

पॉवर सिस्टम ऑपरेशन कार्पोरेशन लिमिटेड

(पावरसिड की पूर्ण स्वामित्व प्राप्त सहायक कंपनी)



उत्तरी क्षेत्रीय भार प्रेषण केंद्र

CIN: U40105DL2009GOI188682

Power Supply Position in Northern Region for 07.10.2015

Date of Reporting : 08.10.2015

I. Regional Availability/Demand:

Demand Met	Evening Peak (20:00 Hrs) MW			Demand Met	Off Peak (03:00 Hrs) MW			Day Energy (Net MU)	
	Shortage	Requirement	Freq* (Hz)		Shortage	Requirement	Freq* (Hz)	Demand Met	Shortage
45941	1576	47516	50.09	39165	3491	42657	50.11	1005.0	57.79

* 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:

State	State's Control Area Generation (Net MU)				Drawal Schedule (Net MU)	Actual Drawal (Net MU)	UI (Net MU)	Consumption (Net MU)	Shortages* (MU)	UI (OD:(+ve), UD:(-ve))
	Thermal	Hydro	Renewable/others \$	Total						
Punjab	87.10	11.63		98.73	68.94	67.62	-1.32	166.35	0.00	
Haryana	63.99	0.66		64.65	92.59	92.57	-0.02	157.22	0.12	
Rajasthan	131.09	0.00	4.73	135.82	67.69	68.44	0.75	204.27	0.12	
Delhi	15.58			15.58	77.26	77.27	0.01	92.85	0.10	
UP	136.16	11.20		147.36	132.50	132.47	-0.03	279.84	48.46	
Uttarakhand		16.59		16.59	18.20	20.26	2.06	36.85	0.00	
HP		10.30		10.30	14.09	14.75	0.67	25.05	0.02	
J & K		11.81	0.00	11.81	24.50	26.17	1.67	37.97	8.98	
Chandigarh				0.00	4.55	4.66	0.27	4.66	0.00	
Total	433.93	62.18	4.73	500.84	500.31	504.21	4.06	1005.05	57.79	

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

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

State	Evening Peak (20:00 Hrs) MW				Off Peak (03:00 Hrs) MW				# Max(hourly) Demand Met of Day (MW)	UI (OD/PA [OD/Import: (+ve), UD/Export: (-ve)])
	Demand Met	Shortage	UI	STOA/PX transaction	Demand Met	Shortage	UI	STOA/PX transaction		
Punjab	7427	0	-116	21	6289	0	-85	-22	7427	
Haryana	7595	469	132	266	5365	0	139	272	7595	
Rajasthan	8759	0	-239	511	8890	0	309	570	9200	
Delhi	4431	0	73	194	3588	0	117	111	4431	
UP	12597	630	-215	233	11334	3255	198	1003	12597	
Uttarakhand	1786	0	-17	225	1382	0	192	203	1806	
HP	1215	0	42	-529	835	0	-7	51	1299	
J&K	1906	477	66	19	1340	236	124	-120	1906	
Chandigarh	225	0	-4	0	144	0	12	0	236	
Total	45941	1576	-277	941	39165	3491	997	2066	45941	

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

figures may not be at simultaneous hour.

