

Annexure- 2.1
(As referred to in Para 2.5)

(A) List of projects selected for Performance Audit

<i>S I . No.</i>	<i>Project Name</i>	<i>Date of Investment Approval</i>	<i>Approved cost (₹ in crore)</i>	<i>Scheduled date of completion</i>
Generation linked projects				
1	Kahalgaon Stage-II (Phase-I) Transmission System	October 2004	1772	July 2007
2	Transmission System Associated with Barh	December 2005	3779	September 2009
3	Common Scheme for 765kV Pooling Station and Network Associated with DVC & Maithon RB Project, etc. and Import by NR & WR via ER.	August 2008	7075	August 2012
4	Transmission System Associated with Mundra Ultra Mega Power Project.	September 2008	4824	September 2012
5	Transmission System Associated with Sasan Ultra Mega Power Project.	November 2008	7032	November 2012
6	Transmission System Associated with Parbati-III HEP.	July 2006	557	January 2010
7	Kaiga 3 & 4 transmission system (Balance lines).	March 2005	588 1007 (Revised)	December 2007
8	Transmission System for Phase-I Generation Projects in Odisha –Pt. B.	December 2010	2743	December 2013
9	Common System associated with ISGS Projects in Krishnapatnam area of Andhra Pradesh.	August 2011	1637	August 2014
System strengthening projects				
10	System Strengthening-VII of SR.	April 2005	279	July 2009
11	System Strengthening in Northern Region for SASAN & MUNDRA (UMPP).	December 2009	1217	August 2012
12	Western Region System Strengthening Scheme-II.	July 2006	5221	July 2010
13	Northern Region System Strengthening Scheme-V.	June 2006	721	June 2009
14	East-West transmission corridor strengthening scheme.	June 2006	804	June 2009
15	Western Region System Strengthening Scheme-X.	January 2009	665	January 2012
16	System Strengthening Scheme III of Southern Region (SRSS-III)	October 2004	285	April 2007
17	Eastern Region System Strengthening Scheme-I (ERSS-I)	October 2006	976	October 2009
18	Northern Region System Strengthening Scheme-XVII.	February 2009	510	November 2011
Other projects				
19	765kV System for Central Part of Northern Grid (Part-III).	October 2009	1075	April 2012
20	North East/Northern Western Interconnector-I.	February 2009	11130	August 2013

(B) Details of sample selected for Performance Audit

Description of projects	Completed		Ongoing		Total	
	No. of projects	Approved cost (₹ in crore)	No. of projects	Approved cost (₹ in crore)	No. of projects	Approved cost (₹ in crore)
Total population:						
Generation Linked	34	43,903	30	49,911	64	93,814
System Strengthening	41	17,279	19	13,118	60	30,397
Other projects	8	1,929	12	18,692	20	20,621
Total	83	63,111	61	81,721	144	1,44,832
Sample selected:						
Generation Linked	5	24,483	4	5,945	9	30,428
System Strengthening	7	9,192	2	1,486	9	10,678
Other projects	1	1,075	1	11,130	2	12,205
Total	13	34,750	7	18,561	20	53,311
Percentage of total population	16%	55%	11%	23%		
Overall percentage of money value being covered	14% in terms of number and 37% in terms of value					

Annexure - 3.1
{As referred to in Para 3.1.1}

Details of installed capacity within region and transfer capability of the respective inter-regional corridor

Corridor	Export Region	Installed capacity (MW) in export region (as on 31-03-2012)*	TTC (MW)**	TTC as a %age of Installed Capacity
WR-NR	WR	64394	2000	3.11
WR-ER	WR	64394	1000	1.55
ER-NER	ER	26286	500	1.90
WR-SR	WR	64394	1000	1.55
ER-NR	ER	26286	4200	15.98
ER-SR	ER	26286	2830	10.77

Source: * CEA monthly report on Installed capacity for March 2012.

**Higher TTC (zero revision) declared by NLDC in any month during 2011-12 considered.

Annexure 3.2
(As referred to in Para 3.1.1)

Details of Congestion in Power Exchanges

Month	Percentage of volume of electricity that could not be cleared due to congestion to the actual cleared volume						Percentage of the time congestion occurred during the month					
	Indian Energy Exchange			Power Exchange of India Limited			Indian Energy Exchange			Power Exchange of India Limited		
	2010-11	2011-12	2012-13	2010-11	2011-12	2012-13	2010-11	2011-12	2012-13	2010-11	2011-12	2012-13
April	2	16	24	8	52	243	35	79	100	34	79	100
May	1	2	4.09	3	7	38.58	7.53	28	99.97	8.06	36	100
June	3	2	4.84	2	8	32.02	15.83	18	76.67	15.69	21	80.42
July	0.6	4	5.07	1.2	9	49.80	5.11	42	79.77	5.24	44	84.71
August	6.9	3	9.90	2.7	14	118.72	8.06	39	98.96	16.26	47	99.44
September	0.0	1	18.04	2.7	4	172.71	10.56	30	98.75	11.25	40	100
October	7	5	7.66	16.5	11	128.08	45.43	72	95.97	49.17	76	97.41
November	5.4	9	17.01	51.7	12	122.25	47.50	47	100	55.83	50	100
December	1.7	16	17.43	18	33	156.59	34.14	78.6	99.97	38.71	79.2	98.59
January	2	21	20.94	7	124	63.14	53	94	99.60	57	93	98.76
February	8.5	38	21.42	22.4	256	74.93	88.69	99.57	100	84.23	100	100
March	10	42	25.19	58	274	61.41	95	100	100	96	100	100

Note: Source of data: CERC web site - Monthly Report on short term transaction of electricity by Market monitoring cell of CERC.

Comparison of market clearing prices (MCP) and area clearing prices (ACP) in Indian Energy Exchange

(figures in ₹)

Year	MCP (Rs. Per kWhr)	ACP > MCP (by 50 paise)		ACP < MCP (by 50 paise)									
		S1	S2	A1	A2	E1	E2	W1	W2	W3	N1	N2	N3
2010-11	3.6	4.4	4.5	-	-	-	-	-	-	-	-	-	-
2011-12	3.5	5.1	5.3	-	-	-	-	-	-	-	-	-	-
2012-13	3.5	6.9	7.3	-	-	2.9	2.9	-	-	2.8	-	-	-

Note: The above amounts are the charges per unit of electricity. Other charges such as transmission charges, losses and other levies are payable extra.

'-' indicates the difference between ACP and MCP was less than 50 paise per unit of electricity.

