Bhutan Power Corporation Limited

Bhutan Power System Operator

Thimphu: Bhutan

Transmission System Performance Report

Second Quarterly Report – April to June, 2022

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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.

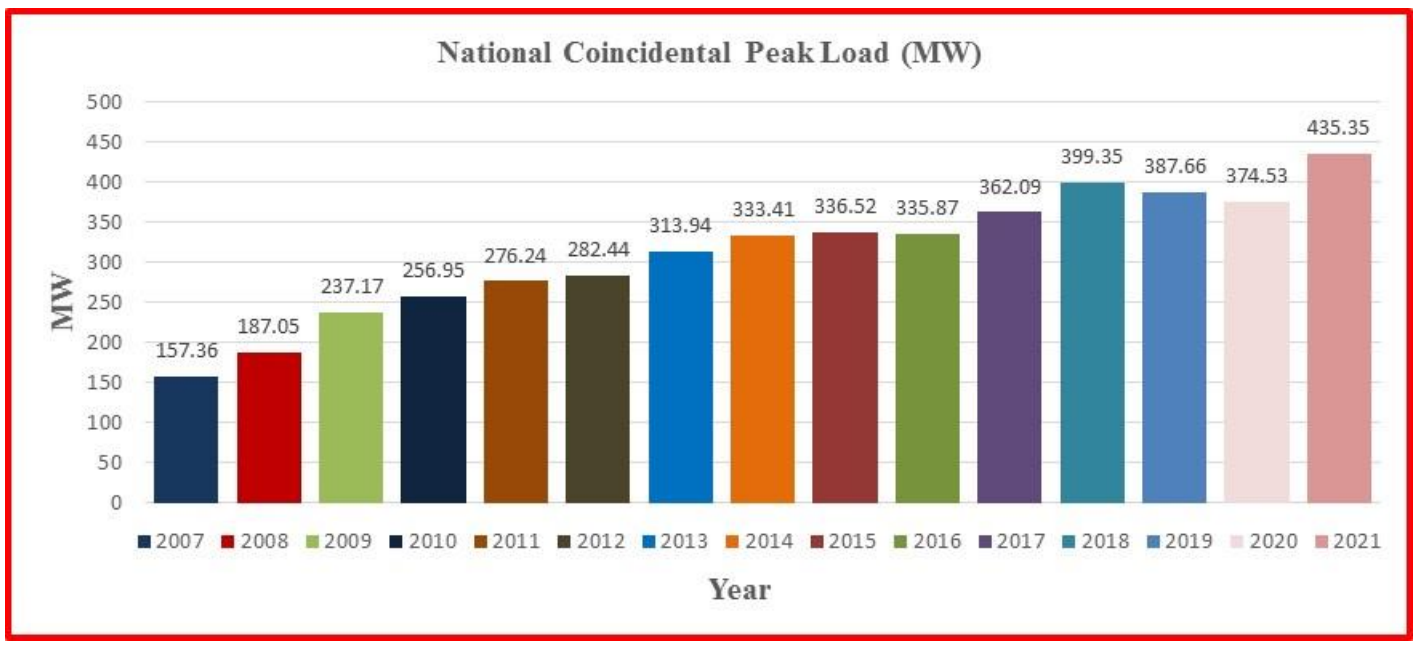
2. National Peak Demand

The national peak demand till now is recorded at **435.35MW** which was occurred on December 26, 2021 at 18:00 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	2021
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	435.35
% 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	16.24

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.

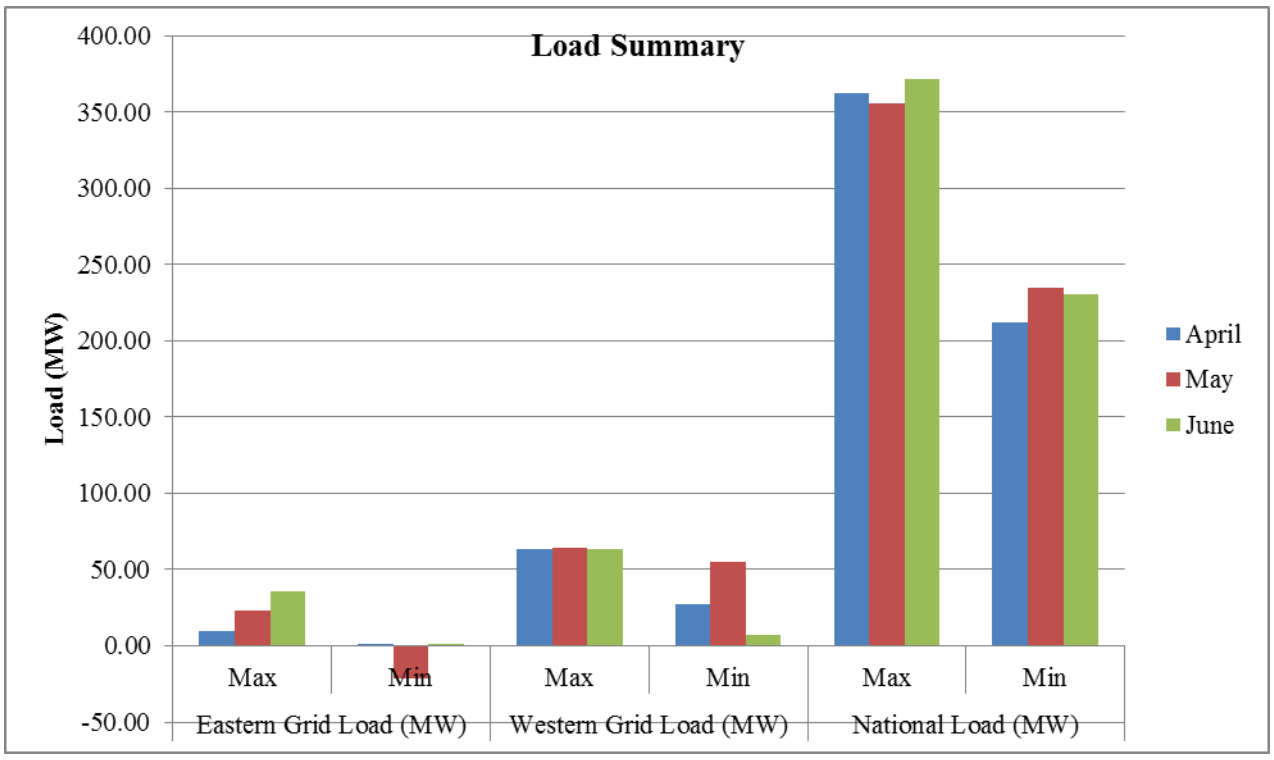
1. **National Demand** = (Sum of all total generation)-(Sum of all Export of Import)
2. **National Demand** = (Sum of all feeders loading at hydropower station) – (Sum of all Export/Import)
3. **National Demand** = (Sum of all substation loading)

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	9.53	0.30	63.12	27.17	362.47	212.23
May	22.75	-21.23	63.93	55.30	355.46	234.94
June	35.82	1.38	63.21	6.77	371.44	230.67

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



The national load pattern for the month of January to March, 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	208.14100000	205.80600000	380.87745783
May	213.19200000	210.71200000	385.19547833
June	385.34000000	380.58300000	402.68335091

