

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Coram:

- 1. Dr. Pramod Deo, Chairperson**
- 2. Shri Bhanu Bhushan, Member**
- 3. Shri R. Krishnamoorthy, Member**

Petition No. 89/2008

In the matter of

Ensuring secure and reliable operation of Southern Regional Grid by maintaining the grid frequency above 49.0 Hz

And in the matter of

Southern Regional Load Despatch Centre, Bangalore **Petitioner**

Vs.

1. Transmission Corporation of Andhra Pradesh Ltd., Hyderabad
2. Karnataka Power Transmission Corporation Ltd., Bangalore
3. Tamil Nadu Electricity Board, Chennai
4. Kerala State Electricity Board, Thiruvananthapuram
5. Electricity Department, Govt. of Pondicherry, Pondicherry
6. Electricity Department, Govt. of Goa, Panaji
7. NTPC Ltd, New Delhi
8. Neyveli Lignite Corporation Ltd, Neyveli
9. Nuclear Power Corporation of India Ltd, Mumbai
10. Southern Regional Power Committee, Bangalore **Respondent**

The following were present:

Shri P. R. Raghavan, SRLDC
Shri K. Srinivasa Rao, SRPC
Shri V. Suresh, SRLDC
Shri S.K. Soonee, NRLDC
Shri.S. R. Bhat, SRPC
Shri S. N. Goel, NTPC
Shri R. Suresh, NLC
Shri Keshava Murthy, KPTCL
Shri K. N. Srinath, KPTCL
Shri P. Suresh Babu, APTRANSCO
Shri Y. L. Narasimha Rao, APTRANSCO
Shri A. Natarajan, TNEB
Shri Sathyanathan, KSEB

ORDER
(DATE OF HEARING : 12.8.2008)

This petition has been filed seeking directions to the beneficiaries in Southern Region (respondents Nos. 1 to 6) to refrain from over-drawals at low frequencies in the interest of grid security and safety and to regularly carry out necessary exercise for short-term and long-term demand estimation and to plan their demand side management to meet the consumers' load within their jurisdiction without over-drawing from the grid.

2. It has been reported that Southern Regional Grid had been experiencing low frequency since May 2008 because of extended summer peak demand and delayed monsoon in the region. Reportedly, frequency remained below 49 Hz for 5.36%, 14.48% and 35.19% of the total time during months of May and June and up to 20th of July 2008 respectively. At the hearing representative of the petitioner furnished the details of maximum over-drawals and overdrawn energy when frequency was below 49 Hz, by respondents as under:

Over-drawal below 49 Hz

	APTRANSCO		KPTCL		KSEB		TNEB	
	Maximum over-drawal (MW)	Energy overdrawn (MU)	Maximum over-drawal (MW)	Energy overdrawn (MU)	Maximum over-drawal (MW)	Energy overdrawn (MU)	Maximum over-drawal (MW)	Energy overdrawn (MU)
May, 2008	1222	1.86	302	0.64	219	0.30	963	3.99
June, 2008	788	2.70	627	1.44	507	1.04	953	3.10
July, 2008 (upto 20th)	1181	6.04	909	4.72	504	2.06	985	7.18

3. It has been pointed out that the desired load relief through operation of under-frequency relays could not be obtained when frequency was falling below 48.5 Hz, though the matter was repeatedly taken up with the constituents of the region by the petitioner and the Member-Secretary, SRPC.

4. A perturbing aspect of the present case that was presented by the representative of the petitioner was that some of the State utilities are reported to be over-drawing from the grid at frequency below 49 Hz. and are also exporting power on Short Term Open Access(hereinafter "STOA") basis outside the region. The representative of the petitioner brought to our notice that respondent No. 4, after requisitioning liquid fuel generation had been selling power to the utilities outside the region and simultaneously over-drawing from the grid, thereby pulling down the frequency. He presented before us the data collated on weekly basis. On the contrary, representative of respondent No. 4 submitted that it had been selling power only during off-peak hours and even that had been stopped completely. In view of the contradiction, the petitioner was directed to give, 15 minute block-wise and day-wise details to establish its point with a copy to respondent No. 4, who in turn was permitted to file reply.

