

पॉवर सिस्टम ऑपरेशन कार्पोरेशन लिमिटेड

(पब्लिसिड की पूर्ण स्वामित्व प्राप्त सहायक कंपनी)



उत्तरी क्षेत्रीय भार प्रेषण केंद्र

CIN: U40105DL2009GOI188682

Power Supply Position in Northern Region for 09.09.2015
Date of Reporting : 10.09.2015

I. Regional Availability/Demand:

Evening Peak (20:00 Hrs) MW				Off Peak (03:00 Hrs) MW				Day Energy (Net MU)	
Demand Met	Shortage	Requirement	Freq* (Hz)	Demand Met	Shortage	Requirement	Freq* (Hz)	Demand Met	Shortage
49216	3521	52737	49.86	46041	5060	51101	49.90	1113.1	98.68

* Half hourly (two 15 minutes block-one block each before and after the designated time) average frequency

II. A. State's Load Details (At States periphery) in MUs:

UI [OD:(+ve), UD:(-ve)]

State	State's Control Area Generation (Net MU)				Drawal Schedule (Net MU)	Actual Drawal (Net MU)	UI (Net MU)	Consumption (Net MU)	Shortages* (MU)
	Thermal	Hydro	Renewable/others \$	Total					
Punjab	99.45	20.97		120.42	98.85	97.98	-0.87	218.39	0.00
Haryana	46.65	0.74		47.39	131.58	131.89	0.31	179.28	0.37
Rajasthan	139.07	4.16	6.20	149.43	85.16	85.24	0.08	234.67	0.00
Delhi	20.15			20.15	86.22	83.94	-2.27	104.09	0.09
UP	135.57	12.03		147.60	117.81	126.48	8.66	274.07	81.29
Uttarakhand		18.51		18.51	13.56	16.00	2.44	34.52	6.60
HP		17.13		17.13	6.04	8.09	2.05	25.22	1.57
J & K		17.18	0.00	17.18	17.78	19.78	2.00	36.96	8.76
Chandigarh				0.00	5.50	5.85	0.27	5.85	0.00
Total	440.88	90.72	6.20	537.80	562.49	575.26	12.68	1113.06	98.68

* Shortage furnished by the respective constituent. \$ Others include UP Co-generation and JK Diesel

II. B. State's Demand Met in MWs:

UI/OA/PX [OD/Import: (+ve), UD/Export: (-ve)]

State	Evening Peak (20:00 Hrs) MW				Off Peak (03:00 Hrs) MW				# Max(hourly) Demand Met of Day (MW)
	Demand Met	Shortage	UI	STOA/PX transaction	Demand Met	Shortage	UI	STOA/PX transaction	
Punjab	10030	0	-33	725	8473	0	-87	703	10030
Haryana	7894	548	-458	1866	7788	0	135	1683	8508
Rajasthan	9445	0	45	231	10344	0	-38	1403	10759
Delhi	4610	0	-69	579	4367	0	-31	222	5059
UP	11947	2215	81	184	11389	4465	513	313	11947
Uttarakhand	1793	260	105	98	1294	375	117	-188	1825
HP	1241	0	-47	-1084	939	0	173	-1005	1261
J&K	1990	498	172	-388	1247	220	16	-512	1990
Chandigarh	265	0	-28	0	201	0	1	0	292
Total	49216	3521	-231	2201	46041	5060	799	2620	49216

* STOA figures are at sellers boundary & PX figures are at regional boundary.

figures may not be at simultaneous hour.

Diversity is 1.05

III. Regional Entities :

UI [OG:(+ve), UG:(-ve)]