Graph 3.1.1. Total Energy (MU) consumed

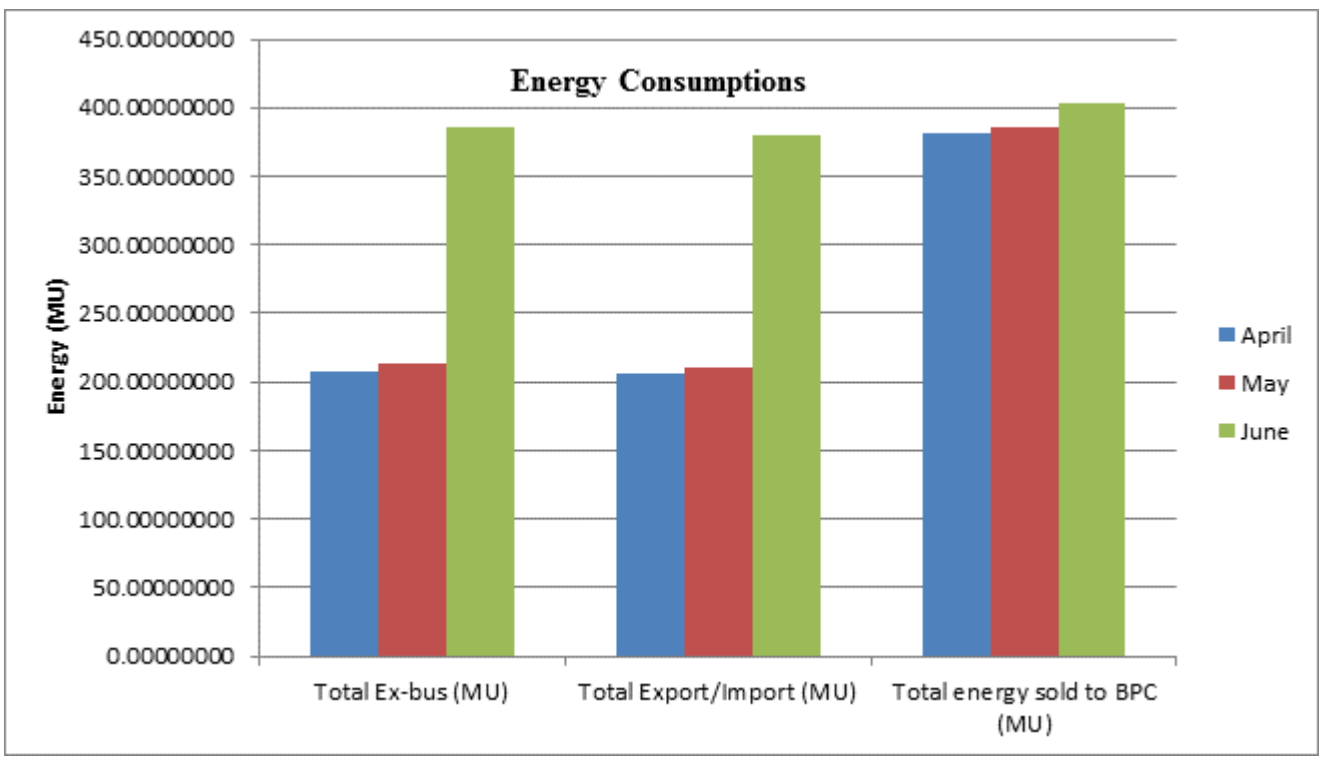
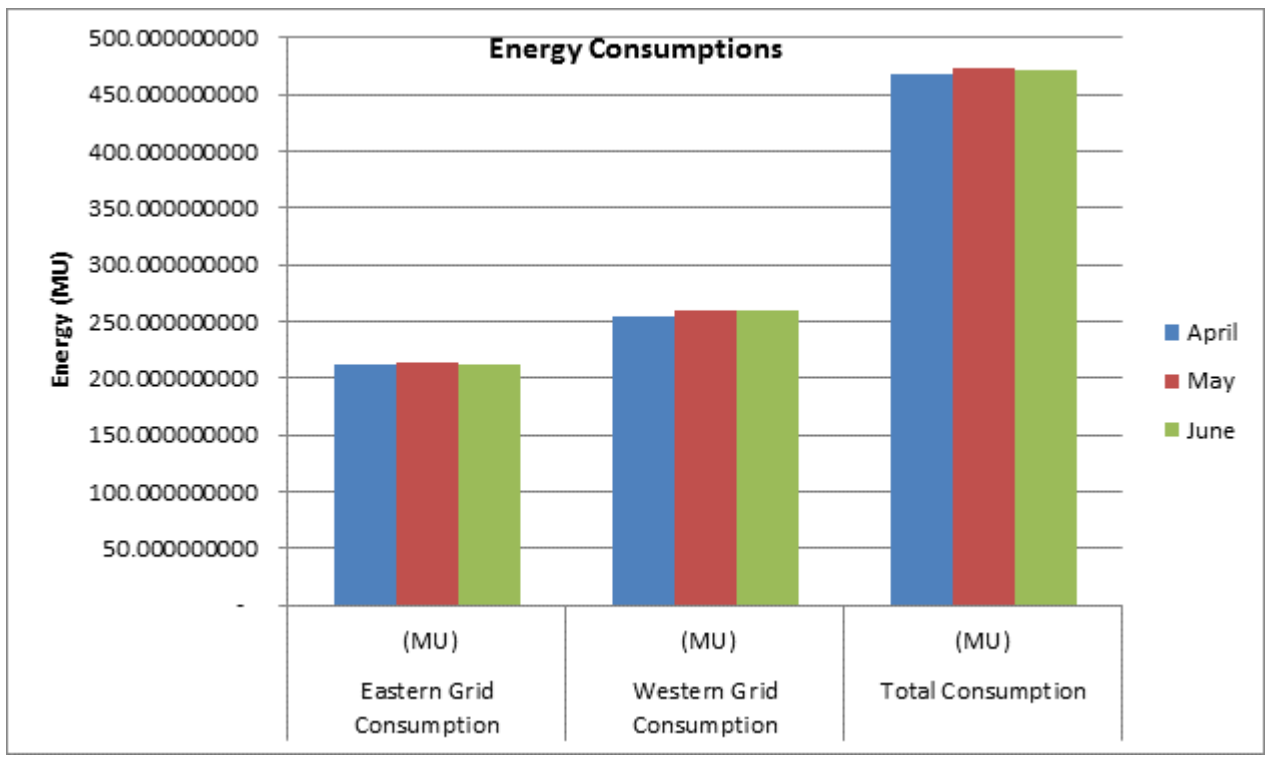


Table 3.1.2. Energy (MU) consumed

Grid	Eastern Grid Consumption	Western Grid Consumption	Total Consumption
Month	(MU)	(MU)	(MU)
April	212.689745905	254.978052	467.6677983
May	213.991283042	259.682439	473.6737223
June	212.41353811	259.234365	471.647903

Graph 3.1.2. Energy (MU) consumed



4. Performance of generating plants

4.1. Power and Energy Generation

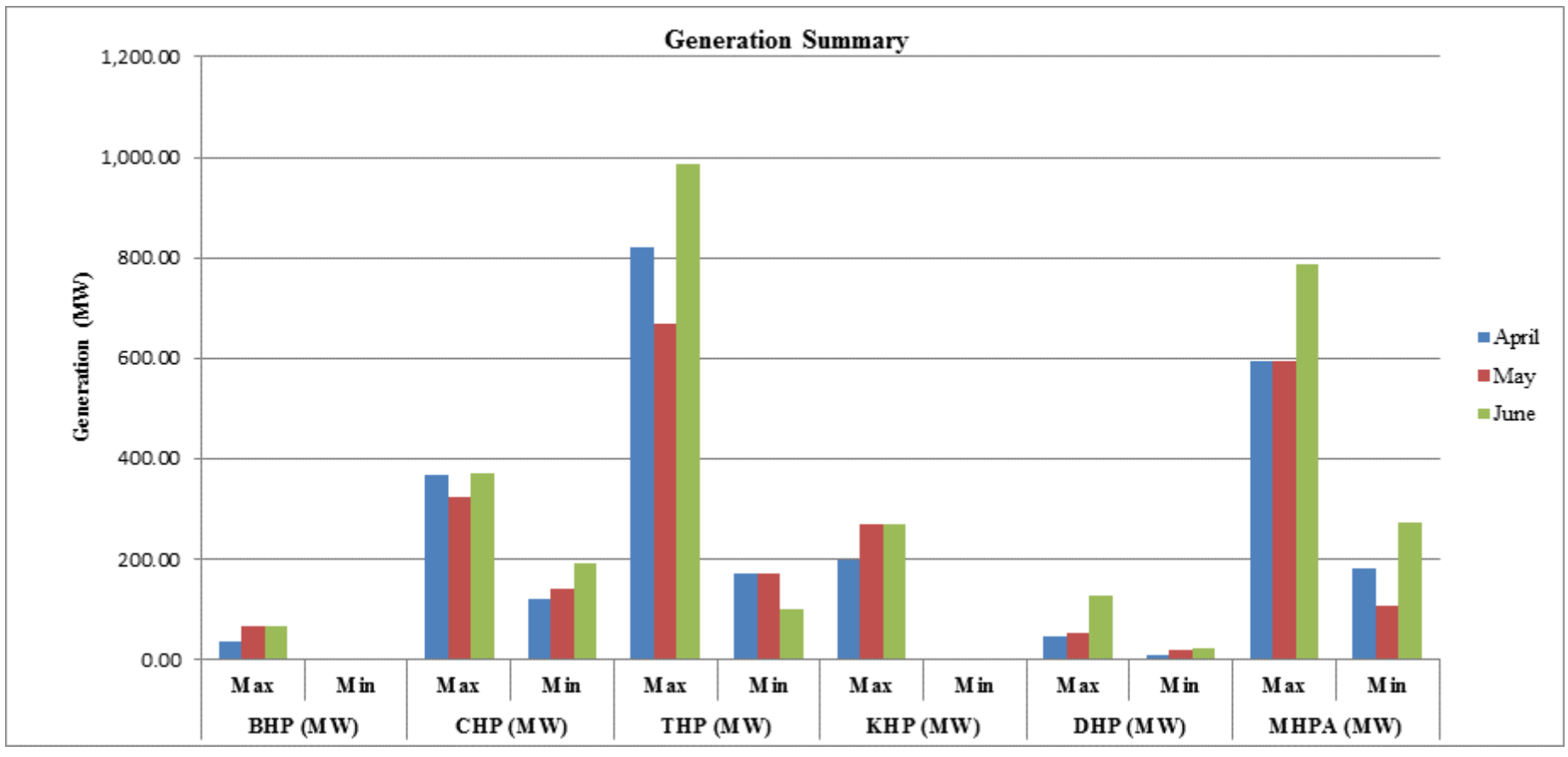
The maximum total generation for the second quarter of year 2022 was 2,606.79 MW in month of June and minimum generation was 1,976.46 MW in the May month.

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	33.92	0.00	368.16	120.51	820.00	170.00	196.45	0.00	45.98	7.70	595.22	181.18	2,059.73	479.39
May	65.46	0.00	324.25	139.73	670.00	170.00	270.23	0.00	53.38	17.97	593.15	105.79	1,976.46	433.49
June	66.64	0.00	369.94	192.13	988.00	100.00	269.59	0.00	126.92	22.7	785.70	271.01	2,606.79	585.84

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, 2022 is attached as

Annexure-I.

