

पॉवर सिस्टम ऑपरेशन कार्पोरेशन लिमिटेड

(पब्लिसिड की पूर्ण स्वामित्व प्राप्त सार्वजनिक कंपनी)



उत्तरी क्षेत्रीय भार प्रेषण केंद्र

CIN: U40105DL2009GOI188682

Power Supply Position in Northern Region for 20.08.2015
Date of Reporting : 21.08.2015

I. Regional Availability/Demand:

Demand Met	Evening Peak (20:00 Hrs) MW			Freq* (Hz)	Off Peak (03:00 Hrs) MW			Demand Met	Day Energy (Net MU)	
	Shortage	Requirement			Shortage	Requirement	Req* (Hz)		Shortage	Requirement
44657	2718	47375		49.99	41964	2329	44293	50.12	1024.8	51.68

* 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:

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	54.04	25.52		79.56	122.21	122.20	-0.02	201.75	0.00
Haryana	24.99	0.47		25.46	136.64	135.65	-0.99	161.10	0.00
Rajasthan	84.78	4.91	29.15	118.83	58.38	58.12	-0.26	176.95	0.00
Delhi	14.50			14.50	91.60	89.67	-1.93	104.17	0.16
UP	118.38	13.17		131.55	147.77	144.90	-2.87	276.46	43.23
Uttarakhand		23.18		23.18	13.15	14.46	1.32	37.65	0.08
HP		24.57		24.57	1.21	1.60	0.40	26.17	0.00
J & K		15.10	0.00	15.10	19.78	19.49	-0.28	34.60	8.22
Chandigarh				0.00	6.47	6.00	0.27	6.00	0.00
Total	296.69	106.92	29.15	432.75	597.19	592.09	-4.35	1024.85	51.68

* 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)
	Demand Met	Shortage	UI	STOA/PX transaction	Demand Met	Shortage	UI	STOA/PX transaction	
Punjab	8855	0	-158		7863	0	70	1667	9014
Haryana	7790	0	-95	2014	6652	0	19	1875	7936
Rajasthan	7399	0	-15	34	7880	0	251	-39	8098
Delhi	4465	8	12	840	4069	0	91	575	4783
UP	11150	2240	-201	627	11748	2130	-242	1019	12389
Uttarakhand	1783	35	155	-91	1437	0	10	-377	1783
HP	1200	0	71	-1456	980	0	45	-1519	1285
J&K	1740	435	113	-456	1130	199	-59	-769	1740
Chandigarh	275	0	-4	0	206	0	-14	0	300
Total	44657	2718	-122	3054	41964	2329	170	2432	45297

