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SALIENT FEATURES OF NORTHERN REGION

S. No.	Parameters	2003-04	2002-03	Increase	% Increase
1	Effective capacity (on the last day of the year) (MW)	30776.07	28249.77	2526.30	8.94
2	Average energy (MU/day net)				
2(a)	Demand met	419.76	389.80	29.96	7.68
2(b)	Requirement	445.79	425.78	20.01	4.70
2(c)	Shortage	26.03	35.98	9.95	27.56
2(d)	% shortage	5.84	8.45		
3	Peak MW				
3(a)	Demand met	22746	21767	979	6.67
3(b)	Requirement	24348	24031	317	1.31
3(c)	Shortage (non-coincidental)	1602	2264		
3(d)	%Shortage (non-coincidental)	6.58	9.42		
3(e)	Demand met at max. reqt. Hrs.	22517	21767		
3(f)	Shortage (coincidental)	1831	2264		
3(g)	%Shortage (coincidental)	7.52	9.42		
4	Frequency (Hz)				
4 (a)	Average	49.82	49.90		
4 (b)	% of time above 50.5 Hz	5.85	15.92		
4 (c)	% of time below 49.0 Hz	4.67	7.08		
4 (d)	% of time between 49.0 to 50.5 Hz	89.47	77.00		
4 (e)	% of time below 48.5 Hz	0.02	0.79		
5	Generation at the time of regional peak demand met				
5 (a)	Hydro (MW)	6842	6080	402	6.61
5 (b)	Thermal (MW) coal Fired	12769	12501	593	4.74
5(c)	Thermal (MW) gas Fired	1945	2245	-284	11.98
5(d)	Nuclear (MW)	989	811	203	25.64
5(e)	Inter regional exchange (MW)	201	-130	71	
5(f)	Total (MW)	22746	21767	979	6.67

SALIENT FEATURES OF NORTHERN REGION

S. No.	Parameters	2003-04	2002-03	Increase	% Increase
6	Gross generation (MU/day Average)				
6 (a)	Hydro	105.73	80.42	23.15	28.03
6 (b)	Thermal (coal fired)	282.50	272.08	10.42	3.82
6 (c)	Thermal (Gas fired)	51.77	47.22	4.55	9.63
6 (d)	Nuclear	20.06	23.48	-3.42	-14.56
6 (e)	Total	460.06	425.35	34.71	8.16
7	PLF (%)				
7 (a)	Thermal (coal fired)	76.44	71.69	4.75	
7 (b)	Thermal (Gas fired)	53.30	65.63	-12.33	
7 (c)	Nuclear	68.86	82.93	-14.07	
7 (d)	Total (coal+gas+nuclear)	66.14	69.68	-3.54	
7 (e)	Central sector (Coal)	85.87	85.38	0.49	
7 (f)	Central sector (gas`)	72.81	72.63	0.18	
7 (g)	Central sector (Nuclear)	68.66	82.93	-14.27	
7 (h)	Central sector (Total)	74.00	81.87	-7.87	
7 (i)	State sector (gas fired)	33.80	40.22	-6.42	
7 (j)	State sector (coal fired)	67.01	62.65	4.36	
7 (k)	State sector (total)	50.40	59.99	-9.59	
8	Water level on Last day of the year (In Mtrs.)				
8 (a)	Bhakra	463.86	460.86	3.00	
8 (b)	Pong	399.60	399.28	0.32	
8 (c)	Rihand	257.01	258.50	-1.49	
8 (d)	R.P.S.	345.11	346.97	-1.86	
8 (e)	G.S.	379.59	379.18	-0.47	

HIGHLIGHTS

1.1 Power supply position:

During the year 2003-2004, the power supply position in the region by & large has been much better as compared to previous year. The increase in effective generation capacity was 8.94% in comparison to 1.25% during 2002-2003. The energy & peak MW availability increased by 7.68% and 6.67% respectively (energy from 389.80MU/day average to 419.76 MU/day & peak MW from 21767 MW/day in 2002-2003 to 22746 MW/day in 2003-2004). Due to Increase in the generation capacity, the energy shortages & peak shortages during the current year were reduced to 5.84% and 6.58% respectively as against the corresponding figures of 8.45% and 9.65% during 2002-2003.

1.2 Frequency regime:

. Frequency profile during the year 2003-2004 was much better than the last year i.e. 2002-2003 due to concert efforts of NRLDC and active co-operation of all constituents. The frequency remained below 49.00 Hz for 04.67 % of total time against 07.08% of total time and above 50.50Hz for 05.85% of total time against 15.92% during last year. There was marked improvement in the frequency profile particularly with respect to the trend above 50.50 Hz due to effective backing down of generation by generating stations and closing down of costlier machines by constituents during high frequency periods.. Overall there has been continuous improvement in the frequency profile particularly after the implementation of ABT (Availability Based Tariff) in the Region w. e .f 1st December 2002.

1.3 Voltage profile:

The month wise maximum & minimum voltage recorded at Dadri during the year 2003-2004 are given under section 9.3. The voltage regime was better than the last year particularly in case of minimum voltage from 340KV to 360KV i.e a rise of around 20KV and decrease in high voltage from 436KV to 426KV. However on certain instances the voltage levels had gone down to low levels mainly due to increase in reactive energy requirements (drawl) of the constituents with non-commensurate increase in installed capacitors. The constituent wise installation of shunt capacitor vis-à-vis the projected requirement as on 31st March 2004 is given in section 10.2.

1.4 Grid incidents:

There was no major incident/disturbance in the grid during the year 2003-2004. The summary of minor incidents/disturbances that occurred during the current year in NR region is given at Annexure(Grid incidents).

1.5 System improvements:

- (i) Commissioning of BASPA-HPS Unit # 1 (100 MW), Unit #2 (100 MW), Unit # 3 (100 MW), completed on 12.05.2003,14.05.2003, and 27.05.2003 respectively.
- (ii) Commissioning of CHAMRA-STAGE-II HPS Unit # 1 (100 MW), Unit # 2 (100 MW), Unit # 3 (100 MW) completed on 06.10.2003, 05.12.2003, and 31.03.2004 respectively.
- (iii) Commissioning of SJVPNL Unit # 4 (250 MW), Unit # 6 (250 MW), Unit # 3 (250 MW), Unit # 2 (250 MW), Unit # 5 (250 MW), unit # 1 (250 MW), completed on 20.09.2003, 23.11.2003, 13.02.2004, 09.03.2004, 22.03.2004, and 31.03.2004, respectively.
- (iv) Commissioning of SURATGARH Unit # 5 (250 MW) on 30.06.2003 resulted in increased availability of power in Rajsthan.
- (v) Commissioning of KOTA Unit # 6 (195 MW) on 30.07.2003 resulted in increased availability of power in Rajsthan.
- (vi) Commissioning of Projects from (i) to (iii) and Units at S.No. (iv) and (v), along with renovation and modernisation of some machines enhanced the regional availability by 2526.30 MW.
- (vii) 132 KV Mau-Balia line commissioned on 01.05.2003, thereby providing more reliability and security to UP system.
- (viii) Commissioning of 315 MVA, 400/220 kV ICT-II at Meerut sub-station on 29.03.2003,resulted in strengthening of UP system.
- (ix) Commissioning of 315 MVA, 400/220KV ICT-III at Meerut on 26.06.2003, resulted in strengthening of UP system.
- (x) Commissioning of 400 KV Ballabgarh-Bamnauli line-1 on 21.08.2003, resulted in completion of 400 KV ring system of Delhi..
- (xi) 400 KV Meerut-Mandola ckt-I commissioned on 30.09.2003 enhancing system strengthening in UP system
- (xii) 400 KV Agra(PGCIL)-Agra(UPPCL) completed in June 2003, enhancing the overall power transfer capacity from Eastern UP to Western UP, Delhi and beyond.
- (xiii) Lilo of 400 KV Chamera-Kishanpur at Chamera- II completed in June 2003.
- (xiv) Commissioning of 220 KV Meerut-Modipuram-II and 220 KV Meerut-Simboli line completed on 28.06.2003.
- (xv) Commissioning of FACTS IN 400 KV Panki-Muradnagar line completed on 03.02.2004, thereby enhancing the capability in central-west corridor.
- (xvi) 220 KV Allahabad-Rewa Road –II completed on 26.07.2003.
- (xvii) Lilo of 220 KV Panki-Naubasta at Kanpur completed on 29.09.2003.

- (xviii) LILO work of 220 kV Anta-Dausa ckt.-I at Swaimadhopur resulted in system strengthening in Rajasthan system.

1.6 Other Important Developments

Implementation of availability based tariff (ABT) in Northern Region

ABT was implemented in Northern region w.e.f 01.12.2002. ABT is a three Part tariff for inter utility active energy and a scheme for reactive energy Exchanges as under.

- Fixed charges to central sector generators linked to availability of Station.
- Energy charges to central sector generators based on the schedule . requisitions given by the states.
- A frequency linked unscheduled interchange (UI) based on difference between schedule and actual drawals on the prevailing frequency.
- Tariff for reactive energy exchanges from the grid below 97% and above 103% of the voltage.

NRLDC-AN OVER VIEW

2.1 NRLDC is the nodal centre for co-ordinating operation of the Northern Regional power system. The Northern Regional power system is the largest amongst the five regional power systems in the country and has several unique features as mentioned under.

Largest in geographical area amongst the five regions, covering 30.7% of the area and approx 28% of the country's population.

Largest number of constituents (9 states/UT's,), 3 central generating companies, one central transmission Utility and Bhakra Beas Management Board and IPP's.

Largest sized hydro unit (250 MW at SJVPNL HEP) in the country.

Establishment of the first super thermal power station (Singrauli SSTPS) 2000 MW and 400 KV transmission system in the country.

Establishment of the first High Voltage Direct Current (HVDC) long distance transmission system in the country (2x750 MW, 500kV Rihand-Dadri HVDC bipole).

First HVDC back-to-back interconnection with Western Region (2x250 MW back-to-back HVDC station at Vindhyachal).

First 400kV Static Var Compensators (SVC's, $2x \pm 140$ MVAR) at Kanpur in the country.

Largest capacity of combined cycle gas power station amongst the five regions (2939.50 MW) located along the 700 Kms. long Hazira-Bijapur-Jagdishpur (HBJ) natural gas pipeline of GAIL.

Real time operation of such a vast and complex power system, with region specific peculiarities of load pattern and power demand, needs special commitment of the team dedicated to this task. Real time data from various generating stations and power control centres is telemetered to this centre (NRLDC, New Delhi) via state load despatch centres (SLDCs) situated at various locations of the region and is made available for display and monitoring in the NRLDC control room to ensure security and integrity of the Northern Grid. Computer based telemetry, display, data logging and associated auxiliary system are kept operational round the clock through out the year backed up by reliable communication system.

2.2 Salient Features of Northern Regional Power System:

1)	Installed generation capacity (as on 31 st March, 2004)		31302.23 MW
2)	Effective generation capacity (as on 31 st March, 2004)		30776.07 MW
3)	Largest Generating Stations		
	--Thermal (coal fired)	Singrauli STPS (NTPC)	2000 MW
	--Hydro	SJVPNL HEP	1500 MW
	--Nuclear	RAPS Complex (NPC)	740 MW
	--Gas fired	Dadri GPS (NTPC)	829.78 MW
4)	Largest generating unit size		
	--Thermal (coal fired)	Singrauli/Rihand/Anpara	500 MW
	--Nuclear	Narora APS/RAPS-B	220 MW
	--Hydro	SJVPNL HPS	250 MW
	--Gas fired	Faridabad GPS	138 MW
5)	Largest transmission elements		
	Longest-400 kV line-- Singrauli-Lucknow		408 Kms.
	Largest ICT-400/220 kV ICTs at Bhiwani/Dadri/S/Stn.		500 MVA
6)	Transmission system (as on 31 st March 2004)	± 500 kV HVDC 400 kV 220 kV Total	1630 ckt. kms. 15348 ckt. kms. 27091 ckt. kms. 44069 ckt. kms.
7)	No. of generating units (Thermal/nuclear/hydro)	500 MW 200/210/220/250 MW 100/110 MW 50/55/60/62.5/67.5 MW	6 nos. 55 nos. 29 nos. 18 nos.
8)	Regional peak met (2003-2004)	22746 MW	
9)	Regional Peak demand (2003-2004)	24348 MW	
10)	Average energy consumption (2003-2004)	419.76 MU / day	
11)	Average energy requirement (2003-2004)	445.79 MU / day	

2.3 Land marks in development of the Northern Grid:

1964	Formation of Northern Regional Electricity Board (NREB).
1970	BBMB & Delhi systems interconnected.
1975	Rajasthan system interconnected with Delhi/BBMB system.
1976-82	UP system intermittently synchronised with rest of the Northern Grid.
1982	Total integration of entire Northern Regional power system.
1984	First Supervisory Control & Data Acquisition (SCADA) system commissioned in Northern Region.
1990	2x250 MW Vindhyachal HVDC back-to-back link with Western Grid commissioned. Pole-2 of Rihand-Dadri HVDC back to back link (750 MW capacity) commissioned.
1991	Pole-1 of Rihand-Dadri HVDC back to back (750 MW capacity) commissioned.
1992	2x $\pm$ 140 MVAR Static Var Compensator (SVC) commissioned at Kanpur.
1996	Transfer of NRLDC from CEA to POWERGRID .
1998	Electricity Law (Amendment) Act 1998 passed by Parliament designating RLDC as apex body to ensure integrated operation in concerned region.
1999	Approval of the Indian Electricity Grid Code (IEGC) by the CERC.
1999	Series Compensation commissioned on 220 kV Kishenpur – Pampore D/C line.
2000	Indian Electricity Grid Code (IEGC) in force w.e.f. 1 st February.
2001	Preparation of ABT based schedule w.e.f. 01.08.2001.
2002	Unified Load Despatch Centre inaugurated by honourable Prime Minister of India at NRLDC, New Delhi.
2002	Uttaranchal carved out of U.P. and joined the Northern Region as new constituent w.e.f 01.04.2002.
2002	Implementation of ABT in the Northern Region w.e.f 01.12.2002.
2002	Series compensation (stage-1) commissioned on 400 kV Kanpur-Ballabgarh line.
2002	I X 500 MW Pusauli HVDC back to back link with eastern Grid commissioned .
2002	Commercial implementation of ABT in Northern Region w.e.f 1 st December 2002.

2003	Exercise on free governor mode of operation commenced in a planned manner.
2003	Indian electricity act 2003 came into force w.e.f 10.06.2003.
2003	With the commissioning of 400 KV Bamnauli-Ballabgarh-CKT-11, 400 KV ring system around Delhi is complete.
2004	Series compensation commissioned on 400 KV Panki-Muradnagar line.
2004	SJVPNL hydro plant having capacity of 1500 MW fully commissioned.

2.4 Functions of NRLDC:

The functions presently being discharged by NRLDC are:

- Round-the-clock system operation and control including Inter-State / Inter-Regional transfer of power, contingency evaluation and analysis and operational planning.
- Operation and maintenance of the Northern Regional Power Control Centre and associated computing & communication facilities.
- Scheduling and rescheduling of generation and drawl schedule under ABT regime.
- Co-ordination of maintenance programme for generating units and transmission lines on short term and real time basis.
- Analysis of tripping/disturbances in the power system and facilitating implementation of remedial measures.
- System restoration following grid disturbance in quickquest possible time..
- Preparation of daily, weekly, monthly, quarterly and annual reports for use by management, planners and energy administrators.
- System studies for resolving operational problems.
- Augmentation of telemetry, computing and communication facilities in the region.
- Metering and data collection , compilation , and furnishing data pertaining to system operation to relevant agencies..

2.5 Present Status of Northern Grid:

The Northern Regional power system has to cater to the high demand in the different parts of the region which includes domestic load, heavy industries load, commercial load and agriculture load particularly to the agriculture bowl of Punjab, Haryana & Western U.P. The agriculture sector forms a considerable part of the total demand met i.e. around 35% of the total power produced. Therefore the demand in the region is highly sensitive to weather conditions and any western disturbance during seasonal changes results in sharp drop in demand at times as much as 8000-10000 MW. During peak summer and winter period, the Northern Region has been found to be a power deficit region and the average shortage in region during the year 2003-2004 has been 5.84 % and 6.58 % in terms of energy and peak MW requirements, respectively.

.Electrically, the power system of Northern Region consists of two major generation pockets and one major load centre. The generation pockets are the coal based thermal power stations located in the south-eastern part of the region near Singrauli coal mines having a generation capacity of around 6000 MW and the hydro stations at the north/north-west part of the region in Himalayan belt having a capacity of around 6500 MW. The load Centre is in the central part of the Region comprising Delhi, Haryana, Punjab, Western U.P. & Northern Rajasthan. Typically, the power has to be transmitted over distances of 800-900 kms emphasising the importance of a strong transmission network system and adequate reactive power compensation devices.

The Northern Regional power system also caters to the strategically important areas such as National Capital Territory of Delhi and railway traction loads on the busy Delhi-Calcutta, Delhi-Mumbai and Delhi-Chennai railway routes traversing through the region.

In order to increase the capability of power transfer , flexible AC transmission system (FACTS) stage-1 was commissioned on 400 kV Kanpur-Ballabgarh line on 02.07.2002 by which line capability has been increased by around 28% and stage-II is under commissioning proses..A similar FACTS is also commissioned on 400 kV Panki-Muradnagar line on 03.02.2004. The 400 kv ring around Delhi system has been completed with the commissioning of 400 kv Ballabgarh-Bamnauli-II on 21.08.2003 and commissioning of ckt-I. (expected to be completed shortly). would further strengthen the Delhi system.

2.6 The task before NRLDC in the days ahead:

FREE GOVERNOR MODE OF OPERATION: In India free governor mode of operation was disabled for long on the imaginary one or other pretext. Concerted efforts by CTU/CERC and all other concerned to operationalize this feature have started bearing fruits. However to start with, in order to have a focussed attention and effective coordination, amongst the higher capacity units, which form the bulk generation in the region, only units of capacity 200 MW and above in case of coal based thermal stations and reservoir based stations in case of hydro stations were targeted for normal governor operation in a planned manner. This exercise was started on experimental basis from October 2003. Initial response to the exercise (along with ABT in place) was quite encouraging which is quite evident from the frequency profile of the region. Further major grid disturbances were avoided with having only 200 MW and above machines on free governor mode of operation on certain occasions. Thus it is evident that all the machines in the region must be put on normal governor operation for safe and secure operation of grid during contingencies and to avoid frequent and sharp notches in frequency profile. It will also give a clear economic signal to utilities about unscheduled interchange pricing under availability based tariff regime which will further improve the safety and security of the grid. NRLDC has already geared up to play an active role in this regard, particularly in light of diverse technical problems and administrative difficulties.

OPEN ACCESS: Implementation of ABT in Northern Region has opened the gate to constituents for optimising their resources on power front. The electricity act 2003 mandates CERC to specify regulations for transmission pricing as well as terms and conditions for regulating open access in inter-state transmission. Open access regulations for inter-state transmission will come into effect very soon heralding a new chapter in the history of Indian electricity industry when generating companies, distribution companies, power traders and captive power plant owners will be able to seek access to inter-state transmission system across the whole country for wheeling electricity. Open access in transmission is vital for creating competition in power industry. The consumers will also be able to seek open access as and when they are permitted by state commissions. Constituents of Northern Region will be able to manage their system more actively by entering in bilateral agreements for Power trading among themselves and/or with the constituents of other regions directly or through traders. This activeness on the part of constituents on this front, besides maintaining grid parameters will also result into financial gain to states, along with meeting higher demand with the existing generation. However, for NRLDC, the work is increasing day by day in facilitating these transactions in real time, up-gradation of scheduling software for incorporating all such type of transactions etc., The activity of intra/inter regional trading/transfer of power has enormous scope to rise further in future, NRLDC is gearing up itself for future vibrant power market in India in overall National interest.

WEBSITE INSTALLATION: In order to meet all the issues related to open access and free governor mode of operation etc. NRLDC has hosted a website www.nrldc.org in its premises using own hardware and site-hosting facilities. The site has been designed and developed in-house and is being maintained by NRLDC engineers. All activity ranging from scheduling to energy accounting is done through the web-based system. An extensive web based MIS reporting system comprising of daily, weekly, monthly and annual reports have been developed. All technical information pertaining to the Northern Grid in the form of maps, grid diagrams, installed capacities, transmission lines, etc. Is available in detail on the website. A section of the website is dedicated to operation related issues like feedback on ABT in Northern Region, Free Governor Mode Of Operation, Contingency plans, System Restoration Procedures, IEGC, etc. Commercial issues like UI Pool Account status, Allocations and methodology adopted in SEM Computations are also provided in detail on the web site.

Apart from this, a separate section has been provided for the ULDC System and SCADA. Real time telemetered data from the SCADA system is available on the website e.g., important parameters like frequency, voltages, line flows, generation and draws from the grid with an update interval of 30 seconds.

DEVELOPMENTS IN SYSTEM OPERATION & ASSOCIATED AREAS

1. Commissioning of new generation units/ Transmission lines/ transformers/ICTs

New generating units & transmission lines /ICTs commissioned/ de-rated/ up-rated during the year 2003-2004 are given in section 1.5. **Total addition in effective capacity during the year : 2526.30 MW.**

S.NO	Generating unit	Agency	Capacity addition	Date of commissioning	Remarks
1	Chamera HPS (#1)	NHPC	100 MW	06.10.2003	-
2	Chamera HPS (#2)	NHPC	100MW	05.12.2003	-
3	Chamera HPS (#3)	NHPC	100MW	31.03.2004	-

S.NO.	Generating unit	Agency	Capacity addition	Date of commissioning	Remarks
1	SJVPNL HPS(#5)	SJVNL	250 MW	20.09.2003	
2	SJVPNL HPS(#6)	SJVNL	250 MW	23.11.2003	
3	SJVPNL HPS(#3)	SJVNL	250 MW	13.02.2004	
4	SJVPNL HPS(#2)	SJVNL	250 MW	09.03.2004	
5	SJVPNL HPS(#4)	SJVNL	250 MW	22.03.2004	
6	SJVPNL HPS(#1)	SJVNL	250 MW	31.03.2004	

S. No	Generating unit	Agency	Capacity addition	Date of commissioning	Remarks
1	Baspa-II HPS(#1)	HP	100 MW	12.05.2003	
2	Baspa-II HPS(#2)	HP	100 MW	14.05.2003	
3	Baspa-II HPS(#3)	HP	100 MW	27.05.2003	

S. No	Generating unit	Agency	Capacity addition	Date of commissioning	Remarks
1	Suratgarh TH(#5)	RAJASTHAN	250 MW	30.06.2003	
2	Kota TH(#6)	RAJASTHAN	195 MW	30.07.2003	

*Including up-rating of machines at Pong(6nos.) from 60 MW to 66 MW.

B. Transmission Lines :

400 KV Lines

S.No.	Transmission Line	Ckt.Km.	Agency	Date of Commissioning
1	Ballabgarh-Bamnuli-II	52.00	DELHI	21.08.2003
2	Meerut-Mandola -I	59.90	POWERGRID	30.09.2003
3	Agra(PGCIL) –Agra(UPPCL)	60.00	POWERGRID	16.06.2003
4	Lilo of CHAMERA-Kishanpur At Chamera-II	095.00	POWERGRID	30.07.2003
5	CHAMERA –1 --Chamera-11	035.00	POWERGRID	31.07.2003
6	FACTS in Panki-Muradnagar	28 MVAR	POWERGRID	03.02.2004

220 KV Lines

S/NO.	<u>Transmission Line</u>	Ckt. Km.	Agency	Date of Commissioning
1	Meerut-Modipuram-II	12.22	UPPCL	28.06.2003
2	Meerut-Simboli	51.43	UPPCL	28.06.2003
3	Allahbad-Rewa Road-II	03.00	POWERGRID	26.07.2003
4	Lilo of Panki –Naubasta at Kanpur	19.32	POWERGRID	29.09.2003

400/220KV,ICT,S

S/No.	ICT,s	Capacity	Agency	Date of Commissioning
1	ICT-II - Meerut	315 MVA	POWERGRID	29.03.2003
2	ICT-III -Meerut	315 MVA	POWERGRID	26.06.2003

COMPUTING & COMMUNICATION FACILITIES AT NRLDC

The Northern Regional Load Despatch Centre (NRLDC) is the apex body to ensure the real time operation of Northern Regional grid at all the time with security, economy & efficiency. To achieve these objectives, a state of the art Supervisory Control And Data Acquisition System/Energy Management System (SCADA/EMS) with a fast and reliable communication network was commissioned in the Northern Region in January, 2002. Facilities of the system are described in the following sections.

4.1 Unified System Control & Co-ordination (SC&C) Scheme:

Manifold expansion due to continuous growth of the power system network and the need for monitoring network on real time basis to ensure optimum system operation necessitated establishment of modern state of art Load Despatch Centres. To achieve this and in order to have uniform Supervisory Control & Data Acquisition (SCADA) facilities in all power utilities in the Northern Region & the RLDC, a unified System Control and Co-ordination (SC&C) scheme was envisaged, planned and implemented by POWERGRID.

Communication network under the project is designed to have performance level of 99.99%. However some of the existing RTUs, Microwave hops & PLCC channels have been also used.

In spite of the phenomenal volume of work and diversities involved, the Project was successfully commissioned in record time and the RSCC system at NRLDC was inaugurated by the Hon'ble Prime Minister of India on 11.01.2002. Since then the ULDC system is being utilised for real time operation of the Northern regional grid and has saved the grid from the brink of collapse time and again.

Salient features of the ULDC Project

- Most Complex System covering 15 Electrical utilities spread over one million Sq. km area with 33 control centres and 369 Remote Terminal Units (RTUs) with database of 435 stations.
- Three Level Hierarchical Control Centers i.e. 1 RLDC, 8 SLDCs & 24 Sub SLDCs..
- Advanced Training Simulator for grid operators.
- Hybrid Dedicated Communication Infrastructure using fibre optic, M/W and PLCC .
- Live line Fibre Optic Stringing.
- Geographical and electrical diversities make it most complex and one of the largest projects in the world.

- Real time grid management and economic despatch of more than 20000 MW.
- Dynamic planning for reliable system operation.
- Real time contingency analysis and preventive action to ensure system stability.
- Real time energy management system covering operation scheduling , power system analysis and load generation balance.

Benefits of ULDC Scheme.

Real time monitoring, supervision and control of Power System in the regime of ABT & open access.

Improved system security, reliability and reduction of undelivered energy.

Saving in the Operation cost.

- Avoidance/minimisation of Grid disturbances/failures.
- Quick restoration during Grid disturbances/failures.
- Capital Investment Saving.
- Better Management Information.
- Better System Operation and Control.
- Real Time Environment for Operator Training.
- Optimal utilisation of Resources and Economic Despatch of Power.
- Availability of Historical northern regional grid data.

Package wise details of ULDC scheme.

SCADA/ EMS:

RTUs	369
RSCC	1
SLDCs	8
Sub-LDCs	25

Apart from data acquisition, EMS functions envisaged are Operational Scheduling, Load Forecasting, Inflow Forecasting, Hydro-Thermal coordination, Inter-change Scheduling, Disturbance Data Collection etc.

2. Communication:

(i).

Optical Fibre Ground Wire (OPGW)	1815 km
Terminal Stations	56 nos.

(ii). **Microwave Communication:**

Microwave Hops	78 nos.
New Towers	46 nos.
Radio Equipment	156 nos.

(iii). **Power Line Carrier Communication (PLCC):**

PLCC Terminals	218 nos.
EPABX	63 nos.

3. Auxiliary Power Supply:

DG Sets	28 nos.
UPS system	33 nos.
DC Supply (48 volts)	59 nos.

4.2 Other Communication Facilities:

- a) Under the ULDC scheme, in addition to the data, voice communication using own optical fibre and microwave facilities has been provided at all the control centres commissioned under the scheme.

b) V-SAT Communication System:

A V-SAT (Very Small Aperture Terminal) network for Data, Voice and fax connectivity in order to support operation of Interim National Load Despatch Centre (NRLDC) is under operation. The said network has connected NRLDC with all other 04 Regional Load Despatch Centre (RLDC), all four HVDC Back to Back Sub- Stations, 02 Inter-Regional Exchange Bi-Pole Sub-Stations (Kolar & Vizag) and two Inter-Regional 400KV A/C Sub-Stations (Raipur & Bongaigaon). These V-SAT is operating as a Closed User Group (CUG) and have been supplied by M/s HCL Comnet System & Services Limited.

Apart from the above V-SAT communication network, NRLDC has terminals of other (03) three V-SAT communication networks viz NHPC's V-SAT network connecting NHPC's corporate centre & hydro stations (Uri, Salal, Chamera, Bairasiul & Tanakpur) to NRLDC and POWERGRID's V-SAT communication network connecting all other 4 RLDCs & all the regional head quarters of the POWERGRID to NRLDC and SJVPNL (Formally NJPC's) V-SAT Network connecting SJVPNL's Corporate Centre (at Simla), Nathpa & Jhakri to NRLDC.

4.3 In-House Developed Software Package**a) NRLDC Website- Paperless working**

NRLDC is hosting a website www.nrldc.org in its premises using own hardware and site-hosting facilities. The site has been designed and developed in-house and is being maintained by NRLDC engineers. All activity ranging from scheduling to energy accounting is done through the web-based system. An extensive web based MIS reporting system comprising of daily, weekly, monthly and annual reports have been developed. All technical information pertaining to the Northern Grid in the form of maps, grid diagrams, installed capacities, transmission lines, etc. Is available in detail on the website.

A section of the website is dedicated to operation related issues like feedback on ABT in Northern Region, Free Governor Mode Of Operation, Contingency plans, System Restoration Procedures, IEGC, etc. Commercial issues like UI Pool Account status, Allocations and methodology adopted in SEM Computations are also provided in detail on the web site.

Apart from this, a separate section has been provided for the ULDC System and SCADA. Real time telemetered data from the SCADA system is available on the website e.g., important parameters like frequency, voltages, line flows, generation and draws from the grid with an update interval of 30 seconds.

b) Scheduling Software

In order to have total flexibility with respect to factionality and report generation/data transfer, a user friendly scheduling software was developed in-house. This package

has been integrated with the NRLDC website so that all information related to day-ahead, current day as well as implemented schedule is available at the website. The package was modified as per the guidelines laid down under Availability Based Tariff (ABT) and related implementation issues coming up from time to time.

4.4 Auxiliary Facilities:

- 2x40 KVA Uninterrupted Power Supply System (UPS) supported by two DG sets of 350 KVA and 125 KVA capacity.
- Centralised Air Conditioning plant comprising of 3 compressors each of 80 TR.
- Microprocessor based intelligent fire detection and alarm system.