Entity	Station/ Constituent	Inst. Capacity (Effective) MW	Declared Capacity(MW)	Peak MW (Gross)	Off Peak MW (Gross)	Energy (Net MU)	Average Sentout(MW)	Schedule Net MU	UI Net MU
	Rihand I STPS (2*500)	1000	852	975	997	20.87	870	20.45	0.42
	Rihand II STPS (2*500)	1000	470	521	513	11.74	489	11.28	0.46
	Rihand III STPS (2*500)	1000	480	495	513	11.76	490	11.52	0.24
	Dadri I STPS (4*210)	840	600	629	613	13.77	574	14.32	-0.55
	Dadri II STPS (2*490)	980	970	1002	1020	21.99	916	23.04	-1.05
	Unchahar I TPS (2*210)	420	326	0	429	7.57	315	7.76	-0.20
	Unchahar II TPS (2*210)	420	400	427	442	9.43	393	9.51	-0.08
	Unchahar III TPS (1*220)	210	200	205	222	4.76	198	4.78	-0.02
	ISTPP (Jhajjar) (3*500)	1500	1436	955	1004	21.48	895	22.07	-0.59
	Dadri GPS (4*130.19+2*154.51)	830	811	335	306	7.76	323	8.13	-0.37
	Anta GPS (3*88.71+1*153.2)	419	391	353	320	8.51	355	8.62	-0.11
	Auraiya GPS (4*111.19+2*109.30)	663	635	0	0	0.00	0	0.12	-0.12
	Dadri Solar	5	1	0	0	0.00	0	0.03	-0.03
	Unchahar Solar	10	3	0	0	0.02	1	0.06	-0.04
	Singrauli Solar	15	3	0	0	0.07	3	0.06	0.00
	KHEP	800	845	846	424	10.49	437	10.88	-0.39
	Sub Total (A)	12112	10180	8779	8343	193	8059	195	-1
B. NPC	NAPS (2*220)	440	379	421	425	9.14	381	9.10	0.04
	RAPS- B (2*220)	440	187	210	213	4.48	187	4.49	-0.01
	RAPS- C (2*220)	440	390	430	435	9.26	386	9.36	-0.10
	Sub Total (B)	1320	956	1061	1073	22.87	953	22.94	-0.07
C. NHPC	Chamera I HPS (3*180)	540	534	468	0	4.68	195	4.50	0.18
	Chamera II HPS (3*100)	300	300	305	203	4.76	198	4.65	0.11
	Chamera III HPS (3*77)	231	229	234	82	3.12	130	3.00	0.12
	Bairasuli HPS(3*60)	180	179	183	63	1.39	58	1.31	0.08
	Salal-HPS (6*115)	690	439	669	460	11.44	477	10.65	0.79
	Tanakpur-HPS (3*40)	94	89	94	95	2.26	94	2.14	0.12
	Uri-I HPS (4*120)	480	204	349	207	5.55	231	4.91	0.64
	Uri-II HPS (4*60)	240	128	179	115	3.15	131	3.07	0.08
	Dhauliganga-HPS (4*70)	280	280	286	145	4.50	187	4.36	0.14
	Dulhasti-HPS (3*130)	390	386	401	395	9.36	390	9.26	0.09
	Sewa-II HPS (3*40)	120	119	0	0	0.62	26	0.45	0.17
	Parbati 3 (4*130)	520	390	397	0	1.93	80	1.84	0.09
	Sub Total (C)	4065	3278	3565	1765	53	2198	50	3
D. SJVNL	NJPC (6*250)	1500	1605	1624	1045	30.52	1272	30.22	0.30
	Rampur HEP (6*68.67)	412	372	375	300	8.01	334	7.79	0.22
	Sub Total (D)	1912	1977	1999	1345	38.53	1606	38.01	0.52
E. THDC	Tehri HPS (4*250)	1000	1080	807	0	5.96	248	5.80	0.16
	Koteshwar HPS (4*100)	400	100	102	98	2.54	106	2.40	0.14
	Sub Total (E)	1400	1180	909	98	8.49	354	8.20	0.29
F. BBMB	Bhakra HPS (2*108+3*126+5*157)	1379	981	1462	668	23.56	981	23.53	0.02
	Dehar HPS (6*165)	990	579	825	560	13.86	578	13.90	-0.04
	Pong HPS (6*66)	396	313	384	186	7.42	309	7.51	-0.09
	Sub Total (F)	2765	1873	2671	1414	44.83	1868	44.94	-0.11
G. IPP(s)/JV(s)	ALLAIN DUHANGAN HPS(IPP) (2*96)	192	0	108	46	1.43	59	1.34	0.08
	KARCHAM WANGTOO HPS(IPP) (4*250)	1000	0	1000	600	17.66	736	17.75	-0.09
	Malana Stg-II HPS (2*50)	100	0	109	41	1.45	60	1.36	0.08
	Shree Cement TPS (2*150)	300	0	146	147	3.49	145	4.14	-0.66
	Budhil HPS(IPP) (2*35)	70	0	75	0	0.98	41	0.96	0.02
	Sub Total (G)	1662	0	1439	834	25.00	1042	25.55	-0.55
H. Total Regional Entities (A-G)		25237	19444	20423	14872	385.89	16079	384.62	1.27