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

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	
										UI
A. NTPC	Singrauli STPS (5*200+2*500)	2000	1360	1541	1480	33.12	1380	32.00	1.12	
	Rihand I STPS (2*500)	1000	845	914	757	18.04	751	17.94	0.10	
	Rihand II STPS (2*500)	1000	943	1026	786	20.45	852	20.21	0.23	
	Rihand III STPS (2*500)	1000	480	520	344	10.01	417	10.01	0.00	
	Dadri I STPS (4*210)	840	600	438	333	8.12	338	8.48	-0.36	
	Dadri II STPS (2*490)	980	970	937	677	16.62	692	17.16	-0.54	
	Unchahar I TPS (2*210)	420	400	413	388	8.14	339	8.62	-0.48	
	Unchahar II TPS (2*210)	420	400	435	350	7.71	321	8.11	-0.41	
	Unchahar III TPS (1*220)	210	200	221	139	3.77	157	4.02	-0.25	
	ISTPP (Jhajjar) (3*500)	1500	1436	963	633	16.06	669	16.28	-0.22	
	Dadri GPS (4*130.19+2*154.51)	830	600	178	169	4.01	167	4.33	-0.32	
	Anta GPS (3*88.71+1*153.2)	419	396	-1	-1	0.00	0	0.00	0.00	
	Auraiya GPS (4*111.19+2*109.30)	663	638	315	207	5.80	242	5.77	0.04	
	Dadri Solar	5	1	0	0	0.02	1	0.03	0.00	
	Unchahar Solar	10	3	0	0	0.03	1	0.06	-0.03	
	Singrauli Solar	15	3	0	0	0.07	3	0.07	0.00	
	KHEP	800	746	843	842	17.19	716	17.91	-0.72	
	Sub Total (A)	12112	10022	8743	7104	169	7048	171	-2	
	B. NPC	NAPS (2*220)	440	373	416	410	8.95	373	8.95	-0.01
RAPS- B (2*220)		440	388	211	437	6.26	261	9.31	-3.05	
RAPS- C (2*220)		440	200	220	222	4.56	190	4.80	-0.24	
Sub Total (B)		1320	961	847	1069	19.77	824	23.06	-3.30	
C. NHPC	Chamera I HPS (3*180)	540	534	543	540	13.01	542	12.82	0.20	
	Chamera II HPS (3*100)	300	300	304	302	7.22	301	7.20	0.03	
	Chamera III HPS (3*77)	231	229	241	237	5.63	235	5.44	0.19	
	Bairasui HPS (3*60)	180	120	124	122	2.46	103	2.46	0.00	
	Salal-HPS (6*115)	690	606	672	668	15.24	635	14.57	0.67	
	Tanakpur-HPS (3*40)	94	91	94	95	2.26	94	2.19	0.08	
	Uri-I HPS (4*120)	480	423	467	430	10.42	434	10.17	0.26	
	Uri-II HPS (4*60)	240	188	0	236	4.90	204	4.76	0.14	
	Dhauliganga-HPS (4*70)	280	273	283	279	6.66	277	6.57	0.09	
	Dulhasti-HPS (3*130)	390	386	396	398	9.32	388	9.26	0.06	
	Sewa-II HPS (3*40)	120	101	85	0	1.48	62	1.40	0.08	
	Parbati 3 (4*130)	520	260	265	264	4.72	197	4.68	0.04	
	Sub Total (C)	4065	3513	3474	3571	83	3472	82	2	
	D.SJVNL	NJPC (6*250)	1500	1605	1637	1613	38.66	1611	38.52	0.14
		Rampur HEP (6*68.67)	412	428	429	430	10.33	431	10.27	0.06
Sub Total (D)		1912	2033	2066	2043	48.99	2041	48.79	0.20	
E. THDC	Tehri HPS (4*250)	1000	1050	1050	1050	25.13	1047	25.00	0.13	
	Koteshwar HPS (4*100)	400	358	402	301	8.63	360	8.60	0.03	
	Sub Total (E)	1400	1408	1452	1351	33.76	1407	33.60	0.16	
F. BBMB	Bhakra HPS (2*108+3*126+5*157)	1379	1450	1455	1460	34.52	1439	34.80	-0.28	
	Dehar HPS (6*165)	990	593	825	560	14.24	593	14.23	0.01	
	Pong HPS (6*66)	396	380	384	384	9.11	380	9.12	-0.01	
	Sub Total (F)	2765	2423	2664	2404	57.87	2411	58.15	-0.28	
G. IPP(s)/JV(s)	ALLAIN DUHANGAN HPS(IPP) (2*96)	192	0	155	140	3.41	142	3.18	0.23	
	KARCHAM WANGTOO HPS(IPP) (4*250)	1000	0	1200	1200	28.67	1195	28.51	0.16	
	Malana Stg-II HPS (2*50)	100	0	111	111	2.62	109	2.45	0.18	
	Shree Cement TPS (2*150)	300	0	290	296	6.48	270	6.41	0.06	
	Budhil HPS(IPP) (2*35)	70	0	76	76	1.80	75	1.80	0.01	
Sub Total (G)	1662	0	1833	1824	42.99	1791	42.34	0.65		
H. Total Regional Entities (A-G)	25237	20360	21079	19366	455.88	18995	458.47	-2.59		

