

# TRANSMISSION COMPANY OF NIGERIA

To: Head (ISO), TCN - Abuja  
From: General Manager, NCC, Osogbo

DAILY OPERATIONAL REPORT OF MONDAY 09/07/2018

FOR: EVENTS OF SUNDAY 08/07/2018

1.0 EXECUTIVE OPERATIONS SUMMARY:

1.1 GENERATION PROFILE: NATIONAL STATISTICS

DETAILS	MW	HRS	DATE
PEAK DEMAND FORECAST (CONNECTED + SUPPRESSED LOAD)	22,330	14:00	08/07/2018
GENERATION CAPABILITY	7308.3	-00-	-00-
UNITS ON BARK CAPABILITY AT PEAK	4121	-00-	-00-
PEAK GENERATION	3621.0	-00-	-00-
LOWEST GENERATION	92.3	15:00	08/07/2018
8-HOURLY DURATION PEAK	3165.6	0100-0800	-00-
	3621	0900-1600	-00-
	3128.6	1700-2400	-00-
PEAK GENERATION TO DATE	5222.3	21:00	18/12/2017
MAXIMUM AVAILABLE CAPACITY TO DATE	7652.6	08:00	14/04/2014
MAXIMUM ENERGY GENERATED (MWH) TO DATE	109,372.01	0000-2400	02/02/2016

1.2 CRITICAL VOLTAGE

DETAILS	KV	STATION	HRS
NOMINAL VOLTAGE	330		
STATUTORY LIMITS	280.5 - 346.6		
HIGHEST VOLTAGE FOR THE DAY	363	Lekki T/S	18:00
LOWEST VOLTAGE FOR THE DAY	300	Gombe T/S	07:00

1.3 FREQUENCY RANGE

DETAILS	HZ	HRS
NOMINAL FREQUENCY	50	
STATUTORY LIMITS	49.75 - 50.25	
HIGHEST FREQUENCY	51.18	16:24
LOWEST FREQUENCY	47.38	14:27

1.4 SYSTEM COLLAPSE UP DATE

		No. of days since last total collapse: 01												No. of days since last partial collapse: 83														
		Highest No of days ever attained in-between total collapses: 134												Highest No of days ever attained in-between partial collapses: 240														
		Jan	Feb.	Mar.	Apr	May	Jun	Jul	Aug	Sep.	Oct	Nov	Dec	Total														
2010	Total	---	3	1	--	3	3	3	--	2	2	1	4	22														
	Partial	1	--	--	1	1	3	4	4	3	2	--	1	20														
2011	Total	--	--	--	--	4	3	1	1	1	2	1	--	13														
	Partial	--	1	1	--	--	--	--	1	--	1	2	--	6														
2012	Total	--		2	1	5	2	1	--	--	2	2	1	16														
	Partial	--		2	3	--	--	--	--	1	--	1	1	8														
2013	Total	--	1	2	2	3	4	1	1	1	1	4	2	22														
	Partial	--		--	--	--	--	--	--	2				2														
2014	Total	2			2	0	3	1	0	0	1	0	0	9														
	Partial			0	0	1	0	0	0	0	0	2	1	4														
2015	Total	1	0	1	0	2	0	1	0	0	0	1	0	6														
	Partial	--	--	1	0	2	0	0	0	0	1	0	0	4														
2016	Total	--	--	2	3	6	5	0	0	1	1	2	2	22														
	Partial	--	--	1	0	1	3	1	0	0	0	0	0	6														
2017	Total	5	3	0	3	1	1	0	0	1	1			15														
	Partial	1	0	1	0	0	0	1	0	3	3			9														
2018	Total	5	1	0	0	0	1	1						8														
	Partial	0	0	0	1	0								1														

1.5 BREAKDOWN OF PEAK & OFF PEAK GENERATION (NATIONAL PEAK & OFF PEAK)

STATION	TURBINE	PEAK GEN. (MW)	OFF-PEAK GEN.(MW)
1 KAINJI	HYDRO	196	0
2 JEBBA	HYDRO	177	0
3 SHIRORO	HYDRO	400	5
4 EGBIN ST2 - 5	STEAM	389	0
5 SAPELE	STEAM	43	0
6 DELTA	GAS	356	85
7 AFAM IV-V	GAS	72	0
8 GEREGU GAS	GAS	121	0
9 OMOTOSHO GAS	GAS	167	0
10 OLORUNSOGO GAS	GAS	130.7	0
11 GEREGU NIPP	GAS	118	0
12 SAPELE NIPP	GAS	205.6	0
13 ALAJOI NIPP	GAS	0	0
14 OLORUNSOGO NIPP	GAS	107.1	0
15 OMOTOSHO NIPP	GAS	108.7	0
16 ODUKPAI NIPP	GAS	0	0
17 IHOVBOR NIPP	GAS	98.7	0
18 OKPAI	GAS	100	0
19 AFAM VI	GAS	144	0
20 IBOM POWER	GAS	0	0
21 ASCO	GAS	0	0
22 A.E.S	GAS	0	0
23 OMOKU	GAS	66.7	2
24 TRANS AMADI	GAS	563	0.3
25 RIVERS IPP	(GAS)	0	0
26 AZURA - EDO IPP	(GAS)	282	0
27 EGBIN ST6	(GAS)	110	0
28 PARAS ENERGY	(GAS)	71.8	0
29 GBARAIN NIPP	GAS	100.4	0
<b>TOTAL</b>		<b>3621</b>	<b>92.3</b>

