.
- 12 generating units achieved Operating Availability of more than 99 %. Some units achieved Operating Availability of 100% but these were mostly units commissioned towards the end of the year with short operating period.
- The details of these Thermal stations/generating units are as follows: -

Thermal Stations achieving the Operating Availability of 99 % to 90%

Stations with Operating Availability (%) more than 90% during 2016-17					
SL. NO.	**STATION NAME**	**ORGANISATION NAME**	**STATE NAME**	**CAPACITY**	**OP. AV. (%)**
1	BHILAI TPS	NSPCL	CHHATTISGARH	500	98.96
2	DAHANU TPS	RIL (DAHANU)	MAHARASHTRA	500	96.29
3	BONGAIGAON TPP	NTPC Ltd.	ASSAM	250	96.17
4	UNCHAHAR TPS	NTPC Ltd.	UTTAR PRADESH	1050	95.92
5	IB VALLEY TPS	OPGC	ORISSA	420	95.74
6	HALDIA TPP	HEL	WEST BENGAL	600	95.42
7	KORBA STPS	NTPC Ltd.	CHHATTISGARH	2600	95.24
8	NEYVELI (EXT) TPS	NLC	TAMIL NADU	420	95.03
9	SIMHADRI	NTPC Ltd.	ANDHRA PRADESH	2000	94.83
10	SABARMATI (D-F STATIONS)	TOR. POW. (UNOSUGEN)	GUJARAT	362	94.44
11	CHAKABURA TPP	ACB	CHHATTISGARH	30	93.99
12	KAHALGAON TPS	NTPC Ltd.	BIHAR	2340	93.98
13	SIPAT STPS	NTPC Ltd.	CHHATTISGARH	2980	93.86
14	TANDA TPS	NTPC Ltd.	UTTAR PRADESH	440	93.13
15	DSPM TPS	CSPGCL	CHHATTISGARH	500	93.07

Stations with Operating Availability (%) more than 90% during 2016-17					
SL. NO.	**STATION NAME**	**ORGANISATION NAME**	**STATE NAME**	**CAPACITY**	**OP. AV. (%)**
16	RAJPURA TPP	NPL	PUNJAB	1400	93.01
17	RAMAGUNDEM STPS	NTPC Ltd.	TELANGANA	2600	92.98
18	RIHAND STPS	NTPC Ltd.	UTTAR PRADESH	3000	92.55
19	FARAKKA STPS	NTPC Ltd.	WEST BENGAL	2100	92.45
20	ANPARA C TPS	LAPPL	UTTAR PRADESH	1200	92.31
21	TALCHER STPS	NTPC Ltd.	ORISSA	3000	92.26
22	MAITHON RB TPP	MPL	JHARKHAND	1050	92.16
23	SASAN UMTPP	SPL	MADHYA PRADESH	3960	92.15
24	BARADARHA TPS	DBPCL	CHHATTISGARH	1200	92.09
25	TALCHER (OLD) TPS	NTPC Ltd.	ORISSA	460	91.86
26	PATHADI TPP	LANCO	CHHATTISGARH	600	91.70
27	NEYVELI TPS-II	NLC	TAMIL NADU	1470	91.39
28	JOJOBERA TPS	TATA PCL	JHARKHAND	360	91.38
29	SINGRAULI STPS	NTPC Ltd.	UTTAR PRADESH	2000	91.33
30	KORBA-WEST TPS	CSPGCL	CHHATTISGARH	1340	90.25
31	KOTHAGUDEM TPS (NEW)	TSGENCO	TELANGANA	1000	90.09
32	RAMAGUNDEM - B TPS	TSGENCO	TELANGANA	62.5	90.01

Thermal Generating Units achieving the Operating Availability of 100 % to 99%

Units with Operating Availability (%) more than 99% during 2016-17						
SL. No.	**Station Name**	**Unit No.**	**Organization name**	**State name**	**Capacity**	**OP. AV. (%)**
1	UNCHAHAR TPS	1	NTPC Ltd.	UTTAR PRADESH	210	100
3	MUNDRA TPS	4	APL	GUJARAT	330	100
5	UNCHAHAR TPS	5	NTPC Ltd.	UTTAR PRADESH	210	99.93
6	RIHAND STPS	3	NTPC Ltd.	UTTAR PRADESH	500	99.66
7	DAHANU TPS	1	RIL (DAHANU)	MAHARASHTRA	250	99.66
8	BHILAI TPS	2	NSPCL	CHHATTISGARH	250	99.61
9	KORBA STPS	7	NTPC Ltd.	CHHATTISGARH	500	99.44
10	RAMAGUNDEM STPS	3	NTPC Ltd.	TELANGANA	200	99.27
11	FARAKKA STPS	6	NTPC Ltd.	WEST BENGAL	500	99.21
12	UNCHAHAR TPS	4	NTPC Ltd.	UTTAR PRADESH	210	99.20

5.3 SECTORWISE OPERATING AVAILABILITY

5.3.1 Among different Sectors, the Central Sector achieved highest overall Operating Availability of 81.21 % during 2016-17 and this was higher than the last year Operating Availability of 80.55 %. The Operating Availability of Private sector decreased sharply to 68.67% from 73.57% during 2015-16. The Operating Availability of State sector was 65.54 % vis-à-vis 68.36 % in 2015-16. The Sector Wise Planned Maintenance, forced outages and Operating Availability of generating units for the last three years were as under: -

SECTOR	Planned Maintenance (%)	Forced Outage (%)	Operating Availability (%) (100-PM%-FO %)

	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
Central	4.31	4.71	4.93	12.3	14.74	13.86	83.39	80.55	81.21
State	6.18	5.34	5.88	20.28	26.30	28.58	73.54	68.36	65.54
Private	3.20	2.93	2.53	24.77	23.50	28.80	72.03	73.57	68.67

5.4 CAPACITY GROUP WISE OPERATING AVAILABILITY

5.4.1 The capacity group wise Planned Maintenance, Forced Outages and Operating Availability for 2016-17 and previous two years is given in the Table below. The Operating Availability of capacity group 25-99 MW has decreased significantly – the main causes are Reserve Shut Down, vintage units closed for operation and commercial reasons in some units. The Operating Availability of 210 MW capacity group has also dropped sharply due to significantly higher RSD losses.

Capacity Group (MW)	Planned Maintenance (%)			Forced Outage (%)			Operating Availability (%)		
	14-15	**15-16**	16-17	**14-15**	**15-16**	**16-17**	**14-15**	**15-16**	**16-17**
660-800	2.73	2.72	2.97	15.85	16.66	19.52	81.42	80.62	77.51
490-600	4.13	4.16	4.46	18.66	18.26	20.11	77.21	77.58	75.43
300-360	3	1.99	2.56	17.65	17.45	22.47	79.35	80.56	74.97
250-250	2.85	4.31	2.97	19.12	29.79	35.27	78.03	65.90	61.76
210-210	5.06	4.74	4.70	15.01	22.02	28.58	79.93	73.24	66.72
195-200	11.05	11.81	10.40	9.75	7.53	12.06	79.20	80.66	77.54
100-150	9.43	5.39	8.23	32.54	38.48	41.92	58.03	56.13	49.85
25-99	4.85	5.56	6.52	38.72	50.62	54.55	56.43	43.82	38.93
ALL INDIA	**4.66**	**4.28**	**4.32**	**19.05**	**21.90**	**24.52**	**76.29**	**73.82**	**71.16**

5.5 REGIONWISE OPERATING AVAILABILITY

Southern Region had the highest overall Operating Availability of 79.29 % followed by NE region with Operating Availability of 77.56 %. All other regions had Operating Availability of around 70 %.. The Region-wise Planned Maintenance, Forced outages and Operating Availability of generating units for the year 2016-17 are furnished as under: -

Region	Planned Maintenance (%)	Forced Outage (%)	Operating Availability (%)
NORTHERN	5.08	26.70	68.22
WESTERN	3.47	27.84	68.69
SOUTHERN	4.86	15.85	79.29
EASTERN	4.82	23.36	71.82
NORTH EASTERN	0.00	22.44	77.56
ALL INDIA TOTAL	4.32	24.52	71.16

5.6 MAKEWISE OPERATING AVAILABILITY:

5.6.1 The Planned maintenance (%), Forced outage (%) and Operating Availability (%) of units of different make during 2016-17 and previous two years were as under:

Make of Units TG / BOILER	Planned Maintenance (%)			Forced Outage (%)			Operating Availability (%)		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
BHEL/BHEL	5.38	4.88	4.84	16.88	23.12	25.81	77.74	72.00	69.35
BHEL/ABL	7.69	3.89	1.20	34.18	47.21	43.05	58.13	48.9	55.75
CHINA/CHINA	4.12	2.77	3.44	20.09	19.87	22.99	85.79	77.36	73.57
RUSSIA/RUSSIA	3.67	5.34	4.15	14.93	17.99	13.94	81.40	76.67	81.91
OTHER	3.03	4.38	4.12	22.71	19.86	21.42	74.26	75.76	74.46
ALL MAKE	**4.66**	**4.28**	**4.32**	**19.0**	**22.20**	**24.52**	**76.29**	**73.52**	**71.16**

As may be seen, the Operating Availability of 81.91% achieved by RUSSIA/RUSSIA make units was the highest among the units of different makes. However, this is a small Capacity Group with major share of central sector units which had very high Operating Availability.

5.6.2 Major share of the units/capacity belongs to China/China and BHEL/BHEL make groups and both these groups show sharp decline in Operating Availability vis-à-vis 2015-16. The China/China make group shows higher Operating Availability of **about 4 % points** as compared to BHEL/BHEL make group. However, there is a remarkable difference between BHEL/BHEL and China/China make group in the losses/outages due to Reserve Shut Down (RSD) and is not attributable to unit performance. BHEL/BHEL make units have about **7 % points** higher losses on account of RSD as compared to China/China make group and thus accounting for the above factor, the BHEL/BHEL make shows slightly considerably higher Operating Availability – of about **3 %** points higher than the China/China make.

Further, the share of larger size units (more than 500 MW) is around 68 % in China/China make group which is much higher than the BHEL/BHEL make group where this share is around 50 %. As may be seen from table at 5.4.1, the larger size Capacity Group have much higher Operating Availability. Thus considering the above aspect, the Operating Availability of BHEL/BHEL make group would be further higher than the China/China group

5.6.3 The Other/Other make group also showed high Operating Availability due to very large share of over 75 % of higher size units of more than 500 MW and supercritical units. This group comprises of large numbers of new supercritical units manufactured by indigenous manufacturer like L&T MHI Toshiba, Doosan etc.

5.6.4 The BHEL/ABL make group is a small group with total capacity of around 3000 MW comprising mostly of old units.

5.7 OPERATING AVAILABILITY OF SYSTEMS

The Operating Availability of different systems / areas during the years 2015-16 and 2016-17 are shown in the Table below. It may be seen that equipment availability in

2015-116 has been marginally higher in all areas, and the lower overall Operating Availability in 2016-17 is due to higher unavailability due to "Other" reasons.

Systems / Areas	OPERATING AVAILABILITY (%)	
	2015-16	2016-17
BOILER & AUXILIARIES	96.05	95.30
TURBINE & AUXILIARIES	98.69	98.45
GENERATOR	99.09	99.41
OTHERS	80.0	78.00
Over All	**73.82**	**71.16**

5.8 MONTHWISE OPERATING AVAILABILITY

During the year 2016-17, the highest Operating Availability of 78.06% was achieved during Oct, 2015 and lowest Operating Availability of 70.16% during Aug'15. Month wise Planned Maintenance (%), Forced outage (%) and Operating Availability (%) during 2014-15 and 2015-16 are shown below:

Month	Unavailability				Operating Availability (%)	
	Planned (%)		Forced (%)			
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
April	4.6	3.75	22.51	10.50	72.89	85.75
May	2.93	3.13	19.33	27.78	77.74	69.09
June	5.58	4.22	19.7	22.82	74.72	72.96
July	5.88	6.29	20.09	24.11	74.03	69.61
August	5.71	6.14	24.13	28.97	70.16	64.89
September	5.39	4.09	19.53	25.53	75.08	70.38
October	4.66	2.91	17.28	23.46	78.06	73.63
November	4.3	3.08	22.43	24.38	73.27	72.54
December	3.75	4.28	21.87	25.70	74.38	70.02
January	3.09	3.43	20.6	22.41	76.31	74.15
February	3.77	3.99	18.53	21.91	77.7	74.11
March	4.46	3.71	21.06	30.28	74.48	66.01
April – March	**4.28**	**4.32**	**21.9**	**24.52**	**73.82**	**71.16**

5.9 OPERATING AVAILABILITY – ORGANISATION WISE

Organization wise Operating Availability in respect of Central Sector, State Sector and Pvt. Utilities during 2016-17 is given below:

Sl. No.	Organization/ Utility	No of units Reviewed	Capacity (mw)	PM (%)	FO (%)	OP. Av. (%)
CENTRAL SECTOR						

Sl. No.	Organization/ Utility	No of units Reviewed	Capacity (mw)	PM (%)	FO (%)	OP. Av. (%)
1	NTPC Ltd.	102	35295.00	4.56	7.09	88.35
2	APCPL	3	1500.00	3.29	36.67	60.04
3	DVC	1	250.00	0.00	84.44	15.56
4	BRBCL	25	7640.00	6.48	38.11	55.41
5	K.B.U.N.L	3	415.00	6.38	51.15	42.47
6	NLC	22	3240.00	5.83	10.88	83.29
7	NSPCL	2	500.00	0.79	0.25	98.96
8	NTECL	3	1500.00	9.04	6.82	84.14
9	NTPL	2	1000.00	4.66	9.60	85.74
10	PVUNL	10	455.00	0.00	86.72	13.28
	CENTRAL SECTOR	**173**	**51795.00**	**4.93**	**13.86**	**81.21**
STATE SECTOR						
NORTHERN REGION						
1	HPGCL	8	2720.00	3.89	36.81	59.30
2	IPGPCL	2	135.00	0.00	100.00	0.00
3	PSPCL	14	2620.00	1.98	67.38	30.64
4	RRVUNL	21	5190.00	9.60	28.87	61.53
5	UPRVUNL	28	5923.00	8.39	20.61	71.00
WESTERN REGION						
6	BECL	2	500.00	0.00	42.30	57.70
7	CSPGCL	15	3280.00	4.03	20.07	75.90
8	GMDCL	2	250.00	3.07	8.09	88.84
9	GSECL	26	4480.00	7.72	46.74	45.54
10	MAHAGENCO	39	10580.00	5.94	29.71	64.35
11	MPPGCL	14	4080.00	8.39	41.04	50.57
SOUTHERN REGION						
12	APGENCO	12	2810.00	3.26	7.97	88.77
13	APPDCL	2	1600.00	8.37	9.99	81.64
14	KPCL	10	2720.00	2.33	17.54	80.13
15	RPCL	1	800.00	0.00	74.36	25.64
16	SCCL	2	1200.00	0.00	10.25	89.75
17	TNGDCL	20	4660.00	9.44	18.95	71.61
18	TSGENCO	14	2882.50	3.03	9.26	87.71
EASTERN REGION						
19	DPL	6	660.00	0.00	66.44	33.56
20	OPGC	2	420.00	3.00	1.26	95.74
21	TVNL	2	420.00	14.55	36.85	48.60
22	WBPDC	25	4360.00	2.07	26.21	71.72
NORTH EASTERN REGION						
20	APGPCL	2	60.00	0.00	100.00	0.00
	STATE SECTOR	**269**	**62350.50**	**5.88**	**28.58**	**65.53**
PRIVATE UTILITY						
WESTERN REGION						
1	RIL (DAHANU)	2	500.00	0.00	3.71	96.29
2	TATA PCL	4	1250.00	3.97	46.17	49.86
3	TOR. POW. (UNOSUGEN)	5	422.00	3.01	15.98	81.01
EASTERN						
4	CESC	13	1125.00	1.80	28.72	69.48
	PRIVATE UTILITY	**24**	**3297.00**	**2.56**	**30.51**	**66.93**
PRIVATE IPPs						
NORTHERN REGION						
1	APL	2	1320.00	0.00	16.05	83.95
2	BEPL	10	450.00	13.98	22.84	63.18
3	GPGSL (GVK)	2	540.00	0.00	96.48	3.52
4	JhPL(HR)	2	1320.00	8.11	55.62	36.27
5	LAPPL	2	1200.00	2.65	5.04	92.31
6	LPGCL	3	1980.00	0.00	46.81	53.19

Sl. No.	Organization/ Utility	No of units Reviewed	Capacity (mw)	PM (%)	FO (%)	OP. Av. (%)
7	NPL	2	1400.00	5.72	1.27	93.01
8	PPGCL (Jaypee)	2	1320.00	0.00	33.13	66.87
9	RPSCL	4	1200.00	4.28	10.85	84.87
10	RWPL (JSW)	8	1080.00	0.00	14.04	85.96
11	TSPL	3	1980.00	3.65	27.44	68.91
WESTERN REGION						
12	ACB	4	325.00	3.17	16.65	80.18
13	AMNEPL	4	246.00	0.00	100.00	0.00
14	APL	14	7920.00	2.04	16.38	81.58
15	BALCO	2	600.00	0.00	20.74	79.26
16	BLAPPL	1	45.00	0.00	15.53	84.47
17	CGPL	5	4000.00	5.48	11.60	82.92
18	DBPCL	2	1200.00	1.44	6.47	92.09
19	DIPL	2	600.00	0.00	50.91	49.09
20	EPGL	2	1200.00	8.65	23.48	67.87
21	ESSARPMPL	1	600.00	0.82	20.13	79.05
22	GCEL	2	1370.00	0.00	90.44	9.56
23	GEPL	2	120.00	0.00	100.00	0.00
24	GIPCL	4	500.00	5.07	10.64	84.29
25	GMR ENERG	2	600.00	0.78	13.32	85.90
26	IEPL	1	270.00	0.00	100.00	0.00
27	JHAPL	1	600.00	2.25	86.86	10.89
28	JPL	8	3400.00	0.90	59.56	39.54
29	JPPVL	4	1820.00	0.70	29.01	70.29
30	JSWEL	4	1200.00	3.79	17.84	78.37
31	KWPCL	1	600.00	0.00	31.90	68.10
32	LANCO	2	600.00	3.15	5.14	91.71
33	MBPMPL	2	1200.00	0.00	55.25	44.75
34	MCCPL	1	300.00	0.00	31.85	68.15
35	RKMPPL	2	720.00	0.00	49.13	50.87
36	RattanIndia	5	1350.00	0.00	80.41	19.59
37	SCPL	2	100.00	0.74	18.28	80.98
38	SPL	6	3960.00	0.00	7.85	92.15
39	STPL	1	270.00	0.00	100.00	0.00
40	SVPPL	1	63.00	1.46	31.26	67.28
41	TRNE	1	300.00	0.00	40.79	59.21
42	VESPL	1	35.00	0.00	100.00	0.00
43	VIP	2	600.00	3.07	10.94	85.99
44	VVL	1	135.00	0.00	100.00	0.00
45	WPCL	6	1740.00	0.66	29.98	69.36
SOUTHERN REGION						
46	CEPL	2	1200.00	7.92	40.05	52.03
47	HNPC	2	1040.00	1.65	45.86	52.49
48	IBPIL	2	300.00	0.00	98.33	1.67
49	ITPCL	2	1200.00	0.00	36.32	63.68
50	JSWEL	4	860.00	4.56	23.11	72.33
51	MEL	2	300.00	0.00	29.20	70.80
52	SEIL	4	2640.00	2.26	13.86	83.88
53	SEPL	4	600.00	0.40	63.27	36.33
54	ST-CMSECP	1	250.00	0.00	17.98	82.02
55	UPCL	2	1200.00	6.77	7.51	85.72
EASTERN REGION						
56	ADHUNIK	2	540.00	7.09	15.54	77.37
57	GMR ENERG	3	1050.00	5.06	11.25	83.69
58	HEL	2	600.00	4.15	0.43	95.42
59	IBPIL	1	350.00	0.00	150.21	-50.21
60	JITPL	2	1200.00	0.00	23.54	76.46
61	MPL	2	1050.00	4.04	3.80	92.16

Sl. No.	Organization/ Utility	No of units Reviewed	Capacity (mw)	PM (%)	FO (%)	OP. Av. (%)
62	SEL	4	1200.00	5.32	25.47	69.21
63	TATA PCL	3	360.00	7.63	1.00	91.37
	PRIVATE IPP	**183**	**68319.00**	**2.52**	**28.71**	**68.76**
	ALL INDIA	**649**	**189946.5**	**4.32**	**24.52**	**71.16**

SECTION-6
CAPACITY GROUPWISE PERFORMANCE

6.1 This section covers the performance analysis of various capacity groups of thermal units during last three years. As on 31st March 2017, capacity group-wise disposition of 649 units considered in the review is as shown below:

Capacity Group Wise Disposition of thermal units												
Capacity	**BHEL/BHEL**		**ABL/BHEL**		**RUSSIA/RUSSIA**		**CHINA/CHINA**		**OTHER/OTHER**		**TOTAL**	
	NO.	**CAP. (MW)**	**NO.**	**CAP. (MW)**	**NO.**	**CAP. (MW)**	**NO.**	**CAP. (MW)**	**NO.**	**CAP. (MW)**	**NO.**	**CAP. (MW)**
25-99	16	1158	0	0	18	930	7	429	44	2262.5	85	4779.5
100-150	51	5907	6	710	3	300	18	2475	20	2530	98	11922.0
195-200	23	4585	0	0	0	0	0	0	3	600	26	5185.0
210-210	117	24570	11	2310	10	2100	0	0	5	1050	143	30030.0
250-270	66	16700	0	0	0	0	0	0	5	1270	71	17970.0
300-360	0	0	0	0	0	0	37	11490	2	650	39	12140.0
490-600	98	50770	0	0	0	0	25	15000	10	5200	132	70370.0
660-800	9	6080	0	0	0	0	25	16500	21	14970	55	37550.0
Total	**380**	**109770**	**17**	**3020**	**31**	**3330**	**117**	**48464**	104	**25362.5**	**649**	**189946.5**

6.2 CAPACITY GROUPWISE PERFORMANCE

Capacity group wise performance of these 649 thermal units is discussed in the subsequent paragraphs.

6.2.1 660-800 MW CAPACITY GROUP (SUPERCRITICAL UNITS)

6.2.1.1 The year 2016-17, 60 super critical units were synchronized to the grid, out of these, 55 units which had been reckoned for PLF calculation during the year have been considered in the Review. The Plant load factor of the group was 65.40%. Performance of 660-800 MW capacity group units during the years 2014-15,2015-16 and 2016-17 are given below:-

Sl. No.	PARTTICULARS	2014-15	2015-16	2016-17
1	**UNITS COMMISSIONED BY HE END OF THE YEAR**			
	(a) Number	40	51	60
	(b) Capacity (MW)	27,485	34,950	41310.0
2	**UNITS REVIEWED**			
	(a) Number	27	45	55
	(b) Capacity (MW)	18,560	30,785	37550.0
	(c) Generation (MU)	109,484.59	164,079.75	189688.54
3	**Planned Maintenance (%)**	2.73	2.72	2.97
4	**Forced outage (%)**	15.85	16.66	19.52
5	**Operating Availability (%)**	81.42	80.62	77.51
6	**Plant Load Factor (%)**	68.23	69.36	65.40

As may be seen, this Capacity Group showed much higher Operating Availability than the overall Operating Availability of the units considered in the review.

During the year 2016-17, energy losses due to forced outage in respect of 660-800 MW capacity group unit was 56169.01 MU. The maximum energy loss of 14235.51 MU was due to RSD. These accounted for over 1/4th of the total forced outage losses of the group. Details of Forced outages and energy loss of 660-800 MW capacity group units and areas of outages for the years 2015-16 and 2016-17 are shown below:

Area/ cause of Outage of 660-800 MW capacity group	No. of Outages		MU Loss		% of Group Forced outage losses	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
I. EQUIPMENT						
1. Boiler	108	144	10,736.94	7876.99	28.17	14.02
2. Turbine	36	51	2,745.22	4155.36	7.2	7.40
3. Generator	26	30	1,460.55	920.19	3.83	1.64
Total	**170**	**225**	**14,942.71**	**12952.54**	**39.21**	**23.06**
II. AUXILIARIES						
1. Boiler	40	49	2,322.29	2117.26	6.09	3.77
2. Turbine	22	46	2,208.71	2125.62	5.8	3.78
Total	**62**	**95**	**4,531**	**4242.89**	**11.89**	**7.55**
III. Boiler & Boiler Aux.	148	193	13,059.23	9994.25	34.27	17.79
IV. Turbine & Turbine Aux.	58	97	4,953.93	6280.99	13	11.18
V. Generator	26	30	1,460.55	920.19	3.83	1.64
VI. Misc. (Elect. /Mech.)	82	167	8,490.54	24738.07	22.28	44.04
VII. Total excluding RSD of the Group	314	487	27,964.25	41933.50	73.38	74.66
VIII. RSD	49	54	10,144.52	14235.51	26.62	25.34
Total	**363**	**541**	**38,108.78**	**56169.01**	**100**	**100.00**

The details of the area/causes of forced outages and energy loss of this capacity group unit during the years 2015-16 and 2016-17 are given below.

Area/ cause of outage (660-800 MW Capacity group)	No. of Outages		MU Loss		% of Group F.O. Loss	
	15-16	16-17	15-16	16-17	15-16	16-17
I. Equipment						
A. Boiler						
1. Water Wall Tube Leakage	37	49	4338.7	3031.72	11.39	5.40
2. Super Heater Tube Leakage	4	8	599.35	759.11	1.57	1.35
3. Reheater Tube Leakage	5	5	159.05	159.30	0.42	0.28
4. Economizer Tube Leakage	0	4	0	74.56	0	0.13
5. Air Preheaters Problem	24	19	3586.66	1437.16	9.41	2.56
6. Furnace Trouble	0	0	0	0	0	0
7. Boiler Operational Problems						
(A) FURNACE FIRE OUT/FLAME FAILURE	7	15	115.53	276.41	0.3	0.49
(B) FURNACE DRAFT ABNORMAL	4	4	63.2	143.42	0.17	0.26
8. Others	26	40	1872.87	1995.30	4.91	3.55
Total Boiler	**108**	**144**	**10736.94**	**7876.99**	**28.17**	**14.02**
B. Turbine						
1.Turbine Bearing Problem	1	0	3.07		0.01	
2.Governing / Oil System Problem	3	5	370.8	109.86	0.97	0.20
3.Turbine Differential Expansion Problem		3		8.94		0.02
4.Turbine Axial Shift/ Thrust Pad Problem	3	0	587.98		1.54	
5.Turbine Eccentricity/ High Vibration	0	3	-	331.77	-	0.59

Area/ cause of outage (660-800 MW Capacity group)	No. of Outages		MU Loss		% of Group F.O. Loss	
	15-16	16-17	15-16	16-17	15-16	16-17
6.Turbine Rotor Failure/Damaged						
7.Turbine Control Valve Problem	1	2	1.6	498.86	0	0.89
8.Condenser Tube Leakage	7	9	642.48	1000.49	1.69	1.78
9.Main Steam Line Problem	8	12	484.86	548.66	1.27	0.98
10.Emergency Safety Valve Closure						
11.Condenser Low Vacuum	4	0	40.88		0.11	
12. H.P. & L.P. Bypass System	2	3	381.75	184.95	1	0.33
13.Turbine Misc. Problems	7	14	231.81	1472.05	0.61	2.62
Total Turbine	**36**	**51**	**2745.22**	**4155.36**	**7.20**	**7.40**
C. Generator						
1. Stator/ Stator Earth Fault	0	3		39.88		0.07
2. Rotor/ Rotor Earth Fault	0	0				
2. Gen. Transformer Tripping/ Damaged	3	2	294.54	7.79	0.77	0.01
3. Excitation Problem	3	1	245.96	5.43	0.65	0.01
4. Gen. Cooling System Failure	2	0	70.58		0.19	
5. Seal Oil System Problem	1	0	12.74		0.03	
6. Fire In Gen. Bushing/ Bushing Failure	0	0				
6. Generator Bearing Problem	2	0	746.18		1.96	
7. A.V.R. Problem		2		11.13		0.02
8. Generator Protection/ Relay Operation Problem	12	18	79.8	395.07	0.21	0.70
9. Hydrogen Pressure Problem	0	2		449.15		0.80
10. Generator Miscellaneous Maintenance	3	2	10.75	11.73	0.03	0.02
Total Generator	**26**	**30**	**1460.55**	**920.19**	**3.83**	**1.64**
II.Auxiliaries						
A. Boiler Auxiliaries						
1. I.D. Fans Problem	4	8	620.47	665.43	1.63	1.17
2. F.D. Fans Problem	4	5	65.96	48.97	0.17	0.09
3. P.A. Fans Problem	18	16	673.49	229.60	1.77	0.41
4. Milling System /RC Feeder Problem	4	8	248.64	531.90	0.65	0.95
5. PIPES And VALVES BOILER SIDE	0	2	0	50.20	0	0.09
6. Boiler Aux. Misc. Problems	10	10	713.74	601.16	1.87	1.07
Total Boiler Aux.	**40**	**49**	**2322.29**	**2117.26**	**6.09**	**3.77**
B. Turbine Auxiliaries						
7. Boiler Feed Pump/Motor Problem	8	13	178.21	310.92	0.47	0.55
8. Condensate Pump Problem	0	2	0	28.76	0	0.05
9. C.W. Pump Problem	4	18	225.44	1185.84	0.59	2.11
10. Regenerative System Problem	6	1	1172.53	234.38	3.08	0.42
11. Turbine Pipes & Valves Problem	0	2	0	65.21	0	0.12
12. Deaerator Problem	0	1	0	3.54	0	0.01
13. Turbine Misc.	4	9	632.53	296.97	1.66	0.53
Total Turbine Aux.	**22**	**46**	**2208.71**	**2125.62**	**5.8**	**3.78**
Total Boiler & Turbine Aux.	**62**	**95**	**4531**	**4242.89**	**11.89**	**7.55**
III. Other Misc. Mechanical & Electrical Problems						
Other Electrical Problems						
1. Unit Aux./Station Transformer Problems	5	2	567.24	441.78	1.49	0.79
2. Gen. Transformer Tripping/ Damaged	5	10	37.87	126.38	0.1	0.23
3. H.T./L.T. Supply Problem	2	4	2.62	88.34	0.01	0.16
4. Dc Supply Problem	2	3	4.14	91.36	0.01	0.16
5. Switch Yard/Bus Bar Problem	13	17	232.74	453.61	0.61	0.81
6. Breaker/Isolator Problems	2	3	9.26	9.26	0.02	0.80
7. Electrical Miscellaneous Problems	17	38	1076.75	1567.92	2.83	2.79
Total Other Electrical Problems	**52**	**89**	**2066.2**	**2778.65**	**5.43**	**4.95**
B. Fuel Supply And Other Misc. Problems						
9. Coal FEEDING PROBLEM	3	8	1396.43	623.52	3.66	1.11
10. Lignite Feeding Problem	0	8		449.56	0	0.80
12. Fuel Oil Problem	2	0	141.15		0.37	
13. Cooling Tower Problem	1	0	150.6		0.4	
14. Ash Handling System Problem	3	5	505.92	798.51	1.33	1.42
15. Raw Water Problem	0	6		3041.46		5.41
16. E.S.P. / Pollution Problem	1	0	54.63		0.14	
17. Non-Readiness Of Residual Work Of New Unit	2	1	1005.13	183.63	2.64	0.33
18. Vintage Unit Withdrawn And Closed For Operation	0					
19. Fuel Supply & Other Misc. Problems	6	16	135.56	2393.22	0.36	4.27

Area/ cause of outage (660-800 MW Capacity group)	No. of Outages		MU Loss		% of Group F.O. Loss	
	15-16	16-17	15-16	16-17	15-16	16-17
20. Other Misc. Problems	1	2	336.3	124.53	0.88	0.22
21. Coal Shortage	1	4	151.46	1143.55	0.4	2.04
22. Lignite Shortage	0	0	0	0	0	0
Total Fuel Supply And Other Misc. Problems	**20**	**50**	**3877.18**	**11014.81**	**10.18**	**19.61**
Grid System						
24. Transmission Constraints/ Grid Disturbance	15	34	166.21	2364.91	0.44	4.21
25. Reserve Shut Down/ Low Schedule	49	54	10144.52	14235.51	26.62	25.34
27. NO Power Purchase Agreement	1	3	2516.52	8572.83	6.6	15.26
28. Other Commercial Reason	0	1	0	6.86		0.01
Total Grid System	**65**	**92**	**12827.25**	**25180.11**	**33.66**	**44.82**
Total Miscellaneous	**190**	**231**	**30463.04**	**38973.57**	**49.27**	**69.39**

6.2.2 490-600 MW CAPACITY GROUP

6.2.2.1 Performance of 490-600 MW capacity group units during the years 2014-15 ,2015-16 and 2016-17 are given below:-

S.N.	PARTTICULARS	2014-15	2015-16	2016-17
1	**Units Commissioned By The End Of The Year**			
	(a) Number	111	129	132
	(b) Capacity (MW)	58730	68670	70370
2	**Units Reviewed**			
	(a) Number	101	118	132
	(b) Capacity (MW)	52930	62750	70370
	(c) Generation (MU)	290852.83	331017.39	372792.82
3	Planned Maintenance (%)	4.13	4.16	4.46
4	Forced outage (%)	18.66	18.26	20.11
5	Operating Availability (%)	77.21	77.58	75.43
6	Plant Load Factor (%)	63.95	65.03	63.15

6.2.2.2 Details of outages and energy loss of 490-600 MW capacity group units on account of outages of various equipment and auxiliaries for the previous three years are shown below.

Area/ cause of Outage	No. of Outages			MU Loss			% of Group F.O. Losses		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
I. Equipment									
1. Boiler	396	455	584	16370.4	15613.45	36117.83	19.57	16.76	30.84
2. Turbine	79	106	151	4304.52	4182.48	6240.42	5.15	4.49	5.33
3. Generator	116	87	111	12229.95	3569.04	2701.90	14.62	3.83	2.31
Total	**591**	**648**	**846**	**32904.86**	**23364.97**	**45060.15**	**39.34**	**25.08**	**38.48**
Ii. Auxiliaries									
1. Boiler	80	97	104	1672.96	1631.33	1159.83	2	1.75	0.99
2. Turbine	30	58	79	911.36	996.64	2914.64	1.09	1.07	2.49
Total	**110**	**155**	**183**	**2584.32**	**2627.97**	**4074.46**	**3.09**	**2.82**	**3.48**
III. Boiler & Boiler Aux.	476	552	688	18043.36	17244.78	37277.66	21.57	18.51	31.83
IV. Turbine & Turbine Aux.	109	164	230	5215.87	5179.11	9155.06	6.24	5.56	7.82
V. Generator	116	87	111	12229.95	3569.04	2701.90	14.62	3.83	2.31
VI. Misc. (Elect. /Mech.)	255	281	335	31051.28	33065.92	29918.66	37.12	35.49	25.55
VII. Total excluding RSD of the Group	956	1084	1364	66540.46	59058.86	79053.28	79.54	63.39	67.51
VIII. RSD	74	156	168	17110.96	34118.69	38052.53	20.46	36.62	32.49
Total	**1030**	**1240**	**1532**	**83651.43**	**93177.54**	**117105.81**	**100**	**100**	**100**

6.2.2.3 The details of the area/causes of forced outages and energy loss of this capacity group unit during the years 2014-15, 2015-16 and 2016-17 are given below.