4.2.Plant Capacity Factor

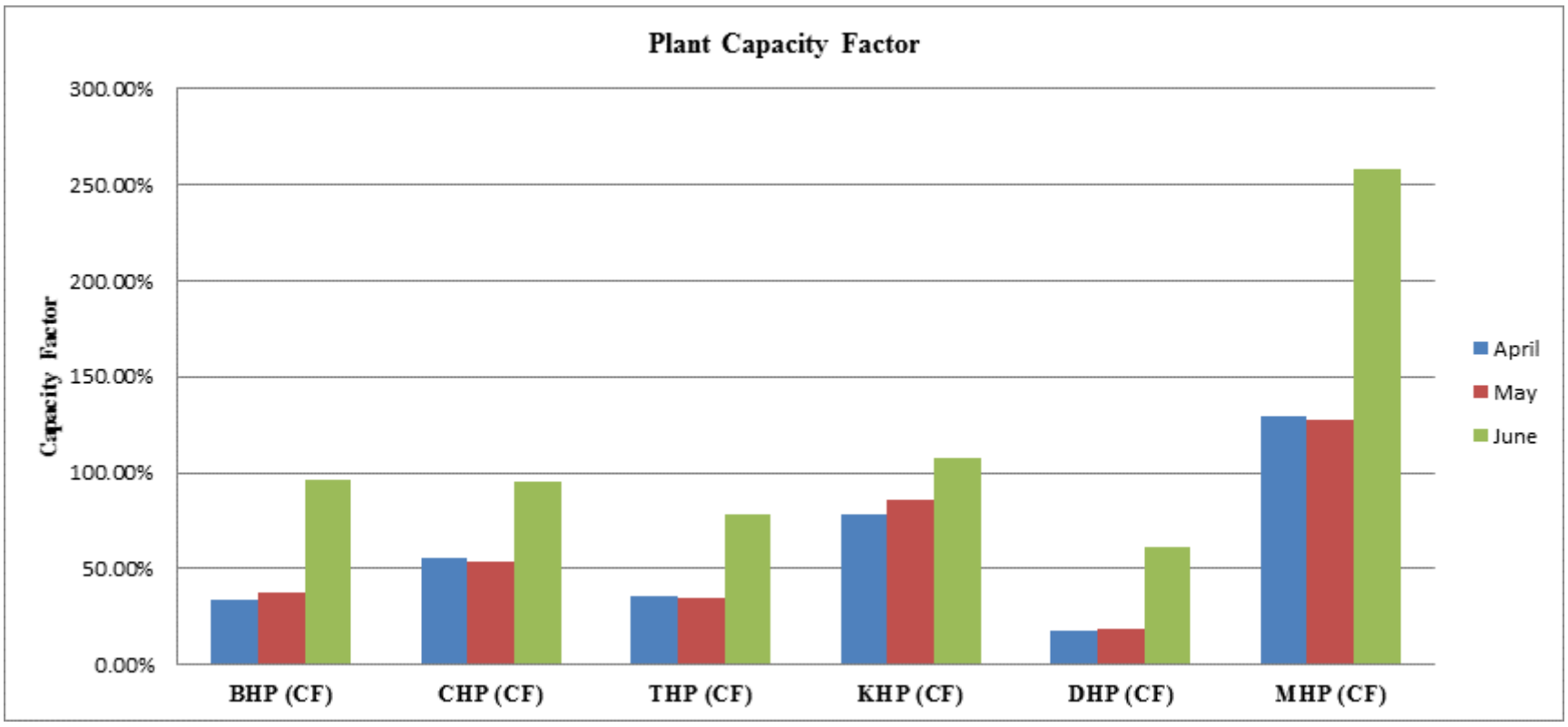
The capacity factor of each generating plant was calculated as below:

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

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	15.62907	33.92%	133.46037	55.17%	264.783273	36.05%	33.939677	78.56%	16.36	18.04%	672.32	129.69%
May	17.85887	37.51%	134.15193	53.66%	263.17964	34.68%	38.233571	85.65%	17.764692	18.95%	684.38069	127.76%
June	44.15511	95.82%	231.57191	95.72%	576.23127	78.46%	46.474033	107.58%	55.33	60.99%	1,339.10	258.31%
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 2022 was 1,108.54 MW in the month of June to Binaguri substation in India. The minimum export recorded was 56.48 MW to Salakoti & 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	256.45	0.55	194.13	0.30	56.48	0.18
May	325.09	0.09	159.78	0.28	67.16	1.55
June	1,108.54	8.00	310.42	31.91	96.56	50.16

Graph 5.1. Export of electricity to India

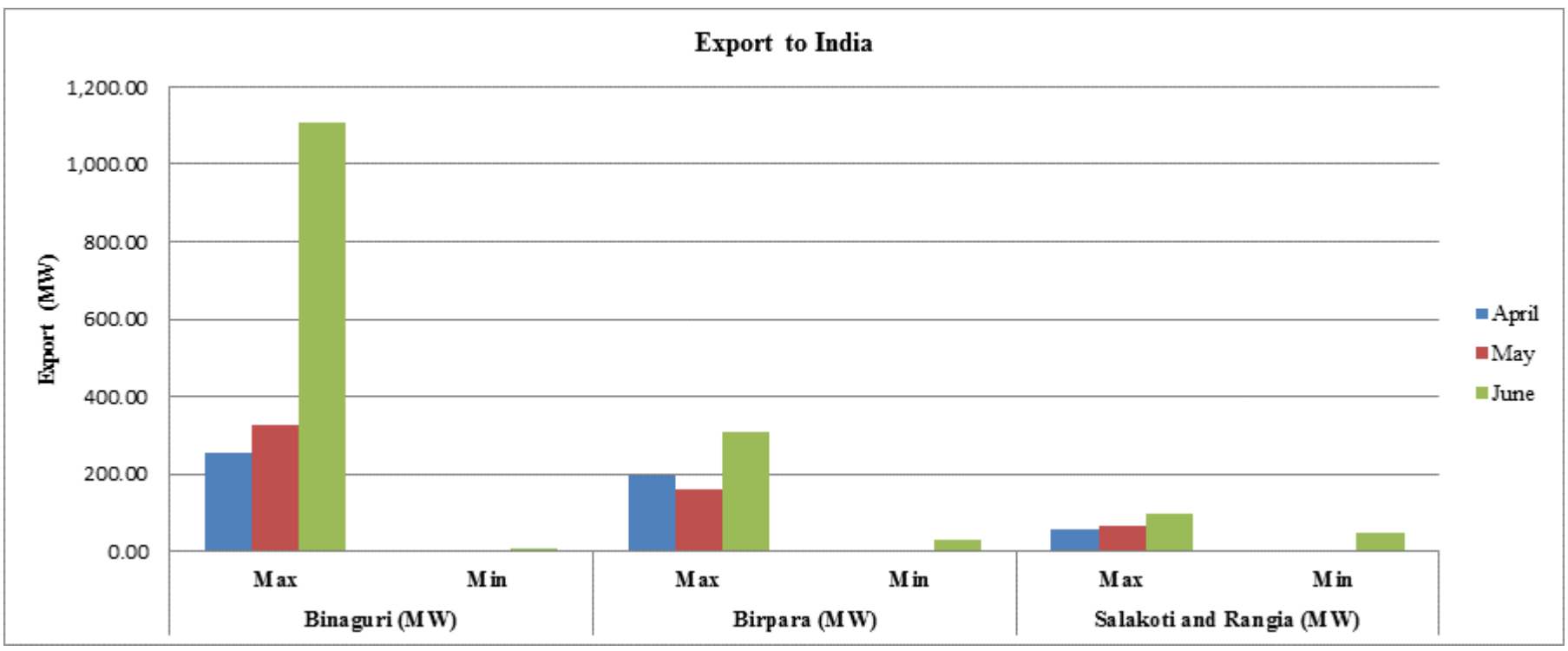
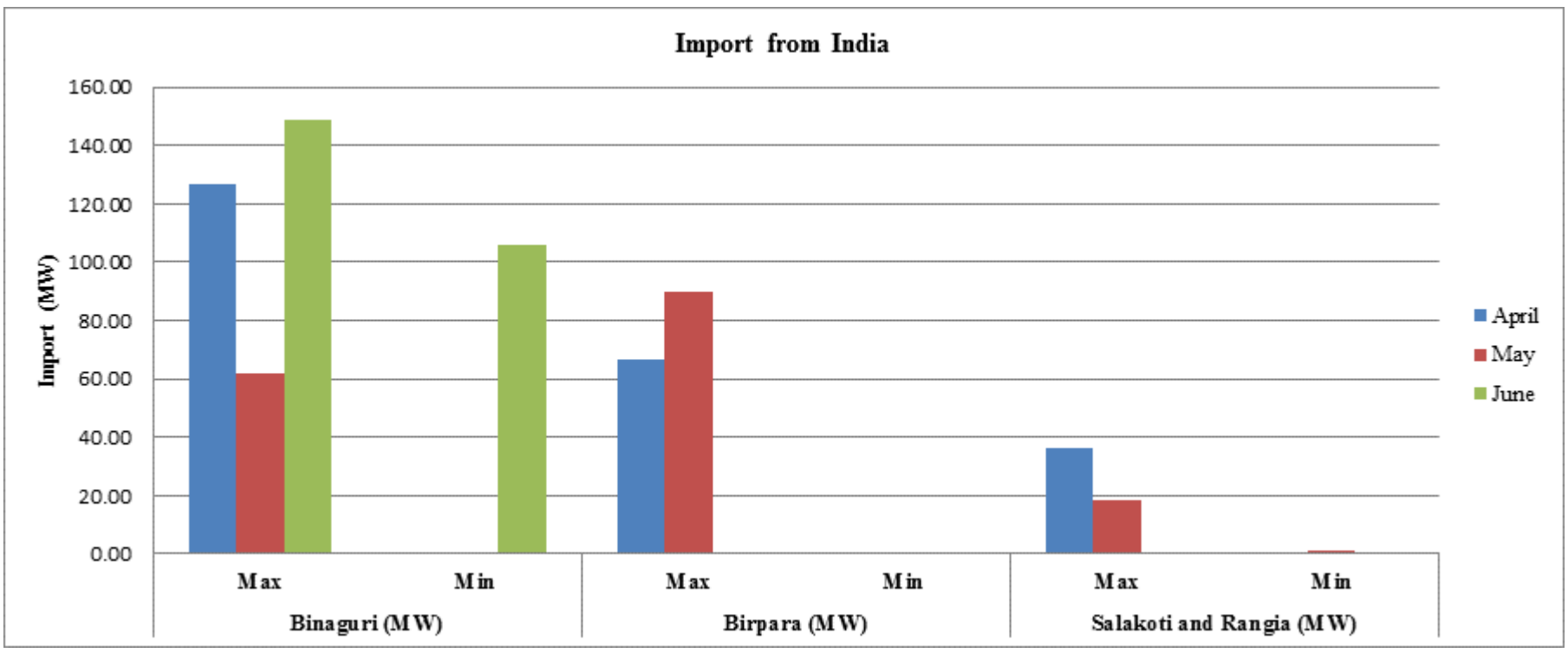


Table 5.2. Import of electricity from India.