5. The petitioner vide letter dated 14.8.2008 has submitted following details in a CD for the month of July 2008 showing over-drawals by respondents Nos. 1 to 4, under intimation to them:

(a) Daily (15 minutes block wise) data and corresponding graphs depicting regional frequency, STOA transaction, Power Exchange transactions and UI,

(b) Statement of over-drawal, STOA and Power exchange transactions in MUs below 49 Hz, and

(c) Details of export on STOA of the regional constituents.

6. The petitioner has also clarified that the entire data is based on Special Energy Meters (SEMs) output and the STOA/Power Exchange values are taken from finally implemented schedule. As per SEM specification, the frequency below 49.02 Hz (and even below 49.0 Hz) is recorded as 49.0 Hz and, therefore, the data furnished indicates over-drawals at the frequency of 49.0 Hz even when such over-drawals are at frequency below 49.0 Hz.

7. No reply has been filed by respondent No. 4.

8. From the data submitted by the petitioner, it is seen that respondents Nos. 1 to 4 had, on many occasions, over-drawn electricity at frequency below 49 Hz. The details of time block wise over-drawals by these respondents culled out from the data submitted by the petitioner are summarized in Annexures I, II, III and IV, for 4.7.2008, 13.7.2008, 19.7.2008 and 25.7.2008 respectively at frequency of 49.02 Hz and below. Besides, the state of over-drawal for the entire month of July has been consolidated in Annexure V. The data collated at the Annexures

reveals that, respondents Nos. 1 to 4 are *prima facie* found to have violated paras 5.4.2(a) and 6.4.4 of the Indian Electricity Grid Code (hereinafter "IEGC") which are extracted hereunder:

"5.4.2 Manual Demand Disconnection

(a) As mentioned elsewhere, the constituents shall endeavour to restrict their net drawal from the grid to within their respective drawal schedules whenever the system frequency is below 49.5 Hz. When the frequency falls below 49.0 Hz, requisite load shedding (manual) shall be carried out in the concerned State to curtail the over-drawal."

"6.4 Demarcation of responsibilities

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4. Provided that the States, through their SLDCs, shall always endeavour to restrict their net drawal from the grid to within their respective drawal schedules, whenever the system frequency is below 49.5 Hz. When the frequency falls below 49.0 Hz, requisite load shedding shall be carried out in the concerned State(s) to curtail the over-drawal."

9. In addition, the Commission has issued directions time and again, to the grid constituents impressing upon them the need to maintain the safety and stability of the grid. The following extract from the Commission's order dated 15.1.2007 in Petition No. 145/2006 is but one such instance specifically addressed to the constituents of Southern Region, respondents 1 to 4 included:

"8. The Commission would like to make it clear that all constituents of the Southern Region have a statutory responsibility to maintain the safety and stability of the Regional Grid in accordance with the provisions of the IEGC. Failure on the part of any of the constituents to comply with the Grid Code will attract severe penal action as provided in the Act. It is, therefore, directed that the petitioner shall watch the conduct of the constituent States of the region for the next ten days i.e. till 21.1.2007 and submit a report to the Commission by 25.1.2007 for initiating appropriate proceedings against the defaulters. We also direct ED (SO & NRLDC), POWERGRID to deliberate the issue of enhancement of the UI prices in

consultation with the RLDCs and SLDCs and submit a consolidated proposal to the Commission by 25.1.2007.”

10. Under these circumstances, we are *prima facie* of the opinion that respondents Nos. 1 to 4 have made themselves liable for penal action on account of non-compliance with the provisions of paras 5.4.2(a) and 6.4.4 of the IEGC, extracted above and also the directions of the Commission. Accordingly, respondents Nos. 1 to 4 are hereby directed to show cause, latest by 10.9.2008, as to why penalty under Section 142 of the Electricity Act, 2003, be not imposed on them.

