

पॉवर सिस्टम ऑपरेशन कार्पोरेशन लिमिटेड

(सार्वजनिक की पूर्ण स्वामित्व प्राप्त सहायक कंपनी)



उत्तरी क्षेत्रीय भार प्रेषण केंद्र

CIN: U40105DL2009GOI188682

Power Supply Position in Northern Region for 20.11.2015
Date of Reporting : 21.11.2015

I. Regional Availability/Demand:

Evening Peak (19:00 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
36760	1850	38610	49.95	29195	1089	30284	50.08	785.3	54.78

* 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)
	Thermal	Hydro	Renewable/others \$	Total					
Punjab	38.74	9.96		48.70	46.26	45.00	-1.27	93.70	0.00
Haryana	40.00	0.48		40.48	65.46	65.55	0.09	106.03	0.00
Rajasthan	107.38	4.87	10.80	123.05	78.84	81.13	2.29	204.18	0.00
Delhi	12.84			12.84	43.82	45.56	1.74	58.40	0.32
UP	98.21	5.69		103.90	111.13	115.10	3.96	219.00	43.92
Uttarakhand		6.47		6.47	24.52	26.54	2.02	33.01	0.49
HP		5.59		5.59	17.42	17.88	0.47	23.48	0.29
J & K		11.68	0.00	11.68	31.29	32.43	1.14	44.10	9.76
Chandigarh				0.00	3.28	3.45	0.27	3.45	0.00
Total	297.16	44.74	10.80	352.70	422.01	432.63	10.72	785.33	54.78

* 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 (19:00 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	4222	0	-155	-325	3123	0	101	-385	4870
Haryana	6124	0	-94	-426	3121	0	-101	-116	6124
Rajasthan	8591	0	-214	366	8027	0	140	612	9843
Delhi	3302	48	147	-156	1618	0	125	-1071	3302
UP	9543	1250	-411	-278	9729	810	396	109	10090
Uttarakhand	1677	75	48	357	1170	0	98	406	1713
HP	1207	0	50	-137	737	0	73	231	1333
J&K	1908	477	31	297	1580	279	137	314	1927
Chandigarh	187	0	-4	-50	91	0	6	-30	188
Total	36760	1850	-604	-351	29195	1089	975	70	36760

* STOA figures are at seller's boundary & PX figures are at regional boundary. # figures may not be at simultaneous hour.