I. State Entities	Station	Effective Installed Capacity (MW)	Peak MW	Off Peak MW	Energy(MU)	Average(Sent out MW)
Punjab	Guru Gobind Singh TPS (Ropar) (6*210)	1260	1160	1160	26.47	1103
	Guru Nanak Dev TPS(Bhatinda) (2*110+2*120)	460	275	305	6.25	260
	Guru Hargobind Singh TPS(L.mbt) (2*210+2*250)	920	937	936	20.39	850
	Goindwal(GVK)		0	0	0.00	0
	Rajpura (2*700)	1400	1392	1386	31.84	1327
	Talwandi Saboo (1*660)	660	673	661	14.49	604
	Thermal (Total)	4700	4437	4448	99.45	4144
	Total Hydro	1000	1035	827	20.97	874
	Total Punjab	5700	5472	5275	120.42	5017
	Haryana	Panipat TPS (4*110+2*210+2*250)	1367	463	460	10.46
DCRTPP (Yamuna nagar) (2*300)		600	277	557	8.26	344
Faridabad GPS (NTPC)		432	0	0	0.00	0
RGTPP (khedar) (IPP) (2*600)		1200	570	563	13.49	562
Magnum Diesel (IPP)		25	0	0	0.00	0
Jhajjar(CLP) (2*660)		1320	618	610	14.43	601
Thermal (Total)		4944	1928	2190	46.65	1944
Total Hydro		62	29	30	0.74	31
Total Haryana		5006	1957	2220	47.39	1974
Rajasthan		kota TPS (2*110+2*195+3*210)	1240	1040	1030	23.98
	suratgarh TPS (6*250)	1500	1131	1042	25.19	1049
	Chabra TPS (4*250)	1000	241	185	5.38	224
	Dholpur GPS (3*110)	330	88	87	2.13	89
	Ramgarh GPS (1*37.5 + 1*35.5 +2*37.5 +1*110 +1*50)	271	206	212	4.70	196
	RAPS A (NPC) (1*100+1*200)	300	159	160	3.41	142
	Barsingar (NLC) (2*125)	250	178	179	4.14	172
	Giral LTPS (2*125)	250	0	0	0.00	0
	Rajwest LTPS (IPP) (8*135)	1080	720	719	16.73	697
	VS LIGNITE LTPS (IPP) (1*135)	135	0	0	0.00	0
	Kalisindh Thermal(2*600)	1200	989	1008	24.19	1008
	Kawai(Adani) (2*660)	1320	1219	1235	29.24	1219
	Thermal (Total)	8876	5971	5857	139	5795
	Total Hydro	550	134	183	4.16	173
	Wind power	3214	14	605	5.58	233
	Biomass	99	25	25	0.62	26
	Solar	730	0	0	0.00	0
	Renewable/Others (Total)	4043	39	630	6.20	258
	Total Rajasthan	13469	6144	6670	149.43	6226
	UP	Anpara TPS (3*210+2*500)	1630	1402	1275	30.54
Obra TPS (2*50+2*94+5*200)		1194	460	465	10.95	456
Paricha TPS (2*110+2*220+2*250)		1140	635	648	15.29	637
Panki TPS (2*105)		210	0	0	0.00	0
Harduaganj TPS (1*60+1*105+2*250)		665	420	414	10.17	424
Tanda TPS (NTPC) (4*110)		440	185	185	4.57	191
Roza TPS (IPP) (4*300)		1200	1107	1107	26.63	1110
Anpara-C (IPP) (2*600)		1200	1087	1085	25.95	1081
Bajaj Energy Pvt.Ltd(IPP) TPS (10*45)		450	405	403	9.21	384
Anpara-D(1*500)		500	59	0	1.07	45
Lalitpur TPS(1*660)		660	0	0	0.00	0
Thermal (Total)		9289	5760	5582	134	5599
Vishnuparyag HPS (IPP)(4*110)		440	0	0	0.00	0
Alaknanda(4*82.5)		330	270	290	6.96	290
Other Hydro		527	213	241	5.07	211
Cogeneration		981	50	50	1.20	50
Total UP		11567	6293	6163	148	6150
Uttarakhand	Total Hydro	1398	804	722	18.51	771
	Total Uttarakhand	1398	804	722	18.51	771
Delhi	Rajghat TPS (2*67.5)	135	0	0	0.00	0
	Delhi Gas Turbine (6x30 + 3x34)	282	34	34	0.78	33
	Prahati Gas Turbine (2x104+ 1x122)	330	264	265	6.39	266
	Rithala GPS (3*36)	95	0	0	0.00	0
	Bawana GPS (4*216+2*253)	1370	250	252	6.06	253
	Badarpur TPS (NTPC) (3*95+2*210)	705	324	332	6.93	289
	Thermal (Total)	2917	872	883	20.15	840
	Total Delhi	2917	872	883	20.15	840
HP	Baspa HPS (IPP) (3*100)	300	218	326	5.86	244
	Malana HPS (IPP) (2*43)	86	88	34	1.14	47
	Other Hydro	878	457	438	10.14	422
	Total HP	1264	763	798	17.13	714
J & K	Baqilhar HPS (IPP) (3*150)	450	586	586	14.06	586
	Other Hydro/IPP	560	160	126	3.12	130
	Gas/Diesel/Others	190	0	0	0.00	0
	Total J & K	1200	746	712	17.18	716
Total State Control Area Generation		42521	23051	23443	537.80	22408
J. Net Inter Regional Exchange [Import (+ve)/Export (-ve)]			8095	9142	208.62	8692
Total Regional Availability(Gross)		67758	51568	47457	1132.31	47180