Annexure 3.3
(As referred to in Para 3.1.1 and 3.1.3)

Details of Cumulative Inter Regional transmission capacity at the end of XII Plan

Corridor (i)	Transmission Capacity expected at the end of XI Plan (ii)	Expected addition during XII Plan (iii)	Cumulative transmission capacity at the end of XII Plan (iv) = (ii)+(iii)
ER-SR	3630	0	3630
ER-NR	10030	7900	17930
ER-WR	4390	8400	12790
ER-NER	1260	1600	2860
NR-WR	4220	10200	14420
WR-SR	1520	6400	7920
NER/ER-NR/WR	0	6000	6000
TOTAL	25050	40500	65550

Annexure 3.4
(As referred to in para 3.1.5)

Average utilisation of Inter-regional lines during 2011 – 12

Corridor	Total No. of Lines analysed	Utilisation range							
		0-30%		31%-50%		51%-75%		76%-100%	
		No. of Lines	%age of lines to total lines of region	No. of Lines	%age of lines to total lines of region	No. of Lines	%age of lines to total lines of region	No. of Lines	%age of lines to total lines of region
WR-NR	9	8	89	1	11	-	-	-	-
ER-NR	9	7	78	1	11	1	11	-	-
WR-ER	7	7	100	-	-	-	-	-	-
ER-SR	4	3	75	-	-	-	-	1	25
ER-NER	8	8	100	-	-	-	-	-	-
WR-SR	3	-	-	-	-	2	67	1	33

Average utilisation of intra-regional transmission lines during 2011-12

Name of Region	Total No. of Lines analysed (excluding lines having 0 power flow)	Utilisation range									
		0-30%		31%-50%		51%-75%		76%-100%		>100%	
		No. of Lines	%age of lines to total lines of region	No. of Lines	%age of lines to total lines of region	No. of Lines	%age of lines to total lines of region	No. of Lines	%age of lines to total lines of region	No. of Lines	%age of lines to total lines of region
NR	176	125	71	39	22	11	6	1	1	0	0
ER	111	87	78	15	14	5	4	4	4	0	0
WR	173	95	55	30	17	36	21	8	5	4	2
NER	118	95	81	22	19	1	1	0	0	0	0
SR	128	76	59	42	33	6	5	1	1	4	3

Annexure-3.5

(As referred to in Para 3.1.6)

Comparison of unused access with STOA rejected

(Figures in MW)

Year/ Month	WR-NR					ER-NR					Total Unused access for NR import (1+2)	Rejected STOA	
	TTC	LTA & MTOA	STOA granted	Total Access granted	Schedule access (1)	Unused access (1)	TTC	LTA & MTOA	STOA granted	Total Access granted			Schedule access (2)
		(A)	(B)	A-B*	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
2009-10													
Apr-09	1300	0	1100	-16	1100	1800	914	586	1500	200	1300	2416	0
May-09	1300	0	1100	205	895	2000	1110	590	1700	966	734	1629	99
Jun-09	1300	0	1100	611	489	2500	1291	909	2200	1083	1117	1606	391
Jul-09	1500	0	1300	994	306	2500	1482	718	2200	1361	839	1145	507
Aug-09	1500	0	1300	1079	221	2800	1478	1022	2500	1795	705	927	364
Sep-09	1500	0	1300	1048	252	2800	1512	988	2500	1664	836	1088	1220
Oct-09	1500	0	1300	907	393	2800	1700	800	2500	1523	977	1370	343
Nov-09	1500	0	1300	883	417	2800	1414	1086	2500	1628	872	1289	67
Dec-09	1500	0	1300	869	431	2900	1398	1202	2600	1484	1116	1547	10
Jan-10	1500	0	1300	1030	270	1800	1058	542	1600	1427	173	443	123
Feb-10	1500	0	1300	789	511	2300	1061	939	2000	1167	833	1344	28
Mar-10	1500	0	1300	455	845	2400	1009	1091	2100	674	1426	2271	0
2010-11													
Apr-10	1500	0	1300	533	767	2900	1226	1374	2600	446	2154	2921	52
May-10	1500	0	1300	721	579	2900	1118	1482	2600	927	1673	2253	14
Jun-10	1800	0	1600	1219	381	3200	1315	1585	2900	1914	986	1367	7
Jul-10	1800	0	1600	1365	235	4000	1124	2576	3700	2148	1552	1787	1
Aug-10	1900	0	1700	1490	210	4300	1331	2669	4000	1990	2010	2220	0

Year/ Month	WR-NR						ER-NR						Total Unused access for NR import (1+2)	Rejected STOA
	TTC	LTA & MTOA	STOA granted	Total Access granted	Schedule	Unused access (1)	TTC	LTA & MTOA	STOA granted	Total Access granted	Schedule	Unused access (2)		
Sep-10	1900	0	1700	1700	959	741	4300	1331	2669	4000	1228	2772	3513	0
Oct-10	1900	0	1700	1700	383	1317	3500	1111	2089	3200	1414	1786	3103	16
Nov-10	2000	0	1800	1800	70	1730	3500	1050	2150	3200	1348	1852	3582	0
Dec-10	1900	0	1700	1700	305	1395	3500	957	2243	3200	1452	1748	3143	0
Jan-11	1900	0	1700	1700	1038	662	3500	1258	1942	3200	1298	1902	2563	0
Feb-11	1900	0	1700	1700	790	910	2500	1007	1193	2200	757	1443	2354	0
Mar-11	1900	0	1700	1700	670	1030	3000	950	1750	2700	631	2069	3100	0
2011-12														
Apr-11	1900	0	1700	1700	593	1107	3000	979	1721	2700	726	1974	3081	0
May-11	1900	0	1700	1700	872	828	3000	1199	1501	2700	1316	1384	2212	0
Jun-11	1900	0	1700	1700	1181	519	3500	1027	2173	3200	1536	1664	2183	66
Jul-11	1900	0	1700	1700	1576	124	4000	1027	2673	3700	2116	1584	1708	428
Aug-11	1900	0	1700	1700	1480	220	4200	1027	2873	3900	1803	2097	2317	116
Sep-11	1900	0	1700	1700	1045	655	4100	1014	2786	3800	880	2920	3575	29
Oct-11	1900	0	1700	1700	270	1430	4100	1049	2751	3800	628	3172	4602	66
Nov-11	2000	0	1800	1800	-345	1800	3500	944	2256	3200	1107	2093	4239	0
Dec-11	2000	0	1800	1800	3	1797	3500	944	2256	3200	1323	1877	3673	0
Jan-12	2000	0	1800	1800	505	1295	3400	977	2123	3100	1572	1528	2823	5
Feb-12	2000	0	1800	1800	436	1364	3400	977	2123	3100	1481	1619	2983	3
Mar-12	2000	0	1800	1800	-143	1800	3100	977	1823	2800	1330	1470	3413	0

