GRID REPORT

APRIL 2002

SYSTEM OPERATION REPORT OF NORTHERN REGION FOR THE MONTH OF APRIL, 2002

SUMMARY REPORT:

Important events:

Uttranchal carved out from U.P. joined the Northern Region as new constituent.

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

NIL

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

The average system frequency during the month of April 2002 was 50.04 Hz and frequency remained between 49.0 & 50.5 Hz for 77.47 % of time. Although there was appreciable increase in the period when frequency remained in this normal band as prescribed by IEGC (Indian Electricity Grid Code), the large number of fluctuations from low to high & vice versa were a cause of concern. The implementation of free governor operation on all generating units in the region assumes importance.

In the month of April 2002, because of commercial and financial problems, U.P. started self-regulation by shedding additional load of around 1000-1500 MW (10-15 Million Units on daily basis). Self-regulation by U.P. caused high frequency and surplus condition in the Grid. However, the system frequency has been controlled by backing down generation at central sector stations and exporting power to Western Region.

Overall voltage profile in the grid during the month has been satisfactory on most of the 400 kV Buses and were generally within limits prescribed by IEGC.

There was no major grid disturbance in the region during April 2002. The details of minor incidents are given in annexure.

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

NIL

II. CENTRAL GENERATING STATIONS SHARE vs DRAWAL OF ALL CONSTITUENTS DURING APRIL 2002

(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	27.50	27.13	11.29	11.4	4.41	7.96	40.90	40.96	84.10	87.47
2	Delhi	747.91	754.61	96.97	98.86	63.89	85.49	0.00	0.00	908.77	938.96
3	Haryana	370.02	373.99	119.57	121.31	25.71	40.46	177.74	178.34	693.04	714.11
4	H.P.	42.10	41.61	54.66	54.69	7.95	9.92	17.53	17.56	122.24	123.79
5	J & K	185.40	197.08	217.93	220.32	68.53	70.78	0.00	0.00	471.86	488.19
6	Punjab	340.47	346.62	184.17	186.82	32.87	27.26	255.89	256.72	813.40	817.41
7	Rajasthan	415.47	431.91	80.94	83.02	137.13	148.90	116.30	116.58	749.85	780.41
8	U.P.	922.44	898.61	132.12	134.36	77.47	35.62	0.00	0.00	1132.03	1068.59
9	Uttranchal	29.02	21.43	26.37	13.23	8.72	0.28	0.00	0.00	64.12	34.94
9	MP / N.F.F.	1.02	11.37	0.00	0.00	0.00	0.00	14.40	12.61	15.42	23.97
10	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Trans. Losses	97.00	97.00	13.65	13.65	9.79	9.79	32.72	32.72	153.16	153.16
12	Others	51.82	28.81	0.00	0.00	0.00	0.00	0.00	0.00	51.82	28.81
	Total	**3230.17**	**3230.17**	**937.68**	**937.68**	**436.48**	**436.48**	**655.48**	**655.48**	**5259.81**	**5259.81**

III. INTER REGIONAL EXCHANGES IN *MU* AND PEAK *MW*

		Energy (MU)	Peak MW
a.	Import over HVDC Back to Back at Vindhyachal	1.55	150
b.	M.P. to Rajasthan(Ujjain - Kota)	0.00	0
c.	Eastern region to Northern region (Import)	119.50	260
d.	Export over HVDC Back to Back at Vindhyachal	188.41	500
e.	220 KV Auraiya -Malanpur	10.59	28
f.	Northern region to Bihar (Export)	0.00	0
g.	Tanakpur to Mahendranagar(NEPAL) (Export)	2.85	10

IV. FREQUENCY PROFILE

a. Maximum frequency	51.40	Hz	at	18:15	hours on	25.04.2002
Minimum frequency	48.20	Hz	at	05:23	hours on	12.04.2002
Average frequency	50.04	Hz				

b. Frequency distribution in %

Hz	< 48.5	<49.0	49.0-50.5	> 50.5
%	0.48	3.63	77.47	18.90

c. Frequency Variation Index

Monthly Average	2.78
Maximum	5.90
Minimum	1.25

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	2.92	2.92	0.00	0.00
Delhi	54.00	54.78	0.78	1.42
Haryana	43.56	43.72	0.16	0.37
H.P.	8.82	8.82	0.00	0.00
J & K	17.42	19.12	1.70	8.89
Punjab	65.80	69.65	3.85	5.53
Rajasthan	65.18	65.28	0.10	0.15
U.P.	97.75	124.04	26.29	21.19
Uttranchal	9.08	9.40	0.32	3.37
N.F.F./Rail	1.39	1.39	0.00	0.00
Total	**365.92**	**399.12**	**33.20**	**8.32**

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	179	179	0	0	0.00	0.00
Delhi	2770	2917	147	161	5.04	5.52
Haryana	2590	2590	0	0	0.00	0.00
H.P. *	511	511	0	0	0.00	0.00
J & K *	940	1169	229	323	19.59	27.63
Punjab	3712	3834	122	325	3.18	8.48
Rajasthan	3412	3412	0	0	0.00	0.00
U.P.	5414	6215	801	1260	12.89	20.27
Uttranchal	587	647	60	60	9.27	9.27
N.F.F./Rail	66	66	0	0	0.00	0.00
Region	**18779**	**20798**	**2019**	**2496**	**9.71**	**12.00**

Diversity Factor = **1.07**

* Approximate and Estimated

B. DETAILED REPORT

I. 1. INSTALLED / EFFECTIVE CAPACITY AT THE END OF APRIL 2002

-	STATION	INSTALLED CAPACITY (MW)		EFFECTIVE CAPACITY	
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	3x 5.65	16.95	3x 5.65	16.95
(f)	Micro 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**

contd/-

	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**
(I)	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 Hydel		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	2x25+2x45	140.00	2x25+2x45	140.00
(b)	Rana Pratap Sagar (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	4x250	1000.00	4x250	1000.00
(g)	Ramgarh GT	1x3	3.00	1x3	3.00
(i)	Ramgarh GT EXT.	1x35.5	35.50	1x35.5	35.50
	Total Thermal		**1888.50**		**1888.50**
(J)	Wind farm	2+2	4.00	2+2	4.00
	Total Rajasthan		**2326.82**		**2326.82**

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)	Ganga Canal				
	Bhola	4x.375+2x.6+		4x.375+2x.6+	
	Salara	2x1.5+		2x1.5+	
	Nirgazni	2x2.5	10.70	2x2.5	10.70
(e)	Khara	3x24.0	72.00	3x24.0	72.00
(f)	Sobla & small hydro	6 +12.2	18.20	6 +12.2	18.20
	Total Hydro		**529.90**		**529.90**
	THERMAL				
(g)	Obra	5x50	250.00	4x40	160.00
(h)	Obra Extn. - I	3x100	300.00	3x94	282.00
(i)	Obra Extn. - II	5x200	1000.00	5x200	1000.00
(j)	Panki	1x32	32.00	1x32	32.00
(k)	Panki Extn.	2x110	220.00	2x105	210.00
(l)	Harduaganj - A	3x30	90.00	0	0.00
(m)	Harduaganj - B	2x50+2x60	220.00	1x40+2x55	150.00
(n)	Harduaganj - C	2x60+1x110	230.00	2x60+1x105	225.00
(o)	Paricha	2x110	220.00	2x110	220.00
(p)	Anpara - A	3x210	630.00	3x210	630.00
(q)	Anpara - B	2x500	1000.00	2x500	1000.00
	Total Thermal		**4192.00**		**3909.00**
	Total UP		**4721.90**		**4438.90**

11	**UTTRANCHAL**				
	HYDRO				
(a)	Khatima	3x13.8	41.40	3x13.8	41.40
(b)	Ramganga	3x66.0	198.00	3x66.0	198.00
(c)	Ganga Canal				
	Chitwa	2x1.5+		2x1.5+	
	Mohamedpur	3x3.1+		3x3.1+	
	Pathri	3x6.8	32.70	3x6.8	32.70
(d)	Yamuna (I & IV)				
	- Dhalipur	3x17.00+		3x17.00+	
	- Dhakrani	3x11.25+		3x11.25+	
	- Kulhal	3x10.00	114.75	3x10.00	114.75
(e)	Chibro	4x60.0	240.00	4x60.0	240.00
(f)	Khodri	4x30.0	120.00	4x30.0	120.00
(g)	Chilla	4x36.0	144.00	4x36.0	144.00
(h)	Maneri Bhali	3x30.0	90.00	3x30.0	90.00
	Total Hydro		**980.85**		**980.85**
	Total Region (1 to 11)		**28317.49**		**27804.63**

2. SUMMARY OF THE EFFECTIVE GENERATING CAPACITY(MW) IN THE NORTHERN REGION AT THE END OF APRIL 2002

Agency / Source	Hydro	Thermal	Gas/Diesel/Wind	Nuclear	Total	% of Total
NTPC	---	5825.00	2344.04	---	**8169.04**	**29.38%**
NHPC	1984.20	---	---	---	**1984.20**	**7.14%**
NPC	---	---	---	1180.00	**1180.00**	**4.24%**
BBMB	2852.15	---	---	---	**2852.15**	**10.26%**
CHANDIGARH	---	---	1.40	---	**1.40**	**0.01%**
DELHI	---	396.50	282.00	---	**678.50**	**2.44%**
HARYANA	48.00	1025.00	25.20	---	**1098.20**	**3.95%**
HIMACHAL	411.97	---	0.13	---	**412.10**	**1.48%**
J&K	225.19	---	182.18	---	**407.37**	**1.47%**
PUNJAB	1145.10	2130.00	---	---	**3275.10**	**11.78%**

RAJASTHAN	434.32	1850.00	42.50	---	**2326.82**	**8.37%**
UP	529.90	3909.00	---	---	**4438.90**	**15.96%**
UTTRANCHAL	980.85	---	---	---	**980.85**	**3.53%**
Total	**8611.68**	**15135.50**	**2877.45**	**1180.00**	**27804.63**	**100.00%**
% of TOTAL	**30.97%**	**54.44%**	**10.35%**	**4.24%**	**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 x 23 = 115
Rana Pratap Sagar	Rajasthan	4 x 43 = 172
Jawahar Sagar	Rajasthan	3 x 33 = 99
	Total	**386**

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

SATPURA

PROJECTS	LOCATED	INSTALLED CAPACITY (MW)
Satpura TPS	M.P.	5x62.5+200.0+3x210.0 = 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 27851.63 MW.