Area/ cause of outage (490- 600MW Capacity group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
I. Equipments									
A. Boiler									
1. Water Wall Tube Leakage	200	172	229	9646.81	5953.72	14767.25	11.53	6.39	12.61
2. Super Heater Tube Leakage	13	21	32	697.02	1243.72	1989.70	0.83	1.33	1.70
3. Reheater Tube Leakage	9	52	40	280.11	1231.31	3736.90	0.33	1.32	3.19
4. Economiser Tube Leakage	28	35	42	912.66	3614.57	1454.18	1.09	3.88	1.24
5. Air Preheaters Problem	17	33	38	416.61	969.16	5504.65	0.5	1.04	4.70
6. Furnace Trouble	2	4	1	200.07	143.24	4.52	0.24	0.15	0.0
7. Boiler Operational Problems									
(A) Furnace Fire Out/Flame Failure	68	50	74	1642.46	284.98	476.04	1.96	0.31	0.41
(B) Furnace Draft Abnormal	26	26	33	346.88	255.35	5142.54	0.41	0.27	4.39
(C) Drum Level High/ Low	24	31	51	1316.93	156.23	276.48	1.57	0.17	0.24
8. Others	9	31	44	910.86	1761.16	2765.57	1.09	1.89	2.36
Total Boiler	**396**	**455**	**584**	**16370.4**	**15613.45**	**36117.83**	**19.57**	**16.76**	**30.84**
B. Turbine									
1.Turbine Bearing Problem	3	6	7	693.11	438.19	1321.41	0.83	0.47	1.13
2.Governing / Oil System Problem	6	8	14	51.56	415	381.17	0.06	0.45	0.33
3.Turbine Differential Expansion	1	4	5	1.74	10.78	74.71	0	0.01	0.06
4.Turbine Axial Shift/ Thrust Pad	1	0	1	23.3		31.41	0.03		0.03
5.Turbine Eccentricity/ High Vibration	14	22	21	2344.7	1380.23	2173.89	2.8	1.48	1.86
6.Turbine Rotor Failure/Damaged			1			127.42			0.11
7.Turbine Control Valve Problem	3	6	6	8.26	195.3	185.21	0.01	0.21	0.16
8.Condenser Tube Leakage/ Cleaning	4	5	5	261.3	190.09	252.34	0.31	0.2	0.22
9.Main Steam Line Problem	6	12	42	53.97	190.15	1000.65	0.06	0.2	0.85
10.Emergency Safety Valve Closure	0	3	5		74.98	72.83		0.08	0.06
11.Condenser Low Vacuum	19	16	25	206.71	125.58	353.57	0.25	0.13	0.30
12. H.P. & L.P. Bypass System	1	7	7	267.53	243.75	115.35	0.32	0.26	0.10
13.Turbine Misc. Problem	21	17	12	392.33	918.41	150.44	0.47	0.99	0.13
Total Turbine	**79**	**106**	**151**	**4304.52**	**4182.48**	**6240.42**	**5.15**	**4.49**	**5.33**
C. Generator									
1. Stator/ Stator Earth Fault	5	14	15	39.73	184.49	1169.55	0.05	0.2	1.00
2. Rotor/ Rotor Earth Fault	1	3	4	2.41	91.37	22.18	0	0.1	0.02
3. Gen. Transformer Tripping/ Damaged	8	3	6	2226.76	16.58	175.16	2.66	0.02	0.15
4. Excitation Problem	6	7	12	18.26	1088.72	92.15	0.02	1.17	0.08
5. Gen. Cooling System Failure	0	3	7	-	227.01	178.27		0.24	0.15
6. Seal Oil System Problem	3	1	1	29.9	7.52	65.00	0.04	0.01	0.06
7. Fire In Turbo Gen. Bushing/ Bushing Failure	1	1	1	3268.5	1.63	2.22	3.91	0	0
8. Generator Bearing Problem	1	2	3	546.05	93.27	10.80	0.65	0.1	0.01
9. A.V.R. Problem	3	6	7	283.36	208.89	17.63	0.34	0.22	0.02
10. Generator Protection/ Relay Operation Problem	75	38	43	4024.63	1536.26	649.65	4.81	1.65	0.55
11. Hydrogen Pressure Problem	5	2	4	1778.15	36.64	285.22	2.13	0.04	0.24
12. Generator Miscellaneous Maintenance	8	7	8	12.19	76.65	34.08	0.01	0.08	0.03
Total Generator	**116**	**87**	**111**	**12230**	**3569.04**	**2701.90**	**14.62**	**3.83**	**2.31**
II Auxiliaries									
A. Boiler Auxiliaries									
1. I.D. Fans Problem	7	17	20	264.74	239.99	361.56	0.32	0.26	0.31
2. F.D. Fans Problem	1	6	6	18.84	94.32	24.68	0.02	0.1	0.02
3. P.A. Fans Problem	30	32	47	347.47	410.01	439.71	0.42	0.44	0.38
4. Milling System /RC Feeder Problem	4	3	1	90.28	196.16	2.15	0.15	0.21	0.00
5. Pipes And Valves Boiler Side	27	31	19	191.86	554.53	146.06	0.32	0.6	0.12
6. Boiler Aux. Misc. Problems	14	8	11	303.41	136.32	185.67	0.5	0.15	0.16
Total Boiler Aux.	**80**	**97**	**104**	**1106.64**	**1631.33**	**1159.83**	**1.84**	**1.75**	**0.99**
B. Turbine Auxiliaries									
1. Boiler Feed Pump/Motor Problem	11	29	33	293.14	298.65	208.85	0.35	0.32	0.18
2. Condensate Pump Problem	0	4	1	0	20.66	0.62	0	0.02	0.00
3. C.W. Pump Problem	9	11	17	253.08	544.54	1360.09	0.3	0.58	1.16
4. Regenerative System Problem	0	0	2	0	0	139.70	0	0	0.12
5. Turbine Pipes & Valves Problem	0	0	0	0	0	0	0	0	0.00
6. Deaerator Problem	0	0	1	0	0	34.85	0	0	0.03
7. Turbine Misc.	10	14	25	365.14	132.79	1170.54	0.44	0.14	1.00
Total Turbine Aux.	**30**	**58**	**79**	**911.36**	**996.64**	**2914.64**	**1.09**	**1.07**	**2.49**
Total Boiler & Turbine Aux.	**110**	**155**	**183**	**2584.32**	**2627.97**	**4074.46**	**3.09**	**2.82**	**3.48**
III Others Misc. Problems									
A. Other Electrical Problems									

Area/ cause of outage (490- 600MW Capacity group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
1. Unit Aux. Transformer/ Station Transformer Problems	5	12	28	75.86	38.4	2892.04	0.09	0.04	2.47
2. Gen. Transformer Tripping/ Damaged	12	21	18	756.95	328.55	342.50	0.9	0.35	0.29
3. H.T./L.T. Supply Problem	3	4	2	6.02	50.8	8.39	0.01	0.05	0.01
4. Dc Supply Problem	7	5	9	18.87	17.12	24.51	0.02	0.02	0.02
5. Switch Yard/Bus Bar Problem	9	14	40	229.47	64.13	283.75	0.27	0.07	0.24
6. Breaker / Isolator Problems	9	3	3	773.64	265.56	10.07	0.92	0.29	0.01
7. Misc. Fire Hazards / Fire In Cable Gallery	1	1	3	3.76	1.59	32.04	0	0	0.03
8. Instrumentation Problem	1	0	0	19.32			0.02		
9. Air Supply Problem	0	1	1		4.1	2.62		0	0.00
10. Electrical Miscellaneous Problems	62	88	105	531.63	1094.8	1541.32	0.64	1.17	1.32
Total Other Electrical Problems	**117**	**169**	**219**	**4953.75**	**1865.05**	**5137.24**	**5.9**	**3.49**	**4.39**
B. Fuel And Other Misc. Problems									
12. Lignite Feeding Problem	32	2	3	6642.99	1793.74	722.65	7.94	1.93	0.62
13. Coal Feeding Problem	23	15	23	4109.49	6483.31	3009.46	4.91	6.96	2.57
14. Wet/ Poor Quality Coal	1	1	2	109.22	24.81	76.84	0.13	0.03	0.07
15. Fuel Oil Problem	4	2	1	4.8	3.46	93.45	0.01	0	0.08
16. Cooling Tower Problem	2	1	0	36.05	11.14		0.04	0.01	
17. Ash Handling System Problem	11	20	14	4564.46	6245.3	880.15	5.46	6.7	0.75
18. Raw Water Problem	4	6	7	133.04	805.32	323.70	0.16	0.86	0.28
19. D.M. Water Problem	2	0	2	178.01		104.30	0.21		0.09
20. E.S.P. / Pollution Problem	0	2	1		224.91	1281.83		0.24	1.09
21. Non-Readiness Of Residual Work Of New Unit	2	2	0	488.52	109.28		0.58	0.12	
23. Fuel Supply & Other Misc. Problems	8	20	10	2538.22	1397.81	876.91	3.03	1.5	0.75
24. Other Misc. Problems	2	8	8	544.11	3049.53	1235.74	0.65	0.48	1.06
25. Coal Shortage	20	9	9	1544.52	1230.56	2635.92	1.85	1.32	2.25
26.Vintage Unit Withdrawn and Closed for Operation			1			93.84			0.08
Total Fuel Supply And Other Misc Problems	**111**	**88**	**81**	**20893.43**	**21379.2**	**18175.62**	**24.97**	**20.15**	**15.52**
C. Grid System									
27. Transmission Constraints/ Grid Disturbance	34	40	36	7186.16	6698.26	181.10	8.59	7.19	0.15
28. Reserve Shut Down	74	156	168	17110.96	34118.69	38052.53	20.46	39.35	32.49
29. No Power Purchase Agreement	_	1	2	_	3123.44	5964.00	_	3.35	5.09
30. Other Commercial Reason			1			460.89			0.39
Total Grid System	**108**	**197**	**207**	**24297.12**	**46489.29**	**44658.51**	**29.05**	**49.89**	**38.12**
Total Miscellaneous	**336**	**454**	**288**	**50144.3**	**68531.35**	**67971.37**	**59.94**	**73.53**	**58.04**

6.2.3 300-360 MW CAPACITY GROUP

6.2.3.1 Plant load factor of 300-360 MW capacity group units during the financial year 2016-17 have slightly lesser than the national average PLF%. Performance of 300-360 MW capacity group units during the year 2014-15, 2015-16 and 2016-17 is given below:-

S.N.	PARTTICULARS	2014-15	2015-16	2016-17
1	**Units Commissioned By The End Of The Year**			
	(a) Number	32	38	39
	(b) Capacity (MW)	9870	11840	12140
2	**Units Reviewed**			
	(a) Number	29	37	39
	(b) Capacity (MW)	8970	11490	12140
	(c) Generation (MU)	52980.93	60158.30	62468.62
3	**Planned Maintenance (%)**	3	1.99	2.56
4	**Forced outage (%)**	17.65	17.45	22.47
5	**Operating Availability (%)**	79.35	80.56	74.97

6	**Plant Load Factor (%)**	66.02	65.12	59.91

6.2.3.2 Forced outage details due to failure of equipment and auxiliaries and energy loss of 300-360 MW capacity group units for the years 2014-15, 2015-16 and 2016-17 is shown below:

Area/ cause of Outage of(300- 360MW Capacity group)	**No. of Outages**			**MU Loss**			**% of Group F.O. Loss**		
	2014-15	**2015-16**	**2016-17**	**2014-15**	**2015-16**	**2016-17**	**2014-15**	**2015-16**	**2016-17**
I. EQUIPMENT									
1. Boiler	68	92	72	2298.5	1513.23	1880.89	16.57	9.42	8.03
2. Turbine	22	33	46	702.81	1661.86	1662.33	5.07	10.35	7.10
3. Generator	14	19	21	599.41	96.29	216.24	4.32	0.6	0.92
Total	**104**	**144**	**139**	**3600.72**	**3271.38**	**3759.46**	**25.96**	**20.37**	**16.05**
II. AUXILIARIES									
1. Boiler	10	26	27	833.09	719.24	967.07	6.01	4.48	4.13
2. Turbine	10	15	11	188.71	287.58	855.47	1.36	1.79	3.65
Total	**20**	**41**	**38**	**1021.8**	**1006.82**	**1822.54**	**7.37**	**6.27**	**7.78**
III. Boiler & Boiler Aux.	78	118	99	3131.59	2232.47	2847.96	22.58	13.9	12.16
IV. Turbine & Turbine Aux.	32	48	57	891.52	1949.44	2517.79	6.43	12.14	10.75
V. Generator	14	19	21	599.41	96.29	216.24	4.32	0.6	0.92
VI. Misc. (Elect. /Mech.)	57	66	93	7546.49	6961.28	12520.58	54.41	43.35	53.46
VII. Total excluding RSD of the Group	181	251	270	12169.01	11239.49	18102.57	87.74	69.99	77.29
VIII. RSD	26	43	54	1700.09	4818.38	5318.09	12.26	30.01	22.71
Total	**207**	**294**	**324**	**13869.1**	**16057.9**	**23420.66**	**100**	**100**	**100**

6.2.3.3 The break-up of the area/causes of forced outages and energy loss of 300-360 MW capacity group units during the years 2014-15, 2015-16 and 2016-17 is given below: -

Area/ cause of outage of (300- 360MW Capacity group)	**No. of Outages**			**MU Loss**			**% of Group F.O. Loss**		
	14-15	**15-16**	**16-17**	**14-15**	**15-16**	**16-17**	**14-15**	**15-16**	**16-17**
I. EQUIPMENTS									
A. Boiler									
1. Water Wall Tube Leakage	28	29	20	1504.34	738.94	460.65	10.85	4.6	1.97
2. Super Heater Tube Leakage	2	5	5	166.79	149.33	134.87	1.2	0.93	0.58
3. Reheater Tube Leakage	3	1	4	230.99	185.28	381.73	1.67	1.15	1.63
4. Economiser Tube Leakage	4	0	2	110.98	0	193.26	0.8	0	0.83
5. Air Preheaters Problem	6	6	12	94.93	42.36	245.79	0.68	0.26	1.05
6. Boiler Operational Problems									
(A) Furnace Fire Out/Flame Failure	16	13	8	27.31	95	36.98	0.2	0.59	0.16
(B) Furnace Draft Abnormal	3	14	3	4.64	17.99	2.30	0.03	0.11	0.01
(C) Drum Level High/ Low	5	8	8	149.87	28.72	8.36	1.08	0.18	0.04
7. Others	1	16	10	8.65	255.61	416.97	0.06	1.59	1.78
Total Boiler	**68**	**92**	**72**	**2298.5**	**1513.23**	**1880.89**	**16.57**	**9.42**	**8.03**
B. Turbine									
1.Turbine Bearing Problem	0	3	5		672.69	632..46		4.19	2.70
2.Governing / Oil System Problem	2	6	9	101.48	26.03	19.08	0.73	0.16	0.08
3.Turbine Differential Expansion Problem	0	0	1			13.73			0.06
4.Turbine Axial Shift/ Thrust Pad Problem									
5.Turbine Eccentricity/ High Vibration	4	6	14	380.12	17.09		2.74	0.11	1.22
6.Turbine Rotor Failure/Damaged									

Area/ cause of outage of (300- 360MW Capacity group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
7.Turbine Control Valve Problem	1	0	2	82.79		14.66	0.6		0.06
8.Condenser Tube Leakage/ Cleaning	5	7	4	85.82	301.8	102.73	0.62	1.88	0.44
9.Main Steam Line Problem	5	1	2	22.5	0.2	2.18	0.16	0	0.01
10.Emergency Safety Valve Closure									
11.Condenser Low Vacuum	1	5	7	0.68	220.09	281.84	0	1.37	1.20
12. H.P. & L.P. Bypass System	0	0							
13.Turbine Misc. Problem	4	5	2	29.41	423.96	310.20	0.21	2.64	1.32
Total Turbine	**22**	**33**	**46**	**702.81**	**1661.86**	**1662.33**	**5.07**	**10.35**	**7.10**
C. Generator									
1. Stator/ Stator Earth Fault	2	3	1	87.22	7.49	2.06	0.63	0.05	0.01
2. Gen. Transformer Tripping/ Damaged	1	0	0	0.91			0.01		
2. Rotor/ Rotor Earth Fault	1	2	0	201.34	7.01		1.45	0.04	
3. Excitation Problem	0	3	3		3.69	21.28		0.02	0.09
4. Gen. Cooling System Failure	0	3	2		18.87	2.20		0.12	0.01
5. Seal Oil System Problem									
6. Fire In Turbo Gen. Bushing/ Bushing Failure									
6. Generator Bearing Problem									
7. A.V.R. Problem	0								
8. Generator Protection/ Relay Operation Problem	8	7	7	31.05	57.41	8.13	0.22	0.36	0.03
9. Hydrogen Pressure Problem	1	0	1	269.73		122.02	1.94		0.52
10. Generator Miscellaneous Maintenance	1	1	7	9.17	1.81	60.55	0.07	0.01	0.26
Total Generator	**14**	**19**	**21**	**599.41**	**96.29**	**216.24**	**4.32**	**0.6**	**0.92**
A. Boiler Auxiliaries									
1. I.D. Fans Problem	3	10	15	434.27	378.4	765.85	3.13	2.36	3.27
2. F.D. Fans Problem	1	1	3	0.36	0.63	91.73	0	0	0.39
3. P.A. Fans Problem	0	9	4	0	259.07	2.88	0	1.61	0.01
4. Milling System /RC Feeder Problem	0	3	4	0	79.09	105.49	0	0.49	0.45
5. PIPES And VALVES BOILER SIDE	0	2	0	0	1.5	0	0	0.01	0.00
6. Boiler Aux. Misc. Problems	6	1	1	398.46	0.55	1.12	2.87	0	0.00
Total Boiler Aux.	**10**	**26**	**27**	**833.09**	**719.24**	**967.07**	**6.01**	**4.48**	**4.13**
B. Turbine Auxiliaries									
1. Boiler Feed Pump/Motor Problem	0	8	3	0	210.51	27.69	0	1.31	0.12
2. Condensate Pump Problem	0	0	0	0	0	0	0	0	0
3. C.W. Pump Problem	2	3	4	20.08	38.18	804.62	0.14	0.24	3.44
4. Regenerative System Problem	1	0	0	39.73	0	0	0.29	0	0
5. Turbine Pipes & Valves Problem	1	0	1	1.78	0	3.03	0.01	0	0.01
6. Deaerator Problem	0	0	0	0	0	0	0	0	0
7. Turbine Misc.	6	4	3	127.12	38.88	20.14	0.92	0.24	0.09
Total Turbine Aux.	**10**	**15**	**11**	**188.71**	**287.58**	**855.47**	**1.36**	**1.79**	**3.65**
Total Boiler & Turbine Aux.	**20**	**41**	**38**	**1021.8**	**1006.82**	**1822.54**	**7.37**	**6.27**	**7.78**
III Others Misc. Problems									
A. Other Electrical Problems									
1. Unit Aux. Transformer/ Station Transformer Problems	2	3	6	3.64	3.91	6.19	0.03	0.02	0.03
2. Gen. Transformer Tripping/ Damaged	4	6	1	22.25	12.23	1.71	0.16	0.08	0.01
3. H.T./L.T. Supply Problem	1	2	0	0.82	9.52		0.01	0.06	
4. Dc Supply Problem	1	4	0	1.23	674.28		0.01	4.2	
5. Switch Yard/Bus Bar Problem	3	7	6	246.27	676.38	36.72	1.78	4.21	0.16
6. Breaker/Isolator Problems	2	0	1	2.32		1.37	0.02		0.01
7. Electrical Miscellaneous Problems	14	11	15	827.85	49.35	19.10	5.97	0.31	0.08
Total Other Electrical Problems	**27**	**33**	**29**	**1104.37**	**1425.67**	**65.08**	**7.98**	**8.88**	**0.29**
B. Fuel And Other Misc. Problems									
8. Coal Feeding Problem	4	3	4	2929.76	1900.22	205.10	21.12	11.83	0.88
9. Lignite Feeding Problem	9	0	1	715.78	0	2.66	5.16	0	0.01
10. Raw Water Problem	0	0	2			611.05			2.61
11. Fuel Oil Problem	1	0	0	2.44	-	-	0.02	-	-
12. Cooling Tower Problem	-	1	1	-	21.01	1.46	-	0.13	0.01
13. Ash Handling System Problem	2	10	7	109.18	166.53	211.69	0.79	1.04	0.90
14. E.S.P. / Pollution Problem	2	1	3	112.55	215.54	405.86	0.81	1.34	1.73
15. Fuel Supply & Other Misc. Problems	0	6	2	-	487.3	422.81	-	3.03	1.81

Area/ cause of outage of (300- 360MW Capacity group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
16. Other Misc. Problems	0	1	5	-	0.84	45.12	-	0.01	0.19
17. Coal Shortage	1	0	7	14.31		873.42	0.1		
Total Fuel Supply And Other Misc Problems	**19**	**28**	**32**	**3884.02**	**2791.44**	**2887.67**	**28**	**17.38**	**12.33**
`16. Grid System									
17. Transmission Constraints/ Grid Disturbance	11	9	28	2558.1	108.97	4088.64	18.44	0.68	17.46
18. Reserve Shut Down/ Low Schedule	26	43	54	1700.09	4818.38	5318.09	12.26	30.01	22.71
24. NO Power Purchase Agreement	0	2	3	0	2635.2	5479.18	0	16.41	23.39
Total Grid System	**37**	**54**	**85**	**4258.19**	**7562.55**	**14885.91**	**30.7**	**47.1**	**63.56**
Total Miscellaneous	**83**	**115**	**146**	**9246.58**	**11779.66**	**17838.66**	**66.67**	**73.36**	**76.17**

6.2.4 250-270 MW CAPACITY GROUP

6.2.4.1 The 250-270 MW capacity group units saw a drop in PLF and operating availability. Forced outage losses of this capacity group units increased from 29.79% in 2015-16 to 35.27% in 2016-17. Detail performance of 250-270 MW capacity group units during the years 2014-15, 2015-16 and 2016-17 is given below:

S.N.	PARTTICULARS	2014-15	2015-16	2016-17
1	**Units Commissioned By The End Of The Year**			
	(a) Number	63	69	73
	(b) Capacity (MW)	15930	17470	18490
2	**Units Reviewed**			
	(a) Number	58	64	73
	(b) Capacity (MW)	14620	16180	18490
	(c) Generation (MU)	84573.8	80118.41	80929.51
3	Planned Maintenance (%)	2.85	4.31	2.97
4	Forced outage (%)	19.27	29.79	35.27
5	Operating Availability (%)	77.88	65.9	61.76
6	Plant Load Factor (%)	68.01	57.45	53.36

6.2.4.2 The details of area/ causes of forced outage and MU losses of 250-270 MW capacity group for the years 2014-15,2015-16 and 2016-17 are shown below:

Area/ cause of Outage of (250-270) MW capacity group	No. of Outages			MU Loss			% of Group F.O. Loss		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
I. Equipment									
1. Boiler	**370**	**312**	312	3061.32	4417.38	6266.35	13	10.68	11.72
2. Turbine	**62**	**56**	72	2781.38	434.79	1414.00	11.81	1.05	2.64
3. Generator	**64**	**64**	54	3291.8	4128.77	1014.92	13.98	9.98	1.90
Total	**496**	**432**	**438**	**9134.49**	**8980.95**	**8695.26**	**38.8**	**21.71**	**16.27**
Ii. Auxiliaries									
1. Boiler	**58**	**77**	61	454.08	2823.08	2129.47	1.93	6.83	3.98
2. Turbine	**24**	**21**	19	855.97	221.73	151.79	3.64	0.54	0.28
Total	**82**	**98**	**80**	**1310.05**	**3044.81**	**2281.26**	**5.56**	**7.36**	**4.27**
III. Boiler & Boiler Aux.	**428**	**389**	373	3515.4	7240.46	8395.82	14.93	17.51	15.71

IV. Turbine & Turbine Aux.	**86**	**77**	91	3637.35	656.52	1565.79	15.45	1.59	2.93
V. Generator	**64**	**64**	54	3478.55	4128.77	1014.92	13.98	9.98	1.90
VI. Misc. (Elect. /Mech.)	**181**	**185**	171	7735.19	14155.23	12138.96	32.86	34.22	22.71
VII. Total excluding RSD of the Group	**760**	**715**	689	18366.48	26180.98	23115.48	77.23	63.3	4324
VIII. RSD	**82**	**144**	202	5355.5	15181.04	30343.86	22.77	36.7	56.76
Total	**841**	**859**	**891**	**23541.23**	**41362.02**	**53459.34**	**100**	**100**	**100**

6.2.4.3 Breakup of the forced outage and energy loss of 250-270 MW capacity group units due to equipment and auxiliaries during 2014-15, 2015-16 and 2016-17 are given below:

Area/ cause of outage (250-270 MW Capacity group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
I. EQUIPMENTS									
A. Boiler									
1. Water Wall Tube Leakage	98	87	79	1637.85	1894.69	1384.81	11.4	4.58	2.59
2. Super Heater Tube Leakage	3	9	8	29.44	138.42	510.07	0.21	0.33	0.95
3. Reheater Tube Leakage	8	14	5	76.8	114.48	1570.98	0.53	0.28	2.94
4. Economiser Tube Leakage	18	25	12	314.33	404.86	190.28	2.19	0.98	0.36
5. Air Preheaters Problem	19	15	12	328.44	272.42	1150.07	2.29	0.66	2.15
6. Furnace Trouble	0	1	1	0	59.48	57.15	0	0.14	0.11
7. Boiler Operational Problems									
(A) Furnace Fire Out/Flame Failure	87	62	55	266.8	376.5	162.71	1.86	0.91	0.31
(B) Furnace Draft Abnormal	70	38	62	199.04	409.79	136.42	1.39	0.99	0.26
(C) Drum Level High/ Low	47	32	43	34.2	145.38	102.21	0.24	0.35	0.19
8. Others	10	29	35	71.84	601.35	998.63	0.5	1.45	1.87
Total Boiler	**360**	**312**	**312**	**2958.75**	**4417.38**	**6266.35**	**20.6**	**10.68**	**11.72**
B. Turbine									
1. Turbine Bearing Problem	2	1	1	7.5	2.62	15.05	0.03	0.01	0.03
2. Governing / Oil System Problem	7	8	8	106.85	32.78	11.95	0.45	0.08	0.02
3. Turbine Differential Expansion Problem		1	2		0.44	2.99	0.03	0	0.01
4. Turbine Axial Shift/ Thrust Pad Problem	8	1	1	581.66	46.22	12.58	2.47	0.11	0.02
5. Turbine Eccentricity/ High Vibration	17	5	10	169.58	65.17	1144.87	0.72	0.16	2.14
6. Turbine Rotor Failure/Damaged	0	0	1			0.26			0
7. Turbine Control Valve Problem	0	1	1		0.47	15.17		0	0.03
8. Condenser Tube Leakage/ Cleaning	3	2	6	8.59	8.96	48.35	0.04	0.02	0.09
9. Main Steam Line Problem	4	7	19	10.66	88.91	73.70	0.05	0.21	0.14
10. Emergency Safety Valve Closure									
11. Condenser Low Vacuum	15	12	13	137.58	33.24	8.98	0.58	0.08	0.02
12. H.P. & L.P. Bypass System	4	3	2	80.45	12.35	7.97	0.34	0.03	0.01
13. Turbine Misc. Problem	9	15	8	1678.5	143.63	72.13	7.13	0.35	0.13
Total Turbine	**62**	**56**	**72**	**2781.38**	**434.79**	**1414.00**	**11.81**	**1.05**	**2.64**
C. Generator									
1. Stator/ Stator Earth Fault	6	6	8	636.3	779.31	194.86	2.7	1.88	0.36
2. Rotor/ Rotor Earth Fault	4	1	7	3.36	1226.38	525.10	0.01	2.96	0.98
3. Gen. Transformer Tripping/ Damaged	0	22	0		866.06			2.09	
4. Excitation Problem	2	3	4	10.08	11.98	4.19	0.04	0.03	0.01

Area/ cause of outage (250-270 MW Capacity group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
5. Gen. Cooling System Failure	0		0						
6. Seal Oil System Problem	2	0	1	1.47		1.08	0.01		0
7. Fire In Turbo Gen. Bushing/ Bushing Failure	1	0	0	1.94			0.01		
8. Generator Bearing Problem	1	1	0	0.4	0.52		0	0	
9. A.V.R. Problem	1	2	2	0.71	1.61	1.98	0	0.00	0
10. Generator Protection/ Relay Operation Problem	41	28	27	2622.78	1230.14	238.51	11.14	2.97	0.45
11. Hydrogen Pressure Problem	1	1	3	1.08	12.78	47.49	0	0.03	0.09
12. Generator Miscellaneous Maintenance	5	0	2	13.68		1.71	0.06		0
Total Generator	**64**	**64**	**54**	**3291.8**	**4128.77**	**1014.92**	**13.98**	**9.98**	**1.90**
Ii Auxiliaries									
A. Boiler Auxiliaries									
1. I.D. Fans Problem	8	6	14	7.24	5.08	33.28	0.03	0.01	0.06
2. F.D. Fans Problem	2	6	4	1.06	18.73	8.45	0	0.05	0.02
3. P.A. Fans Problem	21	21	16	357.6	410.21	39.75	1.52	0.99	0.07
4. Milling System /Rc Feeder Problem	5	26	8	8.22	399.43	38.15	0.03	0.97	0.07
5. PIPES And VALVES BOILER SIDE	15	10	9	13.09	111.94	66.33	0.06	0.27	0.12
6. Boiler Aux. Misc. Problems	7	8	10	66.86	1877.68	1943.50	0.28	4.54	3.64
Total Boiler Aux.	**58**	**77**	**61**	**454.08**	**2823.08**	**2129.47**	**1.93**	**6.83**	**3.98**
B. Turbine Auxiliaries									
7. Boiler Feed Pump/Motor Problem	5	9	5	8	8.15	40.75	0.03	0.02	0.08
8. Condensate Pump Problem	1	0	0	0.89	0	0	0	0	0
9. C.W. Pump Problem	3	3	2	15.81	1.98	1.38	0.07	0	0
10. Regenerative System Problem	0	0	0	0	0	0	0	0	0
11. Turbine Pipes & Valves Problem	0	2	0	0	61.46	0	0	0.15	0
12. Deaerator Problem	0	0	0	0	0	0	0	0	0
13. Turbine Misc.	15	7	12	831.27	150.14	109.66	3.53	0.36	0.21
Total Turbine Aux.	**24**	**21**	**19**	**855.97**	**221.73**	**151.79**	**3.64**	**0.54**	**0.28**
Total Boiler & Turbine Aux.	**82**	**98**	**80**	**1310.05**	**3044.81**	**2281.26**	**5.56**	**7.36**	**4.27**
III. Others Misc. Problems									
A. Other Electrical Problems									
1. Unit Aux. Transformer/ Station Transformer Problems	17	9	9	70.25	15.17	40.20	0.3	0.04	0.08
2. Gen. Transformer Tripping/ Damaged	12	7	8	136.83	1906.8	37.01	0.58	4.61	0.07
3. H.T./L.T. Supply Problem	6	10	2	9.22	27.6	2.84	0.04	0.07	0.01
4. Dc Supply Problem	7	4	2	58.45	20.21	1.42	0.25	0.05	0
5. Switch Yard/Bus Bar Problem	7	6	26	15.76	36.72	85.62	0.07	0.09	0.16
6. Breaker/Isolator Problems	2	3	1	6.85	2.07	11.90	0.03	0.01	0.02
7. Misc. Fire Hazards / Fire In Cable Gallery	1	0	0	46.86	0	0	0.2	0	
8. Instrumentation Problem	1	0	2	0.39	0	5.76	0	0	0.01
10. Air Supply Problem	0	0	2		0	1.56		0	0
11. Electrical Miscellaneous Problems	54	65	58	302.56	270.26	81.07	1.29	0.65	0.15
Total Other Electrical Problems	**113**	**104**	**110**	**707.87**	**2278.84**	**1907.79**	**3.02**	**5.52**	**3.56**
B. Fuel And Other Misc., Problems									
12. Lignite Feeding Problem	7	5	0	339.67	419.37	-	1.44	1.01	-
13. Coal Feeding Problem	22	8	7	1082.45	1218.82	194.8	4.6	2.95	0.36
14. Wet/ Poor Quality Coal	0	3	2		1.58	1.34		0	0
15. Wet/ Poor Quality Lignite	0	1	0	_	12.16	_	_	0.03	-

Area/ cause of outage (250-270 MW Capacity group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
16. Fuel Oil Problem	5	9	1	5.92	8.44	2.08	0.03	0.02	0
17. Ash Handling System Problem	4	10	3	169.16	162.44	312.07	0.72	0.39	0.58
18. Raw Water Problem	2	2	1	383.41	1627.96	1047.36	1.63	3.94	1.96
19. E.S.P. / Pollution Problem	0	1	2		320.38	86.16		0.77	0.16
20. Non-Readiness Of Residual Work Of New Unit	2	1	2	10.96	6.64	1194.66	0.05	0.02	2.23
21. Fuel Supply & Other Misc. Problems	6	12	13	60.7	1777.35	1634.44	0.26	4.3	3.06
22. Other Misc. Problems	1	1	1	11.09	19.37	19.75	0.05	0.05	0.04
23. Coal Shortage	3	0	3	38.26	0	1548.19	0.16	0	2.90
Total Fuel Supply And Other Misc. Problems	**53**	**53**	**35**	**2114.86**	**5574.51**	**4890.58**	**9**	**13.48**	**9.14**
C. Grid System									
28. Transmission Constraints/ Grid Disturbance	20	26	20	2607.96	1558.52	154.24	11.08	3.77	0.29
29. Reserve Shut Down	81	144	202	4989.16	15181.04	30343.86	22.77	36.7	56.76
25. NO Power Purchase Agreement	_	1	2	_	2371.68	2821.20	_	5.73	5.28
Total Grid System	**102**	**171**	**224**	**7969.46**	**19111.2**	**33319.30**	**33.85**	**46.2**	**62.33**
30. Uneconomical Operation	1	1	1	2365.2	2371.68	2365.20	10.05	5.73	4.42
Total Miscellaneous	**270**	**329**	**370**	**13529.7**	**29336.3**	**43633.08**	**57.47**	**70.93**	**81.6**

6.2.5 210 MW CAPACITY GROUP

6.2.5.1 The Plant Load Factor of 210 MW capacity group units dropped sharply from 63.03% in 2015-16 to 57.99% in 2016-17. Performance of 210 MW capacity group units during the years 2014-15, 2015-16 and 2016-17 are given below: -

Particulars	210 MW		
	14-15	15-16	16-17
1. Units commissioned by the end of the year			
(a) Number	143	143	143
(b) Capacity MW	30030	30030	30030
2. Units considered in the review			
(a) Number	143	143	143
(b) Capacity MW	30030	30030	30030
(c) Generation (MU)	180279.02	164237.6	147317.37
3. Planned Maintenance (%)	5.06	4.74	4.70
4. Forced Outage (%)	15.01	22.02	28.58
5. Operating Availability (%)	79.93	73.24	66.72
6. Plant Load Factor (%)	**68.53**	**63.03**	**57.99**

6.2.5.2 The details of forced outage for 210 MW capacity group due to equipment and auxiliaries units during the years 2014-15, 2015-16 and 2016-17 are given below:-

Area/ cause of Outage of 210MW capacity group	No. of Outages			MU Loss			% of Group F.O. Loss		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
I. EQUIPMENTS									
1. Boiler	771	701	574	7688.22	8232.6	7969.80	19.47	14.17	10.83
2. Turbine	94	156	138	1121.44	2248.52	2232.09	2.84	3.87	3.03
3. Generator	129	96	112	1992.41	2426.44	2953.20	5.05	4.18	4.01
Total	**994**	**953**	**824**	**10802.07**	**12907.57**	**12155.09**	**27.36**	**22.22**	**17.87**
II. AUXILIARIES									
1. Boiler	118	87	73	951.06	773.01	32112.39	2.41	1.33	0.42
2. Turbine	29	55	33	150.69	570.15	169.09	0.38	0.98	0.23
Total	**147**	**142**	**106**	**1101.76**	**1343.16**	**481.48**	**2.79**	**2.31**	**0.65**
III. Boiler & Boiler Aux.	889	788	647	8639.28	9005.61	8282.19	21.88	15.5	11.25
IV. Turbine & Turbine Aux.	123	211	171	1272.13	2818.67	2401.18	3.22	4.85	3.26
V. Generator	129	96	112	1992.41	2426.44	2953.20	5.05	4.18	4.01
VI. Misc. (Elect. /Mech.)	289	273	257	11306.62	14770.6	7151.52	28.63	25.43	9.72
VII. Total excluding RSD of the Group	1430	1368	1187	23210.44	29021.32	20788.10	58.78	49.96	28.25
VIII. RSD	258	345	495	16243.95	29061.43	52808.81	41.22	50.03	71.25
Total	**1688**	**3081.00**	**1682**	**39488.29**	**58082.75**	**73596.91**	**100**	**100**	**100**

6.2.5.3 Break-up of the area/ cause of forced outages and energy loss for 210 MW units for the years 2014-15, 2015-16 and 2016-17 are shown below: -

Area/ cause of outage (210 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
I. EQUIPMENTS									
A. Boiler									
1. Water Wall Tube Leakage	309	237	150	4059.13	4457.51	3710.80	10.28	7.67	5.04
2. Super Heater Tube Leakage	36	37	50	686.62	655.06	511.93	1.74	1.13	0.70
3. Reheater Tube Leakage	35	46	64	589.14	549.7	1547.36	1.49	0.95	2.10
4. Economiser Tube Leakage	66	97	102	941.16	1014.88	1200.37	2.38	1.75	1.63
5. Air Preheaters Problem	16	23	20	220	165.7	255.45	0.56	0.29	0.35
6. Furnace Trouble	2	0	3	5.99	0	37.61	0.02	0	0.05
7. Boiler Operational Problems									
(A) Furnace Fire Out/Flame Failure	171	107	79	652.88	395.42	122.60	1.65	0.68	0.17
(B) Furnace Draft Abnormal	74	68	47	352.77	122.84	293.46	0.89	0.21	0.40
(C) Drum Level High/ Low	36	36	32	77.36	295.07	86.99	0.2	0.51	0.12
8. Others	26	50	27	103.17	576.43	203.32	0.26	0.99	0.28
Total Boiler	771	**701**	**574**	7688.22	**8232.6**	**7969.80**	19.47	**14.17**	**10.83**
B. Turbine									
1. Turbine Bearing Problem	4	11	4	71.4	278.55	11.98	0.18	0.48	0.02
2. Governing / Oil System Problem	2	9	13	11.66	226.6	47.37	0.03	0.39	0.06
3. Turbine Differential Expansion	0	5	2		9.09	3.55		0.02	0
4. Turbine Axial Shift/ Thrust Pad	5	2	5	102.11	3.2	110.97	0.26	0.01	0.15
5. Turbine Eccentricity/ High Vibration	14	12	12	283.46	508.92	995.94	0.72	0.88	1.35
6. Turbine Rotor Failure/Damaged	0	0			0			0	
7. Turbine Control Valve	4	6	13	16.97	28.68	178.02	0.04	0.05	0.24