  

1.6 ENERGY GENERATED/ENERGY SENT OUT:		ENERGY GENERATED		ENERGY SENT OUT	
STATION	TURBINE	MWH	MWH/H	MWH	MWH/H
1 KAINJI	HYDRO	1811.00	75.46	1797.60	74.90
2 JEBBA	HYDRO	2868.00	119.50	2850.44	118.77
3 SHIRORO	HYDRO	6360.00	265.00	6334.14	263.92
4 EGBIN ST2 - 5	STEAM	5769.00	240.38	5473.40	228.06
5 SAPELE	STEAM	565.00	23.54	519.40	21.64
6 DELTA	GAS	9514.84	396.45	9258.00	385.75
7 AFAM IV-V	GAS	1314.00	54.75	1310.56	54.61
8 GEREGU GAS	GAS	1916.10	79.84	1897.55	79.06
9 OMOTOSHO GAS	GAS	2588.00	107.83	2562.30	106.76
10 OLORUNSOGO GAS	GAS	2357.21	98.22	2336.51	97.35
11 GEREGU NIPP	GAS	2097.62	87.40	2085.00	86.88
12 SAPELE NIPP	GAS	2831.79	117.99	2812.30	117.18
13 ALAJOI NIPP	GAS	0.00	0.00	0.00	0.00
14 OLORUNSOGO NIPP	GAS	436.10	18.17	412.20	17.18
15 OMOTOSHO NIPP	GAS	2998.30	124.97	2975.60	123.98
16 ODUKPAI NIPP	GAS	0.00	0.00	0.00	0.00
17 IHOVBOR NIPP	GAS	1730.00	72.08	1710.27	71.26
18 OKPAI	GAS	3028.00	126.17	2953.00	123.04
19 AFAM VI	GAS	2289.80	95.41	2247.95	93.66
20 IBOM	GAS	1448.71	60.36	1440.00	60.00
21 ASCO	GAS	0.00	0.00	0.00	0.00
22 AZURA - EDO IPP	GAS	2686.50	111.94	2682.10	111.75
23 A.E.S	GAS	0.00	0.00	0.00	0.00
24 OMOKU	GAS	1476.30	61.51	1441.96	60.08
25 TRANS AMADI	GAS	1084.00	45.17	1053.70	43.90
26 RIVERS IPP	GAS	0.00	0.00	0.00	0.00
27 EGBIN ST6	STEAM	1814.00	75.58	1732.10	72.17
28 PARAS ENERGY	GAS	1232.80	51.37	1229.50	51.23
29 GBARAIN NIPP	GAS	160.90	6.70	153.70	6.40
<b>TOTAL</b>		<b>60,378.97</b>	<b>2,515.79</b>	<b>59,269.28</b>	<b>2,469.55</b>