3. BREAKUP OF EFFECTIVE HYDRO CAPACITY (MW) IN NORTHERN REGION AS ON 30.04.2002

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	229.90	300.00	529.90
UTTRANCHAL	782.85	198.00	980.85
Total	5104.68	3507.00	8611.68

4. Generation Addition/ Deletion During The Month

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II. SALIENT FEATURES OF SYSTEM CONDITIONS

1. Effective Generation Capacity at the end of month

Constituent	Effective Capacity		Increase	
	April 2002	**April 2001**	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	2326.82	1826.82	500.00	27.37
U.P.	4438.90	5419.75	-980.85	-18.10
Uttranchal	980.85	0.00	980.85	----
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	27804.63	26435.13	1369.50	5.18

2. Power Supply Position

State/UT	April 2002			April 2001			Percentage increase over 2001	
	Energy(MU/day)			Energy(MU/day)				
	Demand met	Reqt.	%Shortage	Demand met	Reqt.	%Shortage	Demand met	Reqt.
Chandigarh	2.92	2.92	0.00	2.64	2.64	0.00	10.61	10.61
Delhi	54.00	54.78	1.42	45.21	47.95	5.71	19.44	14.24
Haryana	43.56	43.72	0.37	38.20	38.45	0.65	14.03	13.71
HP	8.82	8.82	0.00	7.89	8.45	6.63	11.79	4.38
J&K	17.42	19.12	8.89	14.13	18.40	23.21	23.28	3.91
Punjab	65.80	69.65	5.53	56.02	61.21	8.48	17.46	13.79
Rajasthan	65.18	65.28	0.15	60.06	61.18	1.83	8.52	6.70
UP	97.75	124.04	21.19	110.24	128.44	14.17	-11.33	-3.43
Uttranchal	9.08	9.40	3.37	0.00	0.00	-----	-----	-----
NFF/Rail	1.39	1.39	0.00	0.93	0.93	0.00	49.46	49.46
REGION	365.92	399.12	8.32	335.32	367.65	8.79	9.13	8.56

Frequency Regime	April 2002	April 2001
Average (Hz)	50.04	49.47
Above 50.5 Hz (%)	18.90	7.62
Above 50.2 Hz (%)	42.01	17.77
Below 49.5 Hz (%)	15.19	55.07
Below 49.0 Hz (%)	3.63	26.11
Below 48.5 Hz (%)	0.48	6.89

3. Peak Power Supply Position

	April 2002	April 2001	Percentage increase

State/UT	Peak (MW)			Peak (MW)			over 2001	
	Demand met	Reqt.	%Shortage	Demand met	Reqt.	%Shortage	Demand met	Reqt.
Chandigarh	179	179	0.00	136	136	0.00	31.62	31.62
Delhi	2770	2917	5.04	2392	2759	13.30	15.80	5.73
Haryana	2590	2590	0.00	2112	2200	4.00	22.63	17.73
HP	511	511	0.00	483	512	5.66	5.80	-0.20
J&K	940	1169	19.59	852	1125	24.27	10.33	3.91
Punjab	3712	3834	3.18	3289	3577	8.05	12.86	7.18
Rajasthan	3412	3412	0.00	3253	3353	2.98	4.89	1.76
UP	5414	6215	12.89	5626	7036	20.04	-3.77	-11.67
Uttranchal	587	647	9.27	0	0	------	------	------
NFF/Rail	66	66	0.00	51	51	0.00	29.41	29.41
REGION	18779	20798	9.71	16947	19832	14.55	10.81	4.87

III. FREQUENCY PROFILE DURING APRIL 2002

DATE	Average	MAX.		MIN.		Std dev	Frequency
	Hz	Hz	Time	Hz	Time	Hz	Var. Index(FVI)
1	50.28	51.28	18.13	49.24	20.40	0.38	2.23
2	50.10	51.28	17.58	48.84	0.25	0.45	2.12
3	50.11	51.12	18.04	48.68	19.06	0.41	1.84
4	49.87	51.04	8.00	48.68	4.55	0.47	2.35
5	50.16	51.28	8.03	49.04	19.24	0.37	1.63
6	50.05	51.16	23.56	48.24	19.15	0.39	1.52
7	50.30	51.32	8.05	49.00	0.55	0.43	2.69
8	50.43	51.28	18.04	49.04	19.12	0.36	3.12
9	50.09	51.04	4.01	48.28	19.10	0.46	2.16
10	49.87	51.24	8.08	48.48	23.17	0.55	3.25
11	49.48	50.92	18.24	48.28	22.11	0.56	5.82
12	49.45	51.08	18.25	48.20	5.23	0.54	5.90
13	49.66	51.16	16.24	48.24	4.13	0.56	4.29
14	50.03	51.04	8.35	48.96	20.10	0.38	1.49

15	49.58	50.88	7.01	48.24	19.20	0.59	5.23
16	49.51	50.88	13.05	48.20	0.51	0.51	5.03
17	49.76	51.16	8.07	48.60	5.29	0.47	2.80
18	50.04	51.08	7.37	48.88	0.00	0.40	1.59
19	50.22	51.36	18.03	49.08	5.38	0.36	1.77
20	50.21	51.16	7.47	49.20	8.11	0.37	1.81
21	50.25	51.24	17.56	49.08	19.20	0.49	2.96
22	49.91	51.24	8.09	48.48	3.18	0.42	1.82
23	49.96	51.20	10.33	48.56	21.06	0.44	1.96
24	50.21	51.20	11.03	48.96	19.16	0.41	2.11
25	50.55	51.40	18.15	49.00	19.37	0.48	5.36
26	50.23	51.08	8.09	48.20	10.21	0.38	2.01
27	50.31	51.28	8.00	49.04	19.31	0.36	2.25
28	50.38	51.36	8.05	49.36	0.46	0.42	3.23
29	50.00	51.04	18.56	48.80	9.20	0.42	1.74
30	50.16	51.24	7.12	49.08	9.08	0.32	1.25
Monthly	**50.04**	**51.40**		**48.20**		**0.44**	**2.78**

Note : $$\mathrm{FVI} = \frac{10\sum (F-50)^2}{24 \times 60 \times 6}$$

where F = frequency measured at 10 second interval

IV. VOLTAGE PROFILE DURING APRIL 2002

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	413	389	412	388	431	389	415	385	218	197
2	419	384	420	394	427	383	414	378	216	191
3	419	384	414	384	422	389	411	384	214	195
4	415	386	416	382	425	389	406	385	215	196
5	419	393	416	386	425	394	410	386	215	198
6	413	388	414	382	422	389	412	378	215	197
7	415	395	422	394	431	407	413	392	215	204
8	413	397	418	386	427	400	411	385	218	200
9	411	386	418	378	429	385	412	381	218	189
10	413	388	420	380	429	389	411	383	215	195
11	410	391	414	394	427	400	417	389	215	197
12	411	391	416	381	425	392	416	383	214	198
13	415	390	415	380	427	394	412	391	211	200
14	413	391	410	380	429	389	415	392	218	197
15	413	389	416	384	427	392	414	386	214	194
16	408	382	414	374	425	387	412	382	214	184
17	411	391	416	388	429	398	413	386	215	196
18	413	386	418	378	429	394	415	383	218	190
19	411	389	414	378	429	394	410	387	215	195
20	411	386	414	382	429	398	410	385	215	197
21	411	384	414	378	431	394	412	382	216	196
22	413	386	416	378	429	396	409	390	214	190
23	410	384	408	378	420	389	406	382	206	184
24	419	395	416	380	431	392	412	379	213	191
25	419	399	414	388	431	400	410	382	212	198
26	420	393	414	388	427	398	411	390	213	196
27	417	393	418	384	431	396	411	390	214	200
28	415	395	416	390	429	403	412	390	214	198
29	417	386	416	378	425	387	412	385	213	191
30	413	388	412	378	427	392	412	386	210	194
Month	**420**	**382**	**422**	**374**	**431**	**383**	**417**	**378**	**218**	**184**

