



GRID REPORT

December 2001

SYSTEM OPERATION REPORT OF NORTHERN REGION FOR THE MONTH OF DECEMBER, 2001

A. SUMMARY REPORT:

I Important events:

(a) Commissioning of new units /lines/transformers during the month.

SURATGARH #3 of RRVUNL synchronised on 08.12.2001 at 18:33 hrs.

(b) Major problems / constraints affecting grid operation including major grid disturbances.

The average system frequency during the month of December 2001, was 49.66 Hz and frequency remained between 49.0 & 50.5 Hz for 81.69 % of time. The system voltage condition was satisfactory.

During the month a large number of tripping occurred in the system mainly during night hrs and early morning hrs due to thick fog conditions. However no major incident occurred in the system except some loss of generation in limited areas, and on few occasions generation backing down had to done in Uri HEP due to tripping of 400kV Uri-Wagoora D/C .

There was no major grid disturbance in the region during December 2001.

(c) Important decisions taken during the month in various meeting / other forums.

NIL

II. CENTRAL GENERATING STATIONS SHARE vs DRAWAL OF ALL CONSTITUENTS DURING DECEMBER 2001(All figs.
in MU)

Sl. No.	State/UT/ System	NTPC (Excl. BTPS, Tanda & FGPS) Entitlement	Actual	NHPC Entitlement	Actual	NPC (Excl. RAPS- A) Entitlement	Actual	BBMB Entitlement	Actual	TOTALS Entitlement	Actual
1	Chandigarh	32.80	27.81	2.87	2.87	3.57	0.66	45.34	45.24	84.58	76.59
2	Delhi	805.36	736.53	24.25	24.25	67.99	1.53	0.00	0.00	897.60	762.32
3	Haryana	454.08	466.62	29.44	29.43	24.83	78.47	176.14	177.13	684.49	751.65
4	H.P.	124.47	128.45	13.77	13.76	13.30	14.91	20.31	20.37	171.84	177.49
5	J & K	249.24	266.74	56.69	56.69	109.28	150.06	0.00	0.00	415.22	473.49
6	Punjab	362.11	334.26	45.25	45.25	32.01	3.16	248.96	250.31	688.33	632.98
7	Rajasthan	658.77	677.07	20.30	20.30	231.18	255.79	167.66	168.13	1077.90	1121.29
8	U.P.	1544.14	1620.89	40.94	40.94	102.25	79.82	0.00	0.00	1687.33	1741.65
9	MP / N.F.F.	8.33	15.92	0.00	0.00	0.00	0.00	14.88	12.11	23.21	28.03
10	Bihar Trans.	0.00	2.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.06
11	Losses	112.12	112.12	7.16	7.16	9.97	9.97	35.77	35.78	165.03	165.02
12	Others	58.53	21.49	0.00	0.00	0.00	0.00	0.00	0.00	58.53	21.49
	Total	4409.96	4409.96	240.66	240.66	594.38	594.38	709.06	709.06	5954.06	5954.06

III. INTER REGIONAL EXCHANGES IN MU AND PEAK MW

	Energy (MU)	Peak MW
a. Import over HVDC Back to Back at Vindhyachal	11.85	250
b. M.P. to Rajasthan(Ujjain - Kota)	0.00	0
Eastern region to Northern region		
c. (Import)	185.81	350
d. Export over HVDC Back to Back at Vindhyachal	28.94	450
220 KV Auraiya -		
e. Malanpur	14.48	25
f. Northern region to Bihar (Export)	1.86	0
g. Tanakpur to Mahendranagar(NEPAL) (Export)	6.58	11

IV. FREQUENCY PROFILE

a. Maximum frequency	51.24	Hz	at	22:59	hours on	28.12.2001
Minimum frequency	48.16	Hz	at	06:53	hours on	17.12.2001
Average frequency	49.66	Hz				

b. Frequency distribution in %

Hz	< 48.5	<49.0	49.0-50.5	> 50.5
%	1.31	11.74	81.69	6.57

c. Frequency Variation Index

Monthly Average	4.28
Maximum	7.37
Minimum	2.07

V. POWER SUPPLY POSITION IN NORTHERN REGION

a. Average Energy/day (Net)

State / U.T.	Availability MU/Day	Requirement MU/Day	Shortage MU/Day	Shortage %
Chandigarh	2.47	2.47	0.00	0.00
Delhi	45.43	46.65	1.22	2.62
Haryana	44.24	45.91	1.67	3.64
H.P.	9.44	9.44	0.00	0.00
J & K	18.77	19.88	1.11	5.58
Punjab	60.96	64.29	3.33	5.18
Rajasthan	71.74	72.58	0.84	1.16
U.P.	124.67	136.09	11.42	8.39
N.F.F./Rail	1.09	1.09	0.00	0.00
Total	378.81	398.40	19.59	4.92

b. Peak MW

State / U.T.	MAX. Availability MW	MAX. Requirement MW	Shortage MW		Shortage %	
			ARITH- METICAL	AT MAXM. REQT HR	ARITH- METICAL	AT MAXM. REQT HR
	A	B	C=B-A	D	(C/B)*100	(D/B)*100
Chandigarh	148	148	0	0	0.00	0.00
Delhi	2584	2871	287	308	10.00	10.73
Haryana	2503	2726	223	429	8.18	15.74
H.P. *	562	562	0	0	0.00	0.00
J & K *	999	1209	210	210	17.37	17.37
Punjab	3541	3714	173	230	4.66	6.19
Rajasthan	3540	3559	19	160	0.53	4.50
U.P.	6400	7339	939	1005	12.79	13.69
N.F.F./Rail	58	58	0	0	0.00	0.00
Region	19748	21828	2080	2080	9.53	9.53

Diversity Factor = 1.08

* Approximate and Estimated

B. DETAILED REPORT

I. 1. INSTALLED / EFFECTIVE CAPACITY AT THE END OF DECEMBER 2001

II. <u>INSTALLED / EFFECTIVE CAPACITY AT THE END OF DECEMBER 2011</u>					
-	<u>STATION</u>	<u>INSTALLED CAPACITY</u> <u>(MW)</u>		<u>EFFECTIVE CAPACITY</u>	
1	CENTRAL SECTOR				
A	NTPC				
(a)	Badarpur TPS	3x100+2x210	720.00	3x95+2x210	705.00
(b)	Singrauli STPS	5x200+2x500	2000.00	5x200+2x500	2000.00
(c)	Rihand STPS	2x500	1000.00	2x500	1000.00
(d)	Dadri NCTPS	4x210	840.00	4x210	840.00
(e)	Unchahar TPS	2x210 + 2x210	840.00	2x210 + 2x210	840.00
(f)	Tanda TPS	4x110	440.00	4x110	440.00
(g)	Anta GPS	3x88.71+1x153.20	419.33	3x88.71+1x153.20	419.33

(h)	Auraiya GPS	4x111.19+2x109.30	663.36	4x111.19+2x109.30	663.36
(i)	Dadri GPS	4x130.19+2x154.51	829.78	4x130.19+2x154.51	829.78
(j)	Faridabad GPS	2x137.75 +1x156.07	431.57	2x137.75 +1x156.07	431.57
	Sub-Total		8184.04		8169.04
B	NHPC				
(a)	Bairasiul	3x60	180.00	3X60	180.00
(b)	Salal Stage - I	3x115	345.00	3x115	345.00
(c)	Salal Stage - II	3x115	345.00	3x115	345.00
(d)	Tanakpur HPS	3x40	120.00	3x31.4	94.20
(e)	Chamera HPS	3x180	540.00	3x180	540.00
(f)	URI	4x120	480.00	4x120	480.00
	Sub-Total		2010.00		1984.20
C.	NPC				
(a)	RAPS -A	2x220	440.00	1x100+1x200	300.00
(b)	RAPS -B	2x220	440.00	2x220	440.00
(c)	NAPS	2x235	470.00	2x220	440.00
	Sub-Total		1350.00		1180.00
Total Central Sector (A + B + C)			11544.04		11333.24
2	BBMB				
(a)	Bhakra Complex				
(i)	Bhakra (L)	5x108	540.00	5x108	540.00
(ii)	Bhakra (R)	5x157	785.00	5x157	785.00
(iii)	Ganguwal	1x29.25+1x27.63+1X26.7	83.58	1x29.25+1x27.63+1X26.7	83.58
(iv)	Kotla	1x29.25+1x24.2+1x28.12	81.57	1x29.25+1x24.2+1x28.12	81.57
	Sub-Total		1490.15		1490.15

(b)	Dehar	6x165	990.00	6x165	990.00
(c)	Pong	4x60 + 2x66	372.00	4x60 + 2x66	372.00
	Total BBMB		2852.15		2852.15
3	CHANDIGARH				
(a)	Diesel Gen Sets		2.00		1.40
4	DELHI				
	THERMAL				
(a)	Indra Prastha	3x62.5+1x60	247.50	3x62.5+1x60	247.50
(b)	Rajghat	1x15+2x67.5	150.00	1x14+2x67.5	149.00
(c)	Gas Turbines	6x30+3x34	282.00	6x30+3x34	282.00
	Total DELHI		679.50		678.50
5	HARYANA				
	HYDRO				
(a)	Western Yamuna Canal (WYC)	6x8	48.00	6x8	48.00
	Total Hydro		48.00		48.00
	THERMAL				
(b)	Faridabad (New)	3x60	180.00	3x55	165.00
(c)	Panipat	4x110+2x210	860.00	4x110+2x210	860.00
	Total Thermal		1040.00		1025.00
(d)	Magnum Diesel (IPP)	4x6.3	25.20	4x6.3	25.20
	Total Haryana		1113.20		1098.20
6	HIMACHAL PRADESH				
	HYDRO				
(a)	Giri	2x30.00	60.00	2x30.00	60.00