Diversity is 1.07

III. Regional Entities :

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	
A. NTPC	Singrauli STPS (5*200+2*500)	2000	1893	1986	1896	45.02	1876	44.35	0.67	
	Rihand I STPS (2*500)	1000	870	828	721	19.69	820	19.65	0.04	
	Rihand II STPS (2*500)	1000	963	731	845	21.58	899	21.14	0.44	
	Rihand III STPS (2*500)	1000	706	450	880	16.15	673	16.02	0.12	
	Dadri I STPS (4*210)	840	610	181	131	3.75	156	3.95	-0.20	
	Dadri II STPS (2*490)	980	980	423	328	9.61	400	10.55	-0.95	
	Unchahar I TPS (2*210)	420	406	373	288	8.50	354	8.21	0.29	
	Unchahar II TPS (2*210)	420	404	357	272	7.19	300	7.54	-0.34	
	Unchahar III TPS (1*220)	210	202	185	128	3.68	153	3.80	-0.13	
	ISTPP (Jhajjar) (3*500)	1500	1453	967	622	15.89	662	16.47	-0.58	
	Dadri GPS (4*130.19+2*154.51)	830	635	554	544	12.23	510	12.49	-0.25	
	Anta GPS (3*88.71+1*153.2)	419	421	246	242	5.48	228	5.72	-0.24	
	Auraiya GPS (4*111.19+2*109.30)	663	653	293	297	6.04	252	6.15	-0.11	
	Dadri Solar	5	0	0	0	0.02	1	0.02	0.00	
	Unchahar Solar	10	1	0	0	0.02	1	0.03	-0.01	
	Singrauli Solar	15	1	0	0	0.04	2	0.03	0.00	
	Sub Total (A)	12112	10855	8221	7194	178	7435	179	-1	
B. NPC	NAPS (2*220)	440	198	217	224	4.78	199	4.75	0.03	
	RAPS- B (2*220)	440	212	220	224	4.59	191	5.10	-0.51	
	RAPS- C (2*220)	440	410	459	459	9.91	413	9.84	0.07	
	Sub Total (B)	1320	820	896	907	19.28	803	19.69	-0.41	
C. NHPC	Chamera I HPS (3*180)	540	540	550	0	2.83	118	2.60	0.23	
	Chamera II HPS (3*100)	300	115	105	0	1.80	75	1.60	0.20	
	Chamera III HPS (3*77)	231	229	225	0	1.04	43	0.95	0.09	
	Bairasuli HPS(3*60)	180	122	123	0	0.70	29	0.67	0.03	
	Salal-HPS (6*115)	690	188	338	150	5.10	213	4.51	0.59	
	Tanakpur-HPS (3*40)	94	26	26	26	0.76	32	0.63	0.13	
	Uri-I HPS (4*120)	480	383	342	412	9.79	408	9.18	0.62	
	Uri-II HPS (4*60)	240	233	211	241	5.63	235	5.58	0.05	
	Dhauliganga-HPS (4*70)	280	280	273	0	1.23	51	1.10	0.13	
	Dulhasti-HPS (3*130)	390	387	399	0	4.22	176	4.00	0.22	
	Sewa-II HPS (3*40)	120	119	129	0	0.55	23	0.45	0.10	
	Parbati 3 (4*130)	520	130	132	0	0.81	34	0.52	0.29	
	Sub Total (C)	4065	2751	2852	829	34	1436	32	3	
	D.SJVNL	NJPC (6*250)	1500	1605	1613	0	9.20	383	9.07	0.12
		Rampur HEP (6*68.67)	412	432	372	0	2.54	106	2.46	0.08
Sub Total (D)		1912	2037	1985	0	11.74	489	11.53	0.20	
E. THDC	Tehri HPS (4*250)	1000	1056	1001	0	6.06	252	6.00	0.06	
	Koteshwar HPS (4*100)	400	92	100	93	2.24	93	2.20	0.04	
	Sub Total (E)	1400	1148	1101	93	8.30	346	8.20	0.10	
F. BBMB	Bhakra HPS (2*108+3*126+5*157)	1379	554	1018	343	13.32	555	13.29	0.03	
	Dehar HPS (6*165)	990	170	465	140	4.10	171	4.07	0.03	
	Pong HPS (6*66)	396	209	318	66	4.93	205	5.02	-0.09	
	Sub Total (F)	2765	932	1801	549	22.35	931	22.37	-0.02	
	G. IPP(s)/JV(s)	ALLAIN DUHANGAN HPS(IPP) (2*96)	192	0	0	0	0.64	27	0.62	0.02
KARCHAM WANGTOO HPS(IPP) (4*250)		1000	0	880	0	5.04	210	5.16	-0.12	
Malana Stg-II HPS (2*50)		100	0	0	0	0.00	0	0.00	0.00	
Shree Cement TPS (2*150)		300	0	111	108	2.64	110	2.70	-0.06	
Budhil HPS(IPP) (2*35)		70	0	75	0	0.27	11	0.27	0.00	
Sub Total (G)		1662	0	1067	108	8.59	358	8.74	-0.15	
H. Total Regional Entities (A-G)	25237	18543	17922	9680	283.17	11799	281.68	1.49		