5.1 DETAILS OF INSTALLED AND EFFECTIVE CAPACITY IN NORTHERN REGION AS ON 31.03.2004

	STATION	INSTALLED CAPACITY		EFFECTIVE CAPACITY	
(MW)					
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 -I TPS	2x210	= 420.00	2x210	= 420.00
(f)	Unchahar -II TPS	2x210	= 420.00	2x210	= 420.00
(g)	Tanda TPS	4x110	= 440.00	4x110	= 440.00
(h)	Anta GPS	3x88.71+1x153.20	= 419.33	3x88.71+1x153.20	= 419.33
(i)	Auraiya GPS	4x111.19+2x109.30	= 663.36	4x111.19+2x109.30	= 663.36
(j)	Dadri GPS	4x130.19+2x154.51	= 829.78	4x130.19+2x154.51	= 829.78
(k)	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-I	3x180	= 540.00	3x180	= 540.00
(f)	Chamera HPS-II	3x100	= 300.00	3x100	= 300.00
(g)	URI	4x120	= 480.00	4x120	= 480.00
	Sub-Total		2310.00		2284.20
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
D	Nathpa-Jhakri	6x250	= 1500.00	6x250	= 1500.00
Total Central Sector (A + B + C + D)			13344.04		13133.24
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	6x66	= 396.00	6x66	= 396.00
	Total BBMB		2876.15		2876.15

	<u>STATION</u>	<u>INSTALLED CAPACITY</u> (MW)		<u>EFFECTIVE CAPACITY</u>	
3	CHANDIGARH				
(a)	Diesel Gen Set		2.00		1.40
4	DELHI				
	<u>THERMAL</u>				
(a)	Indra Prastha	3x62.5+1x60	= 247.50	3x62.5+1x60	= 247.50
(b)	Rajghat	1x15+2x67.5	= 150.00	2x67.5	= 135.00
(c)	I.P.Gas Turbines	6x30+3x34	= 282.00	6x30+3x34	= 282.00
(d)	Pragati Gas Turbines	2x104.6+1x121.2	330.00	2x104.6+1x121.2	330.00
	Total DELHI		1009.50		994.50
5	HARYANA				
	<u>HYDRO</u>				
(a)	Western Yamuna Canal (WYC)	6x8	= 48.00	6x8	= 48.00
	Total Hydro		48.00		48.00
	<u>THERMAL</u>				
(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	HP				
	<u>HYDRO</u>				
(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+Thirot	4.25+4.5	= 8.75	4.25+4.5	= 8.75
(g)	Nogli	2x 0.25+4x0.50	= 2.50	2x 0.25+4x0.50	= 2.50
(h)	Bhabha	3x40.00	= 120.00	3x40.00	= 120.00
(i)	Baner	3x 4.00	= 12.00	3x 4.00	= 12.00
(j)	Gaj	3x 3.50	= 10.50	3x 3.50	= 10.50
(k)	Sal -2	1x2	= 2.00	1x2	= 2.00
(l)	Gumma	1x3	= 3.00	1x3	= 3.00
(m)	Ghanvi	2x11.25	= 22.50	2x11.25	= 22.50
(n)	Malana(IPP)	2x43.00	= 86.00	2x43.00	= 86.00
(o)	Baspa(IPP)	3x100.00	= 300.00	3x100.00	= 300.00
	Total HP		712.20		712.20
7	J & K				
	<u>HYDRO</u>				
(a)	Lower Jhelum	3x35.0	= 105.00	3x35.0	= 105.00
(b)	Upper Sindh	2x11.30+3x35.0	= 127.60	2x11.30+3x35.0	= 127.60
(c)	Ganderbal	2x3+2x4.5	= 15.00	2x3+2x4.5	= 15.00
(d)	Mohra	2x4.5	= 9.00	2x4.5	= 9.00
(e)	Chenani (I+II+III)	5x4.66 +2x1.0+3x2.5	= 32.80	5x4.66 +2x1.0+3x2.5	= 32.80
(f)	Stakna+Kargil+Kai-nah	2x2.0+3x1.25+2.0	= 9.75	2x2.0+3x1.25+2.0	= 9.75
(g)	Sewa	3x3.0	= 9.00	3x3.0	= 9.00
(h)	Small Hydel (Poonch+ Rajouri+ Bhad Canal P.H +Udhampur)		3.54		3.54
	Total Hydro		311.69		311.69

	<u>STATION</u>	<u>INSTALLED CAPACITY</u>		<u>EFFECTIVE CAPACITY</u>		
		<u>(MW)</u>				
J & K (Contd.)						
(h)	<u>GAS TURBINES</u>					
	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. Set		8.94		7.18	
	Total J & K		495.63		493.87	
8 PUNJAB						
(a)	<u>HYDRO</u>					
	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 (Thein Dam)	4x150	= 600.00	4x150	= 600.00	
	(f) Small Hydel		= 4.10		= 4.10	
	Total Hydro		1145.10		1145.10	
	(g)	<u>THERMAL</u>				
	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						
(a)	<u>HYDRO</u>					
	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) Small Hydro		14.85		14.85	
	(e) Anoopgarh	6x1.5	= 9.00	6x1.5	= 9.00	
	Total Hydro		434.85		434.85	
	(f)	<u>THERMAL</u>				
	Kota TPS	2x110+3x210 +1x195	= 1045.00	2x110+3x210+1x195	= 1045.00	
	(g) Suratgarh TPS	5x250	= 1250.00	5x250	= 1250.00	
	(g) RAMGARH GT	1x3	= 3.00	1x3	= 3.00	
(h) RAMGARH GT EXT	1x35.5	= 35.50	1x35.5	= 35.50		
	Total Thermal		2333.50		2333.50	
(I)	Wind Farm+ devgarh W.T		14.01		14.01	
	Total RAJASTHAN		2782.36		2782.36	

	<u>STATION</u>	<u>INSTALLED CAPACITY</u>		<u>EFFECTIVE CAPACITY</u>	
		<u>(MW)</u>			
10 UP					
	<u>HYDRO</u>				
(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)	Khara	3x24.0	= 72.00	3x24.0	= 72.00
	Total Hydro		501.00		501.00
	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		4693.00		4410.00
11 UTTRANCHAL					
	<u>HYDRO</u>				
(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	4x36.00	= 144.00	4x36.0	= 144.00
(h)	Maneri Bhali	3x30.0	= 90.00	3x30.0	= 90.00
(l)	Sibla	2x3.00	= 6.00	2x3.00	= 6.00
(l)	Small hydel	\	12.20		12.20
	Total Hydro		999.05		999.05
Total Region (1 to 9)			31302.23	30776.07	

THE SUMMARY OF EFFECTIVE GENERATING CAPACITY IN THE NORTHERN REGION

Agency/ Source	Hydro	Thermal	Gas/Diesel/W ind	Nuclear	Total	% of Total
NTPC	---	5825.00	2344.04	---	8169.04	26.54%
NHPC	2284.20	---	---	---	2284.20	7.42%
SJVNL	1500.00	---	---	---	1500.00	4.87%
NPC	---	---	---	1180.00	1180.00	3.83%
BBMB	2876.15	---	---	---	2876.15	9.35%
CHANDIGARH	---	---	1.40	---	1.40	0.00%
DELHI	---	382.50	612.00	---	994.50	3.23%
HARYANA	48.00	1025.00	25.20	---	1098.20	3.57%
HIMACHAL	712.20	---	---	---	712.20	2.31%
J&K	311.69	---	182.18	---	493.87	1.60%
PUNJAB	1145.10	2130.00	---	---	3275.10	10.64%
RAJASTHAN	434.85	2333.50	14.01	---	2782.36	9.04%
UP	501.00	3909.00	---	---	4410.00	14.33%
UTARANCHAL	999.05	---	---	---	999.05	3.25%
Total	10812.24	15605.00	3178.83	1180.00	30776.07	100.00%
% of TOTAL	35.13%	50.70%	10.33%	3.83%	100.00%	

Notes The above table doesn't take into account the shares of a state in power stations located in the neighbouring state. Such details are :

- (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 UPCL viz. 111.20 MW. It also has a 20 % share in the Kulhal (UPCL) and Khara (UPPCL) 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 0.38 LU/Day to 2.22 LU/Day.
- (iv) HP has 4.6 % share in Ranjit Sagar Dam Project of Punjab.
- (iv) The share of Rajasthan in Chambal and Satpura projects are as under

CHAMBAL

PROJECT	LOCATED	INSTALLED CAPACITY
Ghandhi Sagar	M.P	5x23=115
Rana Pratap Sagar	Rajasthan	4x43=172
Jawahar Sagar	Rajasthan	<u>3x33=99</u>
		386

Rajasthan has 50% share in Chambal Projects viz. 193 MW

SATPURA

PROJECT	LOCATED	INSTALLED CAPACITY
Satpura TPS	M.P	5x62.5+200.0+3x210.0 =1142.50

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

5.2 BREAKUP OF EFFECTIVE HYDRO CAPACITY (MW) IN NORTHERN REGION AS ON 31st March 2004

Agency / Source	Run-of -the -river	Reservoir	Total
NHPC	1264.20	1020.00	2284.20
SJVNL	0.00	1500.00	1500.00
BBMB	1155.15	1721.00	2876.15
DELHI	0.00	0.00	0.00
HARYANA	48.00	0.00	48.00
HP *	712.20	0.00	712.20
J&K	311.69	0.00	311.69
PUNJAB	545.10	600.00	1145.10
RAJASTHAN	262.85	172.00	434.85
UP	201.00	300.00	501.00
UTTARANCHAL	801.05	198.00	999.05
Total	5301.24	5511.00	10812.24

Includes Malana HEP (86 MW) & Baspa (300 MW)

5.3 GROWTH OF INSTALLED CAPACITY IN NORTHERN REGION DURING PAST DECADE

S. NO.	YEAR	THERMAL	HYDRO	GAS/DIESEL/WIND	NUCLEAR	TOTAL INSTALLED CAPACITY
1	1994-95	13170.60	7311.50	2377.00	880.00	23739.10
2	1995-96	13272.60	7336.50	2377.00	880.00	23866.10
3	1996-97	13358.10	7645.80	2377.50	880.00	24261.40
4	1997-98	13358.10	7782.23	7782.23	880.00	24428.30
5	1998-99	14373.30	7817.40	2407.97	880.00	25478.67
6	1999-2000	14778.00	7868.18	2693.74	1130.00	26469.92
7	2000-01	14988.00	8560.22	2841.56	1350.00	27739.78
8	2001-02	15488.00	8725.22	2851.31	1350.00	28414.53
9	2002-03	15488.00	8742.74	3181.19	1350.00	28761.93
10	2003-04	15605.00	10812.24	3178.83	1180.00	30776.07
Compound Annual Growth Rate (CAGR)%		1.90	4.44	3.28	3.31	2.93

6.1 SUMMARY OF 2003-04 POWER SUPPLY POSITION IN THE NORTHERN REGION

A. Average Energy/day (Net)

State / U.T.	Availability MU/Day	Requirement MU/Day	Shortage MU/Day	Shortage %
Chandigarh	3.04	3.05	0.00	0.03
Delhi	55.12	55.75	0.63	1.14
Haryana	54.11	55.01	0.90	1.64
H.P.	9.57	9.53	-0.04	-0.45
J & K	18.97	20.34	1.37	6.74
Punjab	83.51	86.60	3.09	3.57
Rajasthan	72.46	72.53	0.07	0.09
U.P.	110.47	130.35	19.89	15.26
U'CHAL	11.13	11.35	0.22	1.93
N.F.F./Rail	1.74	1.74	0.00	0.00
Total	419.76	445.79	26.03	5.84

B. Peak MW

State / U.T.	MAX. Availability MW	MAX. Requirement MW	Shortage MW	Shortage %
			ARITHMETICAL	ARITHMETICAL
	A	B	C=B-A	(C/B)*100
Chandigarh	207	207	0	0.00
Delhi	3289	3389	100	2.95
Haryana	3268	3385	117	3.46
H.P. *	682	682	0	0.00
J & K *	1194	1350	156	11.56
Punjab	5484	5726	242	4.23
Rajasthan	4267	4267	0	0.00
U.P.	6134	7460	1326	17.77
U'CHAL	751	802	51	6.36
N.F.F. *	90	90	0	0.00
Region	22746	24348	1602	6.58

Diversity Factor = 1.17

* Approximate and Estimated

**6.2(a) MONTHWISE POWER SUPPLY POSITION (average energy in MU/day)
IN NORTHERN REGION DURING 2003-04**

(ALL FIGS. IN NET MU / DAY AVERAGE)

State / U.T.->	CHANDIGARH				DELHI			
Month	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %
APR - 2003	2.96	2.96	0.00	0.00	55.50	56.20	0.70	1.25
MAY - 2003	3.22	3.22	0.00	0.00	59.39	60.02	0.63	1.05
JUN - 2003	3.57	3.57	0.00	0.00	65.04	66.22	1.18	1.78
JUL - 2003	3.55	3.55	0.00	0.00	60.25	61.20	0.95	1.55
AUG - 2003	3.46	3.46	0.00	0.00	61.40	62.30	0.90	1.44
SEP - 2003	3.27	3.27	0.00	0.00	59.76	60.35	0.59	0.98
OCT - 2003	2.73	2.73	0.00	0.00	51.46	51.83	0.37	0.71
NOV - 2003	2.65	2.65	0.00	0.00	46.47	46.70	0.23	0.49
DEC - 2003	2.85	2.86	0.01	0.35	50.09	50.52	0.43	0.85
JAN - 2004	3.10	3.10	0.00	0.00	54.62	55.46	0.84	1.51
FEB - 2004	2.56	2.56	0.00	0.00	48.39	48.81	0.42	0.86
MAR - 2004	2.58	2.58	0.00	0.00	48.57	48.93	0.36	0.74
2003-04	3.04	3.05	0.00	0.03	55.12	55.75	0.63	1.14

State / U.T.->	HARYANA				HIMACHAL PRADESH			
Month	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %
APR - 2003	46.93	46.93	0.00	0.00	8.76	8.76	0.00	0.00
MAY - 2003	51.95	52.53	0.58	1.10	9.32	9.32	0.00	0.00
JUN - 2003	63.45	65.00	1.55	2.38	9.76	9.76	0.00	0.00
JUL - 2003	58.72	59.15	0.43	0.73	9.89	9.89	0.00	0.00
AUG - 2003	61.03	62.28	1.25	2.01	9.50	9.50	0.00	0.00
SEP - 2003	59.77	60.16	0.39	0.65	9.53	9.53	0.00	0.00
OCT - 2003	55.37	56.26	0.89	1.58	8.65	8.65	0.00	0.00
NOV - 2003	46.46	47.81	1.35	2.82	9.84	9.84	0.00	0.00
DEC - 2003	48.81	49.87	1.06	2.13	9.27	9.27	0.00	0.00
JAN - 2004	50.47	51.25	0.78	1.52	10.63	10.63	0.00	0.00
FEB - 2004	51.13	52.46	1.33	2.54	10.04	10.04	0.00	0.00
MAR - 2004	54.90	56.15	1.25	2.23	9.72	9.22	-0.50	-5.42
2003-04	54.11	55.01	0.90	1.64	9.57	9.53	-0.04	-0.45

**6.2(a) MONTHWISE POWER SUPPLY POSITION (average energy in MU/day)
IN NORTHERN REGION DURING 2003-04**

(ALL FIGS. IN NET MU / DAY AVERAGE)

State / U.T.->	JAMMU & KASHMIR				PUNJAB			
Month	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %
APR - 2003	17.35	18.85	1.50	7.96	67.52	70.00	61.21	87.44
MAY - 2003	17.00	19.50	2.50	12.82	83.65	85.59	1.94	2.27
JUN - 2003	17.68	20.18	2.50	12.39	108.09	111.54	3.45	3.09
JUL - 2003	18.31	19.81	1.50	7.57	108.92	111.66	2.74	2.45
AUG - 2003	17.44	18.94	1.50	7.92	110.47	114.81	4.34	3.78
SEP - 2003	16.64	18.50	1.86	10.05	99.44	102.36	2.92	2.85
OCT - 2003	18.19	19.50	1.31	6.72	77.76	80.65	2.89	3.58
NOV - 2003	20.20	21.50	1.30	6.05	65.96	69.19	3.23	4.67
DEC - 2003	21.15	22.00	0.85	3.86	68.48	72.52	4.04	5.57
JAN - 2004	21.39	22.50	1.11	4.93	68.17	70.85	2.68	3.78
FEB - 2004	21.78	22.28	0.50	2.24	66.19	70.02	3.83	5.47
MAR - 2004	20.68	20.68	0.00	0.00	76.00	78.57	2.57	3.27
2003-04	18.97	20.34	1.37	6.74	83.51	86.60	3.09	3.57

State / U.T.->	RAJASTHAN				UTTAR PRADESH			
Month	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %
APR - 2003	65.81	65.81	0.00	0.00	107.03	120.00	12.97	10.81
MAY - 2003	68.56	68.56	0.00	0.00	112.13	132.82	20.69	15.58
JUN - 2003	64.82	64.82	0.00	0.00	111.55	126.00	14.45	11.47
JUL - 2003	54.36	54.36	0.00	0.00	104.95	127.04	22.09	17.39
AUG - 2003	60.13	60.13	0.00	0.00	104.12	128.88	24.76	19.21
SEP - 2003	61.99	61.99	0.00	0.00	105.86	127.07	21.21	16.69
OCT - 2003	73.75	73.75	0.00	0.00	114.04	125.71	11.67	9.28
NOV - 2003	81.75	81.75	0.00	0.00	110.78	134.13	23.35	17.41
DEC - 2003	81.71	81.94	0.23	0.28	109.71	131.21	21.50	16.39
JAN - 2004	86.27	86.78	0.51	0.59	114.98	137.18	22.20	16.18
FEB - 2004	86.78	86.84	0.06	0.07	114.57	138.06	23.49	17.01
MAR - 2004	84.45	84.45	0.00	0.00	116.07	136.43	20.36	14.92
2003-04	72.46	72.53	0.07	0.09	110.47	130.35	19.89	15.26

**6.2(a) MONTHWISE POWER SUPPLY POSITION (average energy in MU/day)
IN NORTHERN REGION DURING 2003-04**

(ALL FIGS. IN NET MU / DAY AVERAGE)

State / U.T.->	N.F.F./RAIL				REGION			
Month	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %
APR - 2003	1.76	1.76	0.00	0.00	383.57	401.57	18.00	4.48
MAY - 2003	1.83	1.83	0.00	0.00	415.65	438.93	23.28	5.30
JUN - 2003	1.86	1.86	0.00	0.00	455.14	480.43	25.29	5.26
JUL - 2003	1.68	1.68	0.00	0.00	431.77	459.68	27.91	6.07
AUG - 2003	1.46	1.46	0.00	0.00	440.35	473.26	32.91	6.95
SEP - 2003	1.70	1.70	0.00	0.00	428.41	455.55	27.14	5.96
OCT - 2003	1.89	1.89	0.00	0.00	414.55	431.88	17.33	4.01
NOV - 2003	1.79	1.79	0.00	0.00	397.14	426.79	29.65	6.95
DEC - 2003	1.88	1.88	0.00	0.00	405.55	433.96	28.41	6.55
JAN - 2004	1.68	1.68	0.00	0.00	423.36	451.92	28.56	6.32
FEB - 2004	1.66	1.66	0.00	0.00	414.79	444.68	29.89	5.71
MAR -2004	1.65	1.65	0.00	0.00	425.91	450.15	24.24	5.38
2003-04	1.74	1.74	0.00	0.00	419.76	445.79	26.03	5.84

*

State / U.T.->	UTTARANCHAL			
Month	Demand met (MU/day)	Requirement (MU/day)	Shortage (MU/day)	Shortage %
APR - 2002	10.22	10.30	0.08	0.78
MAY - 2003	10.50	10.77	0.27	2.51
JUN - 2003	11.32	11.48	0.16	1.39
JUL - 2003	11.14	11.34	0.20	1.76
AUG - 2003	11.34	11.50	0.16	1.39
SEP - 2003	10.45	10.62	0.17	1.60
OCT - 2003	10.71	10.91	0.20	1.83
NOV - 2003	11.24	11.43	0.19	1.66
DEC - 2003	11.60	11.89	0.29	2.44
JAN - 2004	12.05	12.49	0.44	3.52
FEB - 2004	11.69	11.95	0.26	2.18
MAR -2004	11.29	11.49	0.20	1.74
2002-03	11.13	11.35	0.22	1.93

6.2 (b) MONTHWISE POWER SUPPLY POSITION (Peak MW) IN NORTHERN REGION DURING 2003-04

State / U.T.->	CHANDIGARH				DELHI			
Month	Demand met MW	Requirement MW	Shortage MW	Shortage %	Demand met MW	Requirement MW	Shortage MW	Shortage %
APR - 2003	164	164	0	0.00	2889	2971	82	2.76
MAY - 2003	187	187	0	0.00	2951	3053	102	3.34
JUN - 2003	207	207	0	0.00	3269	3342	73	2.18
JUL - 2003	185	185	0	0.00	3284	3389	105	3.10
AUG - 2003	194	194	0	0.00	3171	3240	69	2.13
SEP - 2003	187	187	0	0.00	3078	3109	31	1.00
OCT - 2003	166	166	0	0.00	2944	2999	55	1.83
NOV - 2003	147	147	0	0.00	2801	2818	17	0.60
DEC - 2003	182	182	0	0.00	3269	3354	85	2.53
JAN - 2004	179	179	0	0.00	3289	3372	83	2.46
FEB - 2004	162	162	0	0.00	3085	3205	120	3.74
MAR - 2004	158	158	0	0.00	2921	2947	26	0.88
2003-04	207	207	0	0.00	3289	3389	100	2.95

State / U.T.->	HARYANA				HIMACHAL PRADESH			
Month	Demand met MW	Requirement MW	Shortage MW	Shortage %	Demand met MW	Requirement MW	Shortage MW	Shortage %
APR - 2003	2510	2510	0	0.00	513	513	0	0.00
MAY - 2003	2799	2887	88	3.05	527	527	0	0.00
JUN - 2003	3167	3267	100	3.06	541	541	0	0.00
JUL - 2003	3117	3385	268	7.92	576	576	0	0.00
AUG - 2003	3268	3368	100	2.97	538	538	0	0.00
SEP - 2003	3092	3127	35	1.12	533	533	0	0.00
OCT - 2003	3031	3031	0	0.00	538	538	0	0.00
NOV - 2003	2785	2985	200	6.70	578	578	0	0.00
DEC - 2003	2920	2948	28	0.95	672	672	0	0.00
JAN - 2004	2890	3090	200	6.47	682	682	0	0.00
FEB - 2004	2948	2948	0	0.00	582	582	0	0.00
MAR - 2004	3042	3042	0	0.00	574	574	0	0.00
2003-04	3268	3385	117	3.46	682	682	0	0.00

6.2 (b) MONTHWISE POWER SUPPLY POSITION (Peak MW) IN NORTHERN REGION DURING 2003-04

State / U.T.->	JAMMU & KASHMIR				PUNJAB			
Month	Demand met MW	Requirement MW	Shortage MW	Shortage %	Demand met MW	Requirement MW	Shortage MW	Shortage %
APR - 2003	1070	1200	130	10.83	3564	3764	200	5.31
MAY - 2003	1015	1165	150	12.88	4545	4647	102	2.19
JUN - 2003	1001	1216	215	17.68	5259	5518	259	4.69
JUL - 2003	1006	1132	126	11.13	5484	5726	242	4.23
AUG - 2003	1058	1116	58	5.20	5449	5674	225	3.97
SEP - 2003	1034	1100	66	6.00	4947	4947	0	0.00
OCT - 2003	1075	1200	125	10.42	4106	4271	165	3.86
NOV - 2003	1160	1250	90	7.20	3534	3715	181	4.87
DEC - 2003	1149	1313	164	12.49	3740	3963	223	5.63
JAN - 2004	1146	1350	204	15.11	3883	3883	0	0.00
FEB - 2004	1160	1260	100	7.94	3882	3900	18	0.46
MAR - 2004	1194	1250	56	4.48	4320	4320	0	0.00
2003-04	1194	1350	156	11.56	5484	5726	242	4.23

State / U.T.->	RAJASTHAN				UTTAR PRADESH			
Month	Demand met MW	Requirement MW	Shortage MW	Shortage %	Demand met MW	Requirement MW	Shortage MW	Shortage %
APR - 2003	3711	3711	0	0.00	5545	6527	982	15.05
MAY - 2003	3640	3640	0	0.00	5692	6536	844	12.91
JUN - 2003	3721	3721	0	0.00	5953	7098	1145	16.13
JUL - 2003	3233	3233	0	0.00	5501	7177	1676	23.35
AUG - 2003	3179	3179	0	0.00	5429	6672	1243	18.63
SEP - 2003	3233	3233	0	0.00	5487	6793	1306	19.23
OCT - 2003	3930	3930	0	0.00	6134	7070	936	13.24
NOV - 2003	3979	3979	0	0.00	5742	6994	1252	17.90
DEC - 2003	3929	3929	0	0.00	5599	6694	1095	16.36
JAN - 2004	4267	4267	0	0.00	5842	7368	1526	20.71
FEB - 2004	4148	4148	0	0.00	5814	7460	1646	22.06
MAR - 2004	4132	4132	0	0.00	6029	7419	1390	18.74
2003-04	4267	4267	0	0.00	6134	7460	1326	17.77

6.2 (b) MONTHWISE POWER SUPPLY POSITION (Peak MW) IN NORTHERN REGION DURING 2003-04

State / U.T.->	N.F.F.				REGION			
Month	Demand met MW	Requirement MW	Shortage MW	Shortage %	Demand met MW	Requirement MW	Shortage MW	Shortage %
APR - 2003	90	90	0	0.00	20224	21887	1663	7.60
MAY- 2003	90	90	0	0.00	20889	22203	1314	5.92
JUN - 2003	86	86	0	0.00	22746	24348	1602	6.58
JUL - 2003	80	80	0	0.00	21933	23427	1494	6.38
AUG - 2003	70	70	0	0.00	21707	23373	1666	7.13
SEP - 2003	70	70	0	0.00	21331	22807	1476	6.47
OCT - 2003	79	79	0	0.00	21713	23257	1544	6.64
NOV - 2003	83	83	0	0.00	20525	22715	2190	9.64
DEC - 2003	85	85	0	0.00	21121	23289	2168	9.31
JAN - 2004	78	78	0	0.00	22079	23690	1611	6.80
FEB - 2004	80	80	0	0.00	21764	23575	1811	7.68
MAR -2004	74	74	0	0.00	21831	23754	1923	8.10
2003-04	90	90	0	0.00	22746	24348	1602	6.58

State / U.T.->	UTTARANCHAL			
Month	Demand met MW	Requirement MW	Shortage MW	Shortage %
APR - 2003	640	660	20	3.03
MAY- 2003	623	680	57	8.38
JUN - 2003	697	737	40	5.43
JUL - 2003	668	708	40	5.65
AUG - 2003	688	728	40	5.49
SEP - 2003	659	709	50	7.05
OCT - 2003	707	747	40	5.35
NOV - 2003	695	711	16	2.25
DEC - 2003	701	740	39	5.27
JAN - 2004	737	777	40	5.15
FEB - 2004	751	802	51	6.36
MAR -2004	722	762	40	5.25
2002-03	751	802	51	6.36

6.3 (a) MONTHWISE MAXIMUM AND MINIMUM ENERGY CONSUMPTION WITH CORRESPONDING DATES IN NORTHERN REGION DURING 2003-04

State / U.T.->	CHANDIGARH				DELHI			
Month	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date
APR - 2003	3.16	30.04.2003	2.83	28.04.2003	59.92	19.04.2003	49.51	06.04.2003
MAY - 2003	3.76	21.05.2003	2.72	25.04.2003	62.50	22.05.2003	52.64	04.05.2003
JUN - 2003	4.04	06.06.2003	2.84	29.06.2003	69.46	13.06.2003	58.03	20.06.2003
JUL - 2003	4.09	04.07.2003	2.72	13.07.2003	70.60	04.07.2003	42.89	11.07.2003
AUG - 2003	3.89	08.08.2003	2.76	03.08.2003	66.90	28.08.2003	49.08	15.08.2003
SEP - 2003	3.70	01.09.2003	2.63	28.09.2003	64.37	02.09.2003	55.06	07.09.2003
OCT - 2003	3.12	08.10.2003	2.16	26.10.2003	56.34	09.10.2003	45.12	26.10.2003
NOV - 2003	2.65	14.11.2003	2.23	09.11.2003	49.03	07.11.2003	43.69	09.11.2003
DEC - 2003	3.58	31.12.2003	2.37	14.12.2003	59.18	31.12.2003	43.50	01.12.2003
JAN - 2004	3.69	02.01.2004	2.46	18.01.2004	61.60	06.01.2004	47.45	26.01.2004
FEB - 2004	2.85	04.02.2004	2.16	29.02.2004	54.40	01.02.2004	44.12	29.02.2004
MAR - 2004	2.90	19.03.2004	2.09	07.03.2004	54.71	19.03.2004	39.78	07.03.2004
2003-04	4.09		2.09		70.60		39.78	

State / U.T.->	HARYANA				HIMACHAL PRADESH			
Month	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date
APR - 2003	52.11	30.04.2003	42.62	06.04.2003	9.49	12.04.2003	7.93	01.04.2003
MAY - 2003	58.88	31.05.2003	39.40	23.05.2003	9.87	27.05.2003	8.47	03.05.2003
JUN - 2003	68.70	16.06.2003	56.74	02.06.2003	11.24	21.06.2003	8.40	09.06.2003
JUL - 2003	66.96	03.07.2003	43.40	11.07.2003	12.98	28.07.2003	9.07	14.07.2003
AUG - 2003	69.61	27.08.2003	54.76	04.08.2003	9.99	16.08.2003	8.63	19.08.2003
SEP - 2003	64.70	02.09.2003	54.51	29.09.2003	9.99	01.09.2003	9.13	27.09.2003
OCT - 2003	60.32	01.10.2003	51.52	31.10.2003	9.56	09.10.2003	7.60	26.10.2003
NOV - 2003	51.48	01.11.2003	42.63	16.11.2003	10.98	29.11.2003	8.85	06.11.2003
DEC - 2003	52.22	31.12.2003	40.52	15.12.2003	10.04	26.12.2003	8.70	10.12.2003
JAN - 2004	55.66	01.01.2004	44.59	23.01.2004	11.45	20.01.2004	9.96	23.01.2004
FEB - 2004	54.89	20.02.2004	46.42	01.02.2004	10.72	05.02.2004	9.30	11.02.2004
MAR - 2004	61.41	05.03.2004	50.34	23.03.2004	10.00	03.03.2004	8.65	07.03.2004
2003-04	69.61		39.40		12.98		7.60	

6.3 (a) MONTHWISE MAXIMUM AND MINIMUM ENERGY CONSUMPTION WITH CORRESPONDING DATES IN NORTHERN REGION DURING 2003-04

State / U.T.->	JAMMU & KASHMIR				PUNJAB			
Month	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date
APR - 2003	18.79	08.04.2003	12.82	26.04.2003	78.07	30.04.2003	60.20	19.04.2003
MAY - 2003	20.02	15.05.2003	10.98	02.05.2003	95.76	22.05.2003	63.52	02.05.2003
JUN - 2003	19.89	30.06.2003	15.58	09.06.2003	116.51	17.06.2003	94.69	01.06.2003
JUL - 2003	19.77	14.07.2003	16.14	23.07.2003	115.52	26.07.2003	96.56	18.07.2003
AUG - 2003	19.12	15.08.2003	15.28	30.08.2003	115.04	18.08.2003	102.04	04.08.2003
SEP - 2003	17.93	29.09.2003	13.45	25.09.2003	108.37	05.09.2003	82.78	29.09.2003
OCT - 2003	19.62	25.10.2003	16.52	09.10.2003	81.97	03.10.2003	72.47	25.10.2003
NOV - 2003	21.93	26.11.2003	18.37	17.11.2003	70.66	07.11.2003	59.97	16.11.2003
DEC - 2003	23.18	25.12.2003	16.22	15.12.2003	74.21	12.12.2003	63.17	15.12.2003
JAN - 2004	23.92	26.01.2004	18.04	18.01.2004	75.75	10.01.2004	55.68	26.01.2004
FEB - 2004	23.96	02.02.2004	20.05	10.02.2004	76.78	25.02.2004	57.17	01.02.2004
MAR - 2004	21.73	05.03.2004	18.97	23.03.2004	83.07	19.03.2004	71.11	31.03.2004
2003-04	23.96		10.98		116.51		55.68	