Diversity is 1.01

III. Regional Entities :

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	
								(+ve)	(-ve)
A. NTPC									
Singrauli STPS (5*200+2*500)	2000	1815	1851	2044	43.99	1833	43.55	0.44	
Rihand I STPS (2*500)	1000	769	913	598	18.64	777	18.37	0.27	
Rihand II STPS (2*500)	1000	943	1008	1016	22.82	951	22.52	0.30	
Rihand III STPS (2*500)	1000	480	517	516	11.52	480	11.49	0.02	
Dadri I STPS (4*210)	840	800	619	574	13.07	545	13.88	-0.81	
Dadri II STPS (2*490)	980	970	930	914	21.20	883	22.56	-1.37	
Unchahar I TPS (2*210)	420	200	214	199	4.32	180	4.64	-0.32	
Unchahar II TPS (2*210)	420	400	381	403	8.65	361	9.17	-0.52	
Unchahar III TPS (1*220)	210	200	184	205	4.15	173	4.56	-0.41	
ISTPP (Jhajjar) (3*500)	1500	1436	963	629	18.11	755	18.41	-0.30	
Dadri GPS (4*130.19+2*154.51)	830	675	388	343	8.09	337	5.31	2.79	
Anta GPS (3*88.71+1*153.2)	419	397	0	0	0.00	0	0.00	0.00	
Auraiya GPS (4*111.19+2*109.30)	663	537	292	247	6.07	253	3.75	2.32	
Dadri Solar	5	1	0	0	0.02	1	0.02	0.00	
Unchahar Solar	10	3	0	0	0.03	1	0.06	-0.03	
Singrauli Solar	15	3	0	0	0.02	1	0.08	-0.06	
KHEP	800	845	830	0	6.14	256	6.11	0.03	
Sub Total (A)	12112	10474	9090	7688	187	7785	184	2	
B. NPC									
NAPS (2*220)	440	200	205	382	6.30	263	4.80	1.51	
RAPS- B (2*220)	440	396	437	441	9.48	395	9.50	-0.02	
RAPS- C (2*220)	440	206	229	230	4.81	200	4.94	-0.14	
Sub Total (B)	1320	802	871	1053	20.59	858	19.25	1.35	
C. NHPC									
Chamera I HPS (3*180)	540	537	363	0	4.87	203	4.60	0.27	
Chamera II HPS (3*100)	300	300	303	0	3.16	132	3.05	0.10	
Chamera III HPS (3*77)	231	229	230	0	2.02	84	1.90	0.12	
Bairasuli HPS(3*60)	180	179	0	0	1.15	48	1.06	0.09	
Saikal-HPS (6*115)	690	263	460	230	7.16	298	6.32	0.85	
Tanakpur-HPS (3*40)	94	56	56	50	1.47	61	1.34	0.14	
Uri-I HPS (4*120)	480	364	473	354	9.48	395	8.70	0.78	
Uri-II HPS (4*60)	240	211	233	244	5.35	223	5.05	0.31	
Dhauliganga-HPS (4*70)	280	279	280	70	2.38	99	2.10	0.28	
Dulhasti-HPS (3*130)	390	386	402	136	6.96	290	6.80	0.16	
Sewa-II HPS (3*40)	120	119	130	0	1.27	53	1.00	0.27	
Parbati 3 (4*130)	520	282	126	0	0.89	37	0.85	0.05	
Sub Total (C)	4065	3204	3057	1085	46	1923	43	3	
D.SJVNL									
NJPC (6*250)	1500	1605	1290	0	15.49	645	15.29	0.20	
Rampur HEP (6*68.67)	412	417	374	0	4.31	180	4.09	0.22	
Sub Total (D)	1912	2022	1664	0	19.80	825	19.38	0.42	
E. THDC									
Tehri HPS (4*250)	1000	1080	921	0	10.20	425	10.00	0.20	
Koteshwar HPS (4*100)	400	129	302	101	3.15	131	3.10	0.05	
Sub Total (E)	1400	1209	1223	101	13.35	556	13.10	0.25	
F. BBMB									
Bhakra HPS (2*108+3*126+5*157)	1379	817	1198	493	19.68	820	19.61	0.07	
Dehar HPS (6*165)	990	294	640	165	7.19	299	7.05	0.13	
Pong HPS (6*66)	396	249	318	192	5.93	247	5.99	-0.05	
Sub Total (F)	2765	1360	2156	850	32.80	1367	32.64	0.15	
G. IPP(s)/JV(s)									
ALLAIN DUHANGAN HPS(IPP) (2*96)	192	0	95	45	1.18	49	1.14	0.04	
KARCHAM WANGTOO HPS(IPP) (4*250)	1000	0	650	180	8.28	345	8.19	0.09	
Malana Stg-II HPS (2*50)	100	0	105	25	0.64	27	0.60	0.04	
Shree Cement TPS (2*150)	300	0	297	293	7.06	294	7.07	-0.01	
Budhil HPS(IPP) (2*35)	70	0	0	0	0.00	0	0.51	-0.51	
Sub Total (G)	1662	0	1148	543	17.16	715	17.51	-0.35	
H. Total Regional Entities (A-G)	25237	19071	19208	11320	336.71	14029	329.13	7.58	