*negative figure in schedule has been ignored

Note: 1. (-) sign denotes EXPORT from NR and (+) sign denotes IMPORT to NR

2. The above analysis shows broad trend regarding unutilised capability. There may be intra day anomalies in the trend.

Annexure-3.6
(As referred to in Para 3.3)

Statement indicating delays in submission of proposals for forest clearances after investment approval in respect of 20 projects selected for audit

S.N.	Project Name	Investment Approval date	Scheduled date of completion of project	Forest proposal application dates (First & Last indicated in bold)
1	Kahalgaoon-II	October 2004	July 2007 (October 2008)	29.10.05/09.09.05/16.01.06/29.11.05/ 14.11.05/30.07.05/ 24.01.05 /09.09.06/ 30.09.05/18.02.06/26.12.06/08.05.06/ 30.01.07 /18.11.06
2	Barh	December 2005	September 2009 (June 2012)	15.02.07/08.03.07/22.01.07/02.11.06/ 29.01.07/23.05.07/22.05.07/08.06.07/ 05.06.07/28.04.07/28.02.07/08.01.07/ 27.11.06/ 09.02.08 /01.04.07/ 25.06.05
3	DVC Maithon	August 2008	August 2012 (Project not yet complete)	25.09.10/25.09.10/07.06.10/01.12.09/ 04.05.10/03.08.10/ 15.03.08 /24.03.08/ 20.01.09/29.03.08/17.08.10/22.02.11/ 19.04.11/11.08.10/14.11.09/14.11.09/ 06.09.11/04.05.11/01.04.11/10.06.11/ 06.09.11 /18.02.10/27.08.10/17.02.10
4	Sasan UMPP	November 2008	November 2012	14.05.09 /22.07.09/28.05.10/24.12.10/ 09.04.12/16.07.12/07.05.12/ 31.08.12
5	Mundra UMPP	September 2008	September 2012	21.07.08 /21.07.08/23.02.10/11.07.09/ 02.09.11 /24.02.10
6	Parbati-III HEP	July 2006	January 2010	26.02.07 /17.03.07/20.10.08/ 30.06.09 / 23.03.09
7	Kaiga 3 & 4 lines)	March 2005	December 2007	17.05.05/07.08.04
8	Generation Projects in Odisha -Part B	December 2010	December 2013	07.01.12 /24.05.12/ 24.09.12 /26.07.12
9	ISGSProjects in Krishnapatnam area of AP	August 2011	August 2014	04.08.11
10	SRSS-VII	April 2005	July 2009	03.06.08/09.06.08
11	SS in N R for SASAN & M U N D R A UMPP	December 2009	August 2012	11.5.12 /30.4.12/11.5.12/14.12.10 / 15.11.10
12	WRSS-II	July 2006	July 2010	04.01.10 /30.10.09/30.07.09/13.07.09/ 12.10.07/01.12.06/23.02.06/17.05.06/ 19.06.06/19.06.06/17.03.06/19.04.06/ 23.01.06

S.N.	Project Name	Investment Approval date	Scheduled date of completion of project	Forest proposal application dates (First & Last indicated in bold)
13	NRSS-V	June 2006	June 2009	29.05.08/ 21.06.08 /04.03.06/18.05.07/ 08.10.07/05.12.06/11.12.06/07.12.06/ 21.08.07/06.3.06/ 04.03.06 /06.03.06/ 03.03.08/08.10.07
14	E/W Tr. corridor SS	June 2006	June 2009	03.01.06/07.02.08
15	WRSS-X	January 2009	January 2012	-
16	SRSS-III	October 2004	April 2007	16.09.05
17	ERSS-I	October 2006	October 2009	20.12.06/08.09.07/05.05.08/02.09.06/ 15.07.06 /28.02.08/ 21.01.09
18	NRSS-XVIII	February 2009	November 2011	20.08.10/18.12.10/ 23.06.10 / 12.3.11
19	765kV System for Central Part of Northern Grid (Part-III)	October 2009	April 2012	01.05.11/07.07.11/27.06.11/02.06.11/ 01.08.11 / 30.08.10
20	N E / N W Interconnector-I	February 2009	August 2013	20.09.10/21.09.10/09.07.11/30.04.09/ 25.05.09/07.01.10/19.10.10/22.10.10/ 20.12.10/27.08.10/ 21.07.11 /31.12.09 /30.07.10/16.07.09/ 27.09.07 /12.05.09/ 17.07.08/31.07.09/05.06.08/13.4.09/ 02.03.10

Note: Date in bracket in third column indicates date of commissioning of last element of transmission project

Annexure 4.1

{As referred to in Para 4.2 (ii)}

Non Financial Performance Evaluation Parameters fixed in MOU

S. No.	Parameter	2008-09	2009-10	2010-11	2011-12	2012-13
		Weightage given in the MOU				
1	Quality	2	2	1	1	0.5
2	Customer Satisfaction	4	2	2	1	0.5
3	Business Development	2	2	2	2	1
4	R & D for Sustained & continuous innovation	2	2	2	5	5
5	Project Implementation	20	19	20	10	8
6	Commercial Targets/Revenue from telecom Business	2	2	3		
7	Human Resource Development(Management)	2	-	-	5	5
8	Environment and Social Management	2	2	2		
9	Availability of Transmission system	13	13	7	6	5
10	Ratio of Inventory to Gross profit	1	1	1		
11	<i>Rajiv Gandhi Grameen Vidyutikaran Yojna</i>		5	5	5	5
12	<i>Corporate Social Responsibility</i>			5	5	5
13	<i>Compliance of Corporate Governance</i>				5	5
14	<i>Sustainable Development</i>				5	5
15	<i>Compliance of DPE Guidelines</i>					5
	Total	50	50	50	50	50

Observations:

1. Only one Non-mandatory Parameter 'Rajiv Gandhi Vidyutikaran Yojna' was included in the year 2009-10 with weightage of 5 points. Out of 5, 3 points were reduced from crucial parameters, customer satisfaction and Project Implementation.
2. In the year 2010-11 one mandatory parameter *i.e.* 'Corporate social responsibility' was included with a weightage of 5 points. However, 6 points were reduced from the important parameter 'Availability of transmission system' alone.
3. In the year 2011-12 three new mandatory parameters were included (Human resource Management, Compliance of Corporate Governance and Sustainable Development) with a weightage of 5 each and for one parameter 'R&D for sustainable development' points were increased from 2 to 5. Out of these 18 points, 12 points alone were reduced from the parameters Project implementation (10 points), Customer satisfaction (1 point) and Availability of transmission system (1 point).
4. In the year 2012-13 one new mandatory parameter 'Compliance of DPE Guidelines' has been included with weightage 5 points. Out of these 3.5 points has been reduced from the above mentioned three important parameters.