11. List the case on 11.9.2008 for further directions.

Sd/=
(R. KRISHNAMOORTHY)
MEMBER

Sd/=
(BHANU BHUSHAN)
MEMBER

Sd/=
(DR. PRAMOD DEO)
CHAIRPERSON

New Delhi dated 4th September 2008

Annexure-I

Statement of Over-drawal at frequency below 49.02 Hz as on 4.7.2008

Block. No.	APTRANSCO				KPTCL			KSEB			TNEB		
	Freq (Hz)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)
1	49	1541	1641	100	770	786					1846	1988	142
2	49	1541	1803	262	766	758					1827	1960	133
3	49	1541	1707	166	766	840	74				1810	1966	157
4	49	1541	1602	60	766	920	154				1800	1962	162
5	49	1551	1629	78	769	905	136				1827	1948	121
6	49	1551	1635	84	769	887	118				1827	1977	150
7	49	1551	1649	98	769	867	99				1827	1991	164
8	49	1550	1647	98	768	813					1827	2078	251
9	49	1625	1802	177	738	725					1836	2094	259
10	49	1625	1753	127	738	763					1836	2033	198
11	49				738	805	67	413	468	54	1836	2034	198
12	49				738	761		413	468	54	1835	2079	244
13	49	1625	1788	163	738	744		413	478	65	1835	2109	274
14	49	1625	1955	330	738	771					1835	2044	209
15	49	1625	1904	279	738	777					1835	2090	255
16	49	1624	1856	232	737	830	93				1835	2107	271
17	49	1624	1746	123	737	893	156	413	459	46	1840	2012	173
18	49	1624	1725	102	737	942	206	413	479	66	1840	2032	192
19	49	1624	1753	130	737	944	207	413	489	76	1840	2034	194
20	49	1624	1834	210	737	961	225	413	484	71	1840	2000	161
22	49	1535	1805	269	737	1005	268	413	572	159	1618	1893	275
23	49	1535	1805	269	737	1057	320	413	527	114	1637	1907	270
24	49	1535	1665	129	737	997	260	413	536	123	1657	1834	178
26	49	1554	1674	120	773	952	179	415	516	102	1679	2017	339
27	49	1554	1700	146	773	952	179	415	490	76	1679	2081	403
28	49	1557	1703	146	775	980	206				1679	1904	226
29	49	1510	1814	303	768	828	60	415	516	101	1651	1888	237
30	49	1510	1926	416	768	791		415	454	40	1651	1958	307
31	49	1509	1871	362	767	883	117	414	463	49	1649	2089	440
32	49	1509	1811	302	767	898	131	414	459	45	1649	2227	578
33	49	1436	1710	274	766	980	214	414	452	38	1636	2330	694
34	49	1436	1748	312	766	906	140	414	497	84	1636	2418	782
36	49	1433	1620	187	763	909	147	412	541	128	1636	2394	758
37	49	1433	1624	192	763	933	170	412	549	137	1636	2379	743
38	49	1433	1661	228	763	905	142	412	490	77	1636	2250	614
39	49	1433	1802	369	763	909	146	412	562	150	1636	2304	668
40	49	1442	1856	414	771	802		419	553	134	1635	2230	594
41	49	1445	1933	488	774	790		420	530	110	1640	2326	686
42	49	1445	1874	429	774	801		420	552	132	1640	2165	525
43	49	1451	1871	420				423	627	204	1648	2010	362
44	49	1451	1977	526				423	630	207	1648	1981	333
45	49	1451	2034	583				423	628	206	1647	2095	448
46	49	1451	1944	493	780	841	62	423	556	133	1596	2229	633
47	49	1451	1701	251	780	926	146	423	580	157	1510	2307	797
50	49	1445	1598	153	775	881	105	421	600	179	1503	2082	579
51	49	1445	1702	256				371	526	156	1598	2023	425