IV. Total Hydro Generation:

Regional Entities Hydro	12234	11207	5733	175.63	7318
State Control Area Hydro	6581	3994	3803	91	3780
Total Regional Hydro	18815	15201	9536	266.35	11098

V(A). Inter Regional Exchange [Import (+ve)/Export (-ve)] [Linkwise]

Element	Peak(20:00 Hrs)		Off Peak(03:00 Hrs)		Maximum Interchange (MW)		Energy (MU)		Net Energy MU
	MW	MW	MW	MW	Import	Export	Import	Export	
Vindhychal(HVDC B/B)	250	250	250	0	6.04	0.00	6.04		
765 KV Gwalior-Agra (D/C)	2681	2520	2808	0	59.51	0.00	59.51		
400 KV Zerda-Kankroli	2	13	85	102	0.16	0.00	0.16		
400 KV Zerda-Bhinmal	78	76	175	32	2.35	0.00	2.35		
220 KV Auraiya-Malanpur	40	41	0	69	0.00	0.42	-0.42		
220 KV Badod-Kota/Morak	-75	-41	71	115	0.00	1.26	-1.26		
Mundra-Mohindergarh(HVDC Bipole)	2503	2403	2520	0	59.80	0.00	59.80		
400 KV Vindhychal - Rihand	505	498	512	0	11.90	0.00	11.90		
765 kV Phagi-Gwalior (D/C)	791	925	506	0	21.66	0.00	21.66		
Sub Total WR	6775	6685			161.42	1.68	159.74		
Pusauli Bypass/HVDC	400	400	400	0	9.00	0.00	9.00		
400 KV MZP- GKP (D/C)	222	510	550	0	9.38	0.00	9.38		
400 KV Patna-Balia(D/C) X 2	412	534	608	0	11.98	0.00	11.98		
400 KV B'Sharif-Balia (D/C)	201	333	416	0	7.17	0.00	7.17		
765 KV Pusauli-Balia	237	224	242	0	3.08	0.00	3.08		
765 KV Gaya-Fatehpur	-127	103	215	127	2.27	0.00	2.27		
220 KV Pusauli-Sahupuri	153	163	187	0	2.94	0.00	2.94		
132 KV K'nasa-Sahupuri	0	0	0	0	0.48	0.00	0.48		
132 KV Son Ngr-Rihand	-36	-42	0	48	0.00	0.93	-0.93		
132 KV Garhwa-Rihand	0	0	0	0	0.00	0.00	0.00		
765 KV Sasaram - Fatehpur	-264	-18	101	264	0.00	0.77	-0.77		
400 KV Barh -GKP (D/C)	122	250	250	0	4.29	0.00	4.29		
Sub Total ER	1320	2457			50.58	1.70	48.88		
+/- 800 KV BiswanathChariali-Agra	0	0	0	0	0	0	0		
Sub Total NER	0	0			0	0	0		
Total IR Exch	8095	9142			212.00	3.38	208.62		