1.7A GENERATION POSITION AT 06:00HRS OF MONDAY 09/07/2018

	STATIONS	NO OF INSTALLED UNITS	AVAILABLE UNITS	INSTALLED CAPACITY OF AVAILABLE UNITS(MW)	GENERATION CAPABILITY OF AVAILABLE UNITS(MW)	UNITS ON BAR	CAPABILITY OF UNITS ON BAR (MW)	GENERATION AT 06:00HRS (MW)	REMARKS
PRIVATISED COMPANIES	KAINJI HYDRO	8	1G5, 11 & 12 3	340	195	1G5 & 12 2	135	116	1G6 - Out on maintenance. 1G7 - Out on stator winding failure. 1G8 - Out due to oil leakage on governor runner head. 1G9 - Out due to burnt 7.5MVA 33/0.415kV & 183.6MVA 16/330kV station service transformer and generator transformer. 1G10 - Shut down due to thrust bearing temperature problem. GT11 - Not yet tied after System collapse of 08/07/2018. Generation reduced due to low gross operating head.
	JEBBA HYDRO	6	2G1 - 5 5	475	400	2G1 & 5 2	160	146	2G2 - 4 - Out on water management. 2G6 - Out due to burnt generator winding and AVR.
	SHIRORO HYDRO	4	411G 2 - 4 3	440	389	411G2 - 4 3	389	389	411G1 - Out due to synchronization problem.
	EGBIN STEAM	5	ST1, 2 & 4 3	660	472	ST1, 2 & 4 3	472	382	ST3 - Out on high vibration since 19th June 2017. ST4 - Still loading up. ST5 - Out due to boiler tube leakage.
	SAPELE (STEAM)	6	ST2 1	120	45	0 0	0	0	ST1 - Shut down due to alarm on inlet gas guide control trouble. ST2 - Not yet tied after System collapse of 08/07/2018. ST3 - Out on stator winding problem. ST4 & 5 - Awaiting major overhaul. ST6 - Out on gas control valve not following reference point.
	DELTA (GAS)	18	GT7, 9 - 13, 15, 16 & 18 - 20 11	635	635	GT7, 9 - 13, 15, 16, 18 - 20 11	615	611	GT3 & 5 - Out due to generator winding fault. GT4 - Out on loss of excitation. GT6, 8 & 14 - Out on major overhaul. GT17 - Tripped on bearing vibration than maximum.
	AFAM IV & V (GAS)	8	0 0	0	0	0 0	0	0	GT1 - 12 - De-commissioned and scrapped. GT13 - 16 - Out on blade failure. GT17 - Out due to technical issues. GT18 - Tripped on loss of excitation. GT19 & 20 - Awaiting major overhaul.
	GEREGU GAS	3	GT11 - 13 3	435	435	GT11 & 12 2	290	215	GT11 - Generation reduced on frequency management. GT13 - Out due to gas constraint.
	OMOTOSHO GAS	8	GT1 - 8 8	336	304	GT1, 2, 5 - 7 5	190	176.8	GT3, 4 & 8 - Out due to gas constraint.
	OLORUNSOGO GAS	8	GT1 - 8 8	336	304	GT1, 2, 4, 6 & 8 5	190	168.5	GT3, 5 & 7 - Out due to gas constraint.
	GEREGU NIPP	3	GT21 - 23 3	435	435	GT22 3	145	120	GT21 & 23 - Out due to gas constraint.
	SAPELE NIPP	4	GT1 & 3 2	225	225	GT1 & 3 2	225	161.4	GT2 - Out due to high air inlet differential pressure. GT3 - Generation reduced due to filter problem. GT4 - Out due to high inlet differential pressure.
	NIPP	ALAOJI NIPP GAS	4	GT1, 2 & 4 3	375	360	0 0	0	0
OLORUNSOGO NIPP		6	GT1 - 3 3	375	360	GT1 1	120	113.2	GT2 & 3 - Out due to gas constraint. GT4 - Out due to ignition failure and control relay failure alarm. ST13 & ST23 - Out on maintenance.
OMOTOSHO NIPP GAS		4	GT1, 2 & 4 3	375	360	GT2 & 4 2	240	203.1	GT1 - Out due to gas constraint. GT3 - Out due to oil leakage on the unit.
ODUKPANI NIPP		5	GT4 & 5 2	240	230	0 0	0	0	GT1 - Out on fault. GT2 - Out due to malfunctioning gas regulating valve. GT3 - Out on high air inlet differential pressure. GT4 & 5 - Shut down due to work on gas pipe line equipment.
IHOVBOR NIPP		4	GT1 & 3 2	225	225	GT3 1	91.2	91.2	GT1 - Out due to gas constraint. GT2 - Out on fault. GT3 - Manual adjustment to frequency. GT4 - Out on maintenance.
GBARAIN NIPP GAS		1	GT2 1	112.5	112.5	GT2 1	112.5	89.1	Available unit on bar.
OKPAI GAS/STEAM		3	GT11 & 12 2	300	300	GT12 1	150	119	GT11 - Not yet tied after System collapse of 08/07/2018. ST18 - Out due to water shortage. Generation reduced on frequency management.
AZURA - EDO		3	GT11 - 13 3	461	461	GT12 & 13 2	306	228	GT11 - Tripped on low gas temperature.
AFAM VI GAS/STEAM		4	GT11 - 13 & ST10 4	650	640	GT13 1	150	122	GT11 & ST10 - Out due to gas constraint. GT12 - Shut down on frequency management.
IBOM POWER GAS		3	GT3 1	115	115	GT3 1	115	80.8	GT3 - Generation reduced due to line constraint.
IPP	AES	0	0 0	0	0	0 0	0	0	Out of production since 27/09/2014.
	ASCO	2	0 0	0	0	0 0	0	0	ST1 - Shut down due to leakage in the furnace.
	OMOKU GAS	6	GT1, 2, 5 & 6 4	100	80	GT1, 2, 5 & 6 4	80	79.7	GT3 - Out due to gas leakage. GT4 - Awaiting major overhaul.
	TRANS-AMADI	4	GT1, 2 & 4 3	75	60	GT1 & 2 2	40	36.1	GT3 - Out on fault. GT4 - Out due to gas constraint.
	RIVERS	1	0 0	0	0	0 0	0	0	GT1 - Out on maintenance.
	SUB TOTAL	131	81	7840.5	7142.5	52	4215.7	3647.9	Frequency = 50.33Hz.