Block. No.	APTRANSCO				KPTCL			KSEB			TNEB		
	Freq (Hz)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)
52	49	1441	1830	389				367	451	84	1606	2049	443
55	49	1431	1942	511	763	857	94	359	475	116	1628	2028	401
56	49	1431	1929	498	763	906	143	359	463	104	1633	1847	214
58	49	1431	2127	695	763	849	86	359	511	152	1637	1715	77
59	49	1431	2011	580	763	947	184	359	553	194	1637	1737	100
60	49	1428	2059	632	759	846	86	357	563	206	1632	1723	91
67	49	1428	2223	796	759	896	137	357	517	160			
68	49	1428	2144	716	759	874	115	357	484	127			
70	49	1364	1959	595	757	847	90	357	445	88	1679	1777	97
71	49	1364	1898	534	757	820	63	357	489	132	1682	1814	132
72	49	1364	1941	577	757	841	84	357	523	166	1686	1865	180
76	49	1301	1418	117				561	646	85	1728	1813	84
77	49	1301	1617	316	765	852	87	561	683	122	1692	1750	59
78	49	1301	1504	203	765	959	194	561	740	179	1689	1789	100
79	49	1301	1506	204	765	853	87	561	681	120	1689	1846	157
80	49	1301	1429	128				561	633	72	1689	1862	173
81	49							561	646	85	1688	1801	113
82	49							557	674	117	1688	1784	96
83	49							557	716	159	1688	1803	116
84	49							557	724	167	1688	1773	85
85	49	1303	1519	216				563	692	129			
86	49	1313	1507	194	776	821	45	573	649	76	1688	1781	93
87	49	1321	1445	124	783	840	57	581	648	67	1688	1789	102
88	49	1329	1402	73							1688	1772	85
89	49	1405	1611	206				545	712	167	1590	1666	76
90	49	1411	1524	113	799	879	80	552	629	78	1590	1687	97
91	49	1414	1487	73							1590	1732	142
92	49	1422	1555	133				565	660	95	1590	1707	117
93	49	1504	1574	70	813	877	64	569	635	66			
94	49	1512	1574	62							1886	1989	103
95	49	1519	1592	73							1886	1980	95
96	49	1525	1630	105				589	637	47	1886	2003	118

Note:

1. The time blocks in which average frequency was 49.02 Hz or above are not indicated in the table.
2. For the time blocks left empty, for a utility, there was no significant overdrawals by the concerned utility.

Annexure-II**Statement of Over-drawal at frequency below 49.02 Hz as on 13.7.2008**

Block. No.	APTRANSCO				KPTCL			KSEB			TNEB		
	Freq (Hz)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)
1	49	1484	2062	578	823	1040	217	620	735	115	1862	2088	226
2	49	1484	1982	498	823	1031	208	620	745	125	1862	2012	149
3	49	1484	1854	370	823	1082	259	620	813	193	1862	2085	223
4	49	1484	1955	471	823	1106	283	620	845	225	1862	2167	305
5	49	1692	2057	365	822	1133	311	643	858	215	1860	2138	277
13	49	1773	2640	867	792	1131	339	645	802	157	1863	2378	516
14	49	1773	2773	1000	792	1129	336	645	768	123	1863	2345	482
15	49	1773	2757	983	792	1153	361	645	788	143	1863	2319	457
16	49	1773	2772	999	792	1175	383	645	801	156	1863	2286	424
17	49	1751	2589	838	792	1228	435	645	834	189	1863	2408	546
18	49	1751	2494	742	792	1263	471	645	826	181	1863	2468	606
19	49	1751	2463	712	792	1251	459	645	800	155	1863	2518	655
20	49	1751	2385	633	792	1303	511	645	810	165	1863	2525	663
23	49	1707	2682	975	792	1265	472	645	897	252	1579	2161	582
24	49	1707	2542	835	792	1226	433	645	849	204	1579	2179	600
26	49	1527	2555	1028	827	1153	326	647	808	161	1584	2195	612
28	49	1527	2088	561	827	1289	461	647	827	180	1584	2449	866
31	49	1513	2205	692	823	1272	449	571	883	311	1577	2495	918
35	49	1504	2354	850	823	1177	354	571	792	221	1577	2462	885
41	49	1517	2198	680	831	1176	345	575	795	220	1590	2463	873
42	49	1517	2289	772	831	1008	177	575	752	177	1590	2253	663
47	49	1601	2228	627	839	1083	245	577	724	148	1601	2157	556
48	49	1601	2076	475	839	1128	289	577	685	108	1601	2123	522
50	49	1596	1889	293	834	1100	267	574	751	177	1593	2429	836
51	49	1596	1941	346	834	1096	262	574	750	176	1593	2385	792
52	49	1596	2050	455	834	1068	235	574	766	192	1593	2364	771
55	49	1602	2204	602	830	1065	236	572	774	202	1587	2188	601
56	49	1602	2158	556	830	1057	228	572	790	218	1587	2146	559
58	49	1757	2314	557	830	1028	198	598	747	149	1588	2042	453
59	49	1757	2428	672	830	1066	236	598	730	132	1588	1986	398
77	49	1507	2260	753	834	1128	294	579	1023	444	1663	2138	475
79	49	1507	1842	335	834	1160	325	579	958	379	1663	1993	330
80	49	1481	1770	289	834	1076	241	579	858	279	1663	1924	262
81	49	1470	1612	143	834	1000	165	579	808	230	1663	1901	238