V(B). Inter Regional Schedule & Actual Exchanges [Import (+ve)/Export (-ve)] [Corridor wise]

ER	ISGS/LT Schedule (MU)		Bilateral Schedule (MU)		Power Exchange Shdl (MU)		Wheeling (MU)	
	Bhutan	Total	Through ER	Through WR	Through ER	Through WR	Through ER	Through WR
30.76	3.93	34.69	16.02	5.48	19.24	9.85	1.13	-1.13
Total IR Schedule (MU)								
Through ER	Through WR	Total	Through ER	Through WR	Total	Through ER	Through WR	Total
71.07	123.04	194.11	48.88	159.74	208.62	-22.19	36.70	14.51

V(C). Inter National Exchange with Nepal [Import (+ve)/Export (-ve)] [Linkwise]

Element	Peak(20:00 Hrs)		Off Peak(03:00 Hrs)		Maximum Interchange (MW)		Energy (MU)		Net Energy MU
	MW	MW	MW	MW	Import	Export	Import	Export	
132 KV Tanakpur - Mahendarnagar	-8	0	0	27	0	0	-0.10		

VI. Frequency Profile <----- % of Time Frequency ----->

<49.2	<49.7	<49.8	<49.9	<50.0	49.9-50.05	50.05-50.10	50.10-50.20	>50.20	>50.50
0.00	0.06	6.39	43.51	81.75	50.59	4.53	1.40	0.00	0.00

Frequency (Hz)				Average Frequency Hz	Frequency Variation Index	Std. Dev.	Frequency in 15 Min Block	
Maximum		Minimum					MAX (Hz)	MIN (Hz)
Freq	Time	Freq	Time					
50.16	15.02	49.69	4.50	49.92	0.133	0.083	50.12	49.86

VII. Voltage profile 400 kV

Station	Voltage Level (kV)	Maximum		Minimum		Voltage (in % of Time)			
		Voltage(KV)	Time	Voltage (KV)	Time	<380 kV	<390 kV	>420 kV	>430 kV
Rihand	400	400	00:00	400	00:00	0.0	0.0	0.0	0.0
Gorakhpur	400	412	18:02	394	10:25	0.0	0.0	0.0	0.0
Barilly	400	410	05:32	391	10:32	0.0	0.0	0.0	0.0
Kanpur	400	412	06:02	398	09:19	0.0	0.0	0.0	0.0
Dadri	400	409	06:00	394	10:24	0.0	0.0	0.0	0.0
Ballabgarh	400	415	06:00	396	14:20	0.0	0.0	0.0	0.0
Bawana	400	413	06:01	364	16:44	30.0	30.0	0.0	0.0
Bassi	400	412	18:01	393	23:18	0.0	0.0	0.0	0.0
Hissar	400	408	06:00	390	11:41	0.0	0.0	0.0	0.0
Moga	400	408	05:29	392	11:42	0.0	0.0	0.0	0.0
Abdullapur	400	410	06:02	391	19:41	0.0	0.0	0.0	0.0
Nalagarh	400	417	05:30	398	11:42	0.0	0.0	0.0	0.0
Kishenpur	400	418	04:01	398	19:45	0.0	0.0	0.0	0.0
Wagoora	400	413	04:01	377	19:47	4.8	12.0	0.0	0.0
Amritsar	400	410	05:05	392	11:44	0.0	0.0	0.0	0.0
Kashipur	400	415	05:47	406	10:24	0.0	0.0	0.0	0.0
Hamirpur	400	0	00:00	9999	00:00	0.0	0.0	0.0	0.0
Rishikesh	400	399	05:47	381	19:11	0.0	52.4	0.0	0.0