Import From	Binaguri (MW)		Birpara (MW)		Salakoti and Rangia (MW)	
Month	Max	Min	Max	Min	Max	Min
April	127.00	0.40	66.36	0.02	36.52	0.37
May	62.18	0.09	90.15	0.01	18.53	1.00
June	149.00	106.00	0.00	0.00	0.00	0.00

Graph 5.2. Import of electricity to India



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, 2022

Table 6.1.1. Bus Frequency profile of Semtokha Substation

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

Graph 6.1.1. Bus Frequency of Semtokha Substation

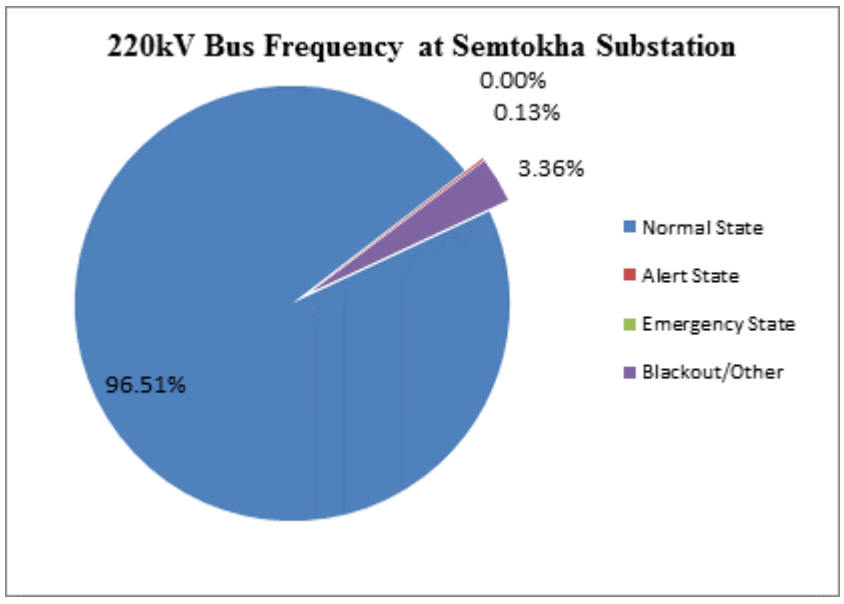
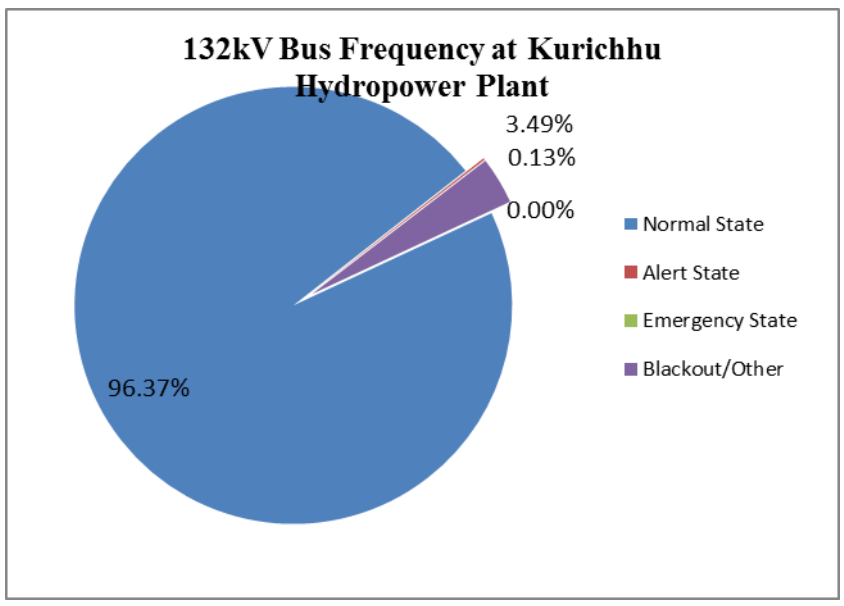


Table 6.1.2. Bus frequency of Kurichhu Hydro Power Plant

Sl. No.	Operating State	Frequency
1	Normal State	96.37%
2	Alert State	0.13%
3	Emergency State	0.00%
4	Blackout/Other	3.49%

Graph 6.1.2. Bus frequency of Kurichhu Hydro Power Plant



In the month of April, 2022, the Western grid was have managed to operate at normal operating range of 96.51% and deviated 0.13% to Alert state and 3.36% to Blackout/other and Eastern grid was maintained at normal operating range of 96.37% and deviated 0.13% to Alert State and 3.49% to blackout/other.

6.2.Frequency for the month of May, 2022

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

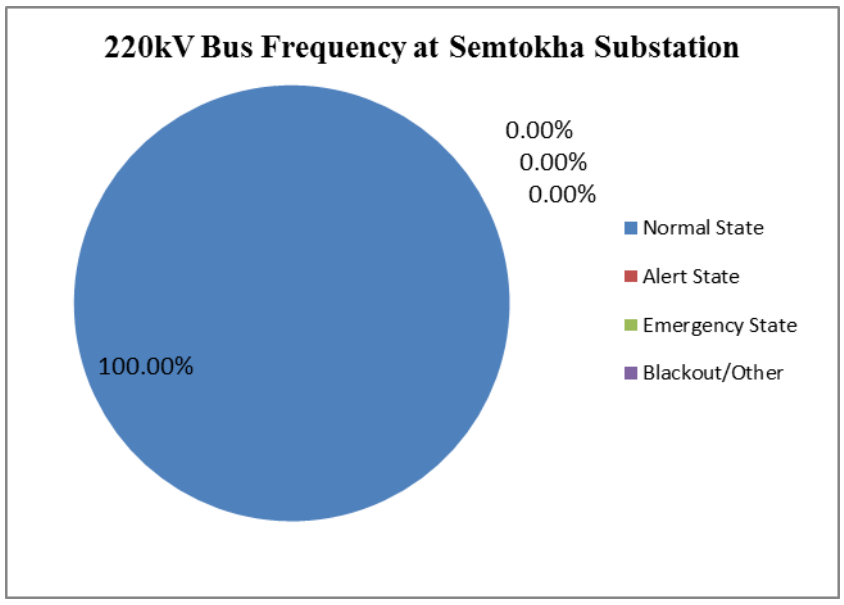
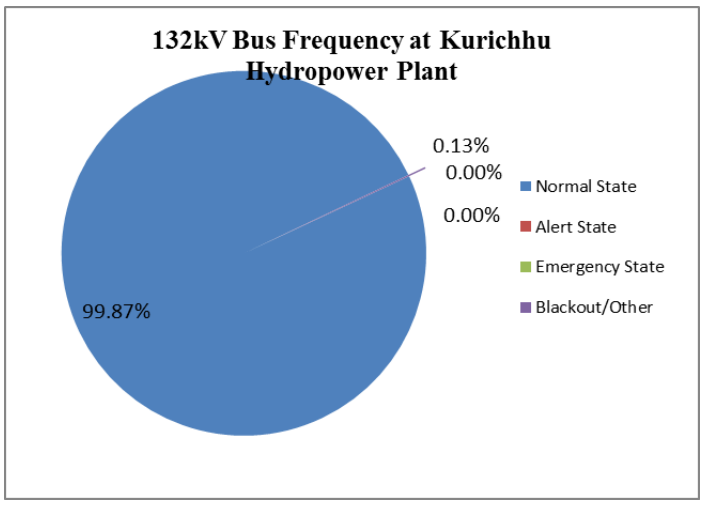


Table 6.2.2. Bus frequency of Kurichhu Hydro Power Plant

Sl. No.	Operating State	Frequency
1	Normal State	99.87%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	0.13%

Graph 6.2.2. Bus frequency of Kurichhu Hydro Power Plant



In the month of May, 2022, the western grid frequency was maintained at 100% operating range and Eastern grid was maintained 99.87% in normal operating range and deviated 0.13% to Blackout/other.

6.3.Frequency for the month of June, 2022

Table 6.3.1. Bus frequency of Semtokha Substation

Sl. No.	Operating State	Frequency
1	Normal State	96.64%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	3.36%

Graph 6.3.1. Bus frequency of Semtokha Substation

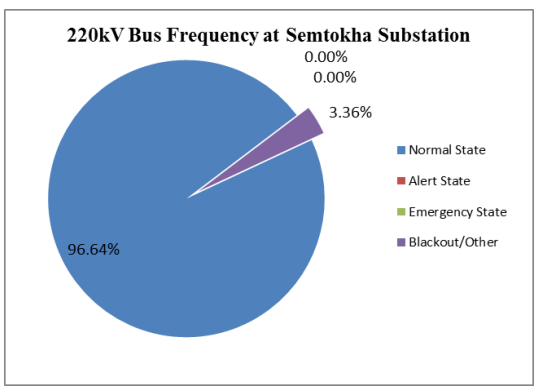
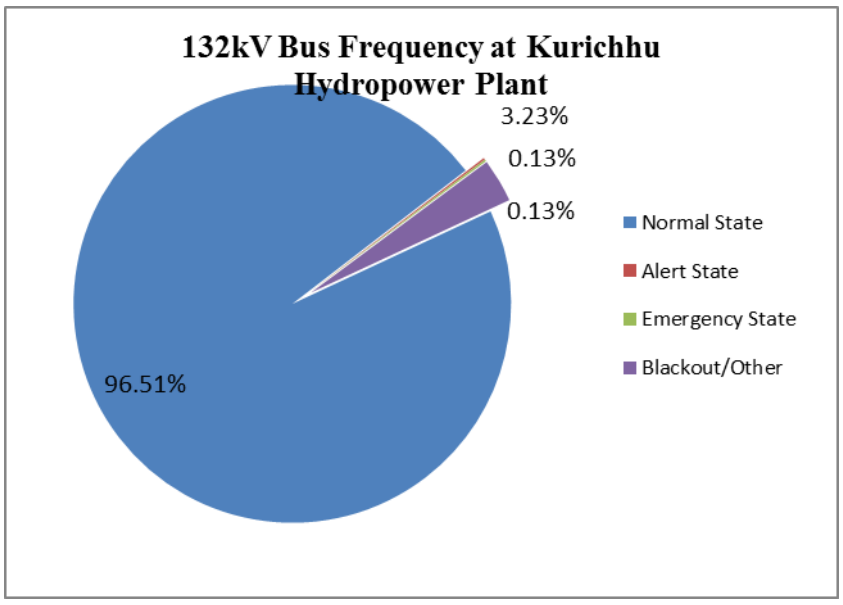