(b)	Bassi	4x15.00	60.00	4x15.00	60.00
(c)	Binwa	2x 3.00	6.00	2x 3.00	6.00
(d)	Rongtong	4x 0.50	2.00	4x 0.50	2.00
(e)	Andhra Micro	3x 5.65	16.95	3x 5.65	16.95
(f)	Hydel+Killar+Thirot		9.22		8.52
(g)	Nogli	2x 0.25+4x0.50	2.50	2x 0.25+4x0.50	2.50
(h)	Bhabha (H)	3x40.00	120.00	3x40.00	120.00
(i)	Baner (H)	3x 4.00	12.00	3x 4.00	12.00
(j)	Gaj (H)	3x 3.50	10.50	3x 3.50	10.50
(k)	Sal -2	1x 2	2.00	1x 2	2.00
(l)	Gumma	.	3.00	3	3.00
(m)	Ghanvi	2x11.25	22.50	2x11.25	22.50
(n)	Diesel Gen. Sets		0.13		0.13
(o)	Malana(IPP)	2x43	86.00	2x43	86.00
	Total HP		412.80		412.10
7 J & K					
	HYDRO				
(a)	Lower Jhelum	3x35.0	105.00	3x35.0	105.00
(b)	Upper Sindh	2x11.30+1x35.0	57.60	2x11.30+1x35.0	57.60
(c)	Ganderbal	2x3+2x4.5	15.00	2x3+2x4.5	15.00
(d)	Mohra	2x4.5	9.00	2x4.5	9.00
(e)	Chenani	5x4.66 +2X1.0	25.30	5x4.66 +2X1.0	25.30
(f)	Stakna	2x2.0 +3x1.25 +2.0	9.75	2x2.0 +3x1.25 +2.0	9.75
(g)	Small Hydel		3.54		3.54
	Total Hydro		225.19		225.19
J & K (Contd.)					
	GAS TURBINES				
(h)	Pampore GT St - I	3x25.0	75.00	3x25.0	75.00
	Pampore GT St - II	4x25.0	100.00	4x25.0	100.00

	Total Gas		175.00		175.00
(l)	Diesel Gen. Sets		8.94		7.18
	Total J & K		409.13		407.37
8	PUNJAB				
	HYDRO				
(a)	Jogindernagar/ Shanan	4x15+1x50	110.00	4x15+1x50	110.00
(b)	Upper Behari Doab Canal (UBDC)	3x15+3x15	90.00	3x15+3x15	90.00
(c)	Mukerian	6x15+6x19.5	207.00	6x15+6x19.5	207.00
(d)	Anandpur Sahib (APS)	4x33.5	134.00	4x33.5	134.00
(e)	Ranjit Sagar HPS	4x150	600.00	4x150	600.00
(f)	Small Hydrel		4.10		4.10
	Total Hydro		1145.10		1145.10
	THERMAL				
(g)	Guru Nanak Dev TPS (Bhatinda)	4x110	440.00	4x110	440.00
(h)	Guru Gobind Singh TPS (Ropar)	6x210	1260.00	6x210	1260.00
(i)	Lehra Mohabbat TPS	2x210	420.00	2x210	420.00
(j)	Jhalkeri Rice Straw Fired	1x10	10.00	1x10	10.00
	Total Thermal		2130.00		2130.00
	Total Punjab		3275.10		3275.10
9	RAJASTHAN				
	HYDRO				
(a)	Mahi Bajaj Sagar Rana Pratap Sagar	2x25+2x45	140.00	2x25+2x45	140.00
(b)	(RPS)	4x43	172.00	4x43	172.00

(c)	Jawahar Sagar (JS)	3x33	99.00	3x33	99.00
(d)	Anoopgarh	6x1.5	9.00	6x1.5	9.00
(e)	Small Hydro		14.32		14.32
	Total Hydro		434.32		434.32
	THERMAL				
(f)	Kota TPS	2x110+3x210	850.00	2x110+3x210	850.00
(g)	Suratgarh TPS	3x250	750.00	3x250	750.00
(g)	Ramgarh GT	1x3	3.00	1x3	3.00
(i)	Ramgarh GT EXT.	1x35.5	35.50	1x35.5	35.50
	Total Thermal		1638.50		1638.50
(J)	Wind farm	2+2	4.00	2+2	4.00
	Total Rajasthan		2076.82		2076.82
10 UP					
	HYDRO				
(a)	Rihand	6x50.0	300.00	6x50.0	300.00
(b)	Obra	3x33.0	99.00	3x33.0	99.00
(c)	Matatilla	3x10.0	30.00	3x10.0	30.00
(d)	Khatima	3x13.8	41.40	3x13.8	41.40
(e)	Ramganga	3x66.0	198.00	3x66.0	198.00
(f)	Ganga Canal				
	Bhola	4x.375+2x.6+		4x.375+2x.6+	
	Salara	2x1.5+		2x1.5+	
	Chitwa	2x1.5+		2x1.5+	
	Nirgazni	2x2.5+		2x2.5+	
	Mohamedpur	3x3.1+		3x3.1+	
	Pathri	3x6.8	43.40	3x6.8	43.40
(g)	Yamuna (I & IV)				
	- Dhalipur	3x17.00+		3x17.00+	
	- Dhakrani	3x11.25+		3x11.25+	

	- Kulhal	3x10.00	114.75	3x10.00	114.75
(h)	Chibro	4x60.0	240.00	4x60.0	240.00
(i)	Khodri	4x30.0	120.00	4x30.0	120.00
(j)	Chilla	4x36.0	144.00	4x36.0	144.00
(k)	Maneri Bhali	3x30.0	90.00	3x30.0	90.00
(l)	Khara	3x24.0	72.00	3x24.0	72.00
(m)	Sobla & small hydro	6 +12.2	18.20	6 +12.2	18.20
	Total Hydro		1510.75		1510.75
	THERMAL				
(m)	Obra	5x50	250.00	4x40	160.00
(n)	Obra Extn. - I	3x100	300.00	3x94	282.00
(o)	Obra Extn. - II	5x200	1000.00	5x200	1000.00
(p)	Panki	1x32	32.00	1x32	32.00
(q)	Panki Extn.	2x110	220.00	2x105	210.00
(r)	Harduaganj - A	3x30	90.00	0	0.00
(s)	Harduaganj - B	2x50+2x60	220.00	1x40+2x55	150.00
(t)	Harduaganj - C	2x60+1x110	230.00	2x60+1x105	225.00
(u)	Paricha	2x110	220.00	2x110	220.00
(v)	Anpara - A	3x210	630.00	3x210	630.00
(w)	Anpara - B	2x500	1000.00	2x500	1000.00
	Total Thermal		4192.00		3909.00
	Total UP		5702.75		5419.75
Total Region (1 to 9)			28067.49		27554.63

2. SUMMARY OF THE EFFECTIVE GENERATING CAPACITY(MW) IN THE NORTHERN REGION AT THE END OF DECEMBER 2001

Agency / Source	Hydro	Thermal	Gas/Diesel/Wind	Nuclear	Total	% of Total
NTPC	---	5825.00	2344.04	---	8169.04	29.65%
NHPC	1984.20	---	---	---	1984.20	7.20%
NPC	---	---	---	1180.00	1180.00	4.28%
BBMB	2852.15	---	---	---	2852.15	10.35%
CHANDIGARH	---	---	1.40	---	1.40	0.01%
DELHI	---	396.50	282.00	---	678.50	2.46%
HARYANA	48.00	1025.00	25.20	---	1098.20	3.99%
HIMACHAL	411.97	---	0.13	---	412.10	1.50%
J&K	225.19	---	182.18	---	407.37	1.48%
PUNJAB	1145.10	2130.00	---	---	3275.10	11.89%
RAJASTHAN	434.32	1600.00	42.50	---	2076.82	7.54%
UP	1510.75	3909.00	---	---	5419.75	19.67%
Total	8611.68	14885.50	2877.45	1180.00	27554.63	100.00%
% of TOTAL	31.25%	54.02%	10.44%	4.28%	100.00%	

Notes The above table doesn't take into account the shares of a state in power stations located in the neighbouring state. Details of this is as under :

- (i) Haryana has one-third share in unit Nos. 2, 3, 4 at Indraprastha power stations of DVB viz. 62.5 MW.
- (ii) HP has 25 % share in the Dhalipur, Dhakrani, Chibro and Khodri power houses of UPSEB viz. 111.20 MW. It also has a 20 % share in the Kulhal and Khara hydro power houses viz. 20.40 MW. However, these shares are subject to actual physical drawals over designated transmission lines.
- (iii) HP has a fixed energy share every month in the Shanan power house of PSEB.
- (iv) HP has 4.6 % share in Ranjit Sagar Dam project of PSEB viz. 27.60 MW.
- (iv) The shares of Rajasthan in Chambal and Satpura projects are as under :

CHAMBAL

PROJECTS	LOCATED	INSTALLED CAPACITY (MW)
Gandhi Sagar	M.P.	$5 \times 23 = 115$
Rana Pratap Sagar	Rajasthan	$4 \times 43 = 172$
Jawahar Sagar	Rajasthan	$3 \times 33 = \underline{99}$
	Total	386

Rajasthan has 50 % share in these Chambal projects viz. 193 MW.

SATPURA

PROJECTS	LOCATED	INSTALLED CAPACITY (MW)
Satpura TPS	M.P.	$5 \times 62.5 + 200.0 + 3 \times 210.0 = 1142.50$

Rajasthan has 40 % share viz. 125 MW in the first five units of Satpura TPS.