Block No.	Freq (Hz)	APTRANSCO			KPTCL			KSEB			TNEB		
		Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)	Schedule (MW)	Actual Drawal (MW)	Over-drawal (MW)
82	49				834	974	139	579	794	215	1663	1868	205
83	49				834	944	110	579	689	110	1663	1850	188
84	49				834	860	26	579	656	77	1663	1793	131
85	49	1470	1736	266	834	889	55	579	653	75	1663	1723	60
86	49	1470	1774	304	834	930	95	579	649	71	1663	1756	93
87	49	1470	1724	254	834	937	103	579	664	86	1663	1789	126
88	49	1470	1665	195	834	946	112	579	654	76	1663	1793	130
89	49	1461	1644	183	830	990	160	625	711	86	1567	1716	149
90	49	1461	1692	231	830	990	160	625	654	30	1567	1731	164
91	49	1461	1569	108	830	1030	200	625	659	35	1567	1719	153
92	49	1461	1695	234	830	985	155				1567	1727	160
93	49	1457	1632	175	827	997	170				1736	1767	31
94	49	1457	1548	90	827	931	105				1736	1856	120
96	49	1457	1699	241	825	886	61	622	729	107	1733	1880	147

Note:

1. The time blocks in which average frequency was 49.02 Hz or above are not indicated in the table.
2. For the time blocks left empty, for a utility, there was no significant overdrawals by the concerned utility.

Annexure-III

Statement of Over-drawal at frequency below 49.02 Hz as on 19.7.2008

Block No.	KPTCL				KSEB			APTRANSCO		
	Freq (Hz)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)
1	49	1034	1363	330				1748	2547	799
2	49	1034	1264	231				1748	2534	787
3	49	1034	1200	166				1748	2428	680
4	49	1034	1215	182				1748	2348	601
5	49	1043	1318	275				1913	2300	387
6	49	1043	1411	368				1913	2291	378
9	49	1011	1444	433				1952	2292	340
11	49	1011	1407	397				1952	2368	415
17	49	1014	1412	398				2056	2589	533
18	49	1014	1227	213				2056	2702	646
19	49	1014	1225	211				2056	2689	633
20	49	1014	1162	147	720	765	45	2056	2767	711
21	49	1014	1224	210	720	804	84	2008	2760	752
22	49	1014	1213	199	720	746	26	2008	2755	747
23	49	1014	1232	218	720	767	47	1990	2552	562
24	49	1014	1373	359	720	764	44	1990	2226	236
25	49	1042	1366	323	709	747	39	2005	2020	16
27	49	1042	1188	146	709	755	46	2005	2150	146
28	49	1042	1215	172	709	731	23	2005	2078	74
30	49	1039	1210	172	708	767	59			
35	49	1021	1298	277	632	717	86	1933	2084	151
39	49	1021	1301	280	632	741	109	1837	2085	249
40	49	1025	1209	183	634	688	54	1841	2068	227
42	49	1028	1272	244	635	646	11	1605	1731	126
43	49	1034	1182	148	638	700	62			
44	49	1034	1156	121	638	714	76			
45	49	1034	1135	101	638	730	92			
46	49	1034	1161	126	638	722	84	1611	1674	63
47	49	1034	1171	136	638	699	61	1611	1704	93
50	49	1031	1417	386	637	714	77	1609	1803	195
51	49	1031	1355	323	637	698	61	1609	1774	165
52	49	1031	1304	272	637	681	44	1609	1797	188
55	49	1028	1245	217				1606	2058	453
56	49	1028	1216	187	635	696	61	1606	1955	349
58	49	1028	1334	306	635	753	118	1606	1765	159
59	49	1028	1295	266	635	768	133	1606	1721	115
60	49	1025	1247	222	634	719	85	1602	1665	63
62	49	1025	1179	154	634	707	73	1602	1619	17
63	49	1025	1208	183	634	699	65	1602	1644	43
64	49	1022	1189	167	631	704	73	1599	1635	36
67	49	1021	1282	260	630	712	82	1599	1649	50
68	49	1021	1214	193	630	691	61	1599	1723	125
70	49	1004	1309	305	542	643	101	1488	1770	282
76	49	995	1064	69	632	722	90	1478	1495	17
77	49	1037	1109	73	632	720	88			
78	49	1037	1094	57	632	659	27	1540	1659	119
79	49	1037	1142	106	632	692	60	1540	1619	79
80	49	1037	1169	132	632	672	40	1540	1585	44