1.7B GENERATION POSITION AT 06:00HRS OF MONDAY 09/07/2018 FOR UNITS ON BILATERAL AGREEMENT

FEEDER	NO.	ST6		TOTAL	REMARK	ST6	NO.	TOTAL	REMARK
		1	2						
EGBIN	1	1	220	130	Available unit on bar.	1	130	130	
PARAS ENERGY	8	8	70.2	70.2	Available units on bar.	8	70.2	70.2	
SUB TOTAL	9	9	290.2	200.2		9	200.2	200.2	
GRAND TOTAL	140	90	8130.7	7342.7		61	4,415.90	3,848.10	Frequency = 50.33Hz.

1.7C

BILATERAL AGREEMENT UNITS DISPATCH - SUNDAY 08/07/2018.  
EGBIN ST6 120MW GENERATION TO IKEJA ELECTRICITY DISTRIBUTION COMPANY

FEEDERS NAME	MAX. LOAD (MW)	TIME (HRS)	MIN LOAD (MW)	TIME (HRS)	HRS IN SERVICE	TOTAL (MWH)	REMARK
U-STEEL	ON	0100HRS			14		FAULT ON 132KV LINE
PTCEXPRESS	7	0900HRS			14		FAULT ON 132KV LINE
SANKYO	OUT	OUT			OUT		FAULT ON 132KV LINE
FEEDER 8	12	1300HRS			14		FAULT ON 132KV LINE
PULK IT	2	1900HRS			24.00HRS		Nil
INDUSTRIAL	18	1100HRS			2400HRS		Nil
SPINTEX	11	0100HRS			2400HRS		Nil
DANGOTE	1	0100HRS			2400HRS		Nil
LAND CRAFT	17	0100HRS			24.00HRS		Nil
TR4 15MVA	4.6	10:00			24HRS		Nil
TR5 -15MVA	3.7	10:00			24HRS		Nil
ALAUZA	12.5	10:00			24HRS		Nil
PTC (MARYLAND)	15	1100HRS			2400HRS		Nil
<b>TOTAL LOAD</b>	<b>103.8</b>						

BILATERAL AGREEMENT LOAD DISPATCH  
60MW PARAS ENERGY GENERATION TO CEB OF SUNDAY 08/07/018

FEEDER	MAX LOAD (MW)	TIME (HRS)	MIN LOAD (MW)	TIME (HRS)	HOURS IN SERVICE	TOTAL (MWH)	REMARK
Ikeja West/Sakete 330kV line	71.8	14:00	57	21:00	18	584.3	Out due to system collapse of 08/07/2018

BILATERAL AGREEMENT MAIN STREAM ENERGY KAINJI LOAD DISPATCH TO THE FOLLOWING COMPANIES OF: SUNDAY 08/07/2018

COMPANY NAME	VOL-TAGE LEVEL	CON-TRAC-TUAL LOAD (MW)	MAX LOAD (MW)	TIME (HRS)	MIN LOAD (MW)	TIME (HRS)	HOURS IN SERVICE	TOTAL (MWH)	REMARK
INNER GALAXY	132kV line	25	0.1	24:00	0.1	01:00	18	128.1	SUPPLY NOT INTERRUPTED
KAM STEEL		0	0	0:00	0	0	0	0	NO COMMI-SSIONED
ASAKA CEMENT	33kV feeder	0	8.4	08:00	4.0	11:00	18	128.1	SUPPLY NOT INTERRUPTED
KAM INTEGRATED		15.0	3.1	23:00	1.2	02:00	18	38.6	SUPPLY NOT INTERRUPTED
OLAM FLOUR MILLS		3.0	1.7	02:00	0.3	14:00	18	21.1	SUPPLY NOT INTERRUPTED
LORDSMITH		3	0.1	01:00	0.1	01:00	24	2.2	E/F

1.8 HYDROLOGICAL DATA: MONDAY 09/07/2018

	KAINJI	JEBBA	SHIRORO
HEAD WATER ELEVATION (METERS)	130.21	100.07	363.65
TAIL WATER ELEVATION (METERS)	101.98	72.60	270.00
GROSS OPERATING HEAD (METERS)	<b>28.23</b>	<b>27.47</b>	<b>93.65</b>
AVERAGE TURBINE DISCHARGE (M3/SEC)	433.00	473.00	313.00
AVERAGE SPILLAGE (M3/SEC)	0.00	0.00	0.00
AVERAGE TOTAL STATION DISCHARGE (M3/SEC)	<b>433</b>	<b>473</b>	<b>313</b>
COMPUTED INFLOW (M3/SEC)	762.00	653.00	896.00
STORAGE DIFFERENTIAL	<b>329.00</b>	<b>180</b>	<b>573</b>
MAXIMUM LEVEL FOR SPILLAGE COMMENCEMENT	141.73	103	382.5
MINIMUM LEVEL BELOW WHICH NO GENERATION	129	99	355