Table 6.3.2. Bus frequency of Kurichhu Hydro Power Plant

Sl. No.	Operating State	Frequency
1	Normal State	96.51%
2	Alert State	0.13%
3	Emergency State	0.13%
4	Blackout/Other	3.23%

Graph 6.3.2. Bus frequency of Kurichhu Hydro Power Plant



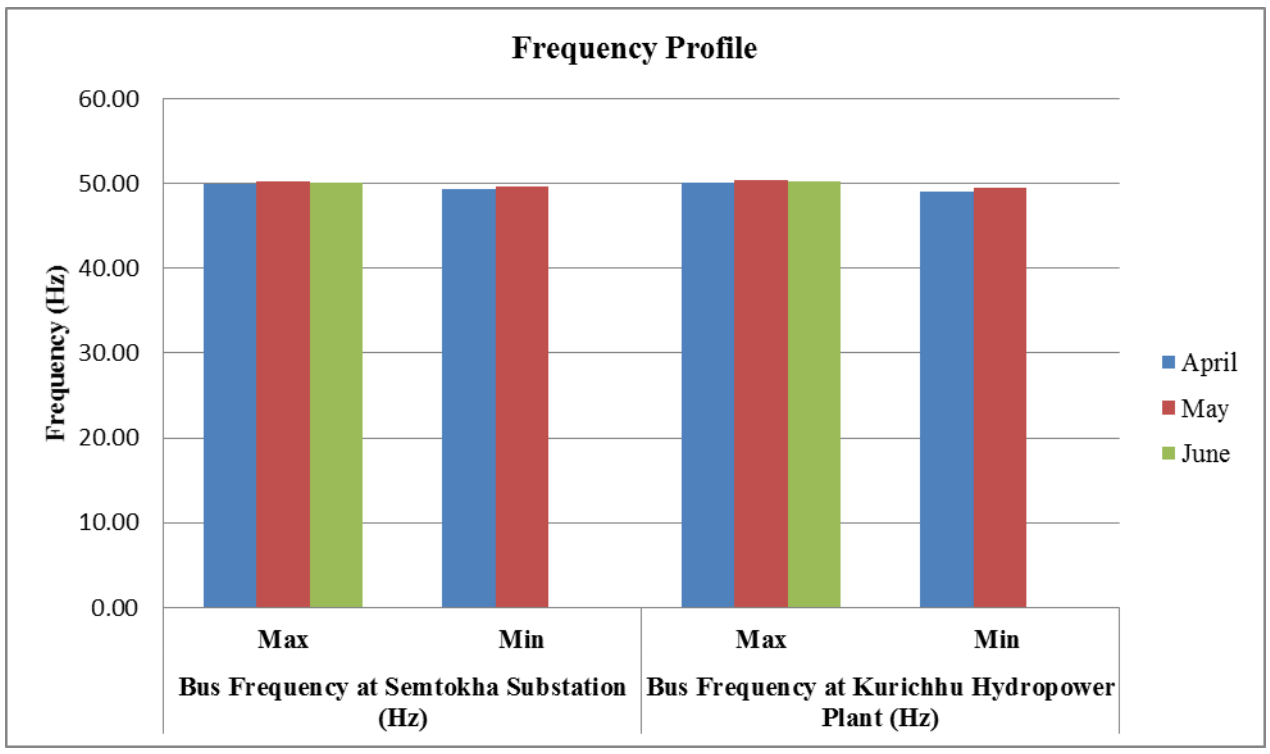
6.4.In the month of June, 2022, the western grid frequency was maintained at normal operating range of 96.64% and deviated 3.36% to Blackout/other whereas Eastern grid was maintained at normal operating range of 96.51% and deviated 0.13% to Alert and Emergency State and 3.23% to Blackout/other.

6.5.Frequency Summary for the month of April to June, 2022

Table 6.4.1. Frequency summary for the month of April to June, 2022.

Substation/Plant	Bus Frequency at Semtokha Substation (Hz)		Bus Frequency at Kurichhu Hydropower Plant (Hz)	
Month	Max	Min	Max	Min
April	50.00	49.40	50.13	49.00
May	50.20	49.60	50.35	49.52
June	50.10	0.00	50.26	0.00

Graph 6.4.1. Frequency summary for the month of April to June, 2022



Daily maximum, minimum and average Frequency of Semtokha substation in western grid and Kurichhu Hydro Power Plant in eastern grid for the month of April to March, 2022 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.

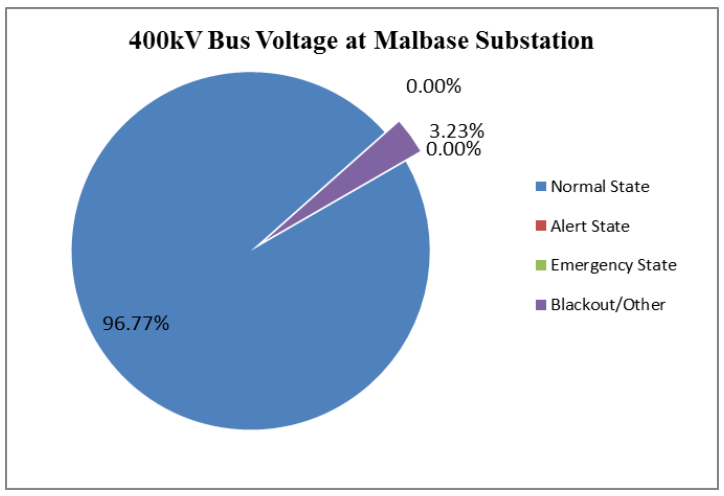
Due to the location of 400/22/66/11kV Malbase substation in western grid and 132/33/11kV Nangkhor substation in the eastern grid, the voltage profile of these substations are considered.

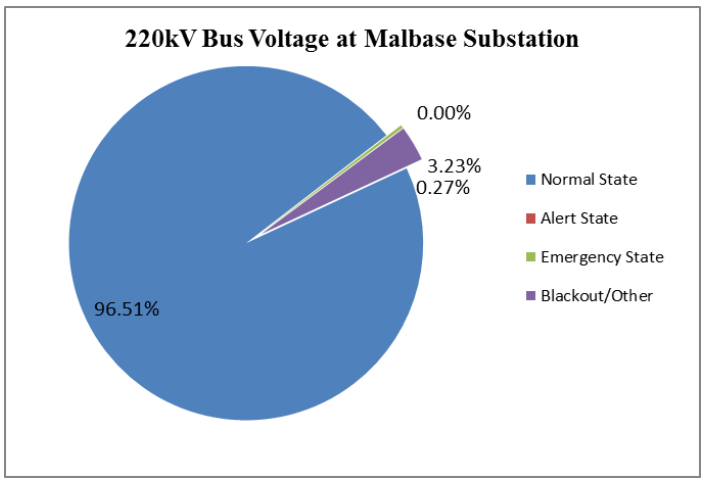
7.1.Voltage profile for the April, 2022

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	96.77%	96.51%	96.64%
2	Alert State	0.00%	0.00%	0.00%
3	Emergency State	0.00%	0.27%	0.13%
4	Blackout/Other	3.23%	3.23%	3.23%

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





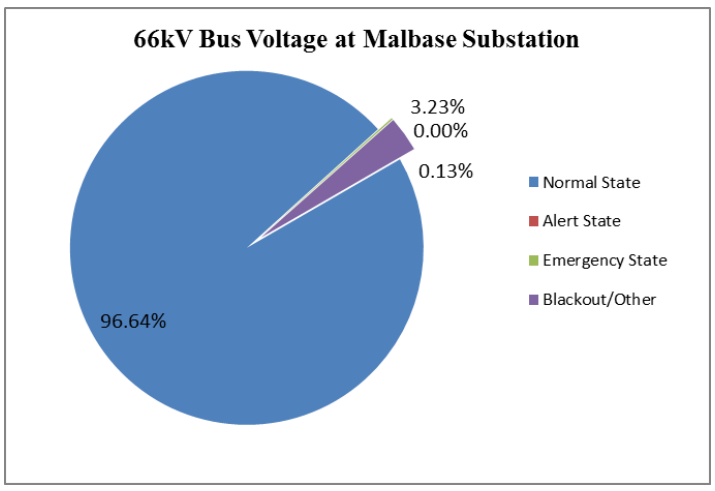
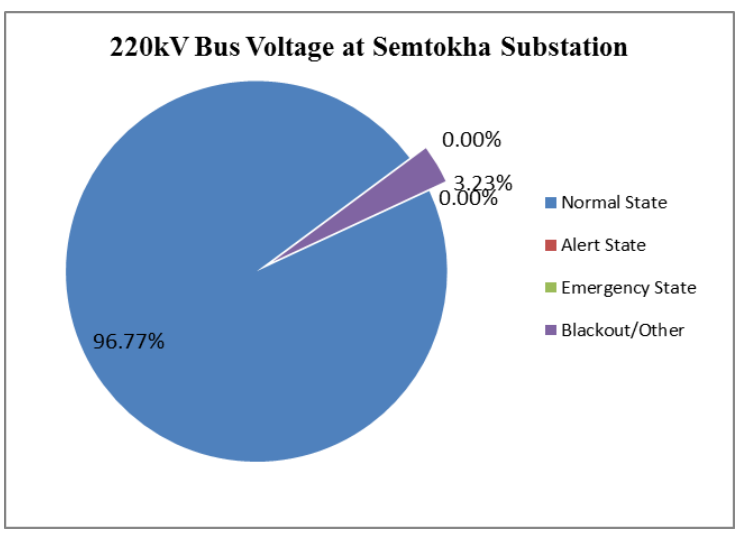