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

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	510	690	14.30	596	
	Guru Nanak Dev TPS(Bhatinda) (2*110+2*120)	460	80	80	1.79	75	
	Guru Hargobind Singh TPS(L.mbt) (2*210+2*250)	920	414	412	8.79	366	
	Goindwal(GVK)		0	0	0.00	0	
	Rajpura (2*700)	1400	1383	703	21.59	900	
	Talwandi Saboo (1*660)	660	435	342	7.57	315	
	Thermal (Total)	4700	2822	2227	54.04	2252	
	Total Hydro	1000	1076	1076	25.52	1063	
	Total Punjab	5700	3898	3303	79.56	3315	
	Haryana	Panipat TPS (4*110+2*210+2*250)	1367	0	0	0.00	0
DCRTPP (Yamuna nagar) (2*300)		600	541	446	11.36	473	
Faridabad GPS (NTPC)		432	381	320	8.14	339	
RGTPP (khedar) (IPP) (2*600)		1200	0	353	5.49	229	
Magnum Diesel (IPP)		25	0	0	0.00	0	
Jhajjar(CLP) (2*660)		1320	0	0	0.00	0	
Thermal (Total)		4944	922	1119	24.99	1041	
Total Hydro		62	20	21	0.47	20	
Total Haryana		5006	942	1140	25.46	1061	
Rajasthan		kota TPS (2*110+2*195+3*210)	1240	705	988	19.29	804
		suratgarh TPS (6*250)	1500	584	506	13.60	567
		Chabra TPS (4*250)	1000	297	56	6.56	273
		Dholpur GPS (3*110)	330	0	0	0.00	0
	Ramgarh GPS (1*37.5 + 1*35.5 +2*37.5 +1*110 +1*50)	271	0	193	0.56	23	
	RAPS A (NPC) (1*100+1*200)	300	155	162	3.93	164	
	Barsingsar (NLC) (2*125)	250	80	0	2.06	86	
	Giral LTPS (2*125)	250	29	0	0.06	2	
	Rajwest LTPS (IPP) (8*135)	1080	464	698	15.27	636	
	V/S LIGNITE LTPS (IPP) (1*135)	135	0	0	0.00	0	
	Kalisindh Thermal(2*600)	1200	0	0	0.00	0	
	Kawai(Adani) (2*660)	1320	897	1200	23.45	977	
	Thermal (Total)	8876	3211	3803	85	3532	
	Total Hydro	550	221	244	4.91	205	
	Wind power	3214	1328	1011	28.55	1190	
	Biomass	99	25	25	0.59	25	
	Solar	730	0	0	0.00	0	
	Renewable/Others (Total)	4043	1353	1036	29.15	1214	
	Total Rajasthan	13469	4785	5083	118.83	4951	
	UP	Anpara TPS (3*210+2*500)	1630	1249	1172	28.82	1201
Obra TPS (2*50+2*94+5*200)		1194	370	297	8.46	353	
Panicha TPS (2*110+2*220+2*250)		1140	529	2941	13.58	566	
Panki TPS (2*105)		210	54	45	1.16	48	
Harduaganj TPS (1*60+1*105+2*250)		665	422	522	11.39	474	
Tanda TPS (NTPC) (4*110)		440	260	270	6.53	272	
Roza TPS (IPP) (4*300)		1200	1085	1076	25.98	1083	
Anpara-C (IPP) (2*600)		1200	541	540	12.89	537	
Bajaj Energy Pvt.Ltd(IPP) TPS (10*45)		450	365	363	8.38	349	
Anpara-D(1*500)		500	0	0	0.00	0	
Lalitpur TPS(1*660)		660	0	0	0.00	0	
Thermal (Total)		9289	4875	7226	117	4883	
Vishnuparyag HPS (IPP)(4*110)		440	0	0	0.00	0	
Alakananda(4*82.5)		330	326	326	7.82	326	
Other Hydro		527	290	367	5.35	223	
Cogeneration		981	50	50	1.20	50	
Total UP	11567	5541	7969	132	5481		
Uttarakhand	Total Hydro	1398	931	954	23.18	966	
	Total Uttarakhand	1398	931	954	23.18	966	
Delhi	Rajghat TPS (2*67.5)	135	0	0	-0.04	-2	
	Delhi Gas Turbine (6x30 + 3x34)	282	32	33	0.79	33	
	Pragati Gas Turbine (2x104+ 1x122)	330	145	146	3.50	146	
	Riithala GPS (3*36)	95	0	0	0.00	0	
	Bawana GPS (4*216+2*253)	1370	0	0	-0.11	-4	
	Badarpur TPS (NTPC) (3*95+2*210)	705	320	332	10.36	432	
	Thermal (Total)	2917	497	511	14.50	604	
	Total Delhi	2917	497	511	14.50	604	
HP	Baspa HPS (IPP) (3*100)	300	334	334	7.67	320	
	Malana HPS (IPP) (2*43)	86	103	103	2.45	102	
	Other Hydro	878	615	585	14.44	602	
	Total HP	1264	1052	1022	24.57	1024	
J & K	Baglihar HPS (IPP) (3*150)	450	450	450	10.80	450	
	Other Hydro/IPP	560	187	185	4.30	179	
	Gas/Diesel/Others	190	0	0	0.00	0	
	Total J & K	1200	637	635	15.10	629	
Total State Control Area Generation		42521	18283	20617	432.75	18031	
J. Net Inter Regional Exchange [Import (+ve)/Export (-ve)]			8113	5926	163.62	6817	
Total Regional Availability(Gross)		67758	47475	45909	1052.25	43844	