Area/ cause of outage (210 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
8. Condenser Tube Leakage/ Cleaning	13	16	18	147.44	727.85	235.13	0.37	1.25	0.32
9. Main Steam Line Problem	3	8	9	33.94	59.05	57.16	0.09	0.1	0.08
10. Emergency Safety Valve Closure	2	2	3	1.51	38.19	16.94	0	0.07	0.02
11. Condenser Low Vacuum	22	41	36	76.35	29.01	125.19	0.19	0.05	0.17
12. H.P. & L.P. Bypass System	2	6	7	14.65	41.34	35.24	0.04	0.07	0.05
13. Turbine Misc. Problem	23	38	16	361.95	298.05	414.59	0.92	0.51	0.56
Total Turbine	**94**	**156**	**138**	**1121.44**	**2248.52**	**2232.09**	**2.84**	**3.87**	**3.03**
C. Generator									
1. Stator/ Stator Earth Fault	13	14	18	259.57	1179.58	106.98	0.66	2.03	0.15
2. Rotor/ Rotor Earth Fault	4	4	5	114.07	107.56	112.82	0.29	0.19	0.15
3. Gen. Transformer Tripping/ Damaged	7	12	7	621.32	671.56	1709.35	1.57	1.16	2.32
4. Excitation Problem	17	16	17	47.03	16.26	63.05	0.12	0.03	0.09
5. Gen. Cooling System Failure	0	5	6		2.89	21.54		0	0.03
6. Seal Oil System Problem	3	0	0	25.22			0.06		
7. Generator Bearing Problem	1	0	2	3.96		1.78	0.01		0
8. Fire In Turbo Gen. Bushing/ Bushing Failure	2	1	4	2.28	115.56	16.92	0.01	0.2	0.02
9. A.V.R. Problem	3	6	3	5.35	146.16	2.27	0.01	0.25	
10. Generator Protection/ Relay Operation Problem	63	24	42	544.65	72.04	842.68	1.38	0.12	1.14
11. Hydrogen Pressure Problem	7	2	4	74.19	18.65	69.80	0.19	0.03	0.09
12. Generator Miscellaneous Maintenance	9	12	4	294.77	96.19	5.01	0.75	0.17	0.01
Total Generator	**129**	**96**	**112**	**1992.41**	**2426.44**	**2953.20**	**5.05**	**4.18**	**4.01**
Ii. Auxiliaries									
A. Boiler Auxiliaries									
1. I.D. Fans Problem	36	21	13	542.13	409.32	125.41	1.37	0.7	0.17
2. F.D. Fans Problem	14	11	8	53.86	13.87	17.79	0.14	0.02	0.02
3. P.A. Fans Problem	42	16	19	213.68	81.16	48.87	0.54	0.14	0.07
4. Milling System /RC Feeder Problem	1	8	1	1.17	154.99	7.13	0	0.27	0.01
5. PIPES And VALVES BOILER SIDE	12	20	27	81.01	79.27	35.85	0.21	0.14	0.05
6. Boiler Aux. Misc. Problems	13	11	5	59.21	34.4	77.35	0.15	0.06	0.11
Total Boiler Aux.	**118**	**87**	**73**	**951.06**	**773.01**	**312.39**	**2.41**	**1.33**	**0.42**
B. Turbine Auxiliaries									
7. Boiler Feed Pump/Motor Problem	13	13	10	66.33	17.19	99.86	0.17	0.03	0.14
8. Condensate Pump Problem	1	1	0	0.43	0.43	0	0	0	0
9. C.W. Pump Problem	4	5	3	6.92	13.78	7.71	0.02	0.02	0.01
10. Regenerative System Problem	0	2	1	0	5.25	2.99	0	0.01	0
11. Turbine Pipes & Valves Problem	1	2	4	16.52	7.11	11.52	0.04	0.01	0.02
12. Deaerator Problem	0	1	0	0	8.59	0	0	0.01	0
13. Turbine Misc.	10	31	15	60.49	517.78	**47.02**	0.15	0.89	0.06
Total Turbine Aux.	**29**	**55**	**33**	**150.69**	**570.15**	**169.09**	**0.38**	**0.98**	**0.23**
Total Boiler & Turbine Aux.	**188**	**142**	**106**	**1404.51**	**1343.16**	**481.48**	**3.9**	**2.31**	**0.65**
Iii. Others Misc. Problems									
A. Other Electrical Problems									
1. Unit Aux. Transformer/ Station Transformer Problems	19	16	18	29.34	281.96	33.63	0.07	0.49	0.05
2. Gen. Transformer Tripping/ Damaged	16	12	17	86.39	1951.31	67.69	0.22	3.36	0.09
3. H.T./L.T. Supply Problem	2	2	1	1.63	19.46	0.52	0	0.03	0
4. Dc Supply Problem	6	14	12	8.95	113.9	23.42	0.02	0.2	0.03
5. Switch Yard/Bus Bar Problem	10	32	46	63.85	77.81	84.70	0.16	0.13	0.12
6. Breaker/Isolator Problems	3	8	11	10.67	11.44	16.77	0.03	0.02	0.02
7. Misc. Fire Hazards / Fire In Cable Gallery	1	3	0	10.8	44.96		0.03	0.08	
8. Instrumentation Problem	1	19	5	0.72	2621.6	6.56	0	4.51	0.01
9. Air Supply Problem	0	6	1		7.27	0.74		0.01	0
10. Electrical Miscellaneous Problems	86	92	68	650.72	449.48	185.21	1.65	0.77	0.25

Area/ cause of outage (210 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
Total Other Electrical Problems	**155**	**206**	**132**	**2052.59**	**5579.19**	**419.24**	**5.19**	**9.6**	**0.57**
B. Fuel And Other Misc. Problems									
12. Coal Feeding Problem	22	0	0	1575.75	0		3.99	0	
13. Lignite Feeding Problem	20	6	0	1850.76	607.17		4.69	1.05	
14. Wet/ Poor Quality Lignite	1	1	0	21.69	9.39		0.05	0.02	
15. Wet/ Poor Quality Coal	6	2	0	51.82	135.44		0.13	0.23	
16. Fuel Oil Problem	10	7	2	34.58	18.65	3.04	0.09	0.03	0
17. Cooling Tower Problem	0	0		0	0		0		
18. Ash Handling System Problem	8	3	1	78.94	53.24	9.16	0.2	0.09	0.01
19. Raw Water Problem	3	8	5	2489.01	1711.85	737.39	6.3	2.95	1
20. D.M. Water Problem	1	0	0	3.35			0.01	0	
21. E.S.P. / Pollution Problem	4	4	5	557.46	293.28	1134.84	1.41	0.5	1.54
22. Vintage Unit Withdrawn And Closed For Operation	1	1	0	7.66	5.51		0.02	0.01	
23. Fuel Supply & Other Misc. Problems	11	19	21	1189.53	2623.89	525.30	3.01	4.51	0.71
24. Other Misc. Problems	3	3	6	14.32	2101.31	223.84	0.04	0.07	0.30
25.Lignite Shortage Problem	-	7	0	-	182.63		-	0.31	
26. Coal Shortage	29	2	2	863.03	37.92	20.02	2.19	0.07	0.03
Total Fuel Supply And Other Misc Problems	**119**	**63**	**42**	**8738.32**	**7780.28**	**2653.59**	**22.13**	**13.39**	**3.59**
C. Grid System									
28. Transmission Constraints/ Grid Disturbance	24	16	34	522.53	18.94	403.36	1.32	0.03	0.55
29. Reserve Shut Down	257	349	495	16274.15	29061.43	52808.81	41.22	50.03	71.75
Total Grid System	**282**	**365**	**529**	**16800.4**	**29080.4**	**53212.17**	**42.54**	**50.06**	**72.30**
30. Uneconomical Operation	2	3	2	1183.7	1392.19	3675.33	3	2.40	4.99
Total Miscellaneous	**559**	**637**	**705**	**28777.7**	**43832**	**59960.33**	**72.88**	**75.46**	**81.47**

6.2.6 195-200 MW CAPACITY GROUP

6.2.6.1 The forced Outage of 195-200 MW capacity group units increased to 12.06 % in 2016-17 from to 7.53% in 2015-16. The PLF of the 195-210 MW Capacity Group also decreased to 68.52 % in 2016-17 from 72.72 % in 2015-16. Performance details of 195-200 MW capacity group units during the years 2014-15, 2015-16 and 2016-17 are given below: -

PARTTICULARS	2014-15	2015-16	2016-17
1.UNITS COMMISSIONED BY THE END OF THE YEAR			
(a) Number	26	26	26
(b) Capacity (MW)	5185	5185	5185
2.UNITS CONSIDERED IN THE REVIEW			
(a) Number	25	25	26
(b) Capacity (MW)	4990	4990	5185
(c) Generation (MU)	31187.9	31875.35	29857.26
3. Planned Maintenance (%)	11.05	11.81	10.40
4. Forced outage (%)	9.75	7.53	12.06
5. Operating Availability (%)	79.2	80.66	77.54
6. Plant Load Factor (%)	71.35	72.72	68.52

6.2.6.2 Forced outage details due to equipment and auxiliaries and energy loss of 195-200 MW capacity group units for the years 2014-15, 2015-16 and 2016-17 are shown below:

Area/ Cause of Outage of 195-200 MW capacity group	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
I. EQUIPMENTS									
1. Boiler	89	80	107	1104.98	729.51	1493.49	25.93	22.09	28.32
2. Turbine	9	13	28	471.05	82.83	894.41	11.06	2.51	16.96
3. Generator	18	18	23	62.9	99.33	53.72	1.48	3.01	1.02
Total	**116**	**111**	**158**	**1638.93**	**911.67**	**2441.63**	**38.47**	**27.61**	**46.30**
II. AUXILIARIES									
1. Boiler	20	34	22	1891.63	365.09	252.19	44.4	11.05	4.78
2. Turbine	3	15	10	1.25	329.86	171.01	0.03	9.99	3.24
Total Aux.	**23**	**49**	**32**	**1892.87**	**694.95**	**423.20**	**44.43**	**21.04**	**8.03**
III. Boiler & Boiler Aux.	109	114	129	2996.6	1094.6	1745.68	70.33	33.14	33.11
IV. Turbine & Turbine Aux.	12	28	38	472.3	412.7	1065.42	11.09	12.5	20.20
V. Generator	18	18	23	62.9	99.33	53.72	1.48	3.01	1.02
VI. Misc. (Elect. /Mech.)	34	32	51	553.55	286.13	225.61	12.99	8.66	4.28
VII. Total excluding RSD of the Group	173	192	241	4085.35	1892.76	3030.43	95.89	57.31	58.61
VII. RSD	9	21	32	175.23	1409.77	2182.64	4.11	42.69	41.39
Total	**182**	**213**	**273**	**4260.58**	**3302.53**	**5273.07**	**100**	**100**	**100**

6.2.6.3 The break-up of the area/ cause of forced outages and generation loss for 195-200 MW capacity group during the years 2015-16, 2016-17 and 2016-17 are shown below: -

Area/ cause of outage (195-200 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
I. EQUIPMENTS									
A. Boiler									
1. Water Wall Tube Leakage	63	35	34	981.86	471.46	1044.39	23.05	14.28	19.81
2. Super Heater Tube Leakage	1	6	11	13.1	52.12	102.42	0.31	1.58	1.94
3. Reheater Tube Leakage	3	8	9	39.02	65.28	67.70	0.92	1.98	1.28
4. Economiser Tube Leakage	5	7	11	29.95	38.81	87.64	0.7	1.18	1.66
5. Air Preheaters Problem	2	3	6	4.2	18.17	32.23	0.1	0.55	0.61
6. Boiler Operational Problems									
(A) Furnace Fire Out/Flame Failure	5	11	5	7.4	29.44	41.15	0.17	0.89	0.78
(B) Furnace Draft Abnormal	2	2	5	4.93	2.7	12.81	0.12	0.08	0.24
(C) Drum Level High/ Low	8	3	15	24.53	5.01	39.62	0.58	0.15	0.75
7. Others	0	5	11	0	46.51	65.54	0	1.41	1.24
Total Boiler	**89**	**80**	**107**	**1104.98**	**729.51**	**1493.49**	**25.93**	**22.09**	**28.32**
B. Turbine									
1. Turbine Bearing Problem			2			9.24			0.18
2. Governing / Oil System Problem	0		2			21.29			0.40
3. Turbine Differential Expansion Problem									
4. Turbine Axial Shift/ Thrust Pad Problem	1	1	1	0.28	38.08	1.39	0.01	1.15	0.03
5. Turbine Eccentricity/ High Vibration	1	1	3	126.74	0.54	37.38	2.97	0.02	0.71
6. Turbine Rotor Failure/Damaged		1	1		0.64	4.36		0.02	0.08
7. Turbine Control Valve Problem	0	2	1		13.44	0.25		0.41	0
8. Condenser Tube Leakage/ Cleaning	2	3	2	14.89	22.31	112.79	0.35	0.68	2.14
9. Main Steam Line Problem	0	0	3			20.36			0.39
10. Emergency Safety Valve Closure	1	0	2	326.34		10.49	7.66		0.20

Area/ cause of outage (195-200 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
11. Condenser Low Vacuum	1	3	4	0.19	3.62	17.35	0	0.11	0.33
12. H.P. & L.P. Bypass System			2			1.99			0.04
13. Turbine Misc. Problems	3	2	5	2.61	4.2	657.52	0.06	0.13	12.47
Total Turbine	**9**	**13**	**28**	**471.05**	**82.83**	**894.41**	**11.06**	**2.51**	**16.96**
C. Generator									
1. Stator/ Stator Earth Fault	4	7	0	22.68	20.89		0.53	0.63	
2. Gen. Transformer Tripping/ Damaged	1	0	0	0.47			0.01		
3. Rotor/ Rotor Earth Fault	0	3	1		4.68	2.87		0.14	0.05
4. Excitation Problem	5	2	4	22.01	35.77	3.96	0.52	1.08	0.08
5. Gen. Cooling System Failure		1	0		4.76			0.14	
6. Seal Oil System Problem		1	1		26.67	7.04		0.81	0.13
7. Fire In Turbo Gen. Bushing/ Bushing Failure									
8. A.V.R. Problem	1	2	3	5.06	3.22	1.50	0.12	0.1	0.03
9. Generator Protection/ Relay Operation Problem	5	1	10	5.57	2.71	13.57	0.13	0.08	0.26
10. Hydrogen Pressure Problem	1	0	2	6.53		11.14	0.15		0.21
11. Generator Miscellaneous Maintenance	1	1	2	0.59	0.63	13.64	0.01	0.02	0.26
Total Generator	**18**	**18**	**23**	**62.9**	**99.33**	**53.72**	**1.48**	**3.01**	**1.02**
Ii. Auxiliaries									
A. Boiler Auxiliaries									
1. I.D. Fans Problem	11	19	11	1782.59	291.21	160.86	41.84	8.82	3.05
2. F.D. Fans Problem	0	1	1	0	0.89	0.50	0	0.03	0.01
3. P.A. Fans Problem	6	5	6	37.83	32.16	33.47	0.89	0.97	0.63
4. Milling System /Rc Feeder Problem	1	4	0	50.28	29.39	0	1.18	0.89	0
5. PIPES And VALVES BOILER SIDE	0	4	2	0	10.37	23.04	0	0.31	0.44
6. Boiler Aux. Misc. Problems	2	1	2	20.92	1.07	34.31	0.49	0.03	0.65
Total Boiler Aux.	**20**	**34**	**22**	**1891.63**	**365.09**	**252.19**	**44.4**	**11.05**	**4.78**
B. Turbine Auxiliaries									
7. Boiler Feed Pump/Motor Problem	1	2	1	1.06	31.77	4.36	0.02	0.96	0.08
8. Condensate Pump Problem	0	0	0	0	0	0	0	0	0
9. C.W. Pump Problem	0	11	6	0	281.01	154.15	0	8.51	2.92
10. Regenerative System Problem	0	0	0	0	0	0	0	0	0
11. Turbine Pipes & Valves Problem	0	0	0	0	0	0	0	0	0
12. Deaerator Problem	0	1	1	0	16.68	10.83	0	0.51	0.21
13. Turbine Misc.	2	1	2	0.19	0.4	1.66	0	0.01	0.03
Total Turbine Aux.	**3**	**15**	**10**	**1.25**	**329.86**	**171.01**	**0.03**	**9.99**	**3.24**
Total Boiler & Turbine Aux.	**23**	**49**	**32**	**1892.87**	**694.95**	**423.20**	**44.43**	**21.04**	**8.03**
Iii. Others Misc. Problems									
A. Other Electrical Problems									
1. Unit Aux. Transformer/ Station Transformer Problems	3	0	2	11.13		1.61	0.26		0.03
2. Gen. Transformer Tripping/ Damaged	1	2	3	68.63	5.89	3.90	1.61	0.18	0.07
3. H.T./L.T. Supply Problem	3	2	1	17.01	8.93	2.02	0.4	0.27	0.04
4. Dc Supply Problem	2	1	2	1.41	0.99	1.41	0.03	0.03	0.03
5. Switch Yard/Bus Bar Problem	3	1	5	4.86	3.45	7	0.11	0.1	0.13
6. Instrumentation Problem	0	0	1			23.08			0.44
7.Breaker /Isolator Problem	0	0	1			0.67			0.01
8. Electrical Miscellaneous Problems	8	13	27	24.78	25.08	62.40	0.58	0.76	1.18
Total Other Electrical Problems	**20**	**19**	**42**	**127.83**	**44.34**	**102.07**	**2.99**	**1.34**	**1.93**
B. Fuel And Other Misc. Problems									
12. Lignite Feeding Problem	3	3	0	92	104		2.16	3.15	
13. Coal Feeding Problem	1	0	1	31.98		0.57	0.75		0.01
14. Wet/ Poor Quality Coal	0	0	0						

Area/ cause of outage (195-200 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
13. Fuel Oil Problem	1	1	0	0.96	0.3		0.02	0.01	
14. Cooling Tower Problem	1	0	0	3.75			0.09		
18. Ash Handling System Problem	2	3	0	10.73	116.65		0.25	3.53	
25. Other Misc. Problems	0	1	1		1.85	10.37		0.06	
26. Fuel Supply & Other Misc. Problems	0	3	0		17.57			0.53	0.20
27. Coal Shortage	4	0	1	278.29		1.90	6.53		0.04
Total Fuel Supply And Other Misc Problems	**12**	**11**	**3**	**417.7**	**240.37**	**12.85**	**9.8**	**7.28**	**0.25**
C. Grid System									
27. Transmission Constraints/ Grid Disturbance	2	2	6	8.02	1.41	110.69	0.19	0.04	2.10
28. Reserve Shut Down	9	21	32	175.23	1409.77	2182.64	4.11	42.69	41.39
TOTAL GRID SYSTEM	**11**	**23**	**38**	**183.25**	**1411.19**	**2293.33**	**4.3**	**42.73**	**43.49**
Total Miscellaneous	**43**	**53**	**83**	**728.78**	**1695.9**	**2408.25**	**17.11**	**51.35**	**45.67**

6.2.7 100-150 MW CAPACITY GROUP

6.2.7.1. Performance details of 100-150 MW capacity group units during the years 2014-15, 2015-16 and 2016-17 are given below: -

PARTTICULARS	2014-15	2015-16	2016-17
1. Units commissioned by the end of the year			
(a) Number	102	98	98
(b) Capacity (MW)	12580	11922	11922
2. Units considered in the review			
(a) Number	103	98	98
(b) Capacity (MW)	12430	11922	11922
(c) Generation (MU)	51045.94	49891.01	**43531.7**
Planned Maintenance (%)	9.43	5.39	8.23
Forced outage (%)	32.54	38.48	41.92
Operating Availability (%)	58.03	56.13	49.85
Plant Load Factor (%)	47.87	50.76	46.34

6.2.7.2 Forced outage details due to equipment and auxiliaries and energy loss of 100-150 MW capacity group units for the years 2014-15, 2015-16 and 2016-17 are shown below:

Area/ cause of Outage	No. of Outages			MU Loss			% of Group F.O. Loss		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
I. EQUIPMENT									
1. Boiler	518	575	433	5394.27	4214.71	3784.21	13.31	10.18	10.15
2. Turbine	145	159	87	3110.45	1924.78	945.24	6.47	4.65	2.53
3. Generator	57	77	42	2785.35	988.89	1236.20	2.45	2.39	3.31
Total	**720**	**811**	**562**	**11290.08**	**7128.38**	**5965.64**	**22.22**	**17.21**	**15.99**

II. AUXILIARIES									
1. Boiler	83	72	56	3836.92	487.01	250.53	10.95	1.18	0.67
2. Turbine	44	56	34	968.07	289.72	334.26	2.76	0.7	0.90
Total	**127**	**128**	**90**	**4804.99**	**776.73**	**584.78**	**13.71**	**1.88**	**1.57**
III. Boiler & Boiler Aux.	601	647	489	9231.19	4701.72	4034.74	26.35	11.35	10.82
IV. Turbine & Turbine Aux.	189	215	121	4078.52	2214.5	1279.49	11.64	5.35	3.43
V. Generator	57	77	42	2785.35	988.89	1236.20	7.95	2.39	3.31
VI. Misc. (Elect. /Mech.)	233	293	229	7613.75	19258.21	17914.49	21.73	46.49	48.03
VII. Total excluding RSD of the Group	1080	1232	881	23708.81	27163.32	24464.92	67.67	65.58	65.59
VIII. RSD	104	148	121	11326.96	14249.49	12833.41	32.33	34.40	34.41
Total	**1184**	**1380**	**1002**	**35035.77**	**41412.81**	**37298.33**	**100**	**100**	**100**

6.2.7.3 The break-up of the area/causes of forced outages and energy loss of 100-150 MW capacity group units during the years 2014-15, 2015-16 and 2016-17 are given below:

Area/ cause of outage (100-150 MW Cap. group)	**No. of Outages**			**MU Loss**			**% of Group F.O. Loss**		
	14-15	**15-16**	**16-17**	**14-15**	**15-16**	**16-17**	**14-15**	**15-16**	**16-17**
I. EQUIPMENTS									
A. Boiler									
1. Water Wall Tube Leakage	204	131	126	3386.68	1385.03	1436.98	9.67	3.34	3.85
2. Super Heater Tube Leakage	36	36	28	322.08	289.79	208.89	0.92	0.7	0.56
3. Reheater Tube Leakage	12	13	15	45.43	73.14	141.98	0.13	0.18	0.38
4. Economiser Tube Leakage	56	37	22	614.65	291.42	177.04	1.75	0.7	0.47
5. Air Preheaters Problem	5	4	11	13.99	4.47	57.53	0.04	0.01	0.15
6. Furnace Trouble	3	0	1	11.92	0	21.85	0.03	0	0.06
7. Boiler Operational Problems									
(A) Furnace Fire Out/Flame Failure	84	122	85	123.29	144.9	182.77	0.35	0.35	0.49
(B) Furnace Draft Abnormal	56	83	38	418.31	157.59	25.65	1.19	0.38	0.07
(C) Drum Level High/ Low	21	39	18	11.85	27.08	28.36	0.03	0.07	0.08
8. Others	41	110	89	446.06	1841.3	1503.17	1.27	4.45	4.03
Total Boiler	**518**	**575**	**433**	**5394.27**	**4214.71**	**3784.21**	**15.4**	**10.18**	**10.15**
B. Turbine									
1. Turbine Bearing Problem	2	9	3	27.97	690.03	14.83	0.08	1.67	0.04
2. Governing / Oil System Problem	8	24	15	2.36	133.09	96.88	0.01	0.32	0.26
3. Turbine Differential Expansion Problem	11	6	5	42	10.51	37.57	0.12	0.03	0.10
4. Turbine Axial Shift/ Thrust Pad Problem	3	2	0	21.38	2.01		0.06	0	
5. Turbine Eccentricity/ High Vibration	34	22	6	1166.96	545.9	27.78	3.33	1.32	0.07
6. Turbine Rotor Failure/Damaged	0	2	0		57.06			0.14	
7. Turbine Control Valve Problem	4	4	2	38.54	18.64	1.03	0.11	0.05	
8. Condenser Tube Leakage/ Cleaning	12	17	13	140.06	128.54	123.99	0.4	0.31	0.33
9. Main Steam Line Problem	14	8	3	263.89	11.48	61.07	0.75	0.03	0.16
10. Emergency Safety Valve Closure	1	0	4	128.59		18.75	0.37		0.05
11. Condenser Low Vacuum	23	43	27	159.47	260.01	545.15	0.46	0.63	1.46
12. H.P. & L.P. Bypass System	3	1	1	1.34	0.22	0.61	0	0	
13. Turbine Misc. Problem	30	21	8	1117.9	67.28	17.57	3.19	0.16	0.05
Total Turbine	**145**	**159**	**87**	**3110.45**	**1924.78**	**945.24**	**8.88**	**4.65**	**2.53**
C. Generator									
1. Stator/ Stator Earth Fault	9	13	1	1388.51	546.69	58.00	3.96	1.32	0.16
2. Gen. Transformer Tripping/ Damaged	4	4	3	205.79	323.3	0.71	0.59	0.78	0
3. Rotor/ Rotor Earth Fault	0	0	6	0	0	37.20	0	0	0.10
4. Excitation Problem	6	9	8	12.29	18.03	960.65	0.04	0.04	2.58
5. Gen. Cooling System Failure	0	0	1	0	0	10.29	0	0	0.03

Area/ cause of outage (100-150 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
6. Fire In Turbo Gen. Bushing/ Bushing Failure	0	3	1	0	5.8	6.46	0	0.01	0.02
7. Generator Bearing Problem	0	0	1			40.79			0.11
8. A.V.R. Problem	3	3	2	2.25	3.13	3.05	0.01	0.01	0.01
9. Generator Protection/ Relay Operation Problem	26	29	2	29.64	29.58	0.51	0.08	0.07	0
10. Hydrogen Pressure Problem	4	4	15	1134.28	50.25	114.09	3.24	0.12	0.31
11. Generator Miscellaneous Maintenance	5	12	**2**	12.6	12.1	4.44	0.04	0.03	0.01
Total Generator	**57**	**77**	**42**	**2785.35**	**988.89**	**1236.20**	**7.95**	**2.39**	**3.31**
II. Auxiliaries									
A. Boiler Auxiliaries									
1. I.D. Fans Problem	14	15	13	239.99	209.56	83.39	0.68	0.51	0.22
2. F.D. Fans Problem	7	4	3	13.38	57.71	1.62	0.04	0.14	0
3. P.A. Fans Problem	31	24	22	269.39	147.94	134.34	0.77	0.36	0.36
4. Milling System /RC Feeder Problem	6	9	10	2136.84	9.87	17.15	6.1	0.02	0.05
5. PIPES And VALVES BOILER SIDE	14	6	2	22.02	9.05	2.64	0.06	0.02	0.01
6. Boiler Aux. Misc. Problems	11	14	6	1155.29	52.89	11.38	3.3	0.13	0.03
Total Boiler Aux.	**83**	**72**	**56**	**3836.92**	**487.01**	**250.53**	**10.95**	**1.18**	**0.67**
B. Turbine Auxiliaries									
7. Boiler Feed Pump/Motor Problem	25	18	22	69.84	62.66	143.15	0.2	0.18	0.35
8. Condensate Pump Problem	4	1	1	16.07	2.64	4.83	0.05	0.01	0.01
9. C.W. Pump Problem	11	5	10	18.46	151.91	52.9	0.05	0.43	0.13
10. Regenerative System Problem	2	0	1	1.32	0	0.23	0	0	0
11. Turbine Pipes & Valves Problem	4	6	0	15.21	21.92	0	0.04	0.06	0
12. Deaerator Problem	1	0	0	0.37	0	0	0	0	0
13. Turbine Misc.	40	14	22	217.41	728.94	88.62	0.64	2.08	0.21
Total Turbine Aux.	**87**	**44**	**56**	**338.68**	**968.07**	**289.72**	**0.99**	**2.76**	**0.7**
Total Boiler & Turbine Aux.	**202**	**127**	**128**	**4139.86**	**4804.99**	**776.73**	**12.1**	**13.71**	**2.08**
III. Others Misc. Problems									
A. Other Electrical Problems									
1. Unit Aux. Transformer/ Station Transformer Problems	10	8	8	88.26	22.15	6.07	0.26	0.06	0.02
2. Gen. Transformer Tripping/ Damaged	18	8	17	68.88	3.8	30.33	0.2	0.01	0.08
3. H.T./L.T. Supply Problem	8	2	7	64.2	1.01	5.1	0.19	0	0.01
4. Dc Supply Problem	7	8	15	235.14	56.22	141.32	0.69	0.16	0.38
5. Switch Yard/Bus Bar Problem	27	13	26	49.91	121.17	45.25	0.15	0.35	0.12
6. Breaker/Isolator Problems	5	0	2	1.36		2.55	0		0.01
7. Misc. Fire Hazards / Fire In Cable Gallery	4	3	2	12.83	85.22	588.19	0.04	0.24	1.58
8. Instrumentation Problem	4	0	12	1.05		97.29	0		0.26
9. Air Supply Problem	2	0	2	14.11		0.65	0.04		0.00
10. Electrical Miscellaneous Problems	96	56	58	255.63	230.28	113.22	0.75	0.66	0.30
Total Other Electrical Problems	**183**	**108**	**149**	**792.44**	**1029.97**	**1029.97**	**2.32**	**3.12**	2.76
B. Fuel and Other Misc. problem									
12. Coal Feeding Problem	2	1	0	44.68	64.07	0.69	0.13	0.18	0
13. Lignite Feeding Problem	21	19	0	1908.53	121.16	430.08	5.58	0.35	1.15
14. Wet/ Poor Quality Lignite	1	0	0	122.18	24.8	0	0.36	0.07	
15. Wet/ Poor Quality Coal	4	7	0	2.02	94.87		0.01	0.23	
16. Fuel Oil Problem	6	4	2	11.37	29.31	3.04	0.03	0.07	0.01
17. Cooling Tower Problem	0	0	0						
18. Ash Handling System Problem	4	8	1	223.59	167.54	9.16	0.64	0.4	0.02
19. Raw Water Problem	0	1	5		6.61	737.39		0.02	1.98
20. D.M. Water Problem	1	0	0	8.69			0.02		
21. E.S.P. / Pollution Problem	4	15	5	561.02	494.16	1134.84	1.6	1.19	3.04
22. Non-Readiness Of Residual Work Of New Unit	0	1	0		1.67			0	
23. Vintage Unit Withdrawn And Closed For Operation	4	13	0	3679.2	12648.96		10.5	30.54	
24. Other Misc. Problems	15	12	6	230.16	97.29	223.84	0.66	0.23	0.60
25. Fuel Supply & Other Misc. Problems	10	16	21	573.44	1392.84	525.30	1.64	3.36	1.41
26. Coal Shortage	13	1	2	176.23	7.06	20.02	0.5	0.02	0.05

Area/ cause of outage (100-150 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
Total Fuel Supply And Other Misc. Problems	**85**	**98**	**42**	**5675.76**	**15371.1**	**3084.36**	**16.2**	**37.1**	**8.27**
27. Transmission Constraints/ Grid Disturbance	47	49	34	99.01	106.48	403.36	0.28	0.26	1.08
28.Reserve Shut Down	104	150	495	11326.96	14249.49	12833.41	32.33	34.40	34.41
29. NO Power Purchase Agreement	_	4	0	_	1433.08		_	3.46	0.00
Total Grid System		**203**	**529**		**15789.1**	**13236.77**		**38.12**	35.49
30. Uneconomical Operation	2	1	2	1318.79	1317.6	3675.33	3.76	3.18	9.85
Total Miscellaneous	**346**	**451**	**531**	**19513.8**	**33507.7**	**21026.43**	**55.7**	**80.90**	**56.37**

6.2.8 25 -99 MW (<100MW) CAPACITY GROUP

6.2.8.1 Performance of 25 -99 MW capacity group units during the year 2016-17 continued to be much below national average mainly due to uneconomic operation and frequent outages in these units – most of which are vintage units. However, several new units have also got added in this group over last 5 to 7 years. Performance details of these units during 2014-15, 2015-16 and 2016-17 are given below:-

PARTTICULARS	2014-15	2015-16	2016-17
1.Units Commissioned By The End Of The Year			
(a) Number	84	84	85
(b) Capacity (MW)	4729.5	4729.5	4779.5
2.Units Considered In The Review			
(a) Number	84	83	85
(b) Capacity (MW)	4767	4704.5	4779.5
(c) Generation (MU)	18271.46	13152.11	13202.78
3. Planned Maintenance (%)	4.85	5.56	6.52
4. Forced outage (%)	38.72	50.62	54.55
5. Operating Availability (%)	56.43	43.82	38.93
6. Plant Load Factor (%)	44.81	33.63	37.83

6.2.8.2 Forced outage details due to equipment and auxiliaries and energy loss of 25- 99 MW capacity group units for the years 2014-15, 2015-16 and 2016-17 are shown below:

Area/ cause of Outage	No. of Outages			MU Loss			% of Group F.O. Loss		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
I. EQUIPMENT									
1. Boiler	380	297	262	3164.16	1272.23	1241.35	20.54	6.08	6.25
2. Turbine	112	75	55	1234.31	241.09	37.29	8.01	1.15	0.19
3. Generator	53	59	35	990.41	257.3	137.44	6.43	1.23	0.69
Total	**545**	**431**	**352**	**5388.78**	**1770.62**	**1416.08**	**34.99**	**8.46**	**7.13**
II. AUXILIARIES									
1. Boiler	69	70	37	1381.54	522.33	256.46	8.76	2.5	1.29
2. Turbine	43	35	36	288.47	255.56	66.55	1.83	1.22	0.34
Total	**112**	**105**	**73**	**1670.01**	**777.89**	**323.01**	**10.58**	**3.72**	**1.63**
III. Boiler & Boiler Aux.	444	367	299	4545.61	1794.55	1497.82	28.81	8.58	7.54

IV. Turbine & Turbine Aux.	155	110	91	1522.78	496.65	103.84	9.65	2.37	0.52
V. Generator	53	59	35	990.41	257.3	137.44	6.28	1.23	0.69
VI. Misc. (Elect. /Mech.)	352	340	376	5606.57	13939.69	13021.24	35.53	66.64	65.57
VII. Total excluding RSD of the Group	**1009**	**876**	**801**	**12665.37**	**16488.19**	**14760.32**	**80.27**	**78.82**	**74.33**
VIII. RSD	113	62	135	3113.56	4430.52	5098.60	19.73	21.18	25.67
Total	**1122**	**938**	**936**	**15778.93**	**20918.71**	**19858.92**	**100**	**100**	**100**

6.2.8.3 The break-up of the area/causes of forced outages and energy loss of 25-99 MW capacity group units during the years 2015-16, 2016-17 and 2016-17 are given below: -

Area/ cause of outage (25-99 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
I. EQUIPMENTS									
A. Boiler									
1.WATER WALL TUBE LEAKAGE	163	110	93	1075.15	633.8	644.02	6.81	3.03	3.24
2. SUPER HEATER TUBE LEAKAGE	23	28	53	1398.22	118.31	364.54	8.86	0.57	1.84
3. REHEATER TUBE LEAKAGE	1	5	1	0.09	39.87	2.55	0	0.19	0.01
4. ECONOMISER TUBE LEAKAGE	52	57	34	140.98	256.24	114.82	0.89	1.22	0.58
5. AIR PREHEATERS PROBLEM	2	4	2	8.02	38.02	5.42	0.05	0.18	0.03
6. FURNACE TROUBLE	4	5	5	8.48	8.53	6.40	0.05	0.04	0.03
7. BOILER OPERATIONAL PROBLEMS									
(A) Furnace Fire Out/Flame Failure	48	14	12	58.26	5.03	8.46	0.37	0.02	0.04
(B) Furnace Draft Abnormal	46	37	26	48.15	19.89	22	0.31	0.1	0.11
(C) Drum Level High/ Low	13	11	9	21.13	17.75	7.31	0.13	0.08	0.04
8. OTHERS	28	26	27	405.58	134.78	65.83	2.57	0.64	0.33
Total Boiler	**380**	**297**	**262**	**3164.06**	**1272.23**	**1241.35**	**20.05**	**6.08**	**6.25**
B. Turbine									
1. TURBINE BEARING PROBLEM	3	6	1	0.19	34.41	0.13	0	0.16	
2. GOVERNING / OIL SYSTEM PROBLEM	5	6	11	5.68	12.71	1.39	0.04	0.06	0.01
3. TURBINE DIFFERENTIAL EXPANSION PROBLEM	0	1	1		1.41	0.67		0.01	
4. TURBINE AXIAL SHIFT/ THRUST PAD PROBLEM	13	2	1	575.52	12.56	0.41	3.65	0.06	
5. TURBINE ECCENTRICITY/ HIGH VIBRATION	15	22	5	38.04	85	0.34	0.24	0.41	
6. TURBINE ROTOR FAILURE/DAMAGED		1	0		10.08			0.05	
7. TURBINE CONTROL VALVE PROBLEM	0	0	6			2.05			0.01
8. CONDENSER TUBE LEAKAGE/ CLEANI	26	6	3	559.27	22.88	4.28	3.54	0.11	0.02
9. MAIN STEAM LINE PROBLEM	11	2	7	4.18	0.38	1.27	0.03	0	0.01
10. Emergency Safety Valve closure	2	1	4	1.9	0.22	1.90	0.01	0	
11. CONDENSER LOW VACCUM	23	10	13	20.3	4.47	12.26	0.13	0.02	0.06
12. H.P. & L.P. bypass system	0	0							
13. TURBINE MISC. PROBLEM	14	18	3	29.23	56.96	12.58	0.19	0.27	0.06
Total Turbine	**112**	**75**	**55**	**1234.31**	**241.09**	**37.29**	**7.82**	**1.15**	**0.19**
C. Generator									
1.STATOR/ STATOR EARTH FAULT	4	20	7	0.99	2.04	0.53	0.01	0.01	
2. ROTOR/ ROTOR EARTH FAULT	0	2	1		51.72	0.04		0.25	
3. GEN. TRANSFORMER TRIPPING/ DAMAGED	5	2	5	5.51	12.28	50	0.03	0.06	0.25
4. EXCITATION PROBLEM	12	4	5	4.58	3.35	55.81	0.03	0.02	0.28

Area/ cause of outage (25-99 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
5. GEN. COOLING SYSTEM FAILURE									
6. SEAL OIL SYSTEM PROBLEM	2	0	2	1.07		14.76	0.01		0.07
7. FIRE IN TURBO GEN. BUSHING/ BUSHING FAILURE	0	1	0		0.07			0	
8. GENERATOR BEARING PROBLEM	2	2	0	0.08	130.59		0	0.62	
9. A.V.R. PROBLEM	6	3	1	348.2	4.32		2.21	0.02	
10. GENERATOR PROTECTION/ RELAY OPERATION PROBLEM	15	19	10	15.83	19.75	2.85	0.1	0.09	0.01
11. HYDROGEN PRESSURE PROBLEM		1	1		13	7.66		0.06	0.04
12. GENERATOR MISCLLANEOUS MAINTENANCE	7	5	3	614.14	20.18	5.78	3.89	0.1	0.03
Total Generator	**53**	**59**	**35**	**990.41**	**257.3**	**137.44**	**6.28**	**1.23**	**0.69**
A. Boiler Auxiliaries									
1. I.D. FANS PROBLEM	17	4	3	39.45	7.47	35.86	0.25	0.04	0.18
2. F.D. FANS PROBLEM	5	4	0	2.82	2.73	0	0.02	0.01	0
3. P.A. FANS PROBLEM	15	2	5	32.43	12.32	23.08	0.21	0.06	0.12
4. MILLING SYSTEM /RC FEEDER PROBLEM	18	49	23	124.21	472.67	185.24	0.79	2.26	0.93
5. PIPES and VALVES BOILER SIDE	1	3	1	0.04	8.49	1.40	0	0.04	0.01
6. BOILER AUX. MISC. PROMLEMS	13	8	5	1182.59	18.66	10.89	7.49	0.09	0.05
Total Boiler Aux.	**69**	**70**	**37**	**1381.54**	**522.33**	**256.46**	**8.76**	**2.5**	**1.29**
B. Turbine Auxiliaries									
7. BOILER FEED PUMP/MOTOR PROBLEM	13	14	6	102.82	74.04	8.21	0.67	0.35	0.04
8. CONDENSATE PUMP PROBLEM	3	2	2	3.07	5.48	1.15	0.02	0.03	0.01
9. C.W. PUMP PROBLEM	4	4	2	4.73	2.94	5.79	0.03	0.01	0.03
10. REGENERATIVE SYSTEM PROBLEM	0	0	0	0	0	0	0	0	0
11. TURBINE PIPES & VALVES PROBLEM	0	0	1	0	0	4.76	0	0	0.02
12. DEAERATOR PROBLEM	0	1	0	0	2.26	0	0	0.01	0
13. TURBINE MISC.	23	14	25	177.85	170.85	46.65	1.15	0.82	0.23
Total Turbine Aux.	43	**35**	**36**	288.47	**255.56**	**66.55**	1.87	**1.22**	**0.34**
Total Boiler & Turbine Aux.	**112**	**105**	**73**	**1670.01**	**777.89**	**323.01**	**10.84**	**3.72**	**1.63**
III. OTHERS MISC. PROBLEMS									
A. Other Electrical Problems									
1.UNIT AUX. TRANSFORMER/ STATION TRANSFORMER PROBLEMS	8	3	2	7.06	8.97	0.53	0.04	0.04	0
2. GEN. TRANSFORMER TRIPPING/ DAMAGED	11	10	3	7.09	10.53	6.66	0.04	0.05	0.03
3. H.T./L.T. SUPPLY PROBLEM	7	3	2	6.03	4.57	0.45	0.04	0.02	0
4. DC SUPPLY PROBLEM	8	1	9	3.89	1.12	3.37	0.02	0.01	0.02
5. SWITCH YARD/BUS BAR PROBLEM	7	65	215	28.03	22.86	45.57	0.18	0.11	0.23
6. BREAKER/ISOLATOR PROBLEMS	3	0	0	6.32			0.04		
7. MISC. FIRE HAZARDS / FIRE IN CABLE GALLERY	1	0	4	11.74		6.27	0.07		0.03
8. INSTRUMENTATION PROBLEM	0	1	1		0.07	0.26		0	
9. Air supply problem	0	3	0		20.96			0.1	
10. ELECTRICAL MISCELLANEOUS PROBLEMS	201	57	32	239.13	79.88	77.75	1.52	0.38	0.39
TOTAL OTHER ELECTRICAL PROBLEMS	**271**	**158**	**280**	**4040.19**	**148.96**	**140.86**	**25.59**	**0.71**	**0.71**
12. COAL FEEDING PROBLEM	4	4	2	17.28	16.98	7.38	0.11	0.08	0.04
13.LIGNITE FEEDING PROBLEM	12	24	9	208.8	140.64	31.86	1.32	0.67	0.16
15. WET/ POOR QUALITY COAL	6	6	4	28.41	31.24	13.58	0.18	0.14	0.07
16. FUEL OIL PROBLEM	2	1	0	0.78	0.1		0	0	
17. COOLING TOWER PROBLEM	0	0	0						