State / U.T.->	RAJASTHAN				UTTAR PRADESH			
Month	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date
APR - 2003	73.71	23.04.2003	62.25	19.04.2003	114.79	25.04.2003	92.97	28.04.2003
MAY - 2003	71.89	19.05.2003	59.90	25.05.2003	118.24	12.05.2003	100.00	23.05.2003
JUN - 2003	76.07	12.06.2003	46.68	24.06.2003	124.32	11.06.2003	103.42	05.06.2003
JUL - 2003	69.93	02.07.2003	40.82	12.07.2003	118.73	05.07.2003	93.92	11.07.2003
AUG - 2003	68.29	23.08.2003	55.17	12.08.2003	110.68	27.08.2003	94.76	21.08.2003
SEP - 2003	66.33	23.09.2003	55.64	01.09.2003	114.15	03.09.2003	97.83	11.09.2003
OCT - 2003	81.69	30.10.2003	65.04	05.10.2003	124.80	11.10.2003	104.87	26.10.2003
NOV - 2003	83.80	06.11.2003	78.08	16.11.2003	116.65	21.11.2003	101.29	10.11.2003
DEC - 2003	86.39	13.12.2003	78.60	02.12.2003	116.63	07.12.2003	102.17	27.12.2003
JAN - 2004	89.18	28.01.2004	82.14	02.01.2004	122.08	12.01.2004	105.14	23.01.2004
FEB - 2004	91.22	02.02.2004	84.47	12.02.2004	120.38	18.02.2004	107.38	06.02.2004
MAR - 2004	90.14	01.03.2004	76.36	31.03.2004	125.69	29.03.2004	105.35	24.03.2004
2003-04	91.22		40.82		125.69		92.97	

6.3 (a) MONTHWISE MAXIMUM AND MINIMUM ENERGY CONSUMPTION WITH CORRESPONDING DATES IN NORTHERN REGION DURING 2003-04

State / U.T.->	N.F.F./RAIL				REGION			
Month	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date
APR - 2003	2.19	23.04.2003	1.43	05.04.2003	408.07	30.04.2003	363.79	19.04.2003
MAY - 2003	2.08	21.05.2003	1.15	05.05.2003	436.07	21.05.2003	387.64	02.05.2003
JUN - 2003	2.16	08.06.2003	1.15	21.06.2003	482.99	11.06.2003	430.05	23.06.2003
JUL - 2003	1.91	06.07.2003	1.46	24.07.2003	466.08	04.07.2003	377.55	11.07.2003
AUG - 2003	1.84	12.08.2003	1.26	18.08.2003	459.48	27.08.2003	410.93	03.08.2003
SEP - 2003	1.96	29.09.2003	1.40	06.09.2003	442.03	02.09.2003	411.76	07.09.2003
OCT - 2003	2.04	19.10.2003	1.69	28.10.2003	426.77	24.10.2003	397.04	02.10.2003
NOV - 2003	1.99	12.11.2003	1.42	05.11.2003	410.42	07.11.2003	382.13	16.11.2003
DEC - 2003	2.04	14.12.2003	1.69	30.12.2003	418.79	26.12.2003	375.60	16.12.2003
JAN - 2004	1.86	10.01.2004	1.36	12.01.2004	439.91	10.01.2004	391.00	23.01.2004
FEB - 2004	1.89	18.02.2004	1.30	19.02.2004	428.69	26.02.2004	403.61	08.02.2004
MAR - 2004	1.77	07.03.2004	1.44	04.03.2004	439.88	17.03.2004	411.69	23.03.2004
2003-04	2.19		1.15		482.99		363.79	
State / U.T.->	UTTRANCHAL							
Month	Max. Consumption MU/Day	Date	Min. Consumption MU/Day	Date				
APR - 2003	11.30	24.04.2003	7.85	28.04.2003				
MAY - 2003	11.71	23.05.2003	7.67	13.05.2003				
JUN - 2003	15.07	09.06.2003	9.03	05.06.2003				
JUL - 2003	12.01	18.07.2003	9.28	05.07.2003				
AUG - 2003	11.76	29.08.2003	10.02	20.08.2003				
SEP - 2003	11.32	01.09.2003	9.58	23.09.2003				
OCT - 2003	11.24	25.10.2003	10.14	20.10.2003				
NOV - 2003	11.64	25.11.2003	10.69	06.11.2003				
DEC - 2003	12.65	30.12.2003	10.15	16.12.2003				
JAN - 2004	13.14	02.01.2004	11.06	24.01.2004				
FEB - 2004	13.08	13.02.2004	10.78	29.02.2004				
MAR - 2004	12.17	23.03.2004	10.21	07.03.2004				
2002-03	15.07		7.67					

6.3(b) MONTHWISE MAXIMUM AND MINIMUM ENERGY REQUIREMENT WITH CORRESPONDING DATES IN NORTHERN REGION DURING 2003-04

State / U.T.->	CHANDIGARH				DELHI			
Month	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date
APR - 2003	3.16	30.04.2003	2.83	28.04.2003	60.08	25.04.2003	45.58	06.04.2003
MAY - 2003	3.76	21.05.2003	2.72	25.05.2003	61.41	17.05.2003	45.65	04.05.2003
JUN - 2003	4.04	06.06.2003	2.84	29.06.2003	76.54	28.06.2003	40.86	11.06.2003
JUL - 2003	4.09	04.07.2003	2.72	13.07.2003	73.05	04.07.2003	44.86	11.07.2003
AUG - 2003	4.53	05.08.2003	2.76	03.08.2003	68.55	29.08.2003	50.87	15.08.2003
SEP - 2003	3.70	01.09.2003	2.63	28.09.2003	65.63	02.09.2003	56.68	28.09.2004
OCT - 2003	3.53	10.10.2003	1.95	26.10.2003	58.16	08.10.2003	47.23	26.10.2003
NOV - 2003	2.65	06.11.2003	2.07	09.11.2003	52.33	07.11.2003	28.81	01.11.2003
DEC - 2003	3.30	31.12.2003	2.19	14.12.2003	63.35	31.12.2003	46.40	01.12.2003
JAN - 2004	3.29	02.01.2004	2.24	18.01.2004	65.58	06.01.2004	51.66	26.01.2004
FEB - 2004	2.85	04.02.2004	2.13	01.02.2004	57.82	03.02.2004	34.28	01.02.2004
MAR - 2004	2.90	19.03.2004	1.92	26.03.2004	56.97	19.03.2004	42.32	07.03.2004
2003-04	4.53		1.92		76.54		28.81	

State / U.T.->	HARYANA				HIMACHAL PRADESH			
Month	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date
APR - 2003	53.49	30.04.2003	43.96	06.04.2003	5.16	25.04.2003	2.49	01.04.2003
MAY - 2003	61.28	31.05.2003	40.34	23.05.2003	5.75	25.05.2003	3.84	05.05.2003
JUN - 2003	72.05	18.06.2003	36.47	11.06.2003	13.08	18.06.2003	-3.91	11.06.2003
JUL - 2003	71.34	03.07.2003	44.46	11.07.2003	10.18	25.07.2003	8.87	13.07.2003
AUG - 2003	71.93	27.08.2003	56.48	04.08.2003	13.04	12.08.2003	-4.47	22.08.2003
SEP - 2003	66.95	02.09.2003	56.58	29.09.2003	12.09	17.09.2003	9.50	30.09.2003
OCT - 2003	62.73	01.10.2003	53.47	31.10.2003	10.33	09.10.2003	8.06	26.10.2003
NOV - 2003	53.69	01.11.2003	40.04	26.11.2003	10.78	24.11.2003	8.87	06.11.2003
DEC - 2003	57.82	11.12.2003	41.97	15.12.2003	11.59	06.12.2003	9.40	31.12.2003
JAN - 2004	58.28	01.01.2004	46.32	23.01.2004	10.70	02.01.2004	7.13	31.01.2004
FEB - 2004	57.42	20.02.2004	25.50	01.02.2004	10.13	05.02.2004	2.87	01.02.2004
MAR - 2004	61.99	11.03.2004	52.22	23.03.2004	10.23	08.03.2004	8.54	07.03.2004
2003-04	72.05		25.50		13.08		-4.47	

6.3(b) MONTHWISE MAXIMUM AND MINIMUM ENERGY REQUIREMENT WITH CORRESPONDING DATES IN NORTHERN REGION DURING 2003-04

State / U.T.->	JAMMU & KASHMIR				PUNJAB			
Month	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date
APR - 2003	20.24	08.04.2003	13.61	26.04.2003	84.11	30.04.2003	64.75	01.04.2003
MAY - 2003	20.49	15.05.2003	10.89	02.05.2003	98.98	22.05.2003	65.19	02.05.2003
JUN - 2003	19.50	01.06.2003	14.04	11.06.2003	121.76	12.06.2003	56.84	11.06.2003
JUL - 2003	18.80	14.07.2003	15.53	23.07.2003	120.20	30.07.2003	99.56	18.07.2003
AUG - 2003	19.81	15.08.2003	15.54	03.08.2003	120.19	27.08.2003	104.15	04.08.2003
SEP - 2003	18.36	29.09.2003	12.17	25.09.2003	110.32	02.09.2003	84.59	29.09.2003
OCT - 2003	18.84	29.10.2003	15.08	20.10.2003	85.15	03.10.2003	75.71	25.10.2003
NOV - 2003	20.80	26.11.2003	16.02	17.11.2003	73.60	28.11.2003	63.26	16.11.2003
DEC - 2003	23.39	30.12.2003	15.31	15.12.2003	77.68	06.12.2003	65.96	15.12.2003
JAN - 2004	22.87	26.01.2004	17.47	22.01.2004	80.12	10.01.2004	50.65	04.01.2004
FEB - 2004	23.62	02.02.2004	20.38	10.02.2004	80.41	25.02.2004	42.77	01.02.2004
MAR -2004	22.40	05.03.2004	19.08	19.03.2004	87.15	19.03.2004	74.22	31.03.2004
2003-04	23.62		10.89		121.76		42.77	

State / U.T.->	RAJASTHAN				UTTAR PRADESH			
Month	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date
APR - 2003	83.97	26.04.2003	72.42	15.04.2003	122.49	25.04.2003	98.37	28.04.2003
MAY - 2003	81.75	08.05.2003	62.58	13.05.2003	139.20	06.05.2003	106.12	23.05.2003
JUN - 2003	86.46	12.06.2003	28.33	11.06.2003	124.56	12.06.2003	62.97	11.06.2003
JUL - 2003	78.03	02.07.2003	43.44	12.07.2003	123.76	04.07.2003	100.53	11.07.2003
AUG - 2003	79.20	23.08.2003	61.61	01.08.2003	117.38	27.08.2003	98.43	19.08.2003
SEP - 2003	75.34	23.09.2003	64.25	01.09.2003	121.92	03.09.2003	103.61	11.09.2003
OCT - 2003	90.95	30.10.2003	69.26	05.10.2003	133.73	11.10.2003	71.82	15.10.2003
NOV - 2003	95.61	22.11.2003	82.63	27.11.2003	125.21	07.11.2003	109.40	25.11.2003
DEC - 2003	92.91	10.12.2003	79.55	30.12.2003	124.86	06.12.2003	107.37	08.12.2003
JAN - 2004	96.77	12.01.2004	82.71	02.01.2004	130.50	12.01.2004	112.48	23.01.2004
FEB - 2004	95.23	23.02.2004	60.72	01.02.2004	127.22	18.02.2004	72.96	01.02.2004
MAR -2004	95.78	01.03.2004	81.71	31.03.2004	133.20	18.03.2004	114.83	26.03.2004
2003-04	96.77		28.33		139.20		62.97	

**6.3(b) MONTHWISE MAXIMUM AND MINIMUM ENERGY REQUIREMENT WITH CORRESPONDING DATES
IN NORTHERN REGION DURING 2003-04**

State / U.T.->	N.F.F./RAIL				REGION			
Month	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date
APR - 2003	2.19	23.04.2003	1.43	05.04.2003	446.98	30.04.2003	390.83	09.04.2003
MAY- 2003	2.08	21.05.2003	1.15	05.05.2003	468.40	17.05.2003	415.23	02.05.2003
JUN - 2003	2.16	08.06.2003	1.15	21.06.2003	512.12	15.06.2003	457.82	30.06.2003
JUL - 2003	1.91	06.07.2003	1.46	24.07.2003	509.86	03.07.2003	402.67	11.07.2003
AUG - 2003	1.84	12.08.2003	1.26	18.08.2003	496.64	27.08.2003	440.37	25.08.2003
SEP - 2003	1.96	29.09.2003	1.40	06.09.2003	477.14	02.09.2003	439.71	04.09.2003
OCT - 2003	2.04	19.10.2003	1.69	28.10.2003	460.86	24.10.2003	424.52	02.10.2003
NOV - 2003	1.99	12.11.2003	1.42	05.11.2003	440.51	06.11.2003	412.89	27.11.2003
DEC - 2003	2.04	14.12.2003	1.69	30.12.2003	456.31	26.12.2003	405.94	16.12.2003
JAN - 2004	1.86	10.01.2004	1.36	12.01.2004	481.48	12.01.2004	425.32	23.01.2004
FEB - 2004	1.89	18.02.2004	1.30	19.02.2004	469.36	24.02.2004	435.78	12.02.2004
MAR -2004	1.77	07.03.2004	1.44	04.03.2004	476.13	17.03.2004	439.57	25.03.2004
2003-04	2.19		1.15		512.12		390.83	

State / U.T.->	UTTRANCHAL			
Month	Max.Requirement MU/Day	Date	Min. Requirement MU/Day	Date
APR - 2003	10.31	24.04.2003	7.13	28.04.2003
MAY- 2003	10.89	23.05.2003	8.28	13.05.2003
JUN - 2003	10.93	09.06.2003	6.77	05.06.2003
JUL - 2003	11.26	18.07.2003	8.87	05.07.2003
AUG - 2003	11.22	29.08.2003	8.54	20.08.2003
SEP - 2003	11.06	01.09.2003	7.25	23.09.2003
OCT - 2003	10.48	25.10.2003	8.82	20.10.2003
NOV - 2003	10.77	25.11.2003	9.56	06.11.2003
DEC - 2003	11.20	30.12.2003	9.52	16.12.2003
JAN - 2004	12.14	02.01.2004	8.61	24.01.2004
FEB - 2004	11.08	13.02.2004	7.08	29.02.2004
MAR -2004	10.64	23.03.2004	9.12	07.03.2004
2003-04	12.14		6.77	

6.4 MONTHWISE PEAK DEMAND MET (MW) AND REQUIREMENT (MW) WITH CORRESPONDING DATES IN NORTHERN REGION DURING 2003-04

State / U.T.->	CHANDIGARH				DELHI			
Month	Peak Met MW	Date	Peak Reqt MW	Date	Peak Met MW	Date	Peak Reqt MW	Date
APR - 2003	164	30.04.2003	164	28.04.2003	2889	24.04.2003	2971	24.04.2003
MAY - 2003	187	21.05.2003	187	25.04.2003	2951	22.05.2003	3053	31.05.2003
JUN - 2003	207	06.06.2003	207	29.06.2003	3269	17.06.2003	3342	10.06.2003
JUL - 2003	185	04.07.2003	185	13.07.2003	3284	04.07.2003	3389	04.07.2003
AUG - 2003	194	08.08.2003	194	03.08.2003	3171	29.08.2003	3240	29.08.2003
SEP - 2003	187	01.09.2003	187	28.09.2003	3078	05.09.2003	3109	23.09.2003
OCT - 2003	166	08.10.2003	166	26.10.2003	2944	08.10.2003	2999	08.10.2003
NOV - 2003	147	14.11.2003	147	09.11.2003	2801	28.11.2003	2818	28.11.2003
DEC - 2003	182	31.12.2003	182	14.12.2003	3269	31.12.2003	3354	31.12.2003
JAN - 2004	179	02.01.2004	179	18.01.2004	3289	05.01.2004	3372	06.01.2004
FEB - 2004	162	04.02.2004	162	29.02.2004	3085	02.02.2004	3205	06.02.2004
MAR - 2004	158	19.03.2004	158	07.03.2004	2921	27.03.2004	2947	27.03.2004
2003-04	207		207		3289		3389	

State / U.T.->	HARYANA				HIMACHAL PRADESH			
Month	Peak Met MW	Date	Peak Reqt MW	Date	Peak Met MW	Date	Peak Reqt MW	Date
APR - 2003	2510	29.04.2003	2510	29.04.2003	513	22.04.2003	513	22.04.2003
MAY - 2003	2799	21.05.2003	2887	30.05.2003	527	19.05.2003	527	19.05.2003
JUN - 2003	3167	20.06.2003	3267	20.06.2003	541	26.05.2003	541	26.05.2003
JUL - 2003	3117	03.07.2003	3385	03.07.2003	576	01.06.2003	576	01.06.2003
AUG - 2003	3268	29.08.2003	3368	29.08.2003	538	01.08.2003	538	01.08.2003
SEP - 2003	3092	02.09.2003	3127	01.09.2003	533	03.09.2003	533	03.09.2003
OCT - 2003	3031	23.10.2003	3031	23.10.2003	538	21.10.2003	538	21.10.2003
NOV - 2003	2785	04.11.2003	2985	02.11.2003	578	28.11.2003	578	28.11.2003
DEC - 2003	2920	07.12.2003	2948	31.12.2003	672	07.12.2003	672	07.12.2003
JAN - 2004	2890	09.01.2004	3090	09.01.2004	682	02.01.2004	682	02.01.2004
FEB - 2004	2948	22.02.2004	2948	22.02.2004	582	09.02.2004	582	09.02.2004
MAR - 2004	3042	05.03.2004	3042	05.03.2004	574	12.03.2004	574	12.03.2004
2003-04	3268		3385		682		682	

6.4 MONTHWISE PEAK DEMAND MET (MW) AND REQUIREMENT (MW) WITH CORRESPONDING DATES IN NORTHERN REGION DURING 2003-04

State / U.T.->	JAMMU & KASHMIR				PUNJAB			
Month	Peak Met MW	Date	Peak Reqt MW	Date	Peak Met MW	Date	Peak Reqt MW	Date
APR - 2003	1070	08.04.2003	1200	26.04.2003	3564	26.04.2003	3764	26.04.2003
MAY- 2003	1015	15.05.2003	1165	02.05.2003	4545	31.05.2003	4647	31.05.2003
JUN - 2003	1001	01.06.2003	1216	11.06.2003	5259	17.06.2003	5518	17.06.2003
JUL - 2003	1006	14.07.2003	1132	23.07.2003	5484	26.07.2003	5726	29.07.2003
AUG - 2003	1058	15.08.2003	1116	03.08.2003	5449	25.08.2003	5674	25.08.2003
SEP - 2003	1034	29.09.2003	1100	25.09.2003	4947	18.09.2003	4947	18.09.2003
OCT - 2003	1075	29.10.2003	1200	20.10.2003	4106	26.10.2003	4271	28.10.2003
NOV - 2003	1160	26.11.2003	1250	17.11.2003	3534	26.11.2003	3715	26.11.2003
DEC - 2003	1149	30.12.2003	1313	15.12.2003	3740	12.12.2003	3963	06.12.2003
JAN - 2004	1146	26.01.2004	1350	22.01.2004	3883	16.01.2004	3883	16.01.2004
FEB - 2004	1160	02.02.2004	1260	10.02.2004	3882	25.02.2004	3900	29.02.2004
MAR -2004	1194	05.03.2004	1250	19.03.2004	4320	07.03.2004	4320	07.03.2004
2003-04	1194		1350		5484		5726	

State / U.T.->	RAJASTHAN				UTTAR PRADESH			
Month	Peak Met MW	Date	Peak Reqt MW	Date	Peak Met MW	Date	Peak Reqt MW	Date
APR - 2003	3711	26.04.2003	3711	26.04.2003	5545	26.04.2003	6527	26.04.2003
MAY- 2003	3640	27.05.2003	3640	27.05.2003	5692	06.05.2003	6536	06.05.2003
JUN - 2003	3721	04.06.2003	3721	04.06.2003	5953	18.06.2003	7098	30.06.2003
JUL - 2003	3233	02.07.2003	3233	02.07.2003	5501	03.07.2003	7177	02.07.2003
AUG - 2003	3179	21.08.2003	3179	21.08.2003	5429	26.08.2003	6672	08.08.2003
SEP - 2003	3233	29.09.2003	3233	29.09.2003	5487	30.09.2003	6793	02.09.2003
OCT - 2003	3930	24.10.2003	3930	24.10.2003	6134	25.10.2003	7070	25.10.2003
NOV - 2003	3979	03.11.2003	3979	03.11.2003	5742	13.11.2003	6994	07.11.2003
DEC - 2003	3929	14.12.2003	3929	14.12.2003	5599	31.12.2003	6694	31.12.2003
JAN - 2004	4267	30.01.2004	4267	30.01.2004	5842	12.01.2004	7368	14.01.2004
FEB - 2004	4148	29.02.2004	4148	29.02.2004	5814	22.02.2004	7460	10.02.2004
MAR -2004	4132	01.03.2004	4132	01.03.2004	6029	18.03.2004	7419	19.03.2004
2003-04	4267		4267		6134		7460	

6.4 MONTHWISE PEAK DEMAND MET (MW) AND REQUIREMENT (MW) WITH CORRESPONDING DATES IN NORTHERN REGION DURING 2003-04

State / U.T.->	N.F.F.				REGION			
Month	Peak Met MW	Date	Peak Reqt MW	Date	Peak Met MW	Date	Peak Reqt MW	Date
APR - 2003	90	23.04.2003	90	23.04.2003	20224	30.04.2003	21887	30.04.2003
MAY- 2003	90	21.05.2003	90	21.05.2003	20889	29.05.2003	22203	29.05.2003
JUN - 2003	86	08.06.2003	86	08.06.2003	22746	11.06.2003	24348	11.06.2003
JUL - 2003	80	06.07.2003	80	06.07.2003	21933	04.07.2003	23427	03.07.2003
AUG - 2003	70	12.08.2003	70	12.08.2003	21707	27.08.2003	23373	28.08.2003
SEP - 2003	70	29.09.2003	70	29.09.2003	21331	02.09.2003	22807	12.09.2003
OCT - 2003	79	19.10.2003	79	19.10.2003	21713	24.10.2003	23257	24.10.2003
NOV - 2003	83	12.11.2003	83	12.11.2003	20525	12.11.2003	22715	24.11.2003
DEC - 2003	85	14.12.2003	85	14.12.2003	21121	26.12.2003	23289	31.12.2003
JAN - 2004	78	10.01.2004	78	10.01.2004	22079	10.01.2004	23690	10.01.2004
FEB - 2004	80	18.02.2004	80	18.02.2004	21764	24.02.2004	23575	28.02.2004
MAR -2004	74	07.03.2004	74	07.03.2004	21831	12.03.2004	23754	12.03.2004
2003-04	90		90		22746		24348	

State / U.T.->	UTTRANCHAL			
Month	Peak Met MW	Date	Peak Reqt MW	Date
APR - 2003	640	24.04.2003	660	28.04.2003
MAY- 2003	623	23.05.2003	680	13.05.2003
JUN - 2003	697	30.06.2003	737	30.06.2003
JUL - 2003	668	26.07.2003	708	26.07.2003
AUG - 2003	688	11.08.2003	728	11.08.2003
SEP - 2003	659	21.09.2003	709	13.09.2003
OCT - 2003	707	24.10.2003	747	24.10.2003
NOV - 2003	695	18.11.2003	711	22.11.2003
DEC - 2003	701	30.12.2003	740	31.12.2003
JAN - 2004	737	03.01.2004	777	03.01.2004
FEB - 2004	751	04.02.2004	802	03.02.2004
MAR -2004	722	20.03.2004	762	20.03.2004
2002-03	751		802	

6.5 MONTHWISE MINIMUM DEMAND MET (MW) WITH CORRESPONDING DATES OF MAJOR STATES IN NORTHERN REGION DURING 2003-04

State / U.T.->	DELHI			HARYANA			PUNJAB		
Month	Minimum Demand Met MW	Date	Time	Minimum Demand Met MW	Date	Time	Minimum Demand Met MW	Date	Time
APR - 2003	1065	15.04.2003	19.00	1519	09.04.2003	15.00	1564	04.04.2003	23.00
MAY - 2003	1449	23.05.2003	09.00	909	23.05.2003	08.00	1953	02.05.2003	14.00
JUN - 2003	1352	11.06.2003	08.00	1339	11.06.2003	16.00	2050	11.06.2003	14.00
JUL - 2003	1528	12.07.2003	05.00	1517	26.07.2003	13.00	3720	19.07.2003	04.00
AUG - 2003	1599	15.08.2003	14.00	1962	03.08.2003	15.00	3937	23.08.2003	17.00
SEP - 2003	1907	29.09.2003	05.00	1885	29.09.2003	09.00	3168	30.09.2003	17.00
OCT - 2003	1518	20.10.2003	04.00	1640	29.10.2003	15.00	2598	25.10.2003	15.00
NOV - 2003	1104	01.11.2003	18.00	1248	26.11.2003	09.00	2055	17.11.2003	03.00
DEC - 2003	1137	16.12.2003	03.00	1110	10.12.2003	01.00	2160	16.12.2003	03.00
JAN - 2004	1295	27.01.2004	03.00	1524	23.01.2004	02.00	1833	23.01.2004	01.00
FEB - 2004	1262	19.02.2004	03.00	1018	01.02.2004	10.00	1462	01.02.2004	03.00
MAR -2004	1227	08.03.2004	03.00	1823	23.03.2004	13.00	2746	22.03.2004	13.00
2003-04	1065	15.04.2003	19.00	909	23.05.2003	08.00	1462	01.02.2004	03.00

State / U.T.->	RAJASTHAN			UTTAR PRADESH			REGION		
Month	Minimum Demand Met MW	Date	Time	Minimum Demand Met MW	Date	Time	Minimum Demand Met MW	Date	Time
APR - 2003	1971	22.04.2003	18.00	3530	27.04.2003	18.00	15584	01.04.2003	16.00
MAY - 2003	2102	25.05.2003	03.00	3860	23.05.2003	09.00	15466	23.05.2003	09.00
JUN - 2003	943	11.06.2003	19.00	2309	11.06.2003	19.00	19990	30.06.2003	03.00
JUL - 2003	1486	12.07.2003	09.00	3652	11.07.2003	19.00	16217	12.07.2003	05.00
AUG - 2003	1828	30.08.2003	13.00	3732	03.08.2003	12.00	18042	03.08.2003	06.00
SEP - 2003	2096	12.09.2003	03.00	3878	11.09.2003	15.00	17629	29.09.2003	04.00
OCT - 2003	2327	05.10.2003	18.00	3908	25.10.2003	07.00	16764	02.10.2003	17.00
NOV - 2003	2477	16.11.2003	09.00	3513	09.11.2003	14.00	15957	17.11.2003	03.00
DEC - 2003	2855	30.12.2003	23.00	3860	28.12.2003	04.00	13950	16.12.2003	04.00
JAN - 2004	2843	26.01.2004	18.00	3843	21.01.2004	18.00	14419	23.01.2004	03.00
FEB - 2004	2139	01.02.2004	03.00	2889	01.02.2004	10.00	16348	02.02.2004	03.00
MAR -2004	2490	07.03.2004	18.00	3983	25.03.2004	13.00	16909	08.03.2004	03.00
2003-04	943	11.06.2003	19.00	2309	11.06.2003	19.00	13950	16.12.2003	04.00

6.6 AVERAGE ENERGY REQUIREMENT/DEMAND MET (MU/DAY) OF STATES IN THE NORTHERN REGION DURING THE PAST DECADE

(ALL FIGS. IN MU/DAY AVERAGE)																			
SL. NO.	YEAR	CHANDIGARH		DELHI		HARYANA		H.P.		J & K		PUNJAB		RAJASTHAN		U.P.		UTTRANCHAL *	
		REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.
1	94-95	1.95	1.95	32.98	32.69	31.15	30.01	5.11	5.09	10.95	8.77	53.75	51.95	45.70	43.50	101.80	89.48	0.00	0.00
2	95-96	2.11	2.11	35.53	35.22	34.31	33.59	6.00	5.94	12.00	9.02	54.83	53.62	51.77	49.90	106.20	93.99	0.00	0.00
3	96-97	2.33	2.33	38.13	37.22	37.14	34.92	6.54	6.49	12.92	10.53	58.99	58.04	53.63	49.98	112.99	97.24	0.00	0.00
4	97-98	2.49	2.49	40.63	40.02	35.35	34.77	7.07	7.06	14.12	13.78	60.32	59.93	55.72	54.82	112.58	98.88	0.00	0.00
5	98-99	2.85	2.85	44.36	43.53	36.99	36.34	7.86	7.85	15.42	14.48	66.02	65.00	62.33	60.90	115.08	103.91	0.00	0.00
6	99-00	2.70	2.70	47.20	45.89	42.08	41.15	8.25	8.22	16.46	13.13	70.44	69.92	66.86	63.86	121.25	105.65	0.00	0.00
7	00-01	2.78	2.78	49.95	47.57	45.76	44.38	8.42	8.24	16.88	14.35	74.38	72.02	66.97	64.99	126.40	109.76	0.00	0.00
8	01-02	2.89	2.89	52.10	50.55	48.10	47.06	8.84	8.79	17.60	15.71	76.92	74.05	65.75	65.05	131.82	118.81	0.00	0.00
9	02-03	3.04	3.04	54.16	52.99	53.21	51.47	9.17	9.17	19.28	17.02	81.55	76.03	70.25	68.79	122.66	100.14	10.10	9.81
10	03-04	3.05	3.04	55.75	55.12	55.01	54.11	9.53	9.57	20.34	18.97	86.60	83.51	72.53	72.46	130.35	110.47	11.35	11.13
RATE OF GROWTH		5.08	5.08	6.01	5.98	6.52	6.77	7.17	7.27	7.13	8.95	5.44	5.42	5.27	5.83	2.79	2.37		
(% PER ANNUM)		6.24	6.24	7.67	7.62	8.51	8.92	9.61	9.79	9.53	12.93	6.79	6.75	6.52	7.40	3.12	2.61		

C: COMPOUND A: AVERAGE

6.7 PEAK REQUIREMENT / DEMAND MET (MW) OF STATES IN THE NORTHERN REGION DURING THE PAST DECADE

(ALL FIGS. IN MW)																			
SL. NO.	YEAR	CHANDIGARH		DELHI		HARYANA		H.P.		J & K		PUNJAB		RAJASTHAN		U.P.		UTTRANCHAL *	
		REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.	REQT.	AVAIL.
1	94-95	140	140	1884	1869	2025	1947	450	450	748	846	4200	3548	2700	2585	6676	5296	0.00	0.00
2	95-96	147	147	2123	2000	2150	2012	506	506	825	600	3925	3820	2950	2818	6793	5420	0.00	0.00
3	96-97	166	166	2234	2078	2187	2090	525	525	900	750	3868	3864	3145	2972	6833	5873	0.00	0.00
4	97-98	179	179	2448	2355	2273	2273	593	593	1076	1035	4371	4371	3262	3229	6616	5666	0.00	0.00
5	98-99	197	197	2710	2491	2449	2331	585	585	1150	973	4559	4559	3718	3589	6864	5926	0.00	0.00
6	99-00	180	180	2854	2591	2575	2575	618	618	1207	1004	5013	5013	3672	3672	7017	5960	0.00	0.00
7	00-01	171	171	3077	2670	2709	2709	585	585	1172	974	4997	4897	3754	3663	7311	6119	0.00	0.00
8	01-02	180	180	3118	2879	2966	2900	562	562	1209	999	5357	4936	3657	3657	7584	6887	0.00	0.00
9	02-03	206	206	3367	3101	3411	3325	696	696	1250	1042	5771	5387	3735	3735	6700	5699	771	692
10	03-04	207	207	3389	3289	3385	3268	682	682	1350	1194	5726	5484	4267	4267	7460	6134	802	751
RATE OF GROWTH		4.44	4.44	6.74	6.48	5.87	5.92	4.73	4.73	6.78	3.90	3.50	4.96	5.22	5.73	1.24	1.65		
(% PER ANNUM)		5.32	5.32	8.88	8.44	7.46	7.54	5.73	5.73	8.94	4.57	4.04	6.06	6.45	7.23	1.30	1.76		

C: COMPOUND A: AVERAGE

* POWER SYSTEM DATA IN RESPECT OF UTTRANCHAL TAKEN SEPERATELY W.E.F 01.04.2002.