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	160	160	3.63	151
	Guru Nanak Dev TPS(Bhatinda) (2*110+2*120)	460	90	90	2.06	86
	Guru Har Gobind Singh TPS(L.mbt) (2*210+2*250)	920	206	0	0.80	33
	Goindwal(GVK)		0	0	0.00	0
	Rajpura (2*700)	1400	350	355	11.31	471
	Talwandi Saboo (2*660)	1320	968	735	20.94	873
	Thermal (Total)	5360	1774	1340	38.74	1614
	Total Hydro	1000	393	390	9.96	415
	Total Punjab	6360	2167	1730	48.70	2029
	Haryana	Panipat TPS (4*110+2*210+2*250)	1367	0	0	0.00
DCRTPP (Yamuna nagar) (2*300)		600	547	457	11.51	480
Faridabad GPS (NTPC)		432	404	318	8.60	358
RGTPP (khedar) (IPP) (2*600)		1200	572	389	9.95	414
Magnum Diesel (IPP)		25	0	0	0.00	0
Jhajjar(CLP) (2*660)		1320	605	375	9.94	414
Thermal (Total)		4944	2128	1539	40.00	1666
Total Hydro		62	17	21	0.48	20
Total Haryana		5006	2145	1560	40.48	1686
Rajasthan		kota TPS (2*110+2*195+3*210)	1240	1039	1101	26.20
	suratgarh TPS (6*250)	1500	402	445	10.40	433
	Chabra TPS (4*250)	1000	499	583	14.28	595
	Dholpur GPS (3*110)	330	87	90	2.24	93
	Ramgarh GPS (1*37.5 + 1*35.5 + 2*37.5 + 1*110 + 1*50)	271	194	166	4.55	190
	RAPS A (NPC) (1*100+1*200)	300	151	128	4.12	172
	Barsingar (NLC) (2*125)	250	94	95	2.06	86
	Giral LTPS (2*125)	250	0	0	0.00	0
	Rajwest LTPS (IPP) (8*135)	1080	656	485	13.00	542
	VS LIGNITE LTPS (IPP) (1*135)	135	0	0	0.00	0
	Kalisindh Thermal(2*600)	1200	0	0	2.64	110
	Kawai(Adani) (2*660)	1320	1173	1156	27.89	1162
	Thermal (Total)	8876	4295	4249	107	4474
	Total Hydro	550	207	188	4.87	203
	Wind power	3214	294	649	7.61	317
	Biomass	99	27	27	0.64	27
	Solar	730	0	0	2.56	106
	Renewable/Others (Total)	4043	321	676	10.80	450
	Total Rajasthan	13469	4823	5113	123.05	5127
	UP	Anpara TPS (3*210+2*500)	1630	1053	897	22.10
Obra TPS (2*50+2*94+5*200)		1194	266	307	7.00	292
Paricha TPS (2*110+2*220+2*250)		1140	493	602	12.90	538
Panki TPS (2*105)		210	0	0	0.00	0
Harduaganj TPS (1*60+1*105+2*250)		665	526	553	12.30	513
Tanda TPS (NTPC) (4*110)		440	375	360	8.45	352
Roza TPS (IPP) (4*300)		1200	191	234	6.05	252
Anpara-C (IPP) (2*600)		1200	1077	1080	25.43	1060
Bajaj Energy Pvt.Ltd(IPP) TPS (10*45)		450	81	57	1.57	66
Anpara-D(1*500)		500	0	0	0.00	0
Lalitpur TPS(1*660)		660	0	0	0.00	0
Bara(1*660)		660	0	0	0.00	0
Thermal (Total)		9949	4062	4090	96	3992
Vishnuparyag HPS (IPP)(4*110)		440	117	112	2.71	113
Alaknanda(4*82.5)		330	74	74	1.80	75
Other Hydro		527	53	26	1.19	50
Cogeneration		981	100	100	2.40	100
Total UP		12227	4406	4402	104	4329
Uttarakhand		Total Hydro	1398	436	168	6.47
	Total Uttarakhand	1398	436	168	6.47	270
Delhi	Rajghat TPS (2*67.5)	135	0	0	0.00	0
	Delhi Gas Turbine (6x30 + 3x34)	282	80	38	1.12	47
	Pragati Gas Turbine (2x104+ 1x122)	330	159	155	3.76	156
	Rithala GPS (3*36)	95	0	0	0.00	0
	Bawana GPS (4*216+2*253)	1370	252	252	6.02	251
	Badarpur TPS (NTPC) (3*95+2*210)	705	165	165	1.94	81
	Thermal (Total)	2917	656	611	12.84	535
Total Delhi	2917	656	611	12.84	535	
HP	Baspa HPS (IPP) (3*100)	300	31	31	1.58	66
	Malana HPS (IPP) (2*43)	86	75	0	0.34	14
	Other Hydro	878	199	96	3.68	153
	Total HP	1264	305	127	5.59	233
J & K	Baglihar HPS (IPP) (3*150)	450	260	260	8.96	373
	Other Hydro/IPP	560	110	111	2.72	113
	Gas/Diesel/Others	190	0	0	0.00	0
	Total J & K	1200	370	371	11.68	487
Total State Control Area Generation		43841	15308	14082	352.70	14696
J. Net Inter Regional Exchange (Import +ve)/Export (-ve)			5500	6441	164.87	6870
Total Regional Availability(Gross)		69078	38730	30202	800.74	33364

IV. Total Hydro Generation:

Regional Entities Hydro	12234	9266	1471	86.11	3588
State Control Area Hydro	6581	1972	1477	45	1864
Total Regional Hydro	18815	11238	2948	130.84	5452

