Bhutan Power Corporation Limited

Bhutan Power System Operator

Thimphu: Bhutan

Transmission System Performance Report

Third Quarterly Report – April to June, 2021

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1. Introduction

The electricity transmission network in Bhutan is solely owned by Bhutan Power Corporation limited (BPC) and electricity generation is solely owned by Druk Green Power Corporation Limited (DGPC). Bhutan Power System Operator (BPSO) under BPC is responsible for safe, secure and efficient operation of Bhutan transmission network and generation.

This quarterly report is prepared in compliance to the Grid Code Regulation (GCR) 2008, clause 6.14.1, "System Operator has to submit a quarterly report covering the performance of the Transmission System to all Licensees, Authority and Ministry". This transmission performance report contains summary of growth of peak demand, performance of generating stations (power and energy generation), energy availability and requirement for the country, export and import of electricity to/ from India, frequency profile of selected substation and voltage profile of few important substations.

All the index and other calculations in this report have been executed based on the data received from substations and generating plants.

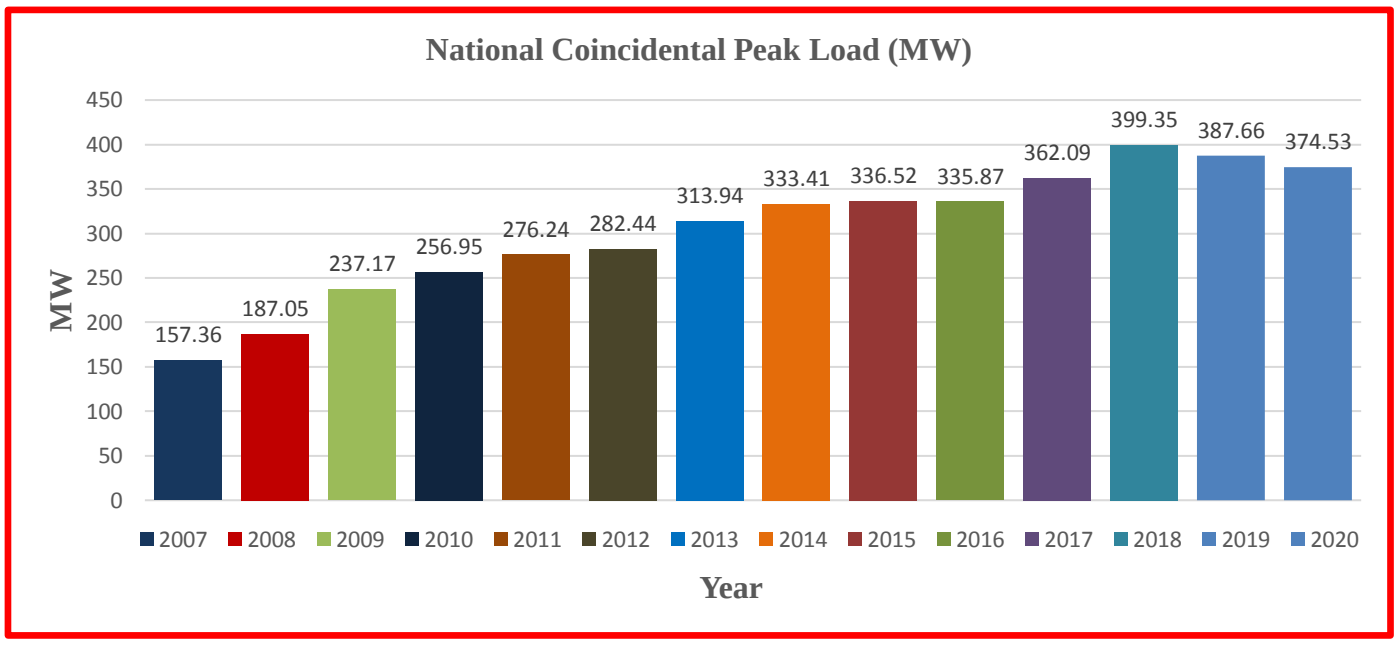
2. National Peak Demand

The national peak demand till now is recorded at **399.35MW** which was occurred on December 27, 2018 at 18:18 hours. This is calculated by summation of Feeder Loading at Plants minus Export.

Table 2.1. The National Peak Demand since 2007

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Peak Load (MW)	157.36	187.05	237.17	256.95	276.24	282.44	313.94	333.41	336.52	335.87	362.09	399.35	387.66	374.53
% Growth over previous Year	-	18.87	26.79	8.34	7.51	2.24	11.15	6.20	0.93	-0.19	7.81	10.29	-2.93	-3.39

Graph 2.1. The growth in National Peak Demand since 2007



2.1. Power (MW) consumed by country

Following methods are used to calculate peak demand for the Eastern Grid, Western Grid and National demand.

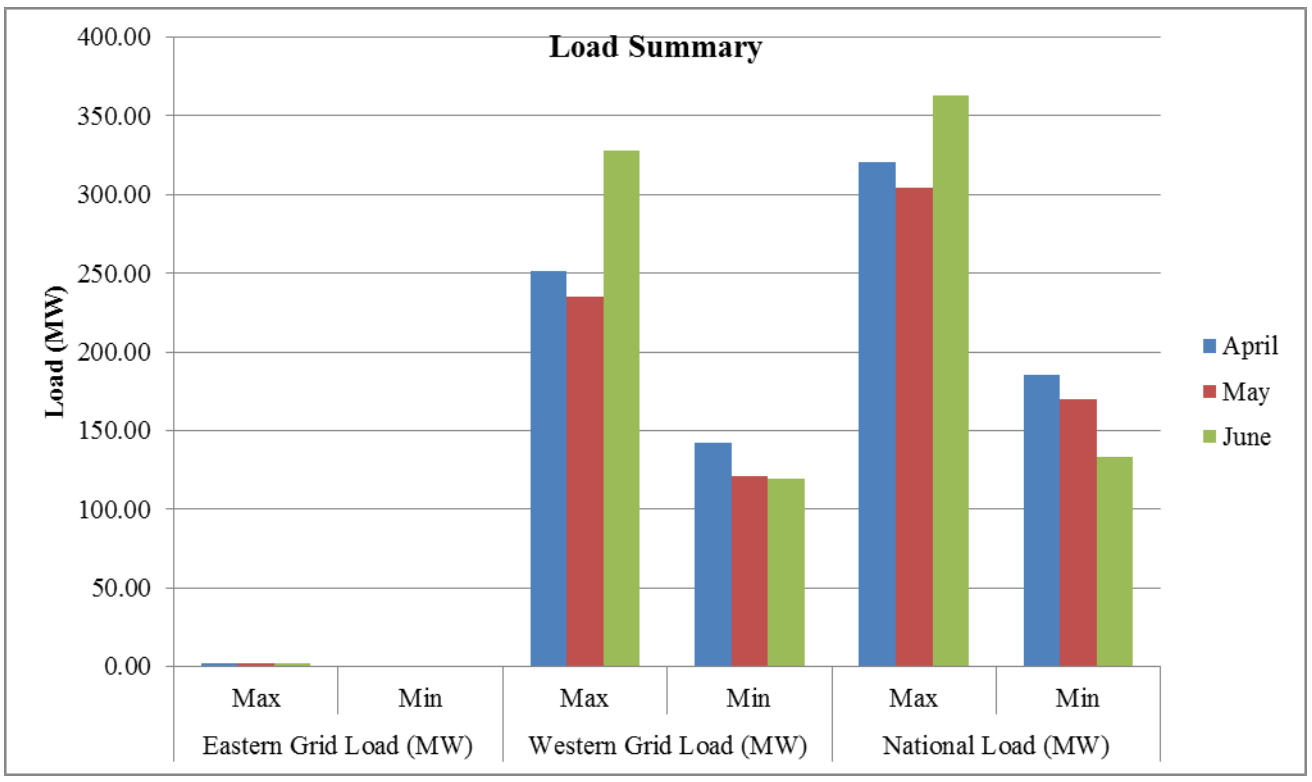
1. **National Demand** = (Sum of all total generation)-(Sum of all Export of Import)
2. **National Demand** = (Sum of all feeders loading at hydropower station) – (Sum of all Export/Import)
3. **National Demand** = (Sum of all substation loading)

For this report, the National Demand was calculated using method-3.

Table 2.1.2. Domestic demand for Eastern Grid, Western Grid and National using method- 3

Grid	Eastern Grid Load (MW)		Western Grid Load (MW)		National Load (MW)	
Month	Max	Min	Max	Min	Max	Min
April	2.38	0.52	251.62	142.39	320.31	185.68
May	1.83	0.36	235.12	120.64	304.53	170.15
June	2.06	0.01	328.00	119.17	362.79	132.89

Graph 2.1.2. Domestic demand for Eastern Grid, Western Grid and National using method- 3



The national load pattern for the month of April to June, 2021 calculated using method-3 is attached as **Annexure-II**

3. Energy Availability and Requirement for the country

3.1. Energy (MU) consumed by Country

The total energy consumed within Bhutan is computed from the total energy DGPC had sold to BPC including the royalty energy.

Table 3.1.1. Total Energy (MU) consumed

Month	Total Ex-bus (MU)	Total Export/Import (MU)	Total energy sold to BPC (MU)
April	345.38710969	152.66528988	192.72182069
May	789.01377024	605.78081100	183.23295924
June	1394.53432065	1188.06521019	206.46911045

Graph 3.1.1. Total Energy (MU) consumed

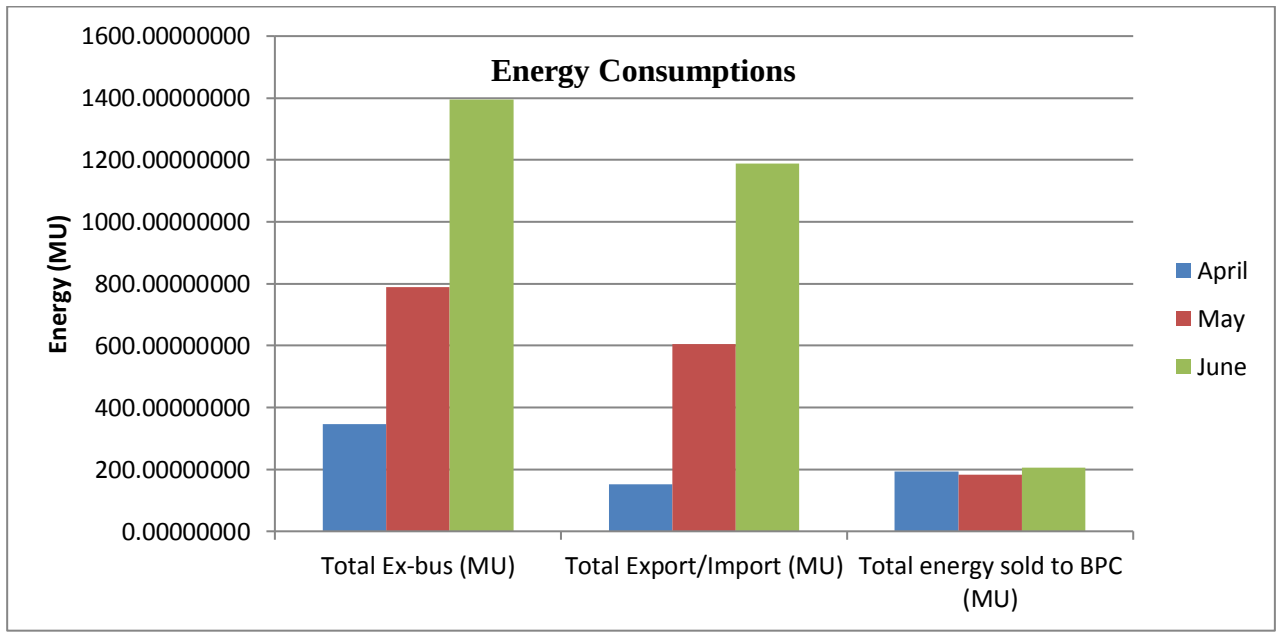
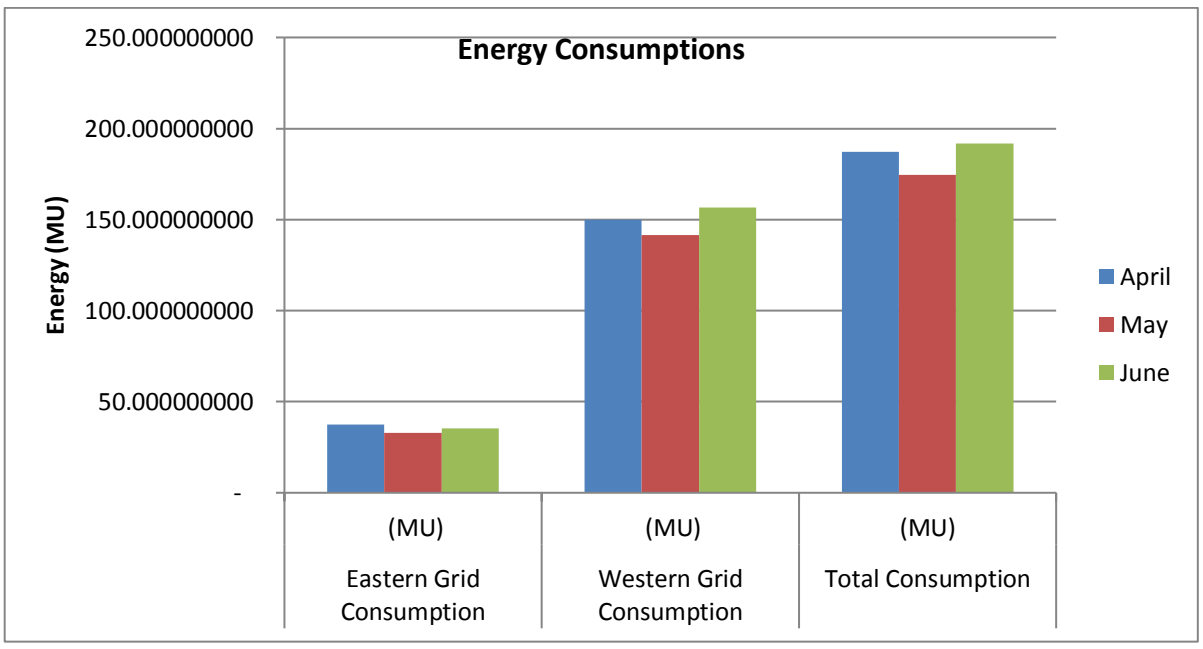


Table 3.1.2. Energy (MU) consumed

Grid	Eastern Grid Consumption	Western Grid Consumption	Total Consumption
Month	(MU)	(MU)	(MU)
April	37.372647000	149.899396	187.2720434
May	32.909221500	141.615677	174.524899
June	35.29364700	156.504260	191.7979066

Graph 3.1.2. Energy (MU) consumed



4. Performance of generating plants

4.1. Power and Energy Generation

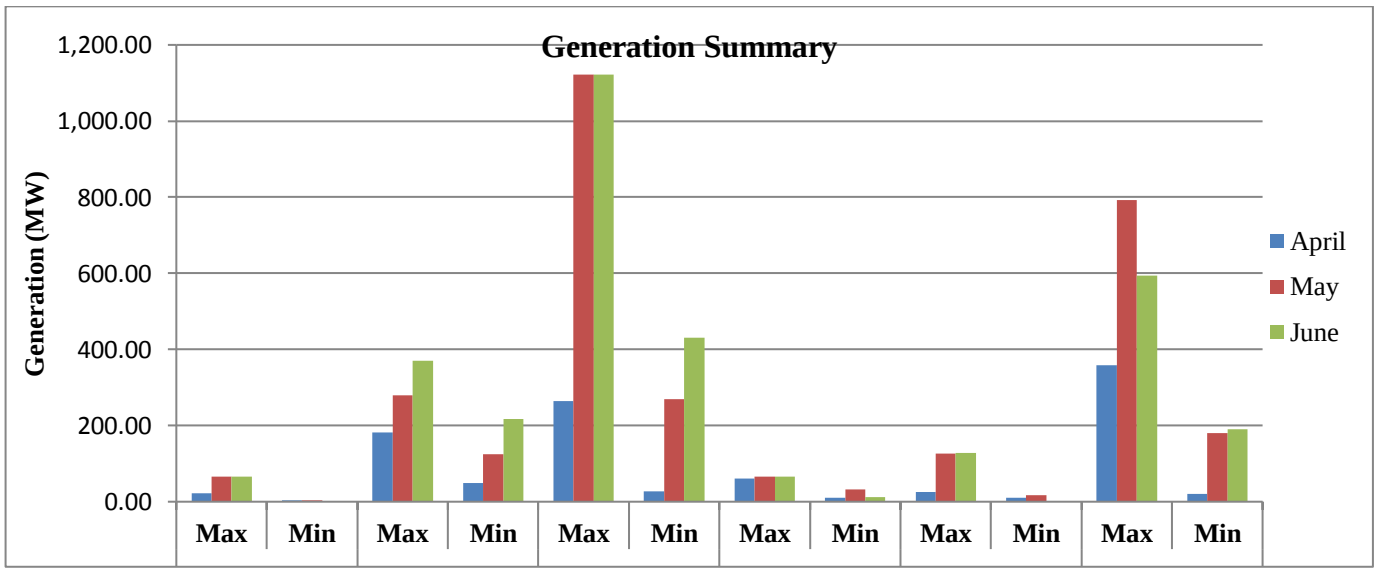
The maximum total generation for the second quarter of year 2021 was 2452.34 MW in month of May and minimum generation was 1222.88 MW in the April month.

Table: 4.1.1 Summary of maximum and minimum generation by various hydropower plant

Generation By	BHP (MW)		CHP (MW)		THP (MW)		KHP (MW)		DHP (MW)		MHPA (MW)		TOTAL (MW)	
Month	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
April	21.83	4.41	182.08	49.24	263.81	27.60	60.33	10.08	25.02	11.06	357.70	19.70	910.77	122.10
May	65.84	4.12	278.79	124.81	1,122.00	270.00	66.18	31.58	126.92	17.16	792.05	180.03	2,451.78	627.70
June	65.79	0.00	369.79	217.70	1,122.00	430.00	66.00	12.67	127.47	0	594.06	190.64	2,345.11	851.01

Source: Hydropower Plants (DGPC)

Graph: 4.1.1 Summary of maximum and minimum generation by various hydropower plant



Daily maximum, minimum and average generation by each generating plant for the month of April to June, 2021 is attached as **Annexure-I.**

4.2.Plant Capacity Factor

The capacity factor of each generating plant was calculated as below:

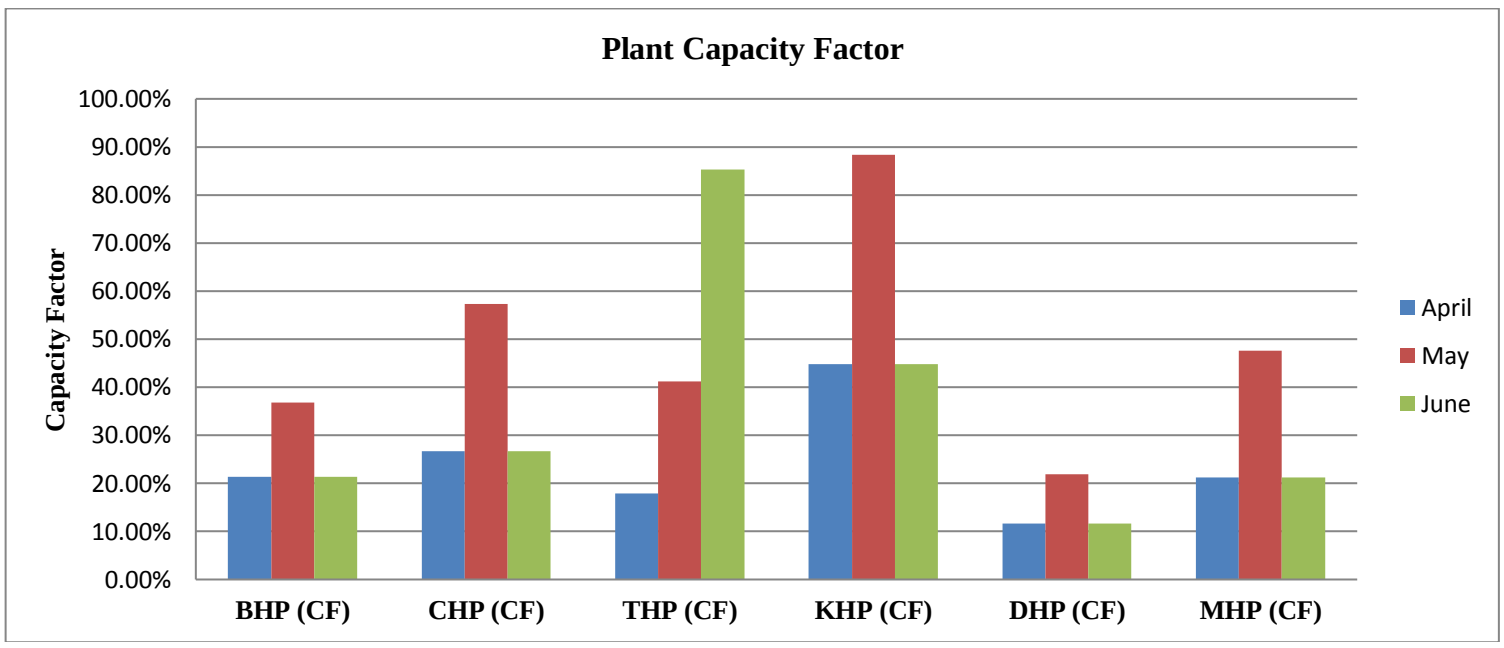
$$Capacity\ factor = \frac{Total\ energy\ plant\ has\ produce\ over\ a\ period}{Total\ energy\ plant\ would\ produce\ when\ operated\ at\ full\ capacity}$$

Table 4.2.1: Total generation and capacity factor of various hydropower plants

Month	BHP (MU)	BHP (CF)	CHP (MU)	CHP (CF)	THP (MU)	THP (CF)	KHP (MU)	KHP (CF)	DHP (MU)	DHP (CF)	MHP (MU)	MHP (CF)
April	9.82938	21.33%	64.49959	26.66%	131.146909	17.86%	19.374278	44.85%	10.61	11.70%	109.92	21.20%
May	17.52197	36.80%	143.26610	57.31%	313.24436	41.28%	39.439818	88.35%	20.47452	21.84%	255.067	47.62%
June	9.82938	21.33%	64.49959	26.66%	626.88145	85.36%	19.374278	44.85%	10.61	11.70%	109.92	21.20%

Source: TD, BPC

Graph 4.2.1: Capacity factor of various hydropower plants



5. Export and Import of Electricity

Maximum export for the second quarter of year 2021 was 1,041.00 MW in the month of May to Binaguri substation in India. The minimum export recorded was 0.16 MW to Salakoti and Rangia substation in India during the month of April.

Table 5.1. Export of electricity to India

Export To	Binaguri (MW)		Birpara (MW)		Salakoti and Rangia (MW)	
Month	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**
April	194.00	11.00	67.40	0.30	33.61	0.16
May	1,041.00	211.00	228.47	2.10	106.55	0.59
June	238.00	1.00	319.50	11.00	165.23	16.94

Graph 5.1. Export of electricity to India

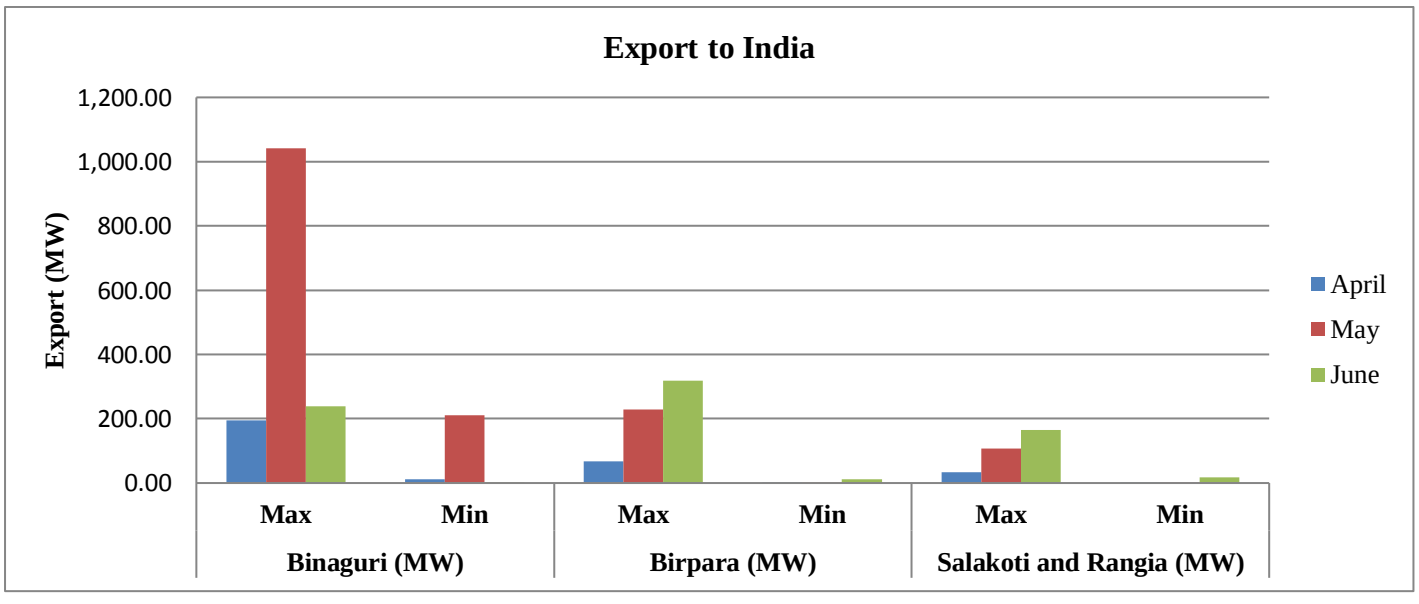


Table 5.2. Import of electricity from India.

Import From	Binaguri (MW)		Birpara (MW)		Salakoti and Rangia (MW)	
Month	Max	Min	Max	Min	Max	Min
April	0.00	0.00	65.02	0.03	45.50	0.03
May	0.00	0.00	25.30	1.20	29.03	0.17
June	297.00	1.00	0.00	0.00	18.03	18.03

6. Frequency profile

The nominal allowed frequency range shall be 50Hz ± 1% in Bhutan. The system is normally managed such that frequency is maintained within operational limit of 49.5 Hz to 50.5 Hz. However, frequency may move outside these limit under faulty condition.

As per the Grid Code 2008, clause 6.4.1 the frequency is classified into three different bands as follows:

a. Normal state
   The transmission System frequency is within the limit of 49.5Hz to 50.5Hz.
b. Alert state
   The Transmission System frequency is beyond the normal operating limit but within 49.0Hz to 50.0Hz.
c. Emergency state
   There is generation deficiency and frequency is below 49.0Hz.

The frequency at 220kV Bus at 220/66/11kV Semtokha substation in the western grid and 132kV Bus at 60MW Kurichhu Hydropower Plant in the eastern grid is considered.

6.1.Frequency for the month of April, 2021

Table 6.1.1. Bus Frequency profile of Semtokha Substation

Sl. No.	Operating State	Frequency
1	Normal State	100.00%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	0.00%

Graph 6.1.1. Bus Frequency of Semtokha Substation

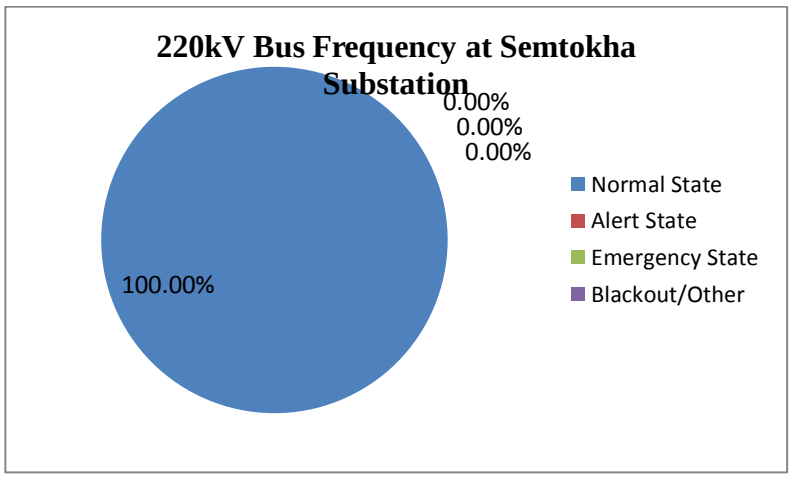
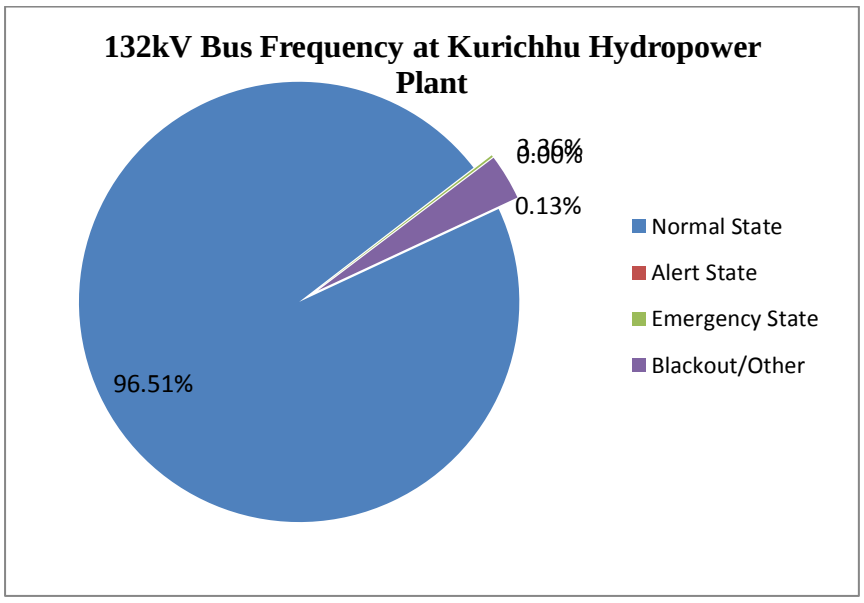


Table 6.1.2. Bus frequency of Kurichhu Hydro Power Plant

Sl. No.	Operating State	Frequency
1	Normal State	96.51%
2	Alert State	0.00%
3	Emergency State	0.13%
4	Blackout/Other	3.36%

Graph 6.1.2. Bus frequency of Kurichhu Hydro Power Plant



In the month of April, 2021, the Western grid has maintained the frequency within the normal operating limit of 100% and Eastern grid have managed to operate the frequency within normal operating limit of 96.51% where 0.13% was deviated to Emergency state and 3.36 % was deviated to blackout and other.

6.2.Frequency for the month of May, 2021

Table 6.2.1. Bus frequency of Semtokha Substation

Sl. No.	Operating State	Frequency
1	Normal State	100.00%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	0.00%

Graph 6.2.1. Bus frequency of Semtokha Substation

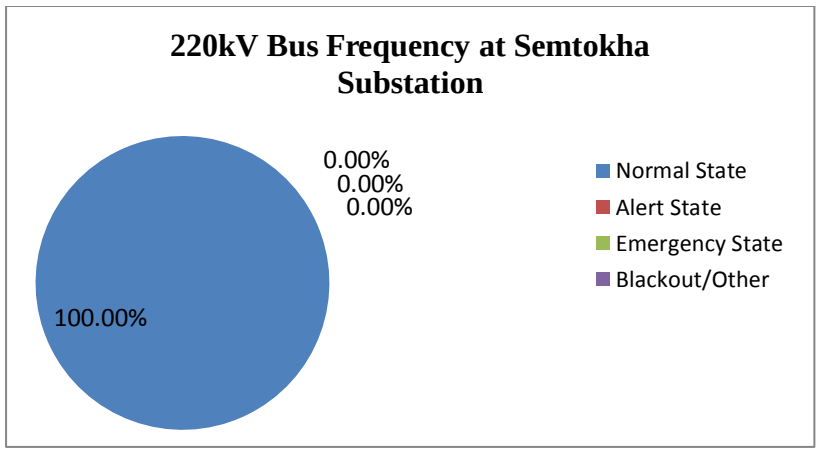
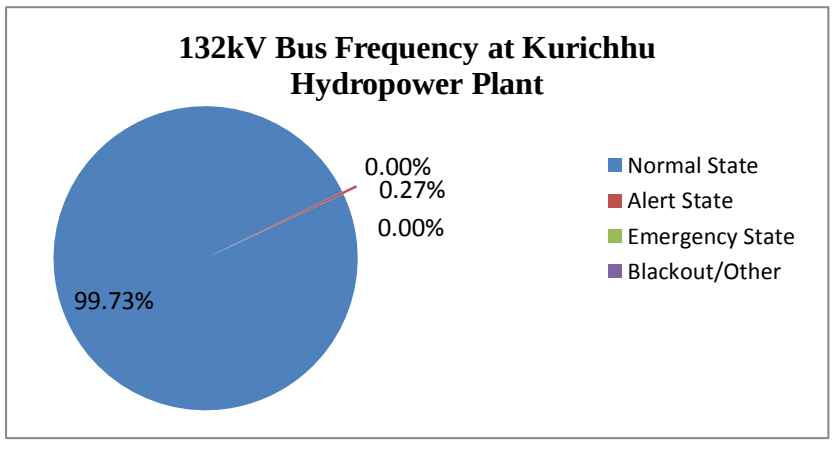


Table 6.2.2. Bus frequency of Kurichhu Hydro Power Plant

Sl. No.	Operating State	Frequency
1	Normal State	99.73%
2	Alert State	0.27%
3	Emergency State	0.00%
4	Blackout/Other	0.00%

Graph 6.2.2. Bus frequency of Kurichhu Hydro Power Plant



In the month of May, 2021, the western grid frequency was maintained at normal operating range of 100% whereas Eastern grid was maintained 99.73% in normal operating range and deviated 0.27% to alert state.