IV. Total Hydro Generation:

Regional Entities Hydro	12234	11965	11662	275.86	11494
State Control Area Hydro	6581	4553	4645	107	4455
Total Regional Hydro	18815	16518	16307	382.78	15949

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)	250	250	250	0	6.05	0.00	6.05
765 KV Gwalior-Agra (D/C)	2267	1204	2341	0	37.74	0.00	37.74
400 KV Zerda-Kankroli	-80	-248	0	354	0.00	4.73	-4.73
400 KV Zerda-Bhimmal	-110	-251	0	348	0.00	4.92	-4.92
220 KV Auraiya-Malanpur	-53	-66	0	97	0.00	1.34	-1.34
220 KV Badod-Kota/Morak	50	-53	45	58	0.13	0.00	0.13
Mundra-Mohinderqarh(HVDC Bipole)	2506	2208	2510	0	55.26	0.00	55.26
400 KV Vindhychal - Rihand	504	271	504	0	9.07	0.00	9.07
765 kV Phagi-Gwalior (D/C)	944	648	473	0	17.50	0.00	17.50
Sub Total WR	6278	3963			125.75	10.99	114.76
Pusauli Bypass/HVDC	400	400	400	0	8.89	0.00	8.89
400 KV MZP- GKP (D/C)	392	540	732	0	13.20	0.00	13.20
400 KV Patna-Balia(D/C) X 2	253	272	524	0	7.15	0.00	7.15
400 KV B'Sharif-Balia (D/C)	70	191	258	0	4.25	0.00	4.25
765 KV Pusauli-Balia	56	73	150	0	0.93	0.00	0.93
765 KV Gaya-Fatehpur	289	152	300	0	5.31	0.00	5.31
220 KV Pusauli-Sahupuri	180	138	166	0	3.32	0.00	3.32
132 KV K'nasa-Sahupuri	0	0	0	0	0.96	0.00	0.96
132 KV Son Ngr-Rihand	-32	-36	0	44	0.00	0.76	-0.76
132 KV Garhwa-Rihand	0	0	0	0	0.00	0.00	0.00
765 KV Sasaram - Fatehpur	85	42	145	23	2.10	0.00	2.10
400 KV Barh -GKP (D/C)	142	191	231	0	3.51	0.00	3.51
Sub Total ER	1835	1963			49.62	0.76	48.86
Total IR Exch	8113	5926			175.36	11.74	163.62

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
27.11	3.68	30.80	21.44	10.53	3.52	5.76	2.09	-2.09
Total IR Schedule (MU)								
Through ER	Through WR Incids Mndra	Total	Through ER	Through WR	Total	Through ER	Through WR	Total
57.83	103.09	160.93	48.86	114.76	163.62	-8.97	11.66	2.69

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	-26	-8	0	40	0	0	-0.42

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	1.10	13.69	58.92	71.35	10.91	3.92	0.17	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	49.98	0.06	0.07	50.21	0.00
50.23	8.02	49.73	19.11					