1.9 MAXIMUM/ALLOCATED LOAD/MINIMUM LOADS FOR ABUJA AND LAGOS AS AT SUNDAY 08/07/2018

DISCO	MAXIMUM LOAD(MW)	TIME(HRS)	ALLOCATED LOAD (MW)	MINIMUM LOAD(MW)	TIME(HRS)
ABUJA	443.9	14:00	428.96	0	15:00
EKO	265.6	04:00	510.31	0	17:00
<b>IKEJA</b>	<b>322.2</b>	<b>15:00</b>	<b>0</b>	<b>0</b>	<b>17:00</b>

2.0 GAS POSITION: MONDAY 09/07/2018

STATION	SIGNED ACQ Annual Contracted Quantity MMSCF/D	INSTALLED CAPACITY OF THERMAL STATIONS (MW)	PREVIOUS DAY OFF-TAKE (MMSCF/D)	CAPABILITY OF UNITS ON BAR OF THERMAL STATIONS (MW)	DIFFERENCE (MW)
EGBIN P/S	376	1100		472	628
DELTA (GAS)	420	915		615	300
OMOTOSHO GAS	143	336.8		190	146.8
OMOTOSHO NIPP	148.9	500		240	290
OLORUNSOGO (GAS)	138.2	336		190	146
OLORUNSOGO NIPP	0	750		113.2	636.8
SAPELE NIPP	129.9	500		225	275
SAPELE STEAM	50	720		0	720
AFAM IV-V	75	300		0	300
AFAM VI	104	650		150	600
GEREGU GAS	180	435		290	145
GEREGU NIPP	100	435		145	290
OKPAI (GAS/STEAM)	185	480		150	330
ALAJU NIPP	0	504		0	504
IHOVOR NIPP	75.7	450		91.2	358.8
IBOM	77.6	198		115	83
ODUKPANI NIPP	0	625		0	625
<b>TOTAL</b>	<b>2203.3</b>	<b>9234.80</b>		<b>2986.4</b>	<b>6248.4</b>

1 MMSCF IS EQUIVALENT TO 3.79MW

3.0 SPINNING RESERVE FOR : SUNDAY 08/07/2018

	(MW)	TIME	FREQUENCY
Maximum (MW)			
Minimum (MW)			
AVERAGE (MW)			

3.1 SYSTEM SPINNING RESERVE AS AT 0600HRS OF MONDAY 09/07/2018 = 0MW. FREQUENCY Hz.

S/N	POWER STATION	UNIT ON SPINNING RESERVE	CONTRACTED RESERVE	ACTUAL RESERVE (MW)	TOTAL (MW)
1	Egbin	ST2	100	0	0
		ST4		0	
		ST5		0	
		ST6		0	
2	Delta	GT16	40	0	0
		GT17	40	0	
3	Olorunsogo NIPP	GT1	40	0	0
		GT2		0	
		GT3		0	
		GT4		0	
4	Geragu NIPP	GT22	35	0	0
5	Omotosho NIPP	GT1	40	0	0
		GT2		0	
		GT3		0	
		GT4		0	
<b>TOTAL (MW)</b>			<b>295</b>	<b>0</b>	<b>0</b>

4.0 UNAVAILABLE GENERATION CAPABILITY

The unavailable generation capability for Monday 09/07/2018 as at 0600Hrs was = 2613.2MW.

S/NO	STATION	ACTUAL GENERATION CAPABILITY (MW)	GENERATION AT 0600HRS (MW)	UNAVAILABLE GENERATION CAPABILITY (MW)	SUB-TOTAL
<b>4.1 DUE TO GAS CONSTRAINTS:</b>					
1	Alajo NIPP GT1, 2 & 4	360	0	360	1973
2	Olorunsogo Gas GT3, 5 & 7	114	0	114	
3	Geragu NIPP GT21 & 23	290	0	290	
4	Atam VI GT11 & ST10	340	0	340	
5	Olorunsogo NIPP GT2 & 3	240	0	240	
6	Odukpani NIPP GT4 & 5	230	0	230	
7	Omotosho Gas GT3, 4 & 8	114	0	114	
8	Geragu Gas GT13	145	0	145	
9	Trans Amadi GT4	20	0	20	
10	Omotosho NIPP GT1	120	0	120	
				0	
				0	
				0	
IT IS ENVISAGED WITH IMPROVED PLANT AVAILABILITY AND RELIEF FROM EXISTING POWER SYSTEM NETWORK RELATED CONSTRAINTS, ADDITIONAL 1666.24MMSCF OF GAS (EQUIVALENT TO 6248.4MW) WILL BE REQUIRED WHEN ALL THERMAL UNITS ARE ON BAR.					
<b>4.2 DUE TO LINE CONSTRAINTS</b>					
1	Ibom Power GT3	115	80.8	34.2	34.2
				0	
				0	
<b>4.3 DUE TO FREQUENCY MANAGEMENT OCCASIONED BY DISCOS' LOAD DEMAND</b>					
				0	286
1	Geragu Gas GT11	145	84	61	
2	Ihovbor NIPP GT1	75	0	75	
3	Atam VI GT12	150	0	150	
				0	
				0	
				0	
				0	
				0	
				0	
<b>4.4 DUE TO WATER MANAGEMENT</b>					
1	Jebba 2G2 - 4	320	0	320	320
				0	
<b>Grand Total</b>			<b>320</b>	<b>0</b>	<b>2613.2</b>