Block No.	Freq (Hz)	KPTCL			KSEB			APTRANSCO		
		Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)
81	49	1038	1116	78	632	644	12	1540	1583	43
82	49	1038	1090	52	632	657	25	1540	1568	28
83	49	1038	1052	14						
84	49	1038	1079	40	632	664	32			
85	49	1033	1136	103	629	652	23			
86	49	1021	1111	90	623	647	24			
87	49	1021	1054	32	623	657	34			
88	49	1021	1092	71	623	645	22			
89	49	1057	1160	103	562	599	37			
90	49	1057	1132	76	562	595	32			
91	49	1057	1138	82	562	578	15			
92	49	1057	1179	122						
93	49	1073	1160	87						
94	49	1073	1322	248						
95	49	1073	1317	243						
96	49	1073	1277	204						

Note:

1. The time blocks in which average frequency was 49.02 Hz or above are not indicated in the table.
2. For the time blocks left empty, for a utility, there was no significant overdrawals by the concerned utility.

Annexure-IV**Statement of Over-drawal at frequency below 49.02 Hz as on 25.7.2008**

Block.No.	APTRANSCO				KPTCL			KSEB		
	Freq (Hz)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)
1	49	1346	1607	261	784	838	53	490	516	27
2	49	1346	1394	48	784	846	62	490	515	25
3	49	1346	1485	139	784	854	70	490	553	64
4	49	1346	1481	135	784	911	127	490	560	70
5	49	1408	1578	170	795	892	97	490	549	59
6	49	1408	1594	186	795	929	134	490	557	67
8	49	1434	1846	412	794	920	126	490	532	42
9	49	1467	1947	480	767	894	127	490	520	31
10	49	1467	1953	486	767	926	159	490	511	21
14	49	1451	1988	537	754	919	166	474	506	32
15	49	1451	1892	441	754	997	244	474	514	40
16	49	1451	1853	402	754	979	226	474	502	28
17	49	1451	1683	231	754	927	173	474	517	43
18	49	1467	1683	217	767	927	160	490	534	45
19	49	1483	1674	192	780	919	139	505	556	51
20	49	1499	1645	146	793	907	114	520	574	54
21	49	1472	1513	41	793	997	204	520	639	119
22	49	1472	1548	76	793	1038	245	520	602	81
23	49	1472	1548	76	793	1098	304	520	553	33
24	49	1472	1585	113	793	1262	468	520	555	35
26	49	1477	2181	703	805	1278	473	499	590	92
27	49	1477	2016	538	805	1210	405	499	603	105
28	49	1477	1944	467	805	1153	348	499	575	76
29	49	1368	1778	409	793	1066	273	498	584	86
30	49	1368	1754	386	793	854	60	498	550	53
31	49				792	858	66	497	556	59
32	49	1367	1417	50	792	856	64	497	538	41
33	49	1367	1610	243	787	875	88	467	531	65
39	49	1370	1845	474	789	886	97	393	462	69
40	49	1374	1938	564	792	919	127	395	449	55
51	49	1382	2187	805	800	1254	454	401	456	55
56	49	1367	2203	835	789	1268	480	393	493	100
59	49	1361	2022	662	785	1250	466	390	457	67
66	49	1360	1883	523	784	1098	315	390	491	101