Annexure- 5.1
(As referred to in Para 5.1)

Statement showing variation in lengths of transmission lines as per FR and as actually constructed.

S.N.	Name of project	Name of Transmission Line	FR Line length (km)	Executed Line length (km)	Percentage Variation
1	Transmission System associated with Barh	Barh-Balia 400 kV D/C(Quad)	195.00	242.66	(+)24.44
2	Transmission System associated with Kahalgaon (stage-II)	Kahalgaon-Patna-Balia 400 kV D/C (Quad)	368	452.50	(+)22.96
3		Biharsharif-Balia 400 kV D/C (Quad)	166	241.79	(+)45.66
4		Balia –Mau (UPPCL) 400 kV D/C	20	9.12	(-)54.40
5	Transmission System associated with Kaiga 3 & 4	LILO of Kolar-Sriperumbudur 400 kV S/C line at Melakottaiyur	40.00	30.67	(-)23.33
6	East-West transmission Corridor strengthening	Ranchi- Rourkela 400 kV DC	170	144.94	(-)14.71
7	NRSS V	400 kV D/C Bhiwadi - Agra line	216	209	(-)3.20
8	System strengthening for Sasan & Mundra	LILO of both circuits of Nathpa-Jhakri-Abdullaur 400 kV D/C (Tripple Snowbird) Line at Panchkula 2 x 25 km)	51	49	(-)3.90
9	DVC & Maithon Right Bank	Lucknow 765/400 kV new substation - Lucknow 400/220 kV existing substation 400 kV Quad 2 X D/C line	80	2.86	(-)96.42
10		Ranchi 765/400 kV new substation - Ranchi 400/220 kV existing substation 400 kV Quad 2 X D/C line	110	144	(+)30.91
11	Sasan UMPP	Indore-Indore (MPPTL) 400 kV D/C line at Sasan	60	49.73	(-)17.12
12	Mundra UMPP	Mundra-Jetpur 400 kV D/C (Tripple Snowbird)	328	336	(+)2.40
13		Gandhar-Navsari 400 kV D/C	134	102.15	(-)23.77
14		LILO of both circuits of kawas-Navsari 220 kV D/C at Navsari	50	40.49	(-)19.02
15	WRSS X	LILO of Sipat-Seoni 765 kV S/C line at WR Pooling Station near Sipat	40	7.91	(-)80.23
16	SRSS-III	Neelamangla –Somanhally 400 kV D/C T/L	50	42	(-)16
17	ERSS-I	Jamshedpur-Baripada 400 kV D/C (ACSR)	135	141	(+)4.44

Source: Feasibility reports of respective projects and information regarding transmission lines furnished by the Management of PGCIL vide letter dated 08.01.2013 and 31.03.2014.

Annexure 5.2
(As referred to in Para 5.3)

Statement showing year wise details of unutilised balance in Power System Development Fund

(Rs. In crore)

Date	Unscheduled Interchange Charges	Congestion Revenue	Congestion Charges	Reactive Energy Charges	Total	Interest income	Amount Utilised	Investment of PSDF amount (Including cumulative Interest amount)
31.03.2011	1340.28	457.04	2.13	25.91	1825.36	40.25	0.03	1825.29
31.03.2012	2067.02	1143.07	7.74	27.41	3245.24	199.05	0.05	3425.77
31.03.2013	2496.25	1765.41	7.9	29.22	4298.78	307.59	0.05	4716.07
31.12.2013	3585.52	1922.27	10.32	30.1	5548.21	306.98	0.09	6301.64

Annexure- 6.1
(As referred to in Para 6.3)

Statement showing scheduled dates of completion as per Investment Approval, dates of actual/anticipated completion and delay with reference to Investment Approval

S.N.	Project Name	Investment approval date	Scheduled date of completion as per Investment Approval	Actual/ anticipated date of completion	Delay in completion (actual/anticipated) with reference to scheduled date of completion as per Investment approval	Delay range (in months)
		(1)	(2)	(3)	(4)=(3) – (2) months	
Generation linked projects						
1	Kahalgaoon Stage-II (Phase-I) Transmission System	October 2004	July 2007	December 2007	5	1 – 10
2	Transmission System Associated with Barh	December 2005	September 2009	December 2010	15	11 - 20
3	Common Scheme for 765kV Pooling Station and DVC & Maithon RB Project, etc.	August 2008	August 2012	March 2014	19	11 - 20
4	Transmission System Associated with Mundra Ultra Mega Power Project	September 2008	September 2012	June 2014	21	21 – 30 (ongoing project)
5	Transmission System Associated with Sasan Ultra Mega Power Project	November 2008	November 2012	September 2013	10	1 - 10
6	Transmission System Associated with Parbati-III HEP	July 2006	January 2010	October 2013	45	Above 40
7	Kaiga 3 & 4 transmission system (Balance lines)	March 2005	December 2007	Mysore-Kozikhode T/L uncertain	More than 40	Above 40 (ongoing project)
System strengthening projects						
8	System Strengthening-VII of SR	April 2005	July 2009	August 2009	1	1 -10
9	Western Region System Strengthening Scheme-II	July 2006	July 2010	December 2012	29	21 - 30
10	Northern Region System Strengthening Scheme-V	June 2006	June 2009	March 2010	9	1 - 10