VIII. Voltage profile 765 kV

Station	Voltage Level (kV)	Maximum		Minimum		Voltage (in % of Time)			
		Voltage(KV)	Time	Voltage (KV)	Time	<728 kV	<742 kV	>800 kV	>820 kV
Fatehpur	765	765	06:01	738	09:20	0.0	2.4	0.0	0.0
Balia	765	770	18:03	733	10:24	0.0	12.2	0.0	0.0
Moga	765	781	06:00	751	11:41	0.0	0.0	0.0	0.0
Agra	765	777	06:01	749	11:39	0.0	0.0	0.0	0.0
Bhiwani	765	783	05:30	755	11:41	0.0	0.0	0.0	0.0
Unnao	765	753	06:01	730	10:24	0.0	68.7	0.0	0.0
Lucknow	765	764	06:02	734	10:27	0.0	4.2	0.0	0.0
Meerut	765	790	05:31	757	11:42	0.0	0.0	0.0	0.0
Jhatikara	765	0	00:00	9999	00:00	0.0	0.0	0.0	0.0
Barilly	765	769	05:33	735	10:25	0.0	4.3	0.0	0.0
Anta	765	777	13:08	0	17:26	0.7	0.7	0.0	0.0
Phagi	765	771	05:58	751	11:43	0.0	0.0	0.0	0.0

IX. Reservoir Parameters:

Name of Reservoir	Parameters		Present Parameters		Last Year		Last day	
	FRL (m)	MDDL (m)	Level (m)	Energy (MU)	Level (m)	Energy (MU)	Inflow (m ³ /s)	Usage (m ³ /s)
Bhakra	513.59	445.62	511.47	1620.46	510.81	1590.18	640.27	695.38
Pong	426.72	384.05	422.24	990.81	416.41	730.66	183.41	419.29
Tehri	829.79	740.04	820.50	1002.27	818.00	962.25	236.86	140.00
Koteshwar	612.50	598.50	610.73	5.20	5611.69	5.46	140.00	167.07
Chamera-I	760.00	748.75	752.68	0.00	0.00	0.00	166.29	126.71
Rihand	268.22	252.98	0.00	0.00	0.00	0.00	0.00	0.00
RPS	352.80	343.81	0.00	0.00	0.00	0.00	0.00	0.00
Jawahar Sagar	298.70	295.78	0.00	0.00	0.00	0.00	0.00	0.00
RSD	527.91	487.91	515.22	10.51	517.47	4.79	141.50	495.52

* NA: Not Available

X(A). Short-Term Open Access Details:

State	Off- Peak Hours (03:00 Hrs)			Peak Hours (20:00 Hrs)			Day Energy (MU)		
	Bilateral (MW)	IEX (MW)	PXIL (MW)	Bilateral (MW)	IEX (MW)	PXIL (MW)	Bilateral (MU)	IEX / PXIL (MU)	Total (MU)
Punjab	703	0	0	704	21	0	17.35	3.50	20.85
Delhi	285	-63	0	530	51	-2	8.26	2.17	10.43
Haryana	1693	-9	0	1704	152	0	40.15	-3.94	36.21
HP	-919	-86	0	-742	-342	0	-19.23	-3.39	-22.61
J&K	-477	-35	0	-477	90	0	-11.45	1.38	-10.07
CHD	0	0	0	0	0	0	0.00	0.13	0.13
Rajasthan	-324	1725	2	-466	693	4	-8.65	34.00	25.35
UP	313	0	0	184	0	0	4.92	0.60	5.52
Uttarakhand	-192	4	0	-347	445	0	-5.56	4.93	-0.63
Total	1081	1536	2	1090	1110	2	25.79	39.38	65.18

X(B). Short-Term Open Access Details:

State	Bilateral (MW)		IEX (MW)		PXIL (MW)	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
Punjab	856	662	794	0	0	0
Delhi	742	119	456	-244	0	-2
Haryana	1704	1583	178	-947	0	0
HP	-742	-919	103	-342	0	0
J&K	-477	-477	189	-35	0	0
CHD	0	0	79	0	0	0
Rajasthan	-298	-467	1897	281	4	2
UP	332	125	491	0	0	0
Uttarakhand	-178	-347	471	1	0	0

XI. System Constraints:

XII. Grid Disturbance / Any Other Significant Event:

SPS setting of 765 kV Gwalior – Agra enhanced to 1800 MW each ckt when both the lines in service & 2500 MW incase of one line in service.

XIII. Weather Conditions For 09.09.2015 :

Normal

XIV. Synchronisation of new generating units :

XV. Synchronisation of new 220 / 400 / 765 KV lines and energising of bus / /substation :

XVI. Tripping of lines in pooling stations :

XVII. Complete generation loss in a generating station :