5.0 **OUTAGES:**

5 (A) **FORCED OUTAGES (GENERATION):-**

- 1 11:46 – 13:37Hrs, Gbarain NIPP GT2 tripped on reverse power due to tripping of Alaaji/Owerri 132kV lines 1 & 2. LHR = 85MW.

5(B) **FORCED OUTAGES (TRANSMISSION):-**

- 1 06:02 – 06:20Hrs, Ayede/Ibadan North/Iwo/Iseyin 132kV line CB tripped at Ayede T/S on O/C 3Phases. LHR = 75MW.
- 2 11:46 – 11:58Hrs, Alaaji/Owerri 132kV lines 1 & 2 CBs tripped at Alaaji T/S on the following relay indications:  
Line 1 - Siemens Relay: O/C trip I> 3Phases. LHR = 20MW.  
Line 2 - Siemens Relay: E/F trip i.e> instantaneous trip. LHR = 20MW.

3 **SYSTEM COLLAPSE REPORT OF 08/07/2018 AT 14:27HRS**

**OBSERVATION FROM NCC CONTROL DESK**

14:27Hrs, system frequency sharply dropped from 50.30Hz to 47.50Hz and resulted in system collapse. Total Load loss was 3621.0MW.

**REPORT FROM STATIONS**

14:27Hrs, Delta/Benin 330kV line (cct G3B) CB tripped at Delta T/S on the following relay indications:  
Siprotec Relay: Zone 2, relay trip, E/F, Distance pick up L3E, pick up time: 427ms, Trip-time: 373ms, Distance = 387.9km.  
Optimho Relay: Location = 307.2km. LHR = 163MW.

14:27Hrs, Sapele/Delta 330kV line (cct S4G) CBs tripped at both ends on the following relay indications:

**At Sapele T/S:** E/F, Phase C Z2, distance = 44.2km.

**At Delta T/S:** Optimho Relay: Tower system fault 293

Siprotec Relay: Zone 1 trip, relay trip & E/F. LHR = 117MW.

**UNDER FREQUENCY RELAY OPERATION FROM STATIONS**

14:27 – 16:20Hrs, Mando T/S 3x60MVA 132/33kV transformers T1 – T3 secondary CBs. LHR = 18.4MW, 22.2MW & 3.8MW respectively.

14:27 – 19:57Hrs, Akangba T/S 60MVA 132/33kV transformer 10T1A secondary CB. LHR = 20.3MW.

14:27 – 21:07Hrs, Abakaliki T/S 60MVA 132/33kV transformer T2 secondary CB. LHR = 9.3MW.

14:27 – 16:26Hrs, Shagamu/Ijebu-Ode 132kV line. LHR = 9MW.

14:27 – 16:30Hrs, Iseyin T/S 45MVA 132/33kV transformer T1A secondary CB. LHR = 15MW.

**RESTORATION**

14:35Hrs, Shiroro P/S was instructed to feed Abuja.

14:48Hrs, Shiroro 411G3 was tied to feed Abuja.

14:59Hrs, Delta GT16 was tied to black start the grid.

15:00Hrs, cct R4B was restored.

15:01Hrs, cct G3B was restored.

15:13Hrs, cct H7V was restored.

**Restoration in progress.**

5 (C) **PLANNED OUTAGES:-**

- 1 10:16 - 14:15Hrs, Eket/Uyo 132kV line was taken out to replace Yellow Phase down dropper conductor at Uyo T/S. Load loss = 60MW.

5(D) **URGENT OUTAGES:**

- 1 07:35 – 07:58Hrs, Calabar T/S 60MVA 132/33kV transformer T1 was taken out to treat hot spot on Yellow Phase secondary bushing. Load loss = 1.5MW.
- 2 10:00 - 14:21Hrs, Ibom Power GT3 went on FSNL due to planned outage on Eket/Uyo 132kV line. Load loss = 72MW.

9 **GENERATOR MERIT ORDER BASED ON SYSTEM RESPONSE AND GRID RELIABILITY**

GROUP 1 - HYDRO UNITS (LEAST COST) ON FREE GOVERNOR CONTROL AND ANCILLARY SERVICE .

GROUP 2A - UNITS FROM ODUKPAI, AZURA, SHELL AFAM VI AGIP OKPAI, OLORUNSOGO POWER PLC AND OMOTOSHO POWER PLC.