V. PERFORMANCE OF GENERATING STATIONS DURING APRIL 2002

S.No.	Power Station	Effective Capacity MW	Energy Generated		Cumulative from 01.04.2002	
			Gross MU	Ex Bus MU	Gross MU	Ex-bus MU
1	**CENTRAL SECTOR**					
A	**NTPC (Thermal)**					
(a)	Badarpur TPS	705.00	452.44	412.83	452.44	412.83
(b)	Singrauli STPS	2000.00	1240.08	1157.81	1240.08	1157.81
(c)	Rihand STPS	1000.00	650.11	613.19	650.11	613.19
(d)	Dadri NCTPS	840.00	405.32	372.49	405.32	372.49
(e)	Unchahar-I TPS	420.00	282.47	257.67	282.47	257.67
(f)	Unchahar-II TPS	420.00	200.66	183.40	200.66	183.40
(g)	Tanda TPS	440.00	207.06	181.08	207.06	181.08
(h)	Anta GPS	419.33	165.90	160.69	165.90	160.69
(i)	Auraiya GPS	663.36	236.06	231.08	236.06	231.08
(j)	Dadri GPS	829.78	330.42	321.31	330.42	321.31
(k)	Faridabad GPS	431.57	158.60	153.35	158.60	153.35
	Total NTPC	**8169.04**	**4329.11**	**4044.90**	**4329.11**	**4044.90**
B	**NHPC**					
(a)	Bairasiul	180.00	98.12	95.13	98.12	95.13
(b)	Salal	690.00	270.18	269.80	270.18	269.80
(c)	Tanakpur HPS	94.20	26.26	26.08	26.26	26.08
(d)	Chamera HPS	540.00	206.52	206.13	206.52	206.13
(e)	Uri HPS	480.00	347.03	343.79	347.03	343.79
	Total NHPC	**1984.20**	948.11	940.94	**948.11**	**940.94**
C	**NPC**					
(a)	RAPS -A	300.00	247.41	225.08	247.41	225.08
(b)	RAPS -B	440.00	213.75	192.15	213.75	192.15
(c)	NAPS	440.00	271.79	244.34	271.79	244.34
	Total NPC	**1180.00**	**732.96**	**661.57**	**732.96**	**661.57**

2	**JOINTLY OWNED (BBMB)**					
(a)	Bhakra Complex	1465.15	357.04	352.72	357.04	352.72
(b)	Dehar	990.00	290.80	290.80	290.80	290.80
(c)	Pong	366.00	11.95	11.95	11.95	11.95
	Total BBMB	**2821.15**	**659.79**	**655.47**	**659.79**	**655.47**
3	**DELHI**					
(a)	Indra Prastha	247.50	61.36	53.99	61.36	53.99
(b)	Rajghat	149.00	76.70	68.26	76.70	68.26
(c)	Gas Turbines	282.00	88.49	85.83	88.49	85.83
	Total DELHI	**678.50**	**226.54**	**208.09**	**226.54**	**208.09**
4	**HARYANA**					
(a)	WYC	48.00	21.01	20.80	21.01	20.80
(b)	Faridabad (New)	165.00	72.91	63.07	72.91	63.07
(c)	Panipat	860.00	383.16	337.18	383.16	337.18
(d)	Magnum Diesel(IPP)	25.20	7.45	7.37	7.45	7.37
	Total Haryana	**1098.20**	**484.52**	**428.42**	**484.52**	**428.42**
5	**HP**					
(a)	Giri	60.00	11.90	11.83	11.90	11.83
(b)	Bassi	60.00	33.85	33.83	33.85	33.83
(c)	Binwa	6.00	2.76	2.76	2.76	2.76
(d)	Rongtong (+Nogli+Micro+Thirot+Sal-2)	15.02	2.04	2.01	2.04	2.01
(e)	Andhra	16.95	9.76	9.74	9.76	9.74
(f)	Bhabha (H)	120.00	31.33	31.20	31.33	31.20
(g)	Baner (H)	12.00	2.78	2.70	2.78	2.70
(h)	Gaj (H)	10.50	2.72	2.72	2.72	2.72
(i)	Gumma	3.00	1.77	1.76	1.77	1.76
(j)	Ghanvi	22.50	7.71	7.69	7.71	7.69
(k)	Malana (IPP)	86.00	21.99	21.99	21.99	21.99
	Total HP	**411.97**	**128.61**	**128.23**	**128.61**	**128.23**
6	**J & K**					

(a)	Lower Jhelum	105.00	3.36	3.33	3.36	3.33
(b)	Upper Sindh	57.60	21.35	21.14	21.35	21.14
(c)	Ganderbal	15.00	2.62	2.60	2.62	2.60
(d)	Mohra	9.00	0.00	0.00	0.00	0.00
(e)	Chenani	25.30	7.86	7.79	7.86	7.79
(f)	Stakna	9.75	0.00	0.00	0.00	0.00
(g)	Small Hydel	3.54	0.00	0.00	0.00	0.00
(h)	Pampore GT St - I	75.00	0.00	0.00	0.00	0.00
	Pampore GT St - II	100.00				
	Total J & K	**400.19**	**35.20**	**34.85**	**35.20**	**34.85**
7	**PUNJAB**					
(a)	Jogindernagar/ Shanan	110.00	58.09	58.06	58.09	58.06
(b)	UBDC	90.00	31.58	31.47	31.58	31.47
(c)	Mukerian	207.00	14.43	14.32	14.43	14.32
(d)	Anandpur Sahib (APS)	134.00	31.92	31.87	31.92	31.87
(e)	Ranjit Sagar HPS	600.00	99.47	99.30	99.47	99.30
(f)	Small Hydel	4.10	0.64	0.63	0.64	0.63
(g)	GNDTPS (Bhatinda)	440.00	230.36	209.10	230.36	209.10
(h)	GGSTPS (Ropar)	1260.00	627.74	574.30	627.74	574.30
(i)	Jhalkeri Rice Straw Fired	10.00	0.00	0.00	0.00	0.00
(j)	Lehra Mohabbat TPS	420.00	155.05	140.18	155.05	140.18
	Total Punjab	**3275.10**	**1249.27**	**1159.22**	**1249.27**	**1159.22**
8	**RAJASTHAN**					
(a)	Mahi Bajaj Sagar	140.00	1.82	1.82	1.82	1.82
(b)	Rana Pratap Sagar (RPS)	172.00	0.99	0.99	0.99	0.99
(c)	Jawahar Sagar (JS)	99.00	1.30	1.29	1.30	1.29
(d)	Anoopgarh	9.00	0.12	0.12	0.12	0.12
(e)	Small Hydro	14.32	0.43	0.43	0.43	0.43
(f)	Kota TPS	850.00	585.07	528.09	585.07	528.09
(g)	RAMGARH GT	3.00				
(h)	RAMGARH GT EXT	35.50	0.00	0.00	0.00	0.00

(l)	Suratgarh TPS	750.00	470.80	427.71	470.80	427.71
(j)	Wind Farm	4.00	2.12	2.12	2.12	2.12
	Total Rajasthan	**2076.82**	**1062.63**	**962.56**	**1062.63**	**962.56**
9	**U.P.**					
	HYDRO					
(a)	Rihand	300.00	91.17	90.26	91.17	90.26
(b)	Obra	99.00	36.47	36.11	36.47	36.11
(c)	Matatilla	30.00	4.04	4.00	4.04	4.00
(d)	Khara	72.00	38.64	38.26	38.64	38.26
	Total U.P. (Hydro)	**501.00**	**170.33**	**168.62**	**170.33**	**168.62**
	THERMAL					
(e)	Obra	1442.00	628.75	550.16	628.75	550.16
(f)	Panki	242.00	42.06	36.80	42.06	36.80
(g)	Harduaganj	375.00	84.59	74.02	84.59	74.02
(h)	Paricha	220.00	89.52	78.33	89.52	78.33
(i)	Anpara	1630.00	880.21	770.19	880.21	770.19
	Total U.P. (Thermal)	**3909.00**	**1725.13**	**1509.49**	**1725.13**	**1509.49**
	Total U.P.	**4410.00**	**1895.45**	**1678.11**	**1895.45**	**1678.11**
10	**UTTRANCHAL**					
(a)	Khatima	41.40	6.94	6.87	6.94	6.87
(b)	Ramganga	198.00	31.94	31.62	31.94	31.62
(c)	Ganga Canal	32.70	10.28	10.17	10.28	10.17
(d)	Yamuna (I & IV)	114.75	53.78	53.24	53.78	53.24
(e)	Chibro	240.00	81.37	80.56	81.37	80.56
(f)	Khodri	120.00	39.11	38.72	39.11	38.72
(g)	Chilla	144.00	49.48	48.98	49.48	48.98
(h)	Maneri Bhali	90.00	56.56	56.00	56.56	56.00
	Total Uttranchal	**980.85**	**329.46**	**326.16**	**329.46**	**326.16**

Total Region	**27486.02**	**12081.65**	**11228.51**	**12081.65**	**11228.51**

Notes : 1. The ex-bus generations are either actual values or based on the following assumptions in respect of auxiliary consumption

-----Hydro and diesel/gas power stations in open cycle------1.0% Nuclear stations-----12.5%

------Gas power stations in combined cycle----------3.0%

------Coal fired power stations

IP ----12% Rajghat----11% Faridabad----13.5% Suratgarh-----10.0%

Panipat----12.0% RTP----7.5% GNDTP----10.5% Tanda----12.5%

Lehra Mohabbat----10.5% KTPS----10% UP----12.5%

2. The generation on small hydro& Sobla in U.P. and on small diesel gen. Sets in UT Chandigarh, H.P.and J&K has been neglected.