Area/ cause of outage (25-99 MW Cap. group)	No. of Outages			MU Loss			% of Group F.O. Loss		
	14-15	15-16	16-17	14-15	15-16	16-17	14-15	15-16	16-17
18. ASH HANDLING SYSTEM PROBLEM	7	12	7	15.2	42.88	11.10	0.1	0.2	0.06
19. RAW WATER PROBLEM	2	0	3	4.48		105.12	0.03		0.53
20. E.S.P. / POLLUTION PROBLEM	2	6	4	982.49	1677.84	2516.93	6.23	8.02	12.67
21. NON-READINESS OF RESIDUAL WORK OF NEW UNIT	0	1	0		1.63			0.01	
22. VINTAGE UNIT WITHDRAWN AND CLOSED FOR OPERATION	0	13	13		6512.24	5338.88		31.13	26.88
23. FUEL SUPPLY & OTHER MISC. PROBLEMS	25	15	12	3730.89	1408.59	822.04	23.64	6.73	4.14
24. OTHER MISC. PROBLEMS	1	1	2	1	2.77	1.15	0.01	0.01	0.01
25. LIGNITE SHORTAGE	_	1	0	_	9.93		_	0.05	
26. COAL SHORTAGE	4	1	0	35.87	3.85		0.23	0.02	
TOTAL FUEL SUPPLY AND OTHER MISC PROBLEMS	**65**	**82**	**65**	**5025.19**	**9848.69**	**8870.33**	**31.85**	**47.06**	**44.67**
C. Grid System									
27. TRANSMISSION Constraints/ GRID DISTURBANCE	40	104	41	9.28	156.14	13.87	0.06	0.75	0.07
28. RESERVE SHUT DOWN	113	62	135	3113.56	4430.52	5098.60	19.73	21.18	25.67
TOTAL GRID SYSTEM	**153**	**166**	**176**	**3122.84**	**4586.66**	**5112.46**	**19.79**	**21.93**	**25.74**
29. NO Power purchase agreement	_	7	9	_	3522.38	3733.37	_	16.84	18.80
30. UNECONOMICAL OPERATION	1	1	1	262.8	263.52	262.80	1.67	1.26	1.32
Total Miscellaneous	**490**	**407**	**531**	**12451.03**	**18370.2**	**18119.82**	**78.91**	**87.77**	**91.24**

SECTION-7
PARTIAL UNAVAILABILITY AND
NON – UTILIZATION OF ENERGY DUE TO SYSTEM LOAD VARIATION

7.1 Partial unavailability implies that units are operational but are not able to operate at their rated capacity due to the following: -

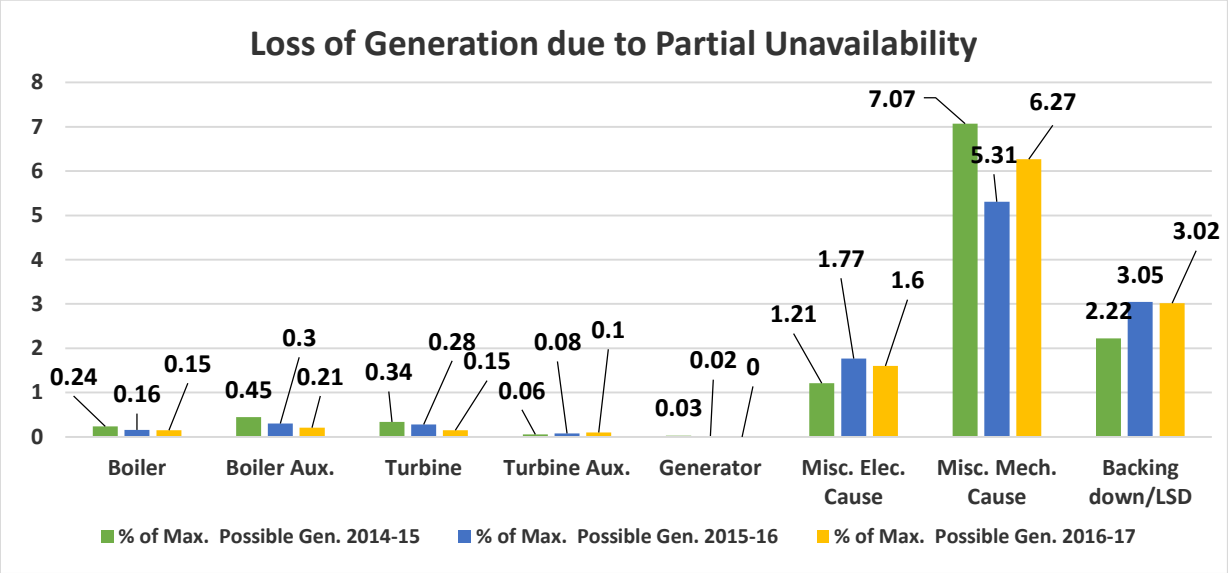
i) Due to **internal constraints in equipment or auxiliaries** as a result of which the operating units could not deliver the rated output despite no grid constraints.
ii) Due to **external constraints not attributable to the generating unit/station** such as shortage of fuel or cooling water and low demand (including grid constraints) resulting in reduced generation of the units vis-à-vis their rated capacity.

7.2 OVERALL PARTIAL UNAVAILABILTY

Energy loss due to partial unavailability of the thermal generating units considered in the Review during 2016-17 increased to **11.48%** of the maximum possible generation from 10.99% in 2015-16. **The energy loss due to partial unavailability on account of miscellaneous problems such as poor quality coal, coal shortages, backing down continued to be the main cause for Partial Unavailability of units.** The broad details of energy loss due to Partial Unavailability of the thermal generating units due to various factors/equipment on All India basis during the period, 2014-15,2015-16 and 2016-17 are given below: -

Sl. No	Constraint Area	MU Loss			% Total Partial Loss			% of Max. Possible Gen.		
		2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
1	Boiler	3072.97	2312.5	2309.89	2.09	1.48	1.28	0.24	0.16	0.15
2	Boiler Aux.	5741.45	4233.6	3247.02	3.91	2.7	1.80	0.45	0.3	0.21
	Boiler + Boiler Aux.	**8814.42**	**6546.11**	**5556.91**	**6.01**	**4.18**	**3.07**	**0.7**	**0.46**	**0.35**
3	Turbine	4333.72	3960.01	2288.25	2.95	2.53	1.27	0.34	0.28	0.15
4	Turbine Aux.	721.46	1189.48	1528.01	0.49	0.76	0.84	0.06	0.08	0.10
	Turbine + Turbine Aux.	**5055.18**	**5149.49**	**3816.26**	**3.44**	**3.29**	**2.11**	**0.4**	**0.36**	**0.24**
5	Generator	397.01	304.35	32.48	0.27	0.19	0.02	0.03	0.02	0.00
6	Electrical	15273.01	25321.56	25247.46	10.41	16.17	13.96	1.21	1.77	1.60
7	Other Miscellaneous	89257.63	75779.87	98702.69	60.81	48.39	54.57	7.07	5.31	6.27
	Total	**118797**	**113101.38**	**133355.81**	**80.94**	**72.22**	**73.73**	**9.41**	**7.93**	**8.47**
8	Backing down/LSD	27972.76	43509.47	47507.70	19.06	27.78	26.27	2.22	3.05	3.02
	Grand Total	**146770**	**156610.85**	**180863.51**	**100**	**100**	**100**	**11.62**	**10.99**	**11.48**

The pictorial representation of the loss of generation on account of Partial Unavailability of various parts in the main equipment & auxiliaries and because of low system demand including grid constraints during the financial years 2014-15 ,2015-16 and 2016-17 is given below: -



7.3 REGION-WISE ENERGY LOSS DUE TO PARTIAL UNAVAILABILITY:

Region wise broad details of the energy loss due to Partial Unavailability of the thermal generating units due to various equipment's during the period 2015-16 and 2016-17 are shown below: -

All Figures are % of Maximum Possible Generation

Type of Equip.	Northern Region		Western Region		Southern Region		Eastern Region		ALL INDIA	
	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17
Main Equipment[6]	5.	5	5.5	5.	4.	4.	5.	3	5	4.9
Axillaries	0.	0	0.1	0.1	0.	0.	0.	0	0	0.3
Other Reasons	5.	5	4.6	5.1	5.	6.	6.	8	5	6.2
Total	**10**	**11**	**10.**	**10.**	**9.**	**11**	**13**	**12**	**10**	**11.4**

Region-wise details of Partial Unavailability due to various long and short duration constraints in the main equipment and its auxiliaries during 2016-17(in MUs) are given in **Annexure 7.1**.

7.4 CAPACITY GROUP-WISE PARTIAL UNAVAILABILITY:

The Partial Unavailability due to various constraints in terms of percentage of All India Maximum Possible Generation in different capacity groups during the years 2014-15, 2015-16 and 2016-17 are shown below:

Capacity Group(MW)	Partial Unavailability as percentage of Maximum Possible Generation											
	Main equipment			Auxiliary			Others			Total		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
660-800	0.83	1.35	1.28	0.04	0.02	0.12	0.56	0.44	0.75	1.43	1.8	2.15
490-600	1.22	1.56	1.67	0.1	0.08	0.06	2.95	2.42	3.20	4.27	4.06	4.93
300-360	0.35	0.48	0.51	0.05	0.03	0.01	0.34	0.32	0.42	0.75	0.83	0.94
250-270	0.39	0.54	0.52	0.03	0.03	0.04	0.57	0.23	0.30	0.99	0.79	0.86

[6] Includes partial loss due to Low System Demand (LSD)

210-210	0.59	0.66	0.67	0.15	0.09	0.03	1.56	1.17	0.86	2.3	1.93	1.57
195-200	0.05	0.06	0.05	0.03	0.03	0.00	0.21	0.16	0.22	0.29	0.26	0.28
100-150	0.24	0.25	0.25	0.05	0.06	0.06	0.43	0.3	0.22	0.73	0.61	0.54
25-99	0.17	0.18	0.04	0.03	0.01	0.01	0.17	0.15	0.16	0.37	0.34	0.21
Total	**4.04**	**5.29**	**4.99**	**0.51**	**0.38**	**0.34**	**7.07**	**5.31**	**6.15**	**11.62**	**10.99**	**11.48**

Detail breakup of cause wise Partial Unavailability during 2016-17 of major capacity groups of thermal units are given in **Annexure 7.2**.

7.5 MAKE-WISE PARTIAL UNAVAILABILITY

Make-wise energy loss due to Partial Unavailability of the thermal generating units in terms of percentage of All India Maximum Possible Generation during 2015-16 and 2016-17 are shown **below. The trend in 2016-17 is largely similar to 2015-16**

Make of Units	PARTIAL UNAVAILABILITY (%)			
	(%) of make-wise Maximum Possible Generation		(%) of All India Maximum Possible Gener	
	2015-2016	2016-17	2015-2016	2016-17
BHEL/BHEL	10.26	10.38	5.88	5.97
BHEL/ABL	17.05	17.23	0.27	0.21
RUSSIA/RUSSIA	13.59	14.93	0.28	0.26
CHINA/CHINA	12.10	14.30	3.02	3.62
OTHER/OTHER	13.96	12.46	1.54	1.42
ALL MAKES	**10.99**	**11.50**	**10.99**	**11.48**

7.6 SECTOR WISE PARTIAL UNAVAILABILITY INCLUDING LOW SYSTEM DEMAND:

Sector wise details of energy loss due to Partial Unavailability of the thermal generating units in terms of percentage of All India Maximum Possible Generation during 2015-16 and 2016-17 are shown below. As may be seen, the state sector faced higher Partial Unavailability.

Year	Central Sector	Private Secto	State Sector	All India Average
2015-2016	**2.97**	**3.82**	**4.19**	**10.99**
2016-2017	**2.91**	**3.86**	**4.71**	**11.48**

7.7 NON – UTILISATION OF ENERGY DUE TO SYSTEM LOAD VARIATION

During the year 2016-17, some thermal units faced Partial Unavailability due to low schedule from the beneficiaries. Such Loss of energy due to backing down of coal/lignite based units increased from 27,972.8 MU in 2015-16 to 43,509.47 MU in 2016-17. Also, the losses due to reserve shutdown (RSD) of units increased from to 1,13,932.88 MU during 2015-16 to **133975.17** MU during 2016-17. **Thus the RSD and low system demand together resulted into loss of 11.48 % of maximum possible generation of the units considered.** Details of non-utilization of energy due to system load variations in different regions during 2015-16 and 2016-17 are given at **Annexure 7.3**.

ANNEXURE - 7.1(a)

REGION WISE DETAILS OF PARTIAL UNAVAILABILITY DUE TO VARIOUS LONG AND SHORT DURATION CONSTRAINTS IN THE MAIN EQUIPMENT AND ITS AUXILLIARIES DURING 2016-17 (in MU)

CAUSE OF PARTIAL LOSS (Due To Equipment & Aux	NORTHERN REGION			WESTERN REGION			SOUTHERN REGION			EASTERN REGION			NORTH EASTERN REGION			All India		
	REGIONAL GEN. LOSS	% OF MAX. POSS .GEN.	% OF TOTAL REGIONALP. LOSS	REGIONAL GEN. LOSS	% OF MAX. POSSGEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONALP.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS .GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONALP.LOSS
MAIN BOILER	182.75	0.05	0.45	971.79	0.15	1.41	746.72	0.25	2.11	408.63	0.14	1.14	0.00	0	0	2309.89	0.15	1.28
BOILER AUXILIARIES	431.61	0.13	1.06	1218.98	0.19	1.77	1181.70	0.40	3.34	414.75	0.15	1.16	0.00	0	0	3247.02	0.21	1.79
BOILER & ITS AUXILIARIES	614.35	0.18	1.51	2190.77	0.34	3.19	1928.42	0.65	5.45	823.38	0.29	2.30	0.00	0	0	5556.91	0.35	3.07
MAIN TURBINE	375.87	0.11	0.92	748.69	0.12	1.09	740.05	0.25	2.09	423.64	0.15	1.18	0.00	0	0	2288.25	0.15	1.26
TURBINE AUXILIARIES	34.40	0.01	0.08	345.71	0.05	0.50	1056.09	0.36	2.98	91.81	0.03	0.26	0.00	0	0	1528.01	0.10	0.84
TURBINE & ITS AUXILIARIES	410.27	0.12	1.01	1094.40	0.17	1.59	1796.14	0.61	5.07	515.45	0.18	1.44	0.00	0	0	3816.26	0.24	2.11
GENERATOR	0.00	0.00	0.00	10.06	0.00	0.01	22.05	0.01	0.06	0.38	0.00	0.00	0.00	0	0	32.48	0.00	0.02
ELECTRICAL	5039.20	1.46	12.37	12842.18	1.98	18.69	5723.12	1.93	16.17	1642.95	0.58	4.59	0	0	0	25247.46	1.60	13.94
OTHER MISC. CAUSES	20664.06	5.99	50.71	33899.53	5.24	49.34	18506.92	6.25	52.27	25182.44	8.86	70.36	449.74	16.56	100.	98702.69	6.27	54.50
TOTAL	**26727.8**	**7.74**	**65.59**	**50036**	**7.73**	**72.83**	**27976**	**9.45**	**79.02**	**28164**	**9.90**	**78.70**	**449.74**	**16.56**	**1000**	**133355**	**8.47**	**73.64**
COMMERCIAL REASON	14018.18	4.06	34.41	18638.47	2.88	27.17	7251.39	2.45	20.98	7599.66	2.67	21.30	0	0	0	47507.70	3.01	26.36
GRAND TOTAL	**40746**	**11.80**	**100**	**68675.**	**10.62**	**100**	**35228**	**11.90**	**100**	**35764**	**12.58**	**100**	**449.74**	**16.56**	**100.**	**180863**	**11.48**	**100**

Annexure 7.1(b)

CAUSE WISE PARTIAL UNAVAILABILITY OF THERMAL UNITS DURING 2016-17

Particulars	NORTHERN REGION			WESTERN REGION			SOUTHERN REGION			EASTERN REGION			NORTH EASTERN			ALL INDIA		
	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS
MAIN BOILER																		
Pressure Parts Leakage	30.45	0.01	0.07	85.01	0.01	0.12	19.05	0.01	0.05	204.80	0.07	0.57	0.00	0.00	0.00	339.30	0.02	0.19
Drum Pressure Restriction	40.24	0.01	0.10	54.26	0.01	0.08	82.65	0.03	0.23	33.86	0.01	0.09	0.00	0.00	0.00	211.02	0.01	0.12
Air Heaters	45.38	0.01	0.11	222.15	0.03	0.32	208.59	0.07	0.59	77.80	0.03	0.22	0.00	0.00	0.00	553.92	0.04	0.31
Furnace	25.88	0.01	0.06	70.89	0.01	0.10	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.24	0.01	0.05
Furnace Draft	0.00	0.00	0.00	2.04	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	2.39	0.00	0.00
High Fuel Gas/ Steam Temperature	0.00	0.00	0.00	6.56	0.00	0.01	0.00	0.00	0.00	58.60	0.02	0.16	0.00	0.00	0.00	65.16	0.00	0.04
Ageing	0.00	0.00	0.00	35.34	0.01	0.05	328.65	0.11	0.93	0.00	0.00	0.00	0.00	0.00	0.00	363.99	0.02	0.20
Miscellaneous Problems - Main Boiler	40.79	0.01	0.10	495.54	0.08	0.72	107.31	0.04	0.30	33.22	0.01	0.09	0.00	0.00	0.00	676.87	0.04	0.37
Total Main Boiler	182.75	0.05	0.45	971.79	0.15	1.41	746.72	0.25	2.11	408.63	0.14	1.14	0.00	0.00	0.00	2309.89	0.15	1.28
BOILER AUXILIARIES																		
I.D. Fan	83.20	0.02	0.20	465.94	0.07	0.68	144.42	0.05	0.41	174.99	0.06	0.49	0.00	0.00	0.00	868.55	0.06	0.48
P.A. Fan	24.99	0.01	0.06	64.03	0.01	0.09	17.76	0.01	0.05	82.87	0.03	0.23	0.00	0.00	0.00	189.66	0.01	0.10
F.D. Fan	11.95	0.00	0.03	8.95	0.00	0.01	3.64	0.00	0.01	3.41	0.00	0.01	0.00	0.00	0.00	27.95	0.00	0.02
Milling System	239.57	0.07	0.59	358.28	0.06	0.52	199.39	0.07	0.56	69.49	0.02	0.19	0.00	0.00	0.00	866.72	0.06	0.48
P.C & R.C. Feeders	4.81	0.00	0.01	58.66	0.01	0.09	290.18	0.10	0.82	0.33	0.00	0.00	0.00	0.00	0.00	353.99	0.02	0.20
ESP	62.26	0.02	0.15	95.74	0.01	0.14	3.81	0.00	0.01	10.60	0.00	0.03	0.00	0.00	0.00	172.41	0.01	0.10
Presipitators	0.00	0.00	0.00	27.90	0.00	0.04	0.00	0.00	0.00	4.21	0.00	0.01	0.00	0.00	0.00	32.11	0.00	0.02
Miscellaneous Problems-Boiler Auxiliaries	4.82	0.00	0.01	139.48	0.02	0.20	522.49	0.18	1.48	68.84	0.02	0.19	0.00	0.00	0.00	735.64	0.05	0.41
Total Boiler Auxiliaries	431.61	0.13	1.06	1218.98	0.19	1.77	1181.70	0.40	3.34	414.75	0.15	1.16	0.00	0.00	0.00	3247.02	0.21	1.79
BOILER & BOILER AUX																		
Boiler & Boiler Aux	614.35	0.18	1.51	2190.77	0.34	3.19	1928.42	0.65	0.65	823.38	0.29	2.30	0.00	0.00	0.00	5556.91	0.35	3.07
Total Boiler & Boiler Aux	614.35	0.18	1.51	2190.77	0.34	3.19	1928.42	0.65	0.65	823.38	0.29	2.30	0.00	0.00	0.00	5556.91	0.35	3.07
BOILER & BOILER AUX																		
MAIN TURBINE																		
Vibrations/Eccentricity	0.00	0.00	0.00	18.42	0.00	0.03	24.72	0.01	0.07	1.64	0.00	0.00	0.00	0.00	0.00	44.78	0.00	0.02
Turbine Differential	4.00	0.00	0.01	13.34	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.34	0.00	0.01
High Curtis Wheel Pressure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	179.80	0.06	0.50	0.00	0.00	0.00	179.80	0.01	0.10
Condenser Tube Leakages	46.24	0.01	0.11	150.11	0.02	0.22	88.22	0.03	0.25	92.87	0.03	0.26	0.00	0.00	0.00	377.44	0.02	0.21
Low Vaccum	72.91	0.02	0.18	111.55	0.02	0.16	236.99	0.08	0.67	19.71	0.01	0.06	0.00	0.00	0.00	441.16	0.03	0.24
Startup/ Shut Down	246.10	0.07	0.60	311.48	0.05	0.45	287.39	0.10	0.81	109.69	0.04	0.31	0.00	0.00	0.00	954.66	0.06	0.53
Axial Shift	0.93	0.00	0.00	0.70	0.00	0.00	22.57	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	24.20	0.00	0.01
Control Valve	0.00	0.00	0.00	0.48	0.00	0.00	2.38	0.00	0.01	6.12	0.00	0.02	0.00	0.00	0.00	8.98	0.00	0.00

Particulars	NORTHERN REGION			WESTERN REGION			SOUTHERN REGION			EASTERN REGION			NORTH EASTERN			ALL INDIA		
	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS
Condenser	2.29	0.00	0.01	6.16	0.00	0.01	8.18	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	16.62	0.00	0.01
Governing System	3.41	0.00	0.01	136.44	0.02	0.20	69.61	0.02	0.20	13.81	0.00	0.04	0.00	0.00	0.00	223.27	0.01	0.12
Total Main Turbine	375.87	0.11	0.92	748.69	0.12	1.09	740.05	0.25	2.09	423.64	0.15	1.18	0.00	0.00	0.00	2288.25	0.15	1.26
TURBINE AUXILIARIES																		
B.F. Pumps	4.12	0.00	0.01	142.14	0.02	0.21	1.97	0.00	0.01	2.39	0.00	0.01	0.00	0.00	0.00	150.63	0.01	0.08
Regenerative System	0.00	0.00	0.00	97.63	0.02	0.14	789.02	0.27	2.23	1.51	0.00	0.00	0.00	0.00	0.00	888.17	0.06	0.49
C.W. Pumps	0.24	0.00	0.00	84.13	0.01	0.12	238.02	0.08	0.67	0.64	0.00	0.00	0.00	0.00	0.00	323.03	0.02	0.18
Condensate Pump	0.00	0.00	0.00	0.94	0.00	0.00	2.35	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.29	0.00	0.00
Miscellaneous Problems - Turbine Aux.	30.04	0.01	0.07	20.86	0.00	0.03	24.72	0.01	0.07	87.27	0.03	0.24	0.00	0.00	0.00	162.90	0.01	0.09
Total Turbine Auxiliaries	34.40	0.01	0.08	345.71	0.05	0.50	1056.09	0.36	2.98	91.81	0.03	0.26	0.00	0.00	0.00	1528.01	0.10	0.84
TURBINE & TURBINE AUX																		
Turbine & Turbine Aux	410.27	0.12	1.01	1094.40	0.17	1.59	1796.14	0.61	5.07	515.45	0.18	.44	0.00	0.00	0.00	3816.26	0.24	2.11
Total Turbine & Turbine Aux	410.27	0.12	1.01	1094.40	0.17	1.59	1796.14	0.61	5.07	515.45	0.18	1.44	0.00	0.00	0.00	3816.26	0.24	2.11
GENERATOR																		
Winding Temperature	0.00	0.00	0.00	3.19	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	3.21	0.00	.00
Generator Cooling System	0.00	0.00	0.00	2.67	0.00	0.00	0.69	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	3.38	0.00	0.00
Miscellaneous Problem Generator	0.00	0.00	0.00	4.19	0.00	0.01	21.36	0.01	0.06	0.34	0.00	0.00	0.00	0.00	0.00	25.89	0.00	0.01
Total Generator	0.00	0.00	0.00	10.06	0.00	0.01	22.05	0.01	0.06	0.38	0.00	0.00	0.00	0.00	0.00	32.48	0.00	0.02
ELECTRICAL																		
Main Transformer	0.00	0.00	0.00	0.82	0.00	0.00	121.64	0.04	0.34	0.00	0.00	0.00	0.00	0.00	0.00	122.46	0.01	0.07
Miscellaneous Others	0.00	0.00	0.00	19.19	0.00	0.03	8.32	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	27.50	0.00	0.02
Commercial Reason/Grid System	2788.62	0.81	6.84	12601.66	1.95	18.34	4317.31	1.46	12.19	1624.73	0.57	4.54	0.00	0.00	0.00	21332.32	1.35	11.78
Grid System	2250.58	0.65	5.52	220.52	0.03	0.32	1275.85	0.43	3.60	18.22	0.01	0.05	0.00	0.00	0.00	3765.17	0.24	2.08
Total Electrical	5039.20	1.46	12.37	12842.18	1.98	18.69	5723.12	1.93	16.17	1642.95	0.58	4.59	0.00	0.00	0.00	25247.46	1.60	13.96
OTHER MISCELLANEOUS CAUSES																		
Coal Shortage	0.00	0.00	0.00	1795.40	0.28	2.61	444.54	0.15	1.26	870.36	0.31	2.43	0.00	0.00	0.00	3110.31	0.20	1.72
Coal Handling Problem / Feeding Trouble	710.79	0.21	1.74	1838.86	0.28	2.68	646.09	0.22	1.82	30.80	0.01	0.09	0.00	0.00	0.00	3226.55	0.20	1.78
Poor Quality/ Wet Coal	1210.21	0.35	2.97	4596.92	0.71	6.69	2433.7	0.82	6.87	2705.69	0.95	7.56	0.00	0.00	0.00	10946.38	0.69	6.04
Fuel Oil Shortage	0.00	0.00	0.00	10.75	0.00	0.02	29.34	0.01	0.08	235.35	0.08	0.66	0.00	0.00	0.00	275.45	0.02	0.15
D.M. Water	0.39	0.00	0.00	25.33	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.71	0.00	0.01
Cooling Water Problems	0.00	0.00	0.00	1.12	0.00	0.00	2.66	0.00	0.01	26.06	0.01	0.07	0.00	0.00	0.00	29.84	0.00	0.02

Particulars	NORTHERN REGION			WESTERN REGION			SOUTHERN REGION			EASTERN REGION			NORTH EASTERN			ALL INDIA		
	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS	REGIONAL GEN. LOSS	% OF MAX. POSS. GEN.	% OF TOTAL REGIONAL P.LOSS
Operational Problems	7.36	0.00	0.02	61.51	0.01	0.09	305.49	0.10	0.86	0.50	0.00	0.00	0.00	0.00	0.00	374.86	0.02	0.21
Air Supply Problems	0.19	0.00	0.00	57.35	0.01	0.08	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	57.65	0.00	0.03
Ash Handling Problems	87.21	0.03	0.21	655.69	0.10	0.95	111.38	0.04	0.31	597.43	0.21	1.67	0.00	0.00	0.00	1451.72	0.09	0.80
Malfunction Of Relays/ Instrument Trouble	14.76	0.00	0.04	7.59	0.00	0.01	2.13	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00	24.54	0.00	0.01
Miscellaneous Problems - Others	18633.15	5.40	45.72	24848.84	3.84	36.17	14531.71	4.91	41.05	20716.07	7.29	57.88	449.74	16.56	100.00	79179.51	5.03	43.72
Transmission Constraints / Evacuation Problem	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00
Total Other Miscellaneous Causes	20664.06	5.99	50.71	33899.53	5.24	49.34	18506.92	6.25	52.27	25182.44	8.86	70.36	449.74	16.56	100.00	98702.69	6.27	54.57
LOW SYSTEM DEMAND																		
Low System Demand	14018.18	4.06	34.40	18638.47	2.88	27.12	7251.39	2.45	20.48	7599.66	2.67	21.23	0.00	0.00	0.00	47507.70	3.01	26.24
Total Low System Demand	14018.18	4.06	34.40	18638.47	2.88	27.12	7251.39	2.45	20.48	7599.66	2.67	21.23	0.00	0.00	0.00	47507.70	3.01	26.27
Grand Total	40746.07	11.80	100	68675.40	10.62	100	35228.04	11.90	100	35764.26	12.58	99.93	449.74	16.56	100.00	180863.5	11.48	100.0

Annexure 7.2

CAUSE WISE CPACITY GROUP WISE PARTIAL UNAVAILABILITY DURING 2016-2017 OF OF THERMAL UNITS

Particulars	660-800 MW		490-600 MW		300-360 MW		250-270 MW		210-210 MW		195-200 MW		100-150 MW		25-99 MW	
	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%
MAIN BOILER																
Pressure Parts Leakage	0	0	61.03	0.08	219.81	1.48	20.65	0.17	32.27	0.13	0	0	5.54	0.06	0	0
Drum Pressure Restriction	0	0	86.72	0.12	0	0	6.2	0.05	117.34	0.46	0	0	0.76	0.01	0	0
Air Heaters	0	0	120.21	0.16	0.17	0	1.86	0.02	195.2	0.77	0	0	**200.2**	1.94	50.45	1.5
Furnace	0	0	29.06	0.04	0	0	0	0	60.82	0.24	3.55	0.09	3.13	0.03	0.69	0.02
Furnace Draft	0	0	0	0	0.34	0	1.53	0.01	0	0	0	0	0	0	0.52	0.02
High Fuel Gas/ Steam Temperature	0	0	5.67	0.01	0	0	0	0	59.49	0.23	0	0	0	0	0	0
Ageing	0	0	0	0	0	0	0	0	38.72	0.15	0	0	236.97	2.47	88.3	2.63
Miscellaneous Problems - Main Boiler	25.4	0.07	16.91	0.02	5.11	0.03	82.08	0.68	366.37	1.44	0	0	164.38	1.72	0.71	0.02
Single Boiler Inspection	0	0	0	0	0	0	0	0	0.29	0	0	0	0	0	0	0
Boiler Inspection, RECERTIFICATION	0	0	0	0	0	0	0	0	1.45	0.01	0	0	0	0	0	0
Total Main Boiler	**25.4**	**0.07**	**319.6**	**0.43**	**225.43**	**1.51**	**112.31**	**0.93**	**871.95**	**3.42**	**3.55**	**0.09**	**610.98**	**6.23**	**140.68**	**4.19**
BOILER AUXILIARIES																
P.A. Fan	0	0	129.1	0.17	21.49	0.14	12.42	0.1	12.19	0.05	11.65	0.3	2.74	0.03	0.07	0
I.D. Fan	318.73	0.94	150.59	0.2	79.68	0.53	116.16	0.97	110.63	0.43	0	0	18.14	0.19	0.14	0
F.D. Fan	7.95	0.02	5.37	0.01	0.07	0	1.72	0.01	8.99	0.04	0	0	2.92	0.03	0.93	0.03
Milling System	198.19	0.44	131.77	0.18	21.95	0.15	109.78	0.91	239.8	0.94	33.37	0.86	78.48	0.82	99.93	2.98
P.C & R.C. Feeders	0	0	0	0	0.25	0	313.28	2.37	2.89	0.01	0	0	6.25	0.07	59.25	1.76

Particulars	660-800 MW		490-600 MW		300-360 MW		250-270 MW		210-210 MW		195-200 MW		100-150 MW		25-99 MW	
	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%
ESP	62.7	0.18	4.4	0.01	0	0	86.97	0.72	22.6	0.09	0	0	27.85	0.29	0	0
Miscellaneous Problems-Boiler Auxiliaries	466.06	1.37	50.49	0.07	2.42	0.02	42.17	0.35	139.54	0.55	5.86	0.15	25.97	0.27	3.12	0.09
Total Boiler Auxiliaries	**1053.63**	**2.96**	**471.72**	**0.63**	**125.85**	**0.84**	**682.5**	**5.44**	**536.65**	**2.1**	**50.89**	**1.31**	**162.33**	**1.69**	**163.44**	**4.87**
BOILER & BOILER AUX																
Boiler & Boiler Aux	1029.03	3.03	791.32	1.06	351.29	2.36	766.89	6.38	1408.6	5.53	54.43	1.4	759.15	7.92	304.12	9.05
Total Boiler & Boiler Aux	**1029.03**	**3.03**	**791.32**	**1.06**	**351.29**	**2.36**	**766.89**	**6.38**	**1408.6**	**5.53**	**54.43**	**1.4**	**759.15**	**7.92**	**304.12**	**9.05**
MAIN TURBINE																
Vibrations/Eccentricity	0	0	12.23	0.02	9.07	0.06	0	0	10.27	0.04	0	0	13.21	0.14	0	0
Turbine Differential	0	0	0.3	0	0	0	0.97	0.01	3.25	0.01	0	0	12.82	0.13	0	0
High Curtis Wheel Pressure	0	0	0	0	0	0	0	0	179.8	0.71	0	0	0	0	0	0
Condenser Tube Leakages/Low Vauum	0	0	209.61	0.28	1.11	0.01	24.06	0.2	175.05	0.69	30.26	0.78	378.49	3.95	0.02	0
Startup/ Shut Down	235.57	0.73	243.56	0.33	39.2	0.26	56.93	0.47	278.21	1.09	35.78	0.92	37.06	0.39	11.15	0.33
Axial Shift	0	0	0	0	0	0	0.93	0.01	21.1	0.08	0	0	0	0	2.17	0.06
Control Valve	0	0	2.37	0	5.02	0.03	0	0	1.59	0.01	0	0	0	0	0	0
Condenser	0	0	3.1	0	0	0	3.06	0.03	0	0	0	0	10.46	0.11	0	0
Governing System	10.54	0.03	24.51	0.03	4.71	0.03	1.75	0.01	116.78	0.46	0	0	34.59	0.36	30.39	0.9
Misc. Problems-Main Turbine	0	0	0	0	0	0	0	0	0	0	0	0	17.23	0.18	0	0
Total Main Turbine	**246.11**	**0.76**	**495.68**	**0.66**	**59.11**	**0.39**	**87.7**	**0.73**	**786.05**	**3.09**	**66.04**	**1.7**	**503.86**	**5.26**	**43.73**	**1.3**
TURBINE AUXILIARIES																
B.F. Pumps	44.78	0.13	80.33	0.11	18.54	0.12	0.32	0	6.66	0.03	0	0	0	0	0	0
Regenerative System	744.73	2.2	16.81	0.02	0.01	0	2.09	0.02	21.91	0.09	0.09	0	49.74	0.52	52.78	1.57
C.W. Pumps	68.41	0.2	229.6	0.31	0	0	0.24	0	16.41	0.06	0	0	7.76	0.08	0.61	0.02

Particulars	660-800 MW		490-600 MW		300-360 MW		250-270 MW		210-210 MW		195-200 MW		100-150 MW		25-99 MW	
	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%
Condensate Pump	0	0	2.35	0	0	0	0.02	0	0.92	0	0	0	0	0	0	0
Miscellaneous Problems - Turbine Aux.	29.95	0.09	37.6	0.05	7.76	0.05	3.21	0.03	84.29	0.33	0	0	0.09	0	0	0
Total Turbine Auxiliaries	**887.87**	**2.62**	**366.69**	**0.49**	**26.31**	**0.18**	**5.89**	**0.05**	**130.19**	**0.51**	**0.09**	**0**	**57.58**	**0.6**	**53.39**	**1.59**
TURBINE & TURBINE AUX																
Turbine & Turbine Aux	1133.98	3.38	862.35	1.16	85.41	0.57	93.58	0.78	916.25	3.6	66.13	1.7	561.46	5.86	97.12	2.89
Total Turbine & Turbine Aux	**1133.98**	**3.38**	**862.35**	**1.16**	**85.41**	**0.57**	**93.58**	**0.78**	**916.25**	**3.6**	**66.13**	**1.7**	**561.46**	**5.86**	**97.12**	**2.89**
GENERATOR																
Winding Temperature	0	0	0	0	0.02	0	0	0	3.19	0.01	0	0	0	0	0	0
Generator Cooling System	0	0	0.69	0	0	0	0	0	2.69	0.01	0	0	0	0	0	0
Miscellaneous Problem Generator	0	0	9.53	0.01	0.34	0	0	0	16.02	0.06	0	0	0	0	0	0
Total Generator	**0**	**0**	**10.22**	**0.01**	**0.36**	**0**	**0**	**0**	**21.91**	**0.09**	**0**	**0**	**0**	**0**	**0**	**0**
ELECTRICAL																
Main Transformer	0	0	0	0	0	0	0	0	122.46	0.48	0	0	0	0	0	0
Miscellaneous Others	0.81	0	78.73	0.1	15.78	0.11	42.32	0.35	108.35	0.43	0	0	1.24	0.01	0.08	0
Commercial Reason/Grid System	4827.24	14.23	12781.54	16.9	1757.65	11.8	570.43	4.74	2931.62	11.5	25.98	0.67	1951.89	20.37	31.34	0.93
Total Electrical	**4828.05**	**14.22**	**12860.27**	**17**	**1773.43**	**11.91**	**612.75**	**5.09**	**3162.43**	**12.41**	**25.98**	**0.67**	**1953.13**	**20.38**	**31.42**	**0.93**
OTHER MISCELLANEOUS CAUSES																
Coal Shortage	1656.76	4.88	840.8	1.13	82.48	0.55	7.53	0.06	258.02	1.01	0	0	71.82	0.75	14.64	0.44
Coal Handling Problem / Feeding Trouble	1691.53	4.99	1285.33	1.73	14.6	0.1	25.38	0.21	148.78	0.58	1.93	0.05	38.16	0.4	20.85	0.62
Poor Quality/ Wet Coal	1701.43	5.02	1934.36	2.6	107.01	0.72	539.05	4.48	4553.83	17.87	73.42	1.88	1627.65	16.99	371.05	11.05