6.3.Frequency for the month of June, 2020

Table 6.3.1. Bus frequency of Semtokha Substation

Sl. No.	Operating State	Frequency
1	Normal State	100.00%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	0.00%

Graph 6.3.1. Bus frequency of Semtokha Substation

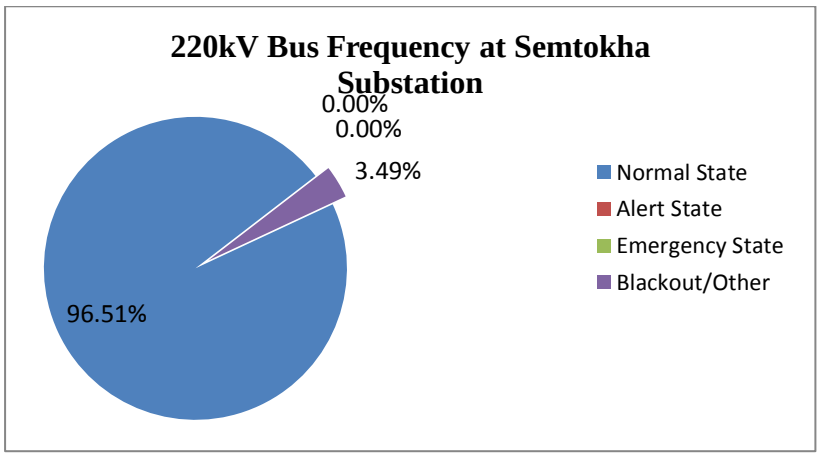
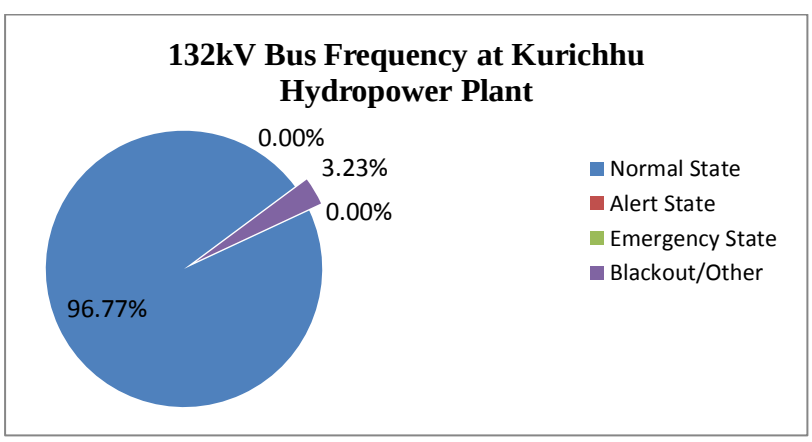


Table 6.3.2. Bus frequency of Kurichhu Hydro Power Plant

Sl. No.	Operating State	132kV Bus Voltage
1	Normal State	96.77%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	3.23%

Graph 6.3.2. Bus frequency of Kurichhu Hydro Power Plant



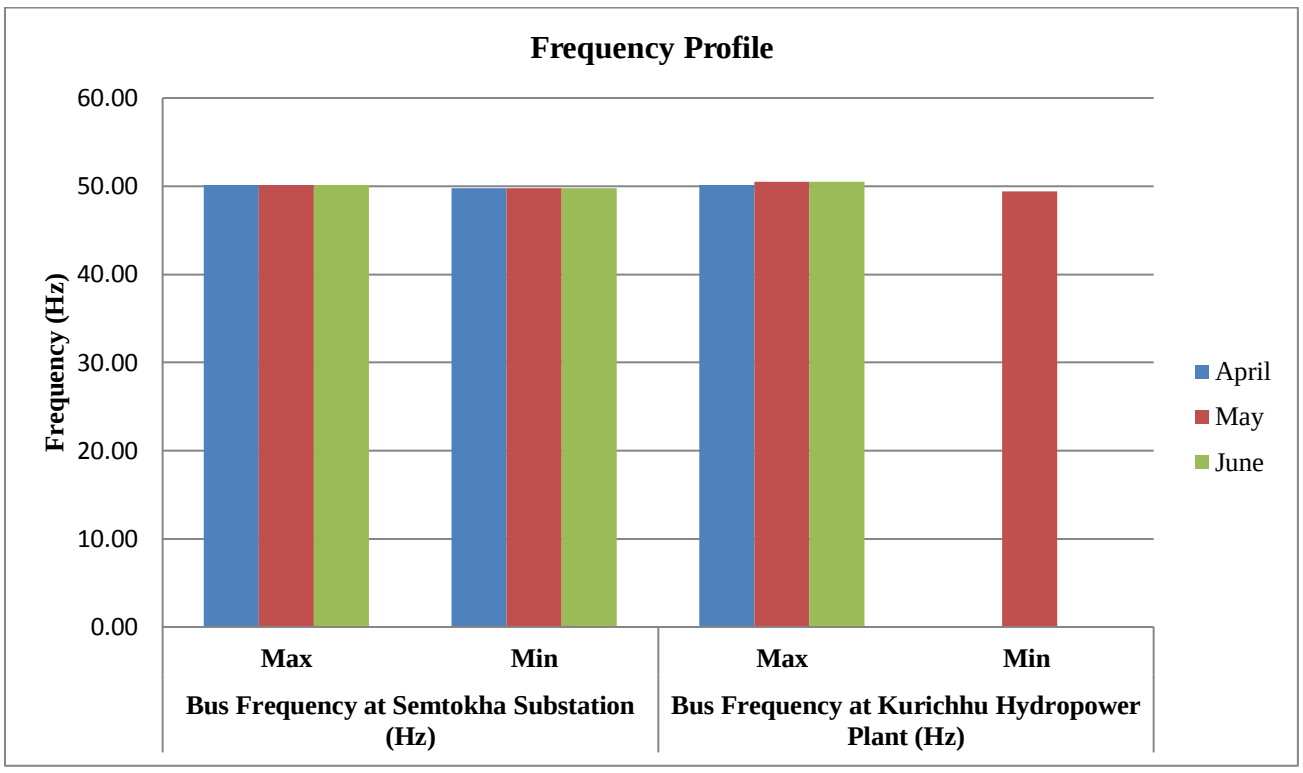
In the month of June, 2021, western gird frequency had maintained at 100 % within the normal operating range and deviated other to blackout/other state. The eastern also maintain almost same as western with 96.77 % within normal operating lime and deviated 3.23 % to blackout/other state.

6.4.Frequency Summary for the month of April to June, 2020

Table 6.4.1. Frequency summary for the month of April to June, 2021.

Substation/Plant	Bus Frequency at Semtokha Substation (Hz)		Bus Frequency at Kurichhu Hydropower Plant (Hz)	
Month	Max	Min	Max	Min
April	50.10	49.80	50.14	0.06
May	50.10	49.80	50.50	49.40
June	50.10	49.80	50.50	0.00

Graph 6.4.1. Frequency summary for the month of April to June, 2021



Daily maximum, minimum and average Frequency of Malbase substation in western grid and Kurichhu Hydro Power Plant in eastern grid for the month of April to June, 2021 is attached as **Annexure-III**

7. Voltage Profile of selected substation

As per the Grid Code 2008, clause 6.4.1 the voltage at all connection point is classified into three different bands as follows:

1. *Normal State*
   The voltage at all connection points are within the limits of 0.95 times and 1.05 times of the normal values

2. *Alert State*
   The voltage at all connection points are outside the normal limit but within the limits of 0.9 times and 1.1 times of the nominal values.

3. *Emergency State*
   Transmission system voltages are outside the limit of 0.9 times and 1.1 times of nominal values.

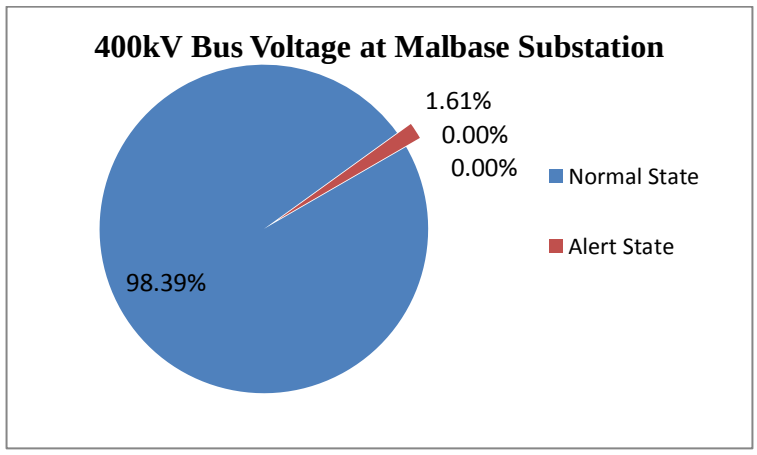
Due to the location of 400/22/66/11kV Malbase substation in western grid and 132/33/11kV Nangkhor substation in the eastern grid, the voltage profile of these substations are considered.

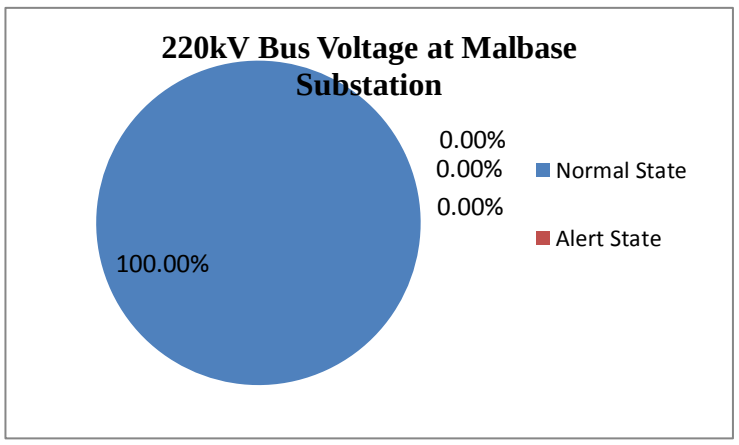
7.1.Voltage profile for the April, 2021

Table 7.1.1. Voltage Profile for 400/220/66kV Malbase Substation

Sl. No.	Operating State	400kV Bus Voltage	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	98.39%	100.00%	100.00%
2	Alert State	1.61%	0.00%	0.00%
3	Emergency State	0.00%	0.00%	0.00%
4	Blackout/Other	0.00%	0.00%	0.00%

Graph 7.1.1. Voltage Profile for 400/220/66kV Malbase Substation





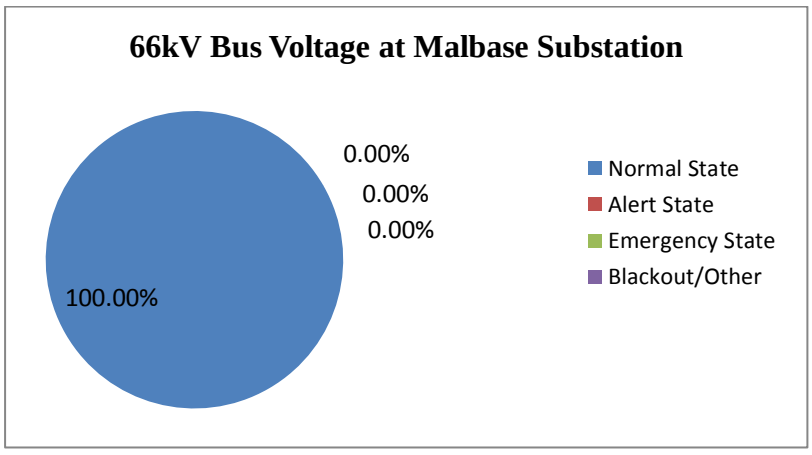
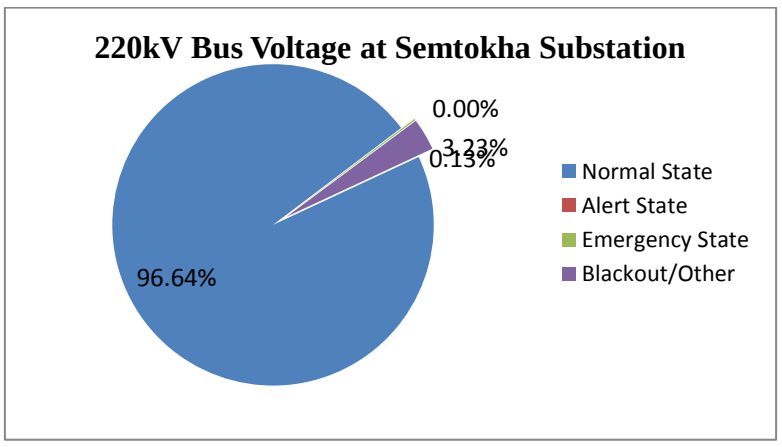


Table 7.1.2. Voltage Profile of 220/66/11kV Semtokha Substation

Sl. No.	Operating State	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	96.64%	96.64%
2	Alert State	0.00%	0.00%
3	Emergency State	0.13%	0.13%
4	Blackout/Other	3.23%	3.23%

Graph 7.1.2. Voltage Profile of 220/66/11kV Semtokha Substation



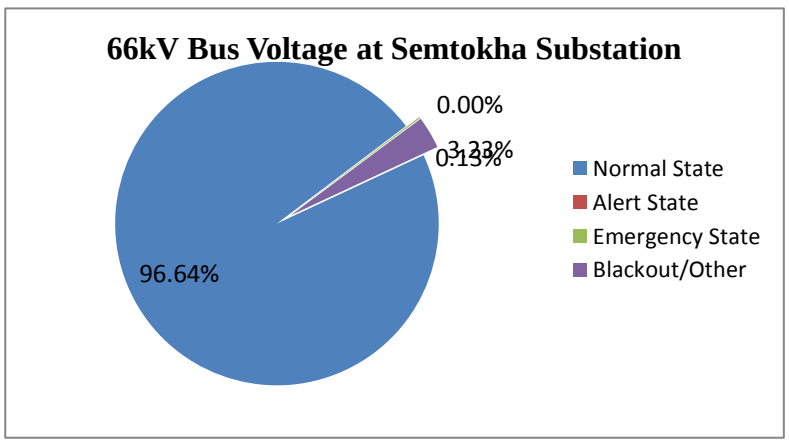
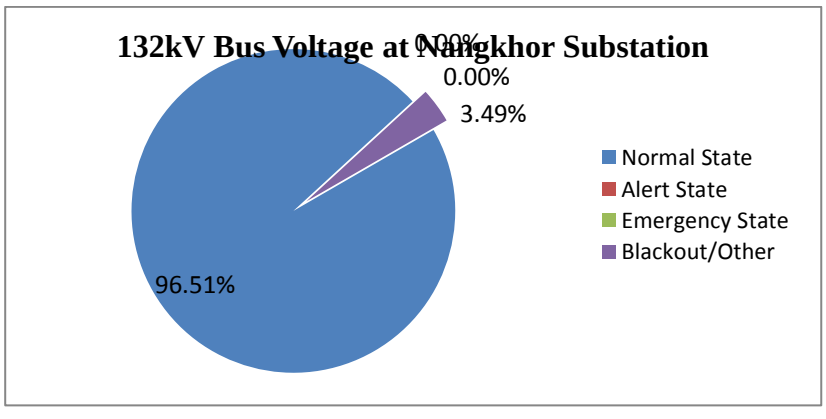


Table 7.1.3. Voltage Profile of 132/33/11kV Nangkhor Substation

Sl. No.	Operating State	132kV Bus Voltage
1	Normal State	96.51%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	3.49%

Graph 7.1.3. Voltage Profile of 132/33/11kV Nangkhor Substation

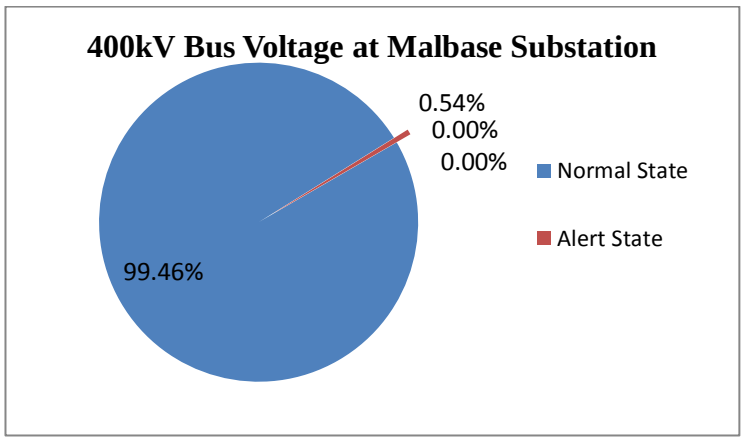


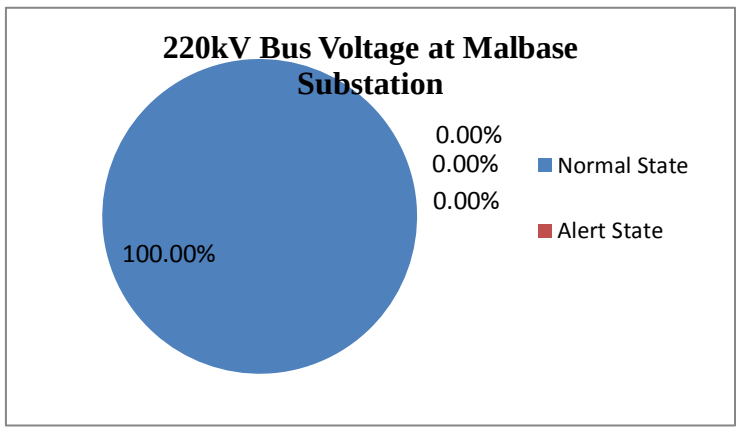
7.2.Voltage Profile for month of May, 2021

Table 7.2.1. Voltage Profile for 400/220/66kV Malbase Substation

Sl. No.	Operating State	400kV Bus Voltage	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	99.46%	100.00%	100.00%
2	Alert State	0.54%	0.00%	0.00%
3	Emergency State	0.00%	0.00%	0.00%
4	Blackout/Other	0.00%	0.00%	0.00%

Graph 7.2.1. Voltage Profile for 400/220/66kV Malbase Substation





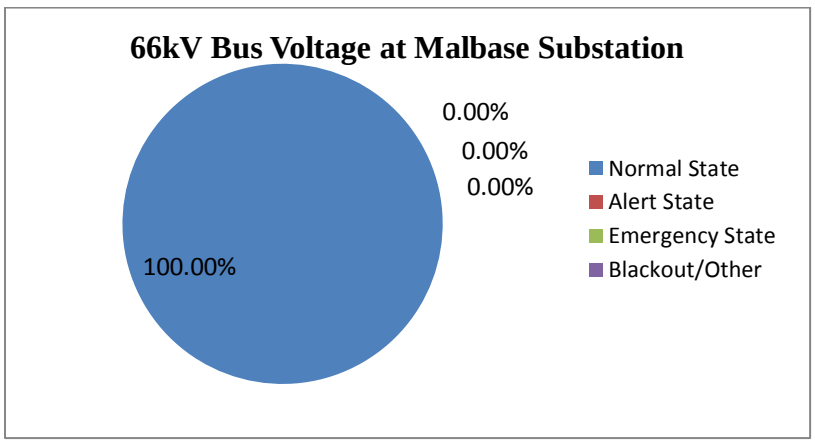
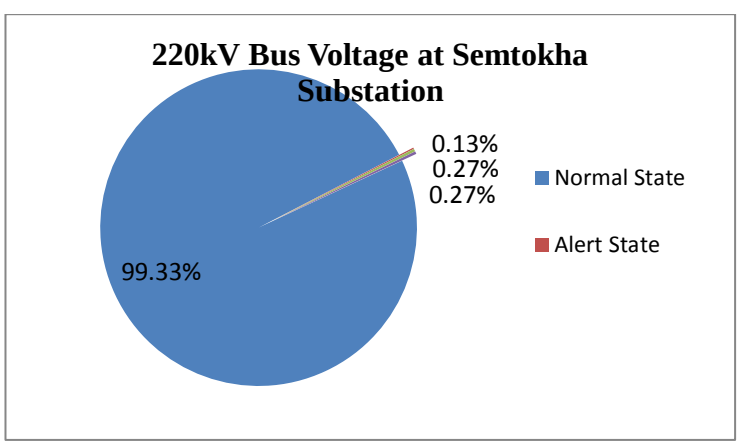


Table 7.2.2. Voltage Profile of 220/66/11kV Semtokha Substation

Sl. No.	Operating State	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	99.33%	99.33%
2	Alert State	0.13%	0.00%
3	Emergency State	0.27%	0.40%
4	Blackout/Other	0.27%	0.27%

Graph 7.2.2. Voltage Profile of 220/66/11kV Semtokha Substation



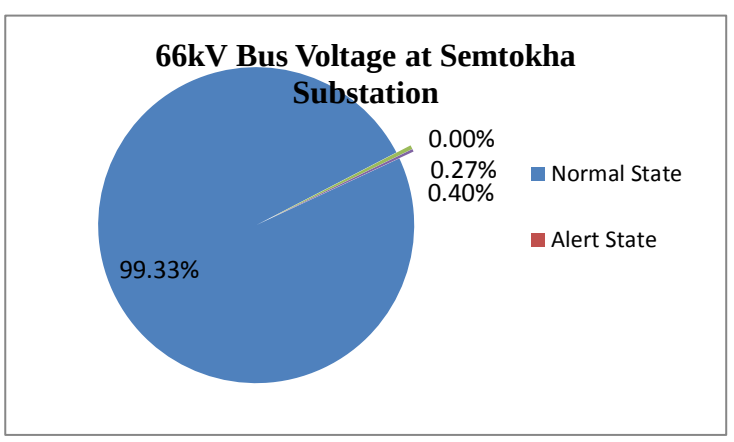
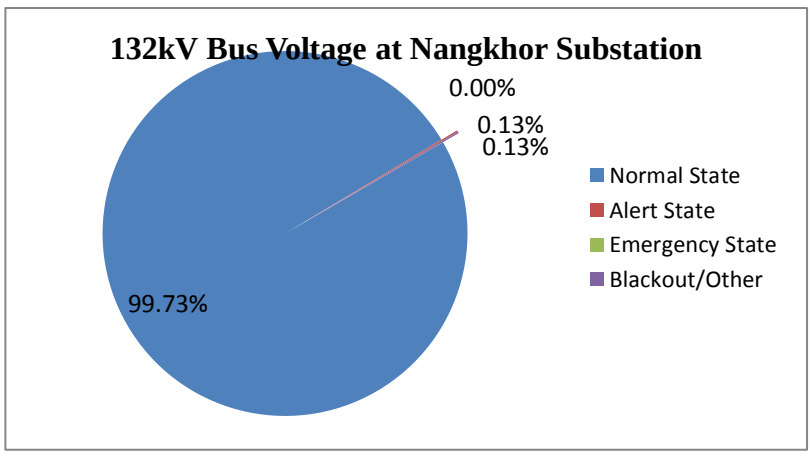


Table 7.2.3. Voltage Profile of 132/33/11kV Nangkhor Substation

Sl. No.	Operating State	132kV Bus Voltage
1	Normal State	99.73%
2	Alert State	0.13%
3	Emergency State	0.00%
4	Blackout/Other	0.13%

Graph 7.2.3. Voltage Profile of 132/33/11kV Nangkhor Substation

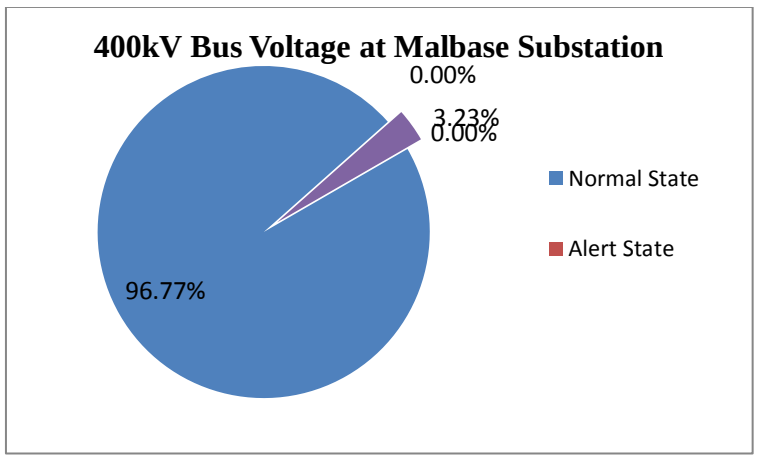


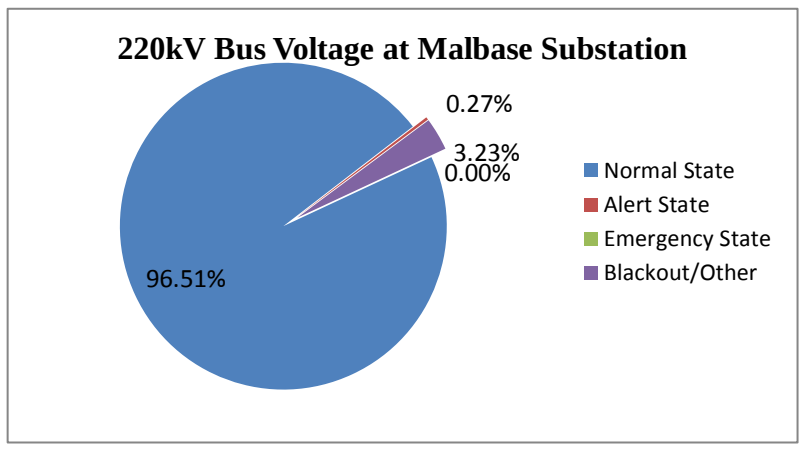
7.3.Voltage Profile for the month of June, 2021

Table 7.3.1. Voltage Profile for 400/220/66kV Malbase Substation

Sl. No.	Operating State	400kV Bus Voltage	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	96.77%	96.51%	96.77%
2	Alert State	0.00%	0.27%	0.00%
3	Emergency State	0.00%	0.00%	0.00%
4	Blackout/Other	3.23%	3.23%	3.23%

Graph 7.3.1. Voltage Profile for 400/220/66kV Malbase Substation





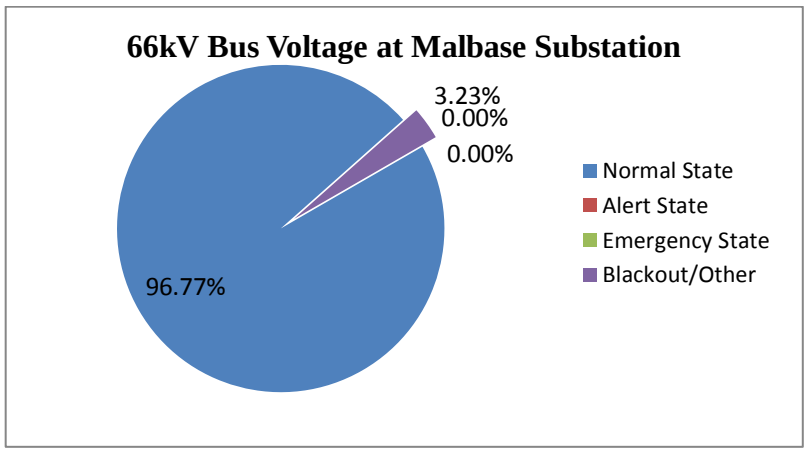
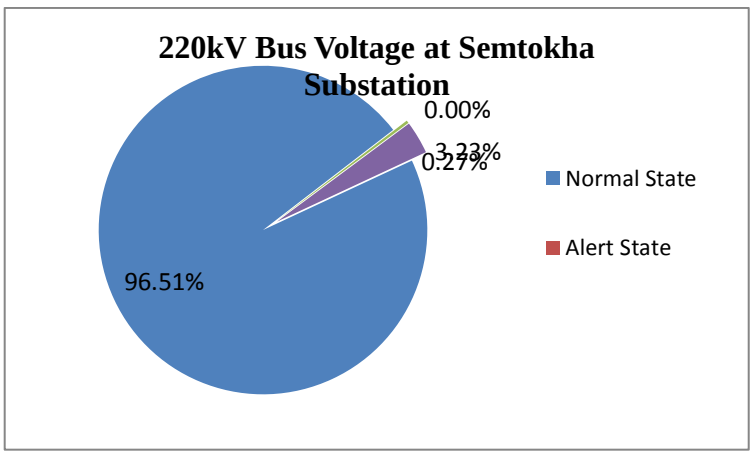


Table 7.3.2. Voltage Profile of 220/66/11kV Semtokha Substation

Sl. No.	Operating State	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	96.51%	96.64%
2	Alert State	0.00%	0.00%
3	Emergency State	0.27%	0.00%
4	Blackout/Other	3.23%	3.36%

Graph 7.3.2. Voltage Profile of 220/66/11kV Semtokha Substation



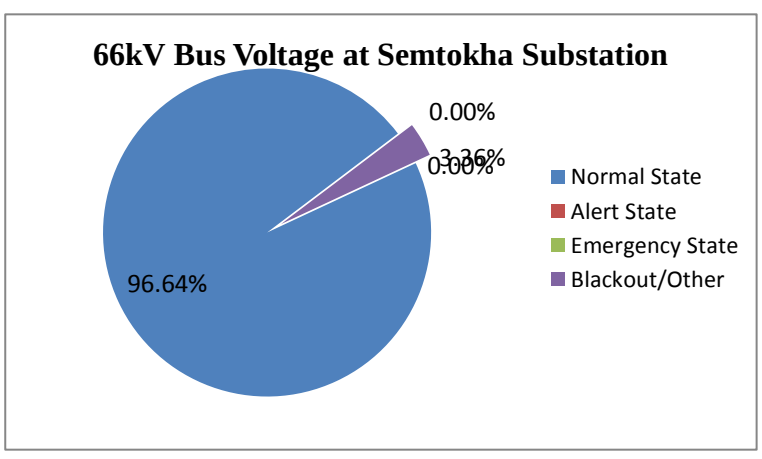
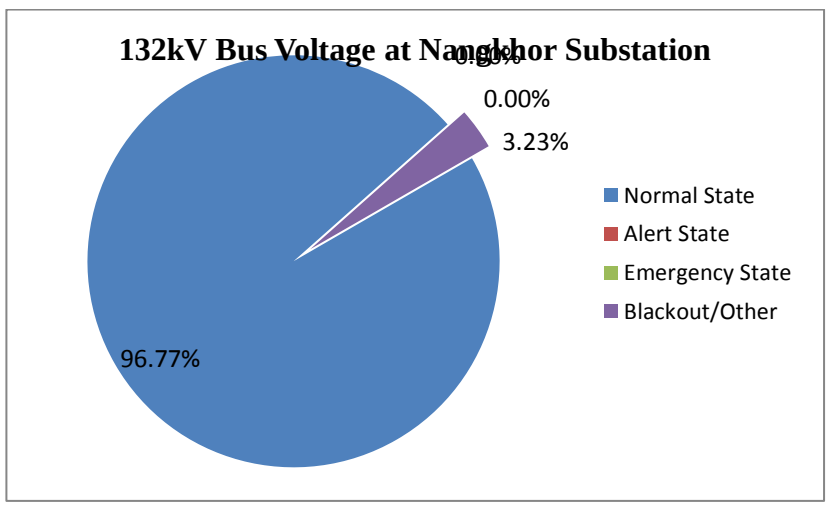


Table 7.3.3. Voltage Profile of 132/33/11kV Nangkhor Substation

Sl. No.	Operating State	132kV Bus Voltage
1	Normal State	96.77%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	3.23%

Graph 7.3.3. Voltage Profile of 132/33/11kV Nangkhor Substation

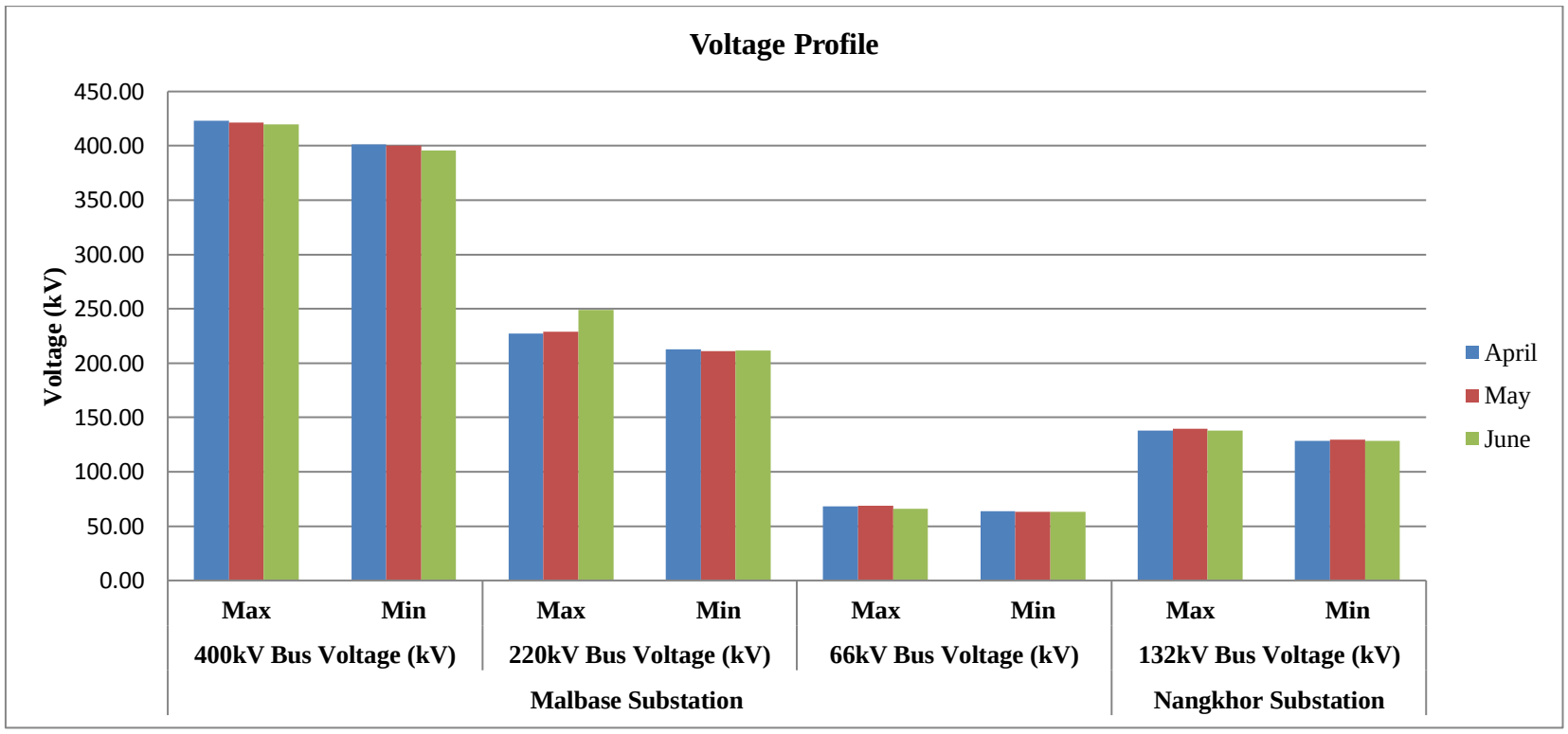


7.4.Voltage Summary for the Month of April to June, 2021

Table 7.4.1. Voltage Summary for the month of April to June, 2021

Substation	Malbase Substation						Nangkhor Substation	
Voltage Level	400kV Bus Voltage (kV)		220kV Bus Voltage (kV)		66kV Bus Voltage (kV)		132kV Bus Voltage (kV)	
Month	Max	Min	Max	Min	Max	Min	Max	Min
April	423.00	401.50	227.50	212.50	68.00	64.00	137.77	128.21
May	421.50	400.00	229.00	211.00	69.00	63.00	139.43	129.66
June	420.00	395.97	249.00	211.58	66.00	62.96	137.90	128.61

Graph 7.4.1. Voltage Summary for the month of April to June, 2021



Daily maximum, minimum and average bus voltage of Malbase substation in western grid and Nangkhor substation in eastern grid for the month of April to June, 2021 is attached as **Annexure-IV**

8. Major Outages of Feeders and Equipment

The transmission lines and equipment which were shut down for annual maintenance and hand/force trip are not considered in the report.