If the above shares of Rajasthan are included, the regional effective generating capacity would be 27351.63 MW.

3. BREAKUP OF EFFECTIVE HYDRO CAPACITY (MW) IN NORTHERN REGION AS ON 31.12.2001

Agency / Source	Run-of -the -river	Reservoir	Total
NHPC	1444.20	540.00	1984.20
BBMB	1155.15	1697.00	2852.15
DELHI	0.00	0.00	0.00
HARYANA	48.00	0.00	48.00
HP	411.97	0.00	411.97
J&K	225.19	0.00	225.19
PUNJAB	545.10	600.00	1145.10
RAJASTHAN	262.32	172.00	434.32
UP	1012.75	498.00	1510.75
Total	5104.68	3507.00	8611.68

4. Generation Addition/ Deletion During The Month

Suratgarh #3 (250 MW) of RRVUNL synchronised on 08.12.2001 at 18:33 hrs.

II. SALIENT FEATURES OF SYSTEM CONDITIONS

1. Effective Generation Capacity at the end of month

Constituent	Effective Capacity		Increase	
	December 2001	December 2000	MW	%
Chandigarh	1.40	1.40	0.00	0.00
Delhi	678.50	678.50	0.00	0.00
Haryana	1098.20	888.20	210.00	23.64

H.P.	412.10	303.60	108.50	35.74
J & K	407.37	407.37	0.00	0.00
Punjab	3275.10	2975.10	300.00	10.08
Rajasthan	2076.82	1826.82	250.00	13.68
U.P.	5419.75	5419.75	0.00	0.00
NTPC	8169.04	8169.04	0.00	0.00
NHPC	1984.20	1984.20	0.00	0.00
NPC	1180.00	960.00	220.00	22.92
BBMB	2852.15	2821.15	31.00	1.10
Total	27554.63	26435.13	1119.50	4.23

2. Power Supply Position

2. Power Supply Position

State/UT	December 2001			December 2000			Percentage increase over 2000	
	Energy(MU/day)			Energy(MU/day)				
	Demand met	Reqt.	%Shortage	Demand met	Reqt.	%Shortage	Demand met	Reqt.
Chandigarh	2.47	2.47	0.00	2.46	2.46	0.00	0.41	0.41
Delhi	45.43	46.65	2.62	41.82	45.14	7.35	8.63	3.35
Haryana	44.24	45.91	3.64	43.31	44.13	1.86	2.15	4.03
HP	9.44	9.44	0.00	8.66	8.81	1.70	9.01	7.15
J&K	18.77	19.88	5.58	16.67	18.54	10.09	12.60	7.23
Punjab	60.96	64.29	5.18	60.06	60.32	0.43	1.50	6.58
Rajasthan	71.74	72.58	1.16	68.98	70.75	2.50	4.00	2.59
UP	124.67	136.09	8.39	114.12	129.91	12.15	9.24	4.76
NFF/Rail	1.09	1.09	0.00	0.78	0.78	0.00	39.74	39.74
REGION	378.81	398.40	4.92	356.86	380.84	6.30	6.15	4.61
Frequency Regime December 2001 December 2000								
Average (Hz)		49.66		49.03				
Above 50.5 Hz (%)		6.57		4.84				
Above 50.2 Hz (%)		19.67		8.72				
Below 49.5 Hz (%)		41.55		75.15				
Below 49.0 Hz (%)		11.74		54.57				
Below 48.5 Hz (%)		1.31		28.10				

3. Peak Power Supply Position

State/UT

State/UT	December 2001			December 2000			Percentage increase over 2000	
	Peak (MW)			Peak (MW)				
	Demand met	Reqd.	%Shortage	Demand met	Reqd.	%Shortage	Demand met	Reqd.
Chandigarh	148	148	0.00	136	136	0.00	8.82	8.82
Delhi	2584	2871	10.00	2371	2740	13.47	8.98	4.78
Haryana	2503	2726	8.18	2327	2327	0.00	7.56	17.15
HP	562	562	0.00	530	555	4.50	6.04	1.26
J&K	999	1209	17.37	958	1172	18.26	4.28	3.16
Punjab	3541	3714	4.66	3340	3440	2.91	6.02	7.97
Rajasthan	3540	3559	0.53	3623	3631	0.22	-2.29	-1.98
UP	6400	7339	12.79	5856	7125	17.81	9.29	3.00
NFF/Rail	58	58	0.00	41	41	0.00	41.46	41.46
REGION	19748	21828	9.53	18062	20475	11.79	9.33	6.61

III. FREQUENCY PROFILE DURING DECEMBER 2001

DATE	Average	MAX.		MIN.		Std dev	Frequency
	Hz	Hz	Time	Hz	Time	Hz	Var. Index(FVI)
1	49.97	51.12	3.04	48.56	16.46	0.62	3.91
2	49.95	51.00	14.34	48.60	19.09	0.47	2.23
3	49.58	50.88	0.08	48.20	6.35	0.53	4.63
4	49.57	50.64	2.22	48.24	6.26	0.51	4.46
5	49.48	50.44	5.40	48.24	6.42	0.51	5.29
6	49.65	50.76	21.41	48.44	5.57	0.44	3.13
7	49.49	50.68	17.06	48.24	5.56	0.48	4.89
8	49.40	50.64	3.34	48.20	17.47	0.50	6.06
9	49.80	51.00	17.02	48.16	4.18	0.51	2.95
10	49.64	50.88	4.00	48.24	17.15	0.59	4.80
11	49.55	51.12	0.04	48.16	17.52	0.57	5.31

12	49.88	51.08	22.50	48.24	11.24	0.55	3.18
13	49.78	51.20	2.19	48.44	6.24	0.62	4.32
14	49.46	50.92	3.05	48.20	17.34	0.53	5.73
15	49.67	50.92	3.06	48.16	17.52	0.54	4.02
16	49.69	50.76	3.08	48.28	9.16	0.54	3.90
17	49.64	51.04	3.59	48.16	6.23	0.60	4.89
18	49.67	51.04	5.02	48.32	10.33	0.55	4.14
19	49.64	50.52	1.33	48.40	9.04	0.48	3.60
20	49.82	50.84	4.34	48.44	19.05	0.46	2.42
21	49.78	50.92	15.47	48.36	9.11	0.52	3.24
22	49.57	50.80	0.46	48.28	9.05	0.50	4.29
23	49.94	50.96	23.54	48.60	22.16	0.45	2.07
24	49.73	51.24	1.53	48.20	9.03	0.64	4.81
25	49.56	50.56	1.41	48.40	8.01	0.47	4.11
26	49.45	50.68	18.00	48.20	21.08	0.40	4.62
27	49.37	50.68	2.28	48.20	18.10	0.59	7.37
28	49.67	51.24	22.59	48.20	10.08	0.60	4.64
29	49.47	51.16	12.51	48.16	6.35	0.63	6.80
30	49.86	51.08	2.59	48.44	19.08	0.50	2.72
31	49.58	50.72	3.41	48.20	10.04	0.49	4.19
Monthly	49.66	51.24		48.16		0.56	4.28

Note :
$$FVI = \frac{10 \sum (F - 50)^2}{24 \times 60 \times 6}$$
 where F = frequency measured at 10 second interval

IV. VOLTAGE PROFILE DURING DECEMBER 2001

Date	Kanpur (400 KV)		Dadri (400 KV)		Jaipur (400 KV)		Moga (400 KV)		B.T.P.S.(220 KV)	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	411	384	412	368	422	389	410	381	215	200
2	411	393	410	382	425	394	409	388	216	202
3	411	389	416	382	425	392	410	381	216	198
4	411	391	414	384	422	392	412	382	215	200
5	410	389	412	402	422	396	411	389	214	198
6	410	393	414	388	422	396	411	384	214	200
7	411	391	410	384	422	396	412	382	214	198
8	411	391	414	384	422	392	411	382	214	197
9	417	404	416	388	425	392	415	382	213	201
10	418	408	418	386	425	394	418	386	215	198
11	416	392	418	386	423	396	415	384	214	197
12	414	386	418	380	425	398	421	386	215	195
13	411	384	416	378	418	376	410	377	215	194
14	410	384	416	380	418	389	415	373	215	195
15	413	384	416	382	422	376	412	394	214	196
16	411	389	418	390	425	398	409	392	216	201
17	413	395	418	388	422	396	415	390	215	201
18	411	388	416	382	420	392	420	384	214	196
19	410	384	412	380	418	387	417	388	212	192
20	410	386	416	382	416	385	414	385	214	194
21	410	382	416	380	418	387	414	382	213	197
22	411	391	416	380	425	387	414	374	213	196
23	409	390	414	384	421	389	414	376	213	196
24	411	388	416	380	411	392	416	377	214	197
25	410	382	416	380	418	385	414	383	213	200
26	410	386	414	382	418	389	412	368	213	196
27	410	382	416	376	416	383	417	383	213	194
28	415	382	416	376	422	378	414	369	213	190
29	415	384	416	370	427	376	416	365	214	195
30	410	388	408	376	418	389	412	370	212	196
31	408	382	412	380	416	389	413	383	213	192
Month	418	382	418	368	427	376	420	365	216	190