Particulars	660-800 MW		490-600 MW		300-360 MW		250-270 MW		210-210 MW		195-200 MW		100-150 MW		25-99 MW	
	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%	MU LOSS	%
Fuel Oil Shortage	0	0	0	0	0	0	0.18	0	245.43	0.96	0	0	12.9	0.13	16.94	0.5
D.M. Water	0	0	0	0	25.33	0.17	0	0	0	0	0	0	0.39	0	0	0
Cooling Water Problems	1.09	0	23.68	0.03	0	0	0.04	0	2.3	0.01	0	0	0	0	0	0
Operational Problems	4.99	0.01	21.01	0.03	0.37	0	14.35	0.12	21.34	0.08	0	0	181.31	1.89	131.49	3.92
Air Supply Problems	0	0	33.23	0.04	0	0	0.16	0	10.14	0.04	0	0	14.12	0.15	0	0
Ash Handling Problems	212.4	0.63	809.13	1.09	192.95	1.3	100.73	0.84	35.43	0.14	0	0	56.1	0.59	37.83	1.13
Malfunction Of Relays/ Instrument Trouble	0.44	0	1.52	0	0.07	0	15.65	0.13	6.69	0.03	0	0	0.18	0	0	0
Miscellaneous Problems - Others	6591.14	19.43	44140.97	57.35	7312.59	42.08	3997.26	33.23	9125.68	33.85	3421.33	87.81	2882.45	30.09	1934.82	57.61
Transmission Constraints / Evacuation Problem	0	0	0.16	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Miscellaneous Causes	**11859.76**	**34.96**	**49090.19**	**64**	**7735.4**	**44.92**	**4700.32**	**39.08**	**14407.64**	**54.57**	**3496.68**	**89.74**	**4885.08**	**50.99**	**2527.62**	**75.26**
LOW SYSTEM DEMAND																
Low System Demand	15059.04	44.39	12459.83	16.76	5993.57	40.24	5854.57	48.67	6065.66	23.8	253.11	6.5	1421.9	14.84	397.52	11.84
Total Low System Demand	**15059.0**	**44.39**	**12459.83**	**16.76**	**5993.57**	**40.24**	**5854.57**	**48.67**	**6065.66**	**23.8**	**255.61**	**6.5**	**1421.9**	**14.8**	**397.52**	**11.84**
Grand Total	**33959.9**	**100**	**76074.2**	**100**	**15939.5**	**100**	**12056.0**	**100**	**25982.5**	**100**	**3898.8**	**100**	**9594.8**	**100**	**3357.8**	**100**

Annexure - 7.3

NON UTILIZATION OF ENERGY DUE TO SYSTEM LOAD VARIATIONS IN DIFFERENT REGIONS DURING 2015-16 AND 2016-17

Region	Energy not utilized due to											
	Reserve Shut Down of units				Backing down of the units				Total			
	MU		% of Maximum possible generation		MU		% of Maximum possible generation		MU		% of Maximum possible generation	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Northern	43761.87	47931.098	3.06	3.04	9455.72	14018.19	0.66	4.06	53217.59	74016.05	3.72	3.93
Western	52646.13	58541.262	3.68	3.72	19486.69	18638.47	1.37	2.88	72132.82	93691.37	5.06	4.90
Southern	4174.08	15684.73	0.29	1.00	5044.29	7251.35	0.35	2.45	9218.37	22936.12	0.65	1.46
Eastern	12831.95	11818.08	0.9	0.75	9522.77	9522.77	0.67	2.67	22354.72	19417.72	1.57	1.35
North-Easterr	0	0	0	-	0.00	0.00	0.00	0	0	0.00	0	-
All India	**113413.88**	**133975.17**	**7.95**	**8.51**	**43509.47**	**47507.70**	**3.05**	**3.02**	**156923.5**	**210061.26**	**11.0**	**11.64**

SECTION-8
PATTERN OF OUTAGES AND OPERATION RELIABILITY

8.1 Outages of thermal units affect their operational reliability. Due to rapid addition of generation capacity over the years, the additional/reserve generation capability available has significantly increased. Thus outages of units do not significantly affect the overall generation availability and reliability in the country. However, the outages trends are indicative of the operational reliability of generating units and have been discussed in this chapter. It should also be kept in view that all unit outages are not attributable to the unit constraints and outages also occur on account of system constraints like coal shortages, transmission constraints, RSD etc. Thus the outage trends discussed in the chapter are indicative of the overall operation reliability of the units including the system constraints.

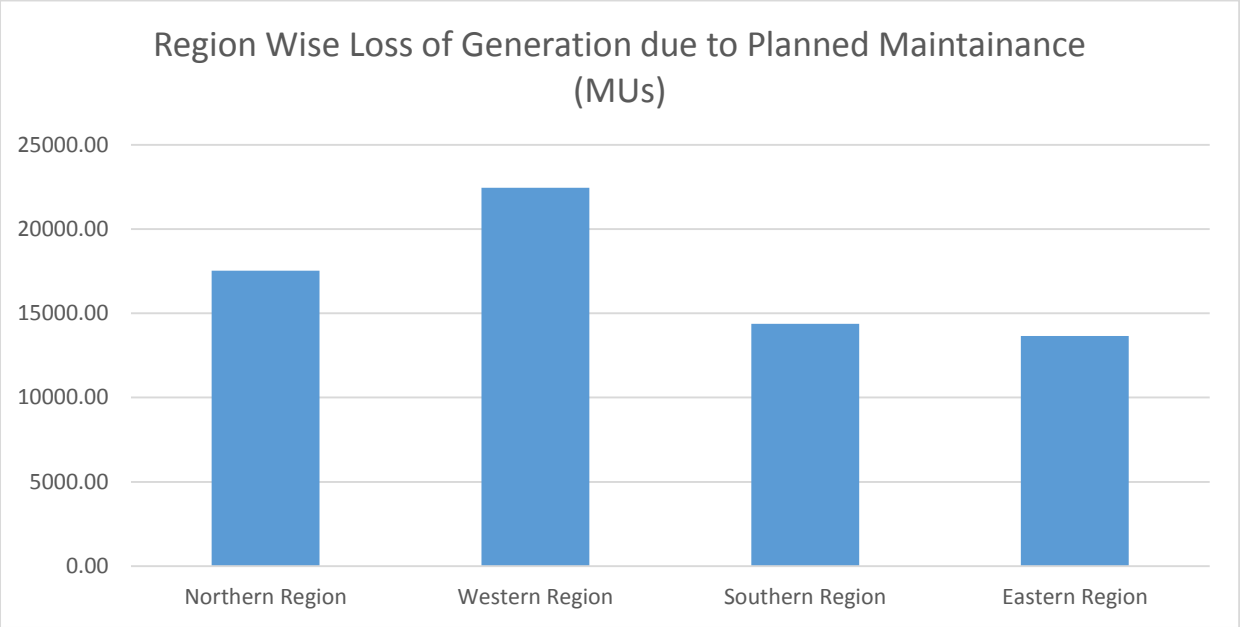
8.2 EFFECT OF PLANNED MAINTENANCE ON OPERATION RELIABILTY

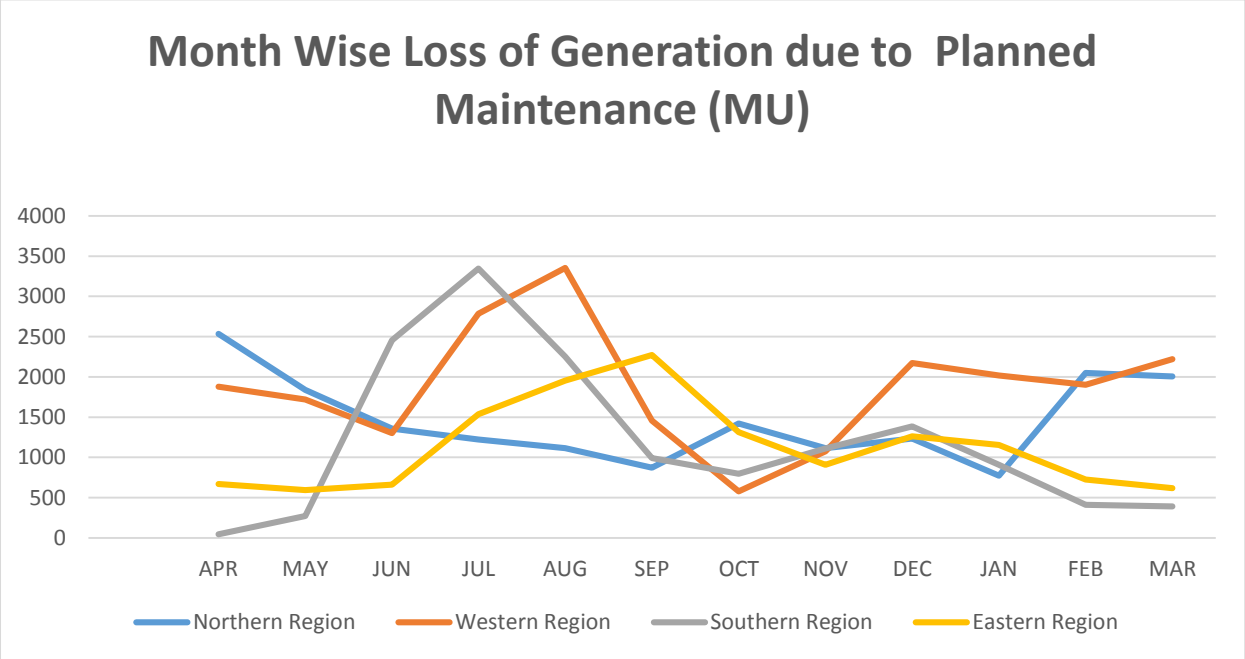
Each power system of the country formulated generation program for 2016-17 to meet its system requirements. All the power systems program to carry out the Planned Maintenance of their thermal units in a phased manner keeping in view the operational requirements. Region-wise month-wise details of loss of generation due to Planned Maintenance (actual) of thermal units during 2016-17 are shown below:

Region and Month Wise Loss of generation (MU) due to Planned Maintenance					
Month	**Northern Region**	**Western Region**	**Southern Region**	**Eastern Region**	**Total All India**
APR	2532.50	1878.48	46.80	671.46	5129.24
MAY	1836.58	1720.32	273.12	593.11	4423.13
JUN	1355.76	1303.08	2455.68	661.15	5775.67
JUL	1222.18	2784.63	3344.16	1535.76	8886.73
AUG	1115.62	3353.16	2251.92	1953.04	8673.74
SEP	872.16	1458.60	992.88	2272.63	5596.27
OCT	1421.02	577.44	796.56	1311.62	4106.63
NOV	1113.60	1075.66	1111.14	906.58	4206.98
DEC	1235.86	2170.30	1386.00	1262.48	6054.63
JAN	771.10	2017.80	908.64	1155.03	4852.56
FEB	2048.18	1902.48	412.56	724.43	5087.66
MAR	2005.30	2218.80	392.88	619.07	5236.04
Total	**17529.84**	**22460.74**	**14372.34**	**13666.37**	**68029.29**

Note: North-Eastern Region has not been considered as all the thermal units at Chandrapura (Assam) were under forced outage throughout the year.

During July, 2016 the total loss of generation (8886.73 MU) due to planned maintenance of thermal units was highest.

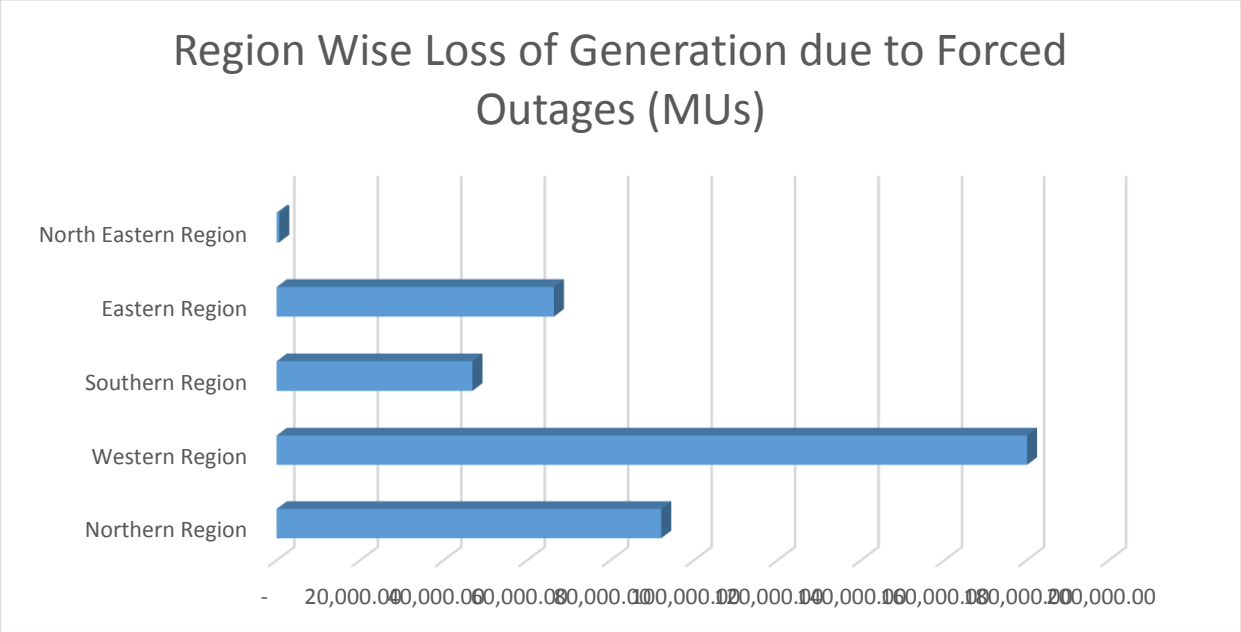


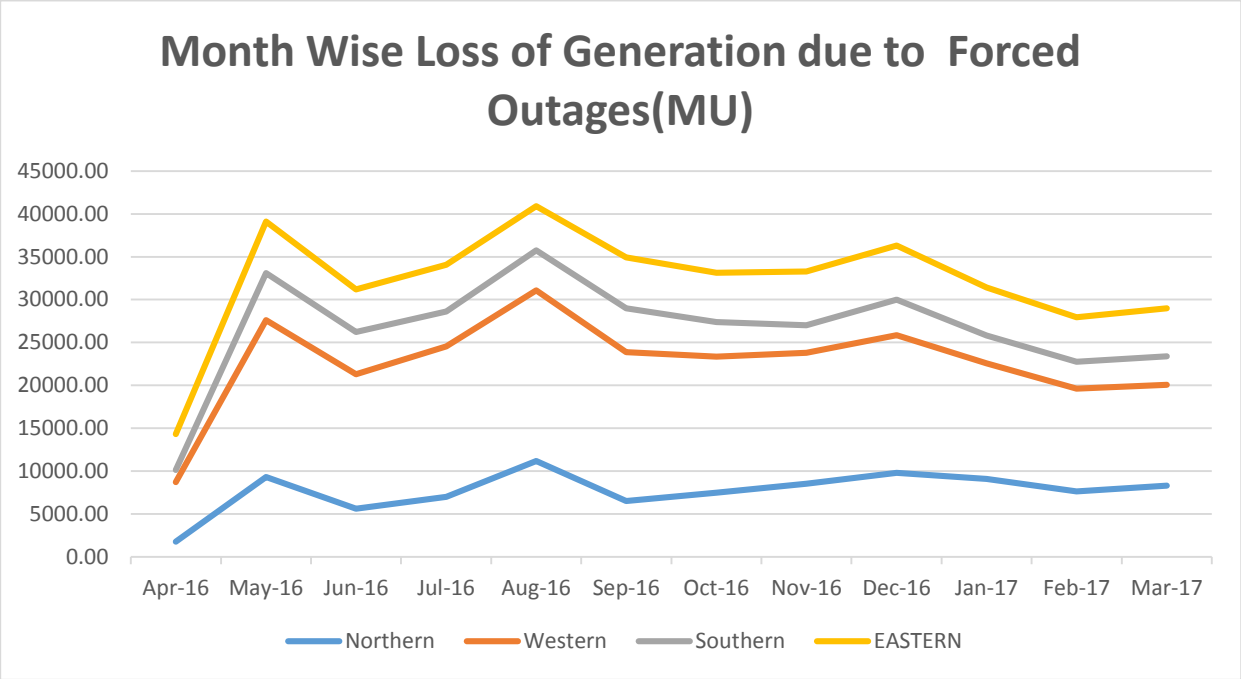


8.3 EFFECT OF FORCED OUTAGE ON GENERATION RELIABILTY

Loss of generation due to forced outages was maximum during the month of Aug'16(40937.05MU) and it was minimum during Apr'16 (14359.75 MU). Western Region experienced maximum forced outage losses. The Region wise and month wise generation loss due to Forced outages is given below:

Region-wise and month-wise generation Loss (in MUs) due to Forced Outage						
MONTH	**NORTHERN**	**WESTERN**	**SOUTHERN**	**EASTERN**	**NORTH EASTERN**	**ALL INDIA**
APR	1763.91	6932.13	1444.07	4172.23	47.40	14359.75
MAY	9306.82	18287.88	5504.03	6023.46	139.74	39261.93
JUN	5609.59	15666.34	4930.66	4985.83	10.24	31202.65
JUL	6999.14	17525.86	4078.92	5461.79	0.00	34065.71
AUG	11178.44	19891.45	4690.18	5140.30	36.68	40937.05
SEP	6495.18	17370.74	5113.32	5933.40	0.00	34912.64
OCT	7473.71	15862.97	4052.57	5759.72	9.47	33158.44
NOV	8523.53	15274.60	3198.90	6269.92	75.11	33342.08
DEC	9789.47	16060.25	4151.17	6311.84	6.76	36319.50
JAN	9081.46	13467.85	3267.57	5598.95	257.34	31673.17
FEB	7617.54	11982.37	3157.78	5179.22	26.65	27963.57
MAR	8310.30	11765.57	3309.62	5600.22	0.00	28985.70
Total	92149.10	180088.00	46898.80	66436.90	609.40	386182.20





8.4 MEAN TIME BETWEEN FAILURE

The degree of reliability of thermal generation is directly proportionate to the Mean Time between Failures (MTBF) of the units. All India / Region wise and Capacity Group-wise details of Mean Time between Failures (MTBF) of thermal units for 2016-17 are given in **Annexure 8.1.**

8.5 CONTINUOUS UNINTERRUPTED OPERATION OF COAL/ LIGNITE BASED UNITS:

Measurement of maximum continuous uninterrupted operation between two consecutive shutdowns and/or failures of a thermal unit also provides the degree of reliability of that unit. It was observed that till the end of 31st March 2017:

- Twenty-one coal/lignite based thermal generating units continuously operated for more than 250 days. MUNDRA TPS Unit-4 (330 MW), UNCHAHAR TPS unit-1(210 MW), SIPAT STPS unit-4 (500 MW) & SIMHADRI unit-4 (500 MW) had operated continuously for more than 350 days.
- Forty-three coal/lignite based thermal generating units (NTPC-17, TATA PCL-4, JSWEL-4, NSPCL-2, APL-4, CESC-3, DVC-2, WBPDC-2, and one each of DIPL, NLC, GSECL, RIL and SEIL, operated continuously for more than 200 days.

DETAILS OF UNITS OPERATED FOR MORE THAN 200 DAYS IN THE YEAR 2016-17

S. NO.	STATION NAME	UNIT NO	CAPACITY	ORGANIZATION NAME	FROM DATE	TO DATE	DAYS
1	MUNDRA TPS	4	330	APL	09-Jul-2015	CONTINUE TO OPERATE	631
2	UNCHAHAR TPS	1	210	NTPC Ltd.	17-Nov-2015	CONTINUE TO OPERATE	499
3	SIPAT STPS	4	500	NTPC Ltd.	30-Jun-2015	06-AUG-16	403
4	SIMHADRI	4	500	NTPC Ltd.	27-Dec-2015	20-DEC-16	359
5	JOJOBERA TPS	2	120	TATA PCL	01-Jun-2015	11-MAY-16	345
6	UNCHAHAR TPS	3	210	NTPC Ltd.	14-May-2016	CONTINUE TO OPERATE	320
7	JOJOBERA TPS	2	120	TATA PCL	14-May-2016	11-MAR-17	301
8	BHILAI TPS	1	250	NSPCL	06-Jun-2016	CONTINUE TO OPERATE	298
19	KAHALGAON TPS	1	210	NTPC Ltd.	26-Jul-2015	13-MAY-16	292
10	TORANGALLU TPS(SBU-I)	2	130	JSWEL	17-Sep-2015	27-JUN-16	285
11	RAMAGUNDEM STPS	4	500	NTPC Ltd.	21-Nov-2015	31-AUG-16	283
12	UNCHAHAR TPS	5	210	NTPC Ltd.	27-Apr-2016	28-JAN-17	276
13	TITAGARH TPS	3	60	CESC	13-Jul-2015	12-APR-16	275
14	MUNDRA TPS	7	660	APL	30-Jun-2016	CONTINUE TO OPERATE	274
15	JSW RATNAGIRI TPP	1	300	JSWEL	28-Jul-2015	22-APR-16	269
16	DHARIWAL TPP	2	300	DIPL	15-Mar-2016	05-DEC-16	265
17	TITAGARH TPS	1	60	CESC	11-Jul-2015	01-APR-16	265
18	BHILAI TPS	2	250	NSPCL	23-Sep-2015	12-JUN-16	263
19	TORANGALLU TPS(SBU-II)	4	300	JSWEL	07-Aug-2015	26-APR-16	263
20	MEJIA TPS	6	250	DVC	18-Oct-2015	30-JUN-16	256
21	BAKRESWAR TPS	1	210	WBPDC	21-Jul-2016	CONTINUE TO OPERATE	252
22	NEYVELI TPS-II	1	210	NLC	01-Feb-2016	05-OCT-16	246
23	TROMBAY TPS	8	250	TATA PCL	24-Mar-2016	24-NOV-16	245
24	BHILAI TPS	2	250	NSPCL	26-Jul-2016	21-MAR-17	238
25	FARAKKA STPS	1	200	NTPC Ltd.	23-Apr-2016	16-DEC-16	237
26	KAHALGAON TPS	7	500	NTPC Ltd.	14-May-2016	03-JAN-17	234
27	SIMHADRI	1	500	NTPC Ltd.	19-Dec-2015	08-AUG-16	233
28	RAMAGUNDEM STPS	3	200	NTPC Ltd.	21-Oct-2015	09-JUN-16	232
29	RIHAND STPS	3	500	NTPC Ltd.	16-Oct-2015	02-JUN-16	230
30	SIPAT STPS	5	500	NTPC Ltd.	18-Sep-2015	02-MAY-16	227
31	VINDHYACHAL STPS	9	500	NTPC Ltd.	20-Dec-2015	03-AUG-16	226
32	TIRORA TPS	5	660	APL	19-Aug-2016	CONTINUE TO OPERATE	223
33	CHANDRAPURA(DVC) TPS	2	130	DVC	07-Jan-2016	18-AUG-16	223
34	MUNDRA TPS	3	330	APL	31-Dec-2015	05-AUG-16	219
35	TORANGALLU TPS(SBU-I)	1	130	JSWEL	26-Oct-2015	31-MAY-16	218
36	SANTALDIH TPS	5	250	WBPDC	12-Oct-2015	18-MAY-16	218
37	TROMBAY TPS	5	500	TATA PCL	06-Feb-2016	09-SEP-16	216
38	VINDHYACHAL STPS	10	500	NTPC Ltd.	15-Nov-2015	18-JUN-16	215
39	PAINAMPURAM TPP	1	660	SEIL	27-Mar-2016	28-OCT-16	214
40	SOUTHERN REPL. TPS	2	67.5	CESC	14-Sep-2015	11-APR-16	211
41	KORBA STPS	4	500	NTPC Ltd.	03-Aug-2016	28-FEB-17	209
42	SIMHADRI	3	500	NTPC Ltd.	28-Sep-2015	22-APR-16	207
43	GANDHI NAGAR TPS	5	210	GSECL	11-Dec-2015	03-JUL-16	205
44	JOJOBERA TPS	3	120	TATA PCL	10-May-2016	01-DEC-16	205
45	RAMAGUNDEM STPS	3	200	NTPC Ltd.	12-Jun-2016	02-JAN-17	204
46	DAHANU TPS	2	250	RIL (DAHANU)	09-Sep-2016	CONTINUE TO OPERATE	203

Annexure- 8.1

STATEMENT OF MEANTIME BETWEEN FAILURES OF THERMAL UNITS **OUTAGES** DURING **2016-17**

ALL INDIA

Number of Units : 649 **Capacity(in MW):189946.5**

RANGE	660-800	490-600	300-360	250-270	210-210	195-200	100-150	25-99	TOTAL
Above 270 Days	0	0	1	0	1	0	1	0	**3**
>180 and Up to 270 Days	1	0	0	1	1	0	0	0	**3**
>120 and Up to 180 Days	1	2	0	2	1	0	2	0	**8**
>90 and Up to 120 Days	3	7	1	1	2	2	2	1	**19**
>80 and Up to 90 Days	1	7	2	1	1	0	0	0	**12**
>70 and Up to 80 Days	2	3	2	2	1	1	0	2	**13**
>60 and Up to 70 Days	1	7	4	1	5	0	2	1	**21**
>50 and Up to 60 Days	3	4	3	1	1	5	4	2	**23**
>40 and Up to 50 Days	8	14	6	2	14	3	6	2	**55**
>30 and Up to 40 Days	9	20	5	6	16	1	7	8	**72**
>25 and Up to 30 Days	3	2	2	4	8	0	10	2	**31**
>20 and Up to 25 Days	1	9	4	9	17	2	3	5	**50**
>15 and Up to 20 Days	2	18	1	5	21	3	13	4	**67**
>10 and Up to 15 Days	7	14	3	14	20	4	5	8	**75**
>5 and Up to 10 Days	10	15	3	14	27	2	8	15	**94**
>3 and Up to 5 Days	0	6	0	0	1	1	6	2	**16**
>1 and Up to 3 Days	1	3	0	3	0	1	5	2	**15**
Up to 1 Day	2	1	2	5	6	1	24	31	**72**
Total	**55**	**132**	**39**	**71**	**143**	**26**	**98**	**85**	**649**

Northern Region

Number of Units : 151 **Capacity(in MW):41143**

RANGE	660-800	490-600	300-360	250-270	210-210	195-200	100-150	25-99	TOTAL
Above 270 Days	0	0	0	0	1	0	0	0	**1**

>180 and Up to 270 Days	0	0	0	0	0	0	0	0	**0**
>120 and Up to 180 Days	0	1	0	0	1	0	0	0	**2**
>90 and Up to 120 Days	0	1	0	0	1	1	0	0	**3**
>80 and Up to 90 Days	1	1	0	0	0	0	0	0	**2**
>70 and Up to 80 Days	0	0	0	0	1	0	0	0	**1**
>60 and Up to 70 Days	0	2	0	0	1	0	0	0	**3**
>50 and Up to 60 Days	0	0	0	0	0	3	3	0	**6**
>40 and Up to 50 Days	2	1	2	0	1	0	3	0	**9**
>30 and Up to 40 Days	0	8	0	0	1	1	3	0	**13**
>25 and Up to 30 Days	1	0	1	0	1	0	5	0	**8**
>20 and Up to 25 Days	0	2	3	4	3	0	1	0	**13**
>15 and Up to 20 Days	0	2	0	2	5	3	1	0	**13**
>10 and Up to 15 Days	1	3	0	4	4	2	2	1	**17**
>5 and Up to 10 Days	7	0	0	8	9	1	2	11	**38**
>3 and Up to 5 Days	1	2	0	0	0	1	3	2	**9**
>1 and Up to 3 Days	0	0	0	2	0	0	3	2	**7**
Up to 1 Day	1	0	0	0	0	0	1	4	**6**
Total	**14**	**23**	**6**	**20**	**29**	**12**	**27**	**20**	**151**

Western Region

***Number of Units : 238** ***Capacity(in MW):77871**

RANGE	660-800	490-600	300-360	250-270	210-210	195-200	100-150	25-99	TOTAL
Above 270 Days	0	0	1	0	0	0	0	0	**1**
>180 and up to 270 Days	1	0	0	1	0	0	0	0	**2**
>120 and up to 180 Days	1	1	0	2	0	0	0	0	**4**
>90 and up to 120 Days	3	3	1	1	0	0	1	0	**9**
>80 and up to 90 Days	0	2	1	1	0	0	0	0	**4**
>70 and up to 80 Days	2	1	1	0	0	1	0	0	**5**
>60 and up to 70 Days	1	2	3	0	1	0	0	0	**7**
>50 and up to 60 Days	2	0	3	0	1	1	0	0	**7**
>40 and up to 50 Days	5	4	4	0	6	0	1	0	**20**
>30 and up to 40 Days	7	6	1	2	3	0	3	0	**22**
>25 and up to 30 Days	1	2	0	4	1	0	2	0	**10**
>20 and up to 25 Days	2	2	1	2	3	1	1	0	**12**
>15 and up to 20 Days	1	9	0	1	7	0	7	2	**27**
>10 and up to 15 Days	3	5	3	9	6	2	1	3	**32**
>5 and up to 10 Days	1	4	2	3	12	1	3	4	**30**
>3 and up to 5 Days	1	3	0	0	1	0	1	4	**10**
>1 and up to 3 Days	0	2	0	1	0	0	1	0	**4**
up to 1 Day	1	1	1	4	6	1	8	10	**32**
Total	**32**	**47**	**22**	**31**	**47**	**7**	**29**	**23**	**238**

Southern Region

Number of Units : 122 **Capacity(in MW):36462.5**

RANGE	660-800	490-600	300-360	250-270	210-210	195-200	100-150	25-99	TOTAL
Above 270 Days	0	0	0	0	0	0	0	0	**0**
>180 and Up to 270 Days	0	0	0	0	0	0	0	0	**0**
>120 and Up to 180 Days	0	0	0	0	0	0	2	0	**2**
>90 and Up to 120 Days	0	3	0	0	0	1	0	0	**4**
>80 and Up to 90 Days	0	3	1	0	0	0	0	0	**4**
>70 and Up to 80 Days	0	1	1	0	0	0	0	1	**3**
>60 and Up to 70 Days	0	2	0	0	1	0	2	0	**5**
>50 and Up to 60 Days	0	1	0	0	0	1	0	1	**3**
>40 and Up to 50 Days	1	4	0	1	6	1	1	2	**16**
>30 and Up to 40 Days	2	1	0	0	7	0	1	1	**12**
>25 and Up to 30 Days	0	0	0	0	5	0	1	2	**8**
>20 and Up to 25 Days	1	3	0	1	8	0	1	3	**17**
>15 and Up to 20 Days	1	5	0	0	5	0	5	1	**17**
>10 and Up to 15 Days	0	4	0	1	7	0	2	0	**14**
>5 and Up to 10 Days	1	5	0	3	0	0	0	0	**9**
>3 and Up to 5 Days	0	0	0	0	0	0	1	0	**1**
>1 and Up to 3 Days	1	0	0	0	0	0	1	0	**2**

Up to 1 Day	0	0	0	0	0	0	3	2	**5**
Total	**7**	**32**	**2**	**6**	**39**	**3**	**20**	**13**	**122**

Eastern Region

Number of Units : 135 **Capacity(in MW):34160**

RANGE	660-800	490-600	300-360	250-270	210-210	195-200	100-150	25-99	TOTAL
Above 270 Days	2	0	0	0	0	0	1	0	**3**
>180 and up to 270 Days	0	0	0	0	1	0	0	0	**1**
>120 and up to 180 Days	0	0	0	0	0	0	0	0	**0**
>90 and up to 120 Days	0	0	0	0	1	0	1	1	**3**
>80 and up to 90 Days	0	1	0	0	1	0	0	0	**2**
>70 and up to 80 Days	0	1	0	2	0	0	0	1	**4**
>60 and up to 70 Days	0	1	1	1	2	0	0	1	**6**
>50 and up to 60 Days	0	3	0	1	0	0	1	1	**6**
>40 and up to 50 Days	0	5	0	1	1	2	1	0	**10**
>30 and up to 40 Days	0	5	4	4	5	0	0	7	**25**
>25 and up to 30 Days	0	0	1	0	1	0	2	0	**4**
>20 and up to 25 Days	0	2	0	2	3	1	0	0	**8**
>15 and up to 20 Days	0	2	1	1	4	0	0	0	**8**
>10 and up to 15 Days	0	2	0	0	3	0	0	3	**8**
>5 and up to 10 Days	0	4	1	0	6	0	3	2	**16**
>3 and up to 5 Days	0	1	0	0	0	0	0	0	**1**
>1 and up to 3 Days	0	1	0	0	0	1	1	0	**3**
up to 1 Day	0	2	1	1	0	0	12	11	**27**
Total	**2**	**30**	**9**	**13**	**28**	**4**	**22**	**27**	**135**

North East Region

Number of Units : 3 **Capacity(in MW):310**

RANGE	660-800	490-600	300-360	250-270	210-210	195-200	100-150	25-99	TOTAL
Above 270 Days	0	0	0	0	0	0	0	0	**0**
>180 and Up to 270 Days	0	0	0	0	0	0	0	0	**0**
>120 and Up to 180 Days	0	0	0	0	0	0	0	0	**0**
>90 and Up to 120 Days	0	0	0	0	0	0	0	0	**0**
>80 and Up to 90 Days	0	0	0	0	0	0	0	0	**0**
>70 and Up to 80 Days	0	0	0	0	0	0	0	0	**0**
>60 and Up to 70 Days	0	0	0	0	0	0	0	0	**0**
>50 and Up to 60 Days	0	0	0	0	0	0	0	0	**0**
>40 and Up to 50 Days	0	0	0	0	0	0	0	0	**0**
>30 and Up to 40 Days	0	0	0	0	0	0	0	0	**0**
>25 and Up to 30 Days	0	0	0	0	0	0	0	0	**0**
>20 and Up to 25 Days	0	0	0	0	0	0	0	0	**0**
>15 and Up to 20 Days	0	0	0	1	0	0	0	0	**1**
>10 and Up to 15 Days	0	0	0	0	0	0	0	0	**0**
>5 and Up to 10 Days	0	0	0	0	0	0	0	0	**0**
>3 and Up to 5 Days	0	0	0	0	0	0	0	0	**0**
>1 and Up to 3 Days	0	0	0	0	0	0	0	0	**0**
Up to 1 Day	0	0	0	0	0	0	0	2	**2**
Total	0	0	0	**1**	0	0	0	**2**	**3**

SECTION-9
FUEL SUPPLY TO POWER STATIONS DURING 2016-17

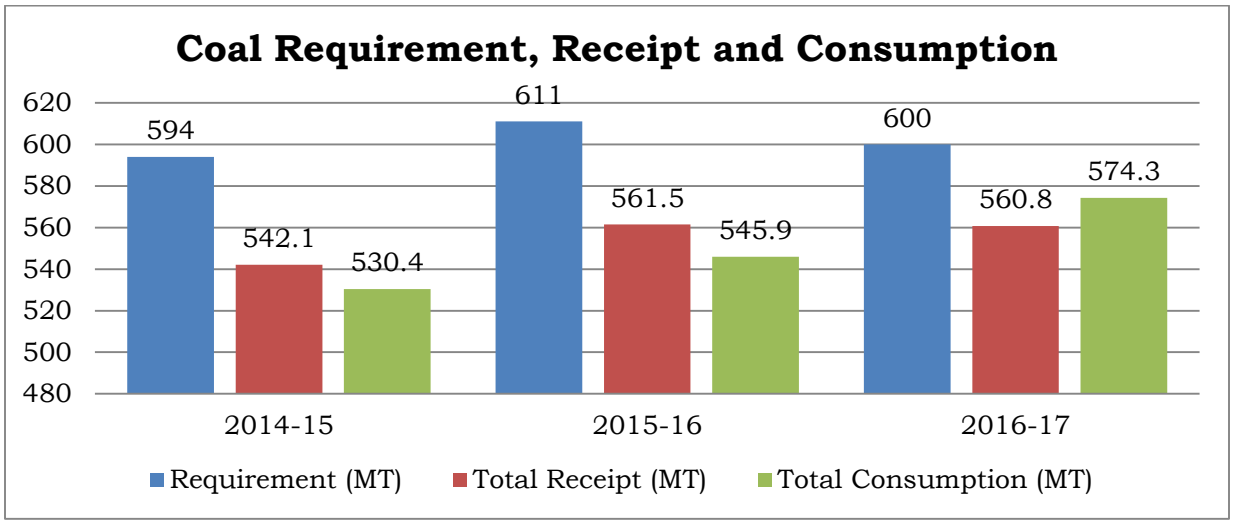
During the year 2016-17, coal supply to **145** number of coal based thermal power plants, having a total capacity of about **171628** MW was monitored in CEA. The total coal consumption in these stations was around **574 Million Tonnes**. Also, the gas supply of **62** gas based power plants having capacity of **24037 MW** was monitored during the year 2016-17. The total gas consumed by these gas based power plants was about **30.32 MMSCMD** (Million Metric Standard Cubic Meter per Day).