6.8 DEMAND MET / REQUIREMENT OF ENERGY AND PEAK POWER IN NORTHERN REGION DURING PAST DECADE

SL. NO.	YEAR	ENERGY IN MU (NET)			PEAK POWER IN MW		
		DEMAND MET	REQUIREMENT	% SHORTAGE	DEMAND MET	REQUIREMENT	% SHORTAGE
1	1994-95	96323.50	103623.50	7.04	14296	16375	12.28
2	1995-96	103834.20	110938.26	6.40	15804	17729	12.70
3	1996-97	108504.70	117906.00	7.97	16109	18201	10.86
4	1997-98	113929.91	119962.88	5.03	17091	19016	11.49
5	1998-99	122300.02	128168.04	4.58	18372	20183	10.12
6	1999-2000	128366.54	137412.29	6.58	19341	21083	8.97
7	2000-01	133389.65	143433.09	7.00	19860	21479	8.26
8	2001-02	140003.11	148033.72	5.42	21586	22589	4.44
9	2002-03	142277.59	155409.00	8.45	21767	24031	9.42
10	2003-04	153633.02	163159.14	5.84	22746	24348	6.58
COMPOUND ANNUAL GROWTH RATE (CAGR) %		5.32	5.17		5.30	4.51	

6.9 MONTHWISE ENTITLEMENT VIS -A -VIS ACTUAL IMPORT BY CONSTITUENTS FROM NORTHERN GRID DURING 2003-04

All figs. in MU

State / U.T.->	CHANDIGARH			DELHI (Excl. BTPS)		
Month	ENTITLEMENT	ACTUAL	O/D(+)/U/D(-)	ENTITLEMENT	ACTUAL	O/D(+)/U/D(-)
APR - 2003	101.08	89.72	-11.36	1070.74	877.36	-193.38
MAY- 2003	118.92	108.48	-10.44	1244.34	1043.58	-200.76
JUN - 2003	123.35	118.39	-4.96	1398.68	1192.39	-206.29
JUL - 2003	130.85	120.31	-10.53	1346.44	1169.36	-177.08
AUG - 2003	124.44	117.10	-7.34	1260.98	1085.15	-175.83
SEP - 2003	110.16	105.90	-4.25	1119.43	1008.94	-110.49
OCT - 2003	108.74	84.77	-23.97	1079.82	875.58	-204.24
NOV - 2003	96.85	76.13	-20.73	867.84	641.29	-226.55
DEC - 2003	102.97	88.51	-14.47	886.47	640.40	-246.07
JAN - 2004	100.81	96.18	-4.63	978.24	784.81	-193.43
FEB - 2004	94.44	78.65	-15.78	775.07	538.87	-236.20
MAR -2004	108.85	84.66	-24.19	867.74	664.92	-202.82
2003-04	1321.44	1168.81	-152.63	12895.77	10522.65	-2373.13

State / U.T.->	HARYANA (Excl. FBD GAS)			HIMACHAL PRADESH		
Month	ENTITLEMENT	ACTUAL	O/D(+)/U/D(-)	ENTITLEMENT	ACTUAL	O/D(+)/U/D(-)
APR - 2003	699.18	801.68	102.50	157.54	152.64	-4.90
MAY- 2003	874.08	1040.21	166.13	124.18	116.72	-7.46
JUN - 2003	987.04	1128.54	141.50	-39.40	-49.37	-9.97
JUL - 2003	1030.13	1141.55	111.41	-45.85	-127.73	-81.89
AUG - 2003	1020.33	1150.73	130.40	-63.37	-131.28	-67.91
SEP - 2003	878.69	1075.64	196.95	21.15	-92.91	-114.06
OCT - 2003	701.59	924.01	222.42	160.15	114.70	-45.45
NOV - 2003	655.96	737.98	82.02	199.64	212.03	12.39
DEC - 2003	669.85	823.96	154.11	224.32	236.33	12.01
JAN - 2004	627.95	761.63	133.68	249.56	258.63	9.07
FEB - 2004	614.47	723.37	108.90	222.95	213.06	-9.89
MAR -2004	777.55	871.79	94.24	213.50	193.31	-20.19
2003-04	9536.82	11181.09	1644.27	1424.37	1096.13	-328.25

NOTE:- The above figures are based on operational data available at NRLDC.

6.9 MONTHWISE ENTITLEMENT VIS -A -VIS ACTUAL IMPORT BY CONSTITUENTS FROM NORTHERN GRID DURING 2003-04

All figs. in MU

State / U.T.->	JAMMU & KASHMIR			PUNJAB		
Month	ENTITLEMENT	ACTUAL	O/D(+)/U/D(-)	ENTITLEMENT	ACTUAL	O/D(+)/U/D(-)
APR - 2003	515.40	447.60	-67.79	827.73	868.21	40.48
MAY- 2003	479.90	446.46	-33.44	1185.05	1193.61	8.57
JUN - 2003	435.77	405.22	-30.55	1532.78	1538.56	5.78
JUL - 2003	421.02	411.51	-9.51	1554.96	1674.84	119.88
AUG - 2003	395.16	431.81	36.65	1519.21	1585.63	66.42
SEP - 2003	385.49	412.38	26.89	1235.54	1322.25	86.72
OCT - 2003	389.17	519.38	130.21	940.65	990.90	50.25
NOV - 2003	427.44	559.32	131.88	641.99	560.16	-81.83
DEC - 2003	536.53	612.27	75.74	615.40	602.62	-12.78
JAN - 2004	539.11	614.98	75.87	613.13	562.42	-50.71
FEB - 2004	518.22	573.77	55.55	625.03	619.51	-5.52
MAR -2004	496.04	554.32	58.28	861.56	824.30	-37.26
2003-04	5539.24	5989.02	449.77	12153.01	12342.99	189.98

State / U.T.->	RAJASTHAN			UTTAR PRADESH (Excl. TANDA)		
Month	ENTITLEMENT	ACTUAL	O/D(+)/U/D(-)	ENTITLEMENT	ACTUAL	O/D(+)/U/D(-)
APR - 2003	883.25	871.77	-11.48	1330.58	1365.88	35.30
MAY- 2003	989.16	918.71	-70.45	1440.23	1484.78	44.55
JUN - 2003	1017.76	965.79	-51.97	1425.93	1552.01	126.08
JUL - 2003	962.98	905.14	-57.84	1418.69	1452.39	33.70
AUG - 2003	896.23	776.69	-119.54	1340.37	1534.36	193.99
SEP - 2003	793.00	668.22	-124.78	1271.26	1357.65	86.40
OCT - 2003	876.10	902.26	26.17	1465.93	1427.75	-38.18
NOV - 2003	875.22	932.43	57.20	1249.18	1304.83	55.65
DEC - 2003	854.37	975.84	121.46	1363.45	1342.35	-21.10
JAN - 2004	959.26	1043.80	84.54	1396.41	1427.58	31.17
FEB - 2004	897.94	1039.95	142.01	1285.32	1364.73	79.41
MAR -2004	902.10	954.23	52.12	1445.68	1695.99	250.31
2003-04	10907.38	10954.82	47.44	16433.04	17310.31	877.27

NOTE:- The above figures are based on operational data available at NRLDC.

6.9 MONTHWISE ENTITLEMENT VIS -A -VIS ACTUAL IMPORT BY CONSTITUENTS FROM NORTHERN GRID DURING 2003-04

All figs. in MU

State / U.T.->	UTTRANCHAL		
Month	ENTITLEMENT	ACTUAL	O/D(+)/U/D(-)
APR - 2003	64.76	66.56	1.80
MAY - 2003	1.24	22.97	21.74
JUN - 2003	-43.80	-47.21	-3.40
JUL - 2003	-13.17	-49.50	-36.33
AUG - 2003	41.51	-3.06	-44.56
SEP - 2003	-1.49	-121.64	-120.15
OCT - 2003	61.18	-4.62	-65.80
NOV - 2003	132.23	108.45	-23.78
DEC - 2003	172.89	151.57	-21.33
JAN - 2004	193.40	202.75	9.35
FEB - 2004	173.84	154.26	-19.59
MAR -2004	165.47	144.41	-21.05
2003-04	948.05	624.95	-323.10

NOTE:- The above figures are based on operational data available at NRLDC.

6.10 INTER REGIONAL EXCHANGES DURING 2003-04

(All figs. in MU)

IR EXCHG VIA -->	WR				ER		
	VINDHYACHAL HVDC B/B		220kV AURIYA MALANPUR EXPORT	220 KV UJJAIN- KOTA	SASARAM HVDC (IMPORT)	SASARAM HVDC (EXPORT)	Export to ER Over 220/132 KV lines
	IMPORT	EXPORT					
APR - 2003	0.00	125.35	14.12	0.00	215.36	0.00	0.00
MAY- 2003	0.00	103.31	13.97	0.00	156.49	0.00	24.09
JUN - 2003	26.34	16.93	14.58	0.00	174.32	0.00	37.11
JUL - 2003	23.18	31.44	14.17	0.00	108.12	3.13	12.70
AUG - 2003	58.13	3.74	15.02	0.00	181.17	0.00	9.36
SEP - 2003	24.03	38.41	6.40	0.00	152.31	0.00	9.82
OCT - 2003	6.58	112.07	13.88	0.00	205.28	0.00	17.63
NOV - 2003	10.18	86.48	41.39	0.00	234.68	0.00	15.55
DEC - 2003	14.50	70.88	50.66	0.00	278.31	0.00	17.12
JAN - 2004	64.78	35.33	50.22	51.38	309.05	0.00	20.76
FEB - 2004	25.73	48.30	39.39	52.13	229.19	0.00	24.07
MAR -2004	28.57	49.45	38.51	65.45	90.48	0.00	3.41
2003-04	282.02	721.69	312.31	168.96	2334.76	3.13	191.62

6.11 UTILISATION OF VINDHYACHAL HVDC B/B STATION (500 MW) DURING PAST DECADE

Sl. No.	Year	Vindhyachal HVDC B/B		Utilisation Factor (%)
		Import (MU)	Export (MU)	
1	1994-95	578.37	53.64	14.43
2	1995-96	189.02	301.05	11.19
3	1996-97	252.05	151.61	9.19
4	1997-98	472.83	352.78	18.85
5	1998-99	442.96	587.30	23.52
6	1999-2000	587.30	215.11	18.32
7	2000-01	450.69	385.71	19.04
8	2001-02	355.86	404.96	17.37
9	2002-03	140.78	1187.65	30.33
10	2003-04	282.02	721.69	22.85

2. UTILISATION OF SASARAM HVDC B/B STATION (500 MW) DURING 2003-2004

YEAR	IMPORT	EXPORT	UTILISATION FACTOR
2003-2004	2334.76	3.13	53.23

7.1 PERFORMANCE OF GENERATING STATIONS IN THE NORTHERN REGION DURING 2003-2004

MONTH -- SL. NO.	Power Station	Effective Capacity MW	Apr'03 Gross MU	May'03 Gross MU	Jun'03 Gross MU	Jul'03 Gross MU	Aug'03 Gross MU	Sep'03 Gross MU	Oct'03 Gross MU	Nov'03 Gross MU	Dec'03 Gross MU	Jan'04 Gross MU	Feb'04 Gross MU	Mar'04 Gross MU	2003-04 Gross MU Ex bus MU	
1	CENTRAL SECTOR															
A	NTPC															
(a)	Badarpur TPS	705.00	425.96	477.33	462.53	407.70	464.86	417.34	427.18	429.22	493.88	501.56	479.93	441.48	5428.97	4940.36
(b)	Singrauli STPS	2000.00	1299.45	1357.10	1303.02	1272.22	1108.87	1156.12	1422.14	1369.66	1460.58	1397.24	1160.97	1334.19	15641.56	14557.85
(c)	Rihand STPS	1000.00	705.48	720.50	709.08	716.72	733.27	420.38	716.95	372.26	704.97	727.41	690.31	739.01	7956.34	7320.19
(d)	Dadri NCTPS	840.00	422.60	515.60	527.21	498.27	491.07	454.98	555.06	564.47	494.12	574.48	562.88	520.43	6181.17	5683.23
(e)	Unchahar - I TPS	420.00	290.18	299.60	282.21	290.68	242.46	291.50	231.59	188.76	184.50	304.74	287.10	304.92	3198.24	2918.30
(f)	Unchahar - II TPS	420.00	228.84	170.80	277.15	277.82	282.38	198.66	307.74	299.60	308.12	299.69	290.90	310.02	3251.72	2956.71
(g)	Tanda TPS	440.00	206.52	221.80	200.91	255.07	200.03	222.29	280.50	270.80	293.43	246.04	276.83	231.93	2906.15	2542.94
(h)	Anta GPS	419.33	190.11	267.26	245.03	255.72	187.91	171.67	251.53	232.94	223.67	252.75	233.95	263.56	2776.10	2698.10
(i)	Auraiya GPS	663.36	366.72	404.52	320.28	376.47	362.09	368.95	382.52	303.84	323.72	334.76	360.69	339.24	4243.80	4225.91
(j)	Dadri GPS	829.78	332.49	457.68	461.03	323.23	457.73	446.15	456.08	458.40	449.67	429.60	351.04	435.70	5058.80	4913.21
(k)	Faridabad GPS	431.57	257.53	161.85	259.81	241.59	236.27	238.19	243.72	203.19	203.37	241.42	231.67	273.50	2792.11	2731.14
	Total NTPC	8169.04	4725.88	5054.04	5048.26	4915.49	4766.93	4386.23	5275.01	4693.14	5140.03	5309.69	4926.27	5193.98	59434.95	55487.93
B	NHPC															
(a)	Bairasiul	180.00	105.35	105.62	83.09	74.89	85.31	56.75	30.99	19.68	15.44	16.62	35.68	58.35	687.77	674.35
(b)	Salal	690.00	323.27	434.40	452.55	507.21	501.61	434.55	171.97	112.05	104.77	110.48	150.47	193.75	3497.08	3480.47
(c)	Tanakpur HPS	94.20	30.78	42.70	63.65	63.59	66.77	65.26	60.42	37.79	22.59	22.15	18.04	17.21	510.95	507.27
(d)	Chamera HPS	540.00	256.50	351.58	391.82	401.98	368.15	221.93	96.32	80.58	46.97	51.02	74.63	122.50	2463.98	2456.83
(e)	Uri HPS	480.00	330.61	336.95	346.13	325.14	227.23	239.05	194.35	85.25	111.98	143.56	211.41	322.10	2873.76	2852.81
(f)	Chamera (2) HPS	300.00						0.00	2.933	10.00	20.20	36.95	43.61	72.03	185.72	184.04
	Total NHPC	2284.20	1046.51	1271.25	1337.24	1372.81	1249.07	1017.54	556.98	345.35	321.95	380.78	533.84	785.94	10219.27	10155.77
C	SJVNL	1500.00	0.00	0.00	0.00	0.00	0.00	2.00	183.60	181.76	190.77	207.41	187.70	228.11	1181.35	1181.35
D	NPC															
(a)	RAPS -A	300.00	120.02	132.92	127.12	131.24	77.12	83.58	97.20	74.58	106.50	89.29	89.64	182.38	1311.58	1167.32
(b)	RAPS -B	440.00	306.48	195.10	278.67	227.56	215.79	200.71	210.32	240.16	275.67	288.70	265.05	267.14	2971.35	2632.00
(c)	NAPS	440.00	221.99	246.61	243.76	222.93	238.72	243.89	254.78	257.54	289.75	296.03	255.03	270.31	3041.34	2691.71
	Total NPC	1180.00	648.49	574.62	649.55	581.73	531.63	528.18	562.30	572.28	671.92	674.02	609.72	719.83	7324.27	6491.03
2	JOINTLY OWNED (BBMB)															
(a)	Bhakra Complex	1490.15	302.16	536.38	727.15	871.86	778.52	674.48	523.96	528.80	565.95	509.29	445.60	596.57	7060.70	7003.98
(b)	Dehar	990.00	293.43	408.95	460.23	476.28	465.97	414.31	204.86	131.55	100.66	89.71	103.87	187.46	3337.27	3220.24
(c)	Pong	396.00	46.72	97.95	93.65	38.18	86.93	103.80	153.84	130.96	89.02	120.14	78.09	72.99	1112.28	1078.51
	Total BBMB	2876.15	642.31	1043.27	1281.03	1386.32	1331.42	1192.59	882.66	791.31	755.63	719.14	627.56	857.01	11510.24	11302.73

7.1 PERFORMANCE OF GENERATING STATIONS IN THE NORTHERN REGION DURING 2003-2004

MONTH -- SL. NO.	Power Station	Effective Capacity MW	Apr'03	May'03	Jun'03	Jul'03	Aug'03	Sep'03	Oct'03	Nov'03	Dec'03	Jan'04	Feb'04	Mar'04	2003-04	
			Gross MU	Gross MU	Gross MU	Gross MU	Gross MU	Gross MU	Gross MU	Gross MU	Gross MU	Gross MU	Gross MU	Gross MU	Gross MU	Ex bus MU
3	DVB															
(a)	Indra Prastha	247.50	40.57	44.50	64.23	56.31	51.93	66.35	52.91	47.57	85.96	86.20	90.03	82.58	769.14	668.09
(b)	Rajghat	135.00	45.73	46.07	59.04	66.13	71.23	51.94	40.39	41.90	96.91	96.78	73.24	84.49	773.83	688.34
(c)	Gas Turbines	282.00	82.74	91.78	84.76	89.08	86.91	103.23	120.96	110.82	118.39	115.84	104.00	106.05	1214.55	1188.44
(d)	Pragati gas turbines	330.00	199.00	208.73	162.65	145.00	217.02	218.37	149.32	209.58	229.33	221.37	218.60	227.12	2406.10	2345.15
	Total DVB	994.50	368.04	391.07	370.68	356.52	427.09	439.89	363.57	409.87	530.59	520.19	485.87	500.24	5163.62	4890.02
4	HARYANA															
(a)	WYC	48.00	20.99	22.78	26.76	28.59	33.07	29.47	30.13	19.85	15.96	13.50	9.18	2.27	252.55	250.58
(b)	Faridabad (New)	165.00	74.21	79.70	81.06	71.57	60.70	57.70	45.00	32.11	45.57	78.02	77.71	90.55	793.90	688.80
(c)	Panipat	860.00	309.21	390.60	496.81	416.01	511.94	504.72	580.82	503.77	524.62	584.43	556.02	569.25	5948.20	5349.46
(d)	Magnum Diesel (IPP)	25.20	6.62	5.87	5.88	3.76	4.19	0.00	0.00	0.00	0.00	0.00	0.00	1.13	27.45	27.45
	Total HARYANA (Hydro)	48.00	20.99	22.78	26.76	28.59	33.07	29.47	30.13	19.85	15.96	13.50	9.18	2.27	252.55	250.58
	Total HARYANA (thermal)	1025.00	383.42	470.30	577.87	487.58	572.64	562.42	625.82	535.88	570.19	662.44	633.73	659.80	6742.10	6038.26
	Total HARYANA	1098.20	411.03	498.95	610.51	519.93	609.90	591.89	655.95	555.73	586.15	675.95	642.91	663.21	7022.10	6316.29
5	HP															
(a)	Giri	60.00	7.75	5.17	5.16	30.50	28.51	21.87	19.10	11.59	10.45	11.04	10.71	6.14	167.99	167.10
(b)	Bassi	60.00	35.80	41.00	42.45	43.69	42.42	35.50	18.00	10.58	8.46	7.19	9.27	21.38	315.75	315.18
(c)	Binwa	6.00	4.23	2.64	2.03	3.15	6.85	4.15	2.12	1.29	1.03	0.93	2.56	3.30	34.27	34.13
(d)	Rongtong	15.55	2.08	1.95	1.73	2.09	2.22	2.63	2.35	1.62	1.57	1.39	1.58	1.46	22.67	22.44
	(+ Nogli + Micro+Thirot)		0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
(e)	Andhra	16.95	7.19	6.81	5.71	8.56	10.89	11.32	6.42	3.17	2.28	1.80	2.19	3.21	69.55	69.36
(f)	Bhabha (H)	120.00	43.50	81.66	85.89	89.82	86.45	79.71	30.36	0.24	22.05	17.78	15.81	26.82	580.09	577.84
(g)	Baner (H)	12.00	4.57	3.37	4.10	5.20	6.85	4.88	2.20	1.31	1.01	0.97	2.53	3.22	40.21	40.10
(h)	Gaj (H)	10.50	6.21	4.02	4.00	6.10	6.94	6.55	2.86	1.52	1.12	1.44	3.37	3.95	48.09	47.97
(i)	Gumma	3.00	1.04	0.97	0.41	0.95	6.38	1.86	1.04	0.57	0.42	0.33	0.34	0.50	14.81	14.71
(j)	Ghanvi	22.50	7.54	8.14	7.16	10.13	1.78	8.55	7.87	3.95	2.88	2.40	1.91	4.07	66.39	66.14
(k)	Malana	86.00	19.90	34.32	58.82	68.50	65.49	45.93	17.44	9.91	6.79	4.35	21.29	11.02	363.76	362.30
(l)	Baspa	300.00	0.00	20.29	189.26	235.94	237.61	203.48	76.33	44.40	382.81	251.04	285.57	346.38	2273.11	2259.89
	Total HP	712.20	139.81	210.34	406.72	504.63	502.39	426.43	186.09	90.15	440.87	300.66	357.13	431.45	3996.67	3977.17
6	J & K															
(a)	Lower Jhelum	105.00	54.61	52.76	61.96	59.09	46.52	45.72	28.19	15.11	29.63	26.18	34.48	58.62	512.87	507.75
(b)	Upper Sindh	127.60	28.89	29.85	30.56	31.64	28.18	11.64	17.76	14.09	13.96	14.87	15.03	19.68	256.16	253.59
(c)	Ganderbal	15.00	0.78	2.09	0.62	2.04	2.85	1.96	1.28	3.28	2.16	2.76	2.25	1.32	23.39	23.15
(d)	Mohra	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(e)	Chenani	32.80	3.44	6.44	8.13	6.70	7.98	7.54	4.94	3.22	3.76	4.79	6.01	7.90	70.85	70.22
(f)	Stakna	9.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(g)	Small Hydel	3.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37	1.37	1.37
(h)	Pampore GT St - I	175.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.52	0.00	0.27	0.00	1.79	1.77
	Pampore GT St - II		0.00	0.00	0.00	0.00	0.00	0.00	0.89	10.96	2.93	0.00	0.49	0.00	15.27	15.12
(l)	Diesel Gen.sets	7.18	0.00	0.00	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 J & K(hydro)	311.69	87.72	91.14	101.27	99.47	85.53	66.86	52.17	35.70	49.51	48.61	57.77	88.88	864.62	856.07
	Total J & K(thermal)	175.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	10.96	4.45	0.00	0.76	0.00	17.06	16.89
	Total J & K	493.87	87.72	91.14	101.27	99.47	85.53	66.86	53.06	46.66	53.96	48.61	58.53	88.88	881.68	872.96

7.1 PERFORMANCE OF GENERATING STATIONS IN THE NORTHERN REGION DURING 2003-2004

MONTH -- SL. NO.	Power Station	Effective Capacity MW	Apr'03 Gross MU	May'03 Gross MU	Jun'03 Gross MU	Jul'03 Gross MU	Aug'03 Gross MU	Sep'03 Gross MU	Oct'03 Gross MU	Nov'03 Gross MU	Dec'03 Gross MU	Jan'04 Gross MU	Feb'04 Gross MU	Mar'04 Gross MU	2003-04 Gross MU Ex bus MU	
7	PUNJAB															
(a)	Jogindernagar/ Shanan	110.00	63.45	69.82	78.00	77.08	78.38	62.69	30.45	18.32	13.94	12.66	17.32	42.10	564.21	563.81
(b)	UBDC	90.00	25.85	48.39	53.49	57.07	53.44	42.00	27.91	26.17	26.86	24.65	23.65	17.97	427.45	372.81
(c)	Mukerian	207.00	47.63	104.88	105.85	40.39	79.09	92.01	95.05	113.62	81.23	110.32	51.08	108.09	1029.24	1025.84
(d)	Anandpur Sahib (APS)	134.00	13.71	93.92	91.91	93.76	94.44	90.44	50.30	51.77	66.01	54.49	47.93	67.67	816.35	815.39
(e)	Ranjit Sagar HPS	600.00	92.04	209.73	253.73	276.05	186.75	130.54	83.65	73.96	68.42	57.74	73.61	41.37	1547.59	1544.86
(f)	Small Hydel	4.10	0.52	0.89	0.94	0.00	0.00	0.00	0.00	0.00	0.77	0.77	0.65	1.12	5.66	5.60
(g)	GNDTPS (Bhatinda)	440.00	166.52	183.32	235.10	231.49	258.82	244.75	222.64	182.41	189.14	221.48	197.61	218.03	2551.31	2307.88
(h)	GGSTPS (Ropar)	1260.00	542.68	474.50	711.61	689.62	867.93	741.94	657.09	648.70	750.02	754.75	703.35	761.56	8303.75	7611.52
(i)	Jhalkeri Rice Straw	10.00	0.00	0.00	0.00	0.00	0.00	0.00	1.66	1.72	1.84	1.76	2.02	14.63	23.63	23.63
(j)	Peda and sugarmill								6.71	4.71	13.62	12.96	10.56			
(k)	Lehra Mohabbat TPS	420.00	273.63	229.41	275.19	298.50	310.41	283.06	300.46	298.26	306.78	303.82	200.20	300.76	3380.48	3079.32
	Total PUNJAB (hydro)	1145.10	243.20	527.63	583.92	544.35	492.10	417.68	287.36	283.84	257.23	260.63	214.24	278.32	4390.50	4328.31
	Total PUNJAB (thermal)	2130.00	982.83	887.23	1221.90	1219.61	1437.16	1269.75	1188.56	1135.80	1261.40	1294.77	1113.74	1294.98	14259.17	13022.35
	Total PUNJAB	3275.10	1226.03	1414.86	1805.82	1763.96	1929.26	1687.43	1475.92	1419.64	1518.63	1555.40	1327.98	1573.30	18649.67	17350.66
8	RAJASTHAN															
(a)	Mahi Bajaj Sagar	140.00	0.00	0.00	0.00	0.27	2.26	15.17	22.40	34.78	32.99	23.54	30.08	30.15	191.64	188.24
(b)	Rana Pratap Sagar (RPS)	172.00	7.01	11.60	5.88	0.00	0.00	0.00	8.43	67.55	65.56	50.32	14.36	9.75	240.46	239.49
(c)	Jawahar Sagar (JS)	99.00	5.06	8.53	6.65	5.13	7.14	7.76	6.38	55.66	45.96	37.38	11.30	6.55	203.50	203.11
(d)	Anoopgarh	9.00	0.64	0.24	0.00	0.00	0.00	0.00	1.30	1.28	1.47	1.17	0.90	1.54	8.54	8.54
(e)	Small Hydro	14.85	0.71	0.92	0.82	1.36	0.87	0.87	0.51	2.13	1.72	1.31	0.31	0.14	11.67	11.44
(f)	Kota TPS	1045.00	562.64	566.67	494.63	320.84	463.73	538.02	566.37	607.80	596.79	682.59	885.94	671.67	6957.69	6283.81
(g)	RAMGARH GT	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(h)	RAMGARH GT EXT	35.50	19.92	18.56	18.74	21.78	18.61	18.24	17.71	16.84	19.27	18.67	27.71	23.27	239.32	221.80
(i)	Suratgarh TPS	1250.00	519.65	621.00	507.23	383.07	619.79	656.50	792.82	809.20	845.76	888.52	772.66	886.91	8303.11	7524.32
(j)	Wind farm	14.01	5.38	10.56	19.67	11.08	14.30	11.79	3.08	5.84	6.26	1.13	8.76	6.83	104.68	104.67
(k)	Others(KPTL bio)		0.00	0.00	0.00	0.00	0.00	4.07	1.77	3.07	3.00	2.27	1.99	1.55	17.72	17.72
	Total RAJ (hydro)	434.85	13.42	21.29	13.35	6.76	10.27	23.80	39.02	161.40	147.70	113.72	56.95	48.13	655.81	650.82
	Total RAJ (thermal)	2333.50	1102.21	1206.23	1020.60	725.69	1102.13	1212.76	1376.90	1433.84	1461.82	1589.78	1686.31	1581.85	15500.12	14029.93
	Total RAJASTHAN	2782.36	1121.01	1238.08	1053.62	743.53	1126.70	1252.42	1420.77	1604.15	1618.78	1706.90	1754.01	1638.36	16278.33	14803.14

7.1 PERFORMANCE OF GENERATING STATIONS IN THE NORTHERN REGION DURING 2003-2004

MONTH -- SL. NO.	Power Station	Effective Capacity MW	Apr'03 Gross MU	May'03 Gross MU	Jun'03 Gross MU	Jul'03 Gross MU	Aug'03 Gross MU	Sep'03 Gross MU	Oct'03 Gross MU	Nov'03 Gross MU	Dec'03 Gross MU	Jan'04 Gross MU	Feb'04 Gross MU	Mar'04 Gross MU	2003-04 Gross MU Ex bus MU	
9	UP															
	HYDRO															
(a)	Rihand	300.00	66.59	74.08	57.54	60.74	99.00	117.58	121.27	111.22	101.22	114.29	101.91	86.72	1112.16	1101.03
(b)	Obra	99.00	27.52	31.57	25.62	27.96	44.00	41.37	44.54	41.31	40.12	43.84	39.55	35.12	442.52	438.09
(c)	Matatilla	30.00	0.89	5.27	0.10	5.04	3.64	20.41	16.02	21.58	17.21	4.39	16.11	16.28	126.94	125.66
(d)	Khara	72.00	29.96	38.89	43.22	47.51	48.69	52.19	43.09	23.84	18.83	17.15	11.65	14.88	389.90	385.97
	Total UP (Hydro)	501.00	124.96	149.81	126.48	141.25	195.33	231.55	224.92	197.95	177.38	179.67	169.22	153.00	2071.52	2050.75
	THERMAL															
(a)	Obra	160.00														
(b)	Obra Extn. - I	282.00														
(c)	Obra Extn. - II	1000.00	564.64	555.95	501.40	549.37	509.92	480.76	516.71	562.18	623.01	539.25	507.17	433.00	6343.36	5550.44
(d)	Panki	32.00														
(e)	Panki Extn.	210.00	75.60	64.44	44.12	51.05	98.55	105.63	100.67	109.12	112.53	113.67	92.97	96.97	1065.32	931.94
(f)	Harduaganj - A	0.00														
(g)	Harduaganj - B	150.00														
(h)	Harduaganj - C	225.00	32.04	34.15	42.06	31.98	52.87	64.35	79.88	76.74	88.01	75.56	74.74	78.25	730.63	639.30
(i)	Paricha	220.00	69.10	40.85	42.66	44.78	36.61	37.77	45.13	36.60	54.40	75.26	75.32	95.25	653.73	572.02
(j)	Anpara - A	0.00														
(k)	Anpara - B	1630.00	961.36	1102.75	999.68	891.86	772.34	844.33	1126.51	1004.07	1049.63	1171.23	1004.19	1051.59	11979.54	10482.10
	Total UP (Thermal)	3909.00	1702.74	1798.14	1629.92	1569.04	1470.29	1532.84	1868.90	1788.71	1927.58	1974.97	1754.39	1755.06	20772.58	18175.80
	Total UP	4410.00	1827.70	1947.95	1756.40	1710.29	1665.62	1764.39	2093.82	1986.66	2104.96	2154.64	1923.61	1908.06	22844.10	20226.55
10	UTTARANCHAL															
	HYDRO															
(a)	Khatima	41.40	14.72	16.89	14.91	17.93	22.02	17.17	18.37	12.43	11.65	10.13	8.08	9.11	173.41	172.10
(b)	Ramganga	198.00	3.64	6.83	10.86	0.00	0.00	0.00	0.72	3.43	36.79	24.23	57.16	65.48	209.14	208.38
(c)	Ganga Canal	32.70	5.89	10.99	13.44	11.87	14.11	12.41	5.77	13.24	12.22	11.02	10.27	9.81	131.04	128.83
(d)	Yamuna (I & IV)	114.75	41.96	48.31	60.93	71.38	67.22	76.61	58.23	32.80	26.09	23.72	16.58	50.32	574.15	570.62
(e)	Chibro	240.00	60.83	73.12	96.44	124.53	102.31	129.40	67.06	41.28	33.59	30.67	30.93	34.23	824.39	822.78
(f)	Khodri	120.00	28.83	36.17	46.60	56.26	46.04	57.01	32.36	20.01	16.94	15.38	15.26	16.94	387.80	387.02
(g)	Chilla	144.00	46.08	57.83	74.30	86.18	91.29	84.07	80.62	50.47	37.92	30.32	25.66	25.23	689.97	688.79
(h)	Maneri Bhali	90.00	52.64	68.06	62.25	24.67	1.61	60.33	63.03	42.62	33.40	27.46	23.92	0.00	459.99	458.83
	Total UTTARANCHAL	999.05	254.59	318.20	379.73	392.82	344.60	437.00	326.16	216.28	208.60	172.93	187.86	211.12	3449.89	3437.35
11	Total Region	30776.07	12499.12	14053.78	14800.83	14347.50	14570.13	13792.84	14035.89	12912.98	14142.84	14426.31	13622.99	14799.49	167956.13	156492.94

Notes :

- 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%
 - Lehra Mohabbat----10.5% KTPS----10% UPSEB----12.5%
- Generation at small hydro & Sobla in UP and H.P. & J&K has been neglected.