VI. CENTRAL GENERATING STATIONS SHARE vs DRAWAL OF ALL CONSTITUENTS DURING APRIL 2002

(All figs. in MU)

Sl. No.	State/UT/ System	Singrauli STPS		Rihand STPS		BTPS	W. Grid	VSTPS (WR)
		Entitlement	Actual	Entitlement	Actual	Actual	Actual	Actual
1	Chandigarh	6.60	6.63	5.46	5.39	0.00	0.00	0.00
2	Delhi	104.64	105.14	87.48	87.94	412.83	0.06	0.00
3	Haryana	139.10	139.56	95.06	95.48	0.00	0.05	0.00
4	H.P.	1.71	1.90	18.23	16.66	0.00	0.02	0.00
5	J & K	17.66	18.29	55.60	56.18	0.00	0.07	0.00
6	Punjab	99.99	100.69	74.86	75.50	0.00	0.08	0.00
7	Rajasthan	180.97	181.53	85.27	85.78	0.00	0.06	0.00
8	U.P.	354.87	356.22	163.43	164.66	0.00	0.15	0.00
9	MP	0.00	0.00	0.00	0.00	0.00	1.02	0.00
10	Uttranchal	24.81	20.39	3.17	0.97	0.00	0.02	0.00
11	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Trans. Losses	38.93	38.93	24.64	24.64	0.00	0.02	0.00

	TOTAL	**969.28**	**969.28**	**613.20**	**613.20**	**412.83**	**1.55**	**0.00**

Note :- Singrauli sentout excludes 188.542 MU supplied to Western Grid

(All figs. in MU)

Sl. No.	**State/UT/**	**Dadri NCTPS**		**Unchahar-I TPS**		**Unchahar-II TPS**	
	System	**Entitlement**	**Actual**	**Entitlement**	**Actual**	**Entitlement**	**Actual**
1	Chandigarh	0.00	0.23	0.88	0.93	0.80	0.82
2	Delhi	357.48	353.66	20.60	23.28	34.28	38.02
3	Haryana	0.00	3.20	24.81	25.73	13.52	12.77
4	H.P.	0.00	0.53	1.78	2.08	1.27	1.92
5	J & K	0.00	1.70	13.76	16.19	21.68	25.21
6	Punjab	0.00	1.07	22.21	23.84	29.91	29.38
7	Rajasthan	0.00	4.65	15.87	18.85	26.05	30.15
8	U.P.	15.00	0.68	147.06	136.41	48.51	37.70
9	MP	0.00	6.76	0.00	0.00	0.00	0.00
10	Uttranchal	0.00	0.00	0.34	0.00	0.00	0.04
11	Bihar	0.00	0.00	0.00	0.00	0.00	0.00
12	Trans. Losses	0.00	0.00	10.36	10.36	7.38	7.38
	Total	**372.48**	**372.48**	**257.67**	**257.67**	**183.40**	**183.40**

Sl. No.	**State/UT/**	**Anta GPS**		**Auraiya GPS**		**Uri HPS**	
	System	**Entitlement**	**Actual**	**Entitlement**	**Actual**	**Entitlement**	**Actual**
1	Chandigarh	2.64	2.48	2.82	2.45	2.16	2.22
2	Delhi	22.29	22.47	38.07	37.83	37.27	38.10
3	Haryana	22.85	21.99	30.88	29.34	18.63	19.39
4	H.P.	3.72	3.62	4.66	4.22	9.32	9.56
5	J & K	15.27	15.51	23.52	23.52	115.41	116.46
6	Punjab	20.70	20.96	33.42	32.75	46.60	47.77
7	Rajasthan	37.98	38.18	27.23	27.11	30.67	31.59
8	U.P.	28.54	29.05	60.92	61.05	68.11	70.36
9	MP	0.00	0.00	0.00	3.58	0.00	0.00
10	Uttranchal	0.29	0.00	0.32	0.00	12.08	4.79

11	Bihar	0.00	0.00	0.00	0.00	0.00	0.00
12	Trans. Losses	6.43	6.43	9.24	9.24	3.44	3.44
	TOTAL	**160.71**	**160.71**	**231.08**	**231.08**	**343.69**	**343.69**

Sl. No.	State/UT/	Dadri GPS		Bairasiul HPS		Salal HPS	
	System	Entitlement	Actual	Entitlement	Actual	Entitlement	Actual
1	Chandigarh	1.56	1.45	0.00	0.00	0.72	0.72
2	Delhi	48.29	51.50	10.06	10.06	30.79	30.79
3	Haryana	14.09	16.21	27.86	27.86	39.80	39.80
4	H.P.	3.98	3.95	10.96	10.96	2.62	2.62
5	J & K	31.11	33.67	0.00	0.00	92.93	92.93
6	Punjab	59.30	62.35	42.48	42.48	70.49	70.49
7	Rajasthan	35.31	38.87	0.00	0.00	7.82	7.82
8	U.P.	75.77	84.49	0.00	0.00	18.42	18.42
9	Uttranchal	0.07	0.00	0.00	0.00	3.21	3.21
10	Railways	51.82	28.81	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	3.81	3.81	2.70	2.70
	Total	**321.30**	**321.30**	**95.17**	**95.17**	**269.50**	**269.50**

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	0.28	0.28	8.13	8.20	0.00	0.00	3.69	0.00
2	Delhi	2.85	2.85	16.00	17.05	0.00	30.90	31.36	0.00
3	Haryana	1.42	1.42	31.86	32.83	0.00	3.62	14.14	0.00
4	H.P.	0.85	0.85	30.91	30.68	0.00	0.00	3.25	0.00
5	J & K	1.71	1.71	7.88	9.22	0.00	46.78	37.00	0.00
6	Punjab	3.99	3.99	20.61	22.09	0.00	5.69	6.72	0.00
7	Rajasthan	2.57	2.57	39.88	41.05	225.08	105.15	95.98	0.00
8	U.P.	4.75	4.75	40.84	40.84	0.00	0.00	0.00	181.08
9	Uttranchal	3.83	3.83	7.26	1.41	0.00	0.00	0.00	0.00
10	Trans. Losses	0.94	0.94	2.76	2.76	0.00	0.00	0.00	0.00

11	0thers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**23.19**	**23.19**	**206.13**	**206.13**	**225.08**	**192.15**	**192.15**	**181.08**

Note :- Tanakpur sentout excludes 2.854 MU supplied to Nepal

Sl. No.	**State/UT/**	**Narora APS**		**Bhakra HPS**		**Dehar HPS**	**Pong**	**F'bad GPS**	**ER import**
	System	**Entitlement**	**Actual**	**Entitlement**	**Actual**	**Actual**	**Actual**	**Actual**	**Actual**
1	Chandigarh	4.41	4.27	40.90	40.96	0.00	0.00	0.00	6.73
2	Delhi	32.99	54.13	0.00	0.00	0.00	0.00	0.00	34.73
3	Haryana	22.09	26.32	89.19	89.79	86.68	1.87	153.35	29.65
4	H.P.	7.95	6.67	9.25	9.28	8.28	0.00	0.00	6.73
5	J & K	21.75	33.78	0.00	0.00	0.00	0.00	0.00	6.73
6	Punjab	27.18	20.53	123.05	123.88	130.03	2.81	0.00	0.00
7	Rajasthan	31.98	52.93	55.53	55.81	54.18	6.59	0.00	6.73
8	U.P.	77.47	35.62	0.00	0.00	0.00	0.00	0.00	28.19
9	N.F.F.	0.00	0.00	14.40	12.61	0.00	0.00	0.00	0.00
10	Uttranchal	8.72	0.28	0.00	0.00	0.00	0.00	0.00	0.00
11	Trans. Losses	9.79	9.79	20.41	20.41	11.63	0.68	0.00	0.00
	Total	**244.33**	**244.33**	**352.73**	**352.73**	**290.80**	**11.95**	**153.35**	**119.50**

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

I. BILATERAL EXCHANGES IN THE NORTHERN REGION DURING APRIL 2002

(All figs in MU'S)

	Chandigarh	Delhi	Haryana	Himachal	J & K	Punjab	Rajasthan	UP	Uttranchal	MP	Bihar	Others
Chandigarh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Delhi	0.00	0.00	0.00	20.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Haryana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Himachal	0.00	-20.26	0.00	0.00	0.00	-5.66	0.00	0.00	0.00	0.00	0.00	0.00
J & K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Punjab	0.00	0.00	0.00	5.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rajasthan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.90	0.00	0.00	0.00
UP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.46	0.00	0.00	0.00
Uttranchal	0.00	-36.90	0.00	0.00	0.00	0.00	0.00	-14.46	0.00	0.00	0.00	0.00
MP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Others	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.000**	**-57.155**	**0.000**	**25.913**	**0.000**	**-5.658**	**0.000**	**-14.462**	**51.362**	**0.000**	**0.000**	**0.000**

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

i) Harayana's share in IP station of Delhi **15.171** MU
ii) Himachal's share in Shanan & RSD power station of Punjab **11.235** MU
iii) Himachal's share in Yamuna hydro power complex of UP & Uttranchal **47.770** MU
iv) Maruti to Harayana **0.000** MU

ote: 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 30.04.2002

CONSTITUENT	REQUIREMENT AT THE END OF 2002-03	CAPACITORS AS ON 30.04.2002	CAPACITORS ADDITION DURING		ADDITIONAL REQUIRED DURING 2002-03
		INSTALLED	2001-02	April 02 -March 03	
Chandigarh	108	92	7	0	16
Delhi	3042	2638	397	5	404
Haryana	2539	2547	416	0	0
H.P.	352	200	57	7	152
J & K	872	159	12	0	713
Punjab	5067	4630	199	0	437
Rajasthan	3021	2443	59	27	578
U.P.	5390	4731	485	40	659
Uttranchal					
BBMB	366	381	0	0	0
TOTAL	20757	17821	1632	79	2959

SOURCE: Minutes of 328th OCC meeting of NREB held on 09 th May, 2002.