8.1.Major Outages in Eastern Grid

It had been observed that there was multiple tripping occurred during the second quarter of the year compare to the previous quarter. Generally, all the tripping occurred are of transient in nature or temporary fault which have been restored within few minutes. The 132kV Kanglung-Phuntshothang feeder tripped and the duration of outage was 28hrs due to Tripped on AN, Zone-1, Fault Current: IA -624A, IB -39A, IC -53A, Fault Location: 29.59km, OC/EF IA-607A, IB-42A, IC-52A.

The feeders and equipment outages for the Eastern grid is attached as **Annexure-V**.

8.2.Major Outages in Western Grid

It had been observed that there was multiple tripping occurred during the second quarter of the year, the 66kV Malbase- Phuntsholing feeder was under idle charge condition since 66kV chukha-Phuntsholing got tripped at both end for 13hrs. Again 66kV Malbase-Phuntsholing feeder was under idle charge since 66kB Pling-Gomtu feeder got tripped at both end for 14 hrs. 66/33kV Damji Station - 66kv incoming line was tripped at 10:48 hrs and line at Damji Substation had been back feed from Punakha at 14:07 hrs. 66kv line charged at 15:40 hrs as per the closing code 1961 from BPSO.

The detail tripping report of any element is compiled and circulated to relevant stakeholder every month.

The feeders and equipment outages for the Western grid is attached as **Annexure-VI.**

9. Annexures

Annexure-I

Table: Generation of April, 2021

Apr-21	BHP (MW)			CHP (MW)			THP (MW)			KHP (MW)			DHP (MW)			MHP (MW)		
Date	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava
1	21.20	14.51	17.76	135.49	82.57	99.62	157.68	27.61	90.14	39.34	20.13	27.45	18.98	16.17	17.69	200.09	109.78	137.89
2	18.61	14.83	16.15	117.37	88.47	102.27	167.62	27.61	52.64	45.35	24.08	31.64	19.70	17.16	18.21	193.41	109.46	141.64
3	15.06	13.45	14.32	110.03	71.60	84.04	87.67	27.60	37.64	22.29	20.18	21.80	16.85	15.65	16.15	115.23	110.11	114.22
4	13.99	12.92	13.62	97.23	69.18	77.67	187.64	87.61	104.31	24.27	20.13	22.37	16.37	15.00	15.46	149.79	105.00	117.05
5	14.10	12.06	13.27	100.12	70.13	76.56	207.66	87.60	123.21	24.29	20.13	21.34	15.36	14.65	15.15	114.94	104.96	110.13
6	14.13	13.32	13.65	98.93	69.75	75.55	147.68	87.61	124.29	32.20	16.48	24.95	15.09	14.65	14.89	159.70	115.05	132.88
7	15.51	13.11	13.80	160.99	69.56	96.96	147.67	113.82	127.83	32.20	20.16	26.16	15.16	14.15	14.69	154.81	124.63	135.70
8	14.14	13.39	13.79	168.71	78.30	123.70	73.86	60.00	70.94	24.19	20.16	20.46	15.47	14.18	15.03	127.11	110.07	114.14
9	17.73	12.90	14.48	75.91	49.24	71.22	160.00	60.00	80.83	26.24	20.11	22.63	16.47	14.17	15.43	129.92	109.96	124.31
10	16.36	13.31	14.53	75.43	70.38	71.43	160.00	160.00	160.00	32.27	20.19	26.95	15.47	14.67	15.10	189.60	44.00	163.39
11	15.63	11.50	13.95	106.02	70.86	86.88	130.00	130.00	130.00	32.24	10.08	27.55	17.18	14.65	15.28	184.97	139.91	159.23
12	14.24	13.14	13.63	94.81	82.52	85.01	150.00	130.00	134.17	29.04	24.19	27.30	15.16	14.64	14.88	149.93	127.60	143.69
13	13.76	12.49	13.31	91.33	80.35	82.56	150.00	130.00	133.33	32.25	25.17	28.25	14.67	14.15	14.37	149.93	124.80	141.67
14	14.57	12.59	13.21	81.61	76.13	77.08	130.00	130.00	130.00	60.33	24.14	27.40	14.64	14.08	14.36	149.79	126.64	137.71
15	13.86	12.47	13.32	88.23	73.27	78.74	130.00	80.00	127.92	30.31	20.19	24.16	15.01	14.03	14.60	179.69	129.84	151.50
16	13.55	12.90	13.17	87.12	80.10	83.54	133.81	60.00	80.82	32.41	20.15	26.45	15.04	11.06	14.10	159.84	129.90	144.64
17	13.75	12.56	13.05	88.80	74.78	84.03	163.84	73.80	122.15	30.21	22.20	24.27	15.26	13.94	14.75	154.71	99.16	131.38
18	14.05	12.90	13.29	87.50	76.26	79.80	163.84	133.80	146.73	32.82	24.13	27.81	14.96	14.23	14.50	259.81	124.73	163.70
19	14.48	12.66	13.42	107.40	84.03	96.26	243.83	153.80	177.56	39.40	30.13	34.66	15.70	14.44	15.09	260.17	174.50	198.58
20	14.64	12.70	13.88	136.85	90.42	112.56	243.86	183.81	213.40	43.21	22.18	26.99	14.76	14.26	14.63	180.26	144.34	155.52
21	14.02	13.04	13.44	182.08	91.02	115.75	253.82	153.80	177.14	32.51	22.15	25.98	15.17	14.38	14.55	166.32	19.70	129.22
22	21.83	13.21	15.04	114.10	75.01	87.88	173.84	173.80	173.81	45.32	20.23	24.44	20.00	13.94	15.45	179.73	129.94	151.36
23	17.60	13.10	14.66	137.15	89.39	117.86	173.84	153.79	162.98	32.04	23.02	25.68	19.98	14.21	16.48	179.78	100.23	146.72
24	14.76	12.64	13.51	134.22	80.70	103.65	153.83	153.79	153.81	32.67	24.18	27.64	14.96	14.23	14.48	190.12	138.02	161.41
25	13.71	12.11	13.14	115.10	89.70	95.99	153.84	153.80	153.82	32.57	24.21	27.85	14.58	13.96	14.24	185.47	140.15	162.29
26	13.47	4.41	12.55	121.54	93.82	104.51	153.84	153.78	153.81	48.40	28.23	35.00	14.23	13.73	13.98	357.70	170.37	216.61
27	16.81	11.63	12.90	122.75	90.15	108.90	263.81	133.80	172.98	42.36	28.24	32.30	13.96	13.17	13.62	259.83	166.83	194.33
28	16.04	12.29	13.00	128.09	100.53	106.30	253.83	133.82	205.90	43.89	28.97	35.63	25.02	13.40	15.63	264.99	184.66	223.57
29	15.70	12.47	13.50	116.73	95.71	106.13	263.81	103.80	208.39	32.22	26.00	28.88	19.97	14.32	16.54	210.05	154.89	179.65
30	13.65	12.51	12.88	109.18	91.79	104.19	263.81	163.80	192.56	45.18	28.26	34.66	15.37	11.97	14.10	215.18	170.09	180.88
31	0.00	No Generati	Error	0.00	No Generati	Error	0.00	No Generati	Error	0.00	No Generati	Error	0.00	No Generati	Error	0.00	No Generation	Error
Max	21.83			182.08			263.81			60.33			25.02			357.70		
Min		4.41			49.24			27.60			10.08			11.06			19.70	

Source: THP, CHP, BHP, KHP,MHP (DGPC)

Graph: Generation for the month April, 2021

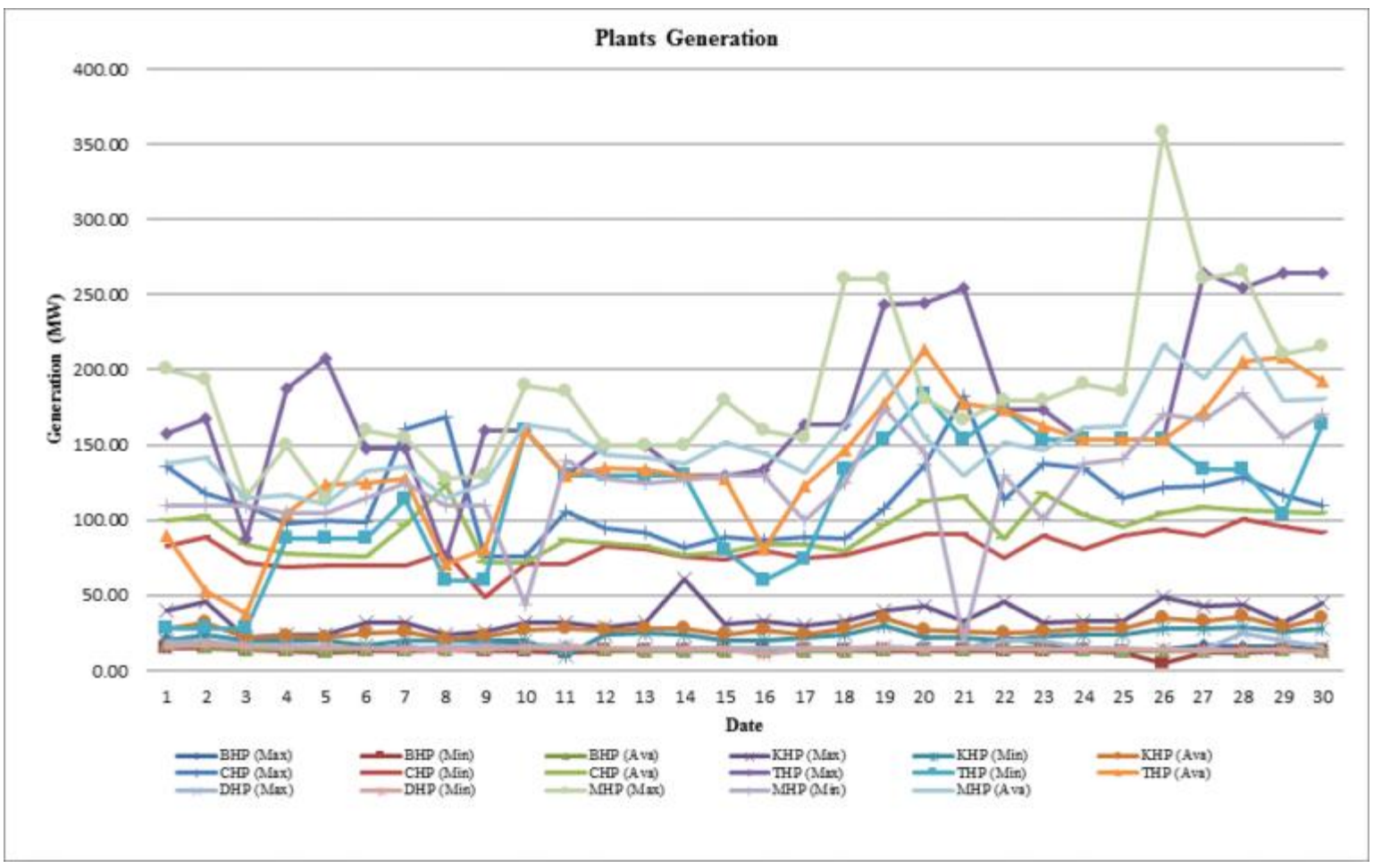


Table: Generation for the month of May, 2021

May-21	BHP (MW)			CHP (MW)			THP (MW)			KHP (MW)			DHP (MW)			MHP (MW)		
Date	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava
1	13.63	11.84	12.95	193.34	154.39	173.51	380.00	300.00	330.83	66.00	31.58	47.17	32.00	24.00	28.13	274.73	199.46	231.19
2	13.37	12.04	12.57	268.33	179.63	203.79	450.00	370.00	400.42	66.00	33.00	60.15	32.00	23.00	24.92	299.17	210.04	246.80
3	24.32	4.12	14.97	226.21	194.66	204.79	450.00	380.00	416.25	66.00	42.11	52.98	50.33	28.26	38.59	349.59	180.36	258.95
4	27.94	16.84	22.06	256.38	196.32	217.44	550.00	380.00	451.25	66.11	48.33	59.30	37.29	26.19	29.65	478.66	196.12	296.18
5	33.62	9.99	19.26	275.01	203.38	233.15	560.00	350.00	470.00	66.18	52.88	65.10	36.17	27.19	30.91	553.28	231.68	393.96
6	57.07	22.40	30.36	234.88	188.85	212.49	470.00	350.00	421.67	66.00	62.51	65.59	33.21	25.21	29.57	518.90	260.00	348.74
7	39.24	18.72	25.38	188.84	136.85	178.09	390.00	350.00	360.83	66.00	48.32	61.26	48.41	20.20	25.72	334.07	239.87	269.65
8	19.46	16.30	17.77	189.88	175.72	181.45	350.00	350.00	350.00	66.00	49.87	62.11	48.19	23.18	33.44	460.86	279.87	349.05
9	33.23	15.85	18.12	176.79	124.81	152.46	350.00	280.00	307.50	54.06	35.08	44.15	25.22	21.15	22.96	274.99	210.45	238.38
10	34.20	18.72	22.00	172.63	145.01	156.72	350.00	300.00	306.25	48.49	37.14	43.12	21.19	18.19	20.09	269.74	215.16	245.15
11	65.22	28.53	43.23	159.31	147.70	156.71	350.00	300.00	307.08	49.32	36.07	43.74	25.00	17.70	19.11	319.61	209.64	247.45
12	65.22	28.53	43.23	161.88	147.73	152.70	310.00	300.00	305.00	45.00	36.30	39.56	18.18	17.16	17.94	210.46	194.31	201.39
13	64.79	26.59	40.26	160.09	141.61	147.68	320.00	270.00	292.08	49.50	32.03	42.80	18.70	17.16	17.90	254.73	194.71	231.09
14	26.42	19.17	22.11	202.15	146.35	152.39	380.00	300.00	303.33	48.48	32.01	41.74	18.21	17.60	17.79	365.07	204.89	225.25
15	19.56	14.68	18.19	224.26	149.78	177.13	450.00	300.00	354.58	58.35	35.98	48.21	20.19	17.66	18.43	494.70	249.49	341.97
16	20.26	14.23	16.55	237.95	177.83	216.16	560.00	360.00	472.92	66.00	45.30	63.83	28.18	18.68	23.39	618.84	360.07	451.57
17	16.40	15.16	16.08	257.40	213.47	228.35	500.00	420.00	467.08	66.00	49.50	63.87	26.17	20.15	23.78	612.36	180.03	358.90
18	18.05	13.88	15.39	275.10	211.81	237.40	530.00	420.00	469.58	66.00	66.00	66.00	26.18	22.14	24.63	590.14	334.75	422.49
19	16.51	14.57	15.14	258.66	188.03	231.26	530.00	420.00	467.50	66.00	66.00	66.00	22.17	18.17	20.33	650.69	260.79	435.21
20	15.67	13.52	14.78	251.97	193.68	211.70	520.00	370.00	435.42	66.00	65.24	65.94	25.19	19.13	21.37	624.31	209.56	431.61
21	14.86	13.74	14.40	278.72	275.24	276.64	1,122.00	420.00	1,005.88	66.00	49.50	64.37	126.92	29.17	103.28	792.05	719.25	755.73
22	18.28	13.25	14.15	278.79	274.18	276.99	1,122.00	1,122.00	1,122.00	65.51	48.15	62.21	126.76	117.62	125.94	765.31	720.10	731.62
23	13.92	13.04	13.46	277.75	275.58	276.73	1,122.00	1,122.00	1,122.00	66.00	65.02	65.68	126.79	63.32	118.19	772.16	763.51	766.62
24	14.34	12.61	13.37	277.29	275.39	276.47	1,122.00	1,122.00	1,122.00	66.00	49.50	65.31	126.81	65.41	86.79	771.93	660.15	730.90
25	17.42	13.13	14.60	277.80	275.12	276.66	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	82.43	55.39	63.09	790.33	613.57	687.62
26	64.74	7.89	29.69	277.90	274.36	276.71	1,122.00	884.00	1,065.42	66.00	66.00	66.00	87.47	54.16	61.89	756.33	500.56	620.35
27	65.81	55.56	64.57	277.95	275.40	276.29	935.00	681.00	893.17	66.00	64.84	65.66	84.42	34.22	58.52	774.96	599.51	707.59
28	65.84	41.09	58.87	277.75	276.00	276.77	831.00	590.00	740.83	66.00	65.62	65.85	90.49	27.21	44.48	629.32	300.08	496.43
29	42.22	27.27	33.71	278.09	274.44	275.98	700.00	610.00	667.50	66.00	65.03	65.77	56.24	38.23	43.75	540.07	319.99	409.12
30	30.98	23.29	26.48	276.65	275.26	276.13	710.00	570.00	657.50	66.00	66.00	66.00	50.28	30.22	43.21	510.32	419.89	445.76
31	38.81	22.53	26.56	277.36	275.18	276.51	690.00	540.00	577.08	66.00	66.00	66.00	55.29	38.42	43.01	549.07	376.39	427.95
Max	**65.84**			**278.79**			**1,122.00**			**66.18**			**126.92**			**792.05**		
Min		**4.12**			**124.81**			**270.00**			**31.58**			**17.16**			**180.03**	

Source: THP, CHP, BHP, KHP,MHP (DGPC)

Graph: Generation for the month of May, 2021

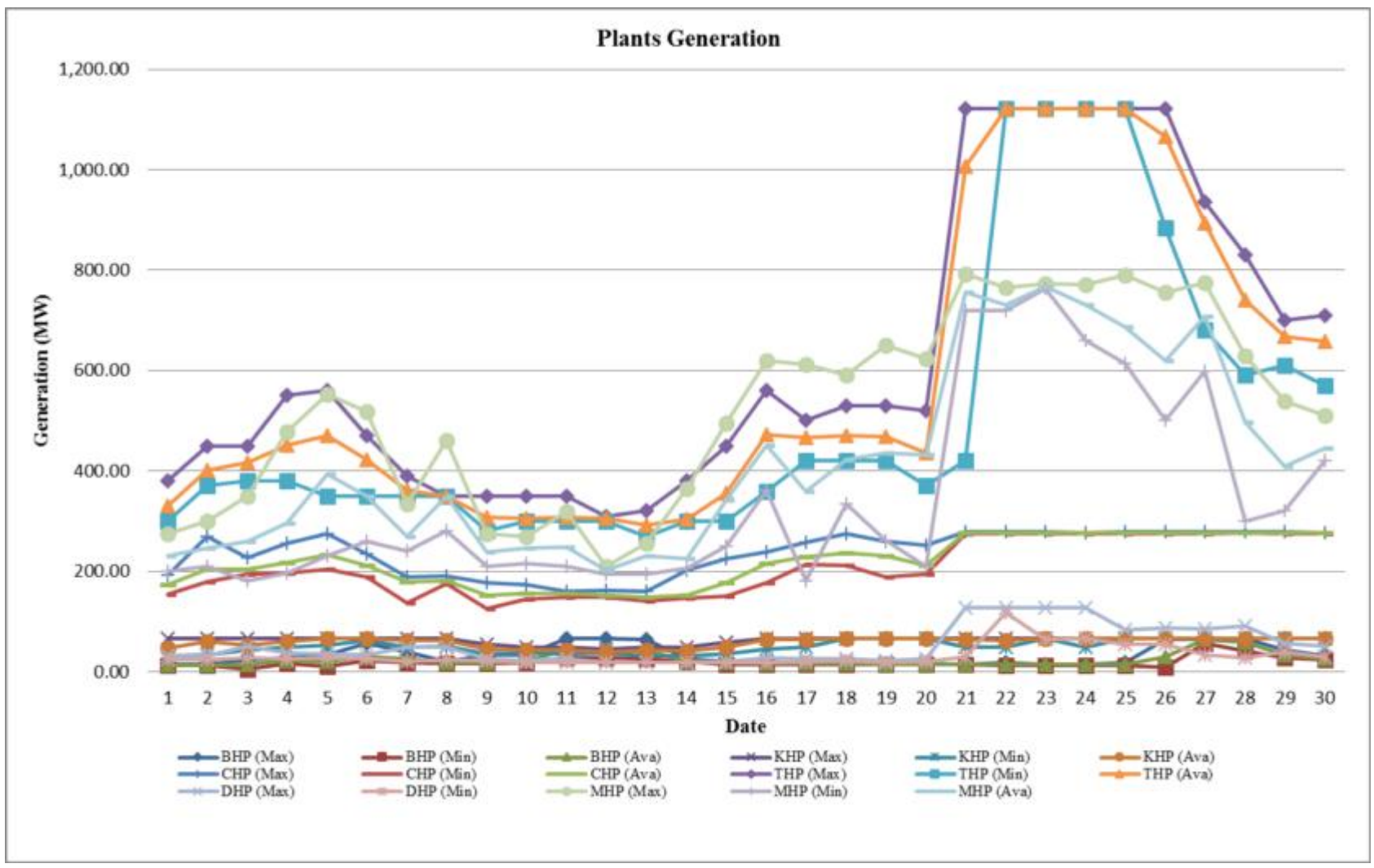


Table: Generation for the month of June, 2021

Jun-21	BHP (MW)			CHP (MW)			THP (MW)			KHP (MW)			DHP (MW)			MHP (MW)		
Date	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava
1	31.66	23.42	26.60	333.19	287.76	306.33	607.00	527.00	578.92	66.00	33.00	61.93	45.96	30.01	36.68	539.27	430.00	490.82
2	49.21	28.11	34.92	327.41	256.45	301.24	660.00	580.00	634.17	66.00	66.00	66.00	69.65	30.99	39.27	518.87	415.04	465.01
3	29.79	21.34	25.18	278.57	244.73	266.68	540.00	510.00	524.17	66.00	66.00	66.00	31.32	26.24	28.44	493.86	384.74	435.24
4	24.00	20.47	21.75	256.18	217.70	242.14	510.00	440.00	448.75	66.00	66.00	66.00	52.08	24.02	26.63	454.12	259.28	391.88
5	20.57	13.14	19.46	288.87	221.04	233.83	480.00	430.00	460.00	66.00	66.00	66.00	25.20	22.49	24.17	569.67	349.23	423.58
6	26.92	19.58	21.76	292.02	220.15	251.01	680.00	430.00	558.33	66.00	66.00	66.00	34.03	23.50	26.82	508.87	424.45	466.99
7	54.25	24.14	44.41	367.80	226.95	320.75	998.00	460.00	770.67	66.00	66.00	66.00	81.20	32.99	58.07	592.98	290.35	511.21
8	59.50	37.07	45.78	368.45	279.47	336.83	920.00	560.00	789.17	66.00	47.80	63.93	70.56	43.20	58.73	594.06	585.27	592.38
9	52.52	36.09	42.10	292.86	264.77	278.06	680.00	530.00	572.92	66.00	33.00	62.59	64.32	41.19	49.68	593.58	589.21	592.21
10	34.27	23.70	29.22	331.67	264.41	300.74	750.00	510.00	626.67	66.00	66.00	66.00	52.23	33.96	41.67	593.48	387.84	551.42
11	30.87	23.49	24.86	330.64	264.98	296.32	680.00	540.00	607.08	66.00	66.00	66.00	33.98	29.96	31.63	593.07	485.21	558.04
12	64.50	0.00	43.36	369.45	319.47	361.51	1,122.00	650.00	948.25	66.00	65.60	65.93	126.66	30.97	97.23	592.78	494.60	581.63
13	65.79	24.41	63.34	369.35	367.30	368.26	1,122.00	1,122.00	1,122.00	65.91	65.25	65.52	126.95	120.38	126.23	592.70	591.45	591.99
14	65.42	44.54	52.17	369.15	367.33	368.22	1,122.00	1,122.00	1,122.00	66.00	33.00	62.24	126.90	74.38	95.34	592.93	493.00	588.05
15	61.96	18.03	46.23	369.79	367.39	368.60	1,122.00	935.00	1,114.21	66.00	16.50	63.94	126.44	0.00	84.57	593.65	190.64	486.36
16	50.53	13.84	40.04	369.11	367.33	368.37	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	107.37	72.31	88.60	593.12	592.06	592.66
17	43.28	22.68	34.90	369.53	367.96	368.82	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	126.85	55.31	80.70	593.23	591.94	592.50
18	52.40	37.72	42.35	368.99	366.69	368.31	1,122.00	935.00	1,114.21	66.00	66.00	66.00	126.92	106.55	122.15	593.39	590.89	592.20
19	51.62	40.77	46.39	369.63	367.72	368.61	1,122.00	935.00	1,114.21	66.00	66.00	66.00	127.47	116.82	126.42	593.07	491.97	588.00
20	64.59	42.08	48.30	369.43	366.41	368.34	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	126.85	126.56	126.75	592.62	588.80	591.33
21	65.13	38.81	45.82	369.33	276.79	358.68	1,122.00	935.00	1,083.04	66.00	65.87	65.99	126.87	100.20	112.02	593.27	591.39	592.21
22	65.34	34.45	41.93	369.53	367.70	368.53	1,122.00	935.00	1,083.04	66.00	66.00	66.00	113.40	80.31	90.72	592.64	591.43	592.13
23	63.21	37.46	47.36	369.45	367.48	368.26	1,122.00	935.00	1,106.42	66.00	65.09	65.52	123.54	79.42	96.03	592.58	591.26	592.04
24	39.67	31.89	35.95	369.37	275.65	354.68	1,122.00	935.00	1,090.83	65.76	65.04	65.44	84.42	68.34	74.24	592.92	590.67	592.15
25	48.32	27.10	35.36	369.43	367.27	368.37	1,122.00	801.00	908.21	64.00	16.50	46.01	79.32	64.32	70.06	592.84	394.12	542.90
26	65.20	44.90	58.61	369.32	367.00	368.35	1,048.00	827.00	872.29	66.00	33.00	53.63	126.88	65.34	84.53	593.59	591.57	592.70
27	65.43	47.11	56.36	369.18	367.08	368.36	917.00	770.00	856.67	66.00	66.00	66.00	111.60	66.32	82.16	593.11	526.90	583.10
28	52.14	42.46	46.92	369.32	367.66	368.61	820.00	650.00	756.25	66.00	66.00	66.00	103.46	70.28	80.45	592.14	510.13	549.59
29	65.56	39.65	46.45	369.69	276.07	338.20	960.00	690.00	759.58	66.00	66.00	66.00	75.38	62.26	68.22	592.94	590.19	591.93
30	65.59	53.47	62.22	369.25	366.57	368.20	1,122.00	935.00	1,061.75	66.00	12.67	61.03	126.97	74.39	110.19	593.21	591.91	592.58
31	0.00	No Generati	Error	0.00	No Generati	Error	0.00	No Generati	Error	0.00	No Generati	Error	0.00	No Generati	Error	0.00	No Generatio	Error
Max	65.79			369.79			1,122.00			66.00			127.47			594.06		
Min		0.00			217.70			430.00			12.67			0.00			190.64	

Source: THP, CHP, BHP, KHP,MHP (DGPC)

Graph: Generation for the month of June, 2021

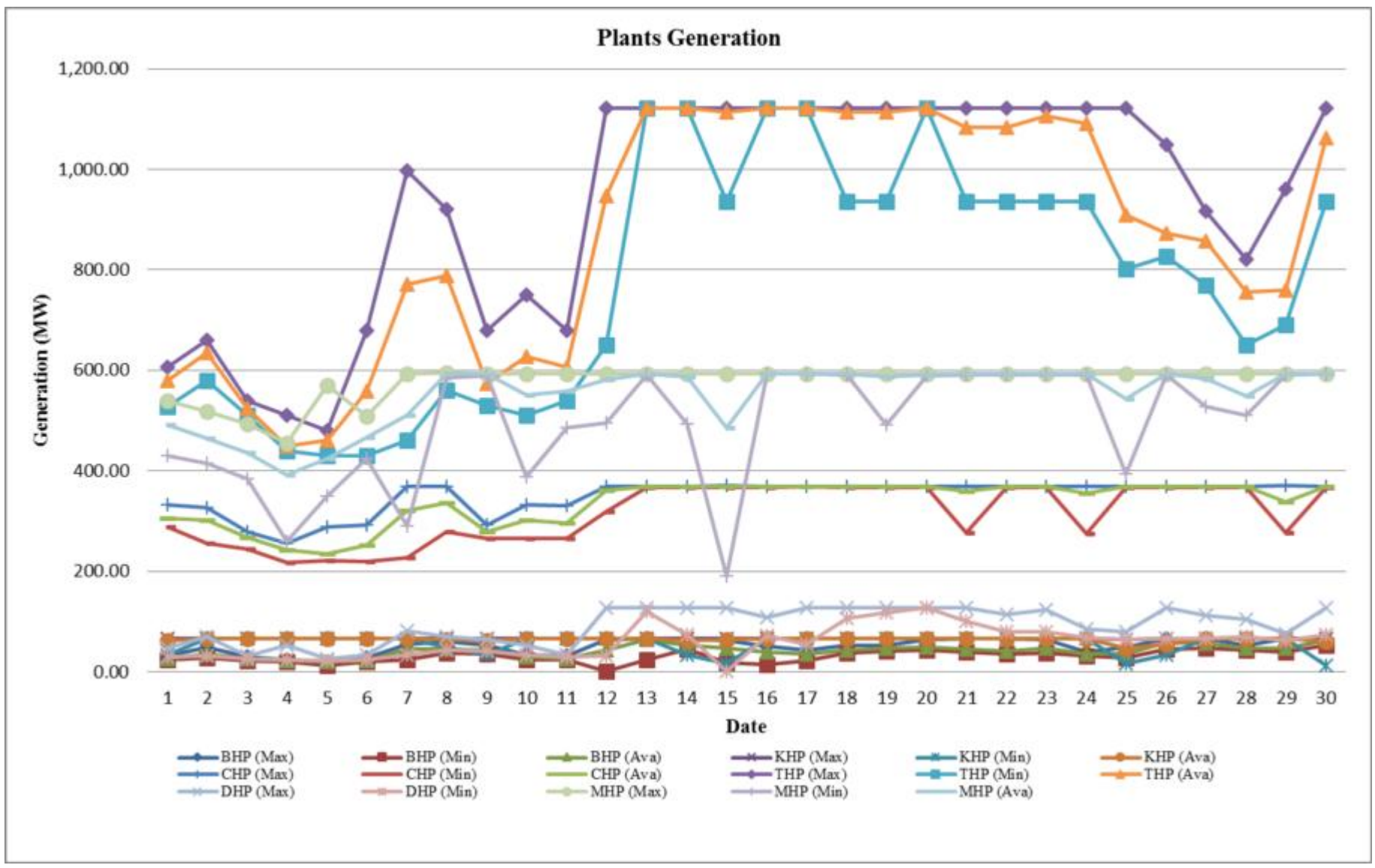


Table: National demand for April, 2021

Apr-21	Max	Min	Ava
0:00	244.56	200.36	225.03
1:00	245.27	196.25	221.65
2:00	241.57	185.68	218.98
3:00	238.33	194.56	217.98
4:00	254.40	195.17	220.45
5:00	263.49	197.89	225.31
6:00	283.86	227.86	251.92
7:00	308.58	236.26	269.86
8:00	295.95	231.98	267.21
9:00	296.84	226.16	263.71
10:00	300.19	224.60	261.44
11:00	299.64	236.17	261.39
12:00	290.36	233.63	261.84
13:00	285.25	229.98	256.72
14:00	287.01	213.22	253.02
15:00	289.06	217.57	252.84
16:00	304.01	228.09	255.05
17:00	295.05	232.37	259.26
18:00	299.46	234.91	263.69
19:00	320.31	262.66	286.86
20:00	318.79	262.26	285.15
21:00	305.67	245.45	271.68
22:00	274.36	222.28	250.97
23:00	257.00	207.86	233.59
	320.31		
		185.68	