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	406	03:43	397	22:11	0.0	0.0	0.0	0.0
Gorakhpur	400	419	08:05	397	22:15	0.0	0.0	0.0	0.0
Bareilly	400	414	05:02	401	11:08	0.0	0.0	0.0	0.0
Kanpur	400	417	03:39	398	22:19	0.0	0.0	0.0	0.0
Dadri	400	412	03:40	393	14:31	0.0	0.0	0.0	0.0
Ballabgarh	400	420	03:26	397	14:36	0.0	0.0	0.0	0.0
Bawana	400	416	05:04	395	14:31	0.0	0.0	0.0	0.0
Bassi	400	424	04:02	401	19:38	0.0	0.0	10.0	0.0
Hissar	400	413	05:04	392	19:36	0.0	0.0	0.0	0.0
Moga	400	410	05:05	394	14:36	0.0	0.0	0.0	0.0
Abdullapur	400	412	05:31	394	19:36	0.0	0.0	0.0	0.0
Nalagarh	400	416	06:01	400	14:35	0.0	0.0	0.0	0.0
Kishenpur	400	412	03:28	402	19:38	0.0	0.0	0.0	0.0
Wagoora	400	407	22:46	388	19:57	0.0	2.1	0.0	0.0
Amritsar	400	411	05:02	393	06:39	0.0	0.0	0.0	0.0
Kashipur	400	418	04:18	408	12:21	0.0	0.0	0.0	0.0
Hamirpur	400	402	00:00	402	00:00	0.0	0.0	0.0	0.0
Rishikesh	400	404	03:46	384	11:57	0.0	12.3	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	777	03:34	740	14:37	0.0	0.9	0.0	0.0
Balia	765	775	08:01	743	22:12	0.0	0.0	0.0	0.0
Moga	765	786	05:02	753	14:35	0.0	0.0	0.0	0.0
Agra	765	795	04:02	751	14:37	0.0	0.0	0.0	0.0
Bhiwani	765	794	03:29	756	14:35	0.0	0.0	0.0	0.0
Unnao	765	760	05:08	727	22:13	0.8	47.4	0.0	0.0
Lucknow	765	774	08:01	740	14:39	0.0	3.0	0.0	0.0
Meerut	765	800	03:40	756	14:37	0.0	0.0	0.0	0.0
Jhatikara	765	793	05:02	762	11:25	0.0	0.0	0.0	0.0
Bareilly	765	773	05:04	737	14:36	0.0	3.0	0.0	0.0
Anta	765	767	00:00	767	00:00	0.0	0.0	0.0	0.0
Phagi	765	791	03:27	758	14:47	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	509.36	1515.08	509.70	1530.03	1272.27	1156.52
Pong	426.72	384.05	422.02	990.81	415.84	705.67	958.30	520.24
Tehri	829.79	740.04	814.80	897.00	812.05	846.00	681.03	573.00
Koteshwar	612.50	598.50	610.15	4.69	610.24	4.69	573.00	568.82
Chamera-I	760.00	748.75	757.26	0.00	0.00	0.00	366.46	352.38
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	522.86	14.09	518.05	11.51	372.44	556.99

* 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	1531	136	0	1513	29	0	36.64	2.27	38.91
Delhi	367	207	0	691	150	0	11.66	8.25	19.91
Haryana	1806	269	0	1755	259	0	38.84	2.84	41.67
HP	-1119	-400	0	-1047	-409	0	-23.47	-9.86	-33.33
J&K	-694	-76	0	-491	35	0	-13.32	-0.72	-14.04
CHD	0	0	0	0	0	0	0.24	0.20	0.43
Rajasthan	-753	715	0	-753	787	0	-18.08	16.29	-1.79
UP	1019	0	0	627	0	0	17.78	0.82	18.59
Uttarakhand	-188	-189	0	-147	56	0	-3.81	-0.84	-4.65
Total	1768	663	0	2147	907	0	46.47	19.24	65.71

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

State	Bilateral (MW)		IEX (MW)		PXIL (MW)	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
Punjab	1531	1513	143	28	0	0
Delhi	848	184	705	-19	0	0
Haryana	1805	1561	276	-170	0	0
HP	-851	-1172	-387	-445	0	0
J&K	-491	-694	35	-152	0	0
CHD	29	0	29	0	0	0
Rajasthan	-753	-753	797	628	0	0
UP	1019	581	489	0	0	0
Uttarakhand	-136	-233	60	-198	0	0

XI. System Constraints:

XII. Grid Disturbance / Any Other Significant Event:

XIII. Weather Conditions For 20.08.2015 :

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 :