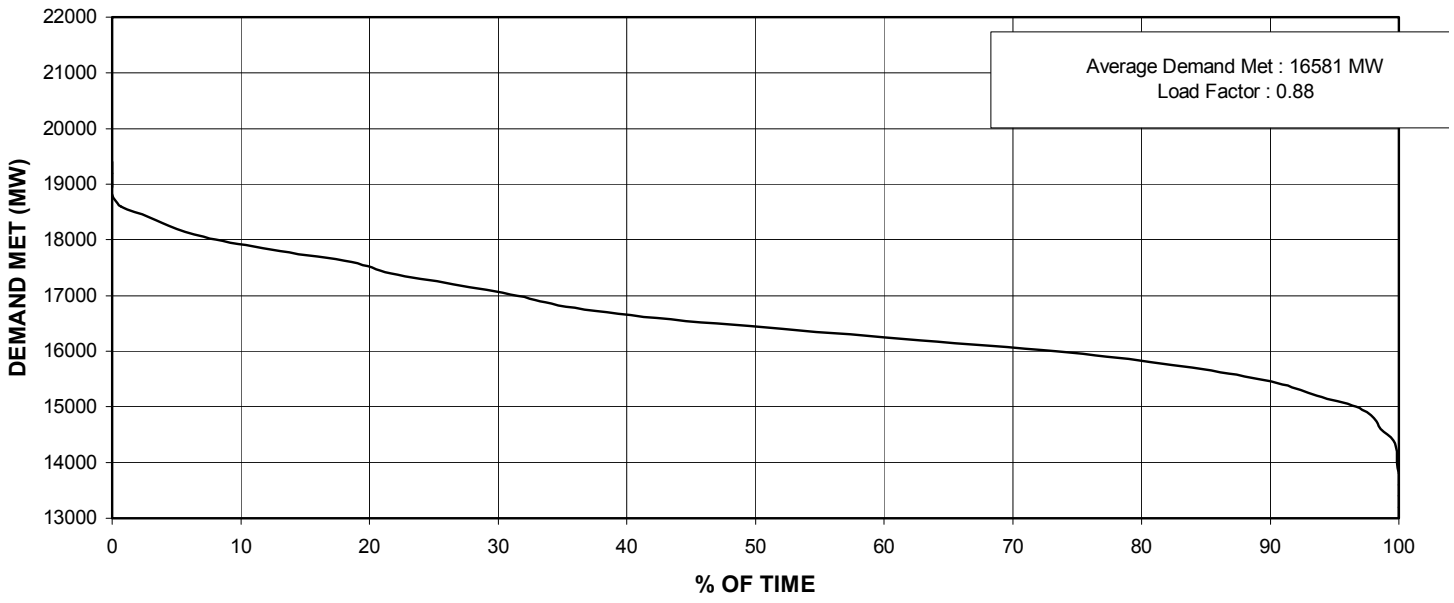
IX. HYDRAULIC DATA FOR RESERVOIRS DURING APRIL 2002

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 (m) April 2002 (ft)	454.99 1492.74	395.17 1296.48	257.46 844.70	345.14 1132.35	380.16 1247.26
Level on last day of (m) April 2001 (ft)	454.52 1491.20	394.22 1293.38	258.17 847.00	344.25 1129.44	380.55 1248.54
Live Capacity as on (mhmt) last day of April 2002(maft)	0.05 0.44	0.11 0.86	0.13 1.05	0.03 0.22	0.00 0.00
Live Capacity as on (mhmt) last day of April 2001(maft)	0.05 0.42	0.09 0.76	0.14 1.15	0.01 0.12	0.00 0.00
Energy content as on last day of April 2002 (MU)	180.00	140.00	575.00	55.00	0.00
Energy content as on last day of April 2001 (MU)	170.00	125.00	650.00	18.00	0.00
Maximum level (m)	458.52	395.17	259.38	345.40	380.34

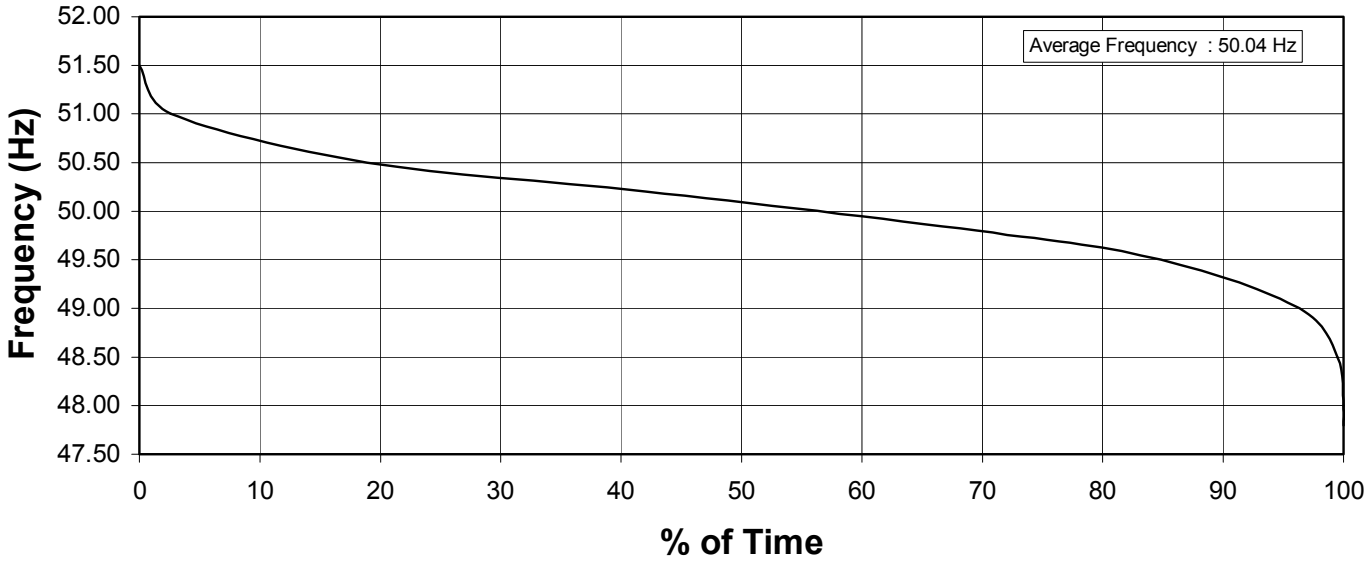
	(ft)	1504.32	1296.48	851.00	1133.20	1247.84
	(date)	01.04.2002	30.04.2002	01.04.2002	01.04.2002	01.04.2002
Minimum level	(m)	454.99	394.11	257.46	345.14	380.16
	(ft)	1492.74	1293.01	844.70	1132.35	1247.26
	(date)	30.04.2002	07.04.2002	30.04.2002	30.04.2002	30.04.2002

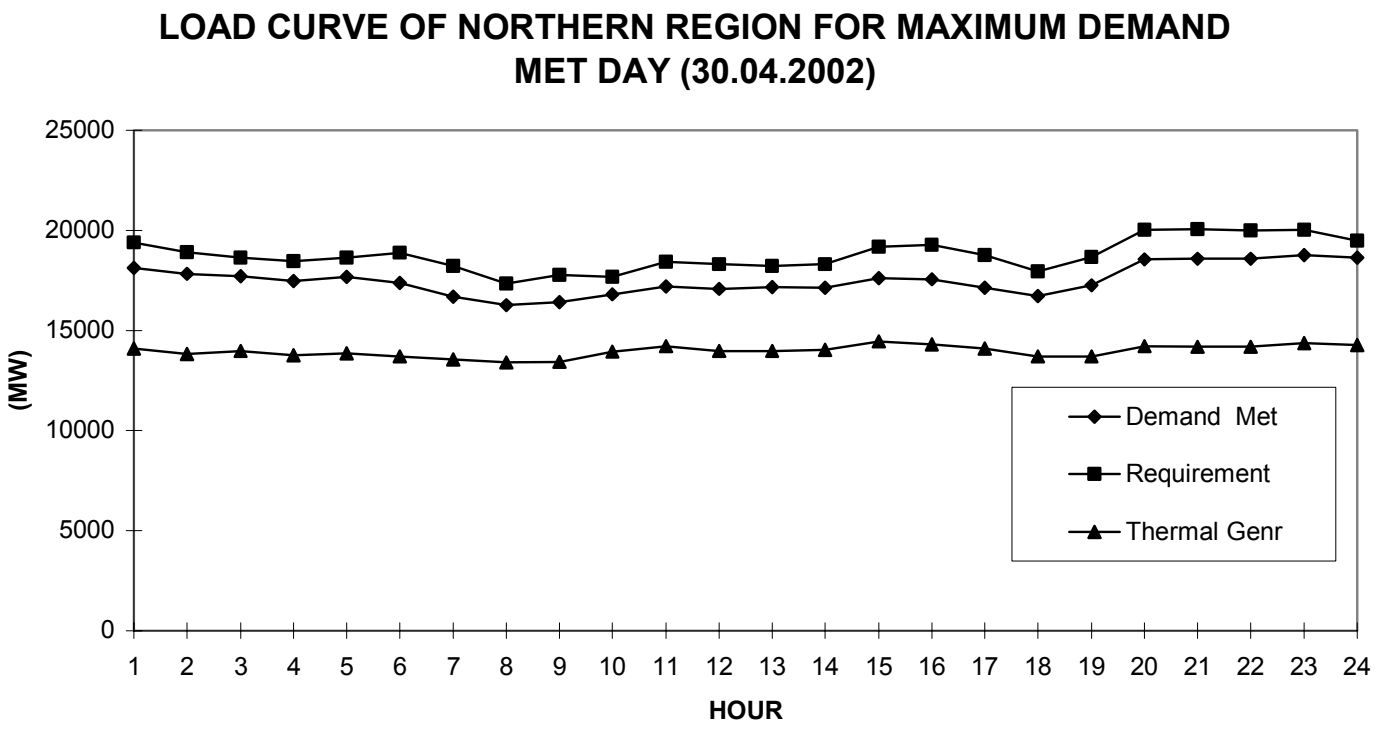
Energy content of Bhakra : Total Energy content at Bhakra, Ganguwal and Kotla power stations
Energy content of Rihand : Total Energy content at Rihand & Obra power stations
Energy content of RPS : Total Energy content of Rana Pratap Sagar and Jawahar Sagar Power Stations.
Energy Content of G. Sagar : Total Energy content at Gandhi Sagar, RP Sagar and Jawahar Sagar Power Stations.