Graph: National Demand for April, 2021

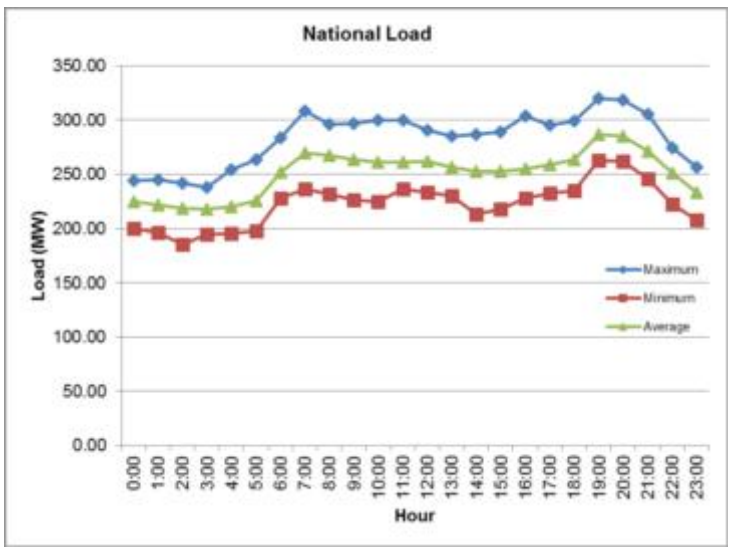
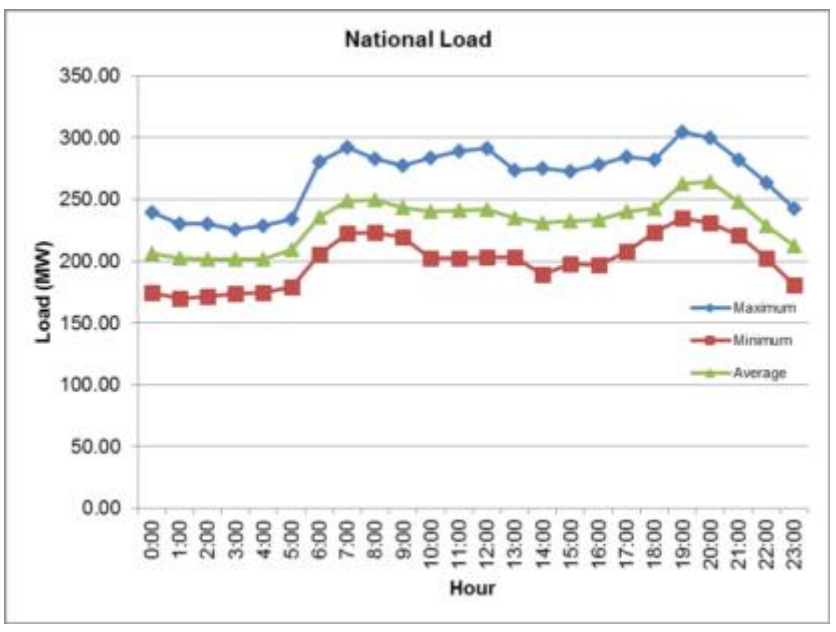


Table: National Demand for May, 2021

May-21	Max	Min	Ava
0:00	239.61	174.34	206.66
1:00	230.54	170.15	202.69
2:00	230.27	171.64	201.65
3:00	225.42	173.59	201.95
4:00	228.82	174.41	201.86
5:00	234.16	179.37	209.04
6:00	281.02	205.46	235.65
7:00	292.56	222.53	249.18
8:00	283.22	223.35	249.54
9:00	277.23	219.50	243.40
10:00	283.83	202.34	240.61
11:00	289.51	202.39	241.51
12:00	291.49	203.30	241.63
13:00	273.31	203.34	234.91
14:00	275.15	189.27	231.38
15:00	272.56	197.97	232.92
16:00	278.51	196.94	233.71
17:00	284.31	207.65	240.05
18:00	282.50	223.27	242.44
19:00	304.53	235.31	263.02
20:00	299.86	231.09	264.67
21:00	282.40	220.81	247.96
22:00	263.42	202.11	228.76
23:00	242.33	180.80	212.78
	304.53		
		170.15	

Graph: National Demand for May, 2021

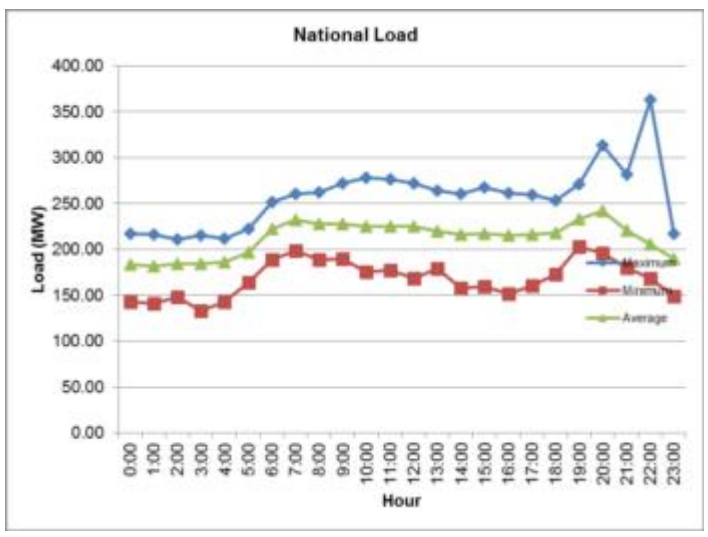


Annexure-II

Table: National Demand for June, 2021

Jun-21	Max	Min	Ava
0:00	217.47	143.18	183.75
1:00	216.41	141.12	181.62
2:00	211.32	148.15	184.58
3:00	215.87	132.89	184.54
4:00	211.97	142.98	185.96
5:00	222.26	163.93	197.00
6:00	251.77	189.11	222.79
7:00	260.53	198.88	232.24
8:00	262.51	189.12	228.03
9:00	272.18	190.10	227.53
10:00	277.87	175.56	225.52
11:00	276.22	177.45	224.86
12:00	271.78	168.87	225.57
13:00	264.49	178.88	219.46
14:00	260.47	158.16	216.47
15:00	267.26	159.67	217.45
16:00	261.87	152.10	215.80
17:00	260.01	160.58	216.05
18:00	253.50	173.04	218.05
19:00	270.84	202.86	233.08
20:00	313.66	195.59	241.89
21:00	281.86	180.33	221.05
22:00	362.79	168.62	205.84
23:00	217.04	149.33	189.69
	362.79		
		132.89	

Graph: National Demand for June, 2021



Annexure-III

Table: Daily maximum, minimum and average frequency for the month of April, 2021

Apr-21	Bus Frequency at Semtokha Substation			Bus Frequency at Kurichhu Hydropower Plant		
Date	Max	Min	Ava	Max	Min	Ava
1	50.10	49.90	49.98	50.12	49.73	49.96
2	50.00	49.90	49.98	50.07	49.86	49.98
3	50.00	49.80	49.96	50.09	49.80	49.96
4	50.00	49.80	49.95	50.07	0.06	47.92
5	50.00	49.80	49.97	50.10	49.78	49.95
6	50.00	49.80	49.97	50.12	49.78	50.00
7	50.00	49.90	49.97	50.09	49.81	49.97
8	50.00	49.80	49.95	50.05	49.83	49.99
9	50.00	49.80	49.95	50.10	49.82	50.01
10	50.10	49.80	49.97	50.09	49.86	50.00
11	50.10	49.90	49.98	50.10	49.91	50.01
12	50.00	49.80	49.97	50.12	49.87	49.99
13	50.00	49.90	49.95	50.06	49.92	50.00
14	50.00	49.90	49.96	50.10	49.85	50.00
15	50.10	49.90	49.96	50.08	49.79	49.99
16	50.00	49.90	49.97	50.14	49.82	49.99
17	50.00	49.90	49.98	50.05	49.81	49.97
18	50.00	49.90	49.96	50.08	49.84	49.99
19	50.00	49.90	49.96	50.07	49.76	50.00
20	50.00	49.80	49.95	50.09	49.85	50.00
21	50.10	49.90	49.98	50.09	49.78	49.99
22	50.00	49.80	49.95	50.10	49.83	50.00
23	50.00	49.80	49.95	50.09	49.89	50.01
24	50.00	49.90	49.96	50.12	49.78	50.00
25	50.00	49.80	49.95	50.12	49.86	50.00
26	50.00	49.90	49.96	50.11	49.80	50.00
27	50.10	49.90	49.98	50.12	49.90	50.02
28	50.10	49.80	49.98	50.08	49.91	50.00
29	50.00	49.80	49.97	50.11	49.90	50.01
30	50.00	49.80	49.95	50.07	49.86	50.00
31	0.00	0.00	0.00	0.00	0.00	0.00
Max	**50.10**			**50.14**		
Min		**0.00**			**0.00**	
Source: TD (BPC), KHP (DGPC)						

Graph: Daily maximum, minimum and average frequency for the month of April, 2021

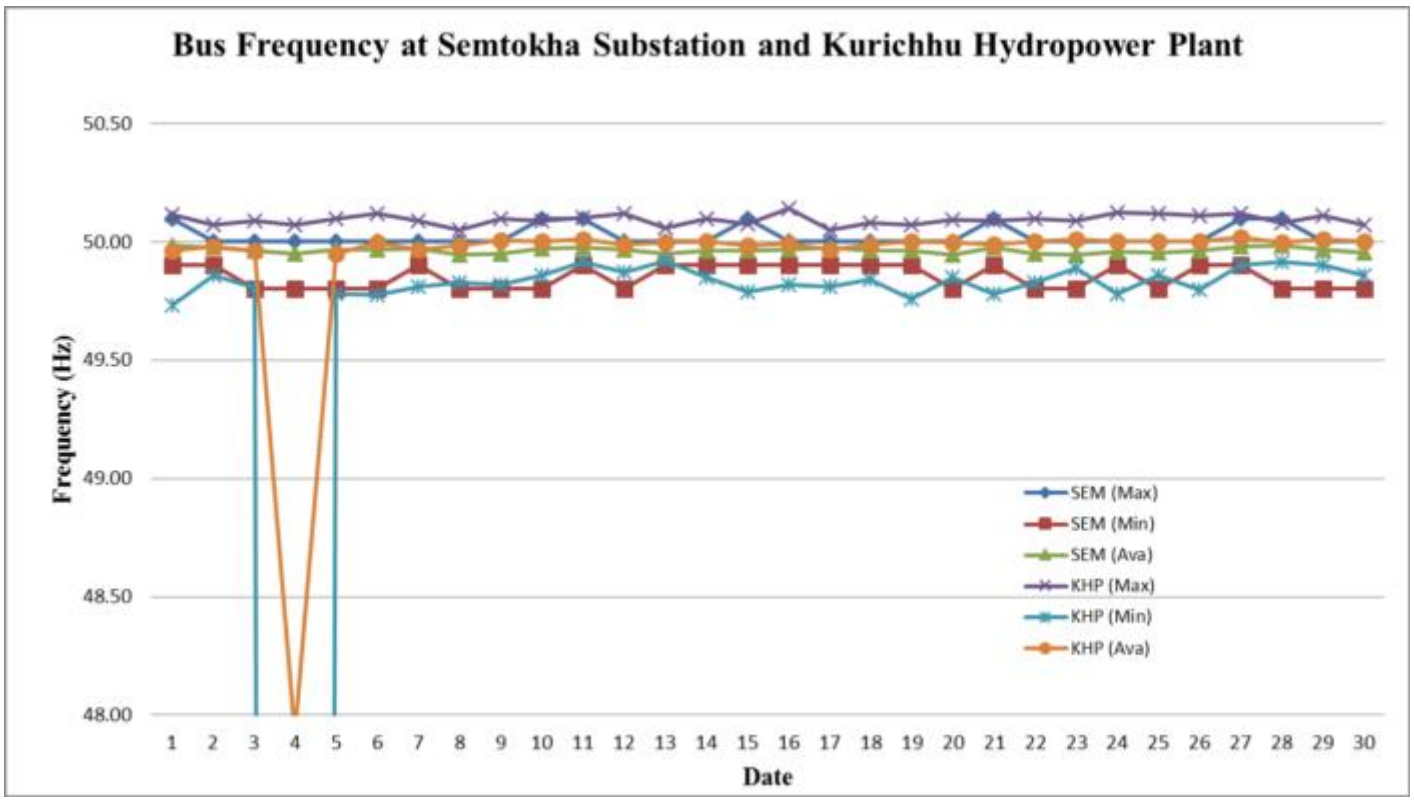


Table: Daily maximum, minimum and average frequency for the month of May, 2021

May-21	Bus Frequency at Semtokha Substation			Bus Frequency at Kurichhu Hydropower Plant		
Date	Max	Min	Ava	Max	Min	Ava
1	50.10	49.90	49.98	50.15	49.92	50.03
2	50.00	49.90	49.98	50.08	49.90	50.02
3	50.00	49.80	49.96	50.07	49.70	50.01
4	50.00	49.80	49.95	50.09	49.93	50.01
5	50.00	49.80	49.97	50.15	49.92	50.01
6	50.00	49.80	49.97	50.15	49.92	50.03
7	50.00	49.90	49.97	50.07	49.90	50.01
8	50.00	49.80	49.95	50.07	49.81	50.00
9	50.00	49.80	49.95	50.09	49.88	50.00
10	50.10	49.80	49.97	50.14	49.86	50.03
11	50.10	49.90	49.98	50.11	49.90	50.02
12	50.00	49.80	49.97	50.12	49.86	50.01
13	50.00	49.90	49.95	50.10	49.50	49.99
14	50.00	49.90	49.96	50.07	49.48	49.98
15	50.10	49.90	49.96	50.09	49.83	50.01
16	50.00	49.90	49.97	50.08	49.94	50.02
17	50.00	49.90	49.98	50.09	49.94	50.01
18	50.00	49.90	49.96	50.50	49.93	50.04
19	50.00	49.90	49.96	50.13	49.87	50.02
20	50.00	49.80	49.95	50.08	49.40	49.99
21	50.10	49.90	49.98	50.15	49.93	50.04
22	50.00	49.80	49.95	50.09	49.88	50.00
23	50.00	49.80	49.95	50.06	49.79	49.98
24	50.00	49.90	49.96	50.08	49.94	50.01
25	50.00	49.80	49.95	50.09	49.90	50.01
26	50.00	49.90	49.96	50.15	49.90	50.02
27	50.10	49.90	49.98	50.20	49.95	50.04
28	50.10	49.80	49.98	50.15	49.65	50.02
29	50.00	49.80	49.97	50.15	49.91	50.03
30	50.00	49.80	49.95	50.09	49.83	49.99
31	50.10	49.90	49.97	50.16	49.91	50.02
Max	**50.10**			**50.50**		
Min		**49.80**			**49.40**	
Source: TD (BPC), KHP (DGPC)						

Graph: Daily maximum, minimum and average frequency for the month of May, 2021

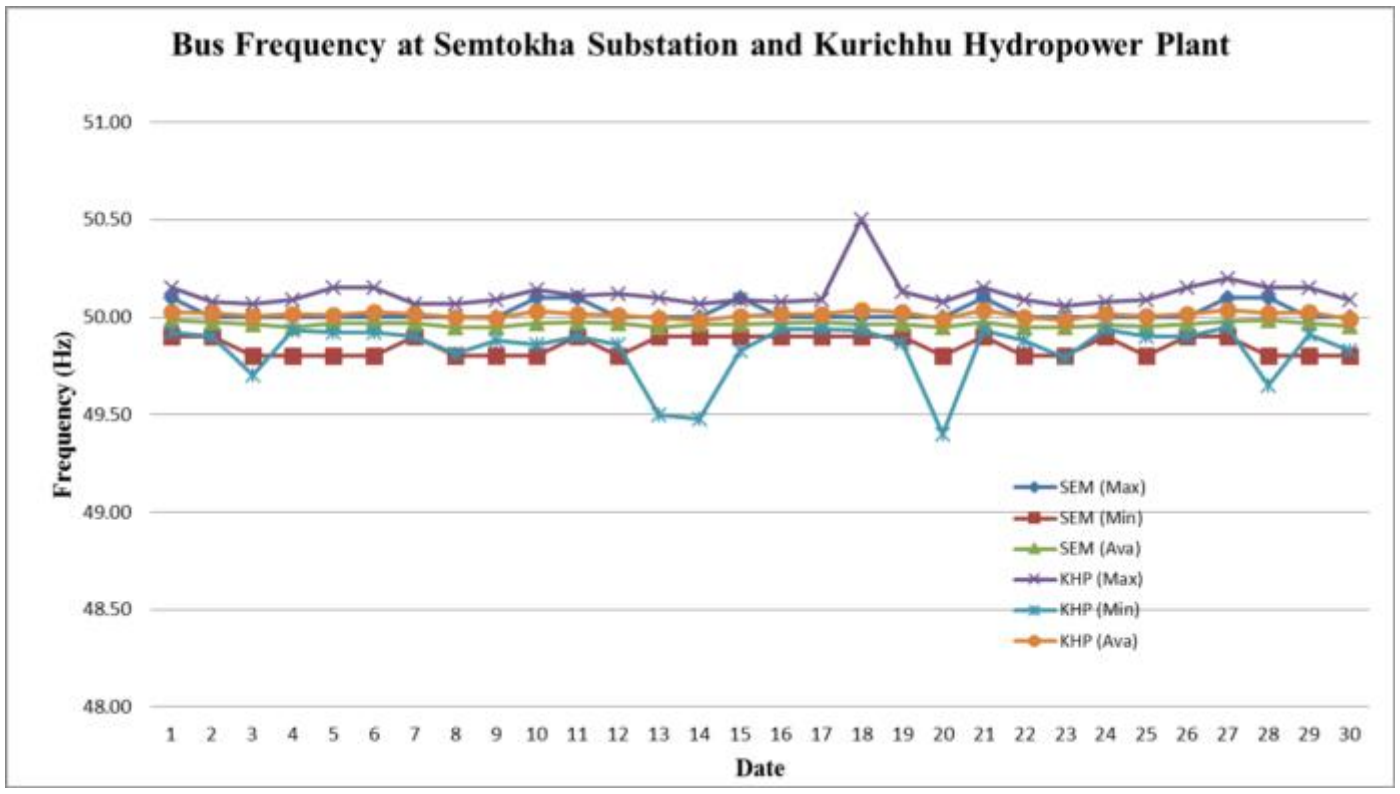
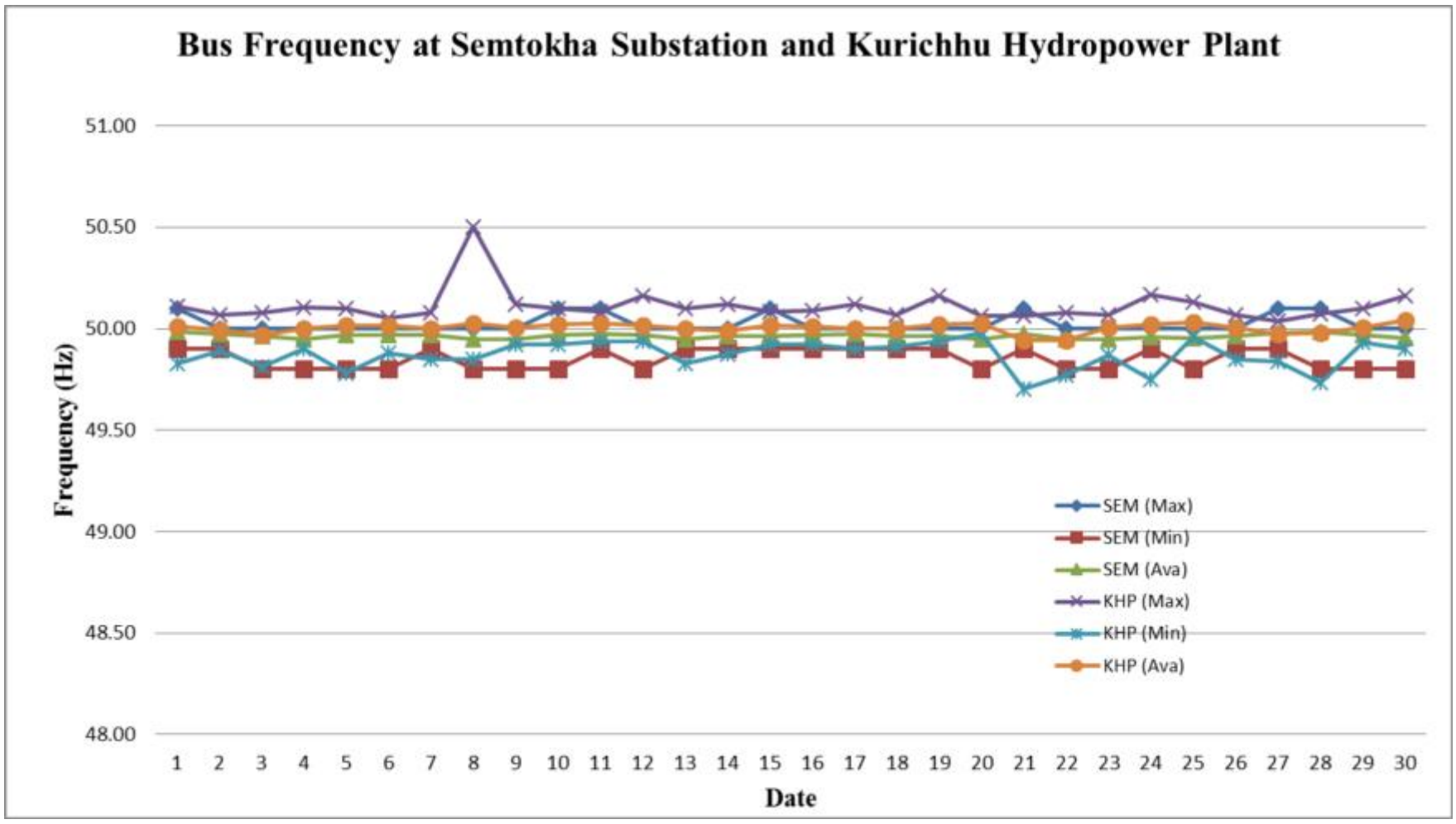


Table: Daily maximum, minimum and average frequency for the month of June, 2021

May-21	Bus Frequency at Semtokha Substation			Bus Frequency at Kurichhu Hydropower Plant		
Date	Max	Min	Ava	Max	Min	Ava
1	50.10	49.90	49.98	50.11	49.83	50.01
2	50.00	49.90	49.98	50.07	49.89	50.00
3	50.00	49.80	49.96	50.08	49.81	49.97
4	50.00	49.80	49.95	50.11	49.90	50.00
5	50.00	49.80	49.97	50.10	49.78	50.01
6	50.00	49.80	49.97	50.05	49.88	50.01
7	50.00	49.90	49.97	50.08	49.85	50.00
8	50.00	49.80	49.95	50.50	49.85	50.03
9	50.00	49.80	49.95	50.12	49.92	50.01
10	50.10	49.80	49.97	50.10	49.92	50.02
11	50.10	49.90	49.98	50.08	49.94	50.03
12	50.00	49.80	49.97	50.16	49.94	50.02
13	50.00	49.90	49.95	50.10	49.83	50.00
14	50.00	49.90	49.96	50.12	49.88	49.99
15	50.10	49.90	49.96	50.08	49.92	50.02
16	50.00	49.90	49.97	50.09	49.92	50.01
17	50.00	49.90	49.98	50.12	49.90	50.00
18	50.00	49.90	49.96	50.07	49.91	50.00
19	50.00	49.90	49.96	50.16	49.94	50.02
20	50.00	49.80	49.95	50.06	49.98	50.03
21	50.10	49.90	49.98	50.06	49.70	49.94
22	50.00	49.80	49.95	50.08	49.77	49.94
23	50.00	49.80	49.95	50.07	49.87	50.00
24	50.00	49.90	49.96	50.17	49.75	50.02
25	50.00	49.80	49.95	50.13	49.96	50.03
26	50.00	49.90	49.96	50.07	49.85	50.01
27	50.10	49.90	49.98	50.04	49.84	49.98
28	50.10	49.80	49.98	50.07	49.74	49.98
29	50.00	49.80	49.97	50.10	49.93	50.00
30	50.00	49.80	49.95	50.16	49.90	50.04
31	50.10	49.90	49.97	0.00	Error	Error
Max	**50.10**			**50.50**		
Min		**49.80**			**49.70**	
Source: TD (BPC), KHP (DGPC)						

Graph: Daily maximum, minimum and average frequency for the month of June 2021



Annexure-IV

Table: Daily maximum, minimum and average Voltage for the month of April, 2021

Apr-21	Malbase Substation									Nangkhor Substation		
	400kV Bus Voltage (kV)			220kV Bus Voltage (kV)			66kV Bus Voltage (kV)			132kV Bus Voltage (kV)		
Date	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava
1	416.50	409.00	413.17	225.50	219.50	222.52	67.00	64.00	65.63	135.48	129.66	133.09
2	415.50	407.50	412.25	225.50	218.00	222.44	67.00	64.00	65.54	135.60	128.83	132.04
3	415.00	407.50	411.79	225.50	219.50	222.29	66.00	64.00	65.33	135.20	129.70	132.79
4	415.00	406.00	410.90	226.00	216.50	221.54	66.00	64.00	65.08	135.90	132.20	133.78
5	415.00	408.00	411.50	225.00	220.00	222.13	66.00	64.00	65.00	135.40	131.50	133.40
6	416.50	406.50	412.10	226.00	219.50	222.17	66.00	64.00	65.21	135.07	131.10	132.97
7	417.50	408.00	413.08	226.00	219.00	222.79	66.00	64.00	65.58	136.20	129.40	133.06
8	417.50	407.50	412.54	226.00	219.50	222.21	67.00	65.00	65.79	136.73	128.21	133.28
9	415.50	406.00	411.58	224.00	219.00	221.96	67.00	64.00	65.71	135.60	131.12	133.59
10	417.00	408.50	411.88	225.00	218.50	221.75	66.00	64.00	64.67	136.10	131.30	133.73
11	416.00	407.00	411.83	225.00	216.00	221.08	66.00	64.00	65.00	136.52	131.10	133.25
12	416.00	407.00	411.75	224.00	218.50	221.17	65.00	64.00	64.83	135.80	128.83	133.33
13	417.00	407.00	412.21	225.00	215.00	220.77	66.00	64.00	64.79	135.80	131.10	133.21
14	416.00	406.50	413.04	225.50	220.50	222.54	67.00	64.00	65.42	136.70	131.50	133.64
15	416.00	403.00	410.85	225.50	214.50	220.71	67.00	64.00	65.00	136.52	129.25	133.63
16	415.00	402.50	409.21	223.50	214.00	219.21	67.00	64.00	64.58	136.10	132.00	133.95
17	415.50	407.50	411.40	224.50	217.00	220.83	66.00	64.00	64.73	137.30	130.08	133.85
18	417.50	407.50	409.85	224.00	216.50	219.19	66.00	64.00	64.71	136.10	132.78	134.22
19	416.50	407.50	410.96	223.50	217.50	221.04	66.00	64.00	64.83	136.73	132.00	134.07
20	416.50	408.50	413.54	223.00	219.00	221.54	66.00	65.00	65.33	135.40	129.70	132.86
21	418.00	405.50	412.21	225.00	216.50	220.58	67.00	64.00	65.33	136.30	131.12	133.13
22	421.00	412.50	415.96	224.50	217.00	220.98	66.50	65.00	65.42	135.90	130.08	133.40
23	420.50	404.00	410.83	222.00	213.50	218.56	67.00	64.00	64.83	135.60	128.60	132.85
24	415.50	401.50	410.63	224.00	212.50	219.21	66.00	64.00	64.75	135.80	130.50	133.15
25	417.00	405.00	412.79	224.00	213.50	219.63	66.00	64.00	64.88	136.31	130.90	133.89
26	418.00	407.50	414.13	223.00	214.00	218.85	66.00	64.00	65.17	137.77	130.08	134.46
27	422.50	407.00	414.38	222.00	218.00	220.33	66.00	64.00	65.13	136.31	131.10	133.72
28	417.50	411.00	413.96	226.00	219.00	222.17	66.00	65.00	65.42	137.35	132.10	134.03
29	420.00	409.50	415.25	226.00	218.00	221.71	67.00	65.00	66.25	137.35	130.70	133.89
30	423.00	410.00	415.73	227.50	218.00	221.52	68.00	65.00	66.25	136.73	131.50	133.90
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	**423.00**			**227.50**			**68.00**			**137.77**		
Min		**0.00**			**0.00**			**0.00**			**0.00**	
Source: TD, BPC												

Graph: Daily maximum, minimum and average Voltage for the month of April, 2021

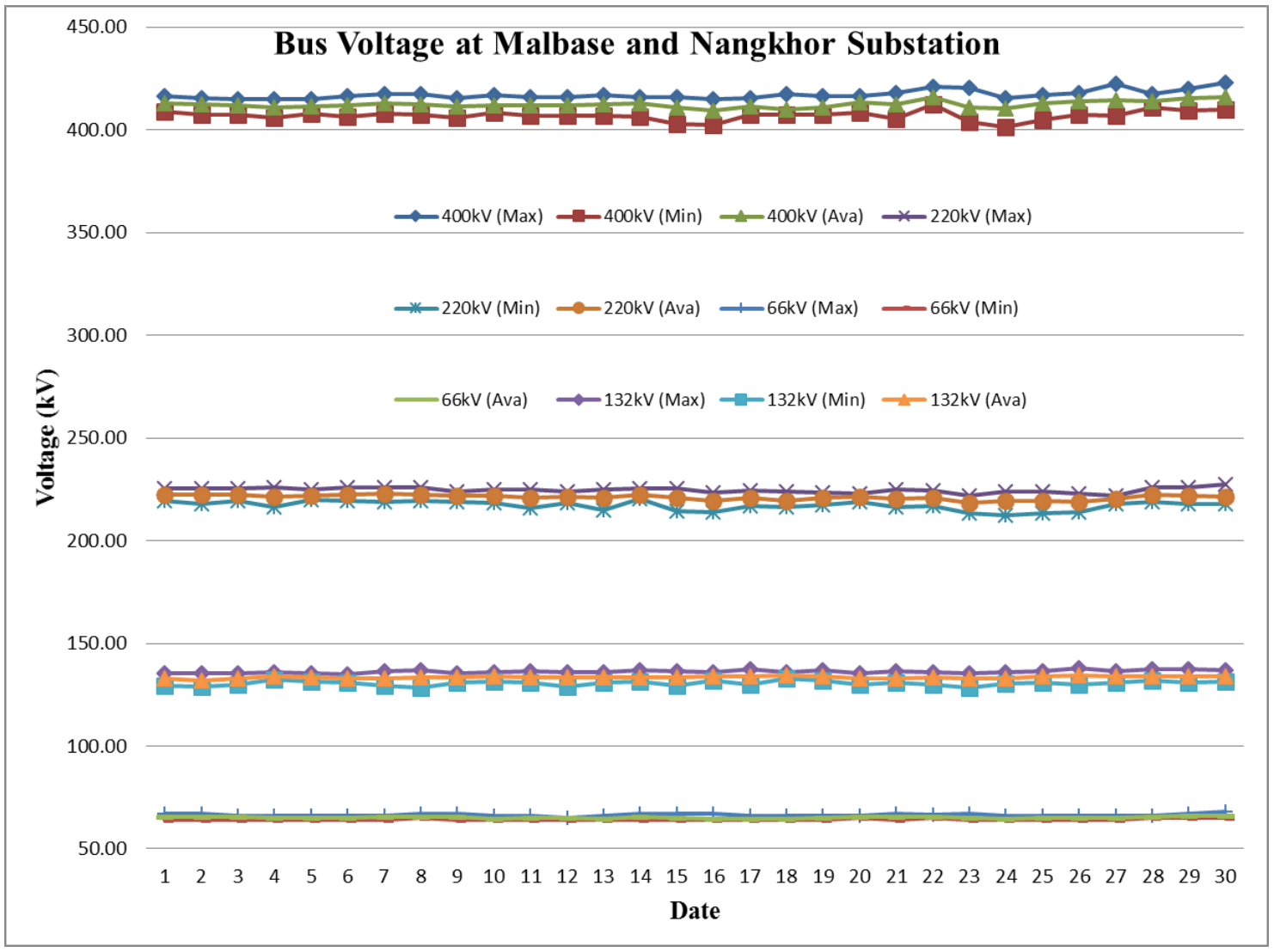


Table: Daily maximum, minimum and average Voltage for the month of May, 2021

May-21	Malbase Substation									Nangkhor Substation		
	400kV Bus Voltage (kV)			220kV Bus Voltage (kV)			66kV Bus Voltage (kV)			132kV Bus Voltage (kV)		
Date	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava
1	417.50	408.50	413.81	225.00	219.50	221.31	67.00	64.00	65.67	137.60	131.50	134.09
2	418.50	407.00	413.58	225.00	217.50	221.29	67.00	65.00	66.17	135.81	130.50	133.98
3	419.00	408.50	414.08	226.00	217.50	221.19	67.00	65.00	66.17	137.10	131.50	134.29
4	421.50	408.50	415.88	229.00	219.00	223.67	69.00	66.00	66.58	135.90	131.20	133.68
5	416.50	405.50	413.04	224.50	217.50	220.96	67.00	65.00	66.17	136.10	131.50	133.57
6	413.50	403.50	409.17	224.00	217.00	220.58	66.00	64.00	65.33	135.00	129.66	133.02
7	414.00	403.00	409.63	224.00	218.00	220.63	67.00	65.00	66.00	135.10	131.10	133.30
8	414.50	404.00	410.48	223.50	216.50	220.52	66.00	65.00	65.71	136.30	131.74	134.26
9	417.50	408.00	412.02	226.00	220.00	222.23	67.00	65.00	65.96	135.60	132.57	134.04
10	415.50	403.00	410.00	225.00	217.00	220.19	67.00	65.00	65.83	135.60	131.40	133.42
11	414.50	404.00	409.71	225.00	215.50	219.98	67.00	65.00	65.75	135.69	131.00	133.82
12	414.50	405.50	409.13	222.50	217.50	219.50	67.00	65.00	65.96	135.48	132.30	133.87
13	413.50	401.50	407.04	224.00	215.50	219.08	66.00	65.00	65.50	135.80	132.36	134.31
14	410.50	402.50	407.13	223.00	215.50	218.71	65.00	64.00	64.92	135.80	131.32	133.99
15	409.00	402.00	406.44	221.00	216.00	218.58	66.00	65.00	65.40	136.73	131.70	134.30
16	412.50	404.00	408.58	224.50	216.00	219.73	66.00	65.00	65.46	135.90	131.12	133.89
17	415.50	401.50	409.58	225.50	213.00	220.08	66.00	64.00	65.42	135.80	131.95	133.93
18	415.50	401.50	408.06	224.50	213.00	217.71	66.00	64.00	64.75	135.90	132.50	133.90
19	416.00	402.00	408.79	222.50	214.00	217.56	66.00	64.00	64.88	135.48	131.12	133.54
20	410.50	403.00	406.42	221.50	215.50	218.17	65.00	64.00	64.88	135.20	131.10	133.34
21	412.00	401.00	406.73	223.50	216.00	219.35	66.00	65.00	65.17	135.40	132.57	134.31
22	413.50	405.00	409.15	225.00	218.00	220.90	66.00	65.00	65.71	134.80	132.00	133.65
23	409.50	403.00	407.38	222.00	216.00	218.96	66.00	65.00	65.71	136.52	132.16	134.20
24	410.50	401.50	407.38	221.50	214.50	219.08	66.00	65.00	65.50	137.50	131.95	134.78
25	410.50	403.50	408.13	221.50	216.00	219.42	67.00	65.00	65.50	139.43	132.25	135.32
26	410.50	400.00	407.75	225.50	215.50	219.25	67.00	65.00	65.42	135.07	131.32	133.27
27	409.50	401.50	405.38	220.50	214.50	217.50	66.00	64.00	65.00	134.44	130.90	133.16
28	410.50	404.00	407.96	221.00	216.00	218.04	66.00	65.00	65.50	135.48	131.33	133.15
29	415.00	407.50	410.94	224.00	211.00	218.85	66.00	63.00	65.54	135.48	130.91	133.25
30	415.50	405.00	410.79	223.00	217.50	221.08	66.00	65.00	65.75	135.27	131.32	133.33
31	415.00	407.50	410.71	222.00	217.50	220.29	66.00	65.00	65.58	136.30	130.70	133.95
Max	**421.50**			**229.00**			**69.00**			**139.43**		
Min		**400.00**			**211.00**			**63.00**			**129.66**	
Source: TD, BPC												