V. PERFORMANCE OF GENERATING STATIONS DURING DECEMBER 2001

GRID REPORT October 2001

S.No.	Power Station	Effective Capacity MW	Energy Generated		Cumulative from 01.04.2001	
			Gross MU	Ex Bus MU	Gross MU	Ex-bus MU
1	CENTRAL SECTOR					
A	NTPC (Thermal)					
(a)	Badarpur TPS	705.00	493.84	450.21	4052.50	3684.08
(b)	Singrauli STPS	2000.00	1422.81	1334.81	11344.33	10585.61
(c)	Rihand STPS	1000.00	734.70	681.01	5587.92	5149.75
(d)	Dadri NCTPS	840.00	611.18	564.07	5015.37	4610.82
(e)	Unchahar-I TPS	420.00	289.69	267.37	2344.59	2130.98
(f)	Unchahar-II TPS	420.00	312.81	288.54	2512.21	2280.30
(g)	Tanda TPS	440.00	191.01	167.13	1503.13	1315.26
(h)	Anta GPS	419.33	265.73	261.48	2376.03	2328.64
(i)	Auraiya GPS	663.36	376.70	371.25	3728.44	3677.11
(j)	Dadri GPS	829.78	484.11	472.68	4493.10	4376.77
(k)	Faridabad GPS	431.57	182.79	178.03	2174.02	2118.45
	Total NTPC	8169.04	5365.35	5036.58	45131.63	42257.77
B	NHPC					
(a)	Bairasiul	180.00	16.73	16.15	490.75	473.45
(b)	Salal	690.00	82.14	81.00	2619.46	2596.71
(c)	Tanakpur HPS	94.20	18.76	18.60	367.23	363.31
(d)	Chamera HPS	540.00	57.40	56.47	1730.66	1725.03
(e)	Uri HPS	480.00	79.94	77.19	1544.52	1525.81
	Total NHPC	1984.20	254.97	249.41	6752.62	6684.31
C	NPC					
(a)	RAPS -A	300.00	122.24	112.11	1074.01	981.99
(b)	RAPS -B	440.00	337.77	308.01	2215.26	2005.28
(c)	NAPS	440.00	315.46	286.37	2374.34	2135.77
	Total NPC	1180.00	775.47	706.49	5663.61	5123.04
2	JOINTLY OWNED (BBMB)					
(a)	Bhakra Complex	1465.15	474.08	472.47	4198.32	4178.56
(b)	Dehar	990.00	97.89	97.89	2559.05	2553.11
(c)	Pong	366.00	138.70	138.70	995.50	991.54
	Total BBMB	2821.15	710.67	709.06	7752.87	7723.21

VI. CENTRAL GENERATING STATIONS SHARE vs DRAWAL OF ALL CONSTITUENTS DURING DECEMBER 2001

(All figs. in
MU)

Sl. No.	State/UT/ System	Singrauli STPS		Rihand STPS		BTPS	W. Grid	VSTPS
		Entitlement	Actual	Entitlement	Actual	Actual	Actual	(WR) Actual
1	Chandigarh	1.91	1.91	7.51	7.27	0.00	0.04	0.00
2	Delhi	106.09	106.09	70.90	71.21	450.21	0.46	0.00
3	Haryana	164.62	164.62	64.30	64.51	0.00	0.33	0.00
4	H.P.	20.62	20.62	34.10	34.16	0.00	0.10	0.00
5	J & K	36.45	36.45	65.35	65.63	0.00	0.42	0.00
6	Punjab	126.25	126.25	72.65	71.03	0.00	0.50	0.00
7	Rajasthan	242.30	242.30	91.35	91.66	0.00	0.47	0.00
8	U.P.	562.19	562.19	251.19	251.87	0.00	1.05	0.00
9	MP	0.00	0.00	0.00	0.00	0.00	8.33	0.00
10	Unallocated	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Trans. Losses	45.47	45.47	23.66	23.66	0.00	0.12	0.00
	TOTAL	1305.90	1305.90	681.01	681.01	450.21	11.82	0.00

Note

:- Singrauli sentout excludes 28.9201258062162 MU supplied to Western Grid

(All figs. in
MU)

Sl. No.	State/UT/ System	Dadri NCTPS		Unchahar-I TPS		Unchahar-II TPS	
		Entitlement	Actual	Entitlement	Actual	Entitlement	Actual
1	Chandigarh	0.00	0.00	1.25	0.81	2.56	0.57
2	Delhi	398.85	353.10	14.60	15.11	34.76	3.57
3	Haryana	19.67	19.44	15.75	16.12	32.42	39.49
4	H.P.	0.00	0.00	5.92	6.03	13.08	15.39

5	J & K	0.00	0.00	10.83	11.30	29.54	39.56
6	Punjab	0.00	0.00	14.77	12.02	28.48	11.94
7	Rajasthan	90.98	89.74	16.38	16.91	40.91	52.15
8	U.P.	54.57	94.03	178.62	179.80	96.76	115.83
9	MP	0.00	6.06	0.00	0.00	0.00	0.00
10	Unallocated	0.00	0.00	0.00	0.00	0.00	0.00
11	Bihar Trans.	0.00	1.72	0.00	0.00	0.00	0.00
12	Losses	0.00	0.00	9.28	9.28	10.03	10.03
	Total	564.07	564.07	267.40	267.40	288.54	288.54
Sl. No.	State/UT/ System	Anta GPS		Auraiya GPS		Uri HPS	
		Entitlement	Actual	Entitlement	Actual	Entitlement	Actual
1	Chandigarh	3.46	3.46	3.39	1.36	0.67	0.67
2	Delhi	28.19	28.19	41.35	43.12	7.97	7.97
3	Haryana	22.65	22.65	48.73	49.91	4.20	4.20
4	H.P.	13.16	13.16	18.85	19.17	2.07	2.07
5	J & K	24.80	24.80	36.19	37.84	24.97	24.97
6	Punjab	29.39	29.39	32.25	21.84	10.05	10.05
7	Rajasthan	60.60	60.60	53.14	54.92	6.52	6.52
8	U.P.	68.79	68.79	124.25	128.10	17.90	17.90
9	MP	0.00	0.00	0.00	1.54	0.00	0.00
10	Unallocated	0.00	0.00	0.00	0.00	0.00	0.00
11	Bihar Trans.	0.00	0.00	0.00	0.34	0.00	0.00
12	Losses	10.46	10.45	13.10	13.10	0.75	0.75
	TOTAL	261.50	261.50	371.25	371.25	75.09	75.09
Sl. No.	State/UT/ System	Dadri GPS		Bairasiul HPS		Salal HPS	
		Entitlement	Actual	Entitlement	Actual	Entitlement	Actual
1	Chandigarh	3.14	2.83	0.00	0.00	0.21	0.21
2	Delhi	50.73	56.24	1.70	1.70	9.09	9.09
3	Haryana	37.44	41.38	4.72	4.72	11.76	11.76

4	H.P.	16.50	17.67	1.86	1.86	0.78	0.78
5	J & K	36.11	41.18	0.00	0.00	28.77	28.77
6	Punjab	57.82	61.29	7.19	7.19	20.82	20.82
7	Rajasthan	53.08	58.76	0.00	0.00	2.31	2.31
8	U.P.	159.31	171.83	0.00	0.00	6.39	6.39
9	MP	0.00	0.00	0.00	0.00	0.00	0.00
10	Railways	58.53	21.49	0.00	0.00	0.00	0.00
11	Bihar	0.00	0.00	0.00	0.00	0.00	0.00
12	Trans. Losses	0.00	0.00	0.64	0.64	0.81	0.81
	Total	472.66	472.66	16.11	16.11	80.94	80.94

Sl. No.	State/UT/ System	Tanakpur HPS		Chamera HPS		RAPS -A	RAPS -B		Tanda TPS
		Entitlement	Actual	Entitlement	Actual	Actual	Entitlement	Actual	Actual
1	Chandigarh	0.00	0.00	1.99	1.99	0.00	0.00	0.31	0.00
2	Delhi	1.52	1.52	3.97	3.97	0.00	34.65	0.00	0.00
3	Haryana	0.76	0.76	8.00	8.00	0.00	0.00	34.71	0.00
4	H.P.	0.49	0.49	8.57	8.57	0.00	0.00	2.11	0.00
5	J & K	0.96	0.96	1.99	1.99	0.00	80.85	88.58	0.00
6	Punjab	2.03	2.03	5.16	5.16	0.00	0.00	0.00	0.00
7	Rajasthan	1.43	1.43	10.04	10.04	112.11	192.51	180.07	0.00
8	U.P.	4.49	4.49	12.16	12.16	0.00	0.00	2.22	167.13
9	Unallocated Trans.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	Losses	0.37	0.37	4.59	4.59	0.00	0.00	0.00	0.00
11	Others	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	12.05	12.05	56.47	56.47	112.11	308.01	308.01	167.13

Note :- Tanakpur sentout excludes 6.575 MU supplied to Nepal

Sl. No.	State/UT/ System	Narora APS		Bhakra HPS		Dehar HPS	Pong	F'bad GPS	ER import
		Entitlement	Actual	Entitlement	Actual	Actual	Actual	Actual	Actual
1	Chandigarh	3.57	0.35	45.34	45.24	0.00	0.00	0.00	9.55
2	Delhi	33.34	1.53	0.00	0.00	0.00	0.00	0.00	59.43
3	Haryana	24.83	43.76	126.83	127.81	27.34	21.98	178.03	48.17

4	H.P.	13.30	12.80	11.75	11.81	8.56	0.00	0.00	2.14
5	J & K	28.43	61.48	0.00	0.00	0.00	0.00	0.00	9.55
6	Punjab	32.01	3.16	174.99	176.35	41.00	32.96	0.00	0.00
7	Rajasthan	38.67	75.72	73.14	73.61	17.08	77.44	0.00	9.55
8	U.P.	102.25	77.60	0.00	0.00	0.00	0.00	0.00	47.41
9	N.F.F.	0.00	0.00	14.88	12.11	0.00	0.00	0.00	0.00
10	Unallocated Trans.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Losses	9.97	9.97	25.54	25.54	3.91	6.32	0.00	0.00
	Total	286.37	286.37	472.47	472.47	97.89	138.70	178.03	185.81

Note :

- The above figures are based on the daily energy accounts prepared by NRLDC.