Table 7.1.2. Voltage Profile of 220/66/11kV Semtokha Substation

Sl. No.	Operating State	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	96.77%	96.64%
2	Alert State	0.00%	0.00%
3	Emergency State	0.00%	0.13%
4	Blackout/Other	3.23%	3.23%

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



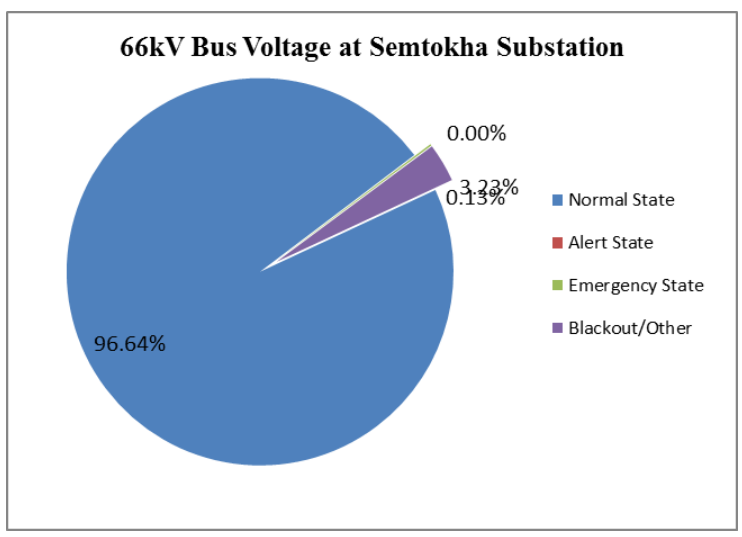
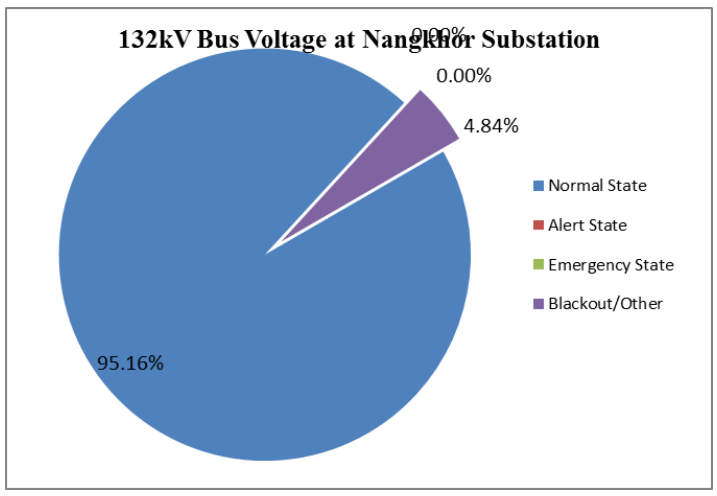


Table 7.1.3. Voltage Profile of 132/33/11kV Nangkhor Substation

Sl. No.	Operating State	132kV Bus Voltage
1	Normal State	95.16%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	4.84%

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

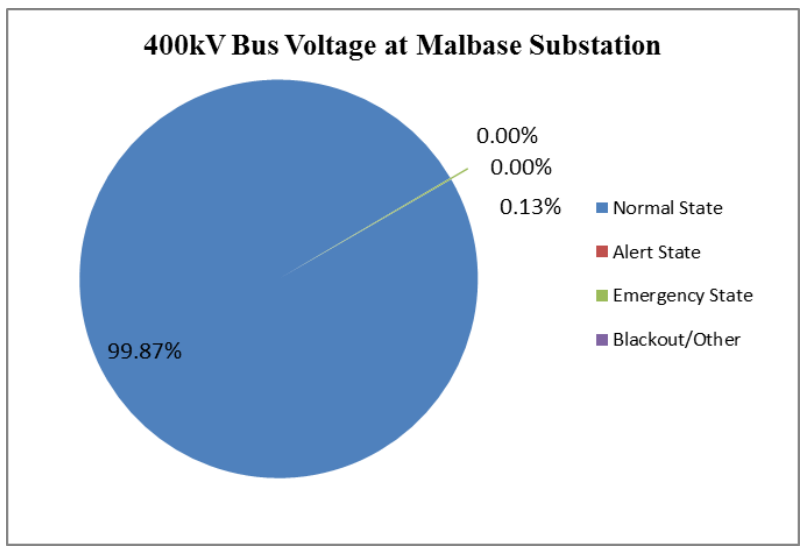


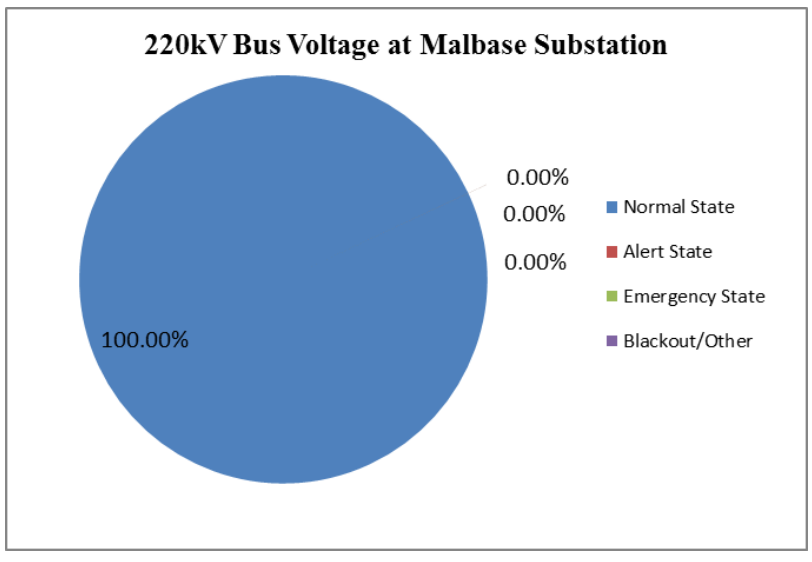
7.2.Voltage Profile for month of May, 2022

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	99.87%	100.00%	100.00%
2	Alert State	0.00%	0.00%	0.00%
3	Emergency State	0.13%	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





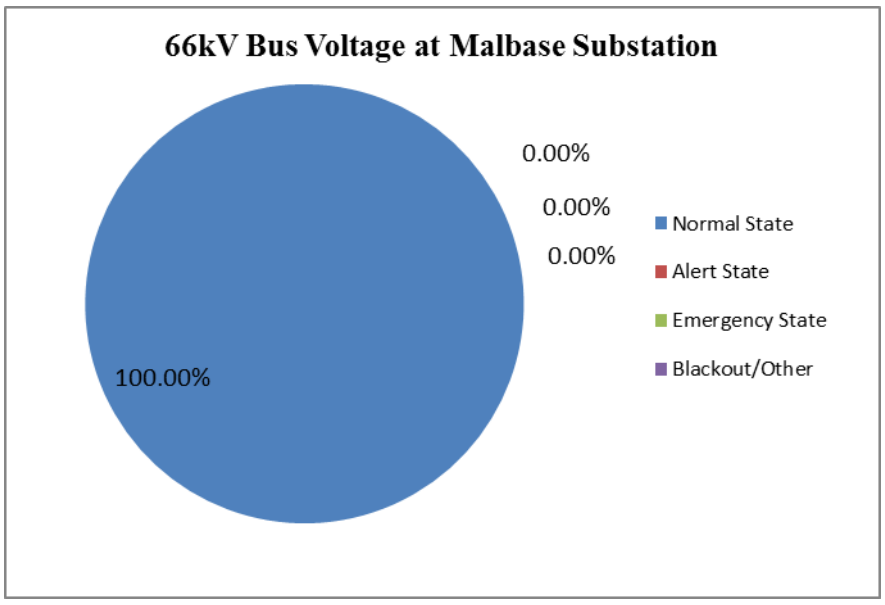
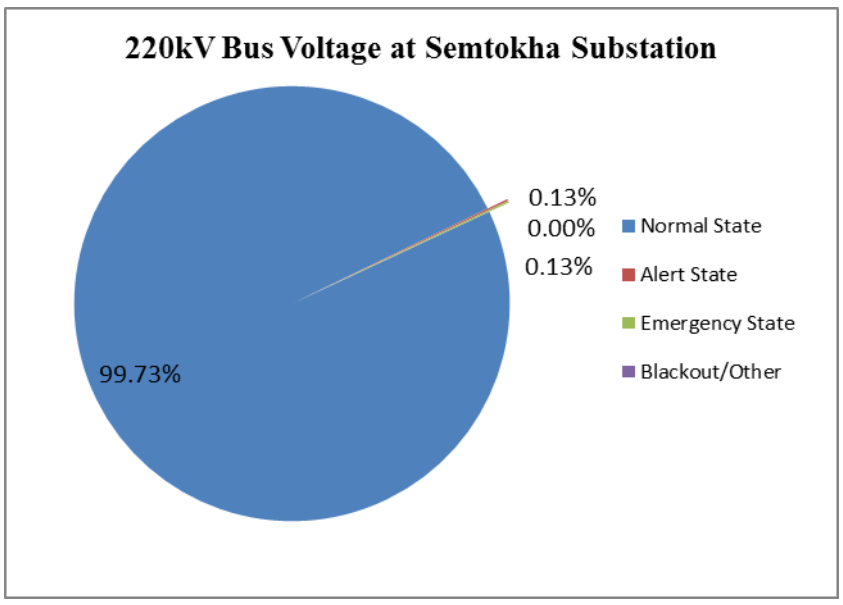


Table 7.2.2. Voltage Profile of 220/66/11kV Semtokha Substation

Sl. No.	Operating State	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	99.73%	99.73%
2	Alert State	0.13%	0.13%
3	Emergency State	0.13%	0.13%
4	Blackout/Other	0.00%	0.00%