Graph: Daily maximum, minimum and average Voltage for the month of May, 2021

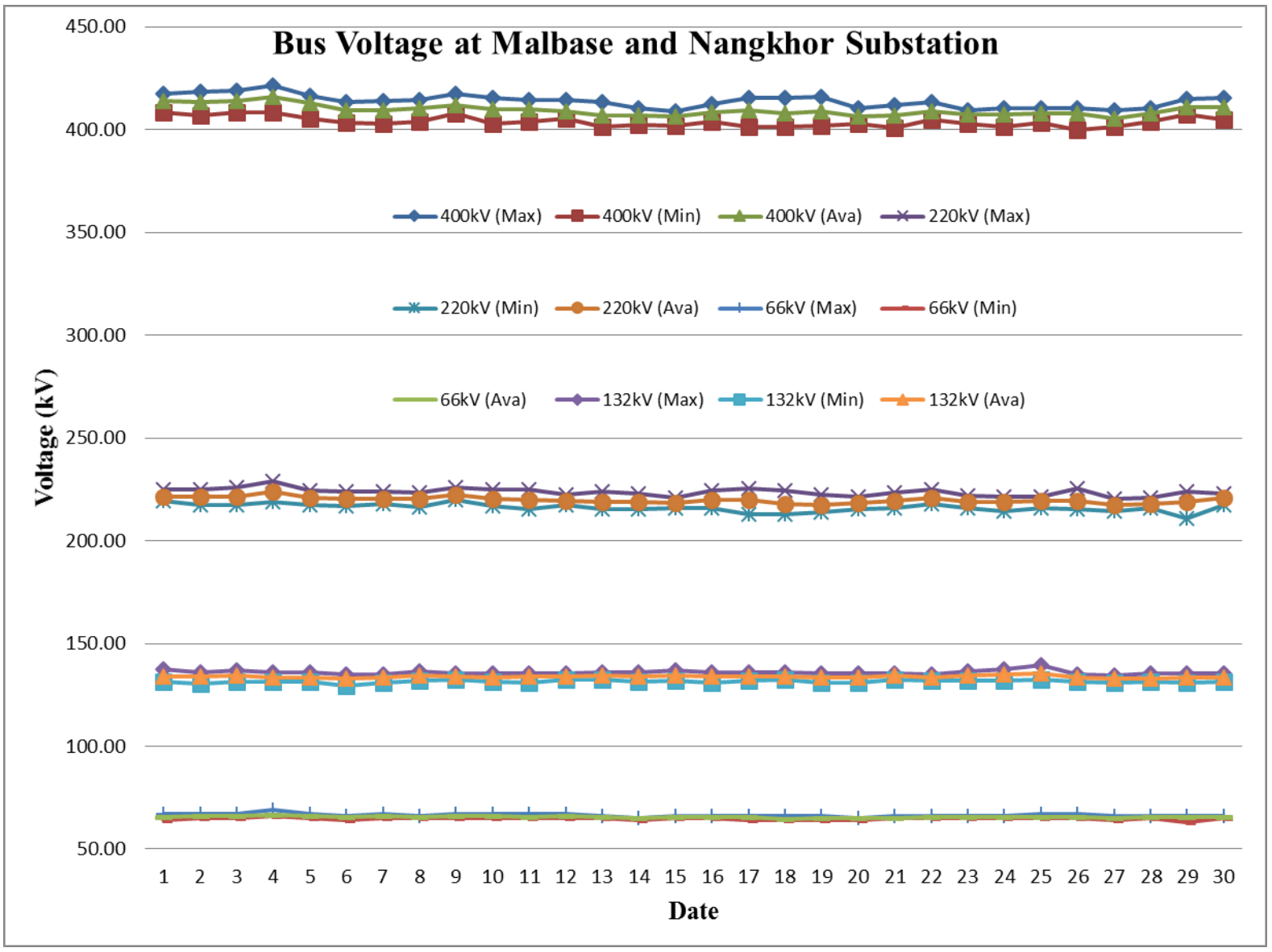
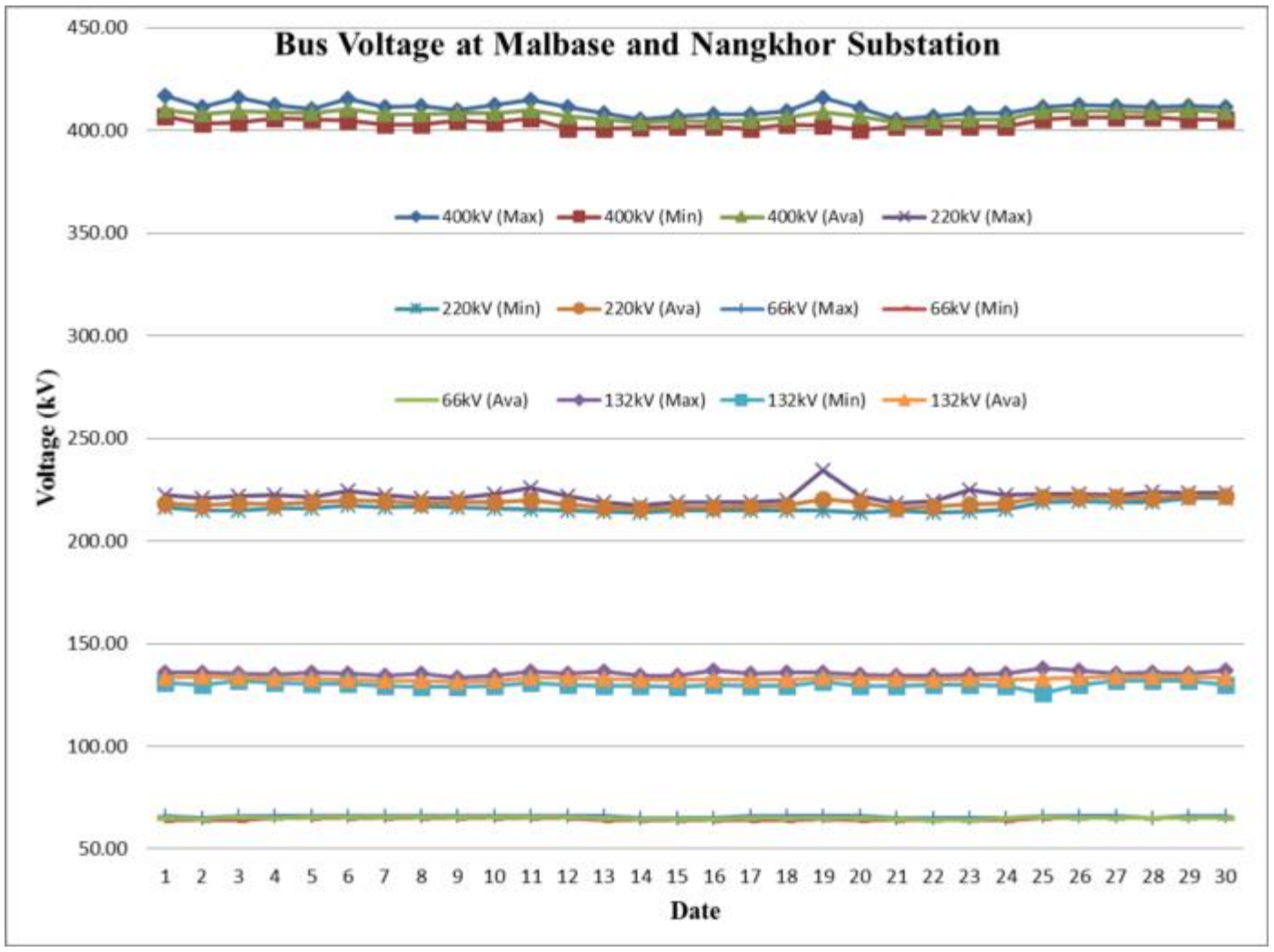


Table: Daily maximum, minimum and average Voltage for the month of June, 2021

May-21	Malbase Substation									Nangkhor Substation		
	400kV Bus Voltage (kV)			220kV Bus Voltage (kV)			66kV Bus Voltage (kV)			132kV Bus Voltage (kV)		
Date	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava	Max	Min	Ava
1	417.00	407.00	410.02	222.50	216.50	218.52	66.00	64.00	65.04	136.11	130.90	133.46
2	411.50	403.50	407.92	221.00	215.00	217.25	65.00	64.00	64.54	135.70	130.08	133.97
3	416.00	404.00	409.50	222.00	215.00	218.42	66.00	64.00	65.33	135.28	131.95	133.66
4	412.50	406.00	408.75	222.50	216.00	218.06	66.00	65.00	65.23	134.80	131.12	133.17
5	410.50	405.50	408.54	221.50	216.00	218.67	66.00	65.00	65.33	135.90	130.49	132.68
6	415.50	405.00	410.35	224.50	217.50	220.15	66.00	65.00	65.70	135.20	130.20	132.51
7	411.50	403.00	408.13	222.50	216.50	219.27	66.00	65.00	65.42	134.65	129.66	132.09
8	412.00	403.00	407.67	221.00	217.00	218.48	66.00	65.00	65.58	135.50	128.80	131.91
9	410.00	405.00	408.25	221.00	216.50	218.96	66.00	65.00	65.58	133.41	128.83	131.52
10	412.50	404.00	408.21	223.00	216.00	218.79	66.00	65.00	65.33	134.40	129.45	131.77
11	415.00	406.00	410.13	226.00	215.50	219.69	66.00	65.00	65.67	136.32	131.12	133.61
12	411.50	401.00	406.81	222.00	215.00	217.69	66.00	65.00	65.42	135.69	130.08	133.51
13	408.50	401.00	405.17	219.00	214.50	216.63	66.00	64.00	64.92	136.50	129.66	132.71
14	405.50	401.50	403.92	217.50	214.00	215.92	65.00	64.00	64.50	134.65	129.25	132.36
15	407.00	402.00	404.83	219.00	215.00	216.35	65.00	64.00	64.63	134.40	128.83	132.52
16	408.00	402.00	404.50	219.00	215.00	216.38	65.00	64.00	64.67	136.94	129.80	132.65
17	408.00	401.00	404.96	219.00	215.00	216.88	66.00	64.00	64.83	135.40	129.20	132.44
18	409.50	403.00	406.58	220.00	215.00	217.54	66.00	64.00	65.00	135.90	129.25	132.66
19	416.00	402.50	409.13	234.50	215.00	220.40	66.00	64.50	65.00	135.80	131.53	133.45
20	411.00	400.50	407.06	222.00	214.00	218.75	66.00	64.00	65.00	134.80	129.66	132.79
21	405.50	402.00	403.71	218.50	215.00	215.96	65.00	64.00	64.38	134.50	129.45	132.81
22	407.00	402.00	404.33	219.50	214.00	216.67	65.00	64.00	64.13	134.65	130.08	132.46
23	408.50	402.00	405.25	225.00	214.50	217.96	65.00	64.00	64.25	134.80	129.87	132.75
24	408.50	402.00	405.25	222.50	215.50	218.44	65.00	64.00	64.92	135.69	129.20	132.32
25	411.50	405.50	409.29	223.00	219.00	221.42	66.00	65.00	65.50	137.90	125.71	132.97
26	412.50	406.50	409.63	223.00	219.50	221.65	66.00	65.00	65.17	136.94	129.87	133.43
27	412.00	406.50	409.42	222.50	219.00	221.17	66.00	65.00	65.17	135.27	132.16	133.75
28	411.50	406.50	409.00	224.00	219.00	221.04	65.00	65.00	65.00	136.10	131.74	133.72
29	412.00	405.50	409.85	223.50	221.00	221.94	66.00	65.00	65.25	135.40	131.90	133.85
30	411.50	405.50	408.96	223.50	221.00	221.79	66.00	65.00	65.29	136.90	130.08	133.37
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	**417.00**			**234.50**			**66.00**			**137.90**		
Min		**0.00**			**0.00**			**0.00**			**0.00**	
Source: TD, BPC												

Graph: Daily maximum, minimum and average Voltage for the month of June, 2021



Annexure-V

Eastern Grid Outages
April Month 2021

EASTERN GRID TRIPPING/OUTAGE

Tripping Report for the of month April, 2021 under SMD Deothang, TD,BPC

Sl. No.	Date of Tripping	Time of outages	Date of Normalization	Time of fault was cleared	Duration of Outages (Hrs)	MW before outage (MW)	Feeder Name	Name of the Substation/lines affacted by the fault	Reasons of fault	Relay operations	Exact location of fault [Line segment/ Substation]	Type of outages	Remarks
1.132/33/11kV Kilikhar Substation													
132kV Feeder													
	30.04.2021	16:59	30.04.2021	17:06		-13.75	132kv kurichu	All feeders	NA	Nill	kurichu end	trip	Line tripped from kurichu end. all unit are trip due to under voltage.
2. 132/33/11kV Kanglung Substation													
132kV Feeder													
1	01.04.2021	14:30	1.4.2021	14:34	0:04	-7.182	Corlung	Kanglung	E/F	E/F	Corlung Line	Tripped on fault	Line Tripped due to Lightening
2	07.04.2021	21:14	07.04.2021	21:17	0:00	-12.168	Corlung	kanglung	O/c	o/c	Corlung Line	Tripped on fault	line tripped due to over current at our end ,due to heavy rainfall with thundering &lightinning
3	28.04.2021	17:03	28.04.2021	17:13	0:00	-11.412	Corlung	kanglung	O/C & E/F	O/C & E/F relay operated Ir-27.56A, Iy-801.8A, Ib-720.2A. Distance relay operated with Zone 1, at 17.88KM	Corlung Line	Tripped on fault	fdr normalised after getting clearence from ms. Karma, (engg). BPSO. At 17:13 hrs.
4	28.04.2022	17:03	28.04.2021	17:14	0:00	9.756	Phuntshothang	Kanglung	NA	nce relay zone 1 ope	Phuntshothang line	Tripped on fault	fdr normalised after getting clearence from ms. Karma, (engg). BPSO. At 17:14hrs.
5	28.04.2021	17:43	28.04.2021	17:45	0:00	-11.412	Corlung	kanglung	O/C & E/F	O/C & E/F relay operated Ir-570.8A, Iy-57.85A, Ib-621A. Distance relay operated with Zone 2, at 25.71KM	Corlung Line	Tripped on fault	fdr normalised after getting clearence from ms. Karma, (engg). BPSO. At 17:45hrs.
6	28.04.2021	17:43	28.04.2021	19:56	2:00	9.756	Phuntshothang	Kanglung	NA	nce relay zone 1 ope	Phuntshothang line	Tripped on fault	fdr normalised after getting clearence from ms. Karma, (engg). BPSO with charging code 2050
7	30.04.2021	16:55	30.04.2021	17:16	0:00	-10.872	Corlung	kanglung	O/C & E/F	O/C & E/F relay operated IA-32.78A, IB-72.53A, IC-797.6A. VAB-134.1kV,VBC-81.7kV,VCA-77.9kV. Distance relay operated with Zone 1, at5.586KM,IA-32.71A,IB-72.2A,IC-822.3A,VAN-78.66kV,VBN-76.45kV,VCN-5.706kV	Corlung Line	Tripped on fault	Feeder normalised after getting clearence from BPSO.
8	30.04.2021	16:55	30.04.2021	17:16	0:00	9.486	Phuntshothang	Kanglung	NA	NA	Phuntshothang line	Tripped on fault	Feeder normalised after getting clearence from BPSO.

3. 132/33/11kV Deothang Substation													
132kV Feeder													
1	04.04.2021	20:50	04.04.2021	20:59	0	8.06	132kV Deothang-Motanga	Deothang-Motanga line	Overcurrent and Earth relay was operated at Motanga end	Nil	Motanga end	Tripped	Grid fail from the Nangkor & Motanga substation. At our ends Breaker was in normal condition.
2	04.04.2021	20:50	04.04.2021	21:03	0	-11.8	132kv incomer	Nangkor	Overcurrent and Earth relay was operated at Nangkhor end	Nil	Nangkhor end	Tripped	Grid fail from the Nangkor & Motanga substation. At our ends Breaker was in normal condition.
3	10.04.2021	20:53	10.04.2021	21:05	0	33.33	132kV Deothang-Motonga	Deothang-Motanga line	Unknown	Nil	Deothang Substation	Tripped	Grid failed, 132kV Deothang-Nangkhor & Deothang-Motonga line was both tripped at their end only. Supply was resumed at 21:05 hrs.
4	10.04.2021	20:53	10.04.2021	21:08	0	-35.28	132 kV Deothang - Nangkhor	Deothang-Nangkhor line	Unknown	Nil	Deothang Substation	Tripped	Grid failed, 132kV Deothang-Nangkhor & Deothang-Motonga line was both tripped at their end only. Supply was resumed at 21:08 hrs.
5	27.04.2021	18:14	27.04.2021	18:17	0	0.79	132/33kV 5MVA Transformer I & II	Deothang SS	Tripped	O/C	132/33/11kV Deothang Ss	Transcent fault	132/33kV 5MVA Transformer I & II both tripped and test charged was done and found normal
6	28.04.2021	0:01	28.04.2021	0:04	0	0.53	132/33kV 5MVA Transformer I & II	Deothang SS	Tripped by Bangtar line	tripping relay 86	Unknow	Tripped	132/33kV 5MVA Transformer was got tripped by Bangtar feeder.Charge and found normal.
7	30.04.2021	16:58	30.04.2021	17:06	0	0.83	132kV Deothang-Nangkhor	Deothang SS	Grid fail	Nill	Unknow	Tripped	Grid fail from both end,at our end all breaker condition was normal
8	30.04.2021	17:58	30.04.2022	18:06	0	0.83	132kV Deothang-Motanga	Deothang SS	Grid fail	Nill	Unknow	Tripped	Grid fail from both end,at our end all breaker condition was normal
4. 132/33/11kV Nangkhor substation													
132kV Feeder													
1	04.04.2021	18:43 hrs	04.04.2021	19:57 hrs	0	0.84	132/33kV, 5MVA Trf-I	All 33kV & 11kV feeders	Transient fault	Non directional IDMT O/C Relay-50A & tripping relay 86 operated	Nangkor Substation	Tripped on fault	Tripped due to fault on 33kV Tsebar feeder
2	04.04.2021	18:43 hrs	04.04.2021	18:47 hrs	0	0.61	132/33kV, 5MVA Trf-II	All 33kV & 11kV feeders	Transient fault	Non directional IDMT O/C Relay-50A & tripping relay 86 operated	Nangkor Substation	Tripped on fault	Tripped due to fault on 33kV Tsebar feeder
3	04.04.2021	19:33 hrs	04.04.2021	19:37 hrs	0	0.46	132/33kV, 5MVA Trf-II	All 33kV & 11kV feeders	Transient fault	Non directional IDMT O/C Relay-50A & tripping relay 86 operated	Nangkor Substation	Tripped on fault	Tripped due to fault on 33kV Tsebar feeder
4	04.04.2021	20:50 hrs	04.04.2021	21:03 hrs	0	11.7	Nangkor-Deothang	Nangkor-Deothang line	Tripped on fault	Non directional E/F,O/C relay & tripping relay 86 operated.	Nangkor-Deothang line	Tripped on fault	Start Ø CN, Trip Ø N. O/C start I>1, E/F start IN1>12, trip IN1>2. IA-60.16A, IB-52.54A,IC-404.0A, IN measured-353.5A. Informed to BPSO, and charged the feeder with instruction from BPSO.
5	10.04.2021	20:53 hrs	10.04.2021	21:06 hrs	0	35.7	Nangkor-Deothang	Nangkor-Deothang line	Tripped on fault	Non directional E/F,O/C relay & tripping relay 86 operated.	Nangkor-Deothang line	Tripped on fault	Start Ø CN, Trip Ø N. O/C start I>1, E/F start IN1>12, trip IN1>2. IA-102.4A, IB-100.9A,IC-447.5A, IN measured-361.4A. Informed to BPSO, and charged the feeder with instruction from BPSO.
6	14.04.2021	04:32 hrs	14.04.2021	14:50 hrs	0	0.39	132/33kV, 5MVA Trf-I	All 33kV & 11kV feeders	NA	Non directional IDMT O/C Relay-50A,50C & tripping relay 86 operated	Nangkor Substation	Tripped on fault	Due to fault on 33kV Tsebar feeder.
7	16.04.2021	15:58 hrs	16.04.2021	16:03 hrs	0	0.42	132/33kV, 5MVA Trf-I	All 33kV & 11kV feeders	Transient fault	Non directional IDMT O/C Relay-50A,50C & tripping relay 86 operated	Nangkor Substation	Tripped on fault	Tripped due to fault on 33kV Yurung feeder
8	16.04.2021	15:58 hrs	16.04.2021	16:03 hrs	0	0.24	132/33kV, 5MVA Trf-II	All 33kV & 11kV feeders	Transient fault	Non directional IDMT O/C Relay-50A,50C & tripping relay 86 operated	Nangkor Substation	Tripped on fault	Tripped due to fault on 33kV Yurung feeder
9	22.04.2021	02:26 hrs	22.04.2021	02:40 hrs	0	0.38	132/33kV, 5MVA Trf-I	All 33kV & 11kV feeders	Transient fault	Non directional IDMT O/C Relay-50A,50C & tripping relay 86 operated	Nangkor Substation	Tripped on fault	Tripped due to fault on 33kV Namng feeder & Namng Feeder
10	22.04.2021	02:26 hrs	22.04.2021	02:40 hrs	0	0.43	132/33kV, 5MVA Trf-II	All 33kV & 11kV feeders	Transient fault	Non directional IDMT O/C Relay-50A,50C & tripping relay 86 operated	Nangkor Substation	Tripped on fault	Tripped due to fault on 33kV Namng feeder & Namng Feeder
11	28.04.2021	00:03 hrs	28.04.2021	00:26 hrs	0	24.1	Nangkor-Deothang	Nangkor-Deothang line	Tripped on fault	Non directional O/C,E/F Relay & tripping relay 86 operated.	Nangkor-Deothang line	Tripped on fault	Start Ø CN, Trip Ø N. O/C start I>1, E/F start IN1>12, trip IN1>2. IA-100.2A, IB-96.92A,IC-467.9A, IN measured-391.2A. Informed to BPSO, and charged the feeder with instruction from BPSO.
12	28.04.2021	08:23 hrs	28.04.2021	09:58 hrs	1	0.24	132/33kV, 5MVA Trf-II	132/33kV, 5MVA Trf-II	Tripped on fault	Aux-Relay Diff/ref 87x,64x, 30CWDG temp. Alarm, 30D Buch. Alarm & tripping relay 86 operated	Nangkor Substation	Tripped on fault	No supply interrupted. Tripped due to Shake of Earth Quake. Charged the Xmer after inspection.
13	30.04.2021	16:03 hrs	30.04.2021	16:15 hrs	0	28.6	Nangkor-Nganglam	Nangkor-Nganglam line	Tripped on fault	Directional O/C,E/F & tripping relay 86 operated	Nangkor-Nganglam line	Tripped on fault	Directional O/C & E/F & trip relay 86 operated at our end: Start phase BN, trip phase N, O/C start I>1, E/F start E/F IN1>12, trip IN1>2. IA-78.17A, IB-670A, IC-141.2A, VAB-109.8kV, VBC-107.3kV, VCA-130.5kV, VAN-72.7kV, VBN-53.08kV, VCN-74.15kV, VN-0.00, 49.98Hz,IN measured-456.0A, IN derieved-455.8A. Informed to BPSO & charged the feeder as per their instruction.
14	30.04.2021	16:57 hrs	30.04.2021	17:04 hrs	0	28.6	Main Grid	All 33kV & 11kV feeders	-	-	Motonga Substation & Tintibi Substation	Tripped on fault	Supply failed from Motonga Substation and Tintibi Substation and received from Motonga Substation.

5. 132/33/11kV Nganglam substation													
132kV Feeder													
1	12.04.2021	17:40	12.04.2021	17:45	0	0.44	3MVA Transformer	3MVA Transformer	Over Current	O/C & 86opted	33kV Dechenling Feeder	Tripped on Fault	After the tripping of 3MVA Transformer the load is changed over to 5MVA Transformer at 17:45hrs
2	14.04.2021	02:18	14.04.2021	02:34	0	-15.17	Nganglam -Tingtibi	Nganglam-Tingtibi	Earth Fault	E/F & 86opted	Nganglam-Tingtibi Line	Tripped on Fault	Trip Values: Tripped ABCN Z-1 Fault location 10.75km IA- 1.495KA IB-1.517KA IC-1.254KA
3	23.04.2021	8:12	23.04.2021	14:22	6	-24.54	Nganglam-Tingtibi	Nganglam-Tingtibi	Shutdown	NA	Nganglam-Tingtibi Line	Tripped on Fault	Shutdown taken by TMD, Nganglam to cut/fell down fast grown tree between the line section of TN#211 to TN#212 and TN#215 to TN#216 with vide Switch off code# 0439 issued by Miss. Linley Wangmo & PTW No# 1768 issued by Substation. The supply was restored after returning of PTW No# 1768 by Mr. Dawa Tshering TMD, Line Incharge & coordination to Tingtibi end and BPSO with vide Switch On code# 2036 issued by Miss. Kinley Wangmo, BPSO.
4	30.04.2021	15:58	30.04.2021	16:30	0	-24.84	Nganglam-Tingtibi	Nganglam-Tingtibi	Earth Fault	E/F & 86opted	Nganglam-Tingtibi Line	Tripped on Fault	Trip Values: Tripped ABCN Z-1 Fault location 10.75km IA- 3.218A IB-776.6A IC-160.5A Fault location 131km. CB operatered at both end and Nangkhor-Nganglam CB operated at Nangkhor end there by resulting Substation in Black out.
5	30.04.2021	16:58	30.04.2021	17:04	0	-24.84	Nganglam-Tingtibi	Nganglam-Tingtibi	Grid fail	Grid fail	Nganglam-Tingtibi Line	Grid fail	Suply fail from Tingtibi end(Jigmeling -Tingtibi CB opted at Jigmeling end) and Nangkhor-Nganglam CB opted at Nangkhor end thus Black out at Nganglam Substation
6. 132kV Motanga substation													
1	4/4/2021	20:53 hrs	4/4/2021	20:58 hrs	_	-10.5	Deothang fdr incomer	_	Tripped on Fault	86A & 86B OPTD,OC/EF at one end	Motanga ss	_	Informed BPSO,as per there instruction by Karma Yangzom without clossing code CB closed at 20:58hrs from our end as emergency.
2	4/8/2021	10:15 hrs	4/8/2021	13:52hrs	3	0.1	15MVA Xmer	_	Hand tripped	_	Motanga ss	_	Informed BPSO and CB closed at 13:52hrs from our end.
3	4/10/2021	20:52 hrs	4/10/2021	21:01hrs	_	-34.5	Deothang fdr incomer	_	Tripped on Fault	86A & 86B OPTD,OC/EF at one end	Motanga ss	_	Taken shutdown by DCSD for maintenance work at Azista end.
4	4/11/2021	08:02hrs	4/11/2021	08:40hrs	_	0.02	33kV POP Factory	_	Hand tripped	_	Motanga ss	_	Shutdown taken by DCSD S/Jongkhar to replace Fuse at there end.
5	28/04/201	08.25hrs	28/04/201	09.22hrs		-22.47	Deothang fdr incomer	_	Hand tripped	_	Motanga ss	_	Informed BPSO, Thimphu as instructed to closed CB with code no.2046 CB closed form our end at 09:22hrs.Due to heavy earthquake all isolators alignment was slightly gone out and Rangia main isolator and line isolator and Phuntshothang line isolator got burnt. So firstly control the fire at isolators by hand tripping CB for Deothang,Rangia and Phuntshothang feeders and than we the staffs physically check all the structures and alignment for all bays.manually closed all isolators to confrimed fully closed and inform BPSO to charge the line.
6	28/04/201	08.25hrs	28/04/201	13.07hrs	4 hrs	6.11	Motanga-Rangia line		Hand tripped	_	Motanga ss	_	Informed to BPSO, Thimphu as instructed to closed CB with code no.NLDC Bht-2047,NLDC India-1349,NERLDC -1875 CB closed from our end at 13:07hrs.Due to earthquake main isolator and line isolator alignment gone out and got burnt .informed maintenance team at Deothang and done all alignment works both for Rangia and Phuntshothang isolators and both line charged from our end.
7	28/04/201	08.25hrs	28/04/201	13.26hrs	5 hrs	-8.97	tanga-Phuntshothang line		Hand tripped	_	Motanga ss	_	Informed BPSO , Thimphu as instructed to closed CB with code 2048 from our end at 13:26hrs. Due to earthquake isolator s got burnt and informed maintenance team and after completing alignment works only line charged from our end.
8	28/04/201	17.04hrs	28/04/201	17.16hrs		-8.96	tanga-Phuntshothang line		Tripped on Fault	86A & 86B OPTD,OC/EF at one end	Motanga ss	_	Informed BPSO and closed the CB from our end at 17:16hrs from our end.
9	28/04/201	17.39hrs	28/04/201	17.45hrs		-8.96	tanga-Phuntshothang line		Tripped on Fault	86A & 86B OPTD,OC/EF at one end	Motanga ss	_	Informed BPSO and closed the CB from our end at 17:45hrs from our end.
10	30/04/201	16.55hrs	30/04/201	17.04hrs		-26.9	Motanga-Deothang line		Tripped on Fault	86A & 86B OPTD,OC/EF at one end	Motanga ss	_	Informed BPSO and closed the CB from our end at 17:04hrs from our end.
11	30/04/201	16.55hrs	30/04/201	17.05hrs		-6.47	tanga-Phuntshothang line		Tripped on Fault	86A & 86B OPTD,OC/EF at one end	Motanga ss	_	Informed BPSO and closed the CB from our end at 17:05hrs from our end.
7. 132/33 kV Corlung substation													
132kV Feeder													
1	30.04.2021	16:58 hrs	30.04.2021	17:04 hrs	0	9.57	132 Khilihar-Corlung line and 132 kV Corlung-Kanglung Line	132 Khilihar-Corlung line and 132 kV Corlung-Kanglung Line, 132kv Corlung Substation and 33 kV T/Yantse Fedeer	Incoming supply fail	NA	Kurichhu Supply fail	Grid fail	At 14:58 hrs Incomming supply from khilikar substation fail amd Corlung substation was blckout but no breaker tripping has occoured at Corlung substation.
7. 132/33 kV Phuntshothang substation													
132kV Feeder													
1	1/04/2021	14:20	4/1/2021	14:47		7.02	Kanglung Line	Kanglung line	Zone one Distance Relay Trip for Kanglung s/s	86A and 86B	Kanglung Line	Trip	Kanglung s/s zone one distance relay trip
2	7/04/2021	21:09	4/7/2021	21:17		10.50	V incomer Kanglung	Kanglung Line	1OPTD (R,Y,B Phas	89A and 89B	Kanglung Line	Trip	Zone-1 OPTD R,Y,B Phase trip
3	28/04/2021	17:03	4/28/2021	17:24		9.39	KANGLUNG LINE	Kanglung Line	Zone one Distance Relay Trip for Kanglung s/s	86A and 86B	Kanglung Line	TRIP	Kanglung s/s zone one distance relay trip
4	28/04/2021	17:42	4/28/2021	19:59	2	9.39	KANGLUNG LINE	Kanglung Line	1OPTD (R,Y,B Phas	89A and 89B	Kanglung Line	TRIP	Zone-1 OPTD R,B Phase trip
5	30-04-21	16:55	4/30/2021	17:15		11.03	KANGLUNG LINE	Kanglung Line	zone -1OPTD(B Phase trip) and over voltage	89A and 89B	Kanglung Line	TRIP	Zone-1 OPTD B Phase trip(grid fail)
1. 400/220/132/33kV Jigmeling Substation													
Sl. No.	**Date of Tripping**	**Time of Outages/ Time of Tripping**	**Date of Normalization**	**Time of Fault was Cleared**	**Duration of Outages (Hrs)**	**MW before Outage (MW)**	**Name of feeder**	**Name of the Substation/lines Affected by the Fault**	**Reasons of Fault**	**Relay Operations**	**Fault Location(KM)**	**Type of outages**	**Remarks**
i) 400kV													
1	22.04.2021	12:44 hrs			0	64.1MW	MHPA Line-2	Jigmeling Substation	DTT trip. RYB phase Tripped.			Transient Fault (Lightening and thundering)	
2	30.04.2021	02:50 hrs	30.04.2021	14:57 hrs			Shunt Reactor-1		Rphase- Ground fault			Transient Fault (Lightening and thundering)	
ii) 220 kv and 132 kV													
1	10.04.2021	19:28hrs	10.04.2021	19:42hrs	0	ICT-1 36.4	80MVA ICT1 & 2	Jigmeling s/s	LV SEF optd	50N/51N Trip, (Ia=0.53kA,Ib=0kA Ic=0 kA for ICT 1). 50N/51N Trip, (Ia=0.54kA,Ib=0kA Ic=0 kA for ICT 2)		Transient (lightning and thundering	Both ICT1&2 Trip at the sametime.
2	22.04.2020	12:02hrs	22.04.2021	01:45hrs	0	12.99MW	Tsirang Feeder	Jigmeling s/s	Earthfault(L2-E)	50N/51N pick up, L2E phase tripped, main 1 operated , dist. 23.4km	dist. 23.4km	Transient (lightning and thundering	
3	22.04.2021	12:23hrs	22.04.2021	12:23hrs	0	1.13MW	Dagapela Feeder	Jigmeling s/s	Line Fault	Y&Bphase tripped, zone 1 optd, Dist. 21.68km	Dist. 21.68km	Transient (lightning and thundering	
4	30.04.2021	15:26hrs	30.04.2021	15:34hrs	0	29.33	132kV Jigmeling-Gelephu Line	Jigmeling & Tingtibi	Ground fault	main 1 = Relay General Trip and R & Y phase with ground fault trip.	Distance -65.9km	Transient	
2. 220/66/33kV Dhajay Substation													
i) 66kV and above													
1	22.04.2021	00:01:50hrs	22.04.2021	1:46:30hrs	1	13.3	Jigmeling feeder	Dhajay SS	main 1-Ia=0.47KA, I	86.1 &2, Distance re	Main I=16.8km, Mai	Tripped	whole Tsirang is black out as line couldnot extand from Jigmeling since their bus