9.1 COMPARATIVE COAL SUPPLY POSITION DURING THE YEAR 2014-15, 2015-16 & 2016-17

A Summary of coal receipt and consumption at various coal based power stations monitored by CEA during the last 3 years is as under:

(Figs. in Million Tonnes)

STATUS	YEAR		
	2014-15	2015-16	2016-17
Demand/Requirement	594	611	600
Receipt (Indigenous coal)	450.9	480.9	494.7
Receipt (Imported coal)	91.2	80.6	66.1
Total Receipt (including Imported Coal)	542.1	561.5	560.8
Consumption (Including Imported coal)	530.4	545.9	574.3



The plant wise coal consumption during 2016-17 is given at Annexure 9.1.

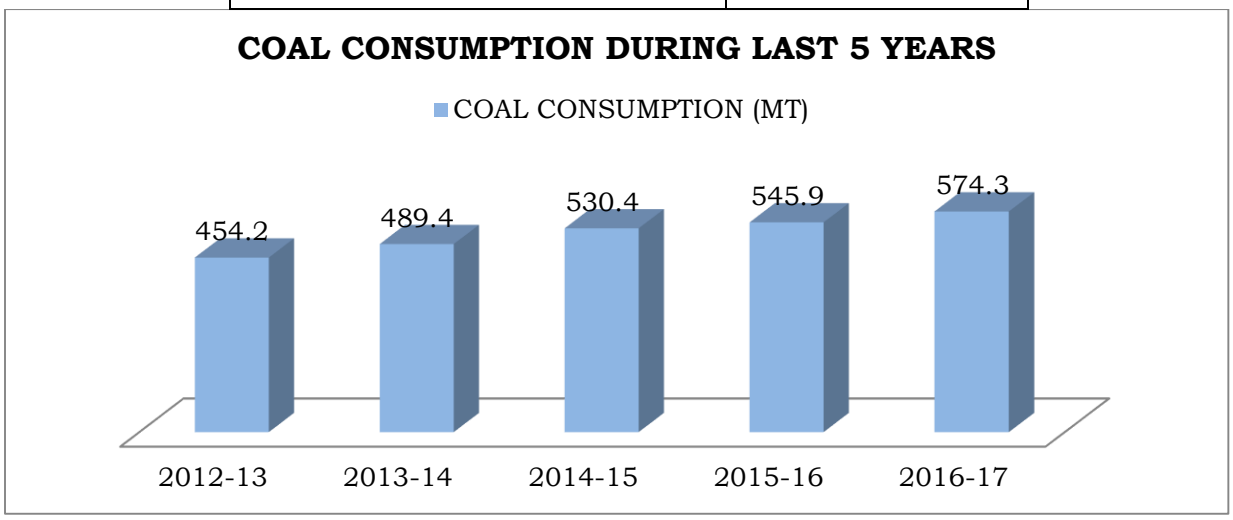
9.2 COAL CONSUMPTION TREND

All India coal consumption in coal based thermal power stations monitored by CEA during 2016-17 was **574.3** Million Tonnes as against 545.9 Million Tonnes during 2015-16.

Coal consumption from 2012-13 to 2016-17 is as under:

YEAR	CONSUMPTION* (Million Tonnes)
2012-13	454.2
2013-14	489.4
2014-15	530.4
2015-16	545.9
2016-17	574.3

(*Total consumption of the stations monitored by CEA)

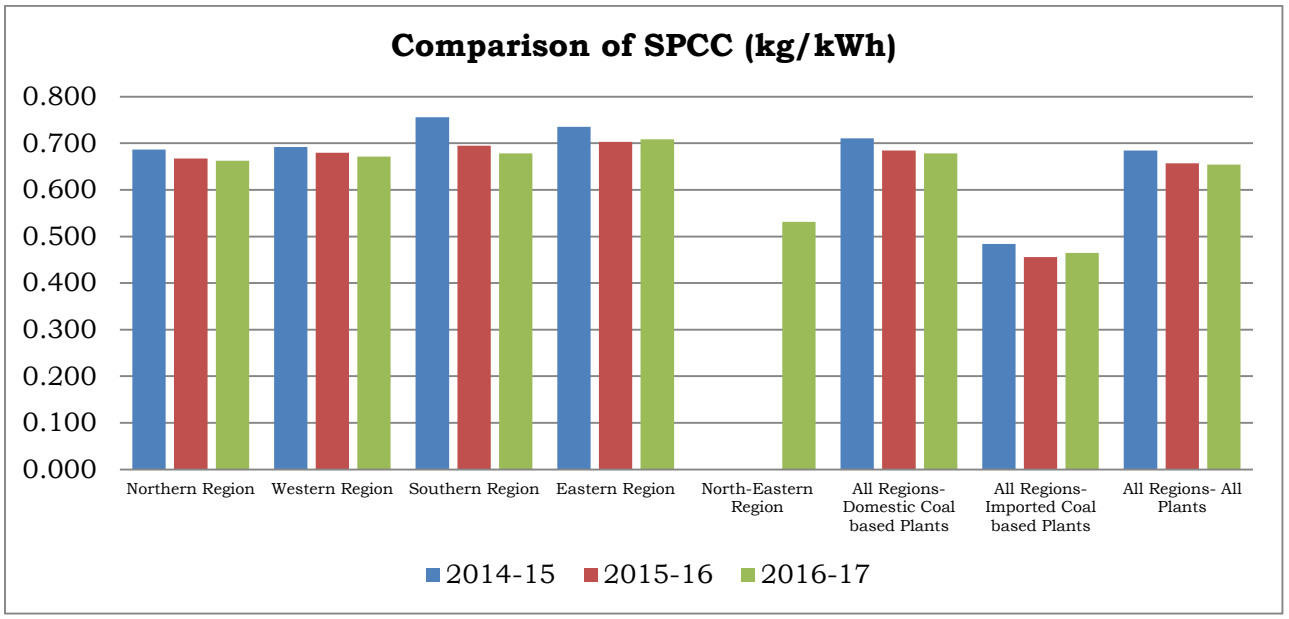


9.3 SPECIFIC COAL CONSUMPTION (kg/kWh)

Specific coal consumption (SPCC) of power plants monitored by CEA during the year 2016-17 was 0.654 kg/kWh as compared to 0.657 kg/kWh during the year 2015-16. The region-wise details of SPCC for last three years is given as under:

Specific Coal Consumption (kg/kWh)

REGION	2014-15	2015-16	2016-17
Northern Region	0.686	0.667	0.663
Western Region	0.692	0.680	0.671
Southern Region	0.756	0.695	0.678
Eastern Region	0.735	0.703	0.708
North-Eastern Region	-	-	0.531
All Regions-Domestic Coal based Plants	0.710	0.684	0.678
All Regions-Imported Coal based Plants	0.484	0.456	0.465
All Regions- All Plants	**0.684**	**0.657**	**0.654**



Plant-wise SPCC during last three years is given in Annexure-9.2.

9.4 COAL QUALITY ISSUES

In order to address quality concern of the coal supplied to power plants, it has been decided that coal samples shall be collected and prepared by a Single Third Party Agency appointed by power utilities and coal companies. The power utilities and coal companies shall make necessary funding arrangement for third party sampling on equal sharing basis.

9.5 GAS SUPPLY TO GAS BASED POWER STATIONS

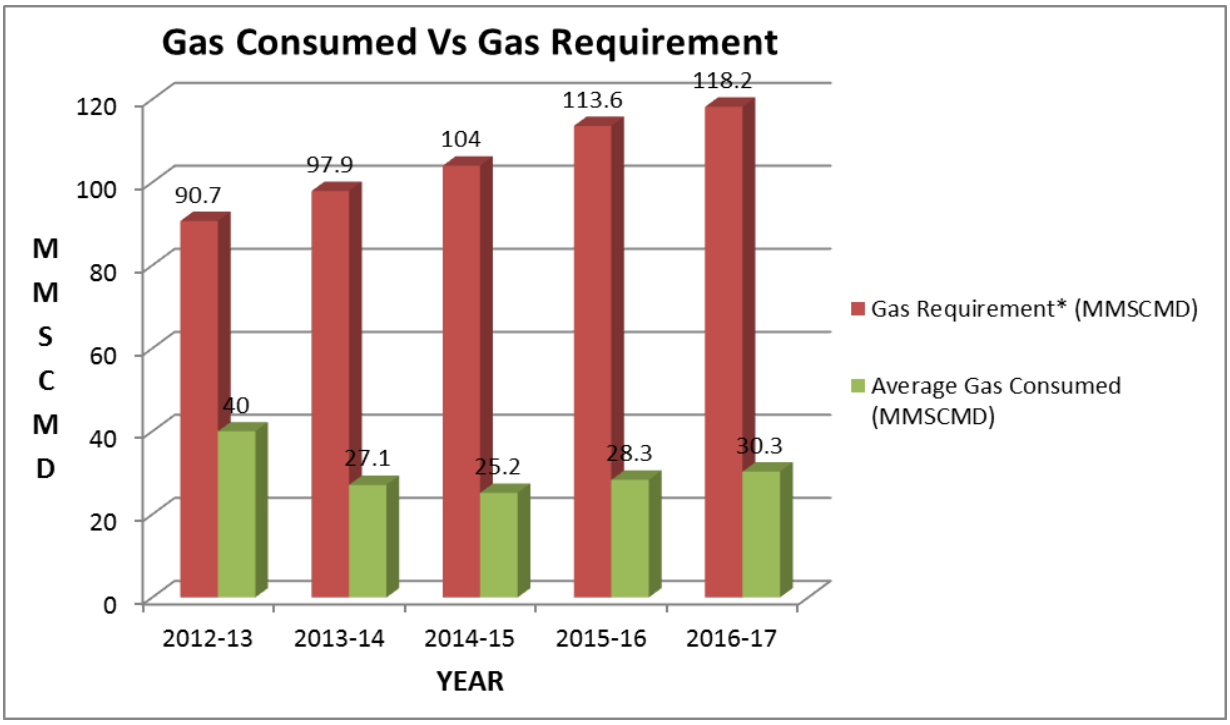
CEA monitored the supply of gas to 62 gas based power stations totalling to a capacity of 24037.2 MW (excluding liquid fuel based power plants). The details of gas consumed by the gas based power plants for the last five year is as under:

Gas Requirement and Supply Position

Years	Capacity (MW)	Gas Requirement* (MMSCMD)	Average Gas Consumed (MMSCMD)
2012-13	18,362.3	90.7	40.0
2013-14	20385.3	97.9	27.1
2014-15	21665.6	104.0	25.2
2015-16	23075.6	113.6	28.3
2016-17	24037.2	118.2	30.3

MMSCMD – Million Standard Cubic Metres per Day.

*Gas requirement at 90% PLF.



The plant-wise detail of gas supplied/consumed for the year 2016-17 is at Annexure 9.3

Annexure 9.1

Plant wise Coal Consumption during 2016-17

Sl.No.	Name of TPS	Capacity (MW) as on 31.03.2017	Total Consumption (Thousand Tonnes)
I	**TPS Designed on Indigenous Coal**		
	NORTHERN REGION		
DELHI			
1	BADARPUR TPS	705	1224
2	RAJGHAT TPS	135	0
	Sub Total	**840.0**	**1224.0**
HARYANA			
3	PANIPAT TPS	920	1444
4	YAMUNA NAGAR TPS	600	2296
5	RAJIV GANDHI TPS	1200	2654
6	INDIRA GANDHI STPP	1500	4138
7	MAHATMA GANDHI TPS	1320	1840
	Sub Total	**5540.0**	**12372.0**
PUNJAB			
8	GND TPS(BHATINDA)	440	443
9	GH TPS (LEH.MOH.)	920	1823
10	ROPAR TPS	1260	1897
11	RAJPURA TPP	1400	4881
12	TALWANDI SABO TPP	1980	5010
	Sub Total	**6000.0**	**14054.0**
RAJASTHAN			
13	KOTA TPS	1240	4449
14	SURATGARH TPS	1500	3139
15	CHHABRA TPP	1000	4179
16	KAWAI TPS	1320	4072
17	KALISINDH TPS	1200	3365
	Sub Total	**6260.0**	**19204.0**
UTTAR PRADESH			
18	ANPARA TPS	2630	10980
19	HARDUAGANJ TPS	665	2530
20	OBRA TPS	1278	3255
21	PANKI TPS	210	736
22	PARICHHA TPS	1140	4537
23	TANDA TPS	440	2284
24	UNCHAHAR TPS	1550	4780
25	RIHAND STPS	3000	14356
26	SINGRAULI STPS	2000	10459
27	DADRI (NCTPP)	1820	5508
28	ROSA TPP Ph-I	1200	5080
29	ANPARA C TPS	1200	5618
30	BARKHERA TPS	90	329
31	MAQSOODPUR TPS	90	353
32	KHAMBARKHERA TPS	90	313
33	KUNDARKI TPS	90	393
34	UTRAULA TPS	90	361

Annexure 9.1

Plant wise Coal Consumption during 2016-17

Sl.No.	Name of TPS	Capacity (MW) as on 31.03.2017	Total Consumption (Thousand Tonnes)
35	PRAYAGRAJ TPP	1320	2178
36	LALITPUR TPS	1980	2587
	Sub Total	**20883.0**	**76637.0**
	TOTAL N. R.	**39523.0**	**123491.0**
WESTERN REGION			
	CHHATTISGARH		
51	DSPM TPS	500	2701
52	KORBA-II	440	2224
53	KORBA-WEST TPS	1340	7092
54	KORBA STPS	2600	13334
55	PATHADI TPP	600	2955
56	BHILAI TPS	500	2478
57	SIPAT STPS	2980	14367
58	AKALTARA TPS	1200	3757
59	OP JINDAL TPS	1000	3505
60	TAMNAR TPP	2400	4780
61	BARADARHA TPS	1200	3683
62	BALCO TPS	600	801
63	MARWA TPS	1000	1941
64	AVANTHA BHANDAR	600	945
65	BANDAKHAR TPP	300	538
66	NAWAPARA TPP	300	331
	Sub Total	**17560.0**	**65432.0**
	GUJARAT		
37	SABARMATI (C STATION)	422	1588
38	GANDHI NAGAR TPS	630	1374
39	SIKKA REP. TPS	740	1115
40	UKAI TPS	1350	3499
41	WANAKBORI TPS	1470	2624
	Sub Total	**4612.0**	**10200.0**
	MADHYAPRADESH		
42	AMARKANTAK EXT TPS	210	884
43	SANJAY GANDHI TPS	1340	4948
44	SATPURA TPS	1330	2688
45	VINDHYACHAL STPS	4760	21801
46	BINA TPS	500	528
47	SASAN UMTPP	3960	16949
48	SHRI SINGHAJI TPP	1200	1603
49	ANUPPUR TPP	1200	2286
50	NIGRI TPP	1320	2817
	Sub Total	**15820.0**	**54504.0**
	MAHARASHTRA		
67	BHUSAWAL TPS	1420	4350
68	CHANDRAPUR(MAHARASHTRA) STPS	2920	11562
69	KORADI TPS	2600	3882

Annexure 9.1

Plant wise Coal Consumption during 2016-17

Sl.No.	Name of TPS	Capacity (MW) as on 31.03.2017	Total Consumption (Thousand Tonnes)
70	KHAPARKHEDA TPS	1340	5958
71	NASIK TPS	630	2506
72	PARLI TPS	1170	1060
73	PARAS TPS	500	2108
74	DAHANU TPS	500	2153
75	WARDHA WARORA TPP	540	944
76	TIRORA TPS	3300	11058
77	AMARAVATI TPS	1350	1120
78	GMR WARORA TPS	600	2264
79	MAUDA TPS	2320	2932
80	BUTIBORI TPP	600	2310
81	DHARIWAL TPP	600	581
	Sub Total	**20390.0**	**54788.0**
	TOTAL W.R.	**58382.0**	**184924.0**
SOUTHERN REGION			
	ANDHRA PRADESH		
82	Dr. N.TATA RAO TPS	1760	8913
83	RAYALASEEMA TPS	1050	4730
84	SIMHADRI	2000	9510
85	DAMODARAM SANJEEVAIAH TPS	1600	5095
86	PAINAMPURAM TPP	1320	4732
87	VIZAG TPP	1040	1669
	Sub Total	**8770.0**	**34649.0**
	TELANGANA		
88	KOTHAGUDEM TPS	720	8769
89	RAMAGUNDEM - B TPS	62.5	329
90	RAMAGUNDEM STPS	2600	12585
91	KAKATIYA TPS	1100	4115
92	KOTHAGUDEM TPS (NEW)	1000	496
	Sub Total	**5482.5**	**26294.0**
	KARNATAKA		
93	RAICHUR TPS	1720	7762
94	BELLARY TPS	1700	4284
	Sub Total	**3420.0**	**12046.0**
	TAMIL NADU		
95	ENNORE TPS	340	261
96	METTUR TPS	1440	6360
97	TUTICORIN TPS	1050	4070
98	NORTH CHENNAI TPS	1830	7084
99	VALLUR TPP	1500	6196
100	TUTICORIN (JV) TPP	1000	3487
	Sub Total	**7160.0**	**27458.0**
	TOTAL S.R.	**24832.5**	**100447.0**
	EASTERN REGION		
	BIHAR		

Annexure 9.1

Plant wise Coal Consumption during 2016-17

Sl.No.	Name of TPS	Capacity (MW) as on 31.03.2017	Total Consumption (Thousand Tonnes)
101	BARAUNI TPS	210	0
102	MUZAFFARPUR TPS	610	657
103	KAHALGAON TPS	2340	13214
104	BARH II	1320	5099
	Sub Total	**4480.0**	**18970.0**
	JHARKHAND		
105	PATRATU TPS	455	163
106	TENUGHAT TPS	420	1075
107	BOKARO `B` TPS	630	1228
108	CHANDRAPURA(DVC) TPS	760	3669
109	MAITHON RB TPP	1050	4258
110	KODARMA TPP	1000	2323
111	MAHADEV PRASAD STPP	540	2195
	Sub Total	**4855.0**	**14911.0**
	ORISSA		
112	TALCHER (OLD) TPS	460	3073
113	TALCHER STPS	3000	18091
114	IB VALLEY TPS	420	2913
115	STERLITE TPP	1200	5835
116	DERANG TPP	1200	4557
117	KAMALANGA TPS	1050	4150
	Sub Total	**7330.0**	**38619.0**
	WEST BENGAL		
118	DURGAPUR TPS	210	439
119	MEJIA TPS	2340	8206
120	BANDEL TPS	450	1413
121	SAGARDIGHI TPS	1600	2978
122	SANTALDIH TPS	500	2262
123	KOLAGHAT TPS	1260	4990
124	BAKRESWAR TPS	1050	4545
125	TITAGARH TPS	240	167
126	SOUTHERN REPL. TPS	135	322
127	BUDGE BUDGE TPS	750	3160
128	D.P.L. TPS	660	1406
129	FARAKKA STPS	2100	9388
130	DURGAPUR STEEL TPS	1000	4295
131	HALDIA TPP	600	2775
132	RAGHUNATHPUR TPP	1200	772
	Sub Total	**14095.0**	**47118.0**
	TOTAL E.R.	**30760.0**	**119618.0**
NORTH-EASTERN REGION			
	ASSAM		
133	BONGAIGAON TPP	500	**592.0**
	Sub Total	500.0	**592.0**
	TOTAL N.E.R.	**500.0**	**592.0**

Annexure 9.1

Plant wise Coal Consumption during 2016-17

Sl.No.	Name of TPS	Capacity (MW) as on 31.03.2017	Total Consumption (Thousand Tonnes)
	Total All India (Indigeneous Coal Based)	**153997.5**	**529072.0**
II	**Thermal Power Stations Designed on imported**		
1	TROMBAY TPS	1250	2494
2	TORANGALLU TPS(SBU-I)	260	442
3	TORANGALLU TPS(SBU-II)	600	1190
4	MUNDRA TPS	4620	15623
5	JSW RATNAGIRI TPP	1200	2694
6	UDUPI TPP	1200	3434
7	SALAYA TPP	1200	2383
8	MUNDRA UMTPP	4000	10798
9	SIMHAPURI TPS	600	918.8
10	THAMMINAPATNAM TPS	300	951
11	MUTHIARA TPP	1200	2337
12	ITPCL TPP	1200	1922
	Total All India (Imported Coal Based)	**17630.0**	**45186.8**
	ALL INDIA TOTAL	**171627.5**	**574258.8**

Annexure-9.2

Specific Coal Consumption of the Plants during 2014-15, 2015-16 and 2016-17

Sr. No.	Name of TPS	Capacity (MW)	SPCC (kg /kWh)		
I. TPS Designed On Indigenous Coal			**2014-15**	**2015-16**	**2016-17**
NOTHERN					
DELHI					
1	BADARPUR TPS	705	0.863	0.765	0.718
2	RAJGHAT TPS	135	0.904	0.901	-
	Sub Total	**840**			
HARYANA					
3	INDIRA GANDHI STPP	1500	0.777	0.720	0.756
4	MAHATMA GANDHI TPS	1320	0.600	0.647	0.635
5	PANIPAT TPS	920	0.720	0.685	0.655
6	RAJIV GANDHI TPS	1200	0.706	0.670	0.688
7	YAMUNA NAGAR TPS	600	0.651	0.644	0.671
	Sub Total	**5540**			
PUNJAB					
8	GH TPS (LEH.MOH.)	920	0.606	0.598	0.666
9	GND TPS(BHATINDA)	440	0.663	0.673	0.634
10	RAJPURA TPP	1400	0.523	0.534	0.517
11	ROPAR TPS	1260	0.712	0.723	0.683
12	TALWANDI SABO TPP	1980	0.470	0.667	0.708
	Sub Total	**6000**			
RAJASTHAN					
13	CHHABRA TPP	1000	0.644	0.633	0.612
14	KAWAI TPS	1320	0.522	0.473	0.491
15	KOTA TPS	1240	0.648	0.667	0.651
16	SURATGARH TPS	1500	0.677	0.632	0.701
17	KALISINDH TPS	1200	-	0.59	0.566
	Sub Total	**6260**			
UTTAR PRADESH					
18	ANPARA C TPS	1200	0.681	0.642	0.665
19	ANPARA TPS	2630	0.758	0.756	0.721
20	BARKHERA TPS	90	0.892	0.896	0.839
21	DADRI (NCTPP)	1820	0.662	0.647	0.628
22	HARDUAGANJ TPS	665	0.717	0.685	0.661
23	KHAMBARKHERA TPS	90	0.900	0.901	0.834
24	KUNDARKI TPS	90	0.915	0.849	0.853
25	LALITPUR TPS	1980	-	-	0.654
26	MAQSOODPUR TPS	90	0.866	0.899	0.846
27	OBRA TPS	1278	0.917	0.872	0.847
28	PANKI TPS	210	0.944	0.933	0.965
29	PARICHHA TPS	1140	0.772	0.789	0.739
30	PRAYAGRAJ TPP	1320	-	-	0.652
31	RIHAND STPS	3000	0.691	0.658	0.654
32	ROSA TPP Ph-I	1200	0.611	0.659	0.642
33	SINGRAULI STPS	2000	0.704	0.727	0.687
34	TANDA TPS	440	0.790	0.741	0.705
35	UNCHAHAR TPS	1550	0.659	0.676	0.683
36	UTRAULA TPS	90	0.944	0.865	0.870
	Sub Total	**20883**			
	NORTHERN Total	**39523**	**0.686**	**0.667**	**0.663**
WESTERN					
CHHATTISGARH					
37	AKALTARA TPS	1200	0.582	0.615	0.558
38	AVANTHA BHANDAR	600	-	-	0.751
39	BALCO TPS	600	-	-	0.653
40	BANDAKHAR TPP	300	-	-	0.677
41	BARADARHA TPS	1200	-	-	0.758
42	BHILAI TPS	500	0.698	0.687	0.679

Annexure-9.2

Specific Coal Consumption of the Plants during 2014-15, 2015-16 and 2016-17

Sr. No.	Name of TPS	Capacity (MW)	SPCC (kg /kWh)		
43	DSPM TPS	500	0.721	0.714	0.678
44	KORBA STPS	2600	0.725	0.708	0.655
45	KORBA-II	440	1.108	1.038	0.971
46	KORBA-WEST TPS	1340	0.711	0.771	0.768
47	MARWA TPS	1000	-	-	0.760
48	NAWAPARA TPP	300	-	-	0.721
49	OP JINDAL TPS	1000	0.702	0.772	0.782
50	PATHADI TPP	600	0.715	0.686	0.664
51	TAMNAR TPP	2400	0.531	0.711	0.996
52	SIPAT STPS	2980	0.607	0.629	0.604
	Sub Total	**17560**			
GUJARAT					
53	GANDHI NAGAR TPS	630	0.644	0.640	0.633
54	SABARMATI (C STATION)	422	0.613	0.569	0.646
55	SIKKA REP. TPS	740	0.720	0.610	0.519
56	UKAI TPS	1350	0.679	0.672	0.661
57	WANAKBORI TPS	1470	0.699	0.687	0.668
	Sub Total	**4612**			
MADHYA PRADESH					
58	AMARKANTAK EXT TPS	210	0.644	0.593	0.597
59	ANUPPUR TPP	1200	-	0.545	0.688
60	BINA TPS	500	0.665	0.673	0.650
61	NIGRI TPP	1320	-	-	0.612
62	SANJAY GANDHI TPS	1340	0.753	0.713	0.723
63	SASAN UMTPP	3960	0.494	0.533	0.576
64	SATPURA TPS	1330	0.897	0.822	0.737
65	SHRI SINGHAJI TPP	1200	0.857	0.710	0.648
66	VINDHYACHAL STPS	4760	0.699	0.688	0.677
	Sub Total	**15820**			
MAHARASHTRA					
67	AMARAVATI TPS	1350	0.642	0.602	0.597
68	BHUSAWAL TPS	1420	0.944	0.754	0.711
69	BUTIBORI TPP	600	0.215	0.601	0.617
70	CHANDRAPUR(MAHARASHTRA) STPS	2920	0.880	0.842	0.774
71	DAHANU TPS	500	0.587	0.567	0.575
72	DHARIWAL TPP	600	-	-	0.640
73	GMR WARORA TPS	600	0.598	0.626	0.611
74	KHAPARKHEDA TPS	1340	0.835	0.848	0.772
75	KORADI TPS	2600	0.925	0.687	0.663
76	MAUDA TPS	2320	0.701	0.707	0.681
77	NASIK TPS	630	0.820	0.783	0.753
78	PARAS TPS	500	0.836	0.793	0.705
79	PARLI TPS	1170	0.835	0.831	0.651
80	TIRORA TPS	3300	0.578	0.593	0.627
81	WARDHA WARORA TPP	540	0.591	0.662	0.677
	Sub Total	**20390**			
	WESTERN Total	**58382**	**0.692**	**0.680**	**0.671**
SOUTHERN					
ANDHRA PRADESH					
82	DAMODARAM SANJEEVAIAH TPS	1600	-	-	0.579
83	Dr. N.TATA RAO TPS	1760	0.744	0.764	0.765
84	RAYALASEEMA TPS	1050	0.765	0.732	0.705
85	SIMHADRI	2000	0.650	0.693	0.671
86	PAINAMPURAM TPP	1320	-	-	0.522
87	VIZAG TPP	1040	-	-	0.766
	Sub Total	**8770**			
TELANGANA					

Annexure-9.2

Specific Coal Consumption of the Plants during 2014-15, 2015-16 and 2016-17

Sr. No.	Name of TPS	Capacity (MW)	SPCC (kg /kWh)		
88	KAKATIYA TPS	1100	0.636	0.640	0.626
89	KOTHAGUDEM TPS	720	0.800	0.843	0.878
90	KOTHAGUDEM TPS (NEW)	1000	-	-	0.878
91	RAMAGUNDEM - B TPS	62.5	0.703	0.689	0.725
92	RAMAGUNDEM STPS	2600	0.701	0.653	0.642
	Sub Total	**5482.5**			
KARNATAKA					
93	BELLARY TPS	1700	0.690	0.619	0.669
94	RAICHUR TPS	1720	0.776	0.655	0.675
	Sub Total	**3420**			
TAMIL NADU					
95	ENNORE TPS	340	1.165	1.293	1.359
96	METTUR TPS	1440	0.708	0.651	0.693
97	NORTH CHENNAI TPS	1830	0.638	0.633	0.702
98	TUTICORIN TPS	1050	0.776	0.737	0.734
99	VALLUR TPP	1500	0.660	0.669	0.673
100	TUTICORIN (JV) TPP	1000	-	0.472	0.558
	Sub Total	**7160**			
	SOUTHERN Total	**24832.5**	**0.756**	**0.695**	**0.678**
EASTERN					
BIHAR					
101	BARAUNI TPS	210	-	-	-
102	BARH II	1320	0.637	0.582	0.667
103	KAHALGAON TPS	2340	0.858	0.835	0.829
104	MUZAFFARPUR TPS	610	0.897	0.761	0.828
	Sub Total	**4480**			
JHARKHAND					
105	BOKARO `B` TPS	630	0.821	0.770	0.738
106	CHANDRAPURA(DVC) TPS	760	0.727	0.734	0.650
107	KODARMA TPP	1000	0.714	0.654	0.611
108	MAHADEV PRASAD STPP	540	0.500	0.615	0.674
109	MAITHON RB TPP	1050	0.592	0.560	0.579
110	PATRATU TPS	455	0.959	0.875	0.591
111	TENUGHAT TPS	420	0.786	0.754	0.755
	Sub Total	**4855**			
ODISHA					
112	DERANG TPP	1200	-	-	0.699
113	IB VALLEY TPS	420	0.829	0.893	0.900
114	KAMALANGA TPS	1050	0.675	0.631	0.700
115	STERLITE TPP	1200	0.692	0.693	0.748
116	TALCHER (OLD) TPS	460	0.815	0.830	0.817
117	TALCHER STPS	3000	0.749	0.751	0.792
	Sub Total	**7330**			
WEST BENGAL					
118	BAKRESWAR TPS	1050	0.680	0.693	0.645
119	BANDEL TPS	450	0.855	0.869	0.750
120	BUDGE BUDGE TPS	750	0.596	0.597	0.584
121	D.P.L. TPS	660	0.759	0.691	0.656
122	DURGAPUR STEEL TPS	1000	0.685	0.688	0.645
123	DURGAPUR TPS	210	0.850	0.827	0.741
124	FARAKKA STPS	2100	0.730	0.693	0.683
125	HALDIA TPP	600	0.679	0.657	0.691
126	KOLAGHAT TPS	1260	0.858	0.873	0.826
127	MEJIA TPS	2340	0.704	0.641	0.634
128	RAGHUNATHPUR TPP	1200	-	-	0.592
129	SAGARDIGHI TPS	1600	0.679	0.677	0.611
130	SANTALDIH TPS	500	0.740	0.671	0.617

Annexure-9.2

Specific Coal Consumption of the Plants during 2014-15, 2015-16 and 2016-17

Sr. No.	Name of TPS	Capacity (MW)	SPCC (kg /kWh)		
131	SOUTHERN REPL. TPS	135	0.724	0.770	0.784
132	TITAGARH TPS	240	0.659	0.719	0.717
	Sub Total	**14095**			
	EASTERN Total	**30760**	**0.735**	**0.703**	**0.708**
NORTH EASTERN					
ASSAM					
133	BONGAIGAON TPP	500	**-**	-	0.531
	Sub Total	**500.0**	**-**	-	
	TOTAL N.E.R.	**500.0**	**-**	**-**	**0.531**
	Total All India (Indigeneous Coal Based)	**153997.5**	**0.710**	**0.684**	**0.678**
II. TPS Designed On Imported Coal			**2014-15**	**2015-16**	**2016-17**
1	JSW RATNAGIRI TPP	1200	0.477	0.399	0.403
2	MUNDRA TPS	4620	0.533	0.521	0.516
3	MUNDRA UMTPP	4000	0.396	0.386	0.393
4	SALAYA TPP	1200	0.435	0.421	0.457
5	TROMBAY TPS	1250	0.373	0.498	0.501
6	ITPCL TPP	1200	-	-	0.510
7	MUTHIARA TPP	1200	-	-	0.623
8	SIMHAPURI TPS	600	0.659	0.634	0.568
9	THAMMINAPATNAM TPS	300	0.658	0.687	0.692
10	TORANGALLU TPS(SBU-I)	260	1.037	0.592	0.258
11	TORANGALLU TPS(SBU-II)	600	-	0.240	0.441
12	UDUPI TPP	1200	0.437	0.415	0.436
	Sub Total	**17630**	**0.484**	**0.456**	**0.465**
	Total All India (I + II)	**171627.5**	**0.684**	**0.657**	**0.654**

Annexure 9.3

GAS SUPPLY/CONSUMPTION IN THE COUNTRY FOR THE YEAR 2016-17

S. No	Name of Power Station	Installed Capacity (MW)	Generation (MUs)	Gas Requirement 90% PLF*(MMSCMD)	Gas Alloted** (MMSCMD)	GAS SUPPLIED/ CONSUMED** (MMSCMD)
(A) CENTRAL SECTOR						
1	NTPC, FARIDABAD CCPP	431.59	1034.08	2.1	2.32	0.62
2	NTPC, ANTA CCPP	419.33	695.17	2.0	2.32	0.95
3	NTPC, AURAIYA CCPP	663.36	535.69	3.2	3.85	0.35
4	NTPC, DADRI CCPP	829.78	2236.98	4.0	4.01	1.32
	Sub Total (NR)	**2344.06**	**4501.92**	**11.25**	**12.50**	**3.24**
5	NTPC, GANDHAR(JHANORE)	657.39	2358.81	3.2	3.19	1.44
6	NTPC, KAWAS CCPP	656.2	1718.18	3.1	6.07	1.00
7	RATNAGIRI (RGPPL-DHABHOL)	1967	4560.01	9.4	10.63	2.38
	Sub Total (WR)	**3280.59**	**8637.00**	**15.75**	**19.89**	**4.82**
8	KATHALGURI (NEEPCO)	291	1572.62	1.4	1.4	1.17
9	MONARCHAK (NEEPCO)	101	172.05	0.5	0.5	0.15
10	AGARTALA GT+ST (NEEPCO)	135	904.58	0.6	0.75	0.67
11	TRIPURA CCPP (ONGC)	726.6	4172.70	3.5	2.65	2.24
	Sub Total (NER)	**1253.6**	**6821.95**	**5.98**	**5.30**	**4.23**
	Total (CS)	**6878.25**	**19960.87**	**32.98**	**37.69**	**12.29**
(B) STATE SECTOR						
12	I.P.CCPP	270	695.58	1.3	1.55	0.50
13	PRAGATI CCGT-III	1500	2047.50	7.2	2.49	1.10
14	PRAGATI CCPP	330.4	1805.67	1.6	2.25	1.03
15	DHOLPUR CCPP	330	124.85	1.6	1.60	0.09
16	RAMGARH (RRVUNL,Jaisalmer)	273.8	1425.72	4.1	1.45	1.40
	Sub Total (NR)	**2704.2**	**6099.32**	**15.77**	**9.34**	**4.12**
17	PIPAVAV CCPP	702	229.99	3.4	0.00	0.13
18	DHUVARAN CCPP(GSECL)	594.72	306.76	2.9	0.94	0.18
19	HAZIRA CCPP(GSEG)	156.1	24.32	0.7	0.81	0.01
20	HAZIRA CCPP EXT	351	230.21	1.7	0.00	0.13
21	UTRAN CCPP(GSECL)	518	157.11	2.5	1.69	0.08
22	URAN CCPP (MAHAGENCO)	672	3294.50	3.2	4.90	2.20
	Sub Total (WR)	**2993.82**	**4242.89**	**14.37**	**8.34**	**2.73**
23	KARAIKAL CCPP (PPCL)	32.5	246.84	0.2	0.20	0.18
24	KOVIKALPAL (THIRUMAKOTTAI)	107	347.98	0.5	0.45	0.24
25	KUTTALAM (TANGEDCO)	100	380.20	0.5	0.45	0.24
26	VALUTHUR CCPP(Ramanand)	186.2	966.65	0.9	0.89	0.55
27	GODAVARI (JEGURUPADU)	216	924.13	1.0	1.31	0.53
	Sub Total (SR)	**641.70**	**2865.80**	**3.04**	**3.30**	**1.74**
28	LAKWA GT (ASEB,Maibella)	157.2	888.73	0.8	0.90	0.73
29	NAMRUP CCPP + ST (APGCL)	181.5	354.88	0.9	0.66	0.48
30	BARAMURA GT (TSECL)	58.5	188.00	0.3	0.60	0.23
31	ROKHIA GT (TSECL)	111	435.92	0.5	0.30	0.52
	Sub Total (NER)	**508.2**	**1867.53**	**2.47**	**2.46**	**1.96**
	Total (SS)	**6847.92**	**15075.54**	**35.65**	**23.44**	**10.55**
(C) PVT/IPP SECTOR						
32	RITHALA CCPP (NDPL)	108	0.00	0.5	0.40	0.00

Annexure 9.3

GAS SUPPLY/CONSUMPTION IN THE COUNTRY FOR THE YEAR 2016-17

S. No	Name of Power Station	Installed Capacity (MW)	Generation (MUs)	Gas Requirement 90% PLF*(MMSCMD)	Gas Alloted** (MMSCMD)	GAS SUPPLIED/ CONSUMED** (MMSCMD)
33	GAMA CCPP	225	492.43	1.1	0.48	0.23
34	KASHIPUR CCPP(Sravanthi)	225	476.58	1.1	0.80	0.36
	Sub Total (NR)	**558.00**	**969.01**	**2.72**	**1.68**	**0.59**
35	TROMBAY CCPP (TPC)	180	1413.20	0.9	2.50	0.84
36	MANGAON CCPP	388	215.00	1.9	1.09	0.13
37	BARODA CCPP (GIPCL)	160	135.09	0.8	0.75	0.04
38	ESSAR CCPP #	300	0.00	1.4	1.17	0.00
39	PAGUTHAN CCPP (GPEC)	655	280.57	3.1	1.43	0.19
40	SUGEN CCPP (TORRENT)	1147.5	4771.45	5.5	5.35	2.33
41	UNOSUGEN CCPP	382.5	0.00	1.8	0.00	0.00
42	DGEN Mega CCPP	1200	1.02	5.8	0.00	0.01
	Sub Total (WR)	**4413.00**	**6816.33**	**21.22**	**12.29**	**3.54**
43	GAUTAMI CCPP	464	0.00	2.2	3.82	0.00
44	GMR - KAKINADA (Tanirvavi)	220	0.00	1.1	0.88	0.00
45	GMR-Rajamundry Energy Ltd.	768	643.51	3.7	0.00	0.39
46	GODAVARI (SPECTRUM)	208	1008.75	1.0	1.43	0.57
47	JEGURUPADU CCPP (GVK)	239.4	75.08	1.1	2.85	0.04
48	KONASEEMA CCPP	445	0.00	2.1	1.78	0.00
49	KONDAPALLI EXTN CCPP .	366	157.32	1.8	4.57	0.09
50	KONDAPALLI ST-3 CCPP	742	1266.11	3.6		0.66
51	KONDAPALLI CCPP (LANCO)	350	850.27	1.7	2.32	0.51
52	PEDDAPURAM (BSES)	220	0.00	1.1	1.09	0.00
53	VEMAGIRI CCPP	370	305.33	1.8	4.16	0.11
54	VIJESWARAN CCPP	272	691.10	1.3	1.32	0.42
55	PCIL POWER AND HOLDINGS Ltd	30	N/A	0.1	0.12	-
56	RVK ENERGY	28	N/A	0.1	0.11	-
57	SILK ROAD SUGAR	35	N/A	0.2	0.10	-
58	LVS POWER	55	N/A	0.3	0.22	-
59	KARUPPUR CCPP (LANCO	119.8	478.97	0.6	0.50	0.30
60	P.NALLUR CCPP (PPN)	330.5	189.35	1.6	1.50	0.00
61	VALANTARVY CCPP	52.8	378.18	0.3	0.38	0.26
	Sub Total (SR)	**5315.50**	**6043.97**	**25.47**	**27.15**	**3.35**
62	DLF ASSAM GT	24.5	-	0.1	0.10	-
	Sub Total (NER)	**24.5**	**0.0**	**0.1**	**0.1**	**0.0**
	Total (PVT/ IPP S)=C	**10311.00**	**13829.31**	**49.52**	**41.22**	**7.48**
	GRAND TOTAL=A+B+C	**24037.17**	**48865.72**	**118.15**	**102.35**	**30.32**

** including E-Bid RLNG gas alloted and supplied during the year 2016-17.

MU -- Million Unit

MMSCMD - Million Standard Cubic Metres/day=MMSCM Data /(NO.OF DAYS IN A MONTH)

Out of total 515 MW capacity of Essar CCPP, 300 MW electricity is being supplied to grid & balance 215 MW is used as captive

SECTION-10
GAS TURBINE PLANTS

10.1 Generation performance of 239 GT (Gas/Naphtha) based units of 65 Gas Turbine Plants (25 MW & above) aggregating to 25274.88 MW was reviewed by CEA during the year 2016-17.