VII. BILATERAL EXCHANGES IN THE NORTHERN REGION DURING DECEMBER 2001**(All figs in MU'S)**

	Chandigarh	Delhi	Haryana	Himachal	J & K	Punjab	Rajasthan	UP	MP	Bihar	Others	Total
Chandigarh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Delhi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Haryana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Himachal	0.00	0.00	0.00	0.00	0.00	470.80	0.00	0.00	0.00	0.00	0.00	470.800
J & K	0.00	0.00	0.00	0.00	0.00	832.50	0.00	0.00	0.00	0.00	0.00	832.500
Punjab	0.00	0.00	0.00	-470.80	-832.50	0.00	-307.30	0.00	0.00	0.00	0.00	-1610.600
Rajasthan	0.00	0.00	0.00	0.00	0.00	307.30	0.00	0.00	0.00	0.00	0.00	307.300
UP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
MP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Others	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Total	0.000	0.000	0.000	-470.800	-832.500	1610.600	-307.300	0.000	0.000	0.000	0.000	0.000

The above figures do not indicate the following shares in common projects/ bilateral agreements:

i) Haryana's share in IP station of Delhi	16.136MU
ii) Himachal's share in Shanan & RSD power station of Punjab	5.977MU
iii) Himachal's share in Yamuna hydro power complex of UP	17.890MU
iv) Maruti to Haryana	15.335MU

Note: The above figures are based on the daily energy accounts prepared by NRLDC.

**VIII. PROGRESS OF INSTALLATION OF SHUNT CAPACITORS IN NORTHERN REGION
AS ON 31.12.2001**

(ALL FIGS IN MVAR)

CONSTITUENT	REQUIREMENT AT THE END OF 2001-2002	CAPACITORS AS ON 31.12.2001	CAPACITORS ADDITION DURING		ADDITIONAL REQUIRED DURING 2001-2002
		INSTALLED	2000-2001	April 01 - Dec 01	
Chandigarh	127	96	60	3	31
Delhi	2734	2377	201	141	357
Haryana	3080	2036	368	393	1044
H.P.	335	182	46	46	153
J & K	880	159	0	12	721
Punjab	4950	4587	384	156	363
Rajasthan	3300	2367	176	10	933
U.P.	5654	4345	279	139	1309
BBMB	381	381	0	0	0
TOTAL	21441	16530	1514	900	4911

SOURCE: Minutes of 324th OCC meeting of NREB held on 09th January, 2002.

IX. HYDRAULIC DATA FOR RESERVOIRS DURING DECEMBER 2001

Item	Bhakra	Pong	Rihand	R.P.S.	Gandhi Sagar (M.P.)
Full Reservoir Level (m) (FRL) (ft)	514.50 1688.00	433.12 1421.00	268.22 880.00	352.65 1157.00	402.64 1321.00
Min. Draw Down Level (m) (MDDL) (ft)	445.62 1462.00	384.05 1260.00	252.98 830.00	342.90 1125.00	381.00 1250.00
Level on last day of December 2001 (m) (ft)	485.86 1594.04	407.57 1337.17	265.39 870.70	347.65 1140.58	382.34 1254.41
Level on last day of December 2000 (m) (ft)	484.77 1590.44	401.20 1316.26	262.71 861.90	345.52 1133.58	380.91 1249.71
Live Capacity as on (mhmt) last day of December 2001(maft)	0.32 2.57	0.30 2.46	0.44 3.55	0.06 0.52	0.03 0.25
Live Capacity as on (mhmt) last day of December 2000(maft)	0.31 2.52	0.19 1.54	0.32 2.63	0.03 0.28	0.00 0.00
Energy content as on last day of December 2001 (MU)	1200.00	425.00	825.00	120.00	50.00
Energy content as on last day of December 2000 (MU)	1130.00	265.00	625.00	61.00	0.00
Maximum level (m)	492.54	411.06	265.39	349.69	383.49

	(ft)	1615.94	1348.62	870.70	1147.28	1258.18
	(date)	01.12.2001	01.12.2001	01.12.2001	01.12.2001	01.12.2001
Minimum level	(m)	485.86	407.57	263.83	347.65	382.34
	(ft)	1594.04	1337.17	865.60	1140.58	1254.41
	(date)	31.12.2001	31.12.2001	31.12.2001	31.12.2001	31.12.2001

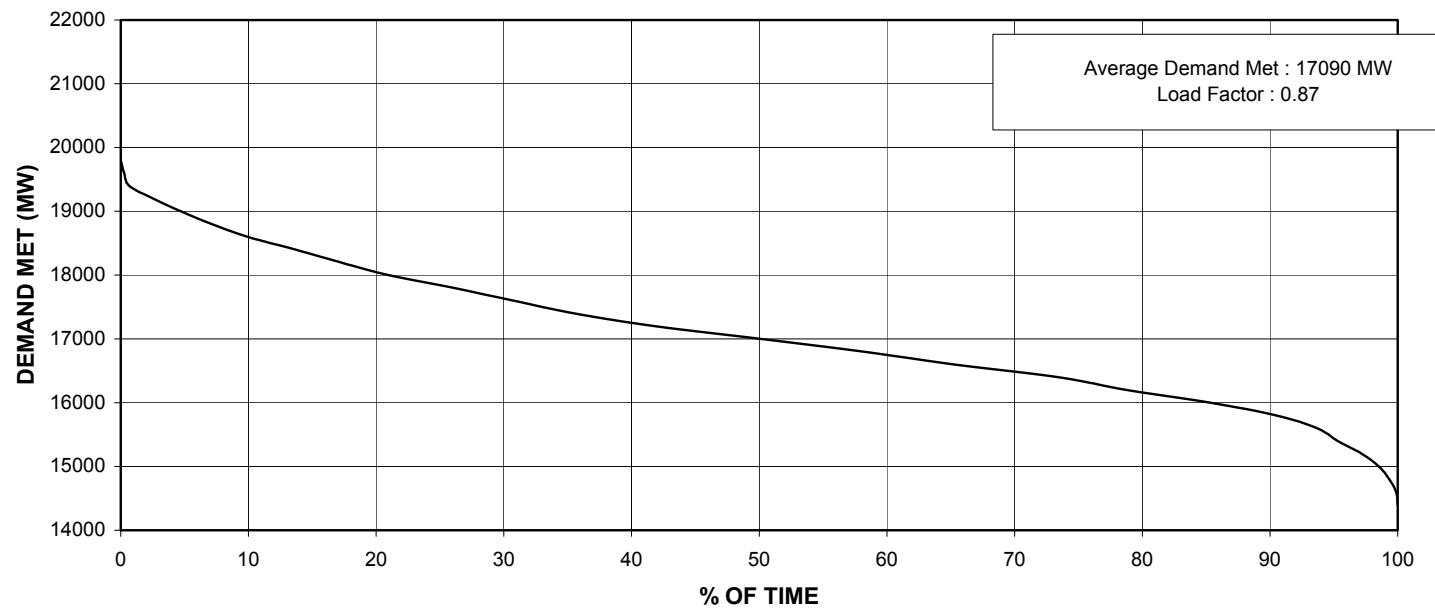
Energy content of Bhakra : Total Energy content at Bhakra, Ganguwal and Kotla power stations

Energy content of Rihand : Total Energy content at Rihand & Obra power stations

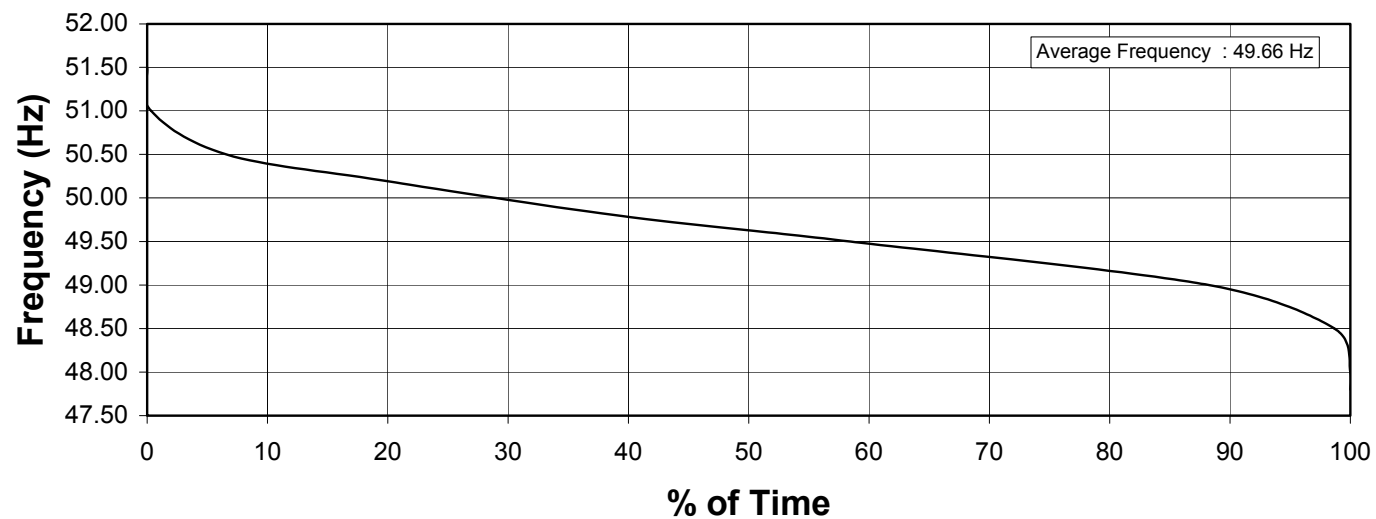
Energy content of RPS : Total Energy content of Rana Pratap Sagar and Jawahar Sagar Power Stations.