7.2 SUMMARY OF REGIONAL ENERGY GENERATION DURING 2003-2004

Sr. No.	Constituent	Gross MU					Ex-bus MU				
		Hydro	Thermal	Gas / Diesel	Nuclear	Total	Hydro	Thermal	Gas / Diesel	Nuclear	Total
1	NTPC	---	44564.14	14870.81	---	59434.95	---	40919.58	14568.35	---	55487.93
2	NHPC	10219.27	---	---	---	10219.27	10155.77	---	---	---	10155.77
3	SJVNL	1181.35	---	---	---	1181.35	1181.35	---	---	---	1181.35
4	NPC	---	---	---	7324.27	7324.27	---	---	---	6491.03	6491.03
5	BBMB	11510.24	---	---	---	11510.24	11302.73	---	---	---	11302.73
6	DELHI	---	1542.97	3620.65	---	5163.62	---	1356.43	3533.59	---	4890.02
7	HARYANA	252.55	6742.10	27.45	---	7022.10	250.58	6038.26	27.45	---	6316.29
8	HP	3996.67	---	---	---	3996.67	3977.17	---	---	---	3977.17
9	J&K	864.62	---	17.06	---	881.68	856.07	---	16.89	---	872.96
10	PUNJAB	4390.50	14259.17	---	---	18649.67	4328.31	13022.35	---	---	17350.66
11	RAJASTHAN	655.81	15260.80	361.72	---	16278.33	650.82	13808.13	344.19	---	14803.14
12	UTTRANCHAL	3449.89	---	---	---	3449.89	3437.35	---	---	---	3437.35
12	UP	2071.52	20772.58	---	---	22844.10	2050.75	18175.80	---	---	20226.55
	Region	38592.42	103141.75	18897.69	7324.27	167956.13	38190.89	93320.55	18490.47	6491.03	156492.94

INTER-REGIONAL EXCHANGES

A Import into the region MU

(i) from Western Grid over HVDC back-to-back at Vindhyachal	282.02
(ii) supply from M.P. to Rajasthan on 200 kV Ujjain - Kota	0.00
(iii) supply from M.P. to Rajasthan	0.00
(iv) from Eastern Grid	2334.76
Total Import	2616.78

B Export from the region MU

(i) to Western Grid over HVDC back-to-back at Vindhyachal	721.69
(ii) 220 kV Auraiya - Malanpur (M.P.)	312.31
(iii) to Bihar	194.75
(iv) Rajasthan to MP	168.96
(v) Tanakpur to Mahendragarh (NEPAL)	52.11
Total Export	1449.82

Net Regional energy consumption (including transmission losses) = **157659.90 MU**

7.3 SOURCE WISE CONTRIBUTION TO MONTHLY GENERATION IN 2003-2004

(All Figs. In MU/day, Gross)

Month	Hydro	Thermal		Total	Nuclear	Total	% age Contribution			
		Coal fired	Gas Fired				Hydro	Thermal	Nuclear	Total
APR - 2003	85.78	260.55	48.68	309.24	21.62	416.64	20.59	74.22	5.19	100.00
MAY - 2003	117.93	264.41	52.48	316.89	18.54	453.35	26.01	69.90	4.09	100.00
JUN - 2003	141.88	277.23	52.60	329.83	21.65	493.36	28.76	66.85	4.39	100.00
JUL - 2003	144.42	252.29	47.35	299.64	18.77	462.82	31.20	64.74	4.05	100.00
AUG - 2003	136.90	264.80	51.13	315.93	17.15	469.97	29.13	67.22	3.65	100.00
SEP - 2003	128.16	261.30	52.69	313.99	17.61	459.76	27.88	68.29	3.83	100.00
OCT - 2003	89.33	292.80	52.50	345.31	18.14	452.77	19.73	76.27	4.01	100.00
NOV - 2003	77.45	282.05	51.85	333.90	19.08	430.43	17.99	77.57	4.43	100.00
DEC - 2003	82.76	300.78	51.00	351.78	21.67	456.22	18.14	77.11	4.75	100.00
JAN - 2004	77.32	314.11	52.19	366.30	21.74	465.36	16.62	78.71	4.67	100.00
FEB - 2004	85.77	324.02	54.97	378.99	21.78	486.54	17.63	77.90	4.48	100.00
MAR - 2004	99.49	300.56	54.13	354.69	23.22	477.40	20.84	74.30	4.86	100.00
2003-04	105.73	282.58	51.77	334.35	20.07	460.15	22.98	72.66	4.36	100.00

7.4 MONTHWISE PLANT LOAD FACTORS OF THERMAL /NUCLEAR UNITS DURING 2003-2004

(ALL FIGS. IN %)

S.No.	Power Station	Effective Capacity MW	APR-03	MAY-03	JUN-03	JUL-03	AUG-03	SEP-03	OCT-03	NOV-03	DEC-03	JAN-03	FEB-03	MAR-03	2003-04
A CENTRAL SECTOR (CS)															
1	NTPC														
(a)	Badarpur TPS	705.00	83.92	91.00	91.12	77.73	88.63	82.22	81.44	84.56	94.16	95.62	97.81	84.17	87.67
(b)	Singrauli STPS	2000.00	90.24	91.20	90.49	85.50	74.52	80.29	95.57	95.12	98.16	93.90	83.40	89.66	89.03
(c)	Rihand STPS	1000.00	97.98	96.84	98.48	96.33	98.56	58.39	96.36	51.70	94.75	97.77	99.18	99.33	90.58
(d)	Dadri NCTPS	840.00	69.87	82.50	87.17	79.73	78.58	75.23	88.82	93.33	79.06	91.92	96.28	83.27	83.77
(e)	Unchahar TPS -I	420.00	95.96	95.88	93.32	93.02	77.59	96.40	74.11	62.42	59.04	97.52	98.21	97.58	86.69
(f)	Unchahar TPS -II	420.00	75.67	54.66	91.65	88.91	90.37	65.69	98.48	99.07	98.60	95.91	99.51	99.21	88.14
(g)	Tanda TPS	440.00	65.19	67.75	63.42	77.92	61.10	70.17	85.69	85.48	89.64	75.16	90.40	70.85	75.19
	Total NTPC (Coal)														
	CS (coal)	5825.00	82.69	82.83	87.95	85.59	81.33	75.48	88.64	81.67	87.63	92.54	94.97	89.15	85.87
(h)	Anta GPS	419.33	62.97	85.67	81.16	81.97	60.23	56.86	80.62	77.15	71.69	81.01	80.16	84.48	75.37
(i)	Auraiya GPS	663.36	76.78	81.96	67.06	76.28	73.37	77.25	77.51	63.62	65.59	67.83	78.12	68.74	72.83
(j)	Dadri GPS	829.78	55.65	74.14	77.17	52.36	74.14	74.68	73.88	76.73	72.84	69.59	60.78	70.58	69.41
(k)	Faridabad GPS	431.57	82.88	50.41	83.61	75.24	73.58	76.65	75.90	65.39	63.34	75.19	77.13	85.18	73.65
	Total NTPC (Gas)														
	CS (gas)	2344.04	69.57	73.04	77.25	71.46	70.33	71.36	76.98	70.72	68.37	73.40	74.05	77.24	72.81
	Total NTPC	8169.04	76.13	77.94	82.60	78.53	75.83	73.42	82.81	76.20	78.00	82.97	84.51	83.20	79.34
2	NPC														
(a)	RAPS -A	300.00	55.56	61.53	56.95	58.80	34.55	38.69	43.55	34.53	47.72	40.00	42.93	84.43	50.01
(b)	RAPS -B	440.00	96.74	61.58	85.13	69.51	65.92	63.36	64.25	75.81	84.21	88.19	86.55	84.32	77.05
(c)	NAPS	440.00	70.07	77.84	74.46	68.10	72.92	76.99	77.83	81.29	88.51	90.43	83.28	85.33	78.93
	Total NPC	1180.00	74.13	66.99	72.18	65.47	57.80	59.68	61.87	63.88	73.48	72.87	70.92	84.69	68.66
Total Central Sector (CS)		9349.04	75.13	72.46	77.39	72.00	66.81	66.55	72.34	70.04	75.74	77.92	77.71	83.95	74.00

7.4 MONTHWISE PLANT LOAD FACTORS OF THERMAL /NUCLEAR UNITS DURING 2003-2004

(ALL FIGS. IN %)

S.No.	Power Station	Effective Capacity MW	APR-03	MAY-03	JUN-03	JUL-03	AUG-03	SEP-03	OCT-03	NOV-03	DEC-03	JAN-03	FEB-03	MAR-03	2003-04
B STATE SECTOR															
1	DELHI														
(a)	Indra Prastha	247.50	22.77	24.17	36.04	30.58	28.20	37.23	28.73	26.69	46.68	46.81	52.26	44.85	35.38
(b)	Rajghat	135.00	47.05	45.86	60.74	65.84	70.92	53.44	40.21	43.11	96.48	96.35	77.95	84.12	65.26
	Total DELHI (coal fired)	382.50	34.91	35.01	48.39	48.21	49.56	45.33	34.47	34.90	71.58	71.58	65.11	64.48	50.32
(c)	DVB GT	282.00	40.75	43.74	41.74	42.46	41.42	50.84	57.65	54.58	56.42	55.21	52.98	50.54	49.03
(d)	Pragati (GT)	330.00	83.75	85.01	68.45	59.05	88.39	91.90	60.81	88.20	93.40	90.16	95.17	92.50	83.00
	Total DELHI	994.50	62.25	64.38	55.10	50.76	64.91	71.37	59.23	71.39	74.91	72.69	74.08	71.52	66.01
2	HARYANA														
(a)	Faridabad (New)	165.00	62.46	64.92	68.23	58.30	49.44	48.56	36.65	27.02	37.12	63.55	67.66	73.76	54.77
(b)	Panipat	860.00	49.93	61.04	80.23	65.01	80.01	81.51	90.77	81.35	81.99	91.34	92.89	88.96	78.74
	Total HARYANA	1025.00	56.20	62.98	74.23	61.66	64.73	65.04	63.71	54.19	59.56	77.45	80.28	81.36	66.75
3	J & K														
(a)	Pampore GT	175.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	8.69	3.41	0.00	0.62	0.00	1.11
	Total J & K	175.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	8.69	3.41	0.00	0.62	0.00	1.11
4	PUNJAB														
(a)	GNDTPS (Bhatinda)	440.00	52.56	55.96	74.21	70.71	79.06	77.25	68.01	57.57	57.77	67.65	64.52	66.60	66.00
(b)	GGSTPS (Ropar)	1260.00	59.81	50.61	78.44	73.56	92.58	81.78	70.09	71.50	80.00	80.51	80.20	81.23	75.02
(c)	Lehra Mohabbat TPS	420.00	90.48	73.41	91.00	95.52	99.33	93.60	96.15	98.63	98.17	97.22	68.48	96.24	91.62
	Total PUNJAB	2120.00	67.62	59.99	81.22	79.93	90.32	84.21	78.08	75.90	78.65	81.79	71.07	81.36	77.55
5	RAJASTHAN														
(a)	Kota TPS	1045.00	91.93	89.60	80.65	41.26	59.64	71.50	72.84	80.78	76.75	87.79	121.80	86.39	79.84
(b)	RAMGARH GT	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(c)	RAMGARH GT EXT	35.50	36.40	32.82	34.24	38.51	32.91	33.33	31.32	30.77	34.07	33.01	52.38	41.15	35.84
(d)	Suratgarh TPS	1250.00	72.17	76.16	70.44	51.48	66.64	72.94	85.24	89.91	90.94	95.53	88.81	95.36	79.62
	Total RAJASTHAN	2333.50	50.13	49.65	46.33	32.81	39.80	44.44	47.35	50.37	50.44	54.08	65.75	55.73	48.83

7.4 MONTHWISE PLANT LOAD FACTORS OF THERMAL /NUCLEAR UNITS DURING 2003-2004

(ALL FIGS. IN %)

S.No.	Power Station	Effective Capacity MW	APR-03	MAY-03	JUN-03	JUL-03	AUG-03	SEP-03	OCT-03	NOV-03	DEC-03	JAN-03	FEB-03	MAR-03	2003-04
6	UP														
(a)	Obra	160.00													
(b)	Obra Extn. - I	282.00													
(c)	Obra Extn. - II	1000.00	54.38	51.82	48.29	51.20	47.52	46.30	48.16	54.14	58.07	50.26	50.53	40.35	50.08
(d)	Panki	32.00													
(e)	Panki Extn.	210.00	43.38	35.79	25.32	28.35	54.73	60.62	55.91	62.62	62.50	63.13	55.19	53.85	50.11
(f)	Harduaganj - A	0.00													
(g)	Harduaganj - B	150.00													
(h)	Harduaganj - C	225.00	11.86	12.24	15.57	11.46	18.94	23.83	28.63	28.42	31.54	27.08	28.63	28.04	22.18
(i)	Paricha	220.00	43.62	24.95	26.93	27.35	22.36	23.84	27.57	23.10	33.23	45.97	49.19	58.19	33.82
(j)	Anpara - A	630.00													
(k)	Anpara - B	1000.00	81.91	90.93	85.18	73.54	63.68	71.94	92.89	85.55	86.55	96.57	88.51	86.71	83.66
	Total UP	3909.00	47.03	43.15	40.26	38.38	41.45	45.31	50.63	50.77	54.38	56.60	54.41	53.43	47.97
	State Sector (gas fired)	825.50	32.18	32.31	28.89	28.00	32.54	35.21	30.09	36.45	37.46	35.68	40.23	36.84	33.80
	State Sector (coal fired)	9731.50	61.64	61.15	65.86	53.49	62.06	64.05	64.16	64.41	71.97	78.46	80.24	77.06	67.01
	State Sector (total)	10557.00	46.91	46.73	47.38	40.74	47.30	49.63	47.13	50.43	54.72	57.07	60.24	56.95	50.40
	Region (coal fired)	15556.50	72.17	71.99	76.91	69.54	71.70	69.77	76.40	73.04	79.80	85.50	87.61	83.11	76.44
	Region (gas fired)	3169.54	50.87	52.68	53.07	49.73	51.44	53.29	53.53	53.58	52.91	54.54	57.14	57.04	53.30
	Region (nuclear)	1180.00	74.13	66.99	72.18	65.47	57.80	59.68	61.87	63.88	73.48	72.87	70.92	84.69	68.66
	Region (Coal+Gas+Thermal)	19906.04	65.72	63.89	67.39	61.58	60.31	60.91	63.94	63.50	68.73	70.97	71.89	74.95	66.14

Notes:

The following have been considered while working out Plant Load Factor (PLF):

- (i) The effective capacity in MW not the Installed capacity.
- (ii) Actual generation and not deemed generation.
- (iii) Effective capacity of new generating units has been considered from their respective synchronisation dates.

7.5 GROWTH OF ENERGY GENERATION AND P.L.F. IN NORTHERN REGION DURING PAST DECADE

S. NO.	YEAR	THERMAL (MU)	HYDRO (MU)	GAS / DIESEL (MU)	NUCLEAR (MU)	TOTAL ENERGY GENERATION (MU)	ANNUAL P.L.F. (THERMAL + NUCLEAR)
1	1994-95	62324.00	27672.30	8894.52	1312.40	100203.22	52.49
2	1995-96	71042.68	28952.06	11057.94	2740.40	113793.08	59.49
3	1996-97	73875.52	29363.53	11399.28	2809.70	117448.03	60.43
4	1997-98	76206.33	30760.98	12307.33	3932.40	123207.04	65.24
5	1998-99	78351.64	36830.65	13179.48	4545.56	132907.33	65.26
6	1999-2000	86265.92	31735.87	15513.19	5329.07	138844.06	69.02
7	2000-01	91566.77	29072.65	16979.93	6668.12	144287.47	70.00
8	2001-02	---	3449.89	---	---	3449.89	53.30
9	2002-2003	99307.95	30139.99	16447.73	8571.92	154467.59	69.68
10	2003-04	103141.75	38592.42	18897.69	7324.27	167956.13	66.14
COMPOUND ANNUAL GROWTH RATE (CAGR %)		5.76	3.76	8.73	21.05	5.91	

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN APRIL 2003

DATE : 30.04.2003

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' = P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED							CORRECTION	CORRECTION
											'P+L _s '	'P _f +L _s '
	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	
1	4372	941	11235	2160	18708	-19	18727	50.02	18716	1451	20178	20167
2	4133	941	10895	2170	18139	-21	18160	49.94	18193	1416	19576	19609
3	4072	941	10612	2195	17820	-17	17837	49.86	17912	708	18545	18620
4	4188	941	10905	2200	18234	-21	18255	50.10	18200	718	18973	18918
5	4257	941	10924	2256	18378	-18	18396	50.06	18363	795	19191	19158
6	4556	941	11023	2272	18792	31	18761	50.10	18705	1271	20032	19976
7	4250	941	11035	2269	18495	-18	18513	50.00	18513	1021	19534	19534
8	3929	941	11098	2210	18178	-15	18193	50.08	18149	540	18733	18689
9	4134	941	10934	2202	18211	185	18026	50.14	17951	586	18612	18537
10	4031	941	11227	2195	18394	-17	18411	50.14	18334	647	19058	18981
11	3973	941	11279	2194	18387	85	18302	50.26	18160	1040	19342	19200
12	3846	941	11340	2276	18403	281	18122	49.98	18133	1148	19270	19281
13	3894	941	11339	2282	18456	182	18274	50.22	18154	1295	19569	19449
14	4004	941	11353	2178	18476	81	18395	50.02	18384	1323	19718	19707
15	3912	941	11360	2203	18416	-15	18431	49.98	18442	1582	20013	20024
16	3496	941	11331	2227	17995	-15	18010	50.74	17619	1653	19663	19272
17	3675	941	11138	2267	18021	-17	18038	49.70	18202	1145	19183	19347
18	3538	941	11147	2267	17893	-16	17909	50.38	17707	1048	18957	18755
19	4312	941	11312	2228	18793	-68	18861	50.22	18737	527	19388	19264
20	5379	941	11449	2283	20052	-172	20224	49.58	20482	1223	21447	21705
21	5236	941	11423	2294	19894	-168	20062	49.70	20244	1160	21222	21404
22	5060	941	11333	2297	19631	-69	19700	49.82	19807	936	20636	20743
23	4951	941	11274	2311	19477	-21	19498	50.34	19301	1043	20541	20344
24	4665	941	11363	2301	19270	131	19139	49.34	19526	1110	20249	20636

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN MAY 2003

DATE : 25.05.2003

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' =P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED							CORRECTION	CORRECTION
											'P+L _s '	'P _f +L _s '
(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)	(MW)	
1	5292	570	12042	1921	19825	216	19609	49.50	19908	2093	21702	22001
2	5240	577	12071	1928	19816	227	19589	49.98	19601	2441	22030	22042
3	5150	579	12092	1927	19748	225	19523	49.58	19772	1635	21158	21407
4	5150	580	12105	1981	19816	122	19694	49.66	19897	1095	20789	20992
5	5040	583	12067	2007	19697	127	19570	49.86	19653	2015	21585	21668
6	5041	592	12062	2098	19793	131	19662	50.30	19487	1781	21443	21268
7	4593	580	11792	2053	19018	127	18891	49.94	18925	1146	20037	20071
8	4317	591	11996	2108	19012	113	18899	50.50	18620	915	19814	19535
9	4515	592	11973	2122	19202	-88	19290	50.14	19209	755	20045	19964
10	4576	575	11892	2073	19116	-88	19204	50.18	19101	1215	20419	20316
11	4509	574	11819	2074	18976	-42	19018	50.02	19007	1519	20537	20526
12	4623	577	11789	2065	19054	16	19038	49.74	19188	1912	20950	21100
13	4725	569	11895	2063	19252	-87	19339	49.90	19397	2064	21403	21461
14	4601	566	11677	2058	18902	-94	18996	50.18	18894	1614	20610	20508
15	4636	564	11737	2039	18976	86	18890	49.26	19319	1765	20655	21084
16	4462	558	11351	2070	18441	-83	18524	49.94	18557	1712	20236	20269
17	4399	564	11439	2079	18481	-83	18564	49.26	18985	2182	20746	21167
18	4177	568	11729	2022	18496	-88	18584	50.10	18528	1367	19951	19895
19	4663	567	11746	1969	18945	-89	19034	50.18	18932	531	19565	19463
20	5908	570	11625	2101	20204	-136	20340	49.42	20700	868	21208	21568
21	6155	577	11909	2114	20755	-144	20899	49.66	21114	1349	22248	22463
22	5747	579	11947	2091	20364	-149	20513	49.02	21134	1463	21976	22597
23	5584	578	11710	2088	19960	-27	19987	49.42	20341	1580	21567	21921
24	5349	574	11773	2083	19779	-23	19802	49.06	20377	1741	21543	22118

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN JUNE 2003

DATE : 11.06.2003

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' = P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED							CORRECTION	CORRECTION
											'P+L _s '	'P _f +L _s '
	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)	(MW)
1	6435	987	12498	2488	22408	-127	22535	49.94	22576	736	23271	23312
2	6200	993	12455	2514	22162	-134	22296	50.05	22263	735	23031	22998
3	6195	1001	12429	2422	22047	-133	22180	50.30	21982	729	22909	22711
4	6056	999	12418	2428	21901	-129	22030	50.32	21821	728	22758	22549
5	6136	993	12678	2390	22197	-133	22330	50.20	22197	823	23153	23020
6	6240	1005	12610	2400	22255	-8	22263	50.22	22117	755	23018	22872
7	6087	999	12599	2384	22069	53	22016	50.20	21885	758	22774	22643
8	5483	1019	12964	2280	21746	-49	21795	50.16	21691	1106	22901	22797
9	5558	1015	12860	2302	21735	41	21694	50.30	21500	717	22411	22217
10	5722	995	12959	2384	22060	-149	22209	50.22	22063	1085	23294	23148
11	5952	998	12878	2407	22235	-153	22388	50.30	22188	1280	23668	23468
12	5961	978	12883	2430	22252	-105	22357	49.94	22397	1580	23937	23977
13	6110	982	12848	2436	22376	-104	22480	49.74	22657	2105	24585	24762
14	6056	970	12471	2427	21924	-48	21972	50.20	21841	1924	23896	23765
15	5922	946	12623	2083	21574	-109	21683	50.10	21618	1736	23419	23354
16	5966	983	12561	2115	21625	-65	21690	50.38	21446	2027	23717	23473
17	5877	995	12543	2047	21462	36	21426	50.10	21362	1204	22630	22566
18	5780	1000	12581	2066	21427	36	21391	51.10	20708	569	21960	21277
19	5655	990	12228	2211	21084	-172	21256	50.50	20942	547	21803	21489
20	6842	989	12769	1945	22545	-201	22746	50.46	22436	1602	24348	24038
21	6602	994	12744	2430	22770	-145	22915	50.74	22417	940	23855	23357
22	6310	1004	13094	2428	22836	67	22769	50.54	22406	934	23703	23340
23	6498	1001	12778	2439	22716	-78	22794	50.34	22564	878	23672	23442
24	6534	1017	12682	2461	22694	-88	22782	50.26	22606	747	23529	23353

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN JULY 2003

DATE : 04.07.2003

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' =P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED							CORRECTION 'P+L _s '	CORRECTION 'P _f +L _s '
(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)		
1	6038	586	11831	2139	20594	-291	20885	49.23	21379	2251	23136	23630
2	6020	587	11840	2145	20592	-459	21051	48.89	21776	2154	23205	23930
3	6144	588	11863	2138	20733	-441	21174	48.92	21883	2220	23394	24103
4	6066	594	11953	2138	20751	-576	21327	49.63	21566	1385	22712	22951
5	6224	591	11947	2142	20904	-295	21199	49.04	21828	1608	22807	23436
6	6105	590	11931	2145	20771	-128	20899	49.68	21102	1770	22669	22872
7	5553	700	11877	2068	20198	-125	20323	49.50	20632	1617	21940	22249
8	5452	703	11928	2036	20119	-32	20151	49.65	20365	1358	21509	21723
9	5525	703	11953	2073	20254	-123	20377	49.41	20744	1600	21977	22344
10	5610	697	11917	2064	20288	-122	20410	49.70	20595	1732	22142	22327
11	6183	697	11881	2071	20832	-124	20956	49.40	21340	1884	22840	23224
12	6155	719	11858	2037	20769	-122	20891	49.64	21119	1936	22827	23055
13	6144	759	11919	2010	20832	-273	21105	49.85	21200	2074	23179	23274
14	6161	764	11990	2012	20927	-371	21298	49.51	21616	1716	23014	23332
15	5976	764	12173	1987	20900	-275	21175	49.71	21361	2065	23240	23426
16	5946	782	12059	1956	20743	-274	21017	49.99	21023	1835	22852	22858
17	5924	775	12004	2017	20720	-223	20943	49.61	21191	1682	22625	22873
18	5113	776	11971	1982	19842	-226	20068	50.03	20050	1449	21517	21499
19	5611	786	12088	1996	20481	-51	20532	49.96	20557	1240	21772	21797
20	6966	770	12061	2011	21808	-125	21933	49.97	21953	1464	23397	23417
21	6693	793	12141	2077	21704	-86	21790	50.15	21692	1637	23427	23329
22	6516	784	12191	2072	21563	-86	21649	50.41	21386	1541	23190	22927
23	6278	796	12100	2105	21279	-84	21363	50.39	21116	1105	22468	22221
24	6490	790	12128	2138	21546	-129	21675	49.99	21682	673	22348	22355

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN AUGUST 2003

DATE : 27.08.2003

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' =P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ. CORRECTION 'P+L _s '	WITH FREQ. CORRECTION 'P _f +L _s '
		NUCLEAR	COAL FIRED	GAS FIRED								
(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)	(MW)	
1	6080	640	12009	1826	20555	-669	21224	50.19	21104	1080	22304	22184
2	6071	647	11910	1833	20461	-669	21130	49.99	21136	660	21790	21796
3	6225	650	11918	1829	20622	-523	21145	50.22	21006	490	21635	21496
4	5982	658	11742	1829	20211	-423	20634	50.10	20572	490	21124	21062
5	5976	657	12017	1825	20475	-274	20749	50.01	20743	511	21260	21254
6	5789	660	12044	1826	20319	-274	20593	50.27	20428	1119	21712	21547
7	5076	647	12031	1790	19544	-301	19845	50.11	19780	1472	21317	21252
8	4864	651	11644	1630	18789	-276	19065	50.73	18656	1023	20088	19679
9	4871	661	11680	1732	18944	-176	19120	50.12	19051	1142	20262	20193
10	5000	645	11940	1747	19332	-74	19406	50.19	19296	1431	20837	20727
11	5074	660	11847	1732	19313	-199	19512	50.38	19292	1454	20966	20746
12	5239	639	11903	1799	19580	-273	19853	50.24	19711	1400	21253	21111
13	5201	650	12020	1830	19701	-274	19975	49.83	20077	1846	21821	21923
14	5586	643	12076	1802	20107	-275	20382	50.34	20176	1763	22145	21939
15	5376	646	12072	1751	19845	-274	20119	49.81	20234	1730	21849	21964
16	5250	649	11969	1663	19531	-273	19804	49.62	20032	2002	21806	22034
17	5237	637	11768	1687	19329	-272	19601	50.06	19566	1547	21148	21113
18	4955	667	11885	1699	19206	-275	19481	50.75	19052	1100	20581	20152
19	5926	647	11957	1841	20371	-270	20641	50.59	20282	1398	22039	21680
20	6790	650	11970	1938	21348	-273	21621	49.96	21647	1476	23097	23123
21	6643	666	11577	1994	20880	-272	21152	50.48	20852	2103	23255	22955
22	6393	667	11650	1991	20701	-323	21024	49.97	21043	1636	22660	22679
23	6583	642	11963	2127	21315	-236	21551	49.84	21655	1072	22623	22727
24	6608	658	11592	2128	20986	-469	21455	49.44	21822	1527	22982	23349

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN SEPTEMBER 2003

DATE : 02.09.2003

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' =P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED								
											'P+L _s '	'P _f +L _s '
(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)	(MW)	
1	5792	604	11164	1696	19256	-478	19734	50.03	19716	886	20620	20602
2	5764	744	11109	1665	19282	-480	19762	49.78	19893	785	20547	20678
3	5827	749	11114	1639	19329	-426	19755	49.96	19779	585	20340	20364
4	5742	752	11034	1618	19146	-427	19573	50.24	19433	585	20158	20018
5	5732	755	11321	1621	19429	-383	19812	50.09	19759	665	20477	20424
6	5631	759	11524	1584	19498	-380	19878	50.47	19602	1255	21133	20857
7	5236	750	11366	1595	18947	-328	19275	50.07	19235	1439	20714	20674
8	5020	756	11254	1532	18562	-336	18898	50.44	18652	1006	19904	19658
9	4895	772	10837	1536	18040	-359	18399	50.41	18175	905	19304	19080
10	5018	779	10858	1538	18193	-334	18527	50.06	18494	1544	20071	20038
11	5329	762	10808	1599	18498	-437	18935	49.97	18952	1603	20538	20555
12	5351	765	10968	1643	18727	-388	19115	50.10	19058	1649	20764	20707
13	5452	759	11254	1603	19068	-392	19460	50.75	19032	2244	21704	21276
14	5452	754	11257	1563	19026	-388	19414	50.41	19178	1801	21215	20979
15	5586	758	11406	1611	19361	-383	19744	50.52	19441	1950	21694	21391
16	5482	789	11321	1623	19215	-379	19594	50.47	19322	1810	21404	21132
17	5102	763	11274	1598	18737	-222	18959	50.37	18751	1508	20467	20259
18	5353	763	11321	1611	19048	-230	19278	50.70	18881	1377	20655	20258
19	6040	754	11372	1690	19856	-16	19872	49.74	20028	1315	21187	21343
20	6888	774	11569	1736	20967	-364	21331	50.29	21147	1476	22807	22623
21	6509	775	11527	1703	20514	-216	20730	50.20	20606	1419	22149	22025
22	6610	772	11685	1671	20738	-206	20944	50.42	20683	1084	22028	21767
23	6493	769	11518	1805	20585	-209	20794	49.82	20907	910	21704	21817
24	6417	762	11554	1668	20401	-310	20711	50.41	20459	819	21530	21278