5 (E) **EMERGENCY OUTAGES:- NIL**

5 (F) **AUTOMATIC UNDER FREQUENCY OPERATION:-**

- 1 14:27 – 16:20Hrs, Mando T/S 3x60MVA 132/33kV transformers T1 – T3 secondary CBs. LHR = 18.4MW, 22.2MW & 3.8MW respectively.
- 2 14:27 – 19:57Hrs, Akangba T/S 60MVA 132/33kV transformer 10T1A secondary CB. LHR = 20.3MW.
- 3 14:27 – 21:07Hrs, Abakaliki T/S 60MVA 132/33kV transformer T2 secondary CB. LHR = 9.3MW.
- 4 14:27 – 16:26Hrs, Shagamu/Ijebu-Ode 132kV line. LHR = 9MW.
- 5 14:27 – 16:30Hrs, Iseyin T/S 45MVA 132/33kV transformer T1A secondary CB. LHR = 15MW.

5 (G) **330KV LINES THAT ARE OUT ON VOLTAGE CONTROL:-** ccts A1K, U1A & A1S.

5 (H) **330KV LINES THAT ARE OUT ON BREAKER PROBLEM:-** NIL.

5 (I) **330KV LINES THAT ARE OUT ON PLANNED OUTAGE:-** NIL

5 (J) **330KV LINES THAT ARE OUT ON LINE FAULT:-** ccts K4U, J2H & S5B.

5 (K) **330KV LINES THAT ARE ON SOAK:-** ccts N4J & F1K.

6 **WEATHER REPORT:-** NIL

7 **INTERNATIONAL LINES:-**

A **IKEJA WEST/SAKETE 330KV LINE(TCN+PARAS)**

Maximum load - 245MW at 01:00Hrs.

Minimum load - 55MW at 21:00Hrs.

B **BIRNIN KEBBI/NIAMEY 132KV LINE**

Maximum load - 105.0MW at 04:00Hrs.

Minimum load - 1.0MW at 22:00Hrs.

GROUP 2B - OTHER GENERATING UNITS IDENTIFIED TO BE ON FREE GOVERNOR CONTROL.

GROUP 3 - OTHER UNITS IDENTIFIED TO BE OFFERING REGULATORY RESERVE.

GROUP 4 - OTHER UNITS OFFERING SPINNING RESERVE (THE POWER PLANTS CONTRACTED FOR THE ANCILLARY SERVICE).

GROUP 5 - ALL PLANTS DISPATCHED SUBJECT TO TRANSMISSION CONSTRAINT (NOT YET IDENTIFIED).

GROUP 6 - ALL PLANTS PROVIDING VOLTAGE SUPPORT ABOVE STATUTORY LIMIT (NOT YET IDENTIFIED).

10 **COMMUNICATION MEDIA**

STATIONS	NO INSTALLED	NO. WORKING
PLC/PAX	37	27
OPTIC FIBRE	13	8
PLS	14	0

11 **SCADA RTU STATUS**

STATIONS	NO. INSTALLED	NO OF RTU DISTURBED	NO OF RTU WORKING
POWER STATIONS	8	6	2
330kV	19	10	9
132kV	102	88	14

12(A) **UNAVAILABLE TRANSFORMERS/REACTORS:**

**SHIRORO REGION:**

- Birnin Kebbi 75MX Reactor R1.

**ABUJA REGION**

- Apo T/S 60MVA 132/33kV transformer TR3 - Burnt.

**KADUNA REGION:**

- Kumbotso 150MVA 330/132/33kV transformer T1A - Burnt control cables.

**BAUCHI REGION:**

- Gombe T/S -30MX Reactor R2A.

**ENUGU REGION:**

- Onitsha T/S 90MVA 330/132/13.8kV transformer 9T2 - Out due to differential fault.

**LAGOS REGION:**

- Oke-Aro T/S: 75MX Reactor R1.

**PORT HARCOURT REGION**

- Ikot-Ekpene T/S: No available reactor.

12 (B) **UNAVAILABLE BREAKERS/ISOLATORS**

**LAGOS REGION:**

- Akangba T/S. 132kV Bus Coupler CB - Serious Air leakage.(Undergoing repair)
- Egbin/Aja 330kV line 2 (cct N4J) - faulty breaker at Aja T/S
- Otta/Ogba 132kV line isolator - defective control shaft.
- Osogbo/Ikeja West and Olorunsogo/Ikeja West tie CB at Ikeja West T/S - defective pole .
- Oke-Aro/Ikeja West 330kV lines 1 & 2 tie CB at Ikeja West T/S - Defective pole.
- Jebba G.S/Jebba T.S 330kV line 2 CB at Jebba T/S.
- Omotosho/Ikeja West 330kV line CB at Ikeja West T/S.