Energy Content of G. Sagar : Total Energy content at Gandhi Sagar, RP Sagar and Jawahar Sagar Power Stations.

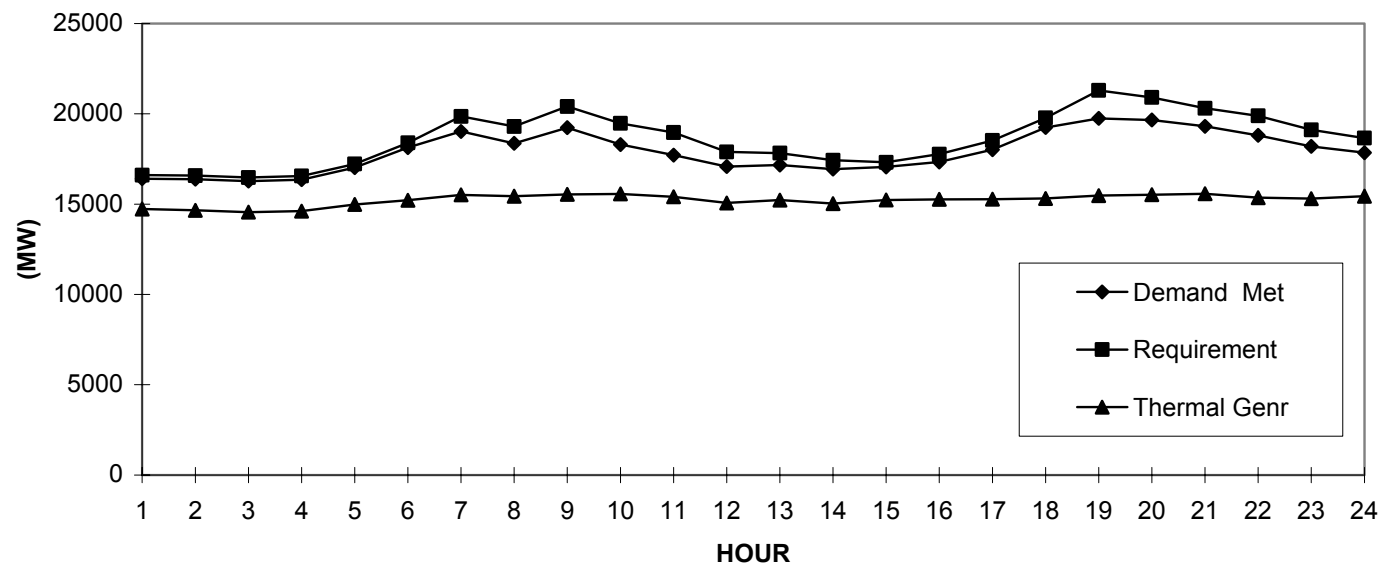
LOAD DURATION CURVE OF NORTHERN REGION FOR DECEMBER 2001



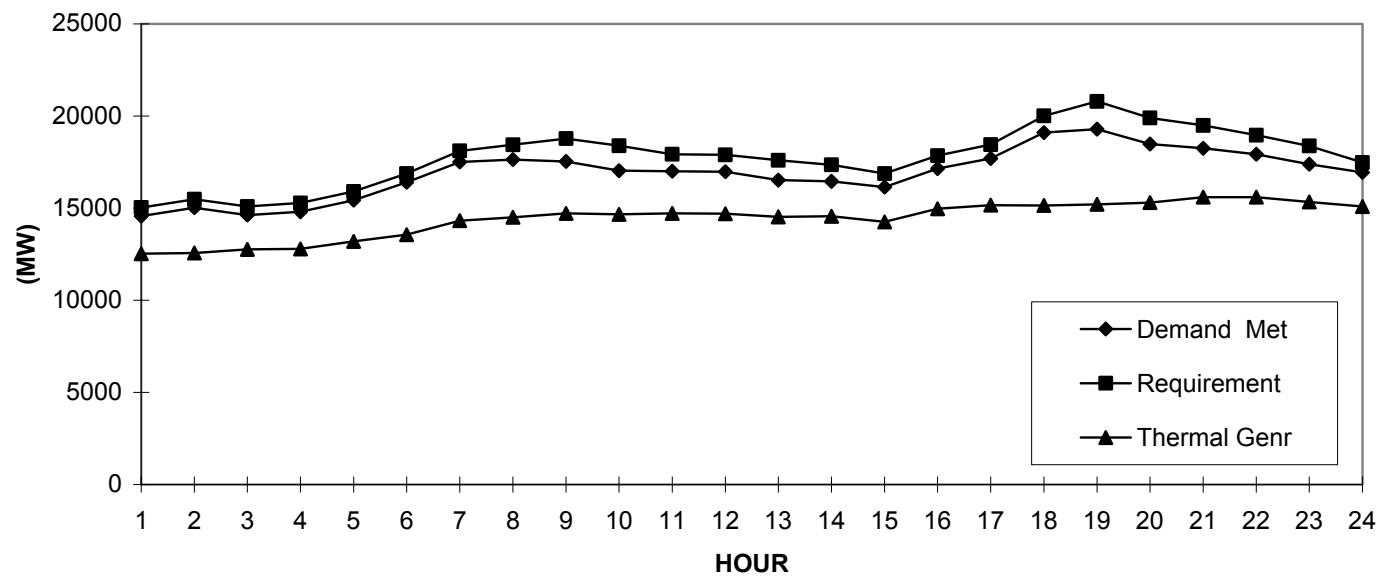
FREQUENCY DURATION CURVE OF NORTHERN REGION FOR DECEMBER 2001



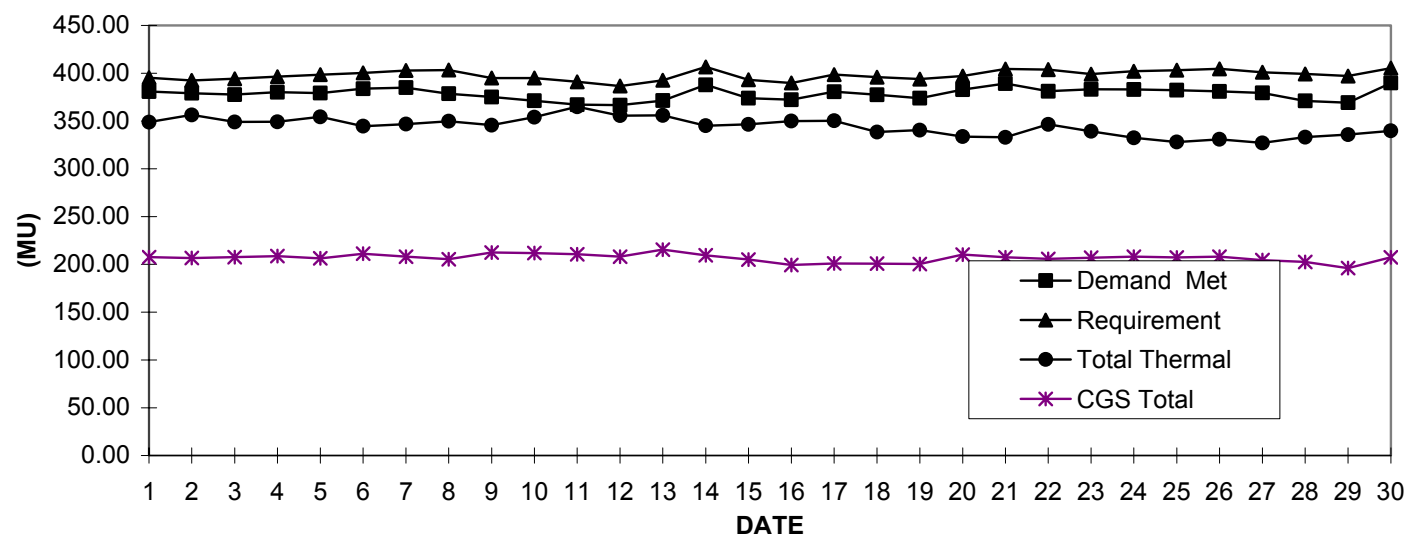
LOAD CURVE OF NORTHERN REGION FOR MAXIMUM DEMAND MET DAY (31.12.2001)