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN OCTOBER 2003

DATE : 24.10.2003

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' =P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED							WITHOUT FREQ.	WITH FREQ.
											CORRECTION	CORRECTION
	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)	(MW)
1	2819	624	12982	1852	18277	-164	18441	50.03	18424	840	19281	19264
2	2449	624	13063	1917	18053	-244	18297	49.95	18324	840	19137	19164
3	2313	631	13022	1903	17869	-192	18061	49.62	18269	740	18801	19009
4	2717	624	12998	1979	18318	-218	18536	50.00	18536	750	19286	19286
5	3904	633	13034	1927	19498	-91	19589	50.19	19478	1090	20679	20568
6	4256	628	12997	2103	19984	114	19870	50.21	19746	1175	21045	20921
7	3047	633	13074	1908	18662	-74	18736	50.21	18619	1379	20115	19998
8	2379	631	13034	2047	18091	-100	18191	49.89	18251	727	18918	18978
9	2244	630	13043	1957	17874	-145	18019	49.87	18090	1160	19179	19250
10	2417	624	12969	2105	18115	-48	18163	49.80	18273	1603	19766	19876
11	2283	802	13088	2186	18359	-45	18404	49.66	18594	1444	19848	20038
12	2256	607	13076	2145	18084	-54	18138	49.06	18664	1599	19737	20263
13	2065	620	13094	2158	17937	-55	17992	49.87	18062	1500	19492	19562
14	2163	625	13137	2025	17950	-100	18050	50.06	18018	1465	19515	19483
15	2003	619	12977	2060	17659	-154	17813	49.60	18029	1450	19263	19479
16	2230	620	12890	2056	17796	-241	18037	49.88	18102	1230	19267	19332
17	2224	624	12983	1980	17811	-287	18098	50.30	17937	1095	19193	19032
18	4397	621	13175	1948	20141	-177	20318	50.16	20221	1478	21796	21699
19	5236	621	13182	2270	21309	-234	21543	49.88	21621	1521	23064	23142
20	5421	623	13130	2308	21482	-231	21713	49.88	21791	1544	23257	23335
21	4850	632	13025	2260	20767	-233	21000	49.87	21082	1600	22600	22682
22	4343	627	12939	2121	20030	-286	20316	50.11	20249	1000	21316	21249
23	3742	792	12950	2182	19666	-336	20002	49.60	20245	607	20609	20852
24	3396	804	12947	1879	19026	-439	19465	49.98	19477	840	20305	20317

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN NOVEMBER 2003

DATE : 12.11.2003

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' =P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED							CORRECTION	CORRECTION
(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)	(MW)	
1	2622	832	11716	1750	16920	-44	16964	50.12	16903	585	17549	17488
2	2552	839	11740	1745	16876	56	16820	50.14	16750	585	17405	17335
3	2397	836	11939	1738	16910	55	16855	50.15	16779	585	17440	17364
4	2807	833	12068	1732	17440	55	17385	50.21	17276	590	17975	17866
5	3962	833	12169	1800	18764	58	18706	49.94	18740	290	18996	19030
6	4442	813	12331	1937	19523	7	19516	49.84	19610	1265	20781	20875
7	3752	820	12222	1871	18665	-246	18911	49.41	19252	1559	20470	20811
8	2583	833	12176	1756	17348	-391	17739	50.29	17586	1412	19151	18998
9	2513	833	12199	1742	17287	-197	17484	49.91	17531	1540	19024	19071
10	2542	835	12201	1758	17336	-194	17530	49.97	17546	1665	19195	19211
11	2838	824	12392	1789	17843	-195	18038	50.09	17989	1170	19208	19159
12	2822	817	12417	1772	17828	-200	18028	50.20	17920	1074	19102	18994
13	2924	817	12308	1740	17789	-208	17997	50.01	17992	1345	19342	19337
14	2893	825	12162	1754	17634	-282	17916	49.75	18051	1422	19338	19473
15	2717	815	12261	1756	17549	-200	17749	49.56	17986	1695	19444	19681
16	2559	819	12408	1765	17551	-193	17744	49.82	17840	1820	19564	19660
17	2381	821	12480	1756	17438	-241	17679	49.70	17840	970	18649	18810
18	4279	807	12597	1837	19520	-220	19740	49.38	20114	1506	21246	21620
19	5294	819	12307	1887	20307	-218	20525	49.37	20920	1733	22258	22653
20	4931	820	12309	1854	19914	-217	20131	49.89	20198	1792	21923	21990
21	4083	824	12185	1841	18933	-227	19160	49.63	19375	1600	20760	20975
22	3598	828	12090	1752	18268	-225	18493	50.15	18410	1350	19843	19760
23	2909	839	12113	1724	17585	-299	17884	50.23	17761	755	18639	18516
24	2669	835	12025	1683	17212	-174	17386	50.24	17262	585	17971	17847

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN DECEMBER 2003

DATE : 26.12.2003

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' = P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED							WITHOUT FREQ.	WITH FREQ.
											CORRECTION	CORRECTION
	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)	(MW)
1	1661	913	12380	1720	16674	-332	17006	50.07	16970	585	17591	17555
2	1761	911	12436	1705	16813	-12	16825	49.92	16865	605	17430	17470
3	1757	921	12403	1666	16747	89	16658	50.02	16648	585	17243	17233
4	1805	906	12502	1666	16879	92	16787	49.43	17079	590	17377	17669
5	2410	902	12619	1723	17654	100	17554	49.48	17832	520	18074	18352
6	3408	910	12668	1895	18881	-89	18970	50.11	18908	1260	20230	20168
7	4301	897	12785	1991	19974	-381	20355	49.85	20447	1637	21992	22084
8	3814	901	12768	1971	19454	-393	19847	49.48	20162	2057	21904	22219
9	3379	884	12846	1974	19083	-484	19567	49.15	20079	2277	21844	22356
10	3195	897	12807	1993	18892	-366	19258	49.83	19357	2375	21633	21732
11	3092	909	12787	1968	18756	-393	19149	49.40	19500	2143	21292	21643
12	3166	889	12803	1885	18743	-372	19115	49.07	19664	1917	21032	21581
13	2886	900	12801	1825	18412	-423	18835	49.96	18858	1920	20755	20778
14	2768	903	12640	1835	18146	-411	18557	49.59	18788	2133	20690	20921
15	2684	898	12646	1826	18054	-300	18354	49.75	18493	2238	20592	20731
16	2680	889	12668	1867	18104	-194	18298	49.51	18571	1718	20016	20289
17	2780	889	12796	1781	18246	-235	18481	49.20	18935	2009	20490	20944
18	4301	898	12967	2117	20283	-271	20554	50.17	20450	1936	22490	22386
19	4897	890	12971	2116	20874	-247	21121	49.50	21443	1912	23033	23355
20	4557	887	12885	2219	20548	-270	20818	49.48	21148	1766	22584	22914
21	3681	889	12736	2245	19551	-321	19872	49.26	20323	1506	21378	21829
22	2861	903	12852	1932	18548	-427	18975	50.20	18862	1912	20887	20774
23	2458	909	12812	1804	17983	-418	18401	49.65	18596	985	19386	19581
24	1998	909	12899	1815	17621	-181	17802	50.15	17722	785	18587	18507

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN JANUARY 2004

DATE : 10.01.2004

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' = P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED							CORRECTION	CORRECTION
											'P+L _s '	'P _f +L _s '
(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)	(MW)	
1	1836	938	13320	1836	17930	-280	18210	49.84	18298	622	18832	18920
2	1790	948	13289	1804	17831	-184	18015	49.99	18020	585	18600	18605
3	1666	943	13273	1778	17660	-183	17843	49.81	17945	585	18428	18530
4	1691	938	13315	1891	17835	-194	18029	49.26	18438	598	18627	19036
5	2182	939	13405	2025	18551	-233	18784	49.66	18978	1051	19835	20029
6	2842	939	13401	2006	19188	-272	19460	49.91	19513	1461	20921	20974
7	3899	946	13548	2040	20433	-695	21128	50.12	21052	1630	22758	22682
8	3879	945	13608	2161	20593	-692	21285	49.87	21368	1506	22791	22874
9	3451	942	13637	2133	20163	-694	20857	49.89	20926	1664	22521	22590
10	3045	943	13599	2221	19808	-626	20434	49.38	20821	1662	22096	22483
11	2757	946	13655	2161	19519	-650	20169	49.72	20340	1615	21784	21955
12	2430	950	13626	2166	19172	-654	19826	49.57	20085	1402	21228	21487
13	2300	938	13647	2139	19024	-528	19552	49.62	19777	1417	20969	21194
14	2246	931	13633	2124	18934	-430	19364	49.96	19387	909	20273	20296
15	2088	932	13662	1989	18671	-430	19101	50.22	18976	1155	20256	20131
16	2127	944	13499	1933	18503	-425	18928	50.19	18821	1210	20138	20031
17	2750	940	13734	1956	19380	-408	19788	49.56	20053	945	20733	20998
18	3811	938	13544	2012	20305	-297	20602	50.15	20510	1487	22089	21997
19	4752	950	13708	2299	21709	-370	22079	49.83	22192	1611	23690	23803
20	4649	945	13645	2288	21527	-269	21796	50.07	21750	1675	23471	23425
21	4079	938	13456	2260	20733	-307	21040	50.12	20965	1325	22365	22290
22	3037	948	13509	2180	19674	-358	20032	50.13	19954	1472	21504	21426
23	2586	944	13424	2056	19010	-411	19421	49.86	19503	1640	21061	21143
24	2022	943	13388	2008	18361	-379	18740	50.07	18701	870	19610	19571

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN FEBRUARY 2004

DATE : 24.02.2004

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' =P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED								
											CORRECTION 'P+L _s '	CORRECTION 'P _f +L _s '
(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)	(MW)	
1	2268	822	13602	1713	18405	248	18157	49.63	18361	740	18897	19101
2	1915	841	13584	1664	18004	150	17854	49.35	18209	665	18519	18874
3	1894	824	13416	1695	17829	199	17630	48.88	18243	590	18220	18833
4	2521	832	13483	1743	18579	144	18435	49.55	18687	530	18965	19217
5	3118	827	13504	1738	19187	301	18886	49.10	19410	592	19478	20002
6	3867	829	13517	2013	20226	144	20082	49.05	20671	805	20887	21476
7	4399	818	13484	1930	20631	2	20629	49.44	20981	1720	22349	22701
8	4408	817	13465	2006	20696	-2	20698	49.31	21136	1594	22292	22730
9	4234	831	13525	2070	20660	13	20647	49.80	20772	1308	21955	22080
10	3682	835	13567	1974	20058	4	20054	49.53	20341	1582	21636	21923
11	3443	830	13557	2049	19879	-36	19915	49.52	20206	1253	21168	21459
12	3247	826	13541	2060	19674	-67	19741	49.82	19848	1142	20883	20990
13	2802	834	13528	2040	19204	-174	19378	49.94	19413	1457	20835	20870
14	2373	820	13611	1988	18792	-147	18939	50.05	18911	1350	20289	20261
15	2251	842	13486	1883	18462	-139	18601	50.11	18540	1195	19796	19735
16	1748	824	13386	1780	17738	-22	17760	50.08	17717	1315	19075	19032
17	1993	815	13454	1786	18048	23	18025	49.81	18128	865	18890	18993
18	2712	823	13395	1752	18682	-27	18709	50.18	18609	1475	20184	20084
19	4970	819	13465	1677	20931	-74	21005	49.63	21241	1456	22461	22697
20	5287	815	13564	2044	21710	-54	21764	49.63	22008	1637	23401	23645
21	4593	829	13629	1882	20933	-34	20967	49.99	20973	1175	22142	22148
22	3666	827	13597	1885	19975	-46	20021	50.15	19931	1245	21266	21176
23	2740	825	13600	1721	18886	-83	18969	49.28	19388	1490	20459	20878
24	2491	817	13578	1702	18588	110	18478	49.48	18771	1350	19828	20121

8.1 HOURLY GENERATION / LOAD FOR THE REGIONAL PEAK DEMAND MET DAY IN MARCH 2004

DATE : 12.03.2004

HOUR	GENERATION					INTER REGIONAL EXCHANGE Export(+)/Import(-) 'I'	TOTAL DEMAND MET 'P' = 'A' - 'I'	FREQ. 'F'	FREQUENCY CORRECTED DEMAND 'P _f ' =P/(1+0.03(F-50))	LOAD SHEDDING 'L _s '	REQUIREMENT	
	HYDRO	THERMAL			TOTAL 'A'						WITHOUT FREQ.	WITH FREQ.
		NUCLEAR	COAL FIRED	GAS FIRED							CORRECTION	CORRECTION
											'P+L _s '	'P _f +L _s '
	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(HZ)	(MW)	(MW)	(MW)	(MW)
1	3173	966	12655	1846	18640	571	18069	49.64	18266	893	18962	19159
2	3045	976	12670	1813	18504	551	17953	49.50	18226	775	18728	19001
3	3160	971	12663	1815	18609	568	18041	49.19	18490	690	18731	19180
4	3644	984	12615	1821	19064	567	18497	49.38	18848	750	19247	19598
5	4442	967	12600	1826	19835	550	19285	49.83	19384	910	20195	20294
6	4967	968	12496	1999	20430	321	20109	49.34	20515	1525	21634	22040
7	5095	976	12631	1965	20667	57	20610	49.12	21169	1581	22191	22750
8	4783	988	12501	1959	20231	5	20226	49.82	20336	1631	21857	21967
9	4041	984	12697	1889	19611	2	19609	49.50	19908	1615	21224	21523
10	3850	984	12375	1822	19031	-27	19058	49.28	19479	1797	20855	21276
11	4206	965	12211	1907	19289	-31	19320	49.85	19407	1161	20481	20568
12	4390	965	12451	1775	19581	-70	19651	49.24	20109	1351	21002	21460
13	3632	958	12456	1801	18847	47	18800	49.73	18954	1813	20613	20767
14	3228	964	12451	1758	18401	-144	18545	49.70	18713	1666	20211	20379
15	3301	958	12234	1738	18231	-146	18377	49.39	18720	1592	19969	20312
16	3271	949	12250	1730	18200	46	18154	48.39	19075	1367	19521	20442
17	2886	962	12392	1743	17983	-43	18026	49.24	18447	1390	19416	19837
18	2985	976	12374	1813	18148	-32	18180	49.46	18479	1468	19648	19947
19	5563	972	12388	1877	20800	72	20728	49.03	21349	1506	22234	22855
20	5971	975	12528	2025	21499	22	21477	48.97	22162	2277	23754	24439
21	5606	975	12548	2032	21161	42	21119	49.12	21692	1529	22648	23221
22	4757	975	12475	2017	20224	76	20148	49.63	20374	1029	21177	21403
23	4243	971	12238	1992	19444	82	19362	49.73	19520	908	20270	20428
24	3377	966	12196	1891	18430	71	18359	49.06	18892	940	19299	19832

8.2 LOAD DURATION CURVE FOR THE YEAR 2003-04

Regional DEMAND IN MW	% OF TIME
ABOVE 23500	0.00
ABOVE 23000	0.03
ABOVE 22500	0.45
ABOVE 22000	1.70
ABOVE 21500	4.78
ABOVE 21000	11.07
ABOVE 20500	19.47
ABOVE 20000	30.08
ABOVE 19500	42.80
ABOVE 19000	56.51
ABOVE 18500	70.07
ABOVE 18000	82.45
ABOVE 17500	90.55
ABOVE 17000	95.34
ABOVE 16500	98.24
ABOVE 16000	99.50
ABOVE 15500	99.83
ABOVE 15000	99.92
ABOVE 14500	99.95
ABOVE 14000	100.00
ABOVE 13500	100.00
ABOVE 13000	100.00

REGIONAL LOAD DURATION CURVE FOR THE YEAR 2003-04 IS ENCLOSED (Graph G6)

9.1 FREQUENCY ANALYSIS FOR 2003-04

Month ----> ITEM	Apr'03	May'03	Jun'03	Jul'03	Aug'03	Sep'03	Oct'03	Nov'03	Dec'03	Jan'04	Feb'04	Mar'04	2003-04
Avg. freq. Hz	50.00	49.96	49.95	50.05	49.89	50.06	49.93	49.67	49.71	49.71	49.48	49.40	49.82
Std Dev Hz	0.40	0.39	0.28	0.42	0.37	0.32	0.27	0.34	0.42	0.45	0.38	0.43	0.38
Maximum Instant Freq. Hz	51.38	51.40	51.32	51.34	51.31	51.17	50.99	50.63	51.28	51.28	50.58	50.58	51.40
Minimum Instant Freq. Hz	48.25	48.19	48.31	48.25	48.31	48.52	48.48	48.53	48.56	48.56	48.52	48.48	48.19
Frequency Variation Index(FVI)	1.87	1.71	1.95	2.04	1.93	1.27	0.88	2.49	2.75	2.84	4.28	5.39	2.45
Above 50.5 %	12.52	10.60	10.06	14.96	6.66	10.17	1.96	0.04	1.74	1.41	0.02	0.02	5.85
50.5 - 49.0 %	85.76	88.50	88.29	83.45	91.35	89.47	97.54	95.44	92.75	91.55	88.51	81.04	89.47
Below 49.0 %	1.72	0.90	1.65	1.59	1.99	0.36	0.50	4.52	5.51	7.04	11.47	18.94	4.67
Below 48.5 %	0.09	0.04	0.02	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

NOTE : Calculation of FVI is done using the following formula -

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

where frequency 'F' is measured at 10 seconds interval.(approximate updation period of telemetered frequency from 220 kV BTPS bus at NRLDC)

9.2 FREQUENCY SPECTRUM OF THE NORTHERN REGION DURING PAST DECADE

SL . NO.	YEAR	% OF TIME FREQUENCY REMAINED				AVERAGE FREQ (Hz) DURING YEAR
		BELOW 48.5 Hz	BELOW 49.0 Hz	BETWEEN 49.0 Hz TO 50.5 Hz	ABOVE 50.5 Hz	
1	1994-95	14.71	32.73	53.01	14.26	49.37
2	1995-96	8.71	22.77	53.82	23.41	49.63
3	1996-97	25.26	44.93	41.17	13.90	49.14
4	1997-98	15.43	28.16	40.74	31.10	49.61
5	1998-99	14.12	27.81	39.70	32.49	49.64
6	1999-2000	24.83	43.91	43.20	12.89	49.27
7	2000-01	15.19	34.13	55.84	10.03	49.38
8	2001-02	1.87	11.17	76.23	12.60	49.38
9	2002-03	0.79	7.08	77.00	15.92	49.90
10	2003-04	0.02	4.67	89.47	5.85	49.82

9.3 MONTHWISE MAXIMUM & MINIMUM VOLTAGE RECORDED AT 400 KV DADRI BUS DURING THE YEAR 2003-04

MONTH	MAXIMUM VOLTAGE		MINIMUM VOLTAGE	
	(KV)	Date	(KV)	Date
APR - 2003	421	06.04.2003	381	30.04.2003
MAY - 2003	426	23.05.2003	378	28.05.2003
JUN - 2003	419	13.06.2003	360	10.06.2003
JUL - 2003	422	11.07.2003	371	03.07.2003
AUG - 2003	419	02.08.2003	377	25.08.2003
SEP - 2003	419	11.09.2003	380	30.09.2003
OCT - 2003	416	01.10.2003	380	14.10.2003
NOV - 2003	419	17.11.2003	384	28.11.2003
DEC - 2003	426	16.12.2003	379	03.12.2003
JAN - 2004	426	15.01.2004	379	03.01.2004
FEB - 2004	420	22.02.2004	384	27.02.2004
MAR - 2004	422	28.03.2004	380	19.03.2004
2003-04	426	15.01.2004	360	10.06.2003

9.4 RESERVOIR DATA FOR 2003-04

Reservoir ----->	Bhakra			Pong		
End of the Month	Reservoir Level (Mtr)	Live Capacity (Mhmt)	Energy Content (MU)	Reservoir Level (Mtr)	Live Capacity (Mhmt)	Energy Content (MU)
APR - 2003	462.75	0.11	370.00	398.45	0.15	205.00
MAY - 2003	470.84	0.19	610.00	394.34	0.11	135.00
JUN - 2003	486.30	0.35	1100.00	393.07	0.09	110.00
JUL - 2003	495.09	0.42	1650.00	401.41	0.19	260.00
AUG - 2003	505.71	0.57	2300.00	412.97	0.40	575.00
SEP - 2003	509.03	0.63	2550.00	416.41	0.48	720.00
OCT - 2003	506.42	0.58	2350.00	413.80	0.49	600.00
NOV - 2003	501.17	0.50	2000.00	410.97	0.36	515.00
DEC - 2003	493.47	0.41	1600.00	408.94	0.32	450.00
JAN - 2004	485.35	0.32	1150.00	406.05	0.22	310.00
FEB - 2004	477.02	0.22	790.00	404.58	0.25	295.00
MAR - 2004	463.86	0.11	400.00	399.60	0.13	170.00
Max. Level	509.18			416.44		
(DATE)	27.09.2003			27.09.2003		
Min. Level	458.73			392.78		
(DATE)	09.04.2003			27.06.2003		
Full Reservoir Level (FRL)	514.50			433.12		
Min. Draw Down Level (MDDL)	445.62			384.05		

9.4 RESERVOIR DATA FOR 2003-04

Resrvoir ----->	Rana Pratap Sagar			Gandhi Sagar		
Month	Reservoir Level (Mtr)	Live Capacity (Mhmt)	Energy Content (MU)	Reservoir Level (Mtr)	Live Capacity (Mhmt)	Energy Content (MU)
APR - 2003	346.42	0.05	85.00	379.18	0.00	0.00
MAY - 2003	345.60	0.03	60.00	378.77	0.00	0.00
JUN - 2003	345.70	0.03	47.00	378.87	0.00	0.00
JUL - 2003	346.22	0.05	90.00	383.41	0.04	100.00
AUG - 2003	346.94	0.06	100.00	384.90	0.08	200.00
SEP - 2003	347.61	0.06	120.00	388.28	0.17	450.00
OCT - 2003	348.46	0.08	145.00	387.79	0.12	370.00
NOV - 2003	348.58	0.05	150.00	384.69	0.06	170.00
DEC - 2003	346.41	0.05	85.00	383.44	0.05	100.00
JAN - 2004	344.65	0.02	34.00	382.55	0.03	70.00
FEB - 2004	344.74	0.02	37.00	381.27	0.00	10.00
MAR - 2004	345.11	0.02	48.00	379.59	0.00	10.00
Max. Level	348.58			388.28		
(DATE)	30.11.2003			30.09.2003		
Min. Level	344.58			378.77		
(DATE)	01.02.2004			31.05.2003		
Full Reservoir Level (FRL)	352.65			402.64		
Min. Draw Down Level (MDDL)	342.90			381.00		

9.4 RESERVOIR DATA FOR 2003-04

Reservoir ----->	Rihand		
Month	Reservoir Level (Mtr)	Live Capacity (Mhmt)	Energy Content (MU)
APR - 2003	256.95	0.10	175.00
MAY - 2003	255.48	0.07	225.00
JUN - 2003	253.69	0.01	0.00
JUL - 2003	254.33	0.04	65.00
AUG - 2003	259.20	0.18	325.00
SEP - 2003	265.60	0.44	850.00
OCT - 2003	265.42	0.42	825.00
NOV - 2003	264.26	0.39	770.00
DEC - 2003	262.77	0.30	595.00
JAN - 2004	260.91	0.25	480.00
FEB - 2004	259.08	0.19	320.00
MAR - 2004	257.01	0.12	175.00
Max. Level (DATE)	265.60 30.09.2003		
Min. Level (DATE)	253.20 23.06.2003		
Full Reservoir Level (FRL)	268.22		
Min. Draw Down Level (MDDL)	252.98		

Notes :

Energy content of Bhakra : Total energy content at Bhakra, Ganguwal and Kotla Power Stations.

Energy content of Rihand : Total energy content at Rihand and Obra Power Stations.

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

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

**10.1 SETTING OF FLAT UNDERFREQUENCY AND df/dt RELAYS
IN NORTHERN REGION AS APPROVED BY NREB
(AS ON 31.03.2004)**

CONSTITUENTS	Flat Under Frequency					df/dt relay setting						
	at 48.5 Hz	at 48.3 Hz	at 47.8 Hz	at 47.7 Hz	TOTAL	To be initialised at 50.0 Hz		To be initialised at 49.0 Hz		To be initialised at 48.5 Hz		TOTAL
	MW	MW	MW	MW	MW	Setting Hz/sec	Load relief MW	Setting Hz/sec	Load relief MW	Setting Hz/sec	Load relief MW	MW
Chandigarh	5	5	---	---	10	---	---	---	---	---	---	---
Delhi	75	115	100-200	100-200	190	---	---	0.22	581	0.20	166	747
Haryana	70	105	100-200	100-200	175	---	---	0.22	519	0.20	148	667
H.P.	15	25	50-100	---	40	---	---	---	---	---	---	---
J & K	25	35	50-150	---	60	---	---	---	---	---	---	---
Punjab	110	165	200-300	100-150	275	---	---	0.20	656	0.20	328	984
Rajasthan	105	160	200-250	150-200	265	---	---	0.22	655	0.20	327	982
U.P.	195	290	200-300	200-250	485	0.30	1586	---	---	---	---	1586
TOTAL	600	900	900-1500	650-1000	1500		1586		2411		969	4966

FLAT UF RELAYS

- * STAGE - 1 = 600 MW AT 48.5 HZ
- * STAGE - 2 = 900 MW AT 48.3 HZ
- * STAGE - 3 = 900-1500 MW AT 47.8 HZ
- * STAGE - 4 = 650-1000 MW AT 47.7 HZ

DF/DT RELAYS

- * INITIALISED AT 50 HZ =1586 MW
- * INITIALISED AT 49 HZ = 2411 MW
- * INITIALISED AT 48.5 HZ = 969 MW

10.2 SHUNT CAPACITORS INSTALLATION IN NORTHERN REGION DURING 2003-04

CONSTITUENT	INSTALLED		INSTALLED AS ON 31.03.2003	REQUIREMENT AT THE END OF 2003-04	ADDITIONAL REQUIREMENT FOR 2003-04	BALANCE NOT INSTALLED DURING 2003-04
	AS ON 31.03.2004	DURING 2003-04				
Chandigarh	92	0	92	150	58	74
Delhi	3021	266	2755	3364	609	343
Haryana	3269	584	2685	3435	750	166
H.P.	311	33	278	347	69	36
J & K	147	0	147	892	745	745
Punjab	4721	15	4706	4874	168	153
Rajasthan	2949	251	2698	2863	165	0
U.P.	5192	227	4965	5495	530	303
Uttaranchal.	125	2	123	344	221	219
BBMB	381	0	381	381	0	31
TOTAL	20208	1378	18830	22145	3315	2070

SOURCE : Minutes of the 351st OCC meeting of the NREB.

10.3 STATUS OF IMPORTANT TRANSMISSION LINES UNDER CONSTRUCTION

S. NO.	NAME OF LINE/ICT	NO. OF CKTS.	Revised TARGET DATE	LENGTH IN Kms.	TOTAL LOCATIONS	STUBS COMPLETED	ERECTION OF TOWERS COMPLETED	STRINGING COMPLETED IN Ckt. Kms.	REMARKS
800 /400 KV LINES									
POWERGRID									
1	Tehri - Meerut - I(800 KV)	S/C	Sep 2004	186	466	462	458	181	ROW Prolem
2	Tehri - Meerut - II(800 KV)	S/C	Sep 2004	184	466	454	437	146	ROW Prolem
3	Agra(PGCIL)-Agra(UPPCL)	D/C	Aug-2002	60	89	88	88	60	Completed in 06/03
4	LILO of Chamera-Kishanpur at Chamera-II	S/C	May-2003	70	79	79	79	70	Completed in 06/03
5	Kishanpur-Wagoora	D/C	Dec-2004	368	520	246	145	8	Work in progress
6	Rihand-Allahabad	D/C	Dec-2005	596	809	281	201	158	Work in progress
7	Allahabad-Kanpur	D/C	Dec-2005	404	549	231	151	112	Work in progress
8	Kanpur-Mainpuri	D/C	Dec-2005	404	549	235	101	68	Work in progress
9	Mainpuri-Ballabgarh	D/C	Dec-2005	460	620	134	89	0	Work in progress
10	Malerkotla-Patiala	S/C	Dec-2005	62	169	115	38	0	Work in progress
11	Dadri-Panipat-II	S/C	Dec-2005	111	304	70	23	0	Work in progress
12	Merrut-Muzaffarnagar	S/C	Dec-2004	36	99	6	0	0	Foundation work in progress
13	Dauliganga-Bareilly	D/C	Jan-2005	467	604	395	266	164	Court case
14	LILO of Nalagarh-Hissar at Kaithal	D/C	Dec-2005	22	34	0	0	0	Engg in progress
15	LILO of Nalagarh-Hissar at Patiala	D/C	Dec-2005	64	84	0	0	0	
16	Jalandhar-Amritsar	S/C	Jun-2006	65	0	0	0	0	
17	LILO of Bawana-Bhiwani at B'garh	D/C	Jun-2006	18	0	0	0	0	
UPPCL									
1	LILO of Rishikesh-Muradnagar at Mzfrngr	D/C	Sep-2005	40	55	48	0	0	
2	Visnuprayag-Muzaffarnagar	D/C	Jul-2006	520	0	0	0	0	
DTL									
1	Ballabgarh-Bamnauli	D/C	Aug'-2004	104	149	149	147		Ckt.-I completed Ckt.-II under progress
HPSEB									
1	Nalagarh-Kunihar	S/C	Mar-06	33	97	0	0	0	

10.3 STATUS OF IMPORTANT TRANSMISSION LINES UNDER CONSTRUCTION

S. NO.	NAME OF LINE/ICT	NO. OF CKTS.	Revised TARGET DATE	LENGTH IN Kms.	TOTAL LOCATIONS	STUBS COMPLETED	ERECTION OF TOWERS COMPLETED	STRINGING COMPLETED IN Ckt. Kms.	REMARKS
RRVPNL									
1	Heerapura-Roopnagar	S/C	Dec-20003	86	232	212	169	39	
2	Roopnagar-Merta	S/C	Dec-20003	82	218	218	190	56	
3	Merta-mandore (Jodhpur)	S/C	Dec-20003	116	281	278	238	71	
220 KV LINES									
POWERGRID									
1	LILO of Panki-Naubasta at kanpur	D/C	July-2003	30	78	78	77	18	Work completed in Sep-2003.
2	Allahabad-Phulpur	S/C	Jun-2004	39	143	143	143	39	Line completed
3	Meerut(PGCIL)-Shatabadinagar	S/C	May-2004	8	32	29	29	7	Work in progress
DTL									
1	Ghazipur -NOIDA	D/C	April -2005	16	48	38	28	0	48% Work held up due to malba
2	Bawana -Rohini	D/C	April 2005	21	55	41	28	5	Tender awarded for bal. Work
3	LILO of Mandola -Patparganj at S.O.W.	D/C	Sep-04	3	6	2	1	0	8% order for balance work place
	LILO of Bawana-Najafgarh at Kanjawala	D/C	Sep-04	12	33	33	30	10	Work in progress

10.3 STATUS OF IMPORTANT TRANSMISSION LINES UNDER CONSTRUCTION

S. NO.	NAME OF LINE/ICT	NO. OF CKTS.	Revised TARGET DATE	LENGTH IN Kms.	TOTAL LOCATIONS	STUBS COMPLETED	ERECTION OF TOWERS COMPLETED	STRINGING COMPLETED IN Ckt. Kms.	REMARKS
PSEB									
1	Jalandhar(PGCIL) -Nakodar	S/C on D/C	May-2003	36	115	115	115	36	Completed in 4/03
2	GHTP - Bajakhana (2nd ckt strg.)		Mar-05	29	84	84	84	13	
3	Muktsar -GNDTP	S/C on D/C	June-05	56	152	32	0	0	Surway work completed
4	Muktsar -Abohor	S/C on D/C	Mar-06	50	-	0	0	0	
5	Civil Lines - Khassa (2nd ckt strng.)	D/C	May-2003	24	0	0	0	14	
6	LILO of Moga -Muktsar at Bajakhana	D/C	Sep- 2003	48	71	71	68	17	Work to be started.
7	Sarna -Kotli Suratmalli	S/C on D/C	March-2006	62	185	70	0	0	
8	LILO of Patiala-Patran at Raja	D/C	Jun-2004	10	-	0	0	1	
9	LILO of GGSSTP-sahnewal at Kohara	D/C	Jun-2003	6	12	12	11	2	Route plan uder appr.
10	Nalagarh-Mohali	S/C on D/C	Dec-2005	55	-	0	0	0	
11	Patran-Sunam	S/C on D/C	June 05	34	108	97	42	0	
RAJASTHAN									
1	Bassi-Kukas	D/C	Sep -2004	68	120	114	112	50	Completed in 5/03
2	Ramgarh-Phalodi	S/C	Sep -2004	209	640	548	330	60	
3	STPS-Bikaner								
	A) Bikaner end	S/C on D/C	Dec-2004	102	321	321	315	85	
	B) Suratgarh end	S/C on D/C	Dec-2004	59	197	192	0	0	
4	Ratangarh-Khetri	D/C	Dec-2004	240				0	
5	Ratangarh-Sujangarh	S/C	Jun-2005	50				0	
6	LILO of Jodhpur-Bhilwara at Pali	D/C	Jun-2003	19	30	30	30	19	
7	Phlodi-Tinwari	S/C	Mar-2006	75	0	0	0	0	
8	Amarsagar-Barmer	D/C	Mar-2006	340	0	0	0	0	
9	Balotra-Balmer	S/C	Mar-2006	85	0	0	0	0	
10	Phulera-Makrana	S/C	Mar-2006	65	0	0	0	0	