S.N.	Project Name	Investment approval date	Scheduled date of completion as per Investment Approval	Actual/ anticipated date of completion	Delay in completion (actual/anticipated) with reference to scheduled date of completion as per Investment approval	Delay range (in months)	
		(1)	(2)	(3)	(4)=(3) – (2) months		
11	East-West transmission corridor strengthening scheme	June 2006	June 2009	June 2011	24	21 - 30	
12	Western Region System Strengthening Scheme-X	January 2009	January 2012	March 2012	2	1 - 10	
13	System Strengthening Scheme III of Southern Region	October 2004	April 2007	April 2007	-	NIL	
14	Eastern Region System Strengthening Scheme-I	October 2006	October 2009	May 2014	55	Above 40 (ongoing project)	
15	Northern Region System Strengthening Scheme-XVIII	February 2009	November 2011	December 2013	25	21 - 30	
16	North East/ Northern Western Interconnector-I	February 2009	August 2013	June 2015	19	11 -20 (ongoing project)	
Projects approved after of CERC Regulations 2009							
S. No	Project Name	Completion time as per CERC Regulations (in months)	Date of Investment Approval	Actual/ anticipated date of completion	Actual/ anticipated time taken in completion from investment approval (in months)	Delay beyond benchmark completion period (in months)	Delay range (in months)
1	765kV System for Central Part of Northern Grid (Part-III)	30	October 2009	Jan 2014	51	21	21 -30
2	SASAN & MUNDRA (UMPP)	32	December 2009	December 2014	60	28	21 -30 (ongoing)
3	Generation Projects in Odisha -Part B	32	December 2010	December 2014	48	16	11 -20 (Ongoing)
4	ISGS Projects in Krishnapatnam area of Andhra Pradesh	32	August 2011	August 2014	36	4	1 – 10 (Ongoing)

Annexure- 6.2
(As referred to in Para 6.3)

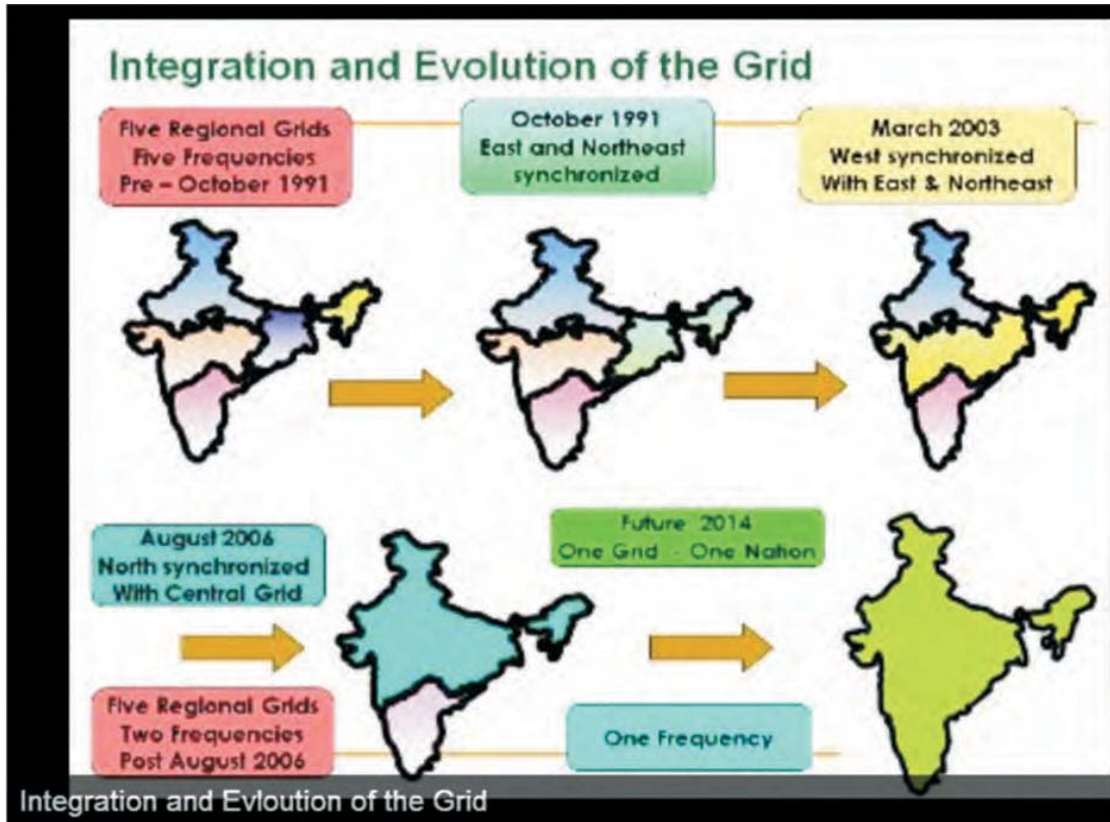
Statement showing loss of incentive of 0.5 per cent additional Return on Equity due to late commissioning of projects with reference to scheduled completion period as per CERC Regulations.

S 1 . No.	Project Name	Date of Investment Approval	Approved cost	Scheduled date of completion	Equity Capital (₹ in crore)	CERC Incentives (0.5 %) – (₹ in crore)
			(₹ in crore)			
1	Generation Projects in Odisha Part B	December 2010	2743	December 2013	822.9	4.1145
2	Krishnapatnam area of Andhra Pradesh	August 2011	1637	August 2014	491.1	2.4555
3	System strengthening of NR for SASAN & MUNDRA (UMPP)	December 2009	1217	August 2012	365.1	1.8255
4	765kV System for Central Part of Northern Grid (Part-III)	October 2009	1075	April 2012	322.5	1.6125
						10.008

Total of additional Return on Equity of 0.5 per cent forgone over the project life of 35 years: ₹10.008 crore X 35 years = ₹ 350.28 crore.

Annexure – 7.1
(As referred to in Para 7.1)

Overview of Indian Power Grid



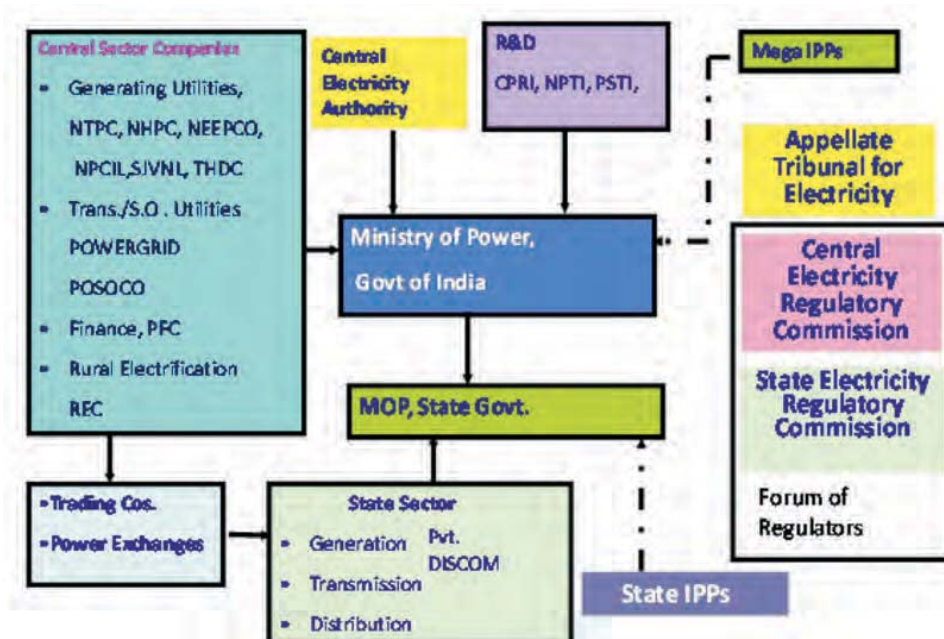
Note: Southern Grid synchronized on 31 December 2013 with rest of the Grid.