LOAD DURATION CURVE OF NORTHERN REGION FOR APRIL 2002



FREQUENCY DURATION CURVE OF NORTHERN REGION FOR APRIL 2002

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20000
15000
10000
5000
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(MW)
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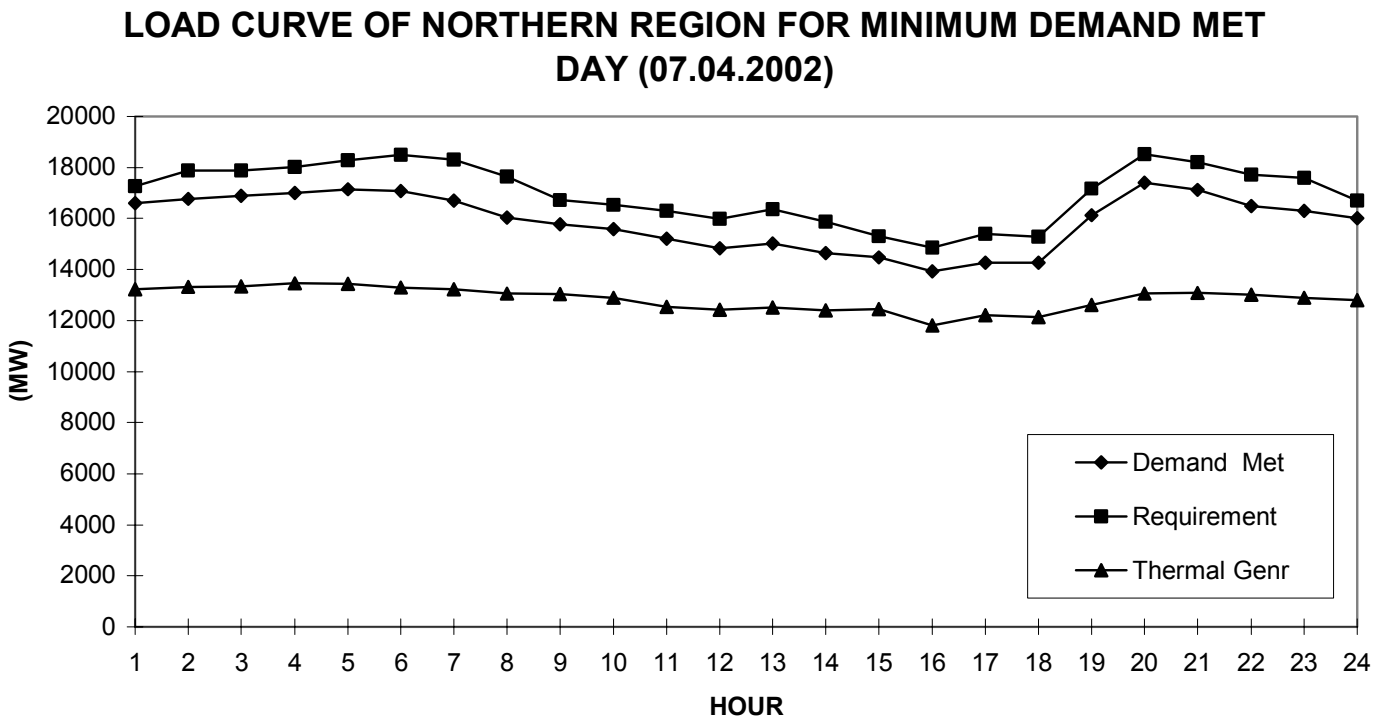
HOUR
Demand Met
Requirement
Thermal Genr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(MW)
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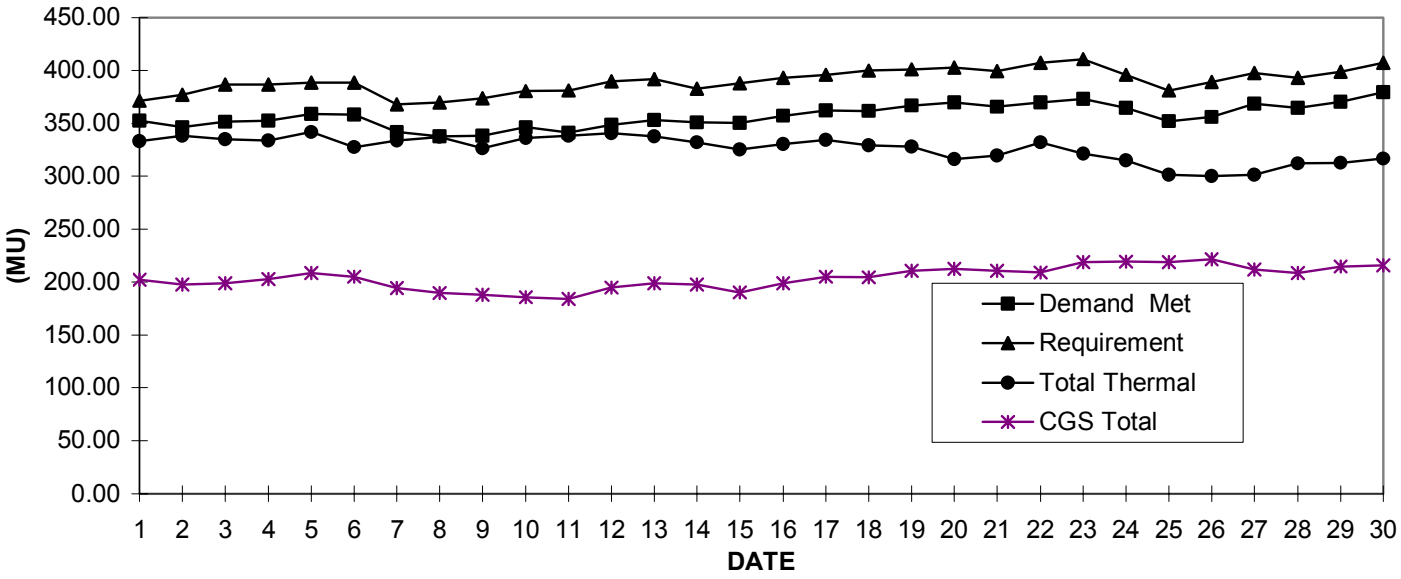
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOUR
Demand Met
Requirement
Thermal Genr

DAYWISE DEMAND MET AND REQUIREMENT (In MU) OF NORTHERN REGION DURING APRIL 2002



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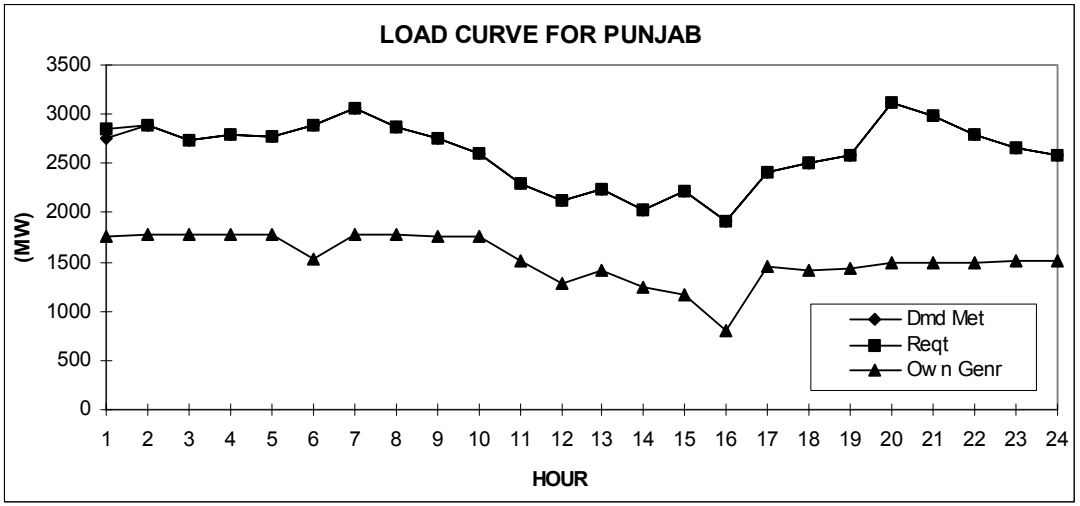