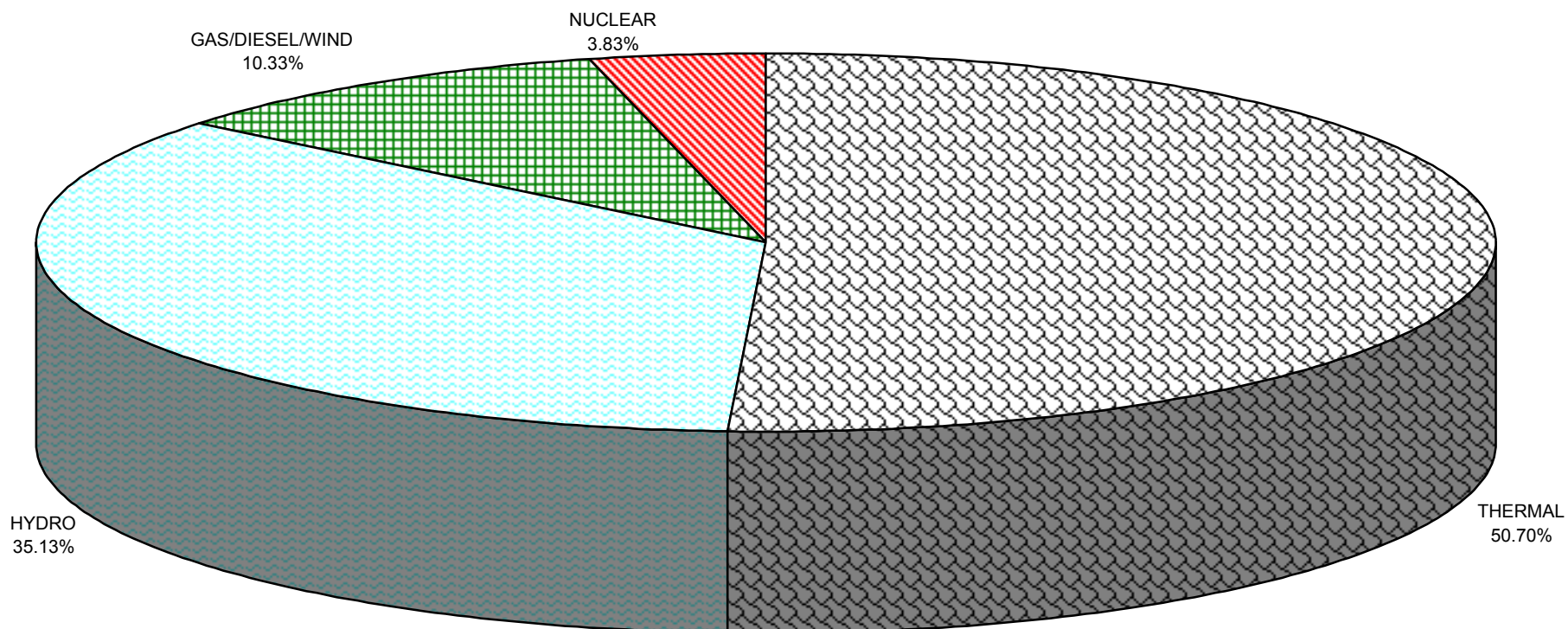
10.3 STATUS OF IMPORTANT TRANSMISSION LINES UNDER CONSTRUCTION

S. NO.	NAME OF LINE/ICT	NO. OF CKTS.	Revised TARGET DATE	LENGTH IN Kms.	TOTAL LOCATIONS	STUBS COMPLETED	ERECTION OF TOWERS COMPLETED	STRINGING COMPLETED IN Ckt. Kms.	REMARKS
UPPCL									
1	Bareilly -Shahjahanpur	S/C	Sep-2004	91	257	257	257	35	
2	Shahajanpur-Hardoi	D/C	Jun -2005	140	208	180	0	0	
3	Gorakhpur-Deoria	S/C	Sep-2004	35	101	101	99	0	
4	Greater Noida-Noida	D/C	Jun -2005	40	0	0	0	0	
UPCL									
1	Kasipur-Haldwani	S/C on D/C	Dec-2005	70	0	0	0	0	
2	Rishikesh-Manerbal-III	S/C	Dec-2005	85	221	0	0	0	
HARYANA									
1	Palli - Badshahpur	D/C	July -2004	45	86	83	50	0	
2	Badshahpur -Manesar	S/C on D/C	Apr -2005	12	50	46	44	3	Court case on loc 46 & 47.
3	Hissar(PGCIL)-Fatehabad	D/C	Dec-2003	130	205	200	172	36	
4	Dadri(BBMB)-Mohindergarh	S/C on D/C	Sep -2003	41	154	154	154	41	
5	Abdullapur-Tepla	D/C	Dec-2003	61	99	99	73	0	completed in 4/03
6	Fatehabad-Rania	S/C on D/C	Dec-2003	61	187	187	186	56	completed in 4/04
7	Kaithal-Cheeka	S/C on D/C	Dec-2003	40	114	113	113	23	
8	Badshahpur-Rewari(2nd ckt strg.)	S/C	Jun -2004	50	-	0	0	0	
9	PTPP-Rohtak(2nd ckt strg.)	S/C	Mar -2005	63	-	0	0	61	
10	PTPP-Sonepat(2nd ckt strg.)	S/C	Mar -2005	51	-	0	0	43	

10.4 STATUS OF NEW GENERATING UNITS UNDER CONSTRUCTION /COMISSIONED DURING 2003-04

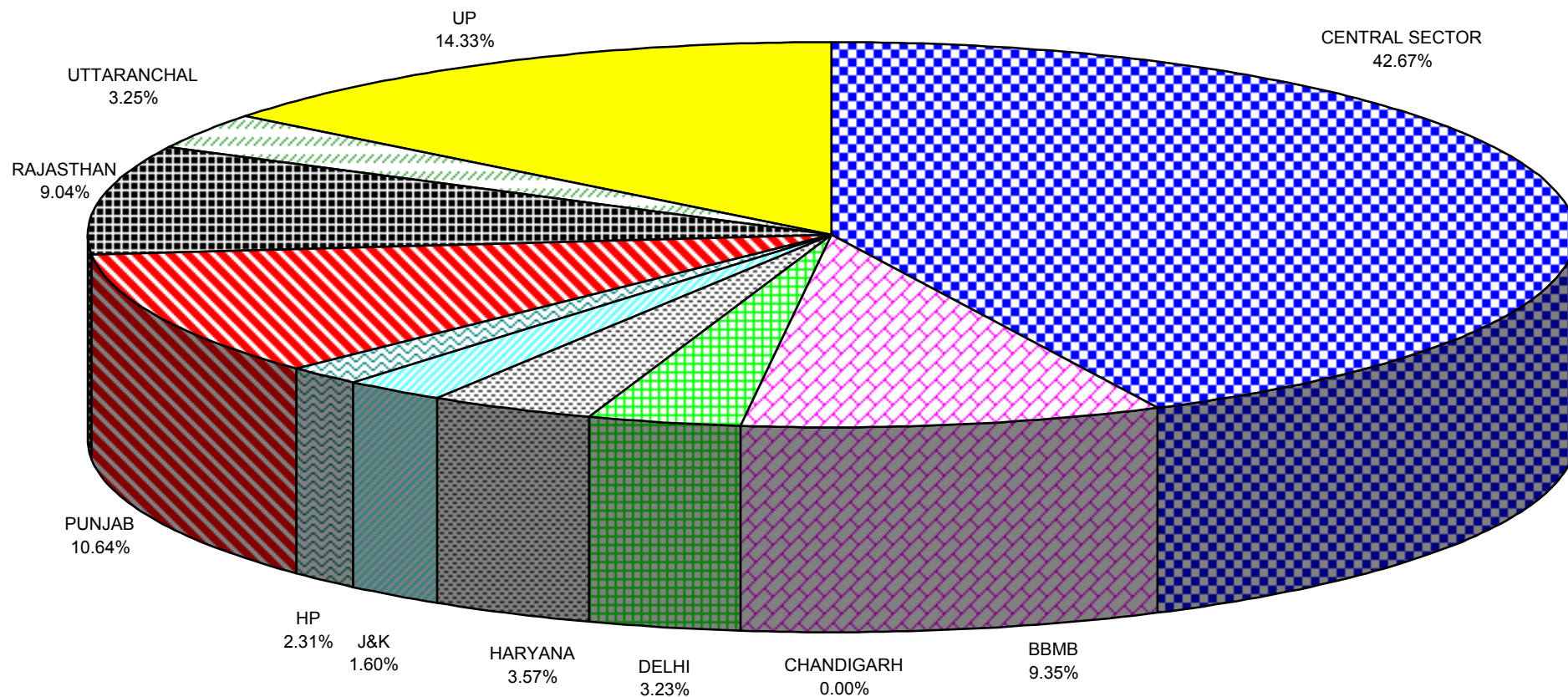
SL. NO.	NAME OF SCHEME	NAME OF UNIT	CAPACITY (MW)	COMMISSIONING SCHEDULE	
				ORIGINAL	REVISED
1.	<u>NHPC</u>				
	(i) DULHASTI HPS	1	130	94-95	2004-05
		2	130	94-95	2004-05
		3	130	94-95	2004-05
	(ii) CHAMERA STAGE -II HPS	1	100	----	06.10.2003 (commissioned)
		2	100	----	05.12.2003 (commissioned)
		3	100	----	31.03.2004 (commissioned)
	(iii) DHAULIGANGA HPS	1	70	----	2004-05
		2	70	----	2004-05
		3	70	----	2004-05
		4	70	----	2004-05
2.	<u>SJVPNL</u>				
	(i) SJVPNL HPS	1	250	95-97	31.03.2004 (commissioned)
		2	250	95-97	09.03.2004 (commissioned)
		3	250	95-97	13.03.2004 (commissioned)
		4	250	95-97	22.03.2004 (commissioned)
		5	250	95-97	20.09.2003 (commissioned)
		6	250	95-97	23.11.2004 (commissioned)
3.	<u>THDC</u>				
	(i) TEHRI STAGE -I HPS	1	250	81-82	2003-2004
		2	250	81-82	2003-2004
		3	250	81-82	2004-2005
		4	250	81-82	2004-2005
4.	<u>HPSEB</u>				
	(i) BASPA - II HPS (P)	1	100	2001-2002	12.05.2003 (commissioned)
		2	100	2001-2002	14.05.2003 (commissioned)
		3	100	2001-2002	27.05.2003 (commissioned)
5.	<u>RRVPNL</u>				
	(I) SURATGARH	5	250	----	30.06.2003 (commissioned)
	(II) KOTA	6	195	----	30.07.2003 (commissioned)

BREAK UP OF EFFECTIVE GENERATING CAPACITY (SOURCE WISE)
AS ON 31st MARCH 2004



<u>GENERATION SOURCE</u>	<u>EFFECTIVE CAPACITY (MW)</u>
THERMAL	15605.00
HYDRO	10812.24
GAS/DIESEL/WIND	3178.83
NUCLEAR	1180.00
TOTAL REGION	30776.07

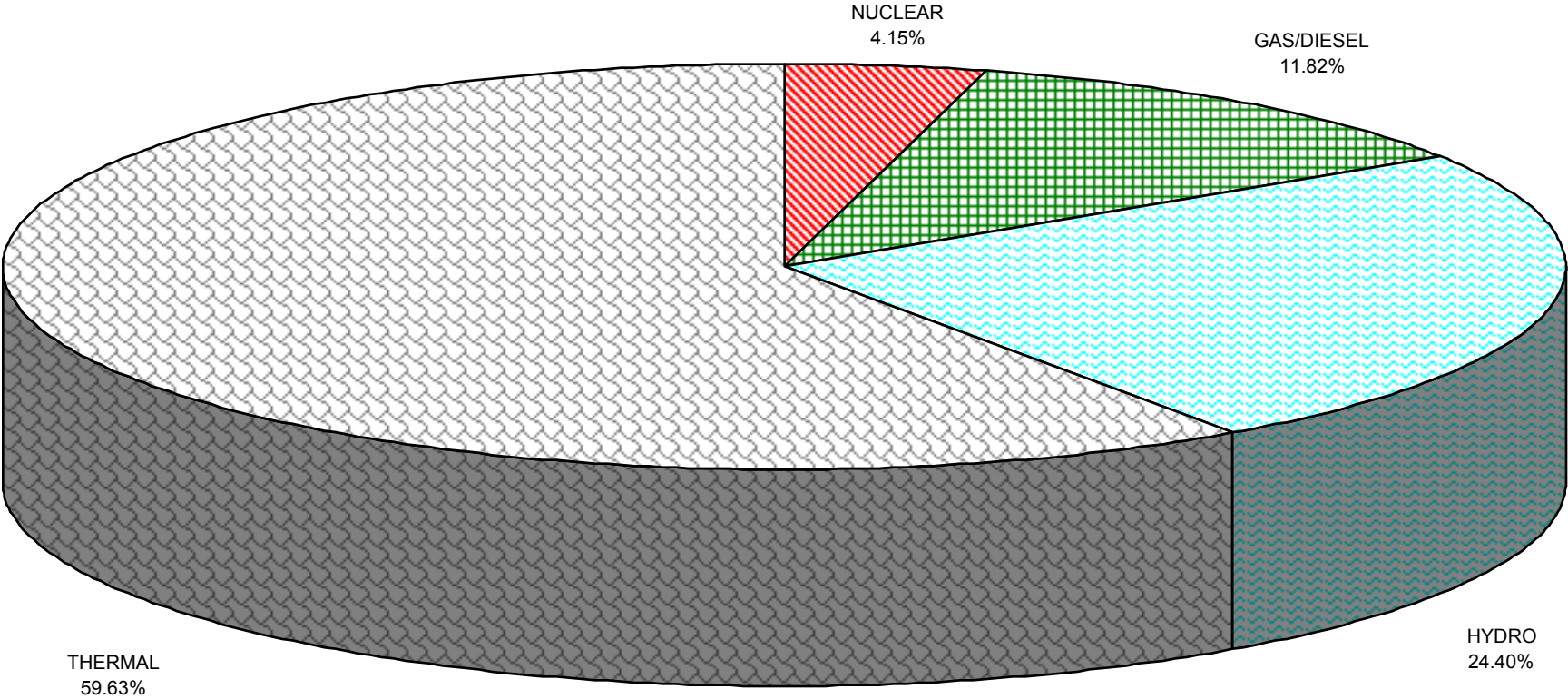
**BREAKUP OF EFFECTIVE GENERATING CAPACITY (CONSTITUENT WISE)
AS ON 31st MARCH 2004.**



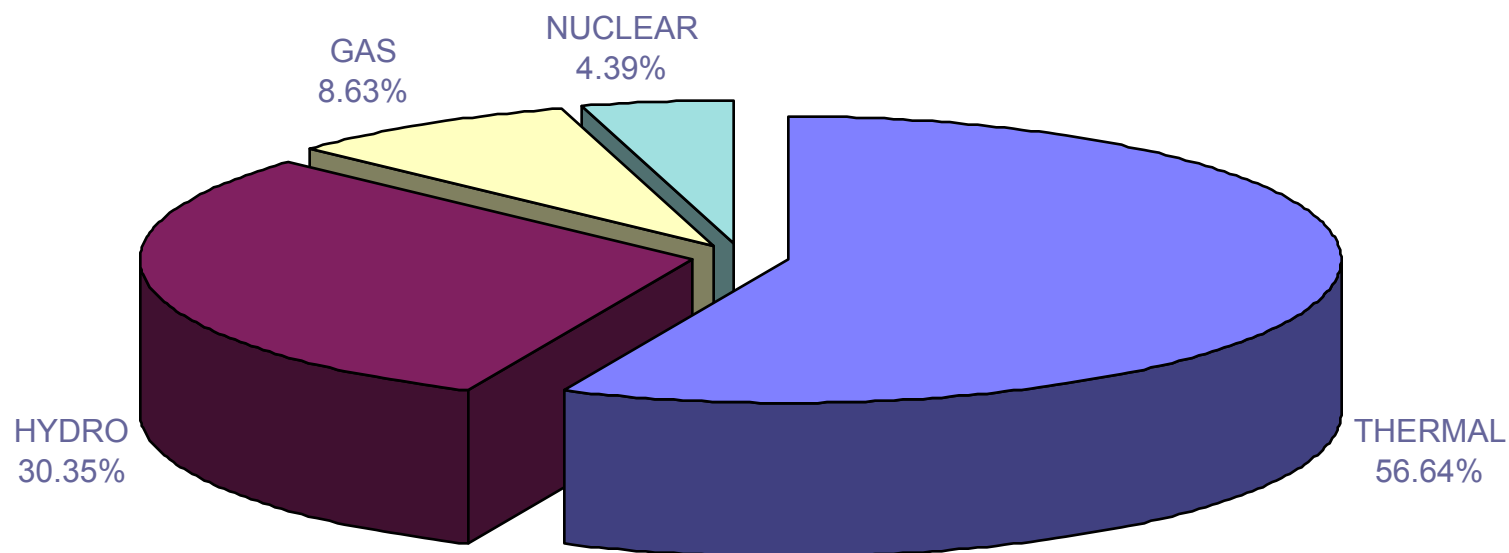
Control Area	CENTRAL SECTOR	BBMB	CHANDIGARH	DELHI	HARYANA	HP	J&K	PUNJAB	RAJASTHAN	UTTARANCHAL	UP	Total
Capacity	13133.24	2876.15	1.40	994.50	1098.20	712.20	493.87	3275.10	2782.36	999.05	4410.00	30776.07

GRAPH -G3

SOURCE WISE CONTRIBUTION TO NET REGIONAL ENERGY DURING 2003-04

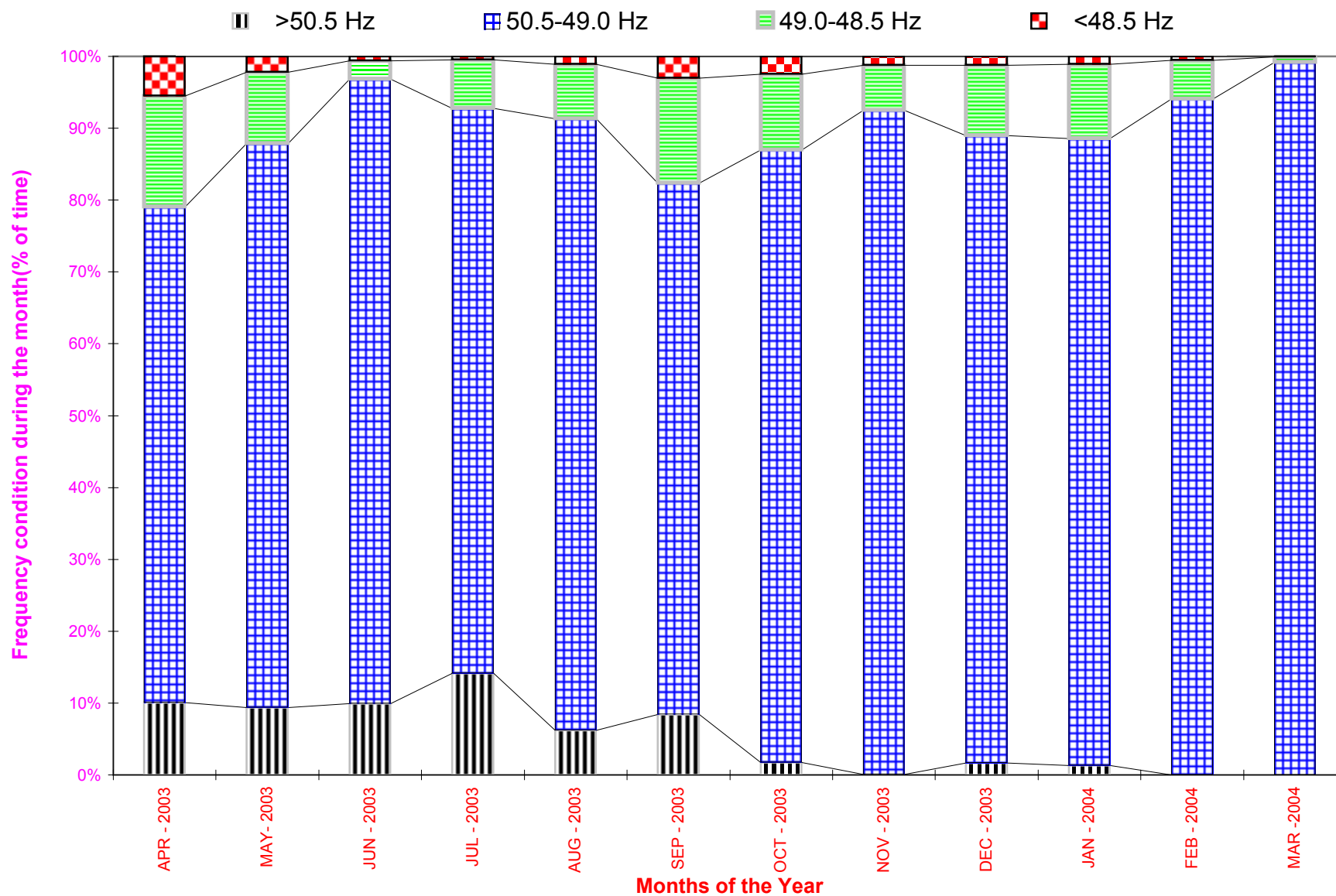


SOURCE	NUCLEAR	GAS/DIESEL	HYDRO	THERMAL	TOTAL REGIONAL
NET ENERGY (MU)	6491.03	18490.47	38190.89	93320.55	156492.94

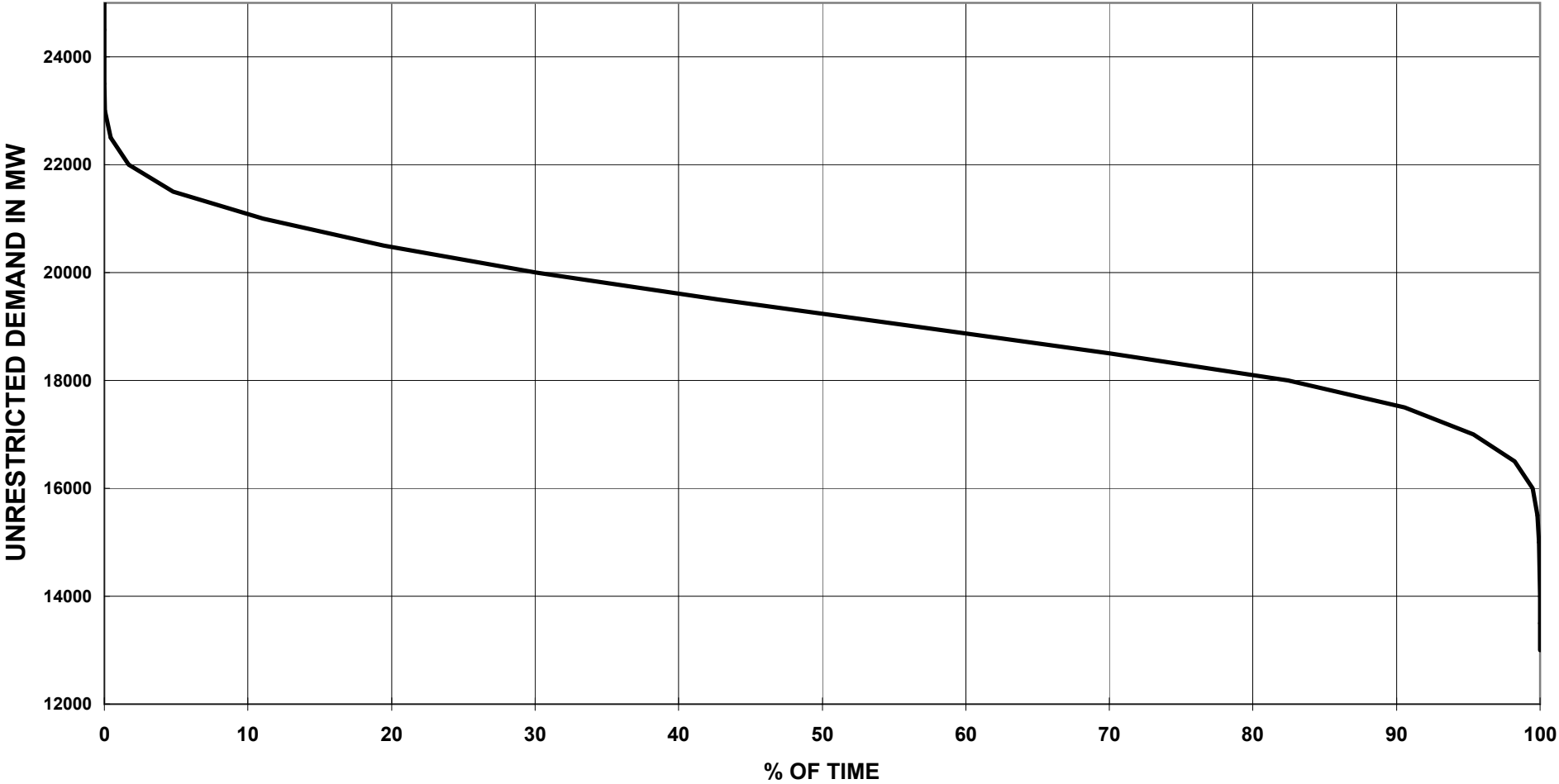
SOURCE WISE CONTRIBUTION (MW) TO REGION'S PEAK MET DURING 2003-04**SOURCE WISE CONTRIBUTION (MW) TO REGION'S PEAK MET DURING 2003-04**

SOURCE	CONTRIBUTION (MW)
THERMAL	12769
HYDRO	6842
GAS	1945
NUCLEAR	989
TOTAL GENERATION	22545
LESS EXPORT	0
ADD IMPORT	201
REGIONAL PEAK	22746

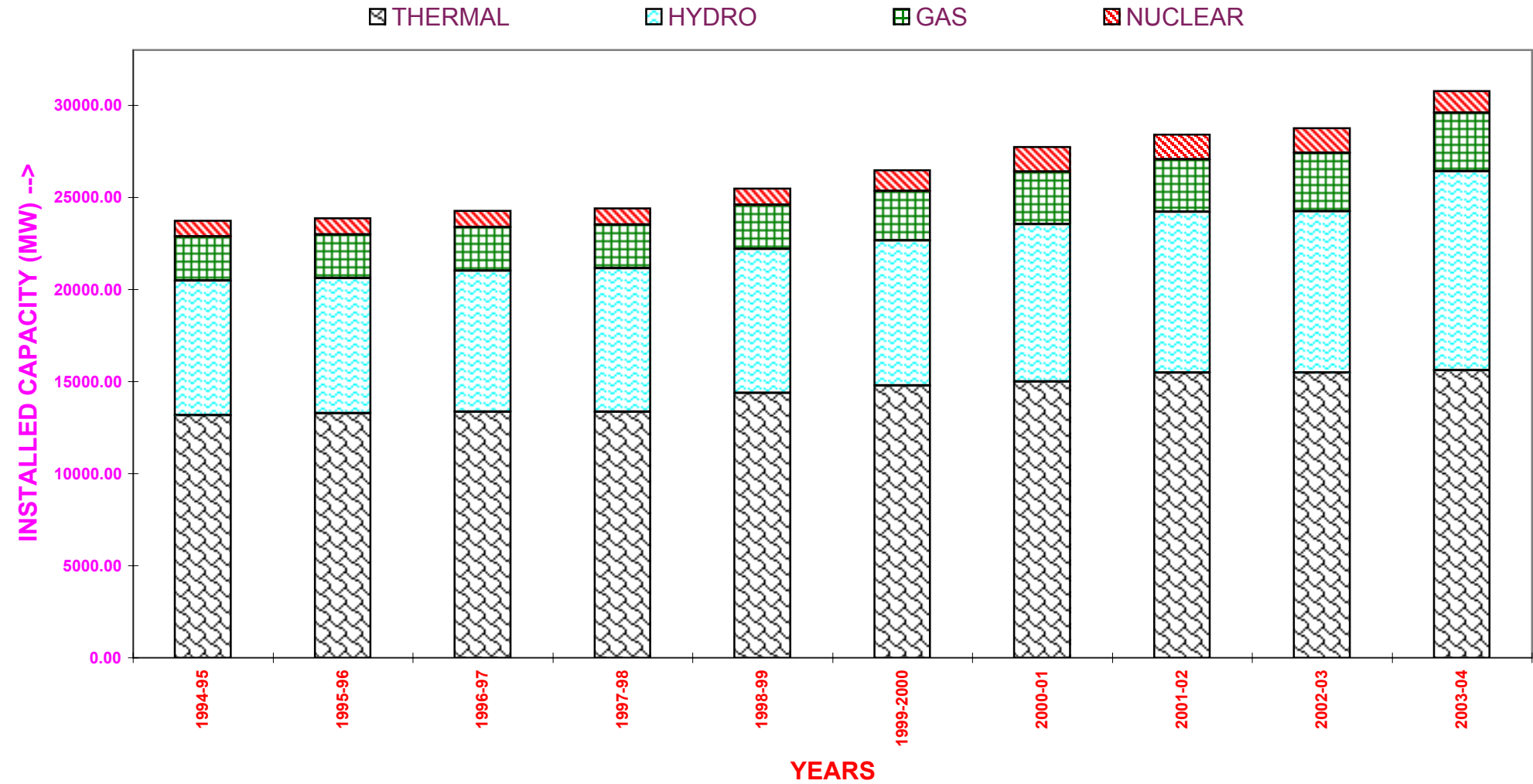
FREQUENCY SPECTRUM OF NORTHERN REGION DURING 2003-04