Source: Website of POSOCO

Annexure – 7.2

(As referred to in Para 7.1)

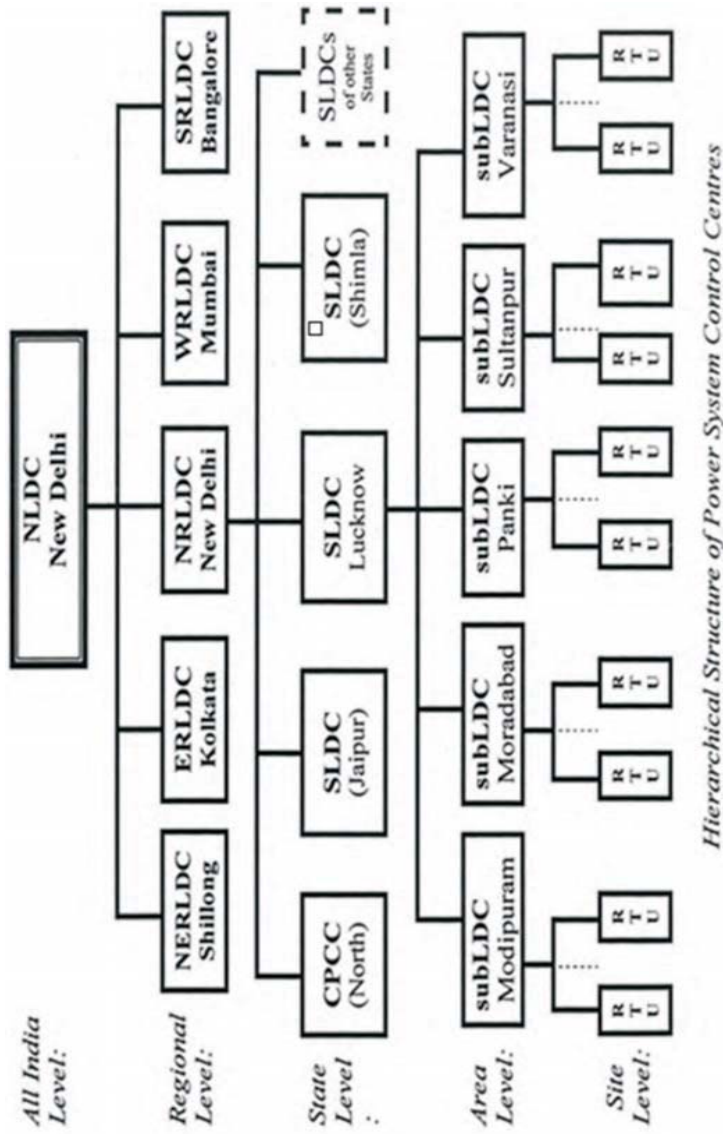
Indian Power Sector - Institutional Arrangement



Source: As provided by POSOCO vide e-mail dated 27 December 2012

Annexure – 7.3
(As referred to in Para 7.2)

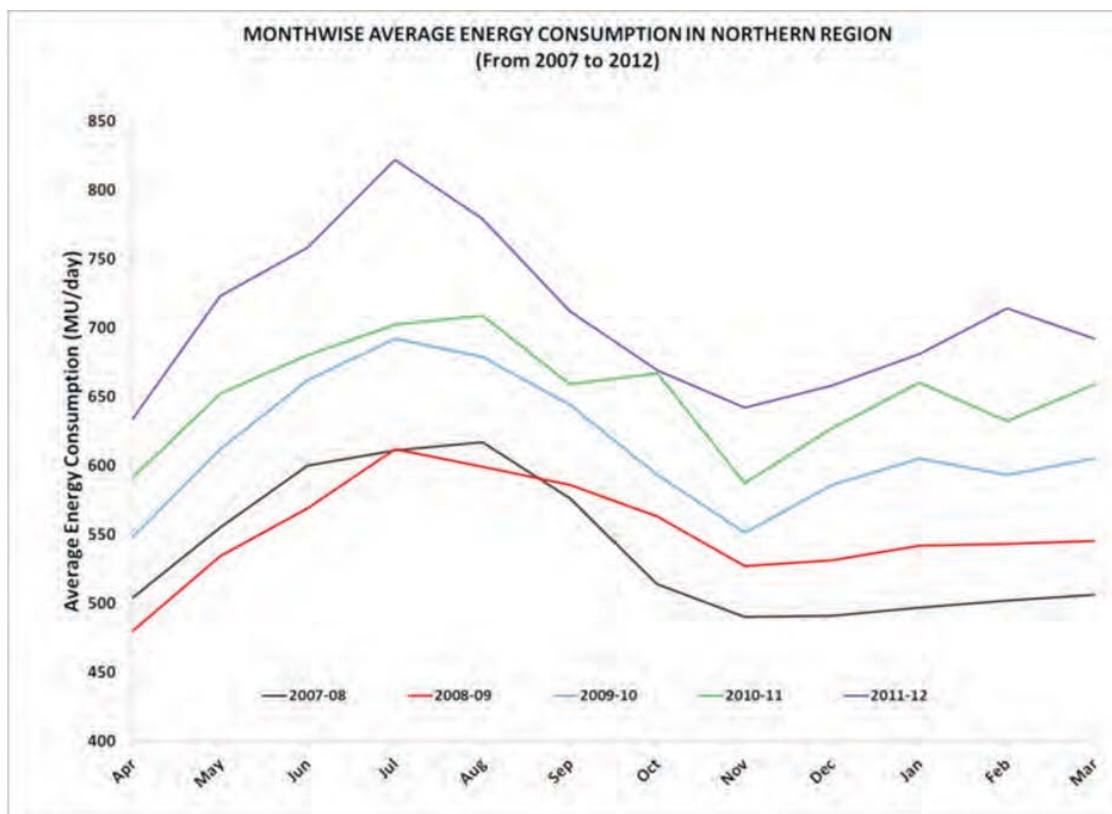
Typical Flow chart showing hierarchical form of Load Despatch Centres