May 2021

Division:	SMD-BEOTHANG
Substation:	132/33/11kV Kilkhar Substation
Month:	May-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition during the Outage	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Optd	Fault Details (As recorded by relay)				
11kV Feeders																
2	Kuruthe	11kV	Tripped	5/27/2021	0:25 hrs	5/27/2021	0:35 hrs		10	24.41	-	-	-	Tripped	Raining	Grid fail from Nanglam and Tingkhe due to o/current along with grid fail from Kanglu

Division:	SMD-BEOTHANG
Substation:	132/33/11kV Kanglung Substation
Month:	May-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition during the Outage	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Optd	Fault Details (As recorded by relay)				
3	[illegible] Feeder	11kV	tripping	01.05.2021	12:40	01.05.2021	12:41	0	1	10.816	Distance protection relay Micom P442	Tripped on ABCN, Zone-1, Fault Current: IA - 7911.1A, IB - 791.6A, IC - 762.2A, Fault Location: 17.936m	Transient,Three phase Fault	NA	windy	restored in coordination with BPSO
4	[illegible] Feeder	11kV	tripping	01.05.2021	12:40	01.05.2021	12:41	0	1	8.686	Distance protection relay REL659	Tripped on ABCN, Zone-1, Fault Current: IA - 7171A, IB - 7524, IC - 7441A, Fault Location: 17.11km	Transient,Three phase Fault	NA	windy	restored in coordination with BPSO
5	[illegible] Feeder	11kV	tripping	01.05.2021	14:12	01.05.2021	20:04	30	19	9.674	Distance protection relay REL659 and DTOC relay	Tripped on AN_Zone-1, Fault Current: IA -6244A, IB - 194A, IC - 91A, Fault Location: 20.98km, OC/EF IA - 6975A, IB-62A, IC-72A	NA	NA	rainy	Test charged the feeder twice after informed to BPSO at 13:14 Hrs and 13:46 Hrs but could not withstand the feeder.Test charged the line as informed by BPSO with charging code 2007 at 20:03 hrs. This feeder was charged via transfer bus at 20:43 with charing code 2068 from BPSO, but it tripped again closing code 2066.
10	Gelephu	132 kV	NA	27.05.2021	0:14	27.05.2021	0:14	0	10	22.179	NA	NA	NA	NA	lightening & Thundering Rainning	Supply fail due to Grid fail from Kurichu but no operation take place at Kanglung Substation.
11	Phuntsholing	11kV	Line fully	27.05.2021	0:14	27.05.2021	0:47	0	13	23.8	NA	NA	NA	NA	lightening & Thundering Rainning	I Charged the feeder after contact to BPSO

Division:	SMD-BEOTHANG
Substation:	132/33/11kV Nanglam Substation
Month:	May-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition during the Outage	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Optd	Fault Details (As recorded by relay)				
11kV Feeders																
1	132/33kV, 5MVA Trf-I	11kV	Tripping	5/1/2021	13:58 hrs	5/1/2021	14:13 hrs	0	14	0.48	Non directional IDMT PROTN Relay operated	O/C Relay-50A, 50C & tripping relay 86 operated	Tripped due to feeder fault	-	Clear	Tripped due to fault on 11kV Namang feeder
2	132/33kV, 5MVA Trf-II	11kV	Tripping	5/1/2021	13:58 hrs	5/1/2021	14:06 hrs	0	8	0.3	Non directional IDMT PROTN Relay operated	O/C Relay-50A, 50C & tripping relay 86 operated	Tripped due to feeder fault	-	Clear	Tripped due to fault on 11kV Namang feeder
3	Nanglam-Deothang Line	11kV	Tripping	5/1/2021	15:19 hrs	5/1/2021	15:27 hrs	0	8	23	MiCOM P143B	Start-Ø CN, O/C start I> 1, E/F1 start IN1>12, trip IN1>2 VAB-133.5kV, VBC-86.5kV,VCA-79.47kV,VAN=75.16kV,VBN=74.41kV,VCN=69.44kV,IA=193.3A,IB=12.51A,IC=1.16kA, INDerived-1.439kA, IN measured-1.418kA & tripping relay 86 operated at one end. [Distance Relay -Start-Ø-CN, Start distance element , TOC start, Tripped Elts-No, 91.018s, fault duration-190.0ms, Relay trip time -0.000s Fault location-25.046km, Zone-2 towards Deothang, IA-193.8A, IB-31.24A, IC-1.397kA, VAN-68.97kV, VBN-72.71kV, VCN-32.17kV , Fault resistance-1.440Ω	Tripped on fault	-	Thunder & lightning	Informed to BPSO, and charged the feeder with instruction from BPSO.
4	132/33kV, 5MVA Trf-I	11kV	Tripping	5/1/2021	16:35 hrs	5/1/2021	16:35 hrs	0	5	0.3	Non directional IDMT PROTN Relay operated	O/C Relay-50A & tripping relay 86 operated	Tripped due to feeder fault	-	Thunder & lightning	Tripped due to fault on 11kV Wamrong feeder
5	132/33kV, 5MVA Trf-I	11kV	Tripping	5/6/2021	11:00 hrs	5/6/2021	11:05 hrs	0	5	0.41	Non directional IDMT PROTN Relay operated	O/C Relay-50A & tripping relay 86 operated	Transient	-	Clear	-
6	132/33kV, 5MVA Trf-I	11kV	Tripping	5/7/2021	22:24 hrs	5/7/2021	22:29 hrs	0	5	0.51	Non directional IDMT PROTN Relay operated	O/C Relay-50A & tripping relay 86 operated	Tripped due to feeder fault	-	Clear	Tripped due to fault on 11kV Wamrong feeder
7	132/33kV, 5MVA Trf-I	11kV	Tripping	5/8/2021	09:31 hrs	5/8/2021	09:40 hrs	0	9	0.5	Non directional IDMT PROTN Relay operated	O/C Relay-50A & tripping relay 86 operated	Tripped on fault	-	Cloudy	No supply interrupted
8	132/33kV, 5MVA Trf-I	11kV	Tripping	5/11/2021	11:09 hrs	5/11/2021	11:15 hrs	0	6	0.48	Non directional IDMT PROTN Relay operated	O/C Relay-50A & tripping relay 86 operated	Tripped due to feeder fault	-	Clear	Tripped while test charging 11kV Wamrong feeder
9	132/33kV, 5MVA Trf-II	11kV	Tripping	5/11/2021	21:37 hrs	5/11/2021	21:41 hrs	0	4	0.35	Non directional IDMT PROTN Relay operated	O/C Relay-50C & tripping relay 86 operated	Tripped due to feeder fault	-	Heavy rainfall	Tripped due to fault on 11kV Tsebar feeder
10	132/33kV, 5MVA Trf-I	11kV	Tripping	5/11/2021	21:37 hrs	5/11/2021	21:51 hrs	0	14	0.53	Non directional IDMT PROTN Relay operated	O/C Relay-50C & tripping relay 86 operated	Tripped due to feeder fault	-	Heavy rainfall	Tripped due to fault on 11kV Tsebar feeder
11	132/33kV, 5MVA Trf-II	11kV	Tripping	5/11/2021	21:55 hrs	5/11/2021	21:57 hrs	0	2	0.44	Non directional IDMT PROTN Relay operated	O/C Relay-50Ah tripping relay 86 operated	Tripped due to feeder fault	-	Heavy rainfall	Tripped due to fault on 11kV Namang feeder
12	132/33kV, 5MVA Trf-I	11kV	Tripping	5/18/2021	03:45 hrs	5/18/2021	03:48 hrs	0	3	0.40	Non directional IDMT PROTN Relay operated	O/C Relay-50Ah tripping relay 86 operated	Tripped due to feeder fault	-	Rainfall	Tripped due to fault on 11kV Wamrong feeder
14	Nanglam-Deothang Line	11kV	Tripping	5/27/2021	00:10 hrs	5/27/2021	00:42 hrs	0	28	57	MiCOM P442	Distance Relay -Start-Ø ABCN, Tripped-Ø ABC,Start distance element , TOC start, distance trip Z1, system frequency 49.998Hz, AR 'Lockout start',fault duration-125.0ms, Relay trip time -01.02ms, Fault location XY-8.159km towards Deothang, IA-485.1A, IB-233.6A, IC-193.1A, VAN-18.94kV, VBN-47.75kV, VCN-18.96kV , Fault resistance XY-2.801Ω, Fault in Z1. And tripping relay 86 operated at one end.	Tripped on fault	-	Heavy rainfall with thunder & lightning	Informed to BPSO, Thimphu & closed the CB as per their instruction/Both Grid failed and Salakati Grid received at 00:14 hrs.
15	132/33kV, 5MVA Trf-I	11kV	Tripping	5/27/2021	00:10 hrs	5/27/2021	00:42 hrs	0	28	0.31	Non directional IDMT PROTN Relay operated	O/C Relay-50C & tripping relay 86 operated	Tripped on fault	-	Heavy rainfall with thunder & lightning	Tripped at the instant of Grid failure.
16	132/33kV, 5MVA Trf-II	11kV	Tripping	5/27/2021	00:43 hrs	5/27/2021	01:19 hrs	0	36	0.17	Non directional IDMT PROTN Relay operated	O/C Relay-50C & tripping relay 86 operated	Tripped due to feeder fault	-	Heavy rainfall with thunder & lightning	Tripped due to fault on 11kV Namang & Wamrong feeder
17	Nanglam-Deothang Line	11kV	Tripping	5/31/2021	09:42 hrs	5/31/2021	09:49 hrs	0	7	37.63	MiCOM P143B	***Directional -O/C & E/F Relay*** : Tripped-Ø N : Start-Ø AN, O/C start I> 1, E/F1 start IN1>12, trip IN1>2 VAB-94.36kV, VBC-132.7kV,VCA-82.64kV,VAN=95.31kV,VBN=76.23kV,VCN=73.17V,IA=1.259kA,IB=263.3A,IC=232.7kA, INDerived-1.210kA, IN measured-1.231kA & tripping relay 86 operated at one end. ***Distance Relay*** -Start-Ø AN, Start distance element , TOC start. Tripped Elts-No, system frequency 50.030Hz,fault duration-206.5ms, Relay trip time -0.000ms, Fault location -41.258km towards Deothang, IA-1.272kA, IB-259.6A, IC-229.1A, VAN-62.67kV, VBN-71.44kV, VCN-69.62kV , Fault resistance -2.115Ω, Fault in Z1.	Tripped due to feeder fault	-	Rainfall	Informed to BPSO, and charged the feeder with instruction from BPSO.
33kV Feeders																

Division:	SMD JHOTHANG
Substation:	132/33/11kV Dorthang Substation
Month:	May-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition during the Outage	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Opid	Fault Details (As recorded by relay)				
1	132kV Dorthang-Naughlum Line	132kV	Tripping	01.05.2021	19:20	01.05.2021	19:20	0	0	-23.44	NA	NIL	Grid fail	NA	Clear	Grid fail from both the end and at one end all breaker was in normal condition.
26	132kV Dorthang- Naughlum line	132kV	Tripping	27.05.2021	0:19	27.05.2021	0:44	0	25	-98.68	Distance relay	Zone-1 Opt. Fault Dist-14.98km 1A-1.1976kA, 3R-274.1kA,IC-1.1498kA,	Assessment on R to R Phase	NA	Raining & thundering	Dorthang breaker trip at the same time grid fail. Dorthang breaker closed at 24.10hrs. After that charge from Naughlum at 24.14hrs found normal.
28	132kV Dorthang-Naughlum line	132kV	Tripping	31.05.2021	9:48	30.05.2021	9:50	0	2	-97.14	Nil	Nil	Transient fault	NA	Raining & Thundering	Grid fail from both the end and at Naughlum showing O/C and E/F. At one(Dorthang end all breaker was in normal condition.

Division:	SMD JHOTHANG
Substation:	132/33/11kV Nganglam Substation
Month:	May-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition during the Outage	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Opid	Fault Details (As recorded by relay)				
132kV																
1	132/11kV 5MVA Transformer -1	11kV	Tripping	07.05.2021	11:56	07.05.2021	11:57	0	1	0.994	O/C & E/F IDMT	Earth Fault	Tripped due to 33kV Dobordiling feeder		Clear	
2	Nganglam-Trongkhi Line	11kV	Tripping	15.05.2021	13:57	15.05.2021	14:08	0	11	-0.96	Distance relay Micom P441	Tripped on ABCN, Fault Current: IA -424.4A, IB-57.26A, IC -81.74A,IN- 488.5A	Transient/Earth fault	-	Clear	
3	132/11kV 5MVA Transformer -1	11kV	Tripping	20.05.2021	01:00	20.05.2021	01:05	0	5	0.601	O/C & E/F IDMT	Earth Fault	Tripped due to 33kV Dobordiling feeder		Light Rainy	
4	Nganglam-Trongkhi Line	11kV	Tripping	27.05.2021	00:01	27.05.2021	00:14	0	13	-10.09	Distance relay Micom P441	Fault Values:IA= 1.105KA,IB= 1.105KA IC= 1.311KA, VAN 10.68kV, VBN= 11.04kV, VCN= 11.13kV	Over Current		Heavy Rainfall	
5	Nganglam-Trongkhi Line	11kV	Tripping	27.05.2021	00:17	27.05.2021	00:34	0	17	-10.09	Distance relay Micom P441	Grid fail	Grid fail		Heavy Rainfall	Supply fail from Rangia end.
6	132/11kV 5MVA Transformer -1	11kV	Tripping	27.05.2021	06:49	27.05.2021	06:54	0	5	0.78	O/C & E/F IDMT	Earth Fault	Tripped due to 33kV Dobordiling feeder		Clear	

Division:	SMD JHOTHANG
Substation:	132/33kV Motanga Substation
Month:	May-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Opid	Fault Details (As recorded by relay)				
1	Motanga-Phuentsholing line	11kV	Tripping	5/1/2021	19:12	5/1/2021	19:16	0	4	-8.08	BACKUP PROTN. RELAY RED615	-	OC/EF	-	Normal	Informed BPSO and CB closed from our end at 19.16hrs
2	Motanga-Deothang line	11kV	Tripping	5/1/2021	19:18	5/1/2021	19:29		11	-22.9	BAY CONTROL UNIT REC670	BAS & 86B OPTD	-	-	Normal	Informed BPSO and charged line at 19.29 hrs
3	Motanga-Deothang line	11kV	Tripping	5/1/2021	19:31	5/1/2021	19:53		22	-23.8	MAIN DISTANCE PROTN. RELAY RELA59	-	I/P	-	Normal	Line Voltage showing to 1.65-3kV and CB auto tripped from our end. Informed BPSO and line revived at 19.53hrs
4	Motanga-Rangia line	11kV	Tripping	5/1/2021	19:12	5/1/2021	19:08		56	7.63	BAY CONTROL UNIT REC670	BAS & 86B OPTD	-	-	Normal	Informed BPSO and with charging code 3007-2045,3LDC India-19 and 5HDLDC-2000 CB closed at 16:08hrs from our end
5	Motanga-Deothang line	11kV	Tripping	5/27/2021	9:16	5/27/2021	9:53		37	-84	BACKUP PROTN. RELAY RED615	-	OC & EF	-	Raining	Informed BPSO and line restored at 09.53 hrs from our end
6	Motanga-Rangia line	11kV	Tripping	5/27/2021	9:16	5/27/2021	9:31	1	11	-9.95	BACKUP PROTN. RELAY RED615	-	OC & EF	-	Raining	Informed BPSO and with code no 01,04 3007-2145,2LDC India-161 & 5HDLDC-1446 CB closed from our end at 9.58hrs
7	Motanga-Phuentsholing Line	11kV	Tripping	5/27/2021	9:07	5/27/2021	9:31		4	-11.37	MAIN DISTANCE PROTN. RELAY RELA59	-	I/P/E/F	-	Raining	Informed BPSO and charged the line at 9.31hrs from our end.
9	Motanga-Deothang line	11kV	Tripping	5/31/2021	9:42	5/31/2021	9:50		8	-11.31	MAIN DISTANCE PROTN. RELAY RELA59	2ZONE1 OPTD & 85 PU TRIP	OC & EF	-	Raining	Informed BPSO, as instructed to closed the CB at 9.58hrs from our end.
10	Motanga-Rangia line	11kV	Tripping	5/31/2021	9:42	5/31/2021	10:00		18	-30.19	BACKUP PROTN. RELAY RED615	-	OC & EF	-	Raining	Informed BPSO,as instructed to close the CB with code 01,04 3007-2145,2LDC India-947 & 5HDLDC-1702 CB closed at 10:00hrs from our end.

Division:	SMD JHOTHANG
Substation:	132/33kV Chorkang Substation
Month:	May-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Opid	Fault Details (As recorded by relay)				
13	132/6V Khilikhar Line	132/6V	Grid fail	27.05.2021	00:10 hrs	27.05.2021	00:10 hrs	0	17	22.830	Nil	Nil	Grid fail		Clear	At 00:10 hrs incoming supply from khilikhar substation fail and Chorkang substation was blicked but no breaker tripping has occurred at Chorkang substation.
14	132/6V Kanglung Line	132/6V								22.330						

Division:	SMD JHOTHANG
Substation:	132/33kV Phuentsholthang Substation
Month:	May-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Opid	Fault Details (As recorded by relay)				
1	Kanglung	132kV	Transient Fault	5/1/2021	12:40	5/1/2021	12:44		4	9.33	86A & 86B	ZONE1 OPTD AMD-R ,S,B Phase-trip and fault distance-92.968KM,Fault value-(1-1277.48KA,(2-1220.69KA,(3-1273.81A,	R,Y and B phase trip	Not available	Sunny	Test charged and line with stand.
3	Kanglung	132kV	Tripped on fault	5/1/2021	13:12	5/1/2021	20:09	19	52	8.79	86B,86 OPTD	Fault current value:I1-344A, I2-6A, I3-3618A, IN-276A, ZONE1 OPTD and R-N phase trip,Fault Distance- 26.123 km,	R and N phase trip	Not available	Cloudy	Test charge but could not stand line at Kanglung end due ZONE1 OPTD , R Phase trip and relay indicating(OV/3N). Fault Distance- 26.123 km,line normalized at 20:04,02/05/21 after received switching code 2000 from BPSO.
4	Motanga	132kV	Tripped on fault	5/1/2021	15:31	5/1/2021	15:56		25	8.37	86B,86 OPTD	Fault current value:I1-788, I2-548, I3-828, IN-1624,Over voltage	Over voltage	CB open /tripped at Motanga end.	Rainy & windy	Our end breaker was normal and Motanga end breaker was open/tripped.
40	Kanglung	132kV	Tripped on fault	5/27/2021	0:33	5/27/2021	0:49		15	21.33	86B	Fault current value:I1-0.22A, I2-0.18A, I3-0.08A, IN-0.11A, Relay indicating(OV/3N),Normalized after receiving call from BPSO.	OV/3/N	Not available	Rainy	Fault current value:I1-0.22A, I2-0.18A, I3-0.08A, IN-0.11A. Relay indicating(OV/3N),Normalized after receiving call from BPSO.
41	Motanga	132kV	Tripped on fault	5/27/2021	0:33	5/27/2021	1:07		33	20.68	86B	Fault current value:I1-5.41A, I2-6.37A, I3-6.48A, IN-0.68A, Relay indicating(OV/3N).	OV/3/N	Not available	Rainy	Fault current value:I1-5.41A, I2-6.37A, I3-6.48A, IN-0.68A. Relay indicating(OV/3N),Normalized after receiving call from BPSO.

I. 400/220/132/33kV Jigmeling Substation

Sl. No.	Date of Tripping	Time of Outages/ Time of Tripping	Date of Normalization	Time of Fault was Cleared	Duration of Outages (Hrs)	MW before Outage (MW)	Name of feeder	Name of the Substation/lines Affected by the Fault	Reasons of Fault	Relay Operations	Fault Location(KM)	Type of outages	Remarks
i) 66kV Above													
1	05.05.2021	12:21hrs	05.05.2021	12:36hrs		-12.990	220kV Jigmeling - Tsirang feeder	Jigmeling SS	Ground fault	Main 1(B ph pick up, zone 1 trip) Main 2(B ph pick up, zone 1 trip)	14.9km		heavy rainfall, thunder and lightning
2	05.05.2021	12:22hrs	05.05.2021	12:38hrs		1.29	220kV Jigmeling - Dagapela feeder	Dagapela SS	Ground fault	Main 1(B ph pick up, zone 1 trip) Main 2(B ph pick up, zone 1 trip)	main 1 - 15.9km main 2- 13.96km		heavy rainfall, thunder and lightning
3	05.05.2021	12:40hrs	05.05.2021	15:08hrs	2	-11.250	220kV Jigmeling - Tsirang feeder	Jigmeling SS	Ground fault	Main 1 ((R &B ph pick up, z1 trip) Main 2((R &B ph pick up, z1 trip)	main 1 - 4km main 2- 3.17km		heavy rainfall, thunder and lightning
4	05.05.2021	13:59hrs	05.05.2021	14:53hrs	0	1.33	220kV Jigmeling - Dagapela feeder	Dagapela SS		relay general trip			heavy rainfall, thunder and lightning
5	29.05.2021	09:06 hrs	29.05.2021	09:12 hrs	0	19.44	132 kV Jigmeling-	Tingtibi SS	Earthfault	Yphase pick up		No DR and relay tripped notifi	

2. 220/66/33kV Dhajay Substation

i) 66kV and above

1	05.05.2021	12:40hrs	05.05.2021	15:06:56hrs	2	17.03	Jigmeling feed	Dhajay S/	main I-Ia=1.77KA, Ib=0.01KA,	86.1 &2, Distance relay Main I&II	Main I=32.3km, Main II=3	Tripped	whole Tsirang is blacl

ii) 33kV and below

1	12.05.2021	2:50hrs	12.05.2021	17.57hrs	14	0.104	Dagapela-I	Dhajay Subsatio n	Ia=4.105A, Ib=452.8A, Ic=450.2A, In=1.371A	MBCOMP122	Line segment	Tripped	Feeder restored after O&M head ,ESD Dagapela confirmed line clerrance.
2	14.05.2021	11:20hrs	14.05.2021	12:40hrs	1	0.079	Rangthanglin g	Dhajay Subsatio n	Ia=2.25A, Ib=3A, Ic=37.12A, In=34.92A	MBCOMP122	Line segment	Tripped	Feeder restored after O&M head ,ESD Tsirang confirmed line clerrance.

3. 132/66/33/11kV Gelephu Substation

i) 66kV and above

NILL

4. 132/33/11kV Tingtibi Substation

i) 66 kV and Above

1	5/3/2021	16:00	5/3/2021	16:05	0	16.2700	132kV Tingtibi-Nang	Tingtibi-Na	Tempoary fault	Distance Protection Relay:Trip phase ABC,Fault Loaction:32.90kM,Fault Zone-1,	132kV Tingtibi-Nanglam	Tempoary	
2	5/5/2021	13:57	5/5/2021	14:01	0	12.1000	132kV Tingtibi-Nang	Tingtibi-Na	Tempoary fault	Distance Protection Relay:Trip phase ABC,Fault Loaction:34.7kM,Fault Zone-1,	132kV Tingtibi-Nanglam	Tempoary	
3	5/13/2021	13:57	5/13/2021	14:07	0	4.5700	132kV Tingtibi-Nang	Tingtibi-Na	Tempoary fault	Distance Protection Relay:Trip phase ABC,Fault Loaction:19.9kM,Fault Zone-1,	132kV Tingtibi-Nanglam	Tempoary	
4	5/26/2021	23:45	5/26/2021	23:55	0	20.3000	132kV Tingtibi-Nang	Tingtibi-Na	Tempoary fault	Distance Protection Relay:Trip phase ABC,Fault Loaction:31.44kM,Fault Zone-1,	132kV Tingtibi-Nanglam	Tempoary	

5. 132/33kV Yurmoo Substation

i) 66kV & Above

Nill

6. 220/33kV Dagapela Substation

i) 66kV & Above

1	05.05.2021	0.582638889	05.05.2021	0.62013889	0	-0.94	220KV Dagap	Dagapela	No datas recorded in Relay on 86 A, 86B	-	Transient Fault	No datas on relay at ti	

June 2021

Division:	SMD JHOTRANG
Substation:	132/33/11kV Kilkhar Substation
Month:	Jun 21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition during the Outage	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Oprd	Fault Details (As recorded by relay)				
132kV Feeders																
										nil						

Division:	SMD JHOTRANG
Substation:	132/33/11kV Kanglung Substation
Month:	Jun 21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Oprd	Fault Details (As recorded by relay)				
1	33KV Chemey Feeder	32.37	Tripped	16.06.2021	5:22	16.06.2021	6:20	0	58	0.173	Over current	3A=729.2A,IB=714A,IC=15.43A	Tripped on fault	Over current	Raining	Feeder tripped owing to o/c ,test charge done once but trippint with same fault,informed to Chemey control room.
2	132/33kv Transformer -I (33kv side)	135.51	Tripped	22.06.2021	12:25	22.06.2021	16:31	4	6	0.471	SOS	SOS	NA	B phase disc insulator puncture	Clear	disablown taken by soman Tashi sllg, substation incharge inorder to change puncture disc insulator and LA of 5MVA tr2 with permit no.1413
3	132 kV Phuntsholthang	130.52	Tripped	25.06.2021	20:08	25.06.2021	20:52	0	14	18.274	NA	NA	NA	NA	Cloudy	charged the feeder after informed by BPSO

Division:	SMD JHOTRANG
Substation:	132/33/11kV Nanglam Substation
Month:	Jun 21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Oprd	Fault Details (As recorded by relay)				
132kV Feeders																
1	Nanglam-Deothang Line	132kV	Tripping	6/8/2021	02:33 hrs	6/8/2021	02:33 hrs	0	12	0.43	MiCOM P442	Distance Relay -Start-D ABCN, Trip-D ABC, Start distance element , TOC start, distance trip-Z1,AR lock out shot= , system frequency 49.89Hz,fault duration-70.17ms, Relay trip time -89.18ms, Fault location - 8.631km towards Deothang, IA-481.7A, IB-981.8A, IC-491AA, VAN-4.458kV, VBN-1.160kV, VCN-1.989kV , Fault resistance - 1.567Ω, Fault in Z1 & tripping relay 86 operated at our end.	Tripped on fault	-	Heavy rainfall with Thunder & lightning	Information received from Deothang Substation to charge the feeder as per the instruction received at their end from BPSO, Thimphu.
2	Nanglam-Deothang Line	132kV	Tripping	6/13/2021	16:20 hrs	6/13/2021	16:20 hrs	0	0	-0.25	MiCOM P442	Directional -O/C & E/F Relay: Tripped-D N : Start-D AN, O/C start I> 1, E/F1 start IN1>12, trip IN1>2,VAB=105.2kV, VBC=131.5kV,VCA=107.2kV,VAN=48.43kV,VBN=74.86kV,VCN=73.98kV,IA=824.6A ,IB=62.45A,IC=24.2AA, INDerived=746.6A, IN measured=745.2A & tripping relay 86 operated at our end, Distance Relay -Start-D AN, Start distance element , TOC start. Tripped Ele-No, system frequency 49.98Hz,fault duration-191.4ms, Relay trip time -0.000ms, Fault location=71.71km towards Nganglam. IA=810.1A, IB=62.83A, IC=12.78A, VAN=48.91kV, VBN=75.17kV, VCN=74.25kV , Fault resistance -5.681Ω, Fault in Z1.	Tripped on fault	-	Cloudy	Informed to BPSO & charged the feeder after receiving instruction from BPSO, Thimphu.
3	132/33kV, 5MVA Trf-I	132kV	Tripping	6/13/2021	10:57 hrs	6/13/2021	10:58 hrs	0	1	0.58	Non-directional IDMT PROTN relay operated	O/C relay-50C & tripping relay 86 operated	Tripped due to feeder fault	-	Cloudy	Tripped due to fault on 33kV Wamrong Feeder.
4	132/33kV, 5MVA Trf-I	132kV	Tripping	6/13/2021	11:27 hrs	6/13/2021	11:28 hrs	0	1	0.43	Non-directional IDMT PROTN relay operated	O/C relay-50C & tripping relay 86 operated	Tripped due to feeder fault	-	Cloudy	Tripped due to fault on 33kV Wamrong Feeder.
5	132/33kV, 5MVA Trf-I	132kV	Tripping	6/14/2021	15:42 hrs	6/14/2021	15:50 hrs	0	8	0.37	Non-directional IDMT PROTN relay operated	O/C relay-50A & tripping relay 86 operated	Tripped due to feeder fault	-	Clear	Tripped due to fault on 33kV Yurung Feeder.
6	Main grid (Rangia Grid)	132kV	Tripping	6/25/2021	20:10 hrs	6/25/2021	20:33 hrs	0	23	55.8	-	-	ICT Trust at Rangia Substation	-	Clear	At 20:33 hrs supply received from Nganglam Substation.

Division:	SMD JHOTRANG
Substation:	132/33/11kV Deothang Substation
Month:	Jun 21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Oprd	Fault Details (As recorded by relay)				
1	132kV Nangkhor line	132kV	Tripping	08.06.2021	2:21	08.06.2021	2:26	0	5	-2.85	O/C & Distance relay operated	1A=1.952kA, IB=1.797kA, IC=1.719kA.	Overcurrent all phase	NA	Rainny	No supply interruption as it is on Motanga Grid.
2	132kV Nangkhor line	132kV	Tripping	08.06.2021	2:47	08.06.2021	3:02	0	10	-2.85	O/C & E/F	1A=802.2A, IB=97.7A, IC=696.2A.	Overcurrent on R & B phase	NA	Rainny	No supply interruption as it is on Motanga Grid.Deothang - Nangkor breaker closed only after the instruction from BPSO .