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



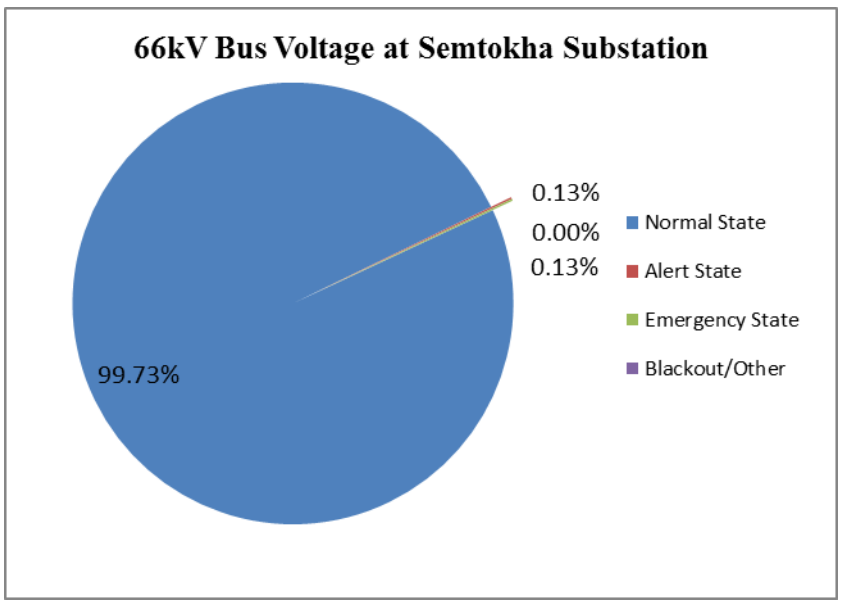
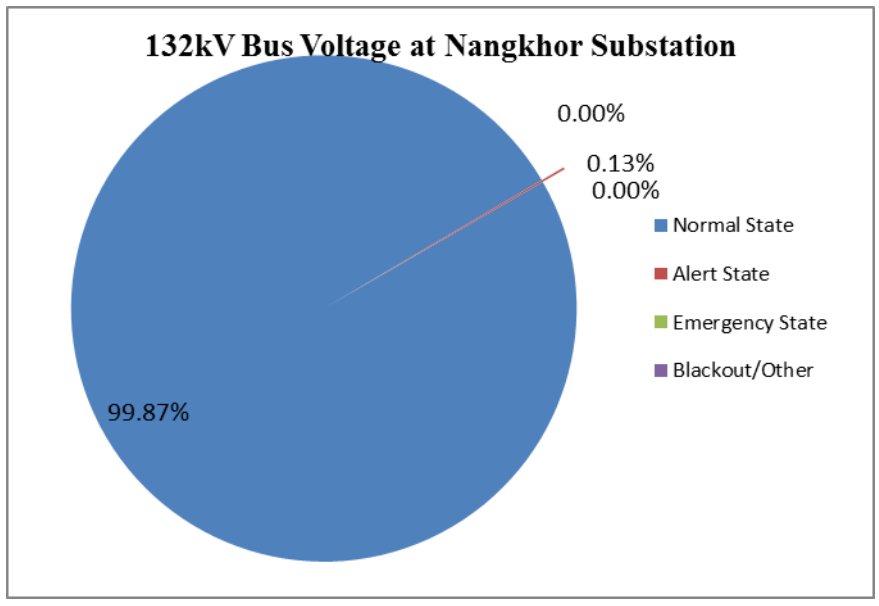


Table 7.2.3. Voltage Profile of 132/33/11kV Nangkhor Substation

Sl. No.	Operating State	132kV Bus Voltage
1	Normal State	99.87%
2	Alert State	0.13%
3	Emergency State	0.00%
4	Blackout/Other	0.00%

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

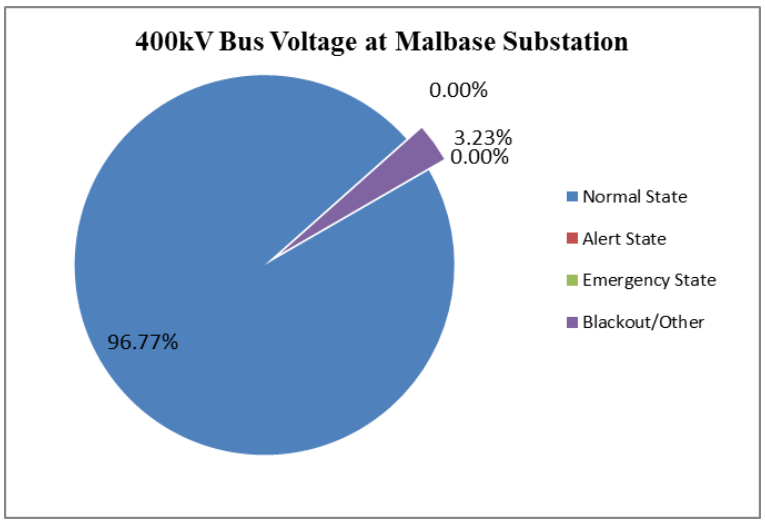


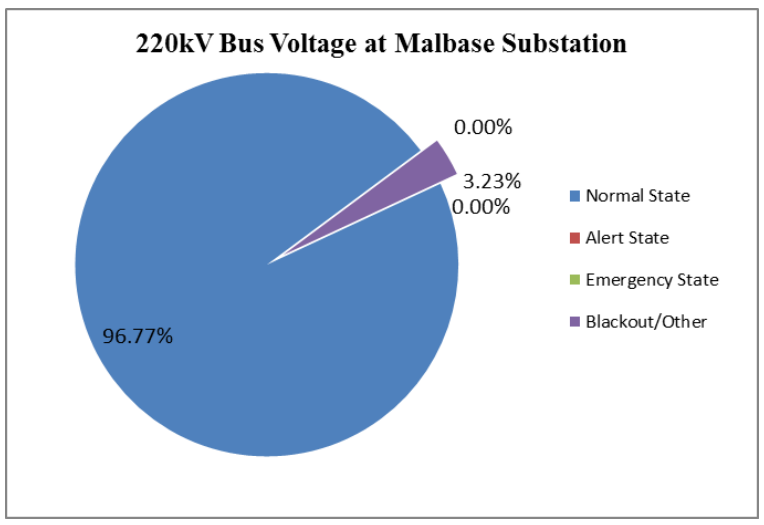
7.3.Voltage Profile for the month of June, 2022

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%	96.77%	96.77%
2	Alert State	0.00%	0.00%	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





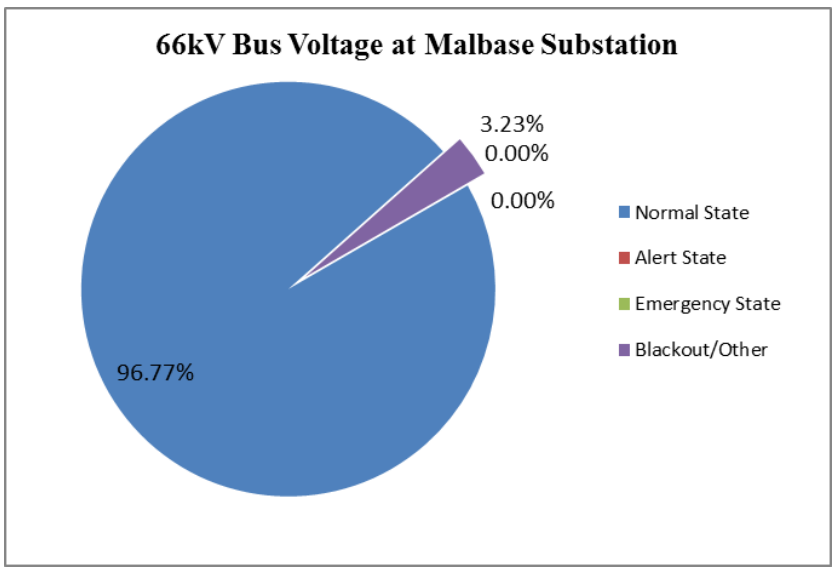
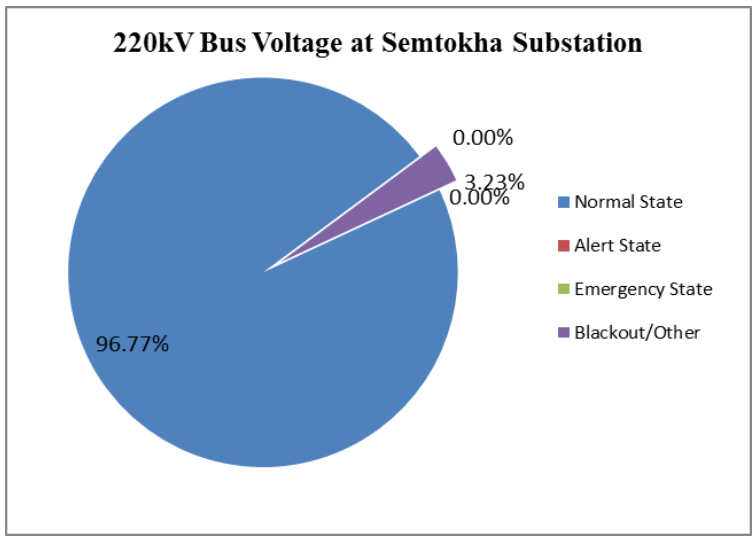


Table 7.3.2. Voltage Profile of 220/66/11kV Semtokha Substation

Sl. No.	Operating State	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	96.77%	96.64%
2	Alert State	0.00%	0.00%
3	Emergency State	0.00%	0.00%
4	Blackout/Other	3.23%	3.36%