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	1060	1040	23.96	998
	Guru Nanak Dev TPS(Bhatinda) (2*110+2*120)	460	200	200	4.51	188
	Guru Hargobind Singh TPS(L.mbt) (2*210+2*250)	920	819	784	18.63	776
	Goindwal(GVK)		0	0	0.00	0
	Rajpura (2*700)	1400	1377	1374	30.91	1288
	Talwandi Saboo (1*660)	660	354	350	9.10	379
	Thermal (Total)	4700	3810	3748	87.10	3629
Total Hydro	1000	467	474	11.63	484	
Total Punjab	5700	4277	4222	98.73	4114	
Haryana	Panipat TPS (4*110+2*210+2*250)	1367	666	460	13.05	544
	DCRTPP (Yamuna nagar) (2*300)	600	558	453	12.58	524
	Faridabad GPS (NTPC)	432	157	154	3.94	164
	RGTTP (khedar) (IPP) (2*600)	1200	602	773	22.04	918
	Magnum Diesel (IPP)	25	0	0	0.00	0
	Jhajjar(CLP) (2*660)	1320	615	372	12.39	516
	Thermal (Total)	4944	2598	2212	63.99	2666
	Total Hydro	62	26	23	0.66	27
	Total Haryana	5006	2624	2235	64.65	2694
	Rajasthan	kota TPS (2*110+2*195+3*210)	1240	773	712	17.62
suratgarh TPS (6*250)		1500	761	1128	21.01	876
Chabra TPS (4*250)		1000	404	423	9.47	395
Dholpur GPS (3*110)		330	0	0	0.09	4
Ramgarh GPS (1*37.5 + 1*35.5 +2*37.5 +1*110 +1*50)		271	201	205	5.01	209
RAPS A (NPC) (1*100+1*200)		300	160	160	3.96	165
Barsingar (NLC) (2*125)		250	95	96	2.21	92
Giral LTPS (2*125)		250	65	65	1.68	70
Rajwest LTPS (IPP) (8*135)		1080	710	722	17.30	721
VS LIGNITE LTPS (IPP) (1*135)		135	0	0	0.00	0
Kalisindh Thermal(2*600)		1200	1119	1060	24.48	1020
Kawati(Adani) (2*660)		1320	1202	1195	28.26	1178
Thermal (Total)		8876	5490	5766	131	5462
Total Hydro		550	0	0	0.00	0
Wind power		3214	109	60	1.63	68
Biomass		99	18	18	0.43	18
Solar		730	0	0	2.67	111
Renewable/Others (Total)		4043	127	78	4.73	197
Total Rajasthan		13469	5617	5844	135.82	5659
UP		Anpara TPS (3*210+2*500)	1630	1355	1362	32.60
	Obra TPS (2*50+2*94+5*200)	1194	438	426	10.30	429
	Paricha TPS (2*110+2*220+2*250)	1140	626	575	14.90	621
	Panki TPS (2*105)	210	54	54	1.30	54
	Haridwar TPS (1*60+1*105+2*250)	665	323	308	6.30	263
	Tanda TPS (NTPC) (4*110)	440	380	370	9.06	378
	Roza TPS (IPP) (4*300)	1200	1080	1078	25.60	1067
	Anpara-C (IPP) (2*600)	1200	1081	541	17.50	729
	Bajaj Energy Pvt.Ltd(IPP) TPS (10*45)	450	324	392	7.60	317
	Anpara-D(1*500)	500	0	0	0.00	0
	Lalitpur TPS(1*660)	660	401	392	8.60	358
	Thermal (Total)	9289	6062	5498	134	5574
	Vishnuparyag HPS (IPP)(4*110)	440	276	276	6.30	263
	Alakanada(4*82.5)	330	132	137	3.40	142
	Other Hydro	527	49	61	1.50	63
	Cogeneration	981	100	100	2.40	100
Total UP	11567	6619	6072	147	6140	
Uttarakhand	Total Hydro	1398	769	559	16.59	691
	Total Uttarakhand	1398	769	559	16.59	691
Delhi	Rajghat TPS (2*67.5)	135	0	0	-0.03	-1
	Delhi Gas Turbine (6x30 + 3x34)	282	36	38	0.89	37
	Pragati Gas Turbine (2x104+ 1x122)	330	146	151	3.57	149
	Rithala GPS (3*36)	95	0	0	0.00	0
	Bawana GPS (4*216+2*253)	1370	249	250	6.04	252
	Badarpur TPS (NTPC) (3*95+2*210)	705	266	238	5.10	213
	Thermal (Total)	2917	697	677	15.58	649
	Total Delhi	2917	697	677	15.58	649
HP	Baspa HPS (IPP) (3*100)	300	58	77	2.65	110
	Malana HPS (IPP) (2*43)	86	90	19	0.58	24
	Other Hydro	878	288	295	7.08	295
	Total HP	1264	436	391	10.30	429
J & K	Baglihar HPS (IPP) (3*150)	450	390	390	9.36	390
	Other Hydro/IPP	560	18	124	2.45	102
	Gas/Diesel/Others	190	0	0	0.00	0
	Total J & K	1200	408	514	11.81	492
Total State Control Area Generation		42521	21447	20514	500.84	20868
J. Net Inter Regional Exchange (Import (+ve)/Export (-ve))			6647	8439	188.06	7836
Total Regional Availability(Gross)		67758	47302	40273	1025.60	42733