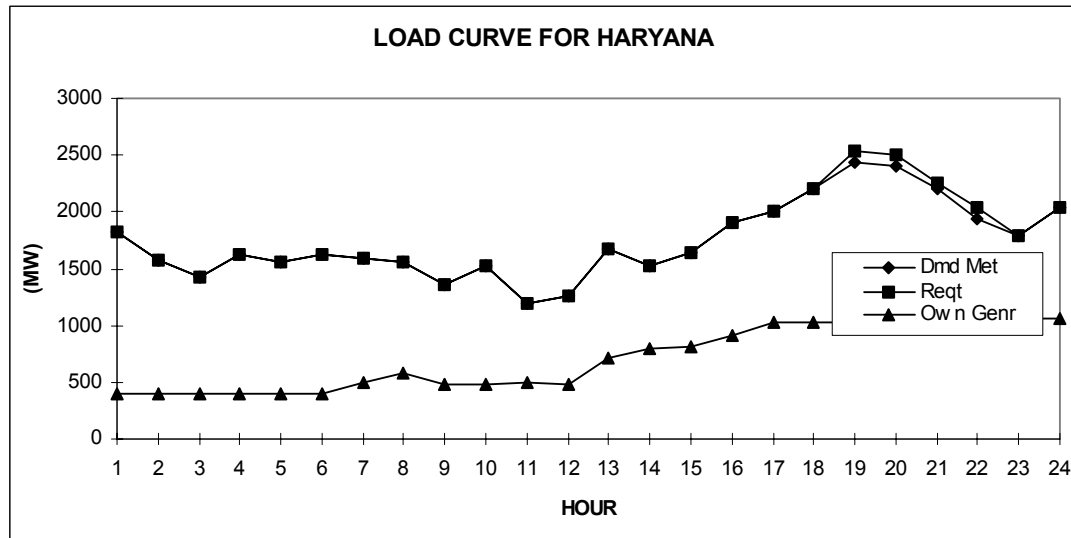
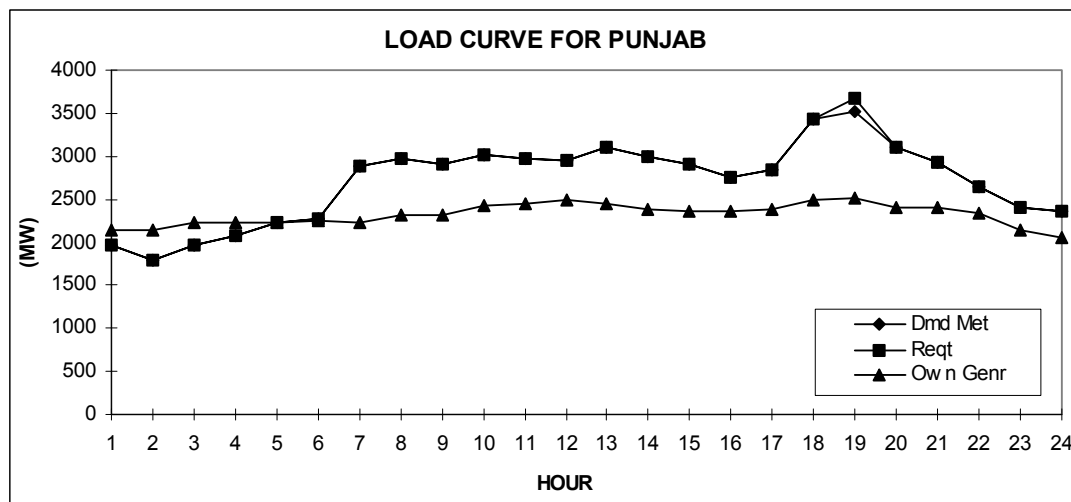
LOAD CURVE OF NORTHERN REGION FOR MINIMUM DEMAND MET DAY (29.12.2001)

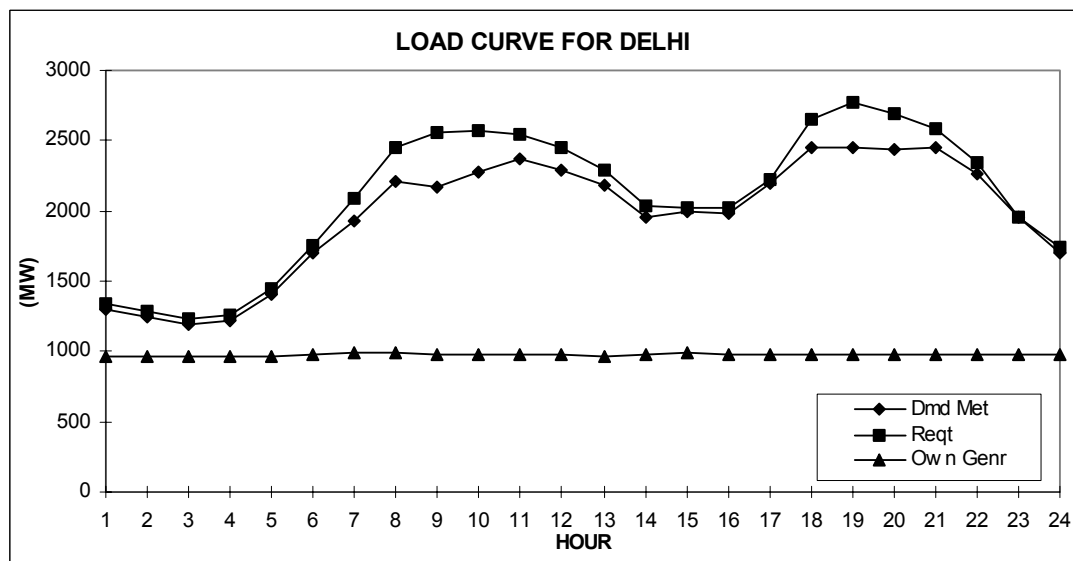
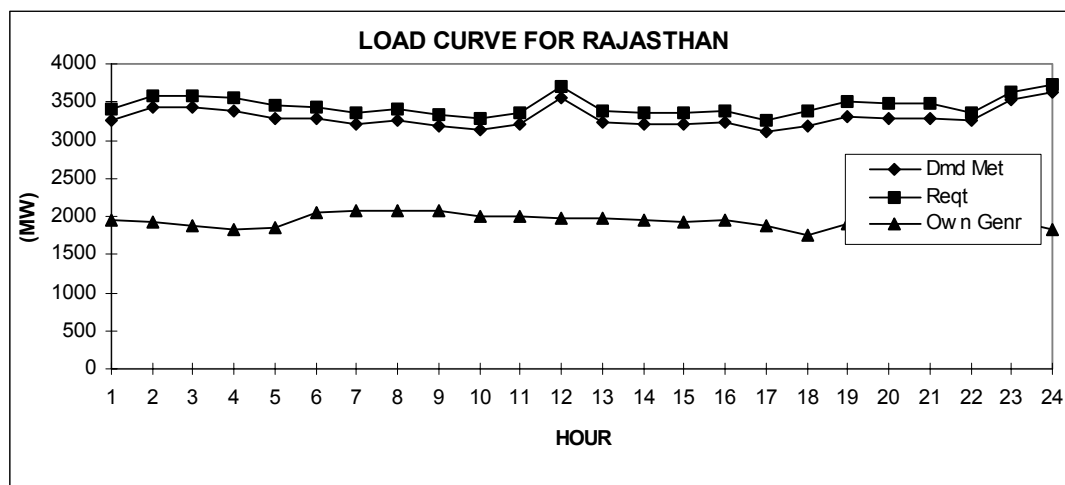


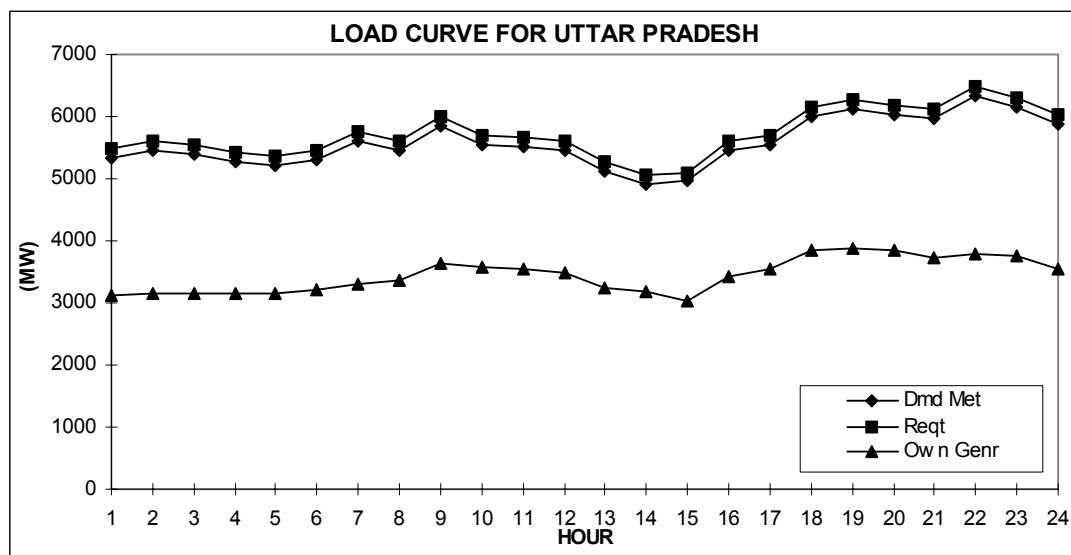
DAYWISE DEMAND MET AND REQUIREMENT (In MU) OF NORTHERN REGION DURING DECEMBER 2001