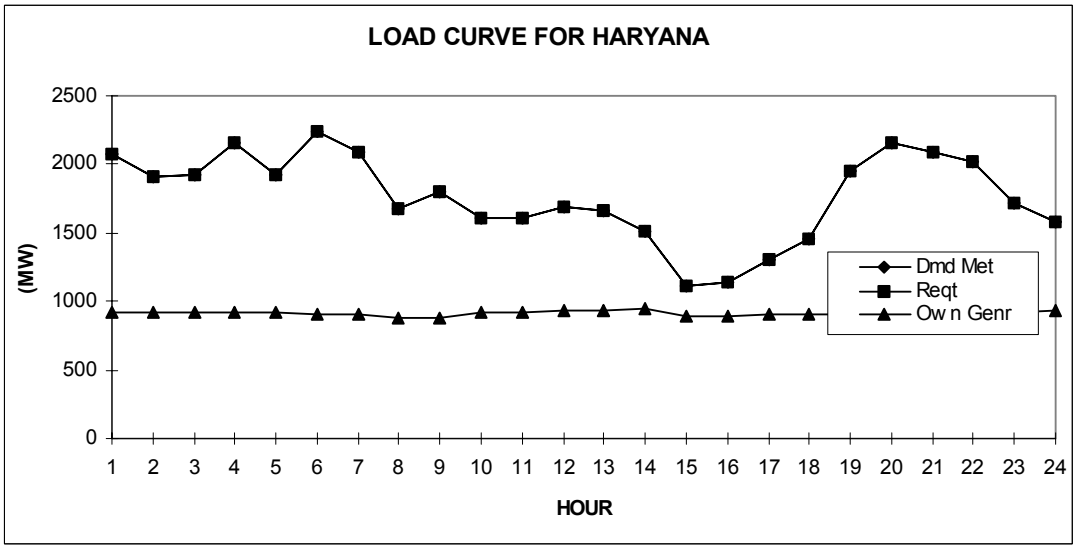

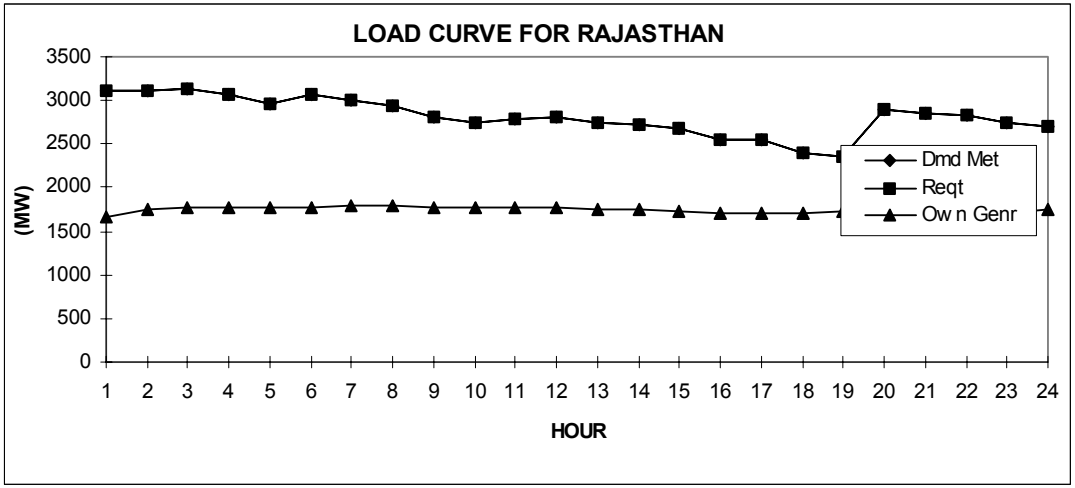
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(MW)
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HOUR
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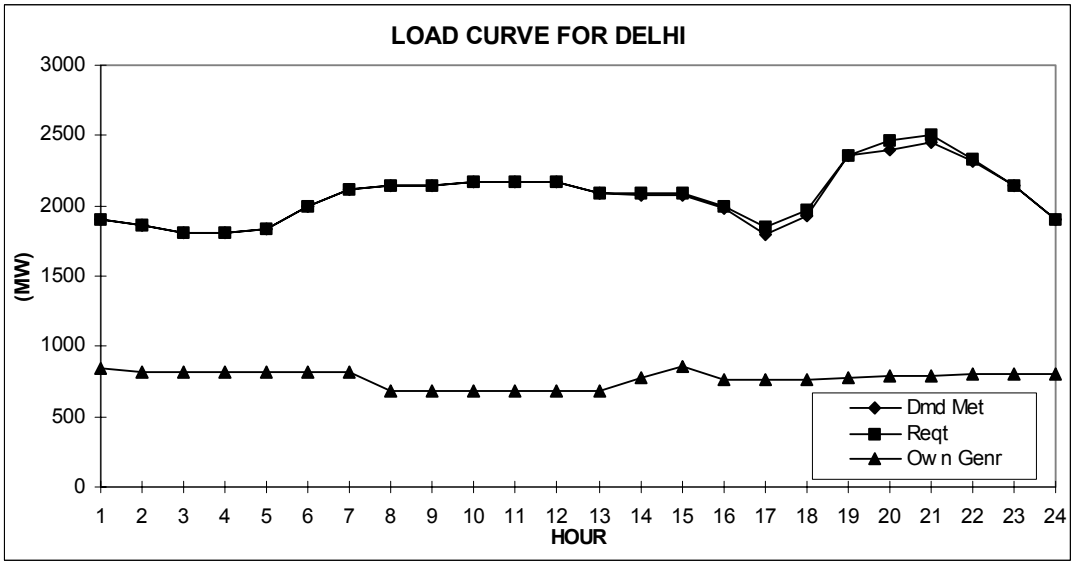
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(MW)
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HOUR
Dmd Met
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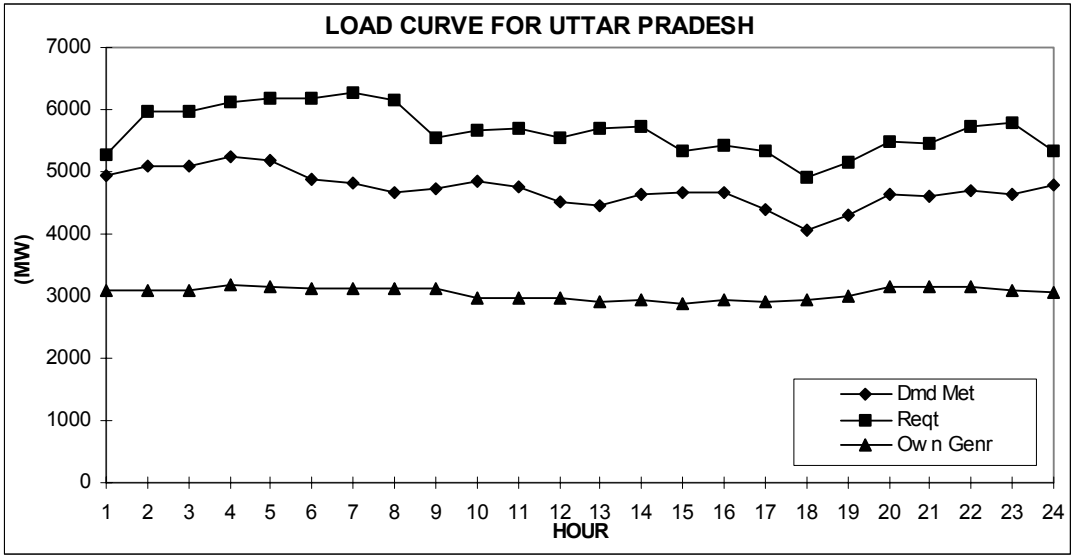

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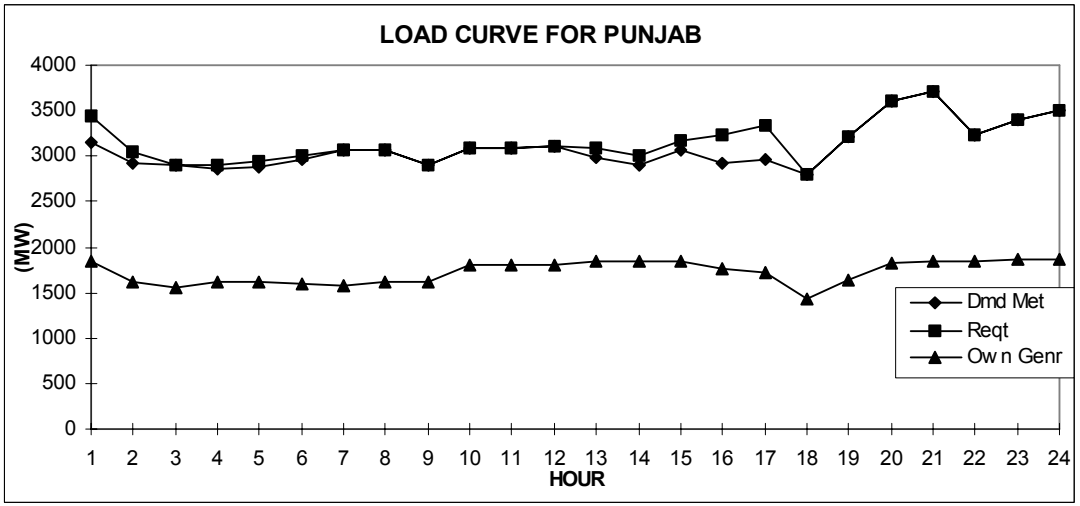