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

Element	Peak(19:00 Hrs)		Off Peak(03:00 Hrs)		Maximum Interchange (MW)		Energy (MU)		Net Energy MU
	MW	MW	Import	Export	Import	Export			
Vindhychal(HVDC B/B)	100	-50	100	250	0.96	2.14	-1.17		
765 KV Gwalior-Agra (D/C)	1965	2315	3000	0	59.03	0.00	59.03		
400 KV Zerda-Kankroli	-155	-232	41	275	0.00	2.32	-2.32		
400 KV Zerda-Bhinmal	-62	-133	191	246	0.05	0.00	0.05		
220 KV Auraiya-Malanpur	-120	-107	0	131	0.00	2.24	-2.24		
220 KV Badod-Kota/Morak	-79	-85	0	72	0.00	1.77	-1.77		
Mundra-Mohindergarh(HVDC Bipole)	2498	2498	2509	0	59.43	0.00	59.43		
400 KV Vindhyachal - Rihand	0	0	0	0	0.00	0.00	0.00		
765 kV Phagi-Gwalior (D/C)	934	896	1475	0	26.14	0.00	26.14		
Sub Total WR	5081	5102			145.61	8.46	137.15		
Pusaull Bypass/HVDC	350	350	350	0	8.86	0.00	8.86		
400 KV MZP -GKP (D/C)	-14	316	396	144	4.55	0.00	4.55		
400 KV Patna-Balia(D/C) X 2	319	402	552	0	9.27	0.00	9.27		
400 KV B'Sharif-Balia (D/C)	-59	125	185	59	1.63	0.00	1.63		
765 KV Gaya-Balia	134	156	203	0	1.69	0.00	1.69		
765 KV Gaya-Fatehpur	-3	93	371	3	3.73	0.00	3.73		
220 KV Pusaull-Sahupuri	115	143	143	0	2.62	0.00	2.62		
132 KV K'nasa-Sahupuri	0	0	0	0	0.00	0.00	0.00		
132 KV Son Ngr-Rihand	-27	-25	0	38	0.00	0.60	-0.60		
132 KV Garhwa-Rihand	0	0	0	0	0.00	0.00	0.00		
765 KV Sasaram - Fatehpur	-156	-65	197	163	0.00	0.21	-0.21		
400 KV Barh -GKP (D/C)	260	344	392	0	7.87	0.00	7.87		
Sub Total ER	919	1839			40.21	0.81	39.41		
+/- 800 KV BiswanathCharialli-Agra	-500	-500	0	500	0.00	11.69	-11.69		
Sub Total NER	-500	-500			0.00	11.69	-11.69		
Total IR Exch	5500	6441			185.83	20.96	164.87		

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

ISGS/LT Schedule (MU)			Bilateral Schedule (MU)			Power Exchange Shdl (MU)		Wheeling (MU)	
ER	Bhutan	Total	Through ER	Through WR	Total	Through ER	Through WR	Through ER	Through WR
29.02	0.79	29.81	2.87	-14.94	6.49	27.66	5.88	-5.88	
Total IR Schedule (MU)			Total IR Actual (MU)			Net IR UI (MU)			
Through ER	Through WR Inclds Mndra	Total	Through ER(including NER)	Through WR	Total	Through ER(including NER)	Through WR	Total	
45.05	114.44	159.49	27.72	137.15	164.87	-17.33	22.71	5.38	

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

Element	Peak(19:00 Hrs)		Off Peak(03:00 Hrs)		Maximum Interchange (MW)		Energy (MU)		Net Energy MU
	MW	MW	Import	Export	Import	Export			
132 KV Tanakpur - Mahendarnagar	-32	-29	0	33	0	1	-0.73		

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	4.50	22.75	64.34	60.97	12.28	3.43	0.59	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					
50.26	12.02	49.72	11.20	49.96	0.089	0.087	50.15	49.87