IV. Total Hydro Generation:

Regional Entities Hydro	12234	9780	2286	128.35	5348
State Control Area Hydro	6581	2563	2435	62	2591
Total Regional Hydro	18815	12343	4721	190.53	7939

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		Import	Export	Import	Export	
Vindhychal(HVDC B/B)	-50		-50		50	250	0.38	1.77	-1.39
765 KV Gwalior-Agra (D/C)	2742		3344		3474	0	73.32	0.00	73.32
400 KV Zerda-Kankrol	5		99		180	38	1.49	0.00	1.49
400 KV Zerda-Bhinmal	40		157		249	1	2.74	0.00	2.74
220 KV Auraiya-Malanpur	-69		-68		0	73	0.00	1.02	-1.02
220 KV Badoh-Kota/Morak	7		38		41	19	0.30	0.00	0.30
Mundra-Mohindergarh(HVDC Bipole)	2502		2497		2637	0	55.98	0.00	55.98
400 KV Vindhychal - Rihand	0		0		0	0	0.00	0.00	0.00
765 kV Phagi-Gwalior (D/C)	552		1153		1182	0	23.10	0.00	23.10
Sub Total WR	5729		7170				157.30	2.79	154.51
Pusauli Bypass/HVDC	300		300		300	0	7.23	0.00	7.23
400 KV MZP- GKP (D/C)	58		188		440	0	5.26	0.00	5.26
400 KV Patna-Balia(D/C) X 2	329		318		473	0	7.95	0.00	7.95
400 KV B'Shanif-Balia (D/C)	-47		36		162	81	1.13	0.00	1.13
765 KV Gaya-Balia	15		72		169	0	0.98	0.00	0.98
765 KV Gaya-Fatehpur	7		63		198	29	2.38	0.00	2.38
220 KV Pusauli-Sahupuri	181		125		185	0	3.63	0.00	3.63
132 KV K'nasa-Sahupuri	0		0		0	0	0.00	0.00	0.00
132 KV Son Ngr-Rihand	-30		-25		0	-29	0.00	0.59	-0.59
132 KV Garhwa-Rihand	0		0		0	0	0.00	0.00	0.00
765 KV Sasaram - Fatehpur	-152		-84		78	195	0.00	0.96	-0.96
400 KV Barh -GKP (D/C)	257		276		329	0	6.55	0.00	6.55
Sub Total ER	918		1269				35.10	1.55	33.55
+/- 800 KV BiswanathChariali-Agra	0		0		0	0	0.00	0.00	0.00
Sub Total NER	0		0				0.00	0.00	0.00
Total IR Exch	6647		8439				192.40	4.34	188.06

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

ER	ISGS/LT Schedule (MU)		Bilateral Schedule (MU)		Power Exchange Shdi (MU)		Wheeling (MU)	
	Bhutan	Total	Through ER	Through WR	Through ER	Through WR	Through ER	Through WR
34.92	2.63	37.55	3.70	-1.16	1.54	24.27	1.19	-1.19
Total IR Schedule (MU)			Total IR Actual (MU)			Net IR UI (MU)		
Through ER	Through WR Incids Mndra	Total	Through ER	Through WR	Total	Through ER	Through WR	Total
43.97	131.37	175.34	33.55	154.51	188.06	-10.42	23.13	12.72

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		Import	Export	Import	Export	
132 KV Tanakpur - Mahendarnagar	0		0		0	0	0	0	0.00

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	0.00	1.57	19.26	66.78	71.06	6.71	2.87	0.16	0.00

<----- Frequency (Hz) ----->				Average Frequency	Frequency Variation Index	Std. Dev.	Frequency in 15 Min Block	
Maximum		Minimum					MAX	MIN
Freq	Time	Freq	Time	Hz	(Hz)	(Hz)	(Hz)	
50.27	18.01	49.74	16.48	49.96	0.065	0.073	50.16	0.00