10.2 DETAILS OF GAS TURBINE STATIONS AS ON 31-3-2017

Region-wise and state-wise details of gas turbine stations and units under Central, State and Private Sectors operating as on 31 March 2017 are given at Annexure 10.1.

Sector-wise summary of these units are as under:

S. No.	Sector	No. of Stations	No. of units	Installed capacity (in MW)
1.	Central	12	60	7490.83
2.	State	24	103	7227.95
3.	Pvt. Utilities+ IPP	29	76	10556.10
	Total	**65**	**239**	**25274.88**

Sector-wise details of gas turbine stations indicating unit-wise capacity, make, and date of synchronization / commissioning and primary fuel used are indicated in Annexure 10.2.

10.3 Performance of Gas Turbine Stations during 2016-17

Month-wise generation performance:

The prevailing gas shortage in the country led to reduction in gas-based generation.

The PLF of gas based plants increased from 21.35% (achieved in April'2015) to 22.51% during the month of Mar'17

Comparison of month-wise energy generation of gas based plants in the country and their average PLF during the year 2016-17 with the energy generation and PLF% during the corresponding months in the year 2015-16 and month wise growth rate is given below:

Month	2015-16			2016-17			Growth (%)
	Monitored Capacity (MW)	Generation (BU)	PLF (%)	Monitored Capacity (MW)	Generation (BU)	PLF (%)	
Apr	23007.65	3246.28	19.6	24454.13	3862.63	21.35	118.99
May	23007.65	3242.43	18.94	24454.13	4321.59	23.75	133.28
Jun	22907.65	3796.41	23.02	24364.13	4069.68	23.20	107.19
Jul	22907.65	3662.57	21.49	24364.13	4027.92	22.22	109.97
Aug	23278.65	3854.07	22.25	25002.63	4439.72	23.87	115.19
Sep	24033.65	4372.24	25.27	25002.63	4583.88	25.46	104.84
Oct	24418.53	4156.93	22.88	25002.63	4231.62	22.75	101.80
Nov	24418.53	4038.93	22.97	25227.63	3986.37	21.95	98.70
Dec	24418.53	4263.18	23.47	25227.63	3888.68	20.72	91.22
Jan	24454.13	3946.31	21.69	25289.88	3563.09	18.94	90.29
Feb	24454.13	3943.45	23.17	25274.88	3640.63	21.43	92.32
Mar	24454.13	4599.28	25.28	25274.88	4167.59	22.16	90.61
Total		**47122.09**	**22.54**	**25274.88**	**49093.95**	**22.51**	**104.18**

Station-wise gas based generation performance:

Comparison of Station-wise energy generation from gas based plants in the country and their average PLF during the year 2016-17 with the energy generation and PLF% during the year 2016-17 is given below:

Sl. No.	Name of the Station	Capacity (MW)	GENERATION(MU)				PLF%		% of Last Year
			Actual Generation 2015-16	2016-17 Target	2016-17 Actual	% of Targe	Actual 2015-16	Actual 2016-17	
CENTRAL SECTOR									
NEEPCO.									
1	**AGARTALA GT**	135.00	763.6	850.0	904.6	106.4	79.39	81.65	118.5
2	**KATHALGURI CCPP**	291.00	1758.8	1725.0	1572.6	91.2	68.81	61.69	89.4
3	**MONARCHAK CCPP**	101.00	127.1	400.0	172.0	43.0	19.48	19.45	135.4
	Total- NEEPCO.	**527.00**	2649.5	**2975.0**	**2649.3**	**89.05**	**63.53**	**58.33**	**99.99**
NTPC Ltd.									
4	**ANTA CCPP**	419.33	942.0	1080.0	695.2	64.4	**25.57**	**18.93**	73.8
5	**AURAIYA CCPP**	663.36	1511.3	1710.0	535.7	31.3	**25.94**	**9.22**	35.4
6	**DADRI CCPP**	829.78	3000.0	2070.0	2237.0	108.1	**41.16**	**30.77**	74.6
7	**FARIDABAD CCPP**	431.59	1100.6	1080.0	1034.0	95.8	**29.03**	**27.35**	94.0
8	**GANDHAR CCPP**	657.39	961.5	1485.0	2358.8	158.8	**16.65**	**40.96**	245.3
9	**KAWAS CCPP**	656.20	1212.4	1620.0	1718.2	106.1	**21.03**	**29.89**	141.7
10	**R. GANDHI CCPP (Liq.)**	359.58	142.8	500.0	15.4	3.1	**4.52**	**0.49**	10.8
	Total- NTPC Ltd.	**4017.23**	8870.6	**9545.0**	**8594.3**	**90.04**	**25.14**	**24.42**	**96.89**
ONGC									
11	**TRIPURA CCPP**	726.60	3479.5	4000.0	4173.1	104.3	**54.52**	**65.56**	119.9
	Total- ONGC	**726.60**	3479.5	**4000.0**	**4173.1**	**104.33**	**54.52**	**65.56**	**119.93**
RGPPL									

12	**RATNAGIRI CCPP**	2220.00	1233.7	3000.0	4557.7	151.9	**6.33**	**23.44**	369.4
	Total- RGPPL	**2220.00**	1233.7	**3000.0**	**4557.7**	**151.92**	**6.33**	**23.44**	**369.44**
	Total-CENTRAL SECTOR	**7490.83**	16233.2	**19520.0**	**19974.3**	**102.33**	**24.84**	**30.47**	**123.05**
STATE SECTOR									
APEPDCL									
13	**JEGURUPADUCCPP PH-I**	235.40	530.2	0.0	924.1	0	**25.64**	**44.81**	174.3
APGPCL									
14	**LAKWA GT**	142.20	947.9	885.0	888.7	100.4	**74.74**	**71.35**	101.4
15	**NAMRUP CCPP**	181.25	507.6	535.0	354.9	66.3	**48.56**	**30.15**	85.8
GPPCL									
16	**PIPAVAV CCPP**	702.00	114.8	0.0	230.0	0.0	**1.86**	**3.74**	200.4
GSECL									
17	**DHUVARAN CCPP**	594.72	416.4	100.0	306.8	306.8	**7.97**	**5.89**	73.7
18	**UTRAN CCPP**	518.00	1272.0	0.0	157.1	0.0	**27.95**	**3.46**	12.4
GSEGL									
19	**HAZIRA CCPP**	156.10	143.5	120.0	24.3	20.3	**10.47**	**1.78**	16.9
20	**HAZIRA CCPP EXT**	351.00	0.0	0.0	230.1	0.0	**0.00**	**7.48**	0.0
IPGPCL									
21	**I.P.CCPP**	270.00	467.2	700.0	695.5	99.4	**19.70**	**29.41**	148.9
JKSPDC									
22	**PAMPORE GPS (Liq.)**	175.00	0.0	0.0	0.0	0.0	**0.00**	**0.00**	0.0
MAHAGENCO									
23	**URAN CCPP**	672.00	2886.5	2500.0	3294.6	131.8	**48.90**	**55.97**	114.1
P&ED, Pudu.									
24	**KARAIKAL CCPP**	32.50	227.6	242.0	246.8	102.0	**79.72**	**86.70**	108.5
PRAGATI									
25	**PRAGATI CCGT-III**	1500.00	1911.6	2000.0	2047.5	102.4	**14.51**	**15.58**	107.1
26	**PRAGATI CCPP**	330.40	1539.3	2000.0	1805.4	90.3	**53.04**	**62.38**	117.3
RRVUNL									
27	**DHOLPUR CCPP**	330.00	328.4	315.0	124.8	39.6	**11.33**	**4.32**	38.0
28	**RAMGARH CCPP**	273.80	1564.5	1568.0	1425.7	90.9	**65.05**	**59.44**	91.1
TNGDCL									
29	**BASIN BRIDGE GT (Liq.)**	120.00	8.7	0.0	11.0	0.0	**0.83**	**1.04**	125.9
30	**KOVIKALPAL CCPP**	107.88	399.1	370.0	348.0	94.0	**42.29**	**36.82**	87.2
31	**KUTTALAM CCPP**	100.00	564.2	557.0	380.2	68.2	**64.23**	**43.40**	67.4
32	**VALUTHUR CCPP**	186.20	721.0	800.0	966.7	120.8	**44.08**	**59.27**	134.1
TSECL									
33	**BARAMURA GT**	58.50	232.9	291.0	188.2	64.7	**45.33**	**36.73**	80.8
34	**ROKHIA GT**	111.00	506.3	390.0	435.9	111.8	**51.93**	**44.83**	86.1
WBPDC									
35	**HALDIA GT (Liq.)**	40.00	0.0	0.0	0.0	0.0	**0.00**	**0.00**	0.0
36	**KASBA GT (Liq.)**	40.00	0.0	0.0	0.0	0.0	**0.00**	**0.00**	0.0
	Total- STATE SECTOR	**7227.95**	15289.8	**13373.0**	**15086.4**	**112.81**	**24.24**	**23.94**	**98.67**
PVT UTILITY									
TATA PCL									
37	**TROMBAY CCPP**	180.00	1179.7	884.0	1413.1	159.9	**74.61**	**89.62**	119.8
	Total- PVT UTILITY	**180.00**	1179.7	**884.0**	**1413.1**	**159.86**	**74.61**	**89.62**	**119.78**
IPP									
ABAN POWR									
38	**KARUPPUR CCPP**	119.80	632.8	500.0	479.0	95.8	**60.14**	**45.64**	75.7
APGPCL									
39	**VIJJESWARAM CCPP**	272.00	701.7	700.0	691.1	98.7	**29.37**	**29.00**	98.5
BSES(C)									
40	**COCHIN CCPP (Liq.)**	174.00	0.0	0.0	0.0	0.0	**0.00**	**0.00**	0.0
BSES(P)									
41	**PEDDAPURAM CCPP**	220.00	25.0	50.0	0.0	0.0	**1.29**	**0.00**	0.0

CIPL									
42	**PEGUTHAN CCPP**	655.00	898.4	300.0	280.6	93.5	**15.61**	**4.89**	31.2
ESSAR									
43	**ESSAR CCPP**	515.00	0.0	0.0	0.0	0.0	**0.00**	**0.00**	0.0
GAUTAMI									
44	**GAUTAMI CCPP**	464.00	104.3	0.0	0.0	0.0	**2.56**	**0.00**	0.0
GIPCL									
45	**BARODA CCPP**	160.00	235.9	200.0	135.1	67.6	**16.78**	**9.64**	57.3
46	**GIPCL. GT IMP**	0	181.6	160.0	203.4	127.1	**NULL**	**NULL**	112.0
GIPL									
47	**GAMA CCPP**	225.0	0	0	492.4	0	**0**	**37.53**	0
GMR ENERG									
48	**GMR Energy Ltd Kakinada**	220.00	0.0	0.0	0.0	0.0	**0.00**	**0.00**	0.0
GREL									
49	**GREL CCP (Rajahmundry)**	768.00	589.6	0.0	643.5	0.0	**14.71**	**9.57**	109.1
GVKP&IL									
50	**JEGURUPADU CCP PH II**	220.00	339.4	250.0	75.1	30.0	**17.56**	**3.90**	22.1
SrCEPL									
51	**KASHIPUR CCPP**	225.00	0.0	0.0	476.6	0.0	**0.00**	**54.58**	0.0
KONA									
52	**KONASEEMA CCPP**	445.00	0.0	0.0	0.0	0.0	**0.00**	**0.00**	0.0
KONDAPALI									
53	**KONDAPALLI EXT CCPP.**	366.00	972.0	0.0	157.3	0.0	**30.23**	**4.91**	16.2
54	**KONDAPALLI CCPP**	350.00	484.5	600.0	850.3	141.7	**15.76**	**27.73**	175.5
55	**KONDAPALLI ST-CCPP**	742.00	615.6	500.0	1266.1	253.2	**14.44**	**19.48**	205.7
NDPL									
56	**RITHALA CCPP**	108.00	0.0	0.0	0.0	0.0	**0.00**	**0.00**	0.0
PENNA									
57	**VALANTARVY CCPP**	52.80	195.1	0.0	378.2	0.0	**42.06**	**81.76**	193.8
PGPL									
58	**MANGOAN CCPP**	388.00	0.0	0.0	215.4	0.0	**0.0**	**9.52**	0.0
PPNPGCL									
59	**P.NALLUR CCPP**	330.50	150.8	40.0	189.4	473.4	**5.19**	**6.54**	125.6
RELIANCE									
60	**GOA CCPP (Liq.)**	48.00	0.0	0.0	0.0	0.0	**0.00**	**0.00**	0.0
SPGL									
61	**GODAVARI CCPP**	208.00	552.7	600.0	1008.8	168.1	**30.25**	**55.36**	182.5
TOR. POW. (SUGEN)									
62	**SUGEN CCPP**	1147.50	3512.1	2500.0	4771.5	190.9	**34.84**	**47.47**	135.9
TOR. POW. (UNOSUGEN)									
63	**DGEN MEGA CCPP**	1200.00	2731.3	0.0	1.0	0.0	**25.91**	**0.01**	0.0
64	**UNOSUGEN CCPP**	382.50	876.1	0.0	0.0	0.0	**26.08**	**0.00**	0.0
VEMAGIRI									
65	**VEMAGIRI CCPP**	370.00	620.5	0.0	305.3	0.0	**19.09**	**9.42**	49.2
	Total- IPP	**10376.10**	**14419.4**	**6400.0**	**12620.1**	**197.19**	**18.43**	**14.35**	**87.52**
	Total- Private	**10556.10**	**15599.1**	**7284.0**	**14033.2**	**192.66**	**19.32**	**15.48**	**89.96**
	Total- All India	**25274.88**	**47122.1**	**40177.0**	**49094.0**	**122.19**	**22.63**	**22.51**	**104.18**

10.4 NEW UNITS SYNCHRONISED DURING 2016-17

Following 4 gas based units aggregating to 900.25 MW were synchronized during the year 2016-17:

Sl. No.	Station Name	Unit Name	Capacity	Organization	State	Date of Sync.	Fuel Used
1	GAMA CCPP	1	225	GIPL	UTTARAKHAND	25-APR-16	NATURAL GAS
2	KASHIPUR CCPP	1	225	SrEPL	UTTARAKHAND	20-NOV-16	NATURAL GAS
3	MANGOAN CCPP	1	388	PGPL	MAHARASHTRA	14-JUL-16	NATURAL GAS
4	NAMRUP CCPP	7	62.25	APGPCL	ASSAM	11-JAN-17	NATURAL GAS

10.5 UNITS RETIRED DURING 2016-17

Following 4 gas based units aggregating to 105 MW was retired during the year 2016-17:

Sl. No.	Station Name	Unit Name	Capacity	Organization	State	Fuel Used
1	MAITHON GT	1	30.00	DVC	JHARKHAD	LIQUID
2	MAITHON GT	2	30.00	DVC	JHARKHAND	LIQUID
3	MAITHON GT	3	30.00	DVC	JHARKHAND	LIQUID
4	LAKWA GT	1	15.00	APGPCL	ASSAM	NATURAL GAS

Annexure- 10.1

LIST OF REGION WISE/ STATE WISE GAS TURBINE STATIONS AS ON 31 MARCH 2017

Region/State	Central Sector			State Sector			Private Utility			Private IPP's			Total		
	No. of Station	No. of Units	Installed Capacity	No. of Station	No. of Units	Installed Capacity	No. of Station	No. of Units	Installed Capacity	No. of Station	No. of Units	Installed capacity	No. of Station	No. of Units	Installed Capacity
NORTHERN REGION															
DELHI	0	0	0.00	3	18	2100.40	0	0	0.00	1	3	108.00	4	21	2208.40
HARYANA	1	3	431.59	0	0	0.00	0	0	0.00	0	0	0.00	1	3	431.59
JAMMU AND KASHMIR	0	0	0.00	1	7	175.00	0	0	0.00	0	0	0.00	1	7	175.00
RAJASTHAN	1	4	419.33	2	9	603.80	0	0	0.00	0	0	0.00	3	13	1023.13
UTTAR PRADESH	2	12	1493.14	0	0	0.00	0	0	0.00	0	0	0.00	2	12	1493.14
UTTARAKHAND	0	0	0.00	0	0	0.00	0	0	0.00	2	2	450.00	2	2	450.00
TOTAL NORTHERN REGION	4	19	2344.06	6	34	2879.20	0	0	0.00	3	5	558.00	13	58	5781.26
WESTERN REGION															
GOA	0	0	0.00	0	0	0.00	0	0	0.00	1	1	48.00	1	1	48.00
GUJARAT	2	10	1313.59	5	17	2321.82	0	0	0.00	7	21	4060.00	14	48	7695.41
MAHARASHTRA	1	9	2220.00	1	6	672.00	1	2	180.00	1	1	388.00	4	18	3460.00
TOTAL WESTERN REGION	3	19	3533.59	6	23	2993.82	1	2	180.00	9	23	4496.00	19	67	11203.41
SOUTHERN REGION															
ANDHRA PRADESH	0	0	0.00	1	4	235.40	0	0	0.00	12	37	4645.00	13	41	4880.40
KERALA	1	3	359.58	0	0	0.00	0	0	0.00	1	4	174.00	2	7	533.58
PUDUCHERRY	0	0	0.00	1	1	32.50	0	0	0.00	0	0	0.00	1	1	32.50
TAMIL NADU	0	0	0.00	4	12	514.08	0	0	0.00	3	5	503.10	7	17	1017.18
TOTAL SOUTHERN REGION	1	3	359.58	6	17	781.98	0	0	0.00	16	46	5322.10	23	66	6463.66
EASTERN REGION															
WEST BENGAL	0	0	0.00	2	4	80.00	0	0	0.00	0	0	0.00	2	4	80.00

Region/State	Central Sector			State Sector			Private Utility			Private IPP's			Total		
	No. of Station	No. of Units	Installed Capacity	No. of Station	No. of Units	Installed Capacity	No. of Station	No. of Units	Installed Capacity	No. of Station	No. of Units	Installed capacity	No. of Station	No. of Units	Installed Capacity
TOTAL EASTERN REGION	0	0	0.00	2	4	80.00	0	0	0.00	0	0	0.00	2	4	80.00
NORTH EASTERN REGION															
ASSAM	1	9	291.00	2	14	323.45	0	0	0.00	0	0	0.00	3	23	614.45
TRIPURA	3	10	962.60	2	11	169.50	0	0	0.00	0	0	0.00	5	21	1132.10
TOTAL NORTH EASTERN REGION	4	19	1253.60	4	25	492.95	0	0	0.00	0	0	0.00	8	44	1746.55
ALL INDIA TOTAL	12	60	7490.83	24	103	7227.95	1	2	180.00	28	74	10376.10	65	239	25274.88

Annexure- 10.2

SECTOR-WISE DETAILS OF GAS TURBINE STATIONS DURING 2016-17

Sl. No	Sector/ Organization/ Station	Location	Type of fuel used	Unit Detail	Capacity (MW)	Make	Date of Synchronization
CENTRAL SECTOR							
	NEEPCO.						
1	AGARTALA GT	TRIPURA	Natural Gas				
				GT-1	21	BHEL	5/2/1998
				GT-2	21	BHEL	25-02-98
				GT-3	21	BHEL	29-03-98
				GT-4	21	BHEL	26-06-98
				ST-5	25.5	Thermax	23-08-15
				ST-6	25.5	Thermax	22-03-15
	AGARTALA GT				**135**		
2	KATHALGURI CCPP	ASSAM	Natural Gas				
				GT-1	33.5	MITS/MITS	18-03-95
				GT-2	33.5	MITS/MITS	22-03-95
				GT-3	33.5	MITS/MITS	30-06-95
				GT-4	33.5	BHEL	30-07-95
				GT-5	33.5	BHEL	2/3/1996
				GT-6	33.5	BHEL	15-10-96
				ST-7	30	BHEL	1/3/1998
				ST-8	30	BHEL	28-03-98
				ST-9	30	BHEL	5/7/1998
	KATHALGURI CCPP				**291**		
3	MONARCHAK CCPP	TRIPURA	Natural Gas				
				GT-1	65.4	BHEL	30-03-15
				GT-2	35.6	BHEL	14-01-16
	MONARCHAK CCPP				**101**		
	NTPC Ltd.						
4	ANTA CCPP	RAJASTHAN	Natural Gas				
				GT-1	88.71	ABB	20-01-89
				GT-2	88.71	ABB	6/3/1989
				GT-3	88.71	ABB	4/5/1989
				ST-4	153.2	ABB	5/3/1990
	ANTA CCPP				**419.33**		
5	AURAIYA CCPP	UTTAR PRADESH	Natural Gas				
				GT-1	111.19	Mitsubishi, Japan	29-03-89
				GT-2	111.19	Mitsubishi, Japan	21-07-89
				GT-3	111.19	Mitsubishi, Japan	9/8/1989
				GT-4	111.19	Mitsubishi, Japan	29-09-89
				ST-5	109.3	Mitsubishi Japan	29-12-89
				ST-6	109.3	Mitsubishi Japan	12/6/1990
	AURAIYA CCPP				**663.36**		
6	DADRI CCPP	UTTAR PRADESH	Natural Gas				
				GT-1	130.19	SIEMENS	21-02-92
				GT-2	130.19	SIEMENS	26-03-92
				GT-3	130.19	SIEMENS	6/6/1992
				GT-4	130.19	SIEMENS	14-10-92
				ST-5	154.51	BHEL	26-02-94
				ST-6	154.51	BHEL	27-03-94
	DADRI CCPP				**829.78**		
7	FARIDABAD CCPP	HARYANA	Natural Gas				
				GT-1	137.76	SIEMENS	18-10-99
				GT-2	137.76	SIEMENS	18-10-99
				ST-3	156.07	BHEL	31-07-00
	FARIDABAD CCPP				**431.59**		

Annexure- 10.2

SECTOR-WISE DETAILS OF GAS TURBINE STATIONS DURING 2016-17

Sl. No	Sector/ Organization/ Station	Location	Type of fuel used	Unit Detail	Capacity (MW)	Make	Date of Synchronization
8	GANDHAR CCPP	GUJARAT	Natural Gas				
				GT-1	144.3	ABB	17-03-94
				GT-2	144.3	ABB	31-03-94
				GT-3	144.3	ABB	20-05-94
				ST-4	224.49	ABB	30-03-95
	GANDHAR CCPP				**657.39**		
9	KAWAS CCPP	GUJARAT	Natural Gas				
				GT-1	106	EGT	22-03-92
				GT-2	106	EGT	25-05-92
				GT-3	106	EGT	30-06-92
				GT-4	106	EGT	27-08-92
				ST-5	116.1	GEC ALSTOM	23-02-93
				ST-6	116.1	GEC Alstom	19-03-93
	KAWAS CCPP				**656.2**		
10	R. GANDHI CCPP (Liq.)	KERALA	Naptha				
				GT-1	115.2	BHEL/GE	2/11/1998
				GT-2	115.2	BHEL/GE	28-02-99
				ST-3	129.18	BHEL/GE	30-10-99
	R. GANDHI CCPP (Liq.)				**359.58**		
	ONGC						
11	TRIPURA CCPP	TRIPURA	Natural Gas				
				GT-1	363.3	BHEL/BHEL	2/1/2013
				GT-2	363.3	BHEL/BHEL	16-11-14
	TRIPURA CCPP				**726.6**		
	RGPPL						
12	RATNAGIRI CCPP	MAHARASHTRA	Natural Gas				
				GT-1	240	GE/BHEL	12/11/1998
				GT-2	240	GE/BHEL	12/11/1998
				ST-3	260	GE/BHEL	12/11/1998
				GT-1	240	GE/BHEL	30-04-06
				GT-2	240	GE/BHEL	14-05-06
				ST-3	260	GE/BHEL	7/5/2006
				GT-1	240	GE/BHEL	28-10-07
				GT-2	240	GE/BHEL	28-10-07
				ST-3	260	GE/BHEL	28-10-07
					2220		
STATE SECTOR							
	APEPDCL						
13	JEGURUPADU CCPP PH-I	ANDHRA PRADESH	Natural Gas S				
				GT-1	52.8	ALSTOM	4/7/1996
				GT-2	52.8	ALSTOM	26-10-96
				GT-3	52.8	ALSTOM	11/12/1996
				GT-4	77	ALSTOM	1/4/1998
					235.40		
	APGPCL						
14	LAKWA GT	ASSAM	Natural Gas				
				GT-2	15	WH	2/8/1981
				GT-3	15	WH	29-07-83
				GT-4	15	GE/BHEL	6/10/1986
				GT-5	20	GE/BHEL	3/1/1994
				GT-6	20	GE/BHEL	21-07-94
				GT-7	20	GE/BHEL	28-05-95
				ST-8	37.2		17-01-12
	LAKWA GT				**142.2**		

Annexure- 10.2

SECTOR-WISE DETAILS OF GAS TURBINE STATIONS DURING 2016-17

Sl. No	Sector/ Organization/ Station	Location	Type of fuel used	Unit Detail	Capacity (MW)	Make	Date of Synchronization
15	NAMRUP CCPP	ASSAM	Natural Gas				
				GT-1	20	BHEL	1/4/1987
				GT-2	21	BHEL	1/7/1987
				GT-3	21	BHEL	1/7/1987
				GT-4	11	BHEL	1/4/1992
				ST-5	24	BHEL/BHEL	6/3/1976
				ST-6	22	BHEL/BHEL	27-03-85
				GT-7	62.5	BHEL	11/01/2017
	NAMRUP CCPP				**181.25**		
	GPPCL						
16	PIPAVAV CCPP	GUJARAT	Natural Gas				
				ST-1	351	BHEL	5/2/2014
				ST-2	351	BHEL	22-03-13
	PIPAVAV CCPP				**702**		
	GSECL						
17	DHUVARAN CCPP	GUJARAT	Natural Gas				
				GT-1	67.85	BHEL	4/6/2003
				ST-2	38.77	BHEL	22-09-03
				GT-3	72	BHEL	17-03-06
				ST-4	40	BHEL	13-08-07
				GT-5	376.1		21-05-14
	DHUVARAN CCPP				**594.72**		
18	UTRAN CCPP	GUJARAT	Natural Gas				
				GT-1	33	GE/BHEL	17-12-92
				GT-2	33	GE/BHEL	28-12-92
				GT-3	33	GE/BHEL	7/5/1993
				ST-4	45	BHEL	17-07-93
				GT-5	240	ALSTOM	8/8/2009
				ST-6	134	ALSTOM	10/10/2009
	UTRAN CCPP				**518**		
	GSEGL						
19	HAZIRA CCPP	GUJARAT	Natural Gas				
				GT-1	52	ALSTOM	30-09-01
				GT-2	52	ALSTOM	30-09-01
				ST-3	52.1	ALSTOM	30-09-01
	HAZIRA CCPP				**156.1**		
20	HAZIRA CCPP EXT	GUJARAT	Natural Gas				
				GT-1	351	BHEL	18-02-12
	HAZIRA CCPP EXT				**351**		
	IPGPCL						
21	I.P.CCPP	DELHI	Natural Gas				
				GT-1	30	ALSTOM	28-05-86
				GT-2	30	ALSTOM	24-06-86
				GT-3	30	ALSTOM	31-07-86
				GT-4	30	ALSTOM	10/9/1986
				GT-5	30	ALSTOM	15-11-86
				GT-6	30	ALSTOM	14-05-86
				ST-7	30	BHEL	29-03-95
				ST-8	30	BHEL	31-10-95
				ST-9	30	BHEL	26-03-96
	I.P.CCPP				**270**		
	JKSPDC						
22	PAMPORE GPS (Liq.)	JAMMU AND KASHMIR	High Speed Diesel				
				GT-1	25	GE/BHEL	31-03-89

Annexure- 10.2

SECTOR-WISE DETAILS OF GAS TURBINE STATIONS DURING 2016-17

Sl. No	Sector/ Organization/ Station	Location	Type of fuel used	Unit Detail	Capacity (MW)	Make	Date of Synchronization
				GT-2	25	GE/BHEL	20-07-89
				GT-3	25	GE/BHEL	11/12/1989
				GT-4	25	GE/BHEL	7/1/1994
				GT-5	25	GE/BHEL	7/2/1994
				GT-6	25	GE/BHEL	4/4/1994
				GT-7	25	GE/BHEL	30-03-95
	PAMPORE GPS (Liq.)				**175**		
	MAHAGENCO						
23	URAN CCPP	MAHARASHTRA	Natural Gas				
				GT-5	108	KWU	1/4/1986
				GT-6	108	KWU	1/4/1986
				GT-7	108	KWU	1/4/1986
				GT-8	108	KWU	1/4/1986
				GT-9	120	SIEMENS,GERMANY	16-03-94
				GT-10	120	SIEMENS,GERMANY	28-10-94
	URAN CCPP				**672**		
	P&ED, Pudu.						
24	KARAIKAL CCPP	PUDUCHERRY	Natural Gas				
				GT-1	32.5	BHEL	2/7/1999
	KARAIKAL CCPP				**32.5**		
	PRAGATI						
25	PRAGATI CCGT-III	DELHI	Natural Gas				
				GT-1	250	BHEL	24-10-10
				GT-2	250	BHEL	17-02-11
				ST-3	250	BHEL	29-02-12
				GT-4	250	BHEL	27-06-12
				GT-5	250	BHEL	7/5/2013
				ST-6	250	BHEL	26-02-14
	PRAGATI CCGT-III				**1500**		
26	PRAGATI CCPP	DELHI	Natural Gas				
				GT-1	104.6	GE/BHEL	15-03-02
				GT-2	104.6	GE/BHEL	9/11/2002
				ST-3	121.2	GE/BHEL	31-01-03
	PRAGATI CCPP				**330.4**	GE/BHEL	
	RRVUNL						
27	DHOLPUR CCPP	RAJASTHAN	Natural Gas				
				GT-1	110	BHEL	29-03-07
				GT-2	110	BHEL	16-06-07
				ST-3	110	BHEL	27-12-07
	DHOLPUR CCPP				**330**		
28	RAMGARH CCPP	RAJASTHAN	Natural Gas				
				GT-1	3	Import by HAL BHEL	15-11-94
				GT-2	35.5	Import by HAL BHEL	12/1/1996
				GT-3	37.5	Import by HAL BHEL	7/8/2002
				ST-4	37.8	Import by HAL BHEL	31-03-03
				GT-5	110	BHEL	20-03-13
				ST-6	50	BHEL	1/5/2014
	RAMGARH CCPP				**273.8**		
	TNGDCL						
29	BASIN BRIDGE GT (Liq.)	TAMIL NADU	Naptha				

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SECTOR-WISE DETAILS OF GAS TURBINE STATIONS DURING 2016-17

Sl. No	Sector/ Organization/ Station	Location	Type of fuel used	Unit Detail	Capacity (MW)	Make	Date of Synchronization
				GT-1	30	SUMITOMO AND ABB	12/2/1996
				GT-2	30	SUMITOMO AND ABB	25-02-96
				GT-3	30	BHEL	1/4/1998
				GT-4	30	BHEL	1/4/1998
	BASIN BRIDGE GT (Liq.)				**120**		
30	KOVIKALPAL CCPP	TAMIL NADU	Natural Gas				
				GT-1	69.65	GE/BHEL	5/2/2001
				ST-2	38.23	GE/BHEL	5/2/2001
	KOVIKALPAL CCPP				**107.88**		
31	KUTTALAM CCPP	TAMIL NADU	Natural Gas				
				GT-1	63	GE/BHEL	27-11-03
				ST-2	37	GE/BHEL	24-03-04
	KUTTALAM CCPP				**100**		
32	VALUTHUR CCPP	TAMIL NADU	Natural Gas				
				GT-1	60	ANSALDO ENERGIA	24-12-02
				ST-2	34	ANSALDO ENERGIA	6/5/2008
				GT-3	59.8	BGR ENERGY SYSTEMS	13-03-03
				ST-4	32.4	BGR ENERGY SYSTEMS	31-08-08
	VALUTHUR CCPP				**186.2**		
	TSECL						
33	BARAMURA GT	TRIPURA	Natural Gas				
				GT-4	37.5	BHEL	27-11-02
				GT-5	21		3/8/2010
	BARAMURA GT				**58.5**		
34	ROKHIA GT	TRIPURA	Natural Gas				
				GT-1	8	BHEL	21-03-90
				GT-2	8	BHEL	26-11-90
				GT-3	8	BHEL	16-07-95
				GT-4	8	BHEL	15-12-95
				GT-5	8	BHEL	2/3/1997
				GT-6	8	BHEL	1/9/1997
				GT-7	21	BHEL	11/7/2002
				GT-8	21	BHEL	31-03-06
				GT-9	21	BHEL	31-08-13
	ROKHIA GT				**111**		
	WBPDC						
35	HALDIA GT (Liq.)	WEST BENGAL	High Speed Diesel				
				GT-1	20	John Brown, UK	4/10/1979
				GT-2	20	John Brown UK	12/12/1979
	HALDIA GT (Liq.)				**40**		
36	KASBA GT (Liq.)	WEST BENGAL	Naptha				
				GT-1	20	John Brown, UK	1/4/1991
				GT-2	20	John Brown UK	1/4/1991
	KASBA GT (Liq.)				**40**		
PRIVATE UTILITY							
	TATA PCL						
37	TROMBAY CCPP	MAHARASHTRA	Natural Gas				
				GT-1	120	SIEMENS, GERMANY	29-07-93

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SECTOR-WISE DETAILS OF GAS TURBINE STATIONS DURING 2016-17

Sl. No	Sector/ Organization/ Station	Location	Type of fuel used	Unit Detail	Capacity (MW)	Make	Date of Synchronization
				ST-2	60	SIEMENS, GERMANY	9/12/1994
	TROMBAY CCPP				**180**		
	IPP						
	ABAN POWR						
38	KARUPPUR CCPP	TAMIL NADU	Natural Gas				
				GT-1	70	GE	18-02-05
				ST-2	49.8	SIEMENS	15-07-05
	KARUPPUR CCPP				**119.8**		
	APGPCL						
39	VIJJESWARAM CCPP	ANDHRA PRADESH	Natural Gas				
				GT-1	33	GE/BHEL	1/4/2012
				GT-2	33	GE/BHEL	2/3/1991
				ST-3	34	GE/BHEL	1/4/1998
				GT-4	112	BHEL/BHEL	1/4/1997
				ST-5	60	GE/BHEL	1/4/1998
	VIJJESWARAM CCPP				**272**		
	BSES(C)						
40	COCHIN CCPP (Liq.)	KERALA	Naptha				
				GT-1	45	GE	6/6/1999
				GT-2	45	GE	6/6/1999
				ST-3	39	BHEL	6/6/1999
				GT-4	45	GE	6/6/1999
	COCHIN CCPP (Liq.)				**174**		
	BSES(P)						
41	PEDDAPURAM CCPP	ANDHRA PRADESH	Natural Gas				
				GT-1	142	ANSALDO ENERGIA	26-01-02
				ST-2	78	ANSALDO ENERGIA	12/9/2002
	PEDDAPURAM CCPP				**220**		
	CIPL						
42	PEGUTHAN CCPP	GUJARAT	Natural Gas				
				GT-1	135	SIEMENS GERMANY	1/4/1998
				GT-2	135	SIEMENS GERMANY	1/4/1998
				GT-3	135	SIEMENS GERMANY	14-02-98
				ST-4	250	SIEMENS GERMANY	13-10-98
	PEGUTHAN CCPP				**655**		
	ESSAR						
43	ESSAR CCPP	GUJARAT	Natural Gas				
				GT-1	110	GE/BHEL GE	10/8/1995
				GT-2	110	GE/BHEL	10/8/1995
				GT-3	185	GE/BHEL	10/8/1995
				GT-4	110	GE/BHEL	10/8/1995
	ESSAR CCPP				**515**		
	GAUTAMI						
44	GAUTAMI CCPP	ANDHRA PRADESH	Natural Gas				
				GT-1	145	ALSTOM	3/5/2009
				GT-2	145	ALSTOM	3/5/2009
				ST-3	174	ALSTOM	3/5/2009
	GAUTAMI CCPP				**464**		
	GIPCL						