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	408	21:44	398	07:39	0.0	0.0	0.0	0.0
Gorakhpur	400	422	05:04	408	17:48	0.0	0.0	0.5	0.0
Bareilly(PG)400kV	400	421	05:03	398	14:39	0.0	0.0	0.1	0.0
Kanpur	400	411	21:37	402	09:12	0.0	0.0	0.2	0.0
Dadri	400	426	03:35	404	11:07	0.1	0.1	22.5	0.0
Ballabgarh	400	431	03:00	408	09:13	0.0	0.0	39.1	1.2
Bawana	400	430	03:35	407	11:10	0.0	0.0	33.8	0.0
Bassi	400	426	20:43	392	08:23	0.0	0.0	9.7	0.0
Hissar	400	424	21:37	400	09:04	0.0	0.0	17.7	0.0
Moga	400	422	21:35	406	18:23	0.0	0.0	8.4	0.0
Abdullapur	400	427	21:37	398	23:06	0.0	0.0	10.6	0.0
Nalagarh	400	437	21:37	410	09:18	0.0	0.0	51.7	6.9
Kishenpur	400	426	03:00	399	18:20	0.0	0.0	17.2	0.0
Wagoora	400	407	03:31	375	18:23	7.5	43.6	0.0	0.0
Amritsar	400	428	01:12	408	09:20	0.0	0.0	39.4	0.0
Kashipur	400	420	20:42	410	14:27	0.0	0.0	0.0	0.0
Hamirpur	400	424	02:57	403	10:32	0.0	0.0	18.5	0.0
Rishikesh	400	412	20:58	386	14:41	0.0	10.6	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	775	13:02	736	09:11	0.0	2.6	0.0	0.0
Balia	765	774	05:01	751	10:10	0.0	0.0	0.0	0.0
Moga	765	806	20:46	773	18:24	0.0	0.0	5.6	0.0
Agra	765	794	21:26	742	09:13	0.0	0.0	0.0	0.0
Bhiwani	765	809	03:35	762	09:04	0.0	0.0	26.3	0.0
Unnao	765	770	21:37	740	10:09	0.0	0.5	0.0	0.0
Lucknow	765	784	13:01	752	10:10	0.0	0.0	0.0	0.0
Meerut	765	820	20:58	764	09:13	0.0	0.0	11.2	0.0
Jhatikara	765	814	03:35	773	08:57	0.0	0.0	49.6	0.0
Bareilly 765 kV	765	0	00:00	9999	00:00	0.0	0.0	0.0	0.0
Anta	765	787	20:56	750	09:05	0.0	0.0	0.0	0.0
Phagi	765	798	20:59	741	09:07	0.0	0.7	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	507.59	1426.07	504.52	1285.56	204.84	386.67
Pong	426.72	384.05	416.81	743.22	411.32	534.70	54.23	299.73
Tehri	829.79	740.04	813.90	882.26	820.55	1023.00	73.43	140.00
Koteshwar	612.50	598.50	610.89	4.95	609.39	4.27	140.00	147.68
Chamera-I	760.00	748.75	0.00	0.00	0.00	0.00	73.03	76.54
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	506.81	3.79	509.88	1.47	95.38	205.40

* NA: Not Available

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

State	Off- Peak Hours (03:00 Hrs)			Peak Hours (19:00 Hrs)			Day Energy (MU)		
	Bilateral (MW)	IEX (MW)	PXIL (MW)	Bilateral (MW)	IEX (MW)	PXIL (MW)	Bilateral (MU)	IEX / PXIL (MU)	Total (MU)
Punjab	-679	294	0	-605	281	0	-12.77	6.65	-6.12
Delhi	-958	-113	0	-548	391	0	-15.78	6.01	-9.77
Haryana	-320	204	0	-717	292	0	-9.61	4.60	-5.01
HP	138	93	0	231	-368	0	5.69	-1.37	4.32
J&K	425	-111	0	408	-111	0	9.82	-1.47	8.34
CHD	-30	0	0	0	-50	0	-0.24	-0.32	-0.56
Rajasthan	0	612	0	0	366	0	9.34	16.83	26.17
UP	109	0	0	-278	0	0	-3.75	0.00	-3.75
Uttarakhand	194	212	0	194	163	0	4.66	6.49	11.15
Total	-1121	1191	0	-1314	963	0	-12.65	37.42	24.76

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

State	Bilateral (MW)		IEX (MW)		PXIL (MW)	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
Punjab	-201	-679	311	181	0	0
Delhi	-544	-958	640	-123	0	0
Haryana	-306	-717	319	-205	0	0
HP	305	138	117	-669	0	0
J&K	425	389	-10	-187	0	0
CHD	0	-30	0	-80	0	0
Rajasthan	718	0	1481	-7	0	0
UP	155	-330	0	0	0	0
Uttarakhand	194	194	432	160	0	0

XI. System Constraints:

XII. Grid Disturbance / Any Other Significant Event:

XIII. Weather Conditions For 20.11.2015 :

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 :