**BENIN REGION:**

- Omotosho T/S 330kV, 2nd series 330kV CB #3322 out due to control circuit problem.

**ENUGU REGION:**

- New Haven/Yandev 132kV line CB - Faulty Red phase CB pole. Protection is transferred to the bus coupler CB.

C **KATSINA/GAZAOUA/MARADI 132KV LINE**

Maximum load - 36.7MW at 22:00Hrs.  
Minimum load - 0.8MW at 20:00Hrs.

8 **MISCELLANEOUS:-**

- 00:39 – 14:10Hrs, Delta GT16 was shut down on frequency management. Load loss = 70MW.
- 01:07 – 11:15Hrs, Jebba 2G1 was shut down on frequency management. Load loss = 60MW.
- 02:04 - 15:41Hrs, Delta GT18 was shut down on frequency management. Load loss = 40MW.
- 08:47 - 20:06Hrs, Omotosho NIPP GT4 was shut down on frequency management. Load loss = 87.8MW.
- 10:38Hrs, Mando/Jos 330kV line (cct M2S) was restored. The line was out on voltage control.
- 11:30Hrs, Gbarain NIPP GT2 was tied. The unit was out due to tripping of Owerri/Ahoada 132kV line.
- 11:30 – 13:33Hrs, Omotosho Gas GT6 was shut down on frequency management. Load loss = 25.7MW.
- 16:13 – 17:57Hrs of 07/07/2018, Kaduna Town T/S 60MVA 132/33kV transformer T3 primary CB tripped on O/C Red & Blue Phases. LHR = 3MW.

\*\*\*\*\* **LACK OF REACTOR AND UNRELIABLE STATION SERVICE SUPPLY AT IKOT-EKPENE T/S ARE HINDERING SMOOTH OPERATION.**

\*\*\*\*\* **THE SCADA COVERAGE OF ONLY LIMITED AREAS IS NOT GOOD FOR THE SMOOTH OPERATION OF THE GRID.**

12(D) **UNAVAILABLE CAPACITOR BANK:**

- (i) Ogba T.S, (ii) Maiduguri T/S, (iii) Isolo T/S, (iv) Ado-Ekiti T/S, (v) Ilorin T/S, (vi) Akure T/S.

12(E) **UNAVAILABLE SKYWIRES**

**LAGOS REGION**

- Omotosho/Ikeja West line (M5W) and Egbin/Ikeja West line 3 (N6W) - 21 spans.
- Ikeja West/Olorunsogo line (cct R1W) - 80 spans.
- 330kV Ikeja West/Osogbo line. - 95 spans.
- Ikeja West/Alimosho/Ogba 132kV lines 1 & 2 - 15 spans.
- Ikeja West/Akangba 330kV line 2 - 1 span.
- Ikeja West/ Ilupeju 132kV lines 1 & 2 - 8 spans.
- Akangba/Iire 132kV lines 1 & 2 - 1 span.
- Ikeja West/Agbara 132kV lines 1 & 2 - 61 spans.
- Ikeja West/Otta 132kV lines 1 & 2- 17 spans.

**SHIRORO REGION**

- Jebba T/S 330kV Osogbo lines 1 & 2 and Ganmo line - 9 spans
- Minna T/S 132kV Bida line - 32 spans
- Shiroro T/S 330kV Jebba line 2 - 28 spans

**ABUJA REGION**

- Apo T/S 132kV Keffi line - 36 spans

12 (F) **UNAVAILABLE SYNCHROSCOPES :**

- 2 Abakaliki T/S 30MVA 132/33kV transformer T1A and 60MVA 132/33kV transformer T2 primary CBs - Breakers were not provided since commissioning but the transformers are protected by Nkalagu 132kV line CB.
- 3 Oji River T/S 30MVA 132/33kV transformer T1A primary CB - The breaker is completely out of service and bypassed. The transformer is either protected by Onitsha/Oji 132kV line CB or New Haven/Oji 132kV line CB.
- 4 Oturkpo/Yandev 132kV By pass isolator - Canibalized to repair the line isolator.

**SHIRORO REGION**

- 1 Jebba T/S 75MX reactor 2R2 CB - exploded.

**PORT HARCOURT REGION**

- 1 New Haven/Nkalagu 132kV line 2 ground switch - Canibalized Red phase female contact and canibalized Yellow phase male contact.

- 1 Benin, Ikeja West, Onitsha, Egbin, Ugwuaji, Osogbo, Kaduna, Jos, Gwagwalada & Alaaji T/S.

**FOR MORE INFORMATION: NCC Telephone Lines -**

- a PAX 09/300, 309, 303 & 305.
- b NCC GSM - 08074888524, 08069379367, 08023572651 & 08051401331. CUG Nos. 08129458488, 08129458489, 08129929806, 08036665323.
- c PLS - 622
- d GM (NCC) - 08036744641.
- e AGM (S/O) - 08056002757, CUG: 08129458475