Division:	SMD JHOTRANG
Substation:	132/33/11kV Nganglam Substation
Month:	Jun 21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping		Normalization Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Weather Condition	Remarks
				Date	Time	Date	Time	(Hrs)	(Min)		Protection Relay Oprd	Fault Details (As recorded by relay)				
11kV																
1	132/33kV 5MVATransformer-I	11kV	Tripping	01.06.2021	19:04	01.06.2021	19:06	0	2	1.315	Micom & IDMT E/F & O/C relay	Earth Fault	Transient/Earth fault		Clear	
2	132/33kV 5MVATransformer-I	11kV	Tripping	02.06.2021	05:47	02.06.2021	05:54	0	7	0.975	Micom & IDMT E/F & O/C relay	Earth Fault	33kV Druk GYP feeder fault		Clear	Test charged and withstood successfully.
3	132/33kV 5MVATransformer -II	11kV	Tripping	02.06.2021	05:47	02.06.2021	05:55	0	7	0	Micom & IDMT E/F & O/C relay	Earth Fault	NCT operated for 33kV side		Clear	
4	132/33kV 5MVATransformer -II	11kV	Tripping	03.06.2021	17:32	03.06.2021	17:38	0	6	0.861	Micom & IDMT E/F & O/C relay	Over Current	Tripped due to 33kV Pauhang Feeder	Rainy & Thunderstorm		
5	132/33kV 5MVATransformer -I	11kV	Tripping	08.06.2021	01:37	08.06.2021	01:40	0	3	0.381	Micom & IDMT E/F & O/C relay	Earth Fault	Tripped due to 33kV Dechenling Feeder		Clear	
6	Nganglam-Tingkhi	11kV	Tripping	08.06.2021	02:21	08.06.2021	02:27	0	6	-15.12	Distance relay Micom P442	Grid Fail	Grid Fail		Heavy Rainy & Thunderstorm	Nganglam-Tingkhi CB operated at Tingkhi end and Nanglkor-Deothang CB operated at Nanglkor end respectively
7	Nganglam-Tingkhi	11kV	Tripping	08.06.2021	02:45	08.06.2021	02:53	0	8	-15.12	Distance relay Micom P443	AR Lockout Tripped Phase ABC Zone1 Frequency 49.92hz Fault Duration 78.12mSEc Rhmo Relay Trip Time 40.13mSEc ohms Fault Resistance =45.99ohms. Fault location 60.04km IA= 1.024KA IB= 121.6A IC= 1.009KA VAN= 13.5KV VBN= 81.66KV VCN= 11.59KV	Over Current		Clear	
8	Nganglam-Tingkhi	11kV	Tripping	08.06.2021	02:58	08.06.2021	03:01	0	3	-15.12	Distance relay Micom P444		Grid Fail		Heavy Rainy & Thunderstorm	Nganglam-Tingkhi CB operatorated at Tingkhi end & Nanglkor- Deothang CB operated at Deothang end.
9	132/33kV 5MVATransformer -I	11kV	Tripping	08.06.2021	10:06	08.06.2021	10:13	0	7	0.69	Micom & IDMT E/F & O/C relay	Earth Fault	33kV Dechenling feeder fault		Clear	
10	Nganglam-Tingkhi	11kV	Tripping	08.06.2021	23:29	09.06.2021	08:25	9	56	-26.56	Distance relay Micom P444					
11	Nganglam-Tingkhi	11kV	Tripping	11.06.2021	16:19hrs	11.06.2021	16:50hrs	0	31	-15.59	Distance relay Micom P444	Earth Fault	Fault Ise=60.87km,Fault Resistance=4.872ms ,Fault duration 203.4ms. Frequency=49.98hz,VAN=10.55kV,VBN=79.72kV,VCN=76.75kV,IA=1.032kV,IB=70.07A,IC=69.47A,VAN=10.55kV,VBN=79.72kV,VCN=76.72kV.		Clear	Feeder charged after confiamtion with Tingkhi and SLDC with closing code 1067convey by madam Karma Choden.
12	132/33kV 3MVATransformer -I	11kV	Tripping	14.06.2021	11:49	14.06.2021	11:50	0	1	0.612	Micom & IDMT E/F & O/C relay	Earth Fault	Due to 33kV Dechenling Feeder fault		Clear	
13	132/33kV 3MVATransformer -I	11kV	Tripping	15.06.2021	02:57	15.06.2021	02:59	0	2	0.453	Micom & IDMT E/F & O/C relay	Earth Fault	Due to 33kV Dechenling Feeder fault		Rainny	
14	DCP	11kV	Tripping	16.06.2021	16:29	16.06.2021	16:30	0	1	12.54		NA			Clear	Due to the continues rainny at site the rain water has seepage inside the CB box and cause the CB position indication lamp to abnormall(not glowing) while rectifying the above problem coordination with SMD maintenance Engg. Incidently CB tripped at our end.
15	Nganglam-Tingkhi	11kV	Tripping	18.06.2021	17:09	18.06.2021	19:37	2	88	10.25	Distance relay Micom P444	Fault Value, 86 opt IA =724.9A IB =169.8A IC =85.87A IN =665.7A VAN =41.14kV VBN= 77.88kV VCN =75.62kV Fault Zone 3 Fault location 142km	Dive get punctured at Tingkhi end.		Clear	Supply restored after completing the Dive changing work at Tingkhi end and coordination to BPSO.
16	132/33kV 3MVATransformer -I	11kV	Tripping	18.06.2021	21:22	18.06.2021	21:24	0	2	1.017	IDMT Earth fault & Over current relay	Over Current	33kV Dechenling feeder fault	Heavy Rainy & Thunderstorm		
17	132/33kV 3MVATransformer -I	11kV	hand triped	30.06.2021	18:20	30.06.2021	18:25	0	5	0.807	Micom & IDMT E/F & O/C relay	NA	Abnormal sound from 11kV penal		Clear	

Division:	SMD DEOTHANG
Substation:	132/33kV Motanga Substation
Month:	Jan-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown Tripping Date	Shutdown Tripping Time	Normalization Time Date	Normalization Time Time	Duration of Outage (Hrs)	Duration of Outage (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Oprd	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Present Condition	Remarks
1	132/33kV Transformer	132kV	Tripping	6/2/2021	9:48	6/2/2021	9:54	0	6	0.13	BACK/UP PROTN: RELAY REF615	86A OPTD	OC & EF	..	Normal	Informed BPSO and CB closed from our end at 09:54hrs.
2	Motanga-Deothang line	132kV	Tripping	6/16/2021	2:20	6/16/2021	2:28		8	-50.84	BACK/UP PROTN: RELAY REF615	86A & 86B OPTD, B-PH TRIPS	OC & EF	..	Raining,Thunder and Lightening	Informed BPSO and line restored at 2:28 hrs from our end.
3	Motanga-Rangia line	132kV	Tripping	6/16/2021	2:20	6/16/2021	2:45		25	54.58	BACK/UP PROTN: RELAY REF615	86A & 86B OPTD, ZONE-1 OPTD,B-PH TRIPS	OC & EF	..	Raining,Thunder and Lightening	Informed BPSO and with code no NLDC BHT-1118,NLDC India-869 & NERLDC-6376 CB closed from our end at 2:45hrs.
4	Motanga-Deothang line	132kV	Tripping	6/25/2021	20:08	6/25/2021	20:41		3	-24.5	BACK/UP PROTN: RELAY REF615	86A & 86B OPTD	OC & EF	..	Normal	Informed BPSO and line restored at 20:41 hrs from our end.
5	Motanga-Phuentsholing Line	132kV	Tripping	6/25/2021	20:08	6/25/2021	20:46		8	-0.06	BACK/UP PROTN: RELAY REF615	86A & 86B OPTD	OC & EF	..	Normal	Informed BPSO and charged the line at 20:46hrs from our end.
6	Motanga-Rangia line	132kV	Tripping	6/25/2021	20:08	6/25/2021	11:48	3	10	9.35	MAIN DISTANCE PROTN. RELAY REL650	86A & 86B OPTD	OV/UV	..	Normal	Informed BPSO,as instructed to closed the CB with code NLDC BHT-1159,NLDC India-1461 & NERLDC-4907 CB closed at 11:48hrs from our end.
7	Motanga-Rangia line	132kV	Tripping	6/26/2021	1:20	6/26/2021	2:27	1	7	9.35	Hand tripped	..	..	..	Normal	As per the BPSO instruction CB hand tripped and kept under shutdown due to grid problem at Rangia end. BPSO instruct to close CB with code no. NLDC BHT-1160,NLDC India-1465 and NERLDC-4911 CB closed at 2:27hrs from our end.

Division:	SMD DEOTHANG
Substation:	132/33kV Corlong Substation
Month:	Jan-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown Tripping Date	Shutdown Tripping Time	Normalization Time Date	Normalization Time Time	Duration of Outage (Hrs)	Duration of Outage (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Oprd	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Present Condition	Remarks
1	132 kV Khilkhar-Corlong Line	132 kV	Incomming supply fail	25.06.2021	20:08 hrs	25.06.2021	20:38 hrs	0	29	21.100	Nil	There was no incomming supply due to grid fail	Grid fail		Close	At 20:08 hrs Incomming supply from khilkhar substation fail and Corlong substation was blakout but no breaker tripping has occcured at Corlong substation.

Division:	SMD DEOTHANG
Substation:	132/33kV Phuentsholing Substation
Month:	Jan-21

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown Tripping Date	Shutdown Tripping Time	Normalization Time Date	Normalization Time Time	Duration of Outage (Hrs)	Duration of Outage (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Oprd	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Present Condition	Remarks
1	Kanglung line(1K7LA)	132kV	Grid Fail	6/25/2021	20:08	6/25/2021	20:54		16	7.18	UV/OV Trip	fault value-L1-14404A,L2-2317A,L3-16594A,IN-87A	Nill	Not available	close	line charged after after called receive from BPSO
2	Motanga line(1K3LA)	132kV	Grid Fail	6/25/2021	20:08	6/25/2021	20:45		7	5.89	UV/OV Trip	fault value-L1-1521A,L2-11984A,L3-3871A,IN-51A	Nill	Not available	close	line charged after after called receive from BPSO

Annexure-VI

Western grid Outages

Tripping report of 66kV and above feeders for the month of April, 2021

Sl No.	Date of Tripping	Time of outages	Date of Normalization	Time of fault was cleared	Duration of Outages (Hrs)	MW before outage (MW)	Feeder Name	Name of the Substation/lines affected by the fault	Reasons of fault	Relay operations	Exact location of fault [Line segment/ Substation]	Type of outages	Remarks
(A) 400/220/66/11 kV Malbase Substation													
1	22.04.2021	12:40	22.04.2021	13:00	0	27	400kV Siliguri Feeder	Siliguri Substation	Transient fault	Main I & 86A B optd.			IL1=376.9A<100.1deg, IL2=256A<47.17deg, IL3=1613A<90.29deg,IL4= 4342A< 87.05deg (Note: weather conditions were light rainfall with lightning).
2	22.04.2021	12:40	22.04.2021	12:40	0	0	220kV Bus coupler	Malbase Substation	Transient fault	30> trip, 86 optd.			Earthfault. (Note: weather conditions were light rainfall with lightning).
(B)220/66/11 kV Singhigaon Substation													
1	22.04.2021	12:40	22.04.2021	12:47	0	5.1	66kV Bhutan Concast fdr.	Singhigaon GIS	Tripped due to Overcurrent	Directional overcurrent trip, IEp Trip, 86 optd			IL1=0.11kA, IL2=0.02kA, IL3=0.08kA.
2	22.04.2021	12:40	22.04.2021	12:48	0	0	66kV Main Bus I	Singhigaon GIS	Tripped due to Overcurrent	O/C Trip, General Trip, 86 optd			IL1=0.22kA, IL2=0.26kA, IL3=0.04kA.
(B)66/33/11 kV Phuentsholing Substation													
1			13.04.2021	9:05	9	idle	66kV Malbase-Pling feeder	66kV Malbase-Pling feeder					At 09:05hrs charged 66kV Pling-Malbase feeder which was under idle condition with charging code 1969 from BPSO (for supply reliability at Pling Ss), since 66kV Chukha-Gedu section was taken shutdown by TMD,Tshimalakha for carrying out annual maintenance on 66kV chukha-Gedu section (.i.e replacement of insulator with glass and polymer). On dated 10.04.2021 at 17.50hrs opened CB of 66kV Pling-Malbase feeder with opening code 0413 from BPSO and again the feeder was kept under idle condition.
2	22.04.2021	3:07	22.04.2021	3:16	0	9.00	66kV Pling-Gomtu feeder	66kV Pling-Gomtu feeder	Tripped	DSTN OPTD, 186&86	Line		At 03:07hrs 66kV Pling-Gomtu feeder got tripped at our end and 66kV Chukha-Pling feeder got tripped at Chukha end causing black out at Phuentsholing. Weather condition was raining with lightning during the time of tripping. At 03:10hrs charged 66kV Malbase-Pling feeder after informing BPSO. At 03:16hrs normalised 66kV Pling-Gomtu feeder after getting clearance from BPSO. At 03:35hrs opened CB of 66kV Pling-Malbase feeder with opening code 0413 from BPSO and again the feeder was kept under idle condition.
(D) 66/33/11 kV Gedu Substation													
(E) 66/33/11 kV Gomtu Substation													
1	22.04.2021	03:09	22.04.2021	03:33	0	-7.57	66kV Inromser Damdum & Gomtu-Phuentsholing	Gomtu Substation	Transient fault	General trip Zone-4 trip R ph. Fault	Line segment	Transient Fault	66 kV Phuentsholing supply resumed at 3:16 hrs. 66kV Damdum feeder charged after informing to BPSO and Dhamdum Substation.

(F) 220/66/33 kV Dhamdum Substation													
1	22.04.2021	3.07	22.04.2021	3:33	31	7.7	66 kV Goretu fdr	N/A	Tripped	N/A	_	N/A	66kV Goretu fdr tripped on B phase fault at 3:07HRS.
Tripping Report for the month of APRIL 2021													
Sl. No.	**Date of Tripping**	**Time of outages**	**Date of Normalization**	**Time of fault was cleared**	**Duration of Outages (Hrs)**	**MW before outage (MW)**	**Feeder Name**	**Name of the Substation/lines affected by the fault**	**Reasons of fault**	**Relay operations**	**Exact location of fault [Line segment/ Substation]**	**Type of outages**	**Remarks**
	(A) 66kV Chumdo switching station												
	(B) 66/33kV Watsa Substation												
	(C) 66/33kV Olakha Substation												
1	08/04/2021	10:40	08/04/2021	12:43	0	7.7	66kV Olakha-Changidaphu Line	Olakha substation	Due to fault at Dechenchholing line	Distance protection relay 21 operated. Indication 1(general trip)	66kV Gasa line from Dechenchholing	Transient Fault	The Supply was fail from Semtokha due to fault at 66kV Dechenchholing to Gasa Line as information received from BPSO and shift duty of Semtokha Substation.
4	19/04/2021	11:58	19/04/2021	12:10	0	5	66kV Olakha-Changidaphu Line	Olakha Substation	Under voltage	Only Trip relay 86 Operated	Olakha Substation	Temporary	The supply was fail due to under voltages. Reset all the relays and charged the feeder, hold normal.
5	4/22/2021	1:40	4/22/2021	1:42	0	3.3	20MVA Transformer I	Only 33KV Chubachu feeder IV was effected as the other feeders was fed from Transformer II	Due to tripping of 33kV Chubachu feeder (Fdr.IV)	TRAFO DIFFL. PROTN. RELAY 87.Indication: 1,3,4 & 5. 1.General Trip, 3.Diff Trip Yph.4.Diff Trip Bph.5.Diff Prot.Optd.DIR.O/C & E/F PROTN.RELAY 67.Trip Relay 86.	Line Segment	Transient Fault	The 66/33kV 20MVA Transformer I was tripped due to tripping of 33kV O/G feeder IV (Chubachu).Charged the feeder and hold normal.
6	4/22/2021	13:15	4/22/2021	13:37	0	8.80	20MVA Transformer I	Only 33KV Chubachu feeder IV was effected as the other feeders was fed from Transformer II	Due to tripping of 33kV Chubachu feeder (Fdr.IV)	TRAFO DIFFL. PROTN. RELAY 87.Indication : 1,3,4 & 5. 1. General Trip ,3.Diff Trip Yph.4.Diff Trip Bph.5.Diff Prot.Optd. .Trip Relay 86.	Line Segment	Transient Fault	66/33kV 20MVA Transformer I tripped due to tripping of 33kV O/G IV (Chubachu feeder).Charged the feeder after confirmation and clearance received from ESD personal and hold normal.
	(D) 66/33/11kV Lobeysa Substation												
1	26.04.2021	20:19hrs	26.04.2021	21:45hrs	1	-9.450	66kV LSA-Basochu	Lobeysa substation	Basochu machine tripped	NA	Basochu Plant	NA	66kV LSA -Basochu feeder tripped at 20:19hrs from Basochu end and No relay& breaker operated at our end.Supply resumed at 21:45hrs from Basochu end.
2	26.04.2021	23:05hrs	27.04.2021	00:21hrs	1	-7.020	66kV LSA-Basochu	Lobeysa substation	Basochu machine tripped	NA	Basochu Plant	NA	66kV LSA -Basochu feeder tripped at 23:05hrs from Basochu end and No relay& breaker operated at our end.Supply resumed at 00:21hrs from Basochu end on 27.04.2021.
	(E) 66/33/11 kV Paro Substation												
	Nil												
	(F) 66/33/11kV Jemina Substation												
	Nil												
	(G) 66/33/11kV Dechencholing substation												
1	4/8/2021	10:47Hrs	4/8/2021	11:08Hrs	0	3.113	Both 10MVA Tr.	Whole o/g fdr.	Due to insulator Puncture/broken	only 86 relay	Opposite of Ding S/S, 66KVline Semtokha to DIing inconer fdr.	Tripped	Sound came out like boom blast from opposite of our substation from double circuit tower, later we have found out that one side of double stringing insulator was puncture/broken due to low rating. 66KV incomer line tripped from semtokha end. however,both 10MVA Tr. are tripped at our end.
	(H) 66/11kV Haa Substation												
1	01.04.2021	11:28	01.04.2021	11:39	0	-2.28	66kV Incomer, along with all the feeders.	unknown	O/C	Punghesa substation,Paro	66kV incomer tripped from Punghesa substation on overcurrent. The same was normalised further.		
2	09.04.2021	14:07	09.04.2021	14:10	0	-1.8	66kV Incomer, along with all the feeders.	unknown	O/C	Punghesa substation,Paro	66kV incomer tripped from Punghesa substation on overcurrent. The same was normalised further.		
	(I) 220kV Substation Semtokha												
1	08.04.2021	10:44hrs	08.04.2021	10:52hrs	0.00	21.560	50MVA Transformer 1	220kV Semtokha Substation	R phase Isolator punctured above Dechencholing	HV and LV Backup protection Optd. (HV: Ia=287.2A, Ib= 61.27A, Ic=63.11A) (LV: Ia= 879.7A, Ib=185.2A, Ic= 195.4A).	220kV Semtokha Substation	Transient	
2	08.04.2021	10:44hrs	08.04.2021	10:45hrs	0.00	21.610	50MVA Transformer 2	220kV Semtokha Substation	R phase Isolator punctured above Dechencholing	HV and LV Backup protection Optd. (HV: Ia=156.1A, Ib= 119.5A, Ic=84.66A) (LV: Ia= 509.5A, Ib=388.3A, Ic= 281.4A)	220kV Semtokha Substation	Transient	
3	28.04.2021	12:10hrs	28.04.2021	12:14hrs	0.00	17.870	50MVA Transformer 1	220kV Semtokha Substation	Due thunder and lightning Dechencholing line triped and sumultaneously both 50MVAtripped.	Differential protection optd. HV and LV Backup protection Optd.	220kV Semtokha Substation	Transient	
4	28.04.2021	12:10hrs	28.04.2021	12:13hrs	0.00	17.900	50MVA Transformer 2	220kV Semtokha Substation	Due thunder and lightning Dechencholing line triped and sumultaneously both 50MVAtripped.	Differential protection optd. HV and LV Backup protection Optd.	220kV Semtokha Substation	Transient	
5	08.04.2021	10:44hrs	08.04.2021	10:59hrs	0.00	6.850	66kV Semtokha-Dechencholing Feeder	220kV Semtokha Substation & 66kV Dechencholing Substation	R phase Isolator punctured above Dechencholing	Io>> Trip Ia= 1.951kA, Ib=56.87A, Ic=65.23A		Permanent	
5	28.04.2021	12:10hrs	28.04.2021	12.21hrs	0.00	7.420	66kV Semtokha-Dechencholing Feeder	220kV Semtokha Substation & 66kV Dechencholing Substation	R phase Isolator punctured above Dechencholing	Distance Protection Optd. Io>> Trip Ia= 3.318kA, Ib=74.6A, Ic=62.66A		Transient	
	(J) 66/33/11kV Pangbesa substation												
1	02.04.2021	11:33Hrs	02.04.2021	11:39Hrs	0	2.21	66kV OG Haa feeder	Haa	O/C			Transient	
2	09.04.2021	14:07Hrs	09.04.2021	14:10Hrs	0	1.74	66kV OG Haa feeder	Haa	O/C			Transient	
	(K) 66/33kV Changilagbu Substation												
	(L) 66/33kV Damji Substation												
1	08.04.2021	10:48hrs	11.04.2021	3:40hrs	76	-0.29	33KV Incoming line		Failure of insulator	NA			66kv incoming line was tripped at 10:48 hrs and line at Damji Substation had been back fired from Punakha at 14:07 hrs. 66kv line charged at 15:40 hrs as per the closing code 1961 from BPSO.
2	28.04.2021	12:14hrs	28.04.2021	12:27hrs	0	-0.29	66/33kv incoming line		Hand trip	NA			66kv line breaks(down (Hand trip) from Semtokha.

May 2021

Sl No.	Date of Tripping	Time of outages	Date of Normalization	Time of fault was cleared	Duration of Outages (Hrs)	MW before outage (MW)	Feeder Name	Name of the Substation /lines affected by the fault	Reasons of fault	Relay operations	Exact location of fault [Line segment/ Substation]	Type of outages	Remarks
[A] 400/220/66/11 kV Malbase Substation													
66kV & Above													
1	03.05.2021	10:25	03.05.2021	13:48	3	-44	220kV Chukha-Malbase Feeder 3	Malbase s/s	Overcurrent	zone 1 trip, 86 Operated, fault loop L2-N, diastance at 10.97 km	L2-N=10.97 km	Overcurrent fault	Ia =68.66 A, Ib=5.381kA, Ic=157A
2	3.05.2021	13:25	03.05.2021	15:02	1	23	50/63 Mva Trafo 3	Malbase S/S	Overcurrent	Differential trip,27 Trip, 86 operated,Inrrm BLK trip		Overcurrent fault	R phase=148.22A/6.70deg, Y phase=708.53A/1.90deg, B phase=89.23A/72.53 deg, N=229.97A/175.10deg
3	03.05.2021	14:50	03.05.2021	14:58	0	10	220kV Malbase-Samtse Feeder	Dhamdum S/s	Earth fault	Main 1 trip,zone 1 trip,R/U trip, 86 operated,fault loop-L1-N, distance at 10.0 km	fault loop- L1-N=10.0 km	Overcurrent fault	R phase=4300A/203.9deg, Y phase=55.02A/116.5deg, B phase=108.4A/109.0deg, N=4141A/203.9deg
4	3.05.2021	15:01	03.05.2021	15:52	0	9	220kV Malbase-Samtse Feeder	Dhamdum S/s	Earth fault	Main 1 trip,zone 1 trip,R/U trip, 86 operated,fault loop-L1-N, distance at 16 km	fault loop- L1-N=16 km	Overcurrent fault	R phase= 4608A/203.0deg,Y phase= 54.04A/119.2deg, B phase= 107.2A/111 deg, N=4447A/ 203.0deg
5	03.05.2021	0.22	03.05.2021	0.31	0	7	220kV Malbase-Samtse Feeder	220kV samtse feeder	Overcurrent	Rel 511,overcurrent protection operated,distance protection operated, Main 1 trip, Trip R,Y,B phase, zone 1 trip		Overcurrent fault	67/67 N, G1 phase A FWD IDMTC(305) Ia=3952A, Ib= 135.7A,Ir FWD(IDMTC)=1924A, E.F (REV) Ie=337mA
6	04.05.2021	1:00	04.05.2021	1:15	0	16	66 kV Punakha Feeder 1	66kV punakha feeder 1.	Overcurrent	Rel670,IEF-50N trip,86 operated,general trip,IOC50 trip		Overcurrent fault	R phase= 2314.17<43.77deg,Y phase= 1997.79A<175.7deg, B phase= 1087.63A<53.50 deg, N=832.07A<164.16deg
7	04.05.2021	1:00	04.05.2021	1:15	0	20	66 kV Punakha Feeder 2	66kV punakha feeder 2.	Overcurrent	Rel670, 51 start,86 operated, IOC50 trip, general trip, IEF50N trip		Overcurrent fault	R phase=3233.90A<70.75deg,Y phase= 2128.21A<173.04deg, B phase= 525.15A<-86.90 deg
8	04.05.2021	1:00	04.05.2021	1:15	0	21	66 kV Punakha Feeder 4	66kV punakha feeder 4.	Overcurrent	Rel 670,51 start,86 operated, IOC50N trip,general trip,IEF50N trip		Overcurrent fault	R phase=3345A<66.27deg,Y phase= 3940.39A<164.22deg, B phase= 5860.2A<35.05 deg
9	11.05.2021	16:17	12.05.2021	12:43	18	72	200 MVA ICT Malbase S/s	Malbase S/S	Buchholz Trip	R phase buchholz alarm, buchholz trip, 86 Relay trip	ICT R phase transformer		L1=0.092 A<13.03 deg, L2=0.022 A<140.4 deg, L3=0.007 A/<-6.15 deg
(B)220/66/11 kV Singhigaon Substation													
1	03.05.2021	15:11	03.05.2021	16:03	0	13	220kV Singye Samtse	GIS, Singhigaon s/s	Overcurrent	overcurrent trip and 86 otpd.		Overcurrent Fault	IL1=3259A<282.9 deg, IL2=189.5A<107.7deg, IL3=188.3A<111.7deg

(B)66/33/11 kV Phuntsholing Substation												
1	03.05.2021	13:37	03.05.2021	15:00	1	-2.26	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder		DSTN OPTD, 186&86		
2			03.05.2021	13:42	13	idle	66kV Malbase-Pling feeder	66kV Malbase-Pling feeder				
3	03.05.2021	15:12	03.05.2021	15:18	0	-4.60	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder		DSTN OPTD, 186&86		
4	05.05.2021	13:56	05.05.2021	14:04	0	-3.09	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder		DSTN OPTD, 186&86		
5	05.05.2021	13:56	05.05.2021	15:41	1	-1.48	66kV Pling-Gomtu feeder	66kV Pling-Gomtu feeder	Tripped	DSTN OPTD, 186&86	Line	
6			05.05.2021	14:01	14	idle	66kV Malbase-Pling feeder	66kV Malbase-Pling feeder				
7	14.05.2021	0:42	14.05.2021	0:48	0	-3.83	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder		DSTN OPTD, 186&86		

(D) 66/33/11 kV Geda Substation													
1	03.05.2021	13:37	3.05.2021	14:15	0	1.73	66kV Chukha-Phuntsholing	Black out	Due to bad weather		Line segment		Weather condition: Heavy Rainfall. 66kV line was charged from Chukha after improving he weather condition.
2	03.05.2021	15:10	03.05.2021	15:10	0	1.73	66kV Chukha-Phuntsholing	Black out	Due to bad weather		Line segment		Weather condition: Heavy Rainfall. 66kV line was charged from Chukha after improving he weather condition.
3	08.05.2021	10:12	10.05.2021	20:33	10	0.44	SMVA 66/33kV Tx-III	33kV Gurungdara feeder -I and II	33kV Supply extended from 33kV Gurungdara-I		Substation	Shutdown	Taken shutdown for installation and commissioning of 33kV Bus section-II panels.vide work permit No. 59 issued to Mrs. Rinchen Zangmo, Sr. Engineer of SMD Pling.
4	10.05.2021	9.26	10.05.2021	9:48	0	0.4	8MVA 66/33kV Tx-I	33kV Gurungdara feeder -I	Bad weather	Differential fault on B phase	Line segment		Weather Condition: Thundering and Raining. Test charged after weather got clear and stood normal.
5	14.05.2021	0:42	14.05.2021	0:46	0	1.54	66kV Chukha-Phuntsholing line	Black out	Due to bad weather		Line segment		Weather condition: Raining and thundering. 66kV line charged from Phuntsholing end.
6	19.05.2021	16:45	19.05.2021	16:55	0	0.55	8MVA 66/33kV Tx-I	33kV Gurungdara feeder -I & 33kV Gurungdara-II	REF	REF	Line segment		Test charged and held normal.
7	20.05.2021	15:33	20.05.2021	15:42	0	0.41	8MVA 66/33kV Tx-I	33kV Gurungdara fdr-I	REF	REF	Line segment		Test charged and held normal.
(E) 66/33/11 kV Gomtu Substation													
1	03.05.2021	13:11	03.05.2021	13:18	0	-9.504	66kV Dhamdum	Gomtu Substation	Nil	Nil	Malbase Substation	Tripped on Fault	66kV supply tripped from Malbase Sub Station.
2	04.05.2021	12:52	04.05.2021	19:54	7	-7.029	66kV Dhamdum	Nil	Over Current	General trip, Zone-trip, R ph fault,Y ph fault, B ph fault Y-T fuse fail.	66kV Samtse-Gomtu Line	Tripped on Fault	66kV Dhamdum tripped due to rainstorm and supply could not withstand from the both end thereby test charged informomg to BPSO at 07:54 hours and the line withstand.
3	05.05.2021	13:59	05.05.2021	14:08	0	-10.734	66kV Dhamdum & Gomtu-Phuntsholing	Whole Gomtu	Over Current/Transient Fault	General trip, Zone-4trip, R ph fault,Y ph fault, B ph fault	66kV Samtse-Gomtu Line	Tripped on Fault	66kV Dhamdum tripped due to rainstorm. Supply charged with confirmation from BPSO at 14:08hours. 66kV Gomtu-Phuntsholing supply resumed at 15:41hrs.
(F) 220/66/33 kV Dhamdum Substation													
220kV													
1	03.05.2021	13:11	3.05.2021	16:04	0	-3.19	Singaygaong Damdum Feeder	Damdum S/S	Transient fault	REL670(21L-M1)	6.5 KM	Line fault	L1 &N Fault , Fault distance 6.5 Km, Zone -1 fault ,
2	04.05.2021	0:21	04.05.2021	0:35	0	-1.93	Singaygaong Damdum Feeder	Damdum S/S	Transient fault	REL670(21L-M1)	20 KM	Line fault	Line tripped due to heavy rainfall and lightning and thunder. Line fault record as under: Zone 1. 4Phase to phase fault(R to B) Distance/fault location:20.1KM(50.3%)
66kV													
1	04.05.2021	0:36	04.05.2021	7:29	6	7.32	Gomtu feeder	NA	Heavy rainfall and lightning and thunder	REL670(21L)	NA	Line fault	Line tripped due to heavy rainfall and lightning and thunder. Line fault record as under: Zone 1. O/C on R &B Ø fault, 1)Abs Dist: 19.99 2)Fault Rel Dist: 49.98% , 3)Fault loop L3L1.
2	05.05.2021	13:54	05.05.2021	14:06	0	12.33	Gomtu feeder	NA	Heavy rainfall and lightning and thunder	REL670(21L)	NA	Line fault	Line tripped due to heavy rainfall and lightning and thunder. Line fault record as under: Zone 2&3 started. 1)Fault loop type: L2 with N. 2)Fault location 15KM(100%)