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SECTOR-WISE DETAILS OF GAS TURBINE STATIONS DURING 2016-17

Sl. No	Sector/ Organization/ Station	Location	Type of fuel used	Unit Detail	Capacity (MW)	Make	Date of Synchronization
45	BARODA CCPP	GUJARAT	Natural Gas				
				GT-5	106	BHEL	26/08/97
				ST-6	54	BHEL	18/11/97
	BARODA CCPP				**160**		
46	GIPCL. GT IMP	GUJARAT	Natural Gas	GT-1	225		
	GIPCL. GT IMP				**225**		
	GIPL						
47	GAMA CCPP	UTTARAKHAND	Natural Gas				
				GT-1	220		25/04/2016
	GAMA CCPP				**220**		
	GMR ENERG						
48	GMR Energy Ltd - Kakinada	ANDHRA PRADESH	Natural Gas				
				GT-1	42.5	HDEC	8/5/2001
				GT-2	42.5	HDEC	8/5/2001
				GT-3	42.5	HDEC	8/5/2001
				GT-4	42.5	HDEC	8/5/2001
				ST-5	50	ABB	8/5/2001
	GMR Energy Ltd - Kakinada				**220**		
	GREL						
49	GREL CCPP (Rajahmundry)	ANDHRA PRADESH	Natural Gas				
				GT-1	240	Others	12/9/2015
				ST-2	144	Others	12/9/2015
				GT-3	240	Others	5/10/2015
				ST-4	144	Others	5/10/2015
	GREL CCPP (Rajahmundry)				**768**		
	APEPDCL						
50	JEGURUPADU CCPP PH-II	ANDHRA PRADESH	Natural Gas				
				ST-5	140	ALSTOM	9/10/2005
				ST-6	80	ALSTOM	11/11/2005
	JEGURUPADU CCPP				**220**		
	GVKP&IL						
	KONA						
51	KONASEEMA CCPP	ANDHRA PRADESH	Natural Gas				
				GT-1	140	SIEMENS	1/5/2009
				GT-2	140	SIEMENS	1/5/2009
				ST-3	165	SIEMENS	30-06-10
	KONASEEMA CCPP				**445**		
	KONDAPALI						
52	KONDAPALLI EXTN CCPP.	ANDHRA PRADESH	Natural Gas				
				GT-1	233	GE	5/12/2009
				ST-2	133	GE	19-07-10
	KONDAPALLI EXTN CCPP.				**366**		
53	KONDAPALLI CCPP	ANDHRA PRADESH	Natural Gas				
				GT-1	112	GE	22-06-00
				GT-2	112	GE	22-06-00
				ST-3	126	GE	22-06-00
	KONDAPALLI CCPP				**350**		
54	KONDAPALLI ST-3 CCPP	ANDHRA PRADESH	Natural Gas				
				GT-1	371	BHEL/GE	7/8/2015
				GT-2	371	BHEL/GE	5/9/2015

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SECTOR-WISE DETAILS OF GAS TURBINE STATIONS DURING 2016-17

Sl. No	Sector/ Organization/ Station	Location	Type of fuel used	Unit Detail	Capacity (MW)	Make	Date of Synchronization
	KONDAPALLI ST-3 CCPP				**742**		
	NDPL						
55	RITHALA CCPP	DELHI	Natural Gas				
				GT-1	35.75	BHEL	9/12/2010
				GT-2	35.75	BHEL	4/10/2010
				ST-3	36.5	BHEL	4/9/2011
	RITHALA CCPP				**108**		
	PENNA						
56	VALANTARVY CCPP	TAMIL NADU	Natural Gas				
				GT-1	38		30-09-04
				ST-2	14.8		30-11-04
	VALANTARVY CCPP				**52.8**		
	PGPL						
57	MANGOAN CCPP	MAHARASHTRA	Natural Gas				
				GT-1	388		14/07/2016
	MANGOAN CCPP				**388**		
	PPNPGCL						
58	P.NALLUR CCPP	TAMIL NADU	Natural Gas				
				GT-1	330.5		22-02-01
	P.NALLUR CCPP				**330.5**		
	RELIANCE						
59	GOA CCPP (Liq.)	GOA	Naptha				
				GT-1	48	GE/BHEL	14-08-99
	GOA CCPP (Liq.)				**48**		
	SPGL						
60	GODAVARI CCPP	ANDHRA PRADESH	Natural Gas				
				GT-1	47	SIEMENS	9/1/1997
				GT-2	47	SIEMENS	1/4/1998
				GT-3	47	SIEMENS	1/4/1998
				ST-4	67	PARSONS	31-03-98
	GODAVARI CCPP				**208**		
	SrEPL						
61	KASHIPUR CCPP	UTTARAKHAND		GT-1	225		20/11/16
	KASHIPUR CCPP				**225**		
	TOR. POW. (SUGEN)						
62	SUGEN CCPP	GUJARAT	Natural Gas				
				GT-1	382.5	SIEMENS	4/2/2009
				GT-2	382.5	SIEMENS	7/5/2009
				GT-3	382.5	SIEMENS	8/6/2009
	SUGEN CCPP				**1147.5**		
	TOR. POW. (UNOSUGEN)						
63	DGEN MEGA CCPP	GUJARAT					
				GT-1	400	Others	12/1/2014
				ST-2	400	Others	23-04-14
				ST-3	400	Others	9/3/2014
	DGEN MEGA CCPP				**1200**		
64	UNOSUGEN CCPP	GUJARAT					
				GT-1	382.5	Others	20-01-13
	UNOSUGEN CCPP				**382.5**		
	VEMAGIRI						
65	VEMAGIRI CCPP	ANDHRA PRADESH	Natural Gas				
				GT-1	233	CEC,USA	13-01-06

Annexure- 10.2

SECTOR-WISE DETAILS OF GAS TURBINE STATIONS DURING 2016-17

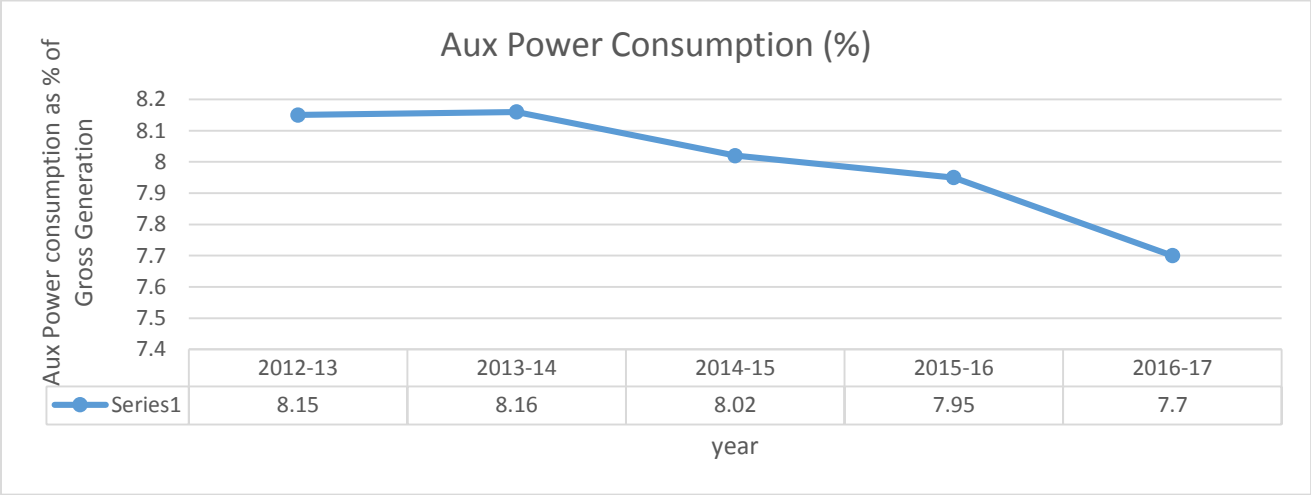
Sl. No	Sector/ Organization/ Station	Location	Type of fuel used	Unit Detail	Capacity (MW)	Make	Date of Synchronization
				ST-2	137	ALSTOM	8/6/2006
	VEMAGIRI CCPP				**370**		
	TOTAL ALL INDIA				**25274.88**		

SECTION -11
AUXILIARY POWER CONSUMPTION IN THERMAL POWER STATIONS

Auxiliary power consumption by the thermal stations comprises the power consumption by all the unit auxiliaries as well as the common station auxiliaries' requirement such as CW system, Water treatment, Coal and ash handling, Compressors, station lighting, air conditioning etc. The All India average auxiliary power consumption by the thermal stations during 2016-17 decreased to 7.35% from 7.95% during 2015-16

The auxiliary power consumption by thermal power stations as percentage of gross generation from 2011-12 onwards is shown below:

ALL INDIA AUX. POWER CONSUMPTION AS % OF GROSS GENERATION



11.1 REGION-WISE AUXILARY POWER CONSUMPTION

The region-wise auxiliary power consumption as percentage of gross generation from 2011-12 onwards is shown below:-

REGION	% AGE AUXILIARY POWER CONSUMPTION					
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
NORTHERN	8.52	8.44	8.35	8.02	8.53	8.05
WESTERN	8.72	8.12	7.84	8.03	7.63	7.48
SOUTHERN	8.17	7.66	8.12	7.76	7.89	7.85
EASTERN	8.16	8.38	8.57	8.3	8.11	7.64
NORTH EASTERN	-	-	-	-	-	9.37
ALL-INDIA	8.44	8.15	8.16	8.02	7.95	7.70

11.2 SECTOR-WISE AUXILARY POWER CONSUMPTION

The Sector-wise auxiliary power consumption as percentage of gross generation from 2011-12 onwards is shown below: -

REGION	% AGE AUXILIARY POWER CONSUMPTION					
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
CENTRAL SECTOR	**6.75**	**7.23**	**7.4**	**7.02**	**7.16**	**6.99**
STATE SECTOR	**9.62**	**8.95**	**9.23**	**8.95**	**9.28**	**9.03**
PVT UTILITY	**7.62**	**7.4**	**8.09**	**8.05**	**8.05**	**8.04**
PRIVATE IPPS	**10.16**	**8.55**	**7.82**	**8.15**	**7.51**	**7.22**
ALL INDIA	**8.44**	**8.15**	**8.16**	**8.02**	**7.95**	**7.70**

11.3 STATIONWISE AUXILIARY POWER CONSUMPTION

11.3.1 The auxiliary power consumption of a Station depends on various factors like type of equipment provided, fuel quality, site specific conditions and operating practices/operating efficiency. The choice of milling systems, fans and Boiler Feed Pump significantly affects the auxiliary power consumption. Fuel quality affects auxiliary power consumption in fuel handling, ash disposal system and also in main plant equipment. Some Stations have site specific requirements like Cooling water taken from very long distances affecting the auxiliary power consumption. Plant operation at low load factors also considerably affects the Auxiliary power consumption.

11.3.2 While it is not possible to account for all of the above factors for comparing auxiliary power consumption of the Stations, a categorization of Stations has been made based on two major factors affecting auxiliary power consumption so as to have meaningful comparisons amongst Stations. These are

- Boiler Type – Circulating Fluidized Bed Combustion vs. Conventional Pulverized coal fired boilers.
- Type of Boiler Feed Pump – Motor driven Vs Turbine driven BFP

11.3.3 The CFBC boilers have significantly higher Auxiliary power consumption due to their higher fan power. Similarly, units with TBFP have significantly lower auxiliary power consumption. Thus Stations with significant capacity (more than 50 %) in TBFP units have been considered as a separate category. The details of overall auxiliary power consumption in these categories of Stations are as under: -

Type of Station	Auxiliary Power Consumption (%)				
	2012-13	2013-14	2014-15	2015-16	2016-17
Stations with Circulating Fluidized Bed Combustion Boilers	13.48	13.64	12.50	12.31	12.28
Stations with PC Boilers and >50 % capacity with TBFPs	7.14	6.88	6.78	6.62	6.58
Stations with PC Boilers and >50 % capacity with MBFPs	8.89	9.26	9.12	9.60	9.29
Overall	**8.15**	**8.16**	**8.02**	**7.95**	**7.70**

Details of Station wise auxiliary power consumption in each of the above categories from 2012-13 onwards are given at the Annex. 11.1.

11.4 STATION AUXILIARY POWER CONSUMPTION Vs. NATIONAL AVERAGE APC

Table of APC lower than national average.

STATION'S NAME	CAPACITY	Utility	Sector	APC _2016-17
Stations with CFBC Boiler (All India Average APC – 12.28 %)				
Surat LIGNITE	500	GIPCL	Pvt	9.88
JALIPA KAPURDI TPP	1080	GSECL	State	12.02
Stations with Motor Driven BFP (All India Average APC - 9.29 %)				
TORANGALLU TPS(SBU-I)	260	JSWEL	PVT	7.23
BHILAI TPS	500	NSPCL	CENTRAL	7.52
UKAI TPS	1350	GSECL	STATE	7.59
NEYVELI (EXT) TPS	420	NLC	CENTRAL	7.73
KAMALANGA TPS	1050	GMR ENERG	PVT	7.76
MUNDRA UMTPP	4000	CGPL	PVT	7.85
DSPM TPS	500	CSPGCL	STATE	7.86
BALCO TPS	600	BALCO	PVT	7.94
MEJIA TPS	2340	DVC	CENTRAL	7.97
BUDGE BUDGE TPS	750	CESC	PVT	8.06
SANJAY GANDHI TPS	1340	MPPGCL	STATE	8.09
ROSA TPP Ph-I	1200	RPSCL	PVT	8.13
KORBA-WEST TPS	1340	CSPGCL	STATE	8.14
HALDIA TPP	600	HEL	PVT	8.15
PATHADI TPP	600	LANCO	PVT	8.15
TORANGALLU TPS(SBU-II)	600	JSWEL	PVT	8.21
DHARIWAL TPP	600	DIPL	PVT	8.23
TUTICORIN TPS	1050	TNGDCL	STATE	8.25
BUTIBORI TPP	600	VIP	PVT	8.39
KHAPARKHEDA TPS	1340	MAHAGENCO	STATE	8.43
HARDUAGANJ TPS	665	UPRVUNL	STATE	8.44
BINA TPS	500	JPPVL	PVT	8.56
METTUR TPS	840	TNGDCL	STATE	8.57
SANTALDIH TPS	980	WBPDC	STATE	8.58
RAICHUR TPS	1720	KPCL	STATE	8.63
GMR WARORA TPS	600	GMR ENERG	PVT	8.67
KORADI TPS	1700	MAHAGENCO	STATE	8.71
YAMUNA NAGAR TPS	600	HPGCL	STATE	8.77
GH TPS (LEH.MOH.)	920	PSPCL	STATE	8.79
Dr. N.TATA RAO TPS	1760	APGENCO	STATE	8.88
SABARMATI (D-F STATIONS)	362	TOR. POW.	PVT	8.9
UNCHAHAR TPS	1050	NTPC Ltd.	CENTRAL	9.03
NEYVELI TPS-II	1470	NLC	CENTRAL	9.05
MAHADEV PRASAD STPP	540	ADHUNIK	PVT	9.09
MAQSOODPUR TPS	90	BEPL	PVT	9.23
JSW RATNAGIRI TPP	1200	JSWEL	PVT	9.26
WANAKBORI TPS	1470	GSECL	STATE	9.27
KHAMBARKHERA TPS	90	BEPL	PVT	9.28
Stations with Turbine Driven BFP (All India Average APC - 6.58%)				
UDUPI TPP	1200	UPCL	PVT	5.03
AVANTHA BHANDAR	600	KWPCL	PVT	5.07
MAITHON RB TPP	1050	MPL	PVT	5.11
SIPAT STPS	2980	NTPC Ltd.	CENTRAL	5.26
KAWAI TPS	1320	APL	PVT	5.34
DERANG TPP	1200	JITPL	PVT	5.38
SIMHADRI	2000	NTPC Ltd.	CENTRAL	5.49
ANPARA C TPS	1200	LAPPL	PVT	5.54
TIRORA TPS	3300	APL	PVT	5.54
KODARMA TPP	1000	DVC	CENTRAL	5.55
RAJPURA TPP	1400	NPL	PVT	5.57
TALWANDI SABO TPP	1980	TSPL	PVT	5.61
NORTH CHENNAI TPS	1830	TNGDCL	STATE	5.7
BARH II	1320	NTPC Ltd.	CENTRAL	5.76
BARADARHA TPS	1200	DBPCL	PVT	5.77
NIGRI TPP	1320	JPPVL	PVT	6
SINGARENI TPP	1200	KPCL	STATE	6.09
TAMNAR TPP	2400	JPL	PVT	6.13
SASAN UMTPP	3960	SPL	PVT	6.14
KORBA STPS	2600	NTPC Ltd.	CENTRAL	6.22
RAMAGUNDEM STPS	2600	NTPC Ltd.	CENTRAL	6.23
KAKATIYA TPS	1100	TSGENCO	STATE	6.24

STATION'S NAME	CAPACITY	Utility	Sector	APC _2016-17
SHREE SINGAJI TPP	1200	MPPGCL	STATE	6.27
DADRI (NCTPP)	1820	NTPC Ltd.	CENTRAL	6.29
SALAYA TPP	1200	EPGL	PVT	6.3
TALCHER STPS	3000	NTPC Ltd.	CENTRAL	6.4
TROMBAY TPS	1400	TATA PCL	PVT	6.41
MAHATMA GANDHI TPS	1320	JhPL(HR)	PVT	6.43
All India Average APC -7.70%				

Annex. 11.1

STATIONWISE AUXILIARY POWER CONSUMPTION IN THERMAL POWER STATIONS FROM 2012-13 TO 2016-17

STATION'S NAME	CAPACITY	Auxiliary power consumption (%)				
		2012-13	2013-14	2014-15	2015-16	2016-17
STATIONS with CFBC Boiler						
I. CENTRAL SECTOR						
BARSINGSAR LIGNITE	250	11.38	16.16	11.28	$	13.39
NEYVELI TPS-II EXP	500	-	-	-	7.44	$
II. STATE SECTOR						
AKRIMOTA LIG TPS	250	18.06	16.62	15.43	15.31	15.28
GIRAL TPS	250	16.1	23.72	21.36	20.28	$
KUTCH LIG. TPS	290	13.4	13.21	12.75	10.88	14.71
BHAVNAGAR CFBC TPP	500	-	-	-	-	$
IV. PRIVATE IPPS						
JALIPA KAPURDI TPP	1080	12.85	11.81	10.81	11.3	12.02
SURAT LIG. TPS	500	13.42	13.01	14.51	11.65	9.88
IV. ALL INDIA	**3620**	**13.48**	**13.64**	**12.5**	**12.31**	**12.28**
PC Stations with Motor Driven BFP						
I. CENTRAL SECTOR						
BADARPUR TPS	705	8.45	9.15	10.2	9.85	9.96
BARAUNI TPS	210	-	-	-	-	10.08
BHILAI TPS	500	9.93	9.06	8.61	7.3	7.52
BOKARO `B` TPS	630	10	12.45	16	12.12	12.64
BONGAIGAON TPP	250	-	-	-	-	9.37
CHANDRAPURA(DVC) TPS	890	9.6	10.09	9.81	9.67	*
DURGAPUR TPS	340	10.63	10.72	11.14	12.74	$
MEJIA TPS	2340	8.8	9.29	8.63	8.2	7.97
MUZAFFARPUR TPS	220	-	20.05	11.01	13.99	*
NEYVELI (EXT) TPS	420	7.89	8.46	8.2	8.2	7.73
NEYVELI TPS- I	600	19.19	19.15	19.46	$	$
NEYVELI TPS-II	1470	8.04	8.79	6.17	9.03	9.05
NABI NAGAR TPP	250	-	-	-	-	$
PATRATU TPS	455	11.25	35.83	31.25	13.51	$
TALCHER (OLD) TPS	460	9.61	10.47	10.39	10.55	10.43
TANDA TPS	440	11.81	11.88	11.43	11.64	11.47
UNCHAHAR TPS	1050	8.24	8.85	8.79	9.06	9.03
II. STATE SECTOR						
AMARKANTAK EXT TPS	210	9.36	9.4	9.28	9.64	9.62
BAKRESWAR TPS	1050	8.87	10.23	9.63	10.31	10.02
BANDEL TPS	450	15.41	17.17	26.12	$	10.47
CHANDRAPUR(ASSAM) TPS	60	-	-	-	-	-
CHHABRA TPP	1000	10.63	11.62	10.66	14.17	9.72
D.P.L. TPS	880	9.64	12.23	13.53	10.73	9.85
Dr. N.TATA RAO TPS	1760	7.43	7.52	8.43	9.1	8.88
DSPM TPS	500	7.79	7.8	7.75	7.8	7.86
ENNORE TPS	340	14.78	16.08	18.38	$	$
GANDHI NAGAR TPS	870	9.44	10.12	9.17	9.64	9.85
GH TPS (LEH.MOH.)	920	7.89	7.97	7.14	8.75	8.79

STATION'S NAME	CAPACITY	Auxiliary power consumption (%)				
		2012-13	2013-14	2014-15	2015-16	2016-17
GND TPS(BHATINDA)	440	10.89	11.12	11.13	11.26	10.72
HARDUAGANJ TPS	665	13.6	11.3	9.02	9.36	8.44
IB VALLEY TPS	420	10.58	10.6	10.29	10.72	10.37
KHAPARKHEDA TPS	1340	8.5	8.42	7.35	9.08	8.43
KOLAGHAT TPS	1260	8.86	11.21	10.41	11.17	$
KORADI TPS	1700	$	14.04	12.68	9.53	8.71
KORBA-II	200	12.55	14.71	15.42	14.51	$
KORBA-III	240	11.69	11.63	12.37	10.94	11.27
KORBA-WEST TPS	1340	8.25	7.74	8.4	8.07	8.14
KOTA TPS	1240	9.46	9.85	10.05	10.36	11.46
KOTHAGUDEM TPS	720	9.08	11.01	10.4	12.73	10.54
METTUR TPS	840	8.27	9.33	7.97	12.68	8.57
NASIK TPS	630	9.84	11.57	11.2	10.94	10.82
OBRA TPS	1278	10.4	11.3	8.56	12.45	11.7
PANIPAT TPS	1360	10.23	10.32	10.94	$	10.34
PANKI TPS	210	13.73	13.75	13.03	$	12.75
PARAS TPS	500	10.24	10.58	11.93	10.95	10.75
PARICHHA TPS	1140	6.49	10.79	7.32	10.86	10.45
PARLI TPS	1130	12.19	9.52	11.26	12.17	11.21
RAICHUR TPS	1720	9.19	10.18	9.07	8.76	8.63
RAJGHAT TPS	135	13.03	14.83	14.42	-	-
RAMAGUNDEM - B TPS	62.5	8.37	8.42	9.71	9.76	11.1
RAYALASEEMA TPS	1050	9.53	10.77	13.34	10.63	10.23
ROPAR TPS	1260	7.96	7.02	8.8	9.05	10.73
SAGARDIGHI TPS	600	9.6	12.57	11.53	$	9.87
SANJAY GANDHI TPS	1340	7.43	7.57	8.69	8.25	8.09
SANTALDIH TPS	980	10.09	9.9	9.25	8.76	8.58
SATPURA TPS	1330	11.03	11.22	10.17	10.06	10.33
SIKKA REP. TPS	740	11.74	12.33	11.37	11.06	9.95
SURATGARH TPS	1500	8.46	9.06	9.32	10.43	9.88
TENUGHAT TPS	420	9.85	7.73	11.92	12.04	12.55
TUTICORIN TPS	1050	7.06	8.07	8.16	8.21	8.25
UKAI TPS	1350	8.34	7.56	6.66	8.22	7.59
WANAKBORI TPS	1470	8.81	9.19	8.76	8.9	9.27
YAMUNA NAGAR TPS	600	9.25	9.03	8.84	8.51	8.77
III. PVT UTILITY						
BUDGE BUDGE TPS	750	8.25	8.27	8.21	8.05	8.06
DAHANU TPS	500	8.8	9.02	8.85	9.02	9.3
NEW COSSIPORE TPS	160	11.86	16.83	21.17	$	$
SABARMATI (C STATION)	60	9.34	10.37	10.04	10.65	-
SABARMATI (D-F STATIONS)	362	9.4	9.71	9.09	9.28	8.9
SOUTHERN REPL. TPS	135	8.64	8.64	8.51	9.89	9.46
TITAGARH TPS	240	8.05	8.24	8.43	8.97	9.62
IV. PRIVATE IPPS						
AMARAVATI TPS	1350	-	17.51	13.91	9.9	9.54
ANPARA C TPS	1200	7.41	7.53	7.13	7.37	5.54
BALCO TPS	600	-	-	-	9.64	7.94
BANDAKHAR TPP	300	-	-	-	$	9.99

STATION'S NAME	CAPACITY	Auxiliary power consumption (%)				
		2012-13	2013-14	2014-15	2015-16	2016-17
BARKHERA TPS	90	10.46	10.58	9.96	9.46	9.4
BELA TPS	270	-	-	-	$	$
BINA TPS	500	10.64	9.73	8.15	8.15	8.56
BUTIBORI TPP	600	-	-	10.54	8.95	8.39
CHAKABURA TPP	30	-	-	11.73	11.95	$
DHARIWAL TPP	600	-	-	17.38	10.29	8.23
GEPL TPP Ph-I	120	9.18	16.34	$	$	$
GMR WARORA TPS	600	-	9.49	9.25	9.44	8.67
GOINDWAL SAHIB TPP	540	-	-	-	-	10.4
HALDIA TPP	600	-	-	-	9.16	8.15
JOJOBERA TPS	360	9.9	10.78	9.54	9.43	$
JSW RATNAGIRI TPP	1200	10.03	9.76	9.06	8.91	9.26
KAMALANGA TPS	1050	-	-	8.35	7.89	7.76
KASAIPALLI TPP	270	$	11.16	11.76	11.82	11.23
KATGHORA TPP	35	27.46	$	$	$	$
KHAMBARKHERA TPS	90	11.58	10.71	10.06	9.8	9.28
KUNDARKI TPS	90	10.92	12.35	9.66	10.02	9.31
MAHADEV PRASAD STPP	540	11.01	8.29	8.17	8.34	9.09
MAQSOODPUR TPS	90	11.67	10.44	8.61	9.72	9.23
MIHAN TPS	246	*	*	*	*	$
MUNDRA UMTPP	4000	7.35	7.49	7.23	7.76	7.85
NASIK (P) TPS	270	$	$	$	$	$
NAWAPARA TPP	300	-	-	-	-	9.85
NEYVELI TPS(Z)	250	7.85	7.85	8.28	8.8	*
NIWARI TPP	45	-	*	19.37	$	13.81
OP JINDAL TPS	1000	8.79	9.48	9.14	9.84	9.77
PATHADI TPP	600	10.25	10.07	9.43	8.88	8.15
RATIJA TPS	50	-	17.85	19.13	$	*
ROSA TPP Ph-I	1200	9.02	6.41	8.65	8.87	8.13
SALORA TPP	135	-	-	12.79	$	$
SIMHAPURI TPS	600	-	10.47	10.02	10.47	11.39
SVPL TPP	63	19.06	$	$	$	10.68
SWASTIK KORBA TPP	25	-	-	-	-	$
THAMMINAPATNAM TPS	300	-	12.91	10.7	10.61	11.79
TORANGALLU TPS(SBU-I)	260	7.19	6.91	6.94	7.12	7.23
TORANGALLU TPS(SBU-II)	600	7.9	7.87	7.25	7.48	8.21
TUTICORIN (P) TPP	300	-	12.35	12.38	12.34	$
UCHPINDA TPP	720	-	-	-	-	*
UTRAULA TPS	90	11.03	10.68	9.78	8.64	9.33
UTKAL TPP(IND BARATH)	350	-	-	-	-	$
WARDHA WARORA TPP	540	10.73	10.57	10.74	11	11.77
IV. ALL India MBFP Stations	**81786.5**	**8.89**	**9.26**	**9.12**	**9.49**	**9.29**
PC Stations with Turbine Driven BFP						
I. CENTRAL SECTOR						
BARH II	1320	-	-	6.4	5.17	5.76
BELLARY TPS	1000	7.42	6.23	6.36	6	6.91
BHUSAWAL TPS	1420	9.81	11.29	9.17	7.11	6.89
BOKARO TPS `A` EXP	500	-	-	-	-	$

STATION'S NAME	CAPACITY	Auxiliary power consumption (%)				
		2012-13	2013-14	2014-15	2015-16	2016-17
DADRI (NCTPP)	1820	6.35	6.62	6.43	6.38	6.29
DURGAPUR STEEL TPS	1000	*	6.21	6.85	5.87	$
FARAKKA STPS	2100	6.93	6.5	6.61	7.06	7.19
INDIRA GANDHI STPP	1500	6.68	6.58	6.23	6.54	6.68
KAHALGAON TPS	2340	7.79	7.9	7.24	6.99	6.89
KODARMA TPP	1000	-	6.9	8.01	6.12	5.55
KORBA STPS	2600	6.26	6.29	6.14	6.04	6.22
MAUDA TPS	1000	-	11.35	8.86	7.64	6.8
RAGHUNATHPUR TPP	1200	-	-	-	$	7.97
RAMAGUNDEM STPS	2600	6.02	6.03	5.85	6.12	6.23
RIHAND STPS	3000	6.59	6.69	6.83	6.66	6.64
SIMHADRI	2000	5.9	5.76	5.48	5.56	5.49
SINGRAULI STPS	2000	7.12	7.25	7.28	7.32	7.82
SIPAT STPS	2980	6.22	6.04	5.33	5.39	5.26
TALCHER STPS	3000	6.54	6.5	5.85	6.14	6.4
TUTICORIN (JV) TPP	1000	-	-	-	8.59	$
VALLUR TPP	1500	-	7.33	7.52	7.54	7.02
VINDHYACHAL STPS	4760	6.27	6.31	6.35	6.61	6.71
II. STATE SECTOR						
ANPARA TPS	2630	8.84	8.49	8.65	8.31	8.79
BELLARY TPS	1000	7.42	6.23	6.36	6	6.91
BHUSAWAL TPS	1420	9.81	11.29	9.17	7.11	6.89
CHANDRAPUR(MAHARASHTRA) STPS	2340	9.39	9.83	8.97	8.41	9.37
DAMODARAM SANJEEVAIAH TPS	1600	-	-	-	8.52	7.13
KAKATIYA TPS	1100	5.81	6.27	6.43	5.69	6.24
KALISINDH TPS	1200	-	-	8.48	9.28	6.96
KOTHAGUDEM TPS (NEW)	1000	6.77	5.97	6.32	7.96	7.91
MARWA TPS	500	-	-	-	$	$
METTUR TPS - II	600	-	-	-	-	6.79
NORTH CHENNAI TPS	1830	9.12	9.42	7.4	6.31	$
RAJIV GANDHI TPS	1200	5.87	5.78	5.95	6.63	$
SHREE SINGAJI TPP	1200	-	-	7.2	7.14	6.27
SINGARENI TPP	1200	-	-	-	-	6.09
YERMARUS TPP	800	-	-	-	-	$
III. PVT UTILITY						
TROMBAY TPS	1400	4.86	6.11	6.08	6.5	6.41
IV. PRIVATE IPPS						
AKALTARA TPS	1200	-	-	7.93	7.2	$
ANPARA C TPS	1200	7.41	7.53	7.13	7.37	5.54
ANUPPUR TPP	1200	-	-	-	7.98	8.21
AVANTHA BHANDAR	600	-	-	*	5.3	5.07
BARADARHA TPS	1200	-	-	-	6.57	5.77
DERANG TPP	1200	-	-	7.74	$	5.38
ITPCL TPP	600	-	-	-	$	$
KAWAI TPS	1320	-	6.08	5.9	5.26	5.34
LALITPUR TPS	1980	-	-	-	$	7.61
MAHAN TPP	600	-	*	10.24	-	7.2

STATION'S NAME	CAPACITY	Auxiliary power consumption (%)				
		2012-13	2013-14	2014-15	2015-16	2016-17
MAHATMA GANDHI TPS	1320	12.61	6.17	5.96	6.33	6.43
MAITHON RB TPP	1050	5.88	5.48	5.07	5.02	5.11
MUNDRA TPS	4620	8.69	7.34	7.89	7.48	7.33
MUTHIARA TPP	1200	-	-	-	8.2	7.1
NIGRI TPP	1320	-	-	*	6.93	6
PRAYAGRAJ TPP	1320	-	-	-	$	7.8
RAIKHEDA TPP	685	-	-	-	$	*
PAINAMPURAM TPP	1320	-	-	-	4.32	*
RAJPURA TPP	1400	-	8.8	12.28	5.71	5.57
SALAYA TPP	1200	-	6.6	5.83	6.36	6.3
SASAN UMTPP	3960	-	-	6.99	6.29	6.14
SGPL TPP	1320	-	-	-	-	*
SEIONI TPP	600	-	-	-	-	10
STERLITE TPP	1200	10.96	8.53	7.59	8.1	7.53
TALWANDI SABO TPP	1980	-	-	11.89	7.87	5.61
TAMNAR TPP	2400	-	*	8.3	6.14	6.13
TIRORA TPS	3300	9.86	5.91	5.91	5.56	5.54
UDUPI TPP	1200	6.53	6.37	6.15	5.79	5.03
VIZAG TPP	520	-	-	-	8.9	*
IV. ALL India TBFP Stations	**105675**	**7.14**	**6.88**	**6.78**	**6.62**	**6.58**
ALL INDIA TOTAL		**8.15**	**8.16**	**8.02**	**7.95**	**7.70**

* Station data is not available.

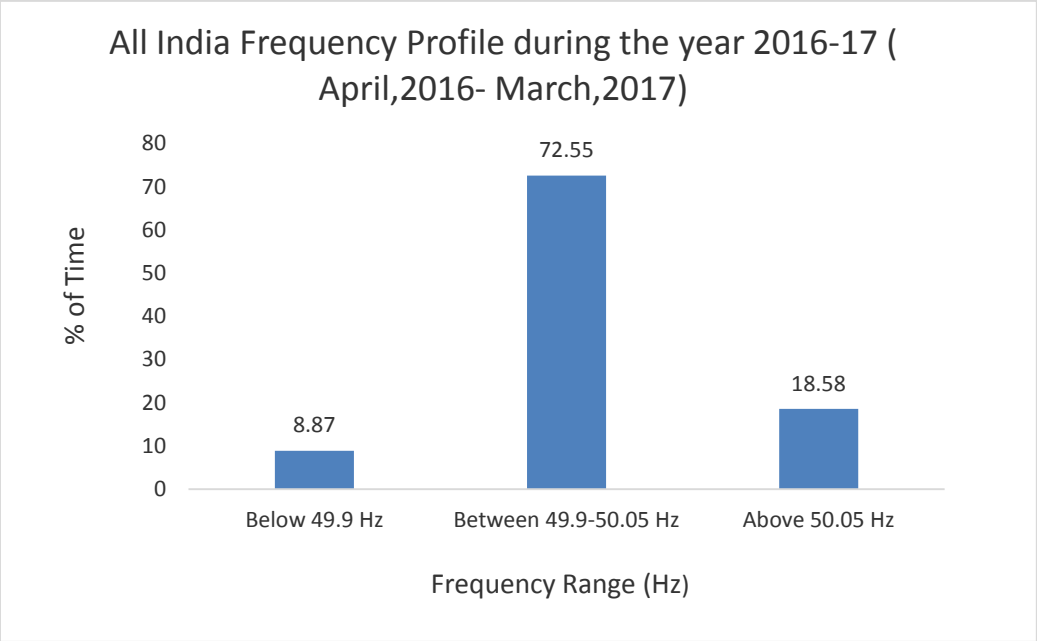
$ % not computed but APC account in overall APC.

\- Station did not exist/non-operational in the years.

SECTION-12
STATION OPERATION UNDER DISTURBED GRID CONDITIONS

12.2 Indian Electricity Grid Code (IEGC) specifies operating band of 49.90 Hz to 50.05 Hz for grid frequency The percentage of time during which the power systems of the country operated below 49.9 Hz, between 49.9 to 50.05 Hz (IEGC Band) and above 50.05 Hz and the maximum and minimum frequencies of the grid during the year 2016-17 is given in the following table and is also shown in the Figure:

% of Time when Frequency was			Maximum	Minimum
Below 49.9 Hz	**Between 49.9-50.05 Hz**	**Above 50.05 Hz**	**Frequency (Hz)**	**Frequency (Hz)**
8.87	72.55	18.58	50.33	49.66



12.3 The monthly All India Frequency Profile during the year 2016-17 and 2015-16 are shown in **Annexure-12.1 and Annexure-12.2 respectively.**

Annexure-12.1

ALL INDIA FREQUENCY PROFILE (MONTHLY) DURING 2016-17

Month	% of Time when Frequency was				
	Below 49.9 Hz	Between 49.9-50.05 Hz	Above 50.05 Hz	Max. Frequency	Min. Frequency
April	14.28	69.52	16.20	50.32	49.64
May	7.54	69.95	22.51	50.44	49.56
June	8.35	73.28	18.37	50.37	49.65
July	4.58	72.22	23.20	50.35	49.69
August	6.71	72.69	20.60	50.35	49.65
September	6.74	74.66	18.60	50.24	49.67
October	7.31	75.43	17.26	50.25	49.74
November	10.98	72.54	16.48	50.27	49.54
December	13.24	69.22	17.54	50.31	49.67
January	7.54	71.17	21.29	50.33	49.71
February	7.65	75.86	16.47	50.34	49.76
March	11.53	74.02	14.46	50.34	49.66
Average	**8.87**	**72.55**	**18.58**	**50.33**	**49.66**

Annexure-12.2

ALL INDIA FREQUENCY PROFILE (MONTHLY) DURING 2015-16

Month	% of Time when Frequency was				
	Below 49.9 Hz	Between 49.9-50.05 Hz	Above 50.05 Hz	Max. Freq	Min. Freq
April	16.65	60.11	23.24	50.55	49.50
May	18.07	64.13	17.80	50.55	49.19
June	10.34	64.44	25.22	50.53	49.56
July	11.97	70.12	17.91	50.33	49.56
August	17.42	69.46	13.12	50.27	49.55
September	32.00	57.88	10.12	50.33	49.36
October	15.32	68.33	16.35	50.33	49.62
November	12.58	66.22	21.20	50.28	49.64
December	17.42	64.87	17.71	50.32	49.58
January	11.45	68.63	19.92	50.39	49.70
February	6.91	71.30	21.79	50.39	49.71
March	10.79	69.50	19.71	50.35	49.68
Average	**15.08**	**66.25**	**18.67**	**50.39**	**49.55**