Block.No.	APTRANSCO				KPTCL			KSEB		
	Freq (Hz)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)	Schedule (MW)	Actual Drawal (MW)	Overdrawal (MW)
67	49	1360	1891	531	784	1059	275	390	461	71
68	49	1360	1768	408	784	1074	290	390	453	63
70	49	1295	1616	321	750	1028	278	289	380	91
71	49	1295	1581	286	750	952	203	289	344	55
72	49	1266	1519	253	724	955	231	260	354	94
73	49	1236	1422	186	701	925	224	265	368	103
76	49	1226	1381	155				387	456	69
77	49	1293	1347	54				387	437	51
81	49	1259	1362	103				384	396	12
82	49	1259	1369	110						
83	49				692	795	103	384	395	10
87	49	1250	1282	32	686	824	138	331	425	94
89	49	1231	1318	87	706	865	159	249	479	231
90	49	1231	1500	269	706	720	15	249	328	79
91	49	1238	1446	208	711	793	82	255	270	15
92	49	1238	1494	256	711	919	208	255	275	19

Note:

1. The time blocks in which average frequency was 49.02 Hz or above are not indicated in the table.
2. For the time blocks left empty, for a utility, there was no significant overdrawals by the concerned utility.

DAY-WISE CONSOLIDATED STATEMENT OF OVER-DRAWAL AT FREQUENCY 49.02 HZ OR BELOW**JULY 2008**

Date	% of time frequency remained at 49.02 Hz or below	APTRANSCO	KPTCL	KSEB	TNEB
		Over Drawal (MU)	Over Drawal (MU)	Over Drawal (MU)	Over Drawal (MU)
1-Jul-08	19.60	1.64	0.31	0.46	1.83
2-Jul-08	23.90	1.48	0.63	0.74	1.74
3-Jul-08	40.00	5.02	1.84	0.88	4.59
4-Jul-08	35.00	4.29	1.48	1.55	4.00
5-Jul-08	42.20	2.40	1.39	1.32	3.36
6-Jul-08	6.00	0.71	0.38	0.32	0.33
7-Jul-08	6.30	0.96	0.57	0.54	0.70
8-Jul-08	18.30	1.19	0.79	1.45	1.45
9-Jul-08	10.40	1.17	0.70	0.96	0.77
10-Jul-08	15.80	0.66	0.74	0.79	1.24
11-Jul-08	22.40	1.31	1.40	0.76	0.93
12-Jul-08	23.20	2.04	1.91	0.92	1.98
13-Jul-08	22.90	5.99	3.13	1.92	5.06
14-Jul-08	67.30	6.98	6.45	2.53	9.12
15-Jul-08	91.40	3.59	3.00	0.77	2.58
16-Jul-08	78.50	3.59	0.72	0.38	1.52
17-Jul-08	72.90	2.06	0.91	0.57	0.86
18-Jul-08	61.70	3.29	2.66	0.72	0.83
19-Jul-08	20.60	3.24	3.07	0.69	0.23
20-Jul-08	25.30	0.90	2.40	0.30	0.80
21-Jul-08	34.30	1.45	2.95	1.55	0.27
22-Jul-08	65.70	1.51	2.19	1.04	0.92
23-Jul-08	55.20	2.23	2.11	0.81	0.19
24-Jul-08	22.90	2.54	2.92	0.95	0.08
25-Jul-08	21.30	3.68	2.33	0.76	0.00
26-Jul-08	17.00	2.36	1.66	0.28	0.02
27-Jul-08	2.20	0.75	0.57	0.12	0.06
28-Jul-08	1.50	0.17	0.00	0.07	0.00
29-Jul-08	10.30	0.89	0.17	0.12	0.05
30-Jul-08	27.10	4.97	1.02	0.58	0.10
31-Jul-08	19.20	4.71	1.11	0.20	0.02
TOTAL		77.76	51.52	25.05	45.61
MAX	91.40	6.98	6.45	2.53	9.12
MIN	1.50	0.17	0.00	0.07	0.00
AVERAGE	31.63	2.51	1.66	0.81	1.47