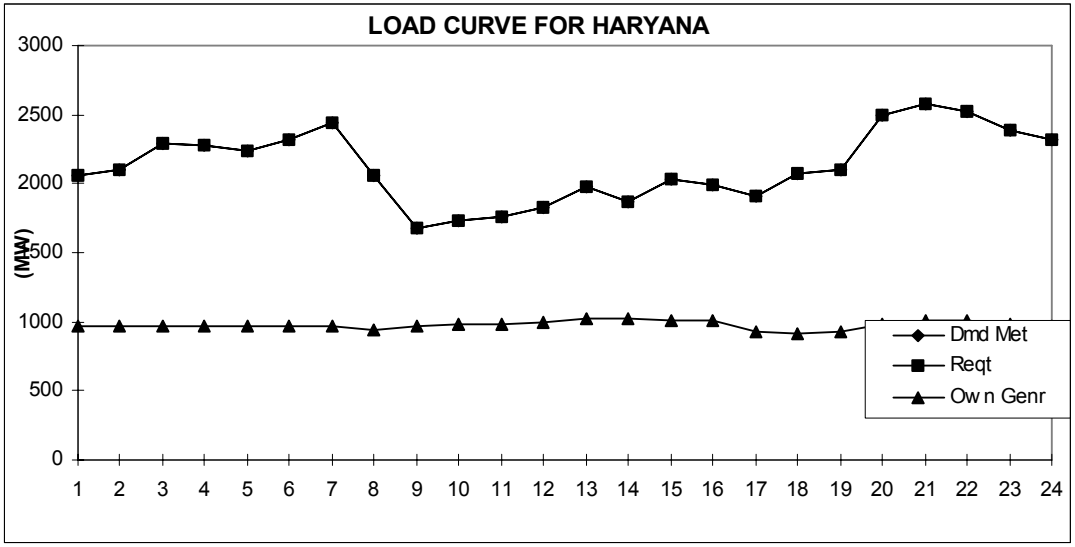
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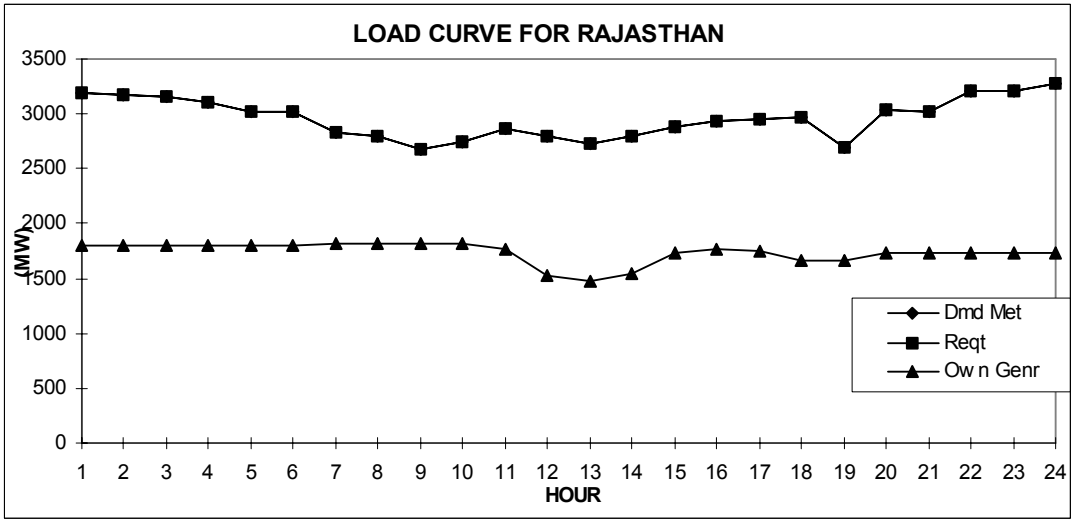
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(MW)
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3000
2500
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HOUR
Dmd Met
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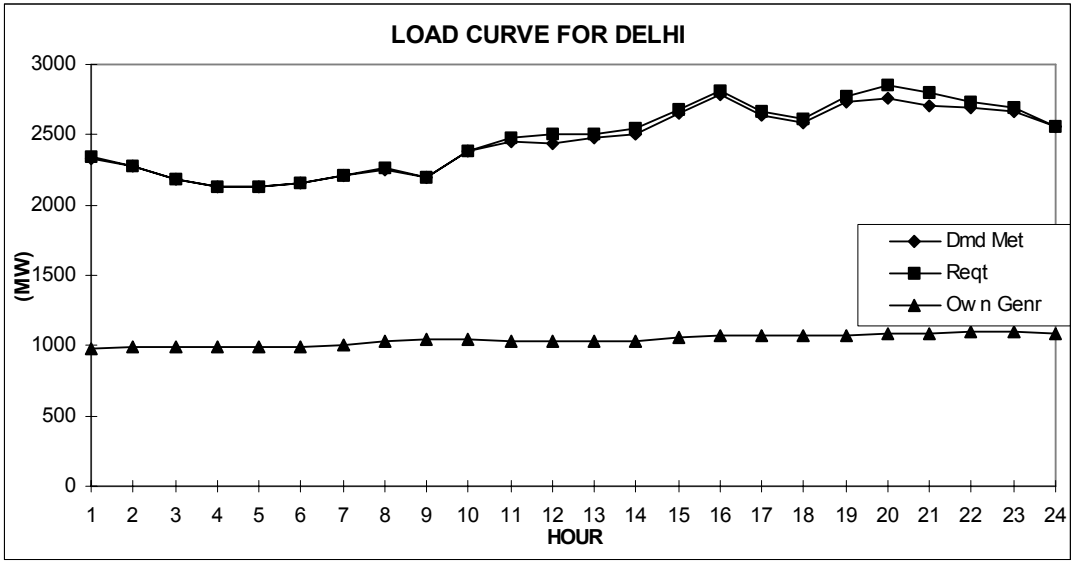
Ow n Genr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(MW)
HOUR
Dmd Met
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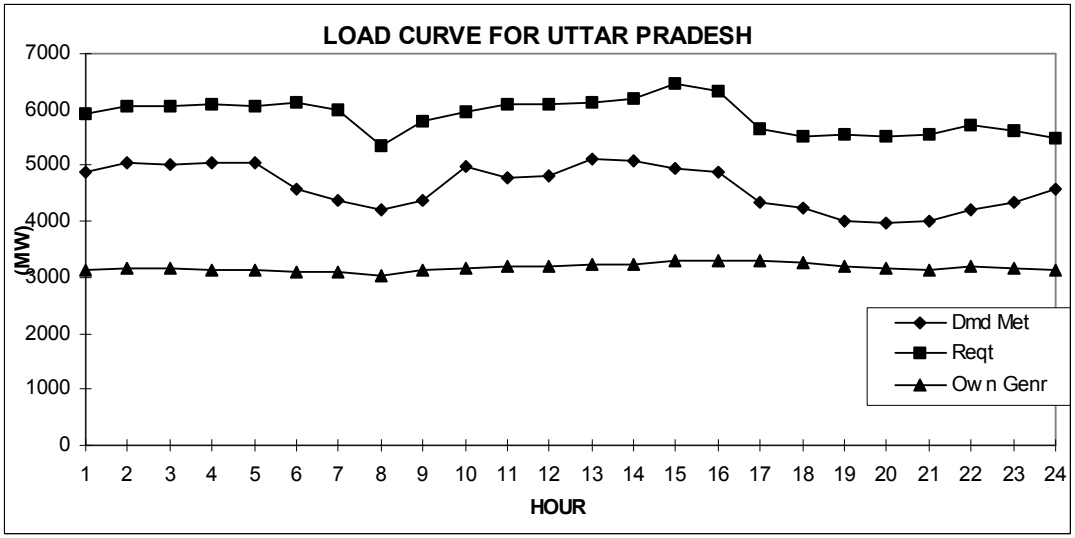
Ow n Genr


LOAD CURVE FOR UTTAR PRADESH
(MW)
HOUR
Dmd Met
Reqt
Ow n Genr

MINOR GRID INCIDENTS DURING APRIL 2002

S No.	DATE	TIME	INCIDENT
1	19.04.2002	12:48	An incident occurred in Punjab system, in which all the four running units at Bhatinda TPS and one running unit at Lehra Mohabat TPS tripped due to mal-operation of bus-differential protection at 220 kV Lehra Mohabat Sub-station. The generation loss was of the order of 600 MW. All the tripped units were brought back on bar by 17:30 hrs. of the same day.
2	23.04.2002	10:30	An incident occurred in Delhi system reportedly due to blasting of B-phase CT of 220 kV IP-Rajghat Ckt-II. This resulted in total loss of generation at IP (68 MW) and Rajghat (68 MW) and loss of power supply (400-500 MW) In Central parts of Delhi. The system were normalized by 11:00 hrs. And tripped units were brought back in service by 15:35 hrs.
3	26.04.2002	10:20	An incident occurred in UP system, in which all the running units at Anpara TPS (1300 MW) and three units at Obra TPS (350 MW) tripped. System frequency dropped from initial level of 50.34 Hz to 48.20 Hz. Further fall in system frequency was arrested by partial operation of under frequency relay installed at 48.20 Hz. However, frequency was brought back to normal level by increasing the generation at other thermal stations. Obra units were tripped due to fault in 220 kV bus and Anpara units (#4 & #5) were tripped due to failure of Cooling Water Pumps. The system was normalized by 19:00 hrs.