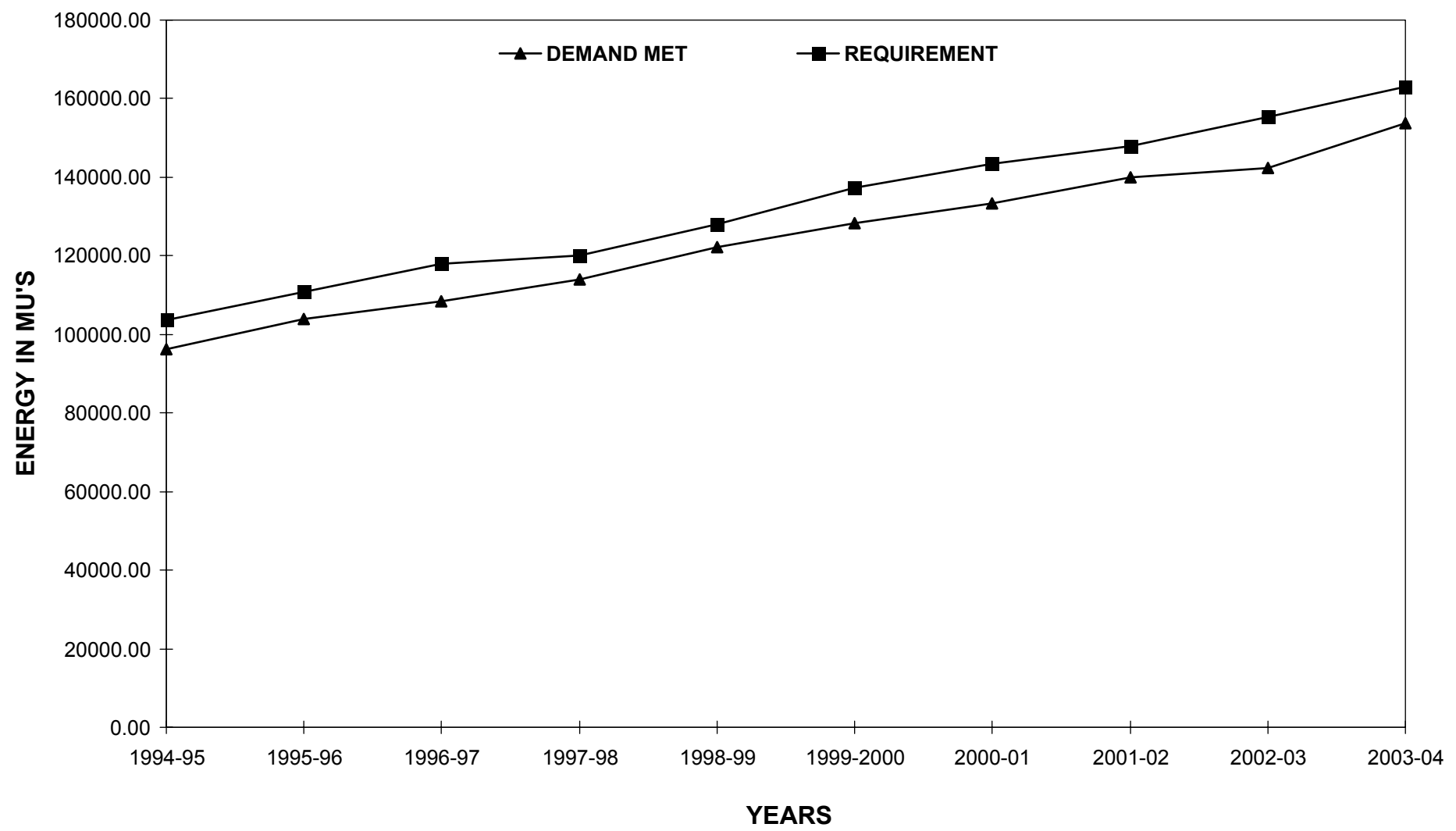
LOAD DURATION CURVE OF THE NORTHERN REGION DURING 2003-04



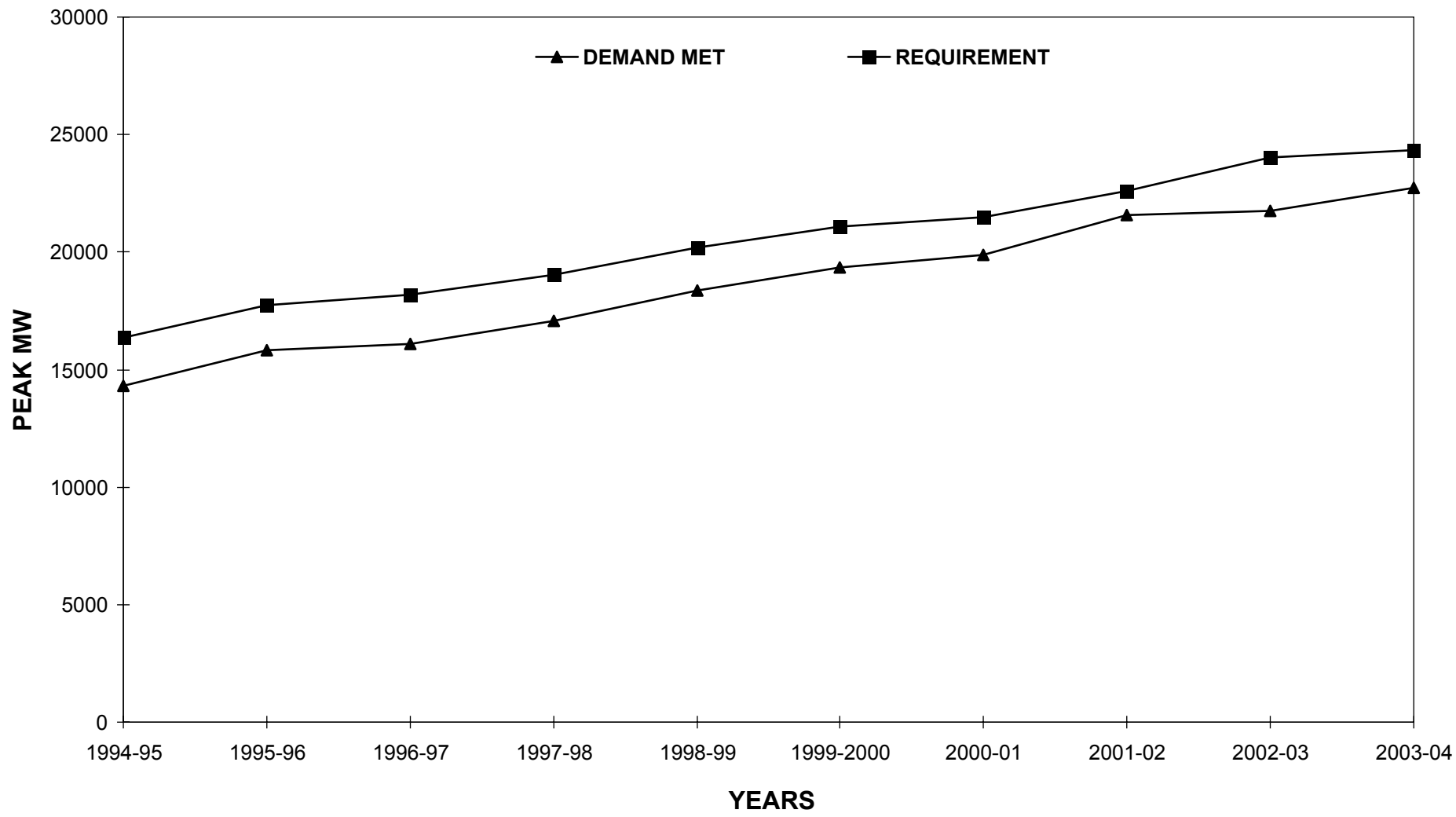
GROWTH OF INSTALLED GENERATING CAPACITY IN NORTHERN REGION



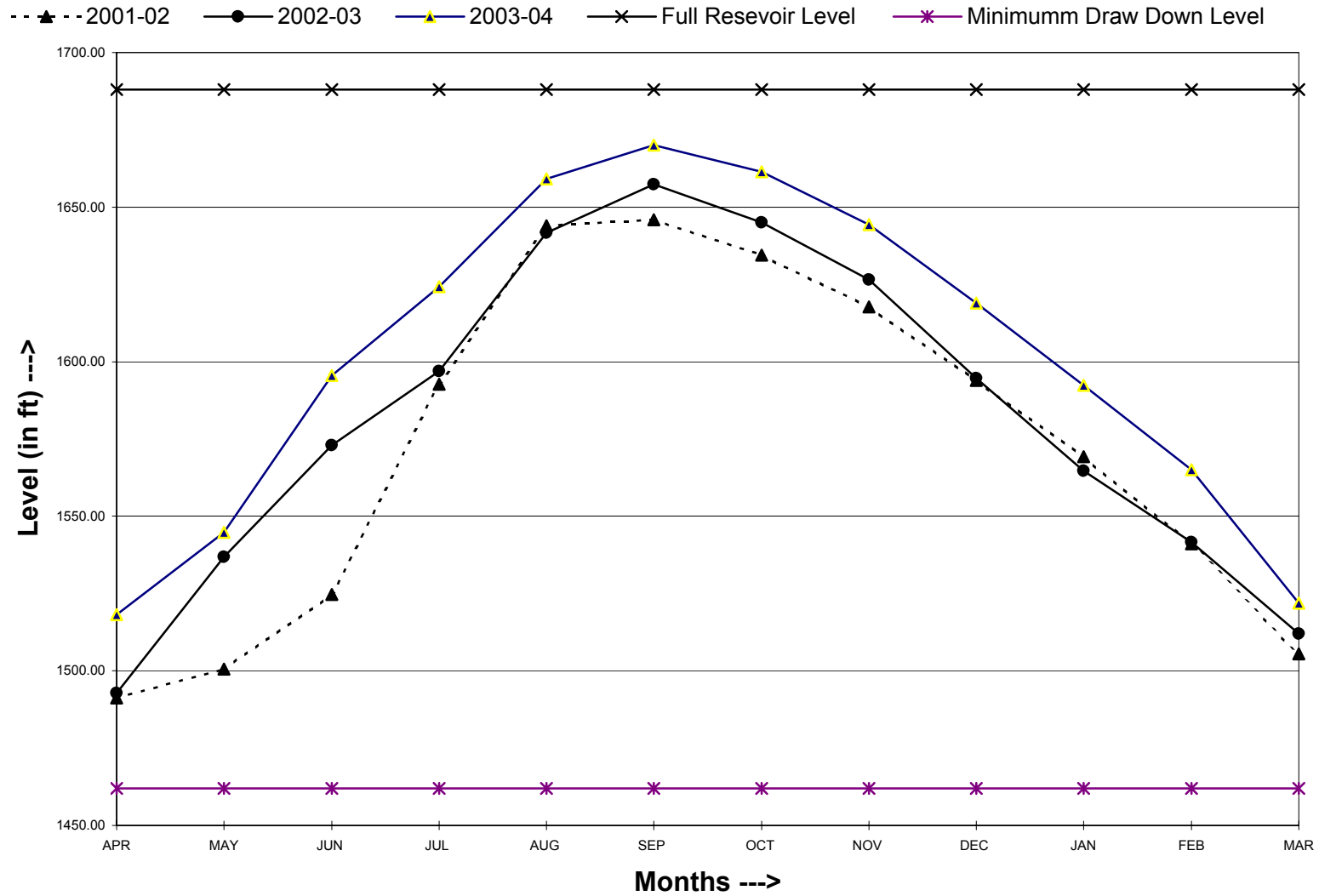
DEMAND MET VS REQUIREMENT IN ENERGY DURING PAST DECADE



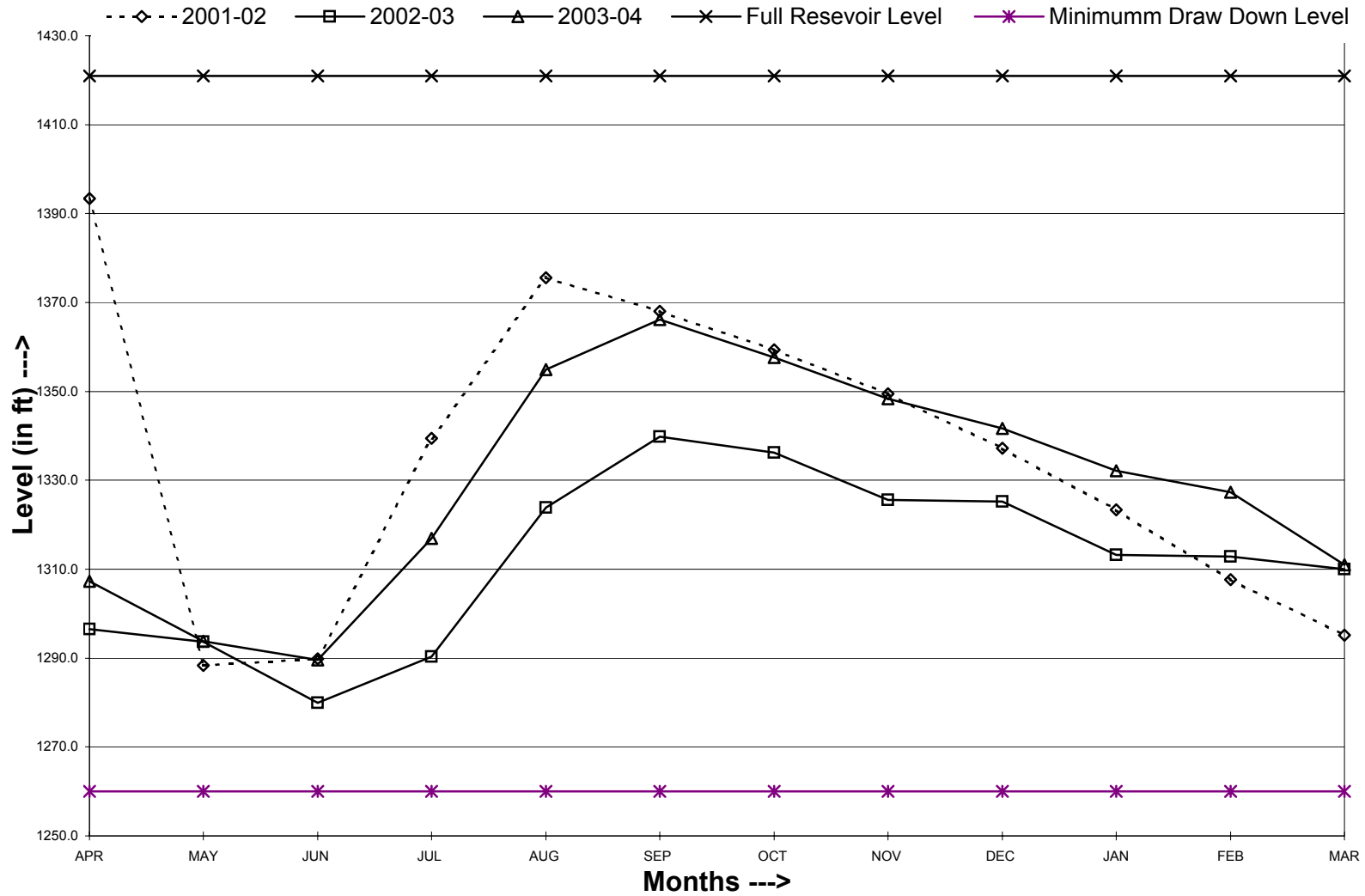
DEMAND MET VS REQUIREMENT IN PEAK MW IN NORTHERN REGION DURING PAST DECADE



Levels recorded at Bhakra reservoir during 2001-02,2002-03 and 2003-04

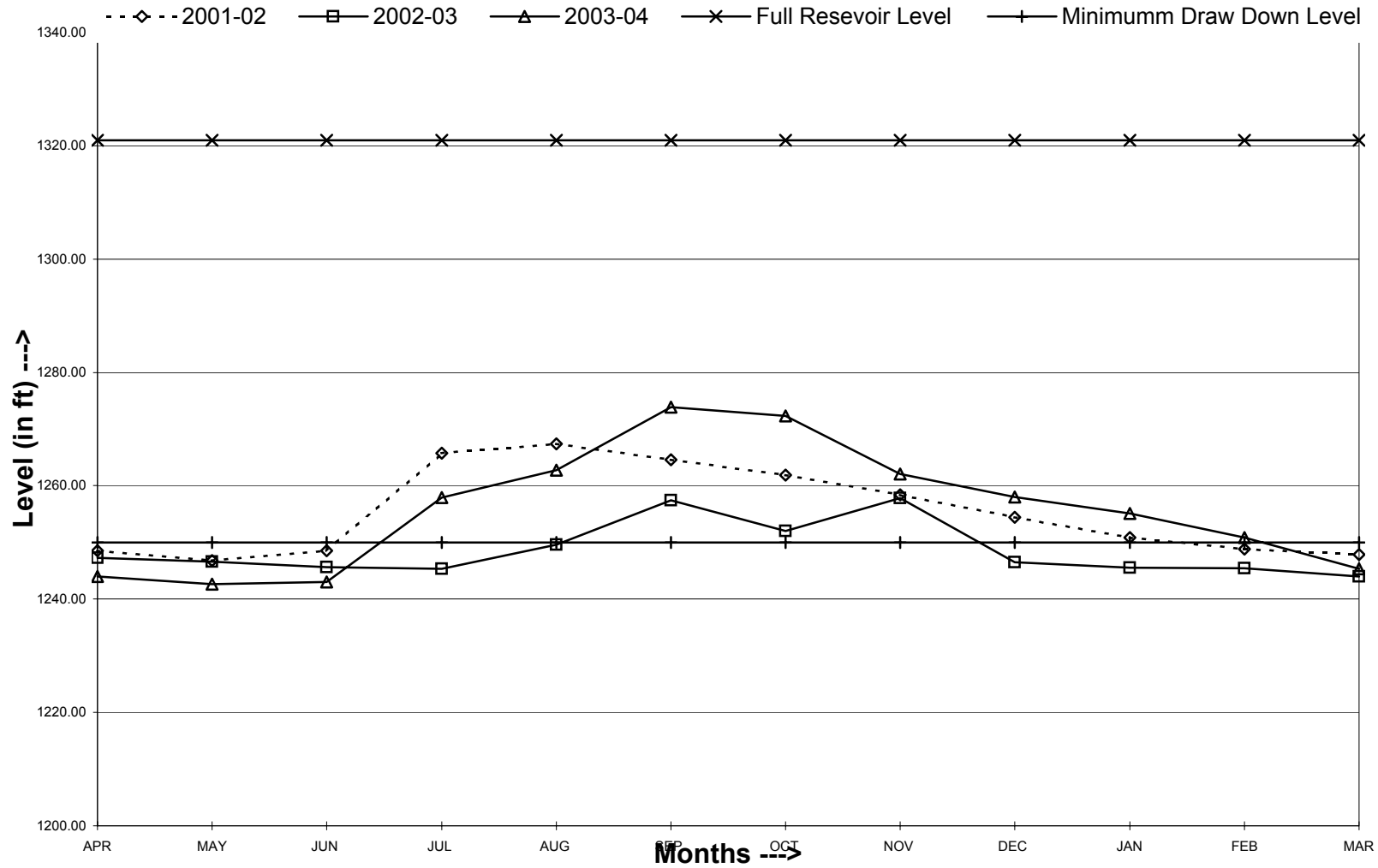


Levels recorded at Pong reservoir during 2001-02,2002-03 and 2003-04



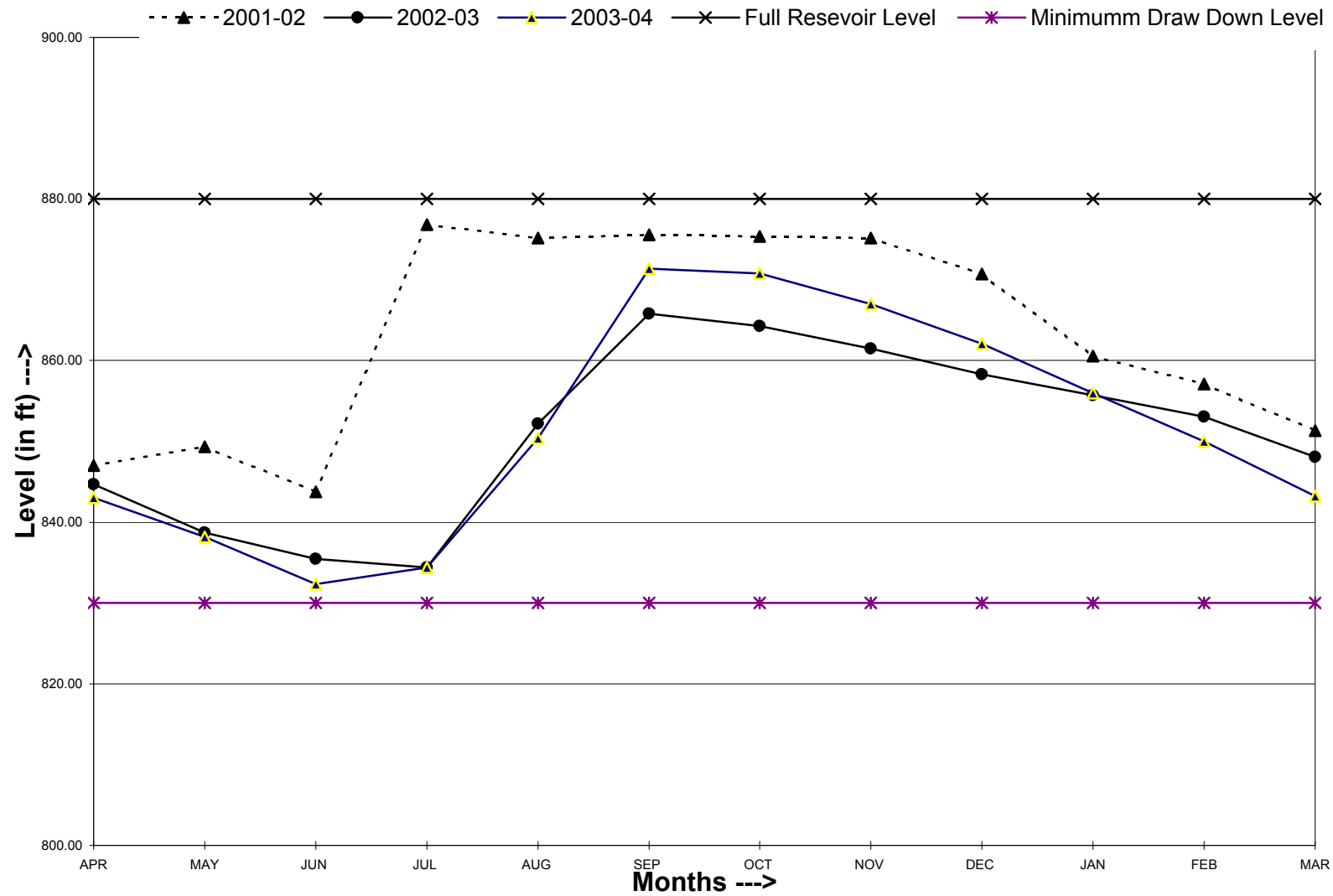
GRAPH-G12

Levels recorded at Gandhi sagar reservoir during 2001-02,2002-03 and 2003-04

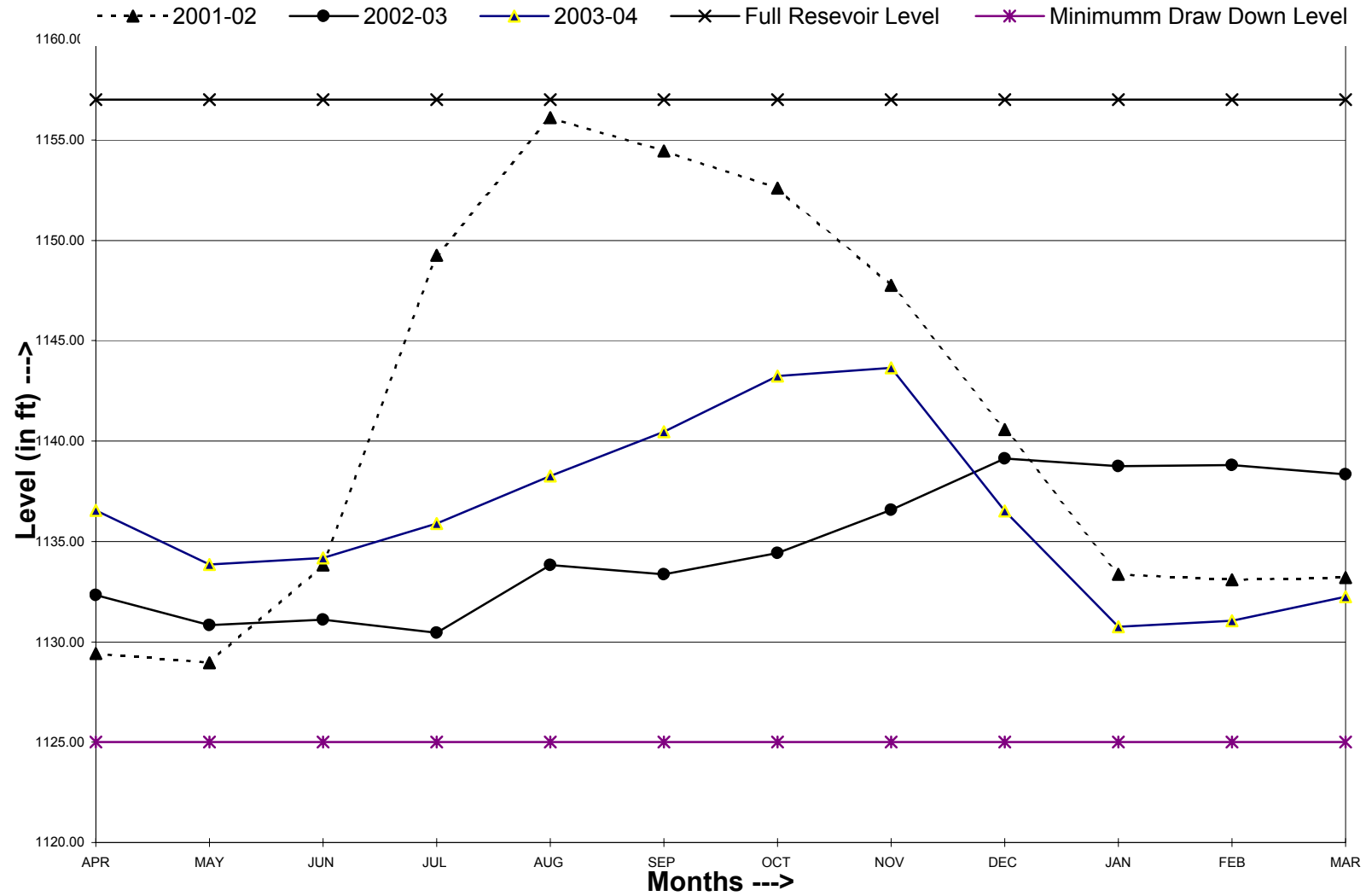


GRAPH-G13

Levels recorded at Rihand reservoir during 2001-02,2002-03 and 2003-04



Levels recorded at Rana Pratap Sagar reservoir during 2001-02,2002-03 and 2003-04



Grid Incident during April 2003

Date	Time	Incident
01.04.2003	13.54 hrs	Following tripping occurred around Kanpur due to protection failure for a fault on 220 kV Panki-Naubasta line. 240MVA 400/220 kV ICT I & II at Panki 315 MVA 400/220 kV ICT I & II at Kanpur 220 kV Kanpur-Panki line 400 kV Allahabad-Sarnath line - Tripped on O/V 400 kV Allahabad-Sasaram line - Tripped on O/V SVC -II at Kanpur All the lines / ICT's were normalised by 15.40 hrs.
09.04.2003	09.43 hrs	All the four units at Suratgarh Power Station (4x250 MW) tripped due to bus fault at 220 kV Ratangarh S/Stn. Units were brought on bar by evening peak hours on same day.
12.04.2003	13.20 hrs	Incident occurred in Delhi system due to tripping of 220 kV Patparganj - I P ckt.-II on earth fault at Patparganj end with simultaneous tripping of 220 kV I P-I P Extension ckt.-II , and Patparganj-Mandola D/C. These trippings resulted in loss of generation at Rajghat (66 MW) and Pragati STG (54 MW). Loss of load was around 468 MW. System was normalised by 14.50 hrs on the same day.
30.04.2003	15.46 hrs.	All the ICT's (2x 240 & 1x315 MVA) at Muradnagar tripped on overload. 240 MVA ICT - I & II were normalised by 16.20 hrs. and 315 MVA ICT-III was normalised at 19.15 hrs on the same day.

Grid Incident during May 2003

Date	Time	Incident
19.05.2003	23.50 hrs	All the running units at Singrauli STPS (2000 MW) tripped due to tripping of 132 kV Bus I & II causing loss of power to CW Pumps and other common auxiliaries. System frequency dropped to 48.2 Hz from 50.12 Hz due to above loss of generation. High voltage conditions were also observed and 400 kV Vindhyachal - Kanpur line tripped on over voltage. System remained intact and survived.

Grid Incident during June 2003

Date	Time	Incident
18.06.2003	16.31 hrs	All the lines emanating from Charkhi Dadri tripped due to bus fault occurred at 220 kV Charkhi Dadri resulted in disruption of Power Supply around that area of HVPN. The lines were normalised within one hour.

Grid Incident during July 2003

Date	Time	Incident
01.07.2003	15.48 hrs	All the units at Uri HEP tripped due to tripping of 220 kV Kishanpur-Pampore D/C. This resulted in power supply Failure in J&K valley. System was normalised by 16.10 hrs.
19.07.2003	18.17 hrs	At BTPS, due to phase to phase fault in 220 kV BTPS-Okhla line, 220 kV BTPS-IP ckt.-I tripped from both ends and 220 kV BTPS-Ballbgarh D/C from Ballabgarh end only. Unit No. 1 & 2 at BTPS tripped simultaneously. All the four lines were closed by 18.40 hrs and units were synchronised by 19.50 hrs

Grid Incident during August 2003

Date	Time	Incident
03.08.2003	21.02 hrs	All the 220 kV lines feeding Jammu tripped because of operation of bus bar protection due to snapping of B-phase jumper of 220 kV Heeranagar-Jammu line at Jammu. Supply to Jammu restored by 21.40 hrs.
09.08.2003	11.34 hrs.	All the three running units at Dadri (th.) tripped due to tripping of both the 500 MVA ICT's because of operation of over fluxing relay. Generation at the time of tripping 600 MW. The units were synchronised by 18.19 hrs.

Grid Incident during September 2003

Date	Time	Incident
12.09.2003	03.03	All the five running units at Suratgarh tripped due to evacuation problem caused by tripping of 400 kV Suratgarh-Ratangarh D/C lines. The problem was initiated due to tripping of 220 kV Bikaner-Nagaur line and Subsequently 220 kV Ratangarh-Sikar D/C line and 220 kV Ratangarh-Reengus line tripped on power swing. The system was restored by 04.30 hrs.

Grid Incident during October 2003

Date	Time	Incident
		-----NIL-----

Grid Incident during November 2003

Date	Time	Incident
16.11.2003	06.55 hrs	All the running units at Suratgarh TPS (1250 MW) tripped due to tripping of 220 kV Ratangarh-Jhunjhunu line because of wave trap jumper failure. This had further resulted in tripping of other 220 kV lines emanating from Ratangarh. 400 kV bus voltage at Ratangarh shoot upto 525 kV due to load throw off at Ratangarh. resulting in tripping of 400 kV Ratangarh-suratgarh line on O/V protection. All the units at Suratgarh were brought back on bar by 20.11 hrs of the same day.

Grid Incident during December 2003

-----NIL-----

Grid Incident during January 2004

DATE	TIME	INCIDENT
23.01.2004	05.20 hrs.	A bus fault occurred due to snapping of jumper of A phase of bus-II isolator of 220 kV Sikar - reengus -II. This resulted in tripping of all the lines emanating from 220 kV reengus GSS. With the tripping of the above 220 kv Ratangarh - Jhunjhunu and 220 kv Bikaner - Nagaur lines tripped on Powe Swing. This caused tripping of all the running machines at Suratgarh on overspeed due to load throw off.

Grid Incident during February 2004

DATE	TIME	INCIDENT
18.02.2004		220 kV Kishanpur-Pampore D/C tripped. This resulted in tripping of Uri generating units due to load mismatch. The system was normalised within half an hour.
20.02.2004		220 kV Kishanpur-Pampore D/C tripped. This resulted in tripping of Uri generating units due to load mismatch. The system was normalised within half an hour.
27.02.2004		At Salal, due to bus fault all lines emanating from Salal tripped except 220 kV Sala-Kishanpur-I and sala-Jammu-I. This resulted in tripping of salal units. At the same time 220 kV Kishanpur-Pampore D/C tripped resulting in tripping of 400 kV uri-Wagoora lines and Uri machines. The system was normalised within one hour.

Grid Incident during MARCH 2004

Date	Time	Incident
		-----NIL-----