Tripping Report for the month of MAY 2021

Sl. No.	Date of Tripping	Time of outages	Date of Normalization	Time of fault was cleared	Duration of Outages (Hrs)	MW before outage (MW)	Feeder Name	Name of the Substation/lines affected by the fault	Reasons of fault	Relay operations	Exact location of fault [Line segment/ Substation]	Type of outages	Remarks
	(A) 66kV Chumdo switching station												
1	03.05.2021	13:20hrs	03.05.2021	13:25hrs		1.05.7MW	66kV both I/c	Paro and Paro	Transient fault	O/C & CB open	Chumdo	Trip	
2		13:55hrs		14:05hrs		1.05.7MW	66kV Cukha I/c	Paro and Paro					
3	09.05.2021	10:10hrs	09.05.2021	19:04hrs	2hrs	1.46.8MW	66kV Jemina I/c	fed from 66kV Chukha I/c	Fault at Olakha end.	CB open	Fault at Olakha end.	Trip	Could not charge due to DC failure.
	(B) 66/33kV Watsa Substation												
1	3/5/2021	13:10hrs	3/5/2021	14:00hrs	0	2.60MW	66KV Incommer	Fdr I and II	66KV Incommer failed from chukha end as clamp jointhis got tripped			Trip	
2	24/5/2021	9:00hrs	24/5/2021	10:12hrs	2hr	2.60MW	66KV Incommer	Fdr I and II	[illegible]			Shutdown	
3	28/5/2021	14:14hrs	28/5/2021	16:25hrs	2hrs	3.60MW	66KV Incommer	Fdr I and II	Shut down taken by TMD Tsimalkha for Bo jumper at Watsa Tie line after completion of annual maintenance			Shutdown	
	(C) 66/33kV Olakha Substation												
1	5/3/2021	13:49	5/3/2021	13:51	0	6.5	20 MVA transformer I	Olakha substation and all outgoing feeders					Supply fail from Chukha (unit fail) supply fail from Chukha at 13:10hrs and charge at 14:08hrs.
2	5/9/2021	16:22				4.5	66kV Olakha-Changidaphu Line	66kV Olakha-Changidaphu Line		On Relay 7SA611 Distance Protection Relay 21. 1. General Trip 2. Distace Operated 3. Zone One Operted along with Tripping relay 86 operated. On Relay 7SJ62 :1. Gnneral Tripped, 2. Direction Over Current and Earth Fult Operated .	IT park near Serbithang		The 66kV Olakha- Changidaphu was tripped on distance relay, so the 66kV line was not Charged owing to the indication and operation of relay. Operational personal has seen that there was spark near the Gantry of Y Phase conductor during tripping happend, therefore informed to BPSO in this regard. Since patroling could not proceed due to time constrain, The 66kV line was kept under shut down for next day Patroling by TMD line person.
3	5/9/2021	16:22	5/9/2021	17:24	1		66kV Bus Coupler	Olakha Substation		On Relay 7SJ61 Over Current and Earth fault Protection Relay 50/51. 1. General Trip 3. Earth Fault Operated 4. LBB start along with Tripping relay 86 operated.			Supply fail from 66kV Semtokha Line and 66KV Changidaphu Line
4	5/9/2021	16:52	5/9/2021	17:21	0	-16.8	66kV Semtokha-Olakha Line	Olakha substation and all outgoing feeders		On Relay 7SA611 Distance Protection Relay 21. 1. General Trip 2. Distace Operated 3. Zone One Operted 12. LBB Operated along with Tripping relay 86 operated.			Supply fail from 66kV Semtokha Line and 66KV Changidaphu Line
5	5/11/2021	15:52	5/11/2021	15:53	0	-13.7	66kV Olakha-Semtokha	Olakha substation and all outgoing feeders		LLLB operated			Feeder was triped while Test charging of 66kV Olakha-Changidaphu feeder which was under shutdown for changing of 3 phase Conductor between death end tower and 66kV gantry at Olakha subvation.After resetting all relays,test charge the feeder and hold normal.
6	5/11/2021	15:52	5/12/2021	17:38	25	4.5	66kV Olakha-Changidaphu Line	66kV Olakha-Changidaphu Line	conductor burnt at IT park	On DISTANCE PROTN Relay 21,1.General Trip 2. Distance Operated 3.Zone 1 Operted along with Tripping relay 86 operated.	IT park		Shutdown taken by Dupthe Wangdi to provide tension fittings for long span,valley crossing and critical. As per Approval request no.,,REF/MSO No.16/TMD/TD/BPC/2021/Vol-1/85 and approved no.10/ABPC/BPSO/PSOD/Vol-1/2021/115.Breaker open,,line and bus isolater open and earth switch close at both Olakha and Changzedaphu end.BPSO Shutdown code 04975Shutdown was returned by Mr.Chando Gyelthen of TMD,Olakha after changing of 3 phase Conductor between death end tower and 66kV gantry at Olakha substation.After receiving code no.2118 from BPSO.Feeder was test charged but could not hold and triped again.Feeder was kept shutdown for further line patrolling by line staffs.After completion of work,charged the feeder with BPSO code no.2127 and hold normal.
7	5/11/2021	15:52	5/11/2021	16:05	0		66kV Bus Coupler	Olakha Substation	OC&EF and Distance protection	Trip Relay 86	Olakha-Changidaphu feeder	Tragporary	Feeder was triped while Test charging of 66kV Olakha-Changidaphu feeder which was under shutdown for changing of 3 phase Conductor between death end tower and 66kV gantry at Olakha subvation.Atter resetting all relays,test charge the feeder and hold normal.
	(D) 66/33/11kV Lobeysa Substation												
1	05.05.2021	12:43hrs	05.05.2021	13:06hrs		-7.140	66kV LSA-Basochu	NA	NA	NA	NA	NA	Grid fail from Basochu Plant(machine tripped)
2	26.05.2021	00:15hrs	26.05.2021	01:21hrs	1	0.000	66kV Basochu- LSA	NA	Grid fail	NA	Basochu	black out	66kV LSA-Dochula feeder tripped at 00:15hrs with out any relay & breaker is operated at
3	10.05.2021	11:45hrs	10.05.2021	13:40hrs	1	0.000	66kV LSA-Dochula	NA	Cable problem at	OC/EF relay operated	Dochula end	NA	66kV LSA -Dochula feeder tripped on O/C/EF relay operated, opening breaker at our end
4	10.05.2021	16:09hrs	10.05.2021	17:05hrs	0	0.000	66kV LSA-Dochula	NA	Cable problem at	OC/EF relay operated	Dochula end	NA	66kV LSA -Dochula feeder tripped on Dist.& OC/EF relay operated, opening breaker at
5	22.05.2021	11:15hrs	22.05.2021	11:57hrs	0	14.230	66kV LSA-Dochula	NA	NA	86 relay operated	NA	NA	66kV LSA-Dochula feeder tripped at 11:15hrs operating breaker open at our end at that
6	26.05.2021	00:15hrs	26.05.2021	01:21hrs	1	0.000	66kV LSA-Dochula	NA	Grid fail	NA	Basochu	black out	66kV LSA-Dochula feeder tripped at 00:15hrs with out any relay & breaker is operated at
7	27.05.2021	08:36hrs	27.05.2021	23:23hrs	14	20.050	66kV LSA-Dochula	NA	Shutdown	NA	NA	NA	66kV LSA -Dochula-Semtokha taken shutdown as per approval.
	(E) 66/33/11 kV Paro Substation												
1	5/3/2021	13:35Hrs	5/3/2021	14:07Hrs	0	2.2	66kV Chundo Line in	Olathang all incoming and outgoing feeders	Tripped from chukha				Grid failure from chukha
2	5/9/2021	13:35Hrs	5/9/2021	16:28Hrs	0	2	66kV Chundo Line in	Olathang all incoming and outgoing feeders	Tripped from chukha				
	(F) 66/33/11kV Jemina Substation												
1	03.05.2021	13:47	03.05.2021	14:30	0	-3.24	66 kV Changedaphu	..	Distance relay operated with auto reclose lock out.	Distance relay			CB B operation: 216, CB C operation: 259, Ia broken: 47.50 mA, Ib broken: 224.5 mA, Ic broken: 259.0 mA, CB operation: 052.0 ms. Ia: 44.16 A, Ib: 48.80 A, Ic: 40.63 A, Vrn: 23 kV, Vbn: 25.38 kV, Vcn: 20.15 kV. Charged the feeder at 14:30 Hrs, upon communicating with BPSO Operator.
2	03.05.2021	14:07	03.05.2021	14:26	0	1.29	66 kV Chundo	..	Distance relay operated with auto reclose lock out.	Distance relay			Ia: 271.7 A, Ib: 30.13 A, Ic: 44.31 A, Vrn: 21.82 kV, Vbn: 37.97 kV, Vcn: 37.34 kV. Charged the feeder at 14:30 Hrs, upon communicating with BPSO Operator.
3	09.05.2021	16:20	09.05.2021	19:17	2	1.89	66 kV Chundo	Black out	Non directional EF operated & auto reclose lock out	IN1>2 trip			Ia: 981.3 A, Ib: 228.8 A, Ic: 144.8 A, Vab: 21.96 kV, Vbc: 64.10 kV, Vca: 58.07 kV. IN measured: 616.2 A, IN derived: 616.9 A, Van: 20.81 kV, Vbn: 35.10 kV, Vcn: 38.40 kV, Frq: 50.08 Hz. upon communicating with BPSO Operator, the Substation was supplied from Chundo at 19:17 Hrs till Changedaphu end.
4	09.05.2021	16:20	09.05.2021	19:17	2	-3.42	66 kV Changedaphu	Black out	Non directional EF operated & auto reclose lock out	IN1>2 trip			Ia: 1.e kA, Ib: 239.1 A, Ic: 140.8 A, Vab: 21.57 kV, Vbc: 64.34 kV, Vca: 58.28 kV. IN measured: 628.8 A, IN derived: 628.5 A, Van: 20.88 kV, Vbn: 35.09 kV, Vcn: 38.51 kV, Frq: 50.08 Hz. upon communicating with BPSO Operator, the Substation was supplied from Chundo at 19:17 Hrs till Changedaphu end.

	(G) 66/33/11kV Deothenbeling substation												
1	03.05.2021	13:38hrs	03.05.2021	14:07hrs	0	+6.034	66KV I/C	....	Supply failed from source				
2	08.05.2021	01:20Hrs	08.05.2021	01:29Hrs	0	0.125	66KV Gasa O/G	....	Over current	O/C,& 86 A& B	Gasa end	tripped	Fdr tripped due fault at Gasa end.
3	09.05.2021	16:22Hrs	09.05.2021	17:12hrs	0	-6.228	66KV I/C	....	Supply failed from Semtokha				
4	15.05.2021	18:5Hrs	15.05.2021	19:00hrs	0	+5.481	10MVA Tr I & II	....	Over current	50B & 50C 86	Not known	tripped	Transformer tripped due to jerking of 11KV Thinphu Hydro fault.
5	17.05.2021	11:43hrs	17.05.2021	11:59hrs	0	-1.225	-do-	....	REF prots.	86 relay	-do-	tripped	Transformer tripped on REF prots.
6	01.05.2021	09:42 Hrs	01.05.2021	17:19Hrs	5 hrs	3.784	10MVA Tr-II	Nil	Shut down taken by Project Office Olakha TPO for fixing the 10MVA Transformer accessories by Hydra machine.				
7	01.05.2021	17:25Hrs	01.05.2021	19:08Hrs	2 hrs	6.028	10MVA Tr-I	Nil	Shut down issued to TPO olakha to installed conservator Tank at new 10MVA Transformer by Hydra machine				
8	01.05.2021	18:15Hrs	01.05.2021	19:30Hrs	1 hrs	6.662	10MVA Tr-II	Nil	10MVA-II Transformer shut down taken by Olakha TPO for connecting conservator accessories.				
9	03.05.2021	11:10 hrs	03.05.2021	17:44hrs	5 hrs	2.806	10MVA Tr-II	Nil	Shut down issued to TPO olakha for transporting the filter Machine to switchyard by Hydra Machine.				
10	04.05.2021	11:10Hrs	04.05.2021	11:32 hrs	0	3.674	10MVA Tr-II	Nil	TPO project Sr Engineer took the shut down for unloading another filter machine at transformer yard by the Hydra machine.				
11	04.05.2021	11:35Hrs	04.05.2021	12:16Hrs	0	3.674	10MVA Tr-I	Nil	Same work				
12	04.05.2021	12:16Hrs	04.05.2021	18:02hrs	6hrs	7.427	10MVA Tr-II	Nil	Shifting of Filter machine to other location by Hydra Machine.				
13	08.05.2021	12:15Hrs	08.05.2021	19:06Hrs	6hrs	3.384	10MVA Tr-I	Nil	Shut down taken by Project Office Olakha TPO for fixing the 10MVA Transformer-I radiator(fin) from HV side by Hydra Machine.				
14	12.05.2021	10:40Hrs	12.05.2021	16:43hrs	5hrs	3.077	10MVA Tr-II	Nil	Shut down taken by Project Office Olakha TPO for fixing the 10MVA-II Transformer-II HV bushing current transformer with help of Hydra Machine.				
15	13.05.2021	09:10hrs	13.05.2021	18:14hrs	9hrs	3.179	10MVA Tr-II	Nil	Installation of bushing CT at new 10MVA x'mer -II				
16	14.05.2021	09:15Hrs	14.05.2021	18:56Hrs	9hrs	2.923	10MVA Tr-II	Nil	Shut down by PTO office to fixed the pipe line of conservator tank to main transformer body.				
17	15.05.2021	09:30hrs	15.05.2021	10:55Hrs	0	3.043	10MVA Tr-II	Nil	For shifting the filter machine from transformer II location to near the transformer-I				
18	15.05.2021	11:10hrs	15.05.2021	14:22Hrs	3hrs	2.406	10MVA Tr-I & 2.5MVA Tr-I	Nil	Shut down taken by SMD maintenance team to made alignment of 33KV side Bus coupler Isolator, spare fdr line & bus isolator.				
19	15.05.2021	14:56hrs	15.05.2021	19:00hrs	3hrs	4.713	10MVA Tr-II	Nil	Shut down taken by Olakha project office to connect the pipe.				
20	17.05.2021	10:30Hrs	17.05.2021	15:18hrs	4hrs	0.728	10MVA Tr-II	Nil	Shut down availed by project staff for fixing and adjustment of pipe on conservator tank.				
21	18.05.2021	10:45hrs	18.05.2021	18:24hrs	7hrs	2.729	10MVA Tr-II	Nil	Shut down availed by SMD semtokha mtc team to for retrofitting new digital relay of 10MVA-II				
22	19.05.2021	10:02hrs	19.05.2021	14:09Hrs	4hrs	2.332	10MVA Tr-I	Nil	For shifting of CCTV for 66KV Gantry.				
23	19.05.2021	14:10Hrs	19.05.2021	19:50Hrs	5hrs	3.908	10MVA Tr-II	Nil	Replacement of CT at HV & LV side of 10MVA Tr-II by Smd mtc semtokha.				
24	20.05.2021	10:10Hrs	20.05.2021	19:29hrs	9hrs	2.329	10MVA Tr-II	Nil	Continuation of replacement of HV CT and testing of relay.				
25	21.05.2021	10:10hrs	21.05.2021	18:30hrs	8hrs	2.378	10MVA Tr-II	Nil	10MVA transformer-II Tan Delta test and IR test by SMD mtc team.				
26	22.05.2021	10:40hrs	22.05.2021	18:19Hrs	7hrs	2.169	10MVA Tr-II	Nil	Shut down taken by Olakha TPO for testing of LV side CT of 10MVA Transformer & installation of relay.				
27	24.05.2021	10:15hrs	24.05.2021	16:21hrs	6hrs	1.85	10MVA Tr-II	Nil	For Testing 10MVA Tr-II				
28	24.05.2021	16:24hrs	24.05.2021	19:11Hrs	3hrs	3.428	10MVA Tr-I	Nil	For installation of Radiator at 10MVA Tr-I				
29	25.05.2021	09:55hrs	25.05.2021	20:23hrs	10hrs	2.11	10MVA Tr-II	Nil	For testing 10MVA Tr-II & installation of Meter in control room				
30	26.05.2021	14:05hrs	26.05.2021	16:44Hrs	2hrs	1.89	10MVA Tr-II	Nil	Continuation of testing 10MVA -Tr-II.				
31	27.05.2021	10:05hrs	27.05.2021	11:30Hrs	1hrs	2.269	10MVA Tr-II	Nil	For installation of HV & LV bushing of 10MVA Transformer-II				
32	29.05.2021	12:12hrs	29.05.2021	14:22hrs	2hrs	0	10MVA Tr-II	Nil	For releasing the Air from Transformer for loading.				
33	31.05.2021	11:17hrs	31.05.2021	15:45hrs	4hrs	0	10MVA Tr-II	Nil	For testing 10MVA relay.				
34	31.05.2021	11:22Hrs	31.05.2021	17:40Hrs	6hrs	0	10MVA Tr-II	Nil	For testing 10MVA Tr LV side CT.				
	(H) 66/11kV Bus Substation												
1	09.05.2021	10:21	09.05.2021	10:27	0	-1.86	66kV Incomer, along with all the feeders.	unknown	O/C	Source fail, Chukha	66kV incomer tripped from the source on overcurrent. The same was normalised further		
2	29.05.2021	10:13	29.05.2021	10:20	0	-1.34	66kV Incomer, along with all the feeders.	unknown	O/C	Pasgbesa substation,Paro	66kV incomer tripped from Pasgbesa substation on overcurrent. The same was normalised further.		
	(I) 220kV Substation Semtokha												
1	22.05.2021	11:16hrs	22.05.2021	11:27hrs	1.00	-28.940	220kV Semtokha-Chukha Line	220kV Semtokha-Chukha Line	Transient L2-L3 Fault	Fault Loop= L2-L3, Zone-1,Dist 7.6ohm, Fault Type= L2-L3, Fault Current= 4.6kA,	44.4km	Transient	No customer affected
2	22.05.2021	11:27hrs	22.05.2021	12:17hrs	0.00	-28.940	220kV Semtokha-Chukha Line	220kV Semtokha-Chukha Line	Transient L2-L3 Fault	Fault Loop= L2-L3, Zone-1,Dist 7.6ohm, Fault Type= L2-L3, Fault Current= 4.6kA,	45.4km	Transient	No customer affected
3	25.05.2021	00:21hrs	25.05.2021	00:43hrs	0.00	16.490	220kV Semtokha-Chukha Line	220kV Semtokha-Chukha Line	Transient L2-N Fault	Fault Loop= L2-N, Fault Type= L2-N, Fault Current= 4.6kA,	54km	Transient	No customer affected
4	09.05.2021	16:23hrs	09.05.2021	16:27hrs	0.00	15.730	50MVA-1	Semtokha oth Olakha ss	Tripped along with 66kv Olakha line	Earth fault, HV & LV Backup Protection Optd	-	Transient	Whole Thimphu
5	09.05.2021	16:27hrs	09.05.2021	17:20hrs	0.00	15.730	50MVA-1	Semtokha oth Olakha ss	Tripped along with 66kv Olakha line	Earth fault, HV & LV Backup Protection Optd		Transient	Whole Thimphu
6	11.05.2021	15:51hrs	11.05.2021	15:55hrs	0.00	12.640	50MVA-1	Semtokha oth Olakha ss	Tripped while charging 66kV Olakha Line from Semtokha end	Differential protection Optd.		Transient	No customer affected
7	09.05.2021	16:23hrs	09.05.2021	16:28hrs	0.00	15.750	50MVA-2	Semtokha oth Olakha ss	Tripped along with 66kv Olakha line	Earth fault, HV & LV Backup Protection Optd	-	Transient	Whole Thimphu
8	09.05.2021	16:28hrs	09.05.2021	17:15hrs	0.00	15.750	50MVA-2	Semtokha oth Olakha ss	Tripped along with 66kv Olakha line	Earth fault, HV & LV Backup Protection Optd		Transient	Whole Thimphu
9	09.05.2021	16:23hrs	09.05.2021	17:10hrs	0	16.77	66kV Semtokha- Olakha Line	Semtokha oth Olakha ss	Directional EF	Directional EF		Transient	Whole Thimphu
10	11.05.2021	15:51hrs	11.05.2021	15:59hrs	0	11.83	66kV Semtokha- Olakha Line	66kV Semtokha-Olakha Line	Dir. EF/OC	Ia=130A,Ib=4.044kA, Ic=111.2A		Transient	No customer affected
11	25.05.2021	00:21hrs	25.05.2021	00:25hrs	0	1.21	10MVA-1	All 11kV Outgoing fe	OC/EF	OC/EF		Transient	All 11kv Direct customers affected.
12	25.05.2021	00:21hrs	25.05.2021	00:26hrs	0	1.21	10MVA-2	All 11kV Outgoing fe	OC/EF	OC/EF		Transient	All 11kv Direct customers affected.
13	31.05.2021	23:44hrs	01.06.2021	00:43hrs		9.560	Semtokha Substation	Shutdown taken by Pema Lethe to remove droping conductor of sectionalizer of 66kV bus					
14	31.05.2021	23:44hrs	01.06.2021	05:26hrsdes	5.00	9.550	Semtokha Substation	Shutdown taken by Pema Lethe to remove droping conductor of sectionalizer of 66kV bus					
15	31.05.2021	23:44hrs	01.06.2021	00:44hrs	1.00	15.050	Semtokha Substation	Shutdown taken by Pema Lethe to remove droping conductor of sectionalizer of 66kV bus					
16	31.05.2021	23:42hrs	01.06.2021	00:45hrs	1.00	1.420	Semtokha Substation	Shutdown taken by Pema Lethe to remove droping conductor of sectionalizer of 66kV bus					
17	31.05.2021	23:43hrs	01.06.2021	05:26hrsdes	5.00	1.410	Semtokha Substation	Shutdown taken by Pema Lethe to remove droping conductor of sectionalizer of 66kV bus					
	(J)66/33/11kV Paughesa substation												
1	29.05.2021	16:15Hrs	29.05.2021	16:22Hrs	0	2.2	66kV OG Has feeder	Has	O/C			Transient	
	(K) 66/33kV Changidaphu Substation												
1	09.05.2021	16:28hrs	12.05.2021	17:38hrs		73 -1.92	66kV Olakha-Changidaphu Line	Changidaphu and Olakha ss	Rph Conductor snapped and got contact with Yph conductor		Babesa near IT park	Permanent	
2	14.05.2021	08:16hrs	14.05.2021	18:43hrs	10.00	-5.810	66kV Olakha-Changidaphu Line	Changidaphu and Olakha ss	No Indication			Permanent	TMD carried out the maintenance work on the same line
3	09.05.2021	18:36hrs	12.05.2021	17:38hrs	59.00	-1.920	66kV Olakha-Changidaphu Line	66kV Olakha-Changidaphu Line	Shutdown taken by TMD to rectify Rph conductor near IT park Babesa				
4	13.05.2021	08:25hrs	13.05.2021	17:58hrs	9.00	-1.920	66kV Olakha-Changidaphu Line	66kV Olakha-Changidaphu Line	Annual Maintenance of the line by TMD.				
5	14.05.2021	08:16hrs	14.05.2021	18:43hrs	10.00	5.810	66kV Olakha-Changidaphu Line	66kV Olakha-Changidaphu Line	Annual Maintenance of the line by TMD.				
6	17.05.2021	08:15hrs	17.05.2023	18:25hrs	10.00		66kV Olakha-Changidaphu Line	66kV Olakha-Changidaphu Line	Annual Maintenance of the line by TMD.		Near Jemina		
	(L) 66/33kV Dunji Substation												
1	03.05.2021	13:38hrs	03.05.2021	14:08hrs	0	-28	66/33kv Incoming line		Outages				Outages of 66kv line from Dling due to grid failure from the source.

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Sl No.	Date of Tripping	Time of outages	Date of Normalization	Time of fault was cleared	Duration of Outages (Hrs)	MW before outage (MW)	Feeder Name	Name of the Substation/lines affected by the fault	Reasons of fault	Relay operations	Exact location of fault [Line segment/ Substation]	Type of outages	Remarks
(A) 400/220/66/11 kV Malbase Substation													
66kV & Above													
1	01.06.2021	22:58	02.06.2021	1:42	1	21	50/63MVA Transformer I	Malbase s/s	Overcurrent	General trip, LBB trip, 86 optd, 51 trip.	66kV Pling line	Overcurrent fault	IL1=759.97A<-1.97 deg, IL2=750.2A<-124.4deg, IL3=733.06A<-11.67deg,IL4=22.13A<-127.06deg. Note: Due to permanent fault in pling line, Feeders connected to the same bus of it could not withstand while test charged. After knowing the fault and isolating pling line only we could charged rest of the feeders.
2	01.06.2021	22:58	02.06.2021	1:45	1	21	66kV Panakha feeder I	Malbase S/S	Overcurrent	50trip,86 optd,General trip.	66kV Pling line	Overcurrent fault	IL1=991.76A<-8.95 deg, IL2=1324A<-134deg, IL3=1164A<115.41deg,IL4=455.4A<-5.36deg
3	01.06.2021	22:58	02.06.2021	14:58	15	-	66kV Bus Coupler	Malbase S/S	Earth fault	-	66kV Pling line	O/C & E/F	IL1=7691.81A<-84.3 deg, IL2=340.5A<115.9deg, IL3=138.67A<-91.54deg,IL4=7437.5A<-84.27deg
4	05.06.2021	20:37	05.06.2021	20:42	0	81	200MVA ICT	Malbase S/S	Earth fault	67/67N optd and 86 optd.		O/C & E/F	G2 PHASE A[FWD]=LS= IDMTL IA=1062A, PHASE B [FWD] 51.66A, PHASE C[FWD] IC=112.7A, E/F [FWD] IDMTL IE=974.5A
5	05.06.2021	20:37	05.06.2021	20:45	0	21	50/63MVA Transformer III	Malbase S/S		OLTC-BUCH trip			IL1=29.1A<99.23 deg, IL2=69.09A<-176.39deg, IL3=121.24A<126.15deg,IL4=189.78A<139.86deg
6	06.06.2021	23:20	06.06.2021	23:29	0	20	50/63MVA Transformer I	Malbase S/S	Overcurrent	LBB trip, General trip,86 B optd	66kV Pling line	Overcurrent fault	IL1=768A<-3.29 deg, IL2=694.51A<133.45deg, IL3=392A<137.94deg,IL4=614A<117.75deg
7	06.06.2021	23:20	06.06.2021	23:31	0	20	66 kV Panakha Feeder I	Malbase S/S	Overcurrent	General trip,IOC 50trip, 86 trip	66kV Pling line	Overcurrent fault	IL1=549A<10.19deg, IL2=175.3A<139.15deg, IL3=209.96A<138.42deg,IL4=171.57A<-130.2deg
8	06.06.2021	23:20	06.06.2021	23:26	0	-	220kV Bus Coupler	Malbase S/S	Overcurrent	SPAJ 140C relay optd. I> trip.	66kV Pling line	Overcurrent fault	Bus coupler tripped due to jerk from 66kV side.
9	06.06.2021	23:20	06.06.2021	23:30	0	-	66kV Bus Coupler	Malbase S/S	E/F	IOC trip, General trip, IEF 50N trip.	66kV Pling line	Overcurrent fault & E/F	IL1=7695.44A<-23.75deg, IL2=290.58A<-17.36deg, IL3=68.15A<-33.41deg,IL4=7695A<-23.75deg
10	12.06.2021	9:19	12.06.2021	9:24	0	24	66 kV Panakha Feeder IV	Malbase S/S	E/F	General trip, IEF 50N trip,86 optd.	66kV Panakha IV line	E/F	IL1=2427.31A<-45.63deg, IL2=271.05A<-76.9deg, IL3=166.6A<90.27deg,IL4=2538.37A<133.82deg
11	12.06.2021	9:19	12.06.2021	9:24	0	24	66 kV Panakha Feeder II	Malbase S/S	Overcurrent	General trip, IEF 50N trip,86 optd.	66kV Panakha II line	Overcurrent fault	IL1=0.27A<40.72deg, IL2=1233.14A<35.39deg, IL3=768.98A<56.88deg
12	12.06.2021	9:19	12.06.2021	9:24	0	25	66 kV Panakha Feeder IV	Malbase S/S	Overcurrent	General trip, IEF 50N trip,86 optd., IOC 50-trip.	66kV Panakha IV line	Overcurrent fault	IL1=1111.43A<-51.27deg, IL2=401.95A<166.54deg, IL3=579.73A<120.4deg
13	19.06.2021	21:18	19.06.2021	21:25	0	23	66 kV Panakha Feeder I	Malbase S/S	E/F	General trip, IEF 50N trip,86 optd.	66 kV Panakha Feeder I line	E/F	IL1=2592.08A<-47.93deg, IL2=299.68A<-94.45deg, IL3=151.74A<127.77deg,IL4=2651.87A<127.7deg
14	19.06.2021	21:18	19.06.2021	21:25	0	23	66 kV Panakha Feeder II	Malbase S/S	Overcurrent	General trip, IEF 50N trip,86 optd.	66 kV Panakha Feeder II line	Overcurrent fault	IL1=0.32A<-140.89deg, IL2=1299.73A<-147.96deg, IL3=848.99A<-131.43deg
15	19.06.2021	21:18	19.06.2021	21:25	0	24	66 kV Panakha Feeder IV	Malbase S/S	Overcurrent	General trip, IEF 50N trip,86 optd.	66kV Panakha IV line	Overcurrent fault	IL1=911.17A<-31.23deg, IL2=304.4A<146.04deg, IL3=615.55A<104.45deg
16	19.06.2021	21:18	19.06.2021	21:25	0	-	66kV Bus Coupler	Malbase S/S	E/F	General trip.	-	E/F	IL1=1437.31A<-46.94deg, IL2=467.77A<-33.38deg, IL3=330.93A<-66.28deg,IL4=2226.45A<-31.4deg
17	22.06.2021	20:30	22.06.2021	20:39	0	78	200MVA ICT	Malbase S/S	Overcurrent	67/67N optd and 86 optd.	-	-	PHASE A[FWD]<LS> IDMTL IA=1190A, PHASE B [FWD] IB= 166.1A, PHASE C[FWD]=LS>IC>1418A, E/F [FWD] IDMTL IE=923.4A.
18	22.06.2021	20:30	22.06.2021	20:43	0	27	50/63MVA Transformer III	Malbase S/S	-	Diff. trip		-	IL1=21A<171.66deg, IL2=121.64A<133.03deg, IL3=59.47A<-175.64deg,IL4=186.2A<-150.48deg
19	22.06.2021	20:30	22.06.2021	20:53	0	51	220kV Birpara Feeder	Malbase S/S & Birpara line	Overcurrent	Zone 1 trip, 86 OPTD.	18.77 kM	Overcurrent fault	IL1=4.613kA, IB=379.7A, IC =5.197kA
(B)220/66/11 kV Singhigoan Substation													
1	05.06.2021	20:37	05.06.2021	21:07	0	7	220kV Samtse feeder	GIS, Singhigoan s/s	E/F	O/C trip, 86 trip.	Samtse line	E/F	IL1=5006 A, IL2=64.75A, IL3=83.95A, I4 =4866A
2	12.06.2021	9:19	12.06.2021	9:20	0	5	66kV Bhutan Concast & Druk cement Feeder	GIS, Singhigoan s/s	Overcurrent	General trip, O/C trip, IE>> trip, I>> Directional trip,IEF Directioanl Trip.	-	Overcurrent Fault	IL1=5.24kA, IL2=0.42kA, IL3=0.22kA
3	19.06.2021	21:18	19.06.2021	21:27	0	1	66kV Bhutan Concast & Druk cement Feeder	GIS, Singhigoan s/s	Overcurrent	I>>D irectioinal trip, General trip	-	Overcurrent Fault	IL1=5.28kA, IL2=0.42kA, IL3=0.28kA

(B)66/33/11 kV Phuntsholing Substation													
1			04.06.2021	9:00	9	idle	66kV Malbase-Pling feeder	66kV Malbase-Pling feeder					At 09.00hrs issued shutdown to Jigme Gyaleg, Sr.Engineer,TMD Pling with work permit no 522 for re-string snapped conductor between location PS-3 & PS-4. After completion of works at 18:30hrs CB closed from Malbase end and 66kV Malbase-Pling feeder kept under idle position.
2			05.06.2021	11:27	11	idle	66kV Malbase-Pling feeder	66kV Malbase-Pling feeder					At 11:27hrs charged 66kV Pling-Malbase feeder which was under idle condition with charging code 1035 as per instruction from BPSO (for supply reliability at Pling Ss), since 66kV Chukha-Pling feeder taken shutdown by Gedu substation for rectification of isolators at Gedu substation. At 13:45hrs opened CB of 66kV Pling-Malbase feeder after getting clearance from BPSO with opening code 0008 and again the feeder was kept under idle condition.
			08.06.2021	10:00			66kV Malbase-Pling feeder	66kV Malbase-Pling feeder			Line		66kV Malbase-Pling feeder test charged with charging code 1070 for checking the healthiness of line as per instruction from BPSO. At 10:39hrs opened CB of said feeder as per instruction from BPSO with opening code 0017.
##			20.06.2021	17:37	17	idle	66kV Malbase-Pling feeder	66kV Malbase-Pling feeder			Line		66kV Malbase-Pling feeder test charged with charging code 1753 from from BPSO, since there was shutdown on 66kV Chukha-Pling feeder. At 18:44hrs opened CB of said feeder as per instruction from BPSO with opening code 0075
##	30.06.2021	2:06	30.06.2021	12:08	10	0.98	66kV Pling-Gomtu feeder	66kV Pling-Gomtu feeder		DSTN OPTD, 186&86	Gomtu substation		66kV Pling-Gomtu feeder tripped at our end and 66kV Chukha-Pling feeder got tripped at their end causing blackout at Pling. At 02:09hrs supply was extended from Malbase substation after informing to BPSO. At 02:25hrs 66kV Chukha-Pling feeder normalised from chukha end. 66kV Pling-Gomtu fdr taken shutdown by Gomtu substation since jumper conductor got snapped at Gomtu ss end. After completion rectification works at Gomtu at 12:08hrs 66kV Pling-Gomtu feeder normalised with charging code 1283 from Gomtu substation. Opened CB of 66kV Malbase-Pling with opening code 0106 from BPSO and feeder was kept under idle charged.
(D) 66/33/11 kV Gedu Substation													
1	03.06.2021	13:29	03.06.2021	13:32	0	0.17	66/33/11kV 5MVA Tr III	33kV Gurungdara-II		REF	Substation		Charged the Transformer after Isolating the out going feeder. 33kV Gurungdara feeder-II was charged from 33kV Gurungdara feeder-I.
2	04.06.2021	9:35	20.06.2021	22:00	12	0.13	66/33/11kV 5MVA Tr III	Nil	Isolator alignment problem and oil filtration		Substation	Shutdown	Work permit No. 71 issued to Mrs. Rinchen Zangmo, Sr. Engineer of SMD Pling to carry out HV isolator alignment problem and to perform oil filtration.
3	05.06.2021	11:36	05.06.2021	13:50	2	0.18	66/33/11kV 5MVA Tr III	Nil	Isolator alignment problem		Substation	Shutdown	Work permit No. 72 issued to Mrs. Rinchen Zangmo, Sr. Engineer of SMD Pling to carry out HV isolator alignment problem on 5MVA 66/33kV transformer-III.
4	07.06.2021	18:10	07.06.2021	20:33	2	1.16	66kV Chukha -Pling Line	Black out	Rectificatin of isolator alignment.		Substation		For rectification of 5MVA transformer-III HV side isolator alignment.
5	08.06.2021	12:17	08.06.2021	12:33	0	1.58	66kV Chukha -Pling Line	Black out	Rectificatin of isolator alignment.		Substation		For rectification of 5MVA transformer-III HV side isolator alignment.
6	17.06.2021	12:52	23.06.2021	11:30	372	1.6	5MVA 66/11kV Tr-II	Nil	Oil filtration		Substation	Shutdown	Work permit No. 76 issued to Mrs. Rinchen Zangmo Sr. Engineer of SMD Pling for transformer oil filtration.
7	20.06.2021	18:08	20.06.2021	18:40	0	1.48	66kV Chukha -Pling Line	Black out	Rectificatin of isolator alignment.		Substation		For rectification of 5MVA transformer-III HV side isolator alignment.
8	21.06.2021	12:27	26.06.2021	14:35	122	0.34	8MVA 66/33kV Tr	Nil	Oil filtration		Substation	Shutdown	Work permit No. 77 issued to Mrs. Rinchen Zangmo Sr. Engineer of SMD Pling for transformer oil filtration.
9	23.06.2021	11:17	27.06.2021	16:57	101	0.79	5MVA 66/11kV Tr-I	Nil	Oil filtration		Substation	Shutdown	Work permit No. 78 issued to Mrs. Rinchen Zangmo Sr. Engineer of SMD Pling for transformer oil filtration.
10	26.06.2021	14:30	27.06.2021	11:58	21	0.43	66/33/11kV 5MVA Tr III	Nil	Oil filtration		Substation	Shutdown	Work permit No 79 issued to. Mrs Rinchen Zangmo, Sr Engineer for oil filtration on OLTC.
11	30.06.2021	2:06	30.06.2021	2:10	0	0.51	66kV Chukha -Pling Line	Black out			line		Supply charged from Phuntsholing end.
(E) 66/33/11 kV Gomtu Substation													
1	30.06.2021	2:06	30.06.2021	02:41	0	-0.301	Dhamdum	Whole Gomtu	NA	NA	Gomtu Sub Station		Supply failed from Dhamdum Sub Station.
2	30.06.2021	2:06	30.06.2021	12:08	10	0.24	Gomtu-P/Ling	Nil	Over Current	IDMTL Over Current 51AX,51BX,51CX	Gomtu Sub Station		Y phase conductor between Wave trap and Line isolator burned to dead.
(F) 220/66/33 kV Dhamdum Substation													
220kV													
1	05.06.2021	20:37	05.06.2021	20:46	0	-6.74	220 kV Singyegoan	N/A	Transient fault	REL670:General trip,Zone-1, R Ph	N/A	N/A	220kV singyegoan feeder tripped from both the end and charge at 20:46hrs as per the clearance given by BPSO, T/phu. Dist. Showing :19.56km and 48.90% and C/B Closed from Malbase end at 21.07 hrs.
2	30.06.2021	2:06	30.06.2021	2:41	0	0.25	66kV Gomtu feeder	Gomtu	Transient fault	REF615=DIR.O/C 67 Trip. R,Y,B Ph fault.	N/A	N/A	66kV Gomtu Feeder feeder tripped at both the ends at 02:06hrs and charged at 02:41 hrs as per the charging code No 1280 by Phub Zangmo, BPSO Thimphu.