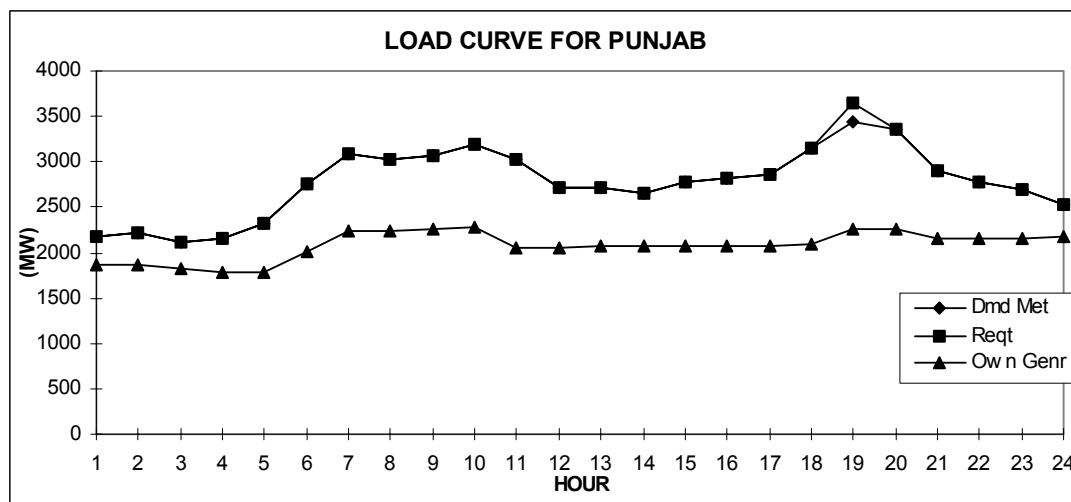
STATE LOAD CURVES FOR REGIONAL MINIMUM DEMAND MET DAY(29.12.2001)

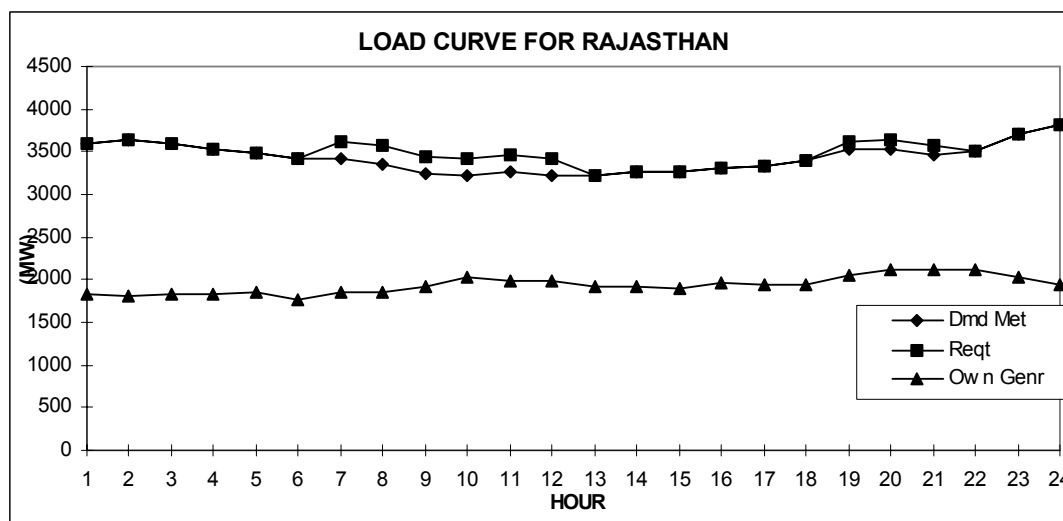
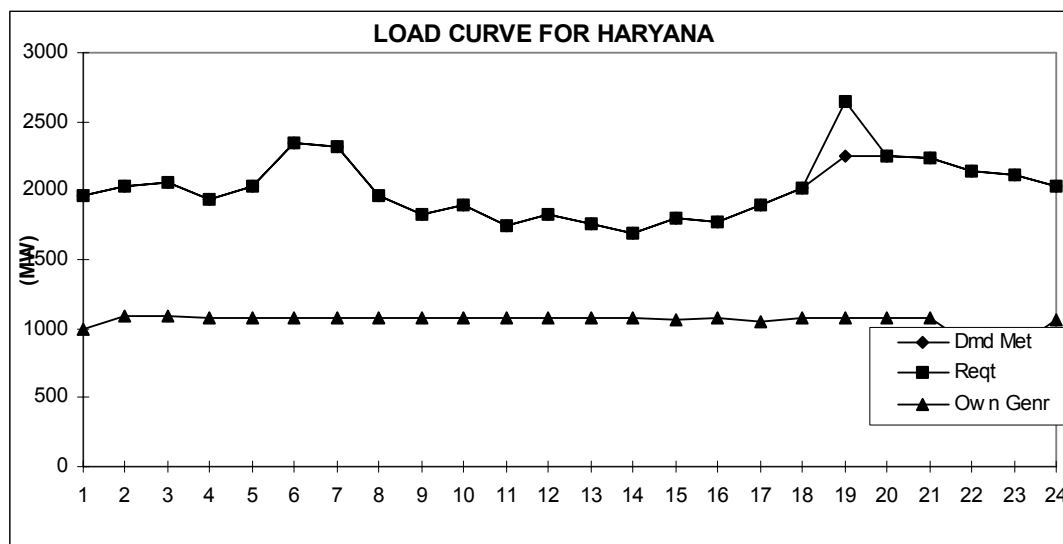


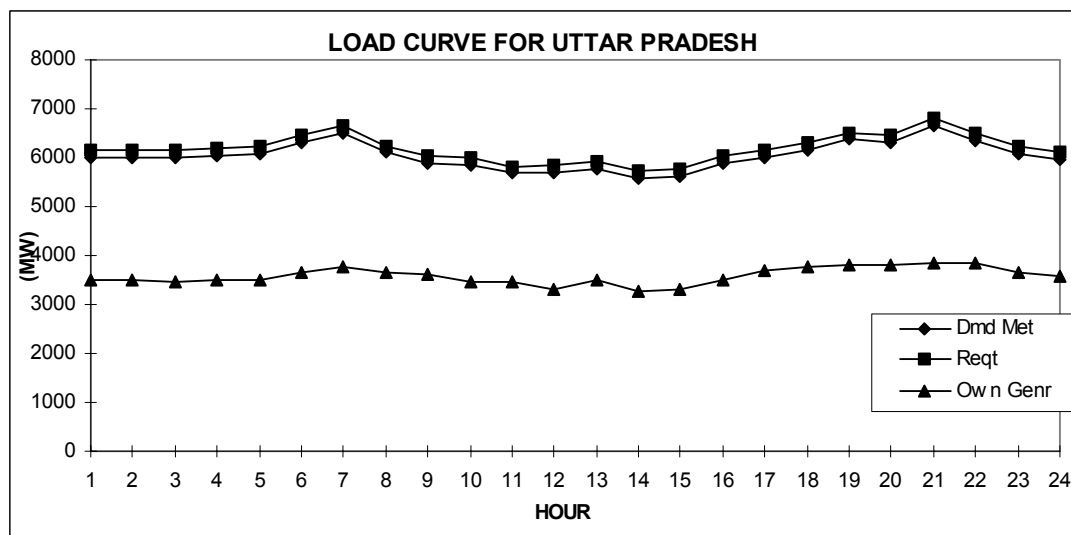
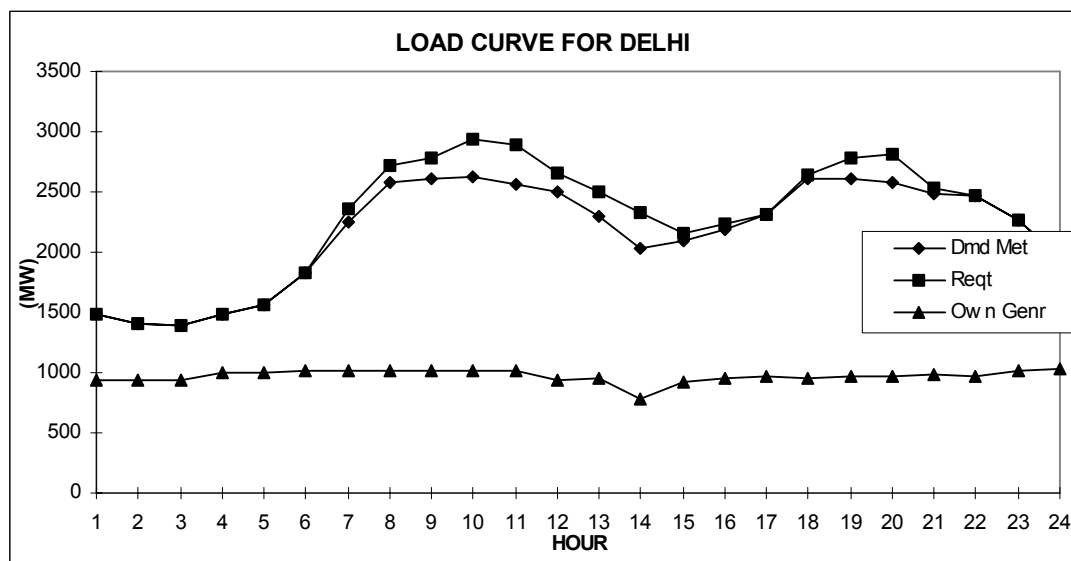




STATE LOAD CURVES FOR REGIONAL MAXIMUM DEMAND MET DAY(31.12.2001)







MINOR GRID INCIDENTS DURING DECEMBER 2001

S No.	DATE	TIME	INCIDENT
1	12.12.2001	05:50	All the running units at Bhatinda & Lehra-Mohabat thermal power house of PSEB tripped (Generation loss of the order of 700 MW) due to tripping of many lines in that area and consequently evacuation problem. All the tripped units were normalized by 13:30 hrs. of 12.12.2001.
2	12.12.2001	22:25	Incident similar to that of 05:50 hrs. of 12.12.2001 occurred again. All the tripped units were revived back by Morning hrs. of 13.12.2001.
3	12.12.2001	23:00	All the running units at Panipat thermal power house of HVUNL tripped (Generation loss of the order of 550 MW) due to tripping of all the 220 kV circuits between Panipat (Th) and Panipat(BBMB) sub-stations. Generation at Panipat were normalized by morning of 13.12.2001.