Hierarchical Structure of Power System Control Centres

Annexure 7.4
(As referred to in para 7.4.1)

Graph showing Average energy consumption in Northern Region during 2007-08 to 2011-12



MONTHWISE AVERAGE ENERGY CONSUMPTION IN NR (From 2007 to 2012)					
(All figures are in MUs per day)					
	2007-08	2008-09	2009-10	2010-11	2011-12
Apr	504	480	548	591	634
May	555	534	612	652	723
Jun	600	569	662	680	758
Jul	611	612	692	702	822
Aug	617	599	679	709	779
Sep	576	586	644	659	712
Oct	514	563	593	667	669
Nov	490	527	551	587	642
Dec	491	531	586	627	658
Jan	497	542	605	660	681
Feb	502	543	593	632	714
Mar	506	545	605	659	692

Annexure- 7.5

(As referred to in para 7.4.2 (b) and (c))

**Table showing excerpts of telephonic conversation between NLDC and RLDC staff on
29 July 2012.**

29 July 2012 at 2243 (ERLDC advising NLDC to order WRLDC to back down generation)	
ERLDC	Toh ye paanch line overloaded hai toh agar koi ek trip karega toh kafi musibat ho jayegi.
NLDC	Achha, achha.
ERLDC	Toh aap WR ko thoh ek dam extremely aap ek dam immediately aap boliye ki wo back down kare apna generation.
NLDC	Achha, achha.
ERLDC	Ya nahi to WR apna NR ke through power pass on kare agar kar sakta hai.
NLDC	NR se nahi kar sakta hai, Gwalior-Agra ek out hai.
ERLDC	Ha agar nahi kar sakta toh he has to back down.
NLDC	Achha, achha. theek hai.
ERLDC	Theek hai na.
NLDC	Ok, ok.
ERLDC	Or NR ko over drawal band karna hai.
NLDC	Ha , ha theek theek.
ERLDC	Toh ye toh nahi toh bilkul system aaj jayega.
NLDC	Theek, theek sir karte hain.
ERLDC	Toh aap ise seriously lijiye.

29 July 2012 at 2328 (ERLDC advising NLDC to be firm with WRLDC)	
ERLDC	Janab WR se to humko koi farak nahi, lagta hai ki badh gaya hai unka
NLDC	WR toh...
ERLDC	Aap unke pechhe thoda lagiye ki what are they doing?
NLDC	Aree bada bekar hai sir unko...
ERLDC	Ji sir aap unko bar bar message dijiye, wo aise chhodne se nahi hoga.
NLDC	Theek hai mai bat karta hu.
ERLDC	Nahi nahi bilkul hi bat nahi, aap bar bar unko msg dijiye.
NLDC	Nahi nahi mai de raha hu.
ERLDC	Kahe jaha jaha underdrawal hai usko kam karaye.
NLDC	Nahi, theek hai. Theek hai.
29 July 2012 at 2331 (NLDC asking WRLDC to reduce under drawal in a rather timid way)	
NLDC	'Ha Sir, ye thoda ye apna Sir under drawal control kar sakte ho Sir Aap'.
WRLDC	Hmm.
NLDC	Kyonki Sir Ye WR-NR ki Sir Vo Gwalior Agra ek shutdown pe hai. Us pe overloading ho rahi hai Sir aur ye ER corridor ki sari lines overload ho rahi hain.
WRLDC	Frequency bhi to kam hai, aapki...
NLDC	frequency kam hai vo to baat hai lekin thoda system constraint hai na ab kya karain sab ER kee lines
WRLDC	overdrawl kam karaiye na NR ka
NLDC	NR ka OD, usko bhi msg kiye hain, Sir aap bhi kar sakte hain to aap bhi dekhiye

Annexure- 7.6
{As referred to in Para 7.4.3 (a)}

Overdrawal by NR states and Underdrawal by WR states during 30 & 31 July Grid Disturbances

Name of the State	Over-drawal or Under-drawal	No. of time blocks (Out of 18 time blocks between 2200 hours of 29 July 2012 and 0230 hours of 30 July 2012) in which overdrawal/underdrawal was made by States				No. of time blocks (Out of 12 time blocks between 1000 hours to 1300 hours of 31 July 2012) in which overdrawal/under-drawal was made by States			
		<100 MW	100<500 MW	500<1000 MW	>1000 MW	<100 MW	100<500 MW	500<1000 MW	>1000 MW
Northern Region									
Punjab	Over-drawal	0	6	11	0	0	3	9	0
Haryana		0	0	13	5	0	2	8	2
UP		0	0	0	18	1	1	0	0
Rajasthan		7	0	0	0	0	4	8	0
Uttarakhand		10	1	0	0	0	11	0	0
Western Region									
Gujarat	Under-drawal	0	1	15	1	1	2	2	0
MP		0	14	3	1	1	11	0	0
Maharashtra		0	11	7	0	0	0	11	1
Chhattisgarh		9	7	0	0	0	12	0	0
Goa		16	0	0	0	1	0	0	0
Dadra and Nagar Haveli		18	0	0	0	12	0	0	0
Daman and Diu		18	0	0	0	12	0	0	0

Annexure-7.7

{As referred to in Para 7.4.5(b) & 7.4.1}

NR Imports- Statement showing inter-se distribution of power flows among the links

Sl. No.	Inter-regional corridors	Inter-regional links	2009-10		2010-11		2011-12	
			Power flow (in MUs)	Share within the corridor (%age)	Power flow (in MUs)	Share within the corridor (%age)	Power flow (in MUs)	Share within the corridor (%age)
1	WR-NR	HVDC Vindhyachal back to back line	1541.33	14.63	1573.78	15.59	1427.39	15.51
		220 kV Auraiya-Malanpur	2.16	0.02	4.21	0.04	34.23	0.37
		220 kV Ujjain-Kota	1238.58	11.75	388.49	3.85	244.49	2.66
		400KV Agra-Gwalior	5990.96	56.85	7001.37	69.35	6622.30	71.98
		400 kV Kankroli-Zerda	1764.83	16.75	1128.01	11.17	294.65	3.20
		400 kV Bhinmal-Zerda	0.00	0.00	0.00	0.00	577.02	6.27
		Sub-total	10537.86	100.00	10095.86	100.00	9200.08	100.00
		400 kV Barh-Balia	0.00	0.00	0.00	0.00	782.72	5.61
		HVDC Sasaram back to back (Bypass w.e.f. 1 December 2008)	1511.65	9.93	1359.09	9.21	929.77	6.66
		400KV Muzzafarpur-Gorakhpur	6127.18	40.27	5830.16	39.51	5491.16	39.36
2	ER-NR	220/132 kV lines	678.64	4.46	527.32	3.57	1138.56	8.16
		400 kV Patna-Balia	3733.13	24.53	4050.99	27.45	2746.95	19.69
		400 kV Biharsharif-Balia	3164.98	20.80	2988.67	20.25	2861.70	20.51
		Sub-total	15215.58	100.00	14756.23	100.00	13950.86	100.00