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	405	02:54	399	18:41	0.0	0.0	0.0	0.0
Gorakhpur	400	418	07:03	398	10:53	0.0	0.0	0.0	0.0
Bareilly	400	411	02:49	386	13:13	0.0	0.1	0.0	0.0
Kanpur	400	416	03:59	398	11:09	0.0	0.0	0.0	0.0
Dadri	400	418	02:49	397	18:43	0.0	0.0	0.0	0.0
Ballabhgarh	400	422	02:47	400	11:09	0.0	0.0	4.4	0.0
Bawana	400	418	02:47	397	18:37	0.0	0.0	0.0	0.0
Bassi	400	418	04:00	396	11:09	0.0	0.0	0.0	0.0
Hissar	400	415	02:47	395	18:39	0.0	0.0	0.0	0.0
Moga	400	416	02:44	400	18:35	0.0	0.0	0.0	0.0
Abdullapur	400	420	02:50	398	11:06	0.0	0.0	0.0	0.0
Nalagarh	400	424	02:49	401	11:08	0.0	0.0	10.6	0.0
Kishenpur	400	426	02:49	402	19:08	0.0	0.0	14.4	0.0
Wagoora	400	413	02:51	395	19:07	0.0	9.3	0.0	0.0
Amritsar	400	421	02:48	169	04:48	0.0	0.0	2.9	0.0
Kashipur	400	413	06:04	405	15:56	0.0	0.0	0.0	0.0
Hamirpur	400	0	00:00	0	00:00	0.0	0.0	0.0	0.0
Rishikesh	400	396	21:46	378	15:56	0.7	54.4	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	773	03:59	741	11:08	0.0	0.5	0.0	0.0
Balia	765	773	07:04	742	11:06	0.0	0.0	0.0	0.0
Moga	765	796	02:49	761	18:38	0.0	0.0	0.0	0.0
Agra	765	784	04:04	747	11:08	0.0	0.0	0.0	0.0
Bhiwani	765	793	02:46	760	18:38	0.0	0.0	0.0	0.0
Unnao	765	760	04:02	731	11:09	0.0	50.9	0.0	0.0
Lucknow	765	768	04:04	739	11:07	0.0	3.4	0.0	0.0
Meerut	765	801	02:48	761	18:42	0.0	0.0	0.2	0.0
Jhatikara	765	800	02:49	765	10:18	0.0	0.0	0.0	0.0
Bareilly	765	0	00:00	9999	00:00	0.0	0.0	0.0	0.0
Anta	765	768	00:00	768	00:00	0.0	0.0	0.0	0.0
Phagi	765	777	03:23	748	10:54	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	510.97	1590.18	509.56	1530.03	345.24	554.64
Pong	426.72	384.05	420.57	916.71	416.15	718.14	92.79	343.34
Tehri	829.79	740.04	821.55	1035.00	824.35	1088.00	133.02	226.00
Koteshwar	612.50	598.50	610.18	4.69	609.28	3.98	266.00	208.00
Chamera-I	760.00	748.75	756.49	0.00	0.00	0.00	120.63	132.07
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	513.68	3.11	512.61	6.15	128.76	139.40

* 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	-90	68	0	-95	116	0	-1.95	2.58	0.64
Delhi	-94	207	-2	-55	249	0	-1.62	7.95	6.34
Haryana	46	226	0	46	220	0	1.09	5.40	6.50
HP	-50	100	0	-90	-439	0	-1.35	-2.14	-3.49
J&K	-46	-75	0	-46	65	0	-1.25	0.21	-1.04
CHD	0	0	0	0	0	0	0.00	0.29	0.29
Rajasthan	-5	573	2	-5	515	2	1.64	12.50	14.14
UP	310	693	0	233	0	0	5.59	6.44	12.03
Uttarakhand	148	55	0	148	77	0	3.56	1.79	5.35
Total	218	1848	0	136	803	2	5.71	35.03	40.74

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

State	Bilateral (MW)		IEX (MW)		PXIL (MW)	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
Punjab	-70	-95	194	68	0	0
Delhi	-7	-94	635	12	0	-2
Haryana	46	46	236	207	0	0
HP	-50	-90	174	-621	0	0
J&K	-46	-96	140	-135	0	0
CHD	0	0	69	-10	0	0
Rajasthan	190	-5	712	267	2	2
UP	355	160	693	0	0	0
Uttarakhand	148	148	204	-75	0	0

XI. System Constraints:

XII. Grid Disturbance / Any Other Significant Event:

XIII. Weather Conditions For 07.10.2015 :
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 :