Annexure – 7.8

{As referred to in Para 7.4.5(d)}

Proportion of Unscheduled Interchange among total power flows through key Inter-regional Corridors during 2009-10 to 2011-12

Year	WR-NR			WR-ER			WR-SR			ER-NR		
	No. of months in which UI as a percentage of Actual Power Flow was			No. of months in which UI as a percentage of Actual Power Flow was			No. of months in which UI as a percentage of Actual Power Flow was			No. of months in which UI as a percentage of Actual Power Flow was		
	0-10%	11%-30%	31%-50%	0-10%	11%-30%	31%-50%	0-10%	11%-30%	31%-50%	0-10%	11%-30%	31%-50%
2009-10	1	5	4	2	0	0	12	6	0	1	5	0
2010-11	1	3	4	4	0	0	12	10	2	0	0	0
2011-12	2	4	2	4	0	2	8	12	0	6	4	1

Annexure- 7.9

(As referred to in para 7.4.5 (d))

Extent of Utilization of Power Transfer Capability 2012-13

(Figures in MW)

Month	WR-NR				ER-NR				ER-NER			
	Month-wise ATC	Actual Flow	Surplus Capacity (ATC – Actual Flow)	Percentage (Surplus Capacity / ATC) X100	Month-wise ATC	Actual Flow	Surplus Capacity (ATC – Actual Flow)	Percentage (Surplus Capacity / ATC) X100	Month-wise ATC	Actual Flow	Surplus Capacity (ATC – Actual Flow)	Percentage (Surplus Capacity / ATC) X100
Apr-12	1800	691.57	1108.43	61.58	2500	1366.83	1133.17	45.33	400	342.11	57.89	14.47
May-12	2000	1152.61	847.39	42.37	2700	1983.53	716.47	26.54	450	311.68	138.32	30.74
Jun-12	2000	1472.63	527.37	26.37	2800	1900.18	899.82	32.14	465	173.31	291.69	62.73
Jul-12	2000	1809.38	190.62	9.53	3700	2400.5	1299.5	35.12	455	116.17	338.83	74.47
Aug-12	2000	1265.42	734.58	36.73	4700	1782	2918	62.09	455	141.72	313.28	68.85
Sep-12	2000	1253.43	746.57	37.33	4700	1816.64	2883.36	61.35	525	125.38	399.62	76.12
Oct-12	2200	1311.9	888.1	40.37	3700	2072.86	1627.14	43.98	565	94.76	470.24	83.23
Nov-12	2200	892.46	1307.54	59.43	3200	1548.26	1651.74	51.62	465	299.82	165.18	35.52
Dec-12	1400	852.82	547.18	39.08	2700	1789.17	910.83	33.73	455	357.53	97.47	21.42
Jan-13	1500	2004.64	-	-	2050	1715.87	334.13	16.30	415	345.43	69.57	16.76
Feb-13	1500	1339.57	160.43	10.70	2400	1305.52	1094.48	45.60	415	327.38	87.62	21.11
Mar-13	1500	1602.69	-	-	2200	1332.66	867.34	39.42	365	422.04	-	-
			Surplus Month = 9				Surplus Month = 12				Surplus Month = 11	
			Congestion Month = 3				Congestion Month = 0				Congestion Month = 1	

Month	WR-ER			
	Month-wise ATC	Actual Flow	Surplus Capacity (ATC – Actual Flow)	Percentage (Surplus Capacity /ATC) X100
Apr-12	700	587.03	112.97	16.14
May-12	700	619.5	80.5	11.50
Jun-12	700	902.18	-	-
Jul-12	700	964.11	-	-
Aug-12	700	583.97	116.03	16.58
Sep-12	700	396.71	303.29	43.33
Oct-12	700	41.16	658.84	94.12
Nov-12	400	25.72	374.28	93.57
Dec-12	400	2.69	397.31	99.33
Jan-13	1100	52.42	1047.58	95.23
Feb-13	1100	23.36	1076.64	97.88
Mar-13	1100	22.85	1077.15	97.92
			Surplus Month = 10	
			Congestion Month = 2	

1. Sign ‘-’ denotes excess of Actual Flow over ATC.

2. Percentage less than 10% considered as congestion.

4. ER - SR and WR-SR not included as these are mainly HVDC Links.

Annexure – 7.10
{As referred to in Para 7.4.5 d(iii)}

**Energy Requirement *vis a vis* Energy Availability of Northern States and Net
 overdrawl or underdrawl during 2011-12**

State Name	Requirement	Availability	Deficit(-)		No. of Months in which there was Net		Remarks
	(MUs)	(MUs)	(MUs)	(%)	Over drawl	Under drawl	
Chandigarh	1,568	1,564	-4	-0.3	3	9	Nominal deficit. Generally in Under drawl mode.
Delhi	26,751	26,674	-77	-0.3	0	12	Nominal deficit. Always in Under drawl mode.
Haryana	36,874	35,541	-1,333	-3.6	10	2	Deficit and Over drawl in most of the months.
Himachal Pradesh	8,161	8,107	-54	-0.7	5	7	Nominal deficit. Under drawl in majority of months.
Jammu & Kashmir	14,250	10,889	-3,361	-23.6	6	6	High deficit. Equal pattern of Over drawl and Under drawl
Punjab	45,191	43,792	-1,399	-3.1	4	8	Deficit. Yet Under drawl in majority of months.
Rajasthan	51,474	49,491	-1,983	-3.9	12	0	Deficit. Over drawl in all the months.
Uttar Pradesh	81,339	72,116	-9,223	-11.3	9	3	High Deficit. High Over drawl.
Uttarakhand	10,513	10,208	-305	-2.9	10	2	Deficit. Generally in Over drawl mode.