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



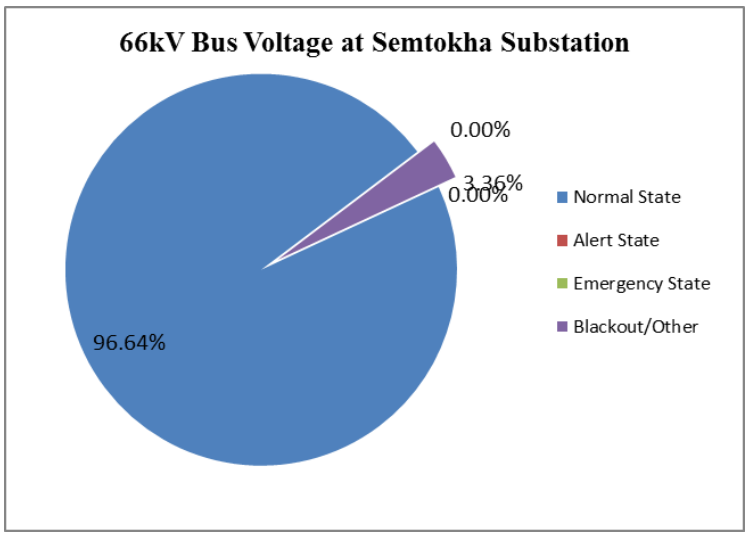
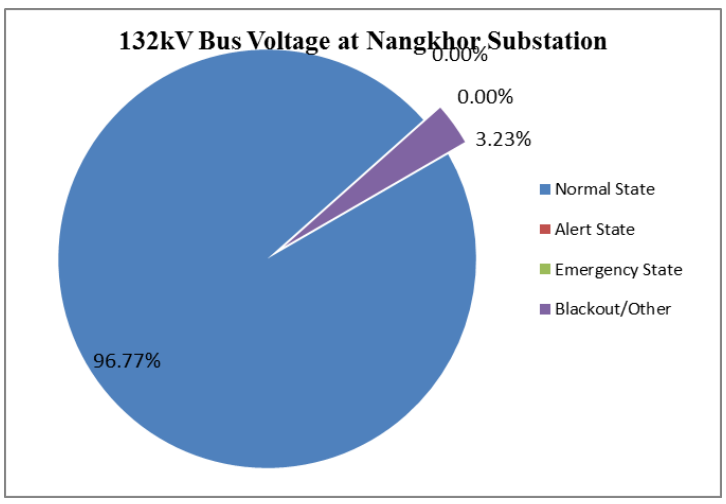


Table 7.3.3. Voltage Profile of 132/33/11kV Nangkhor Substation

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

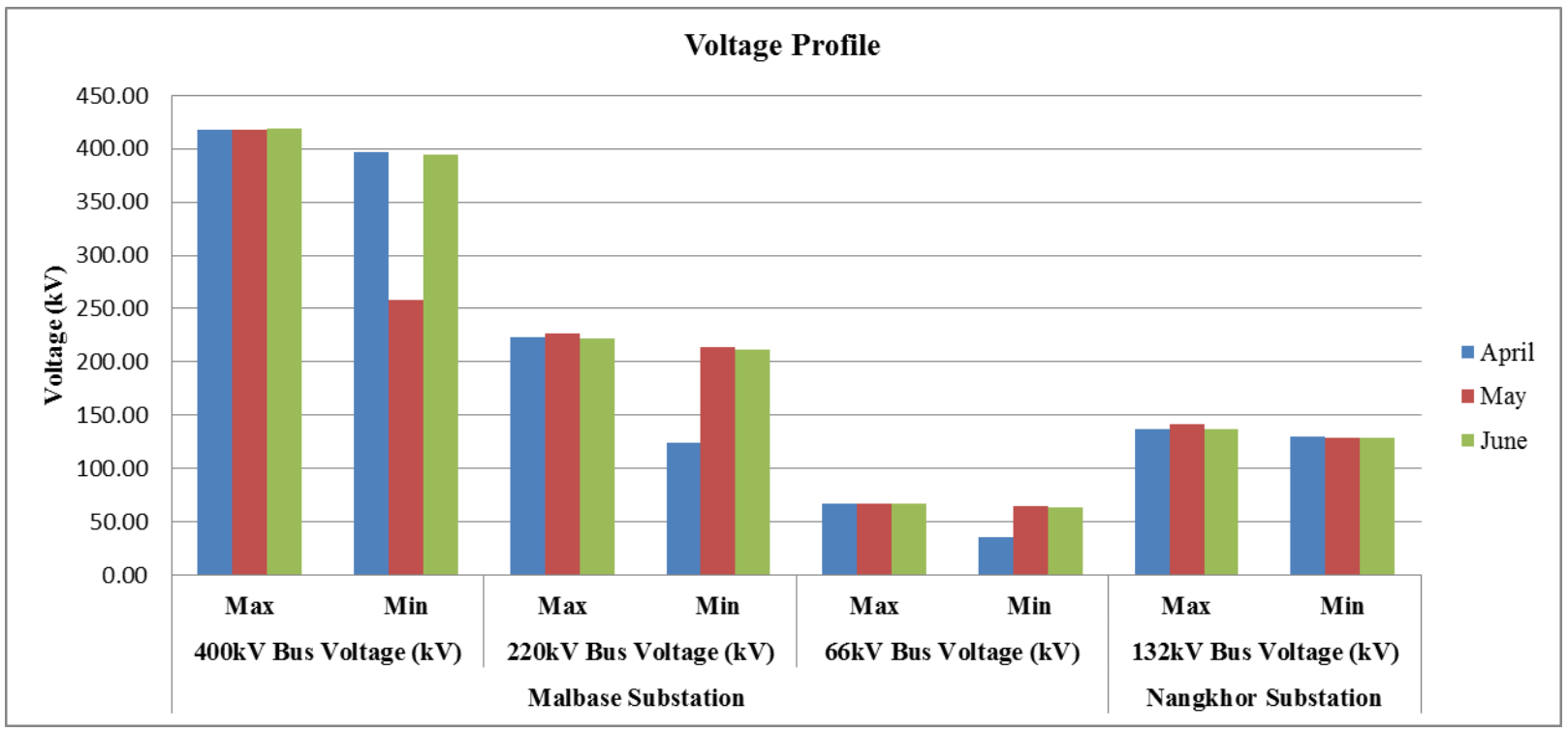


7.4.Voltage Summary for the Month of April to June, 2022

Table 7.4.1. Voltage Summary for the month of April to June, 2022

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	417.50	397.00	223.00	123.50	67.00	35.00	136.61	129.45
May	417.50	258.50	226.00	214.00	67.20	64.00	141.71	128.83
June	419.00	394.24	222.00	210.94	67.00	63.03	136.52	129.02

Graph 7.4.1. Voltage Summary for the month of April to June, 2022



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, 2022 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 very few fault tripping during the first quarter of the year. Almost all the tripping occurred are of transient in nature or temporary fault which have been restored within few minutes/Hours. Few major event occurred during the month of April, The 132/33/11kV Nganglam Substation had a major issue as 132kVNganglam-Motanga Feeder tripped for almost 11hrs due to overvoltage. In the same month the transient trip occurred at 132kV Nganglam feeder at 132/33kV Motanga Substation end which lasted for almost 9hrs. There was a tripping at 400/220/132/33kV Jigmeling Substation due to R&B operated which lasted for almost 25hrs. An event occurred at 132/33kV Tingtibi Substation due to snapping of the conductor which lasted for almost 87hrs. During the month of May 2022 there were major tripping. During the month of June there was one major tripping at 132/33kV Motanga Substation the tripping occurred at 132kV Nganglam feeder due to overcurrent which lasted for almost 21hrs.

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

8.2.Major Outages in Western Grid

During the Second quarter of the year, there was some outage occurred in western grid.

During the month of April one major outage took place at 220/66kV Damdum Station, The 220kV Singeygoan feeder was tripped due to heavy rain with thunder storm and wind which lasted for almost 16hrs. During the month of May there was no major event. During the month of June there was one major event occurred 66kV Phuentsholing Substation the 66kV Malbase – Pling feeder was tripped due to the failure of the supply which lasted for almost 20hrs.

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

9. Annexure

Annexure-I

Table: Generation of April, 2022

Apr-22	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	0.00	0.00	0.00	272.47	171.63	214.44	500.00	330.00	433.92	0.00	0.00	0.00	28.25	23.71	25.69	0.00	No Generation	0.00
2	27.89	7.28	23.08	229.55	169.95	194.12	400.00	300.00	360.83	60.02	40.31	49.92	25.76	23.74	24.88	0.00	No Generation	0.00
3	31.15	17.96	25.32	260.50	168.48	208.68	460.00	272.00	398.75	66.00	60.01	63.23	26.24	24.21	25.51	382.25	372.17	252.79
4	0.00	23.81	31.16	368.16	231.18	307.20	748.00	450.00	674.13	66.00	66.00	66.00	31.29	26.78	29.14	446.02	245.37	416.27
5	0.00	17.56	23.66	241.66	186.24	221.83	605.00	320.00	448.96	66.00	66.00	66.00	27.27	24.22	25.59	440.84	215.82	378.31
6	0.00	20.52	22.93	235.19	183.98	195.45	480.00	335.00	386.04	65.80	45.47	53.82	30.62	22.72	23.89	339.82	181.18	272.05
7	26.27	21.06	22.22	234.18	165.25	191.87	450.00	260.00	389.79	60.75	49.80	53.52	25.27	23.04	24.10	448.29	270.59	352.87
8	33.92	23.33	32.61	353.56	166.57	273.09	820.00	325.00	563.54	66.00	49.50	63.56	36.99	24.45	31.34	595.22	570.65	582.66
9	31.46	24.47	28.23	306.85	209.17	251.56	650.00	350.00	515.00	66.00	61.37	65.32	32.77	24.99	29.97	570.96	286.30	360.43
10	30.85	24.58	27.06	298.06	221.83	263.60	600.00	420.00	540.21	54.96	40.05	46.61	35.97	25.94	30.10	369.93	220.74	299.47
11	30.81	24.94	26.93	254.61	207.06	235.08	560.00	430.00	494.17	60.85	31.98	47.02	45.98	27.82	33.39	359.65	211.80	281.12
12	26.69	21.73	23.45	228.83	163.78	199.40	530.00	260.00	400.83	54.34	30.50	41.77	27.81	23.93	25.55	310.99	225.40	267.55
13	26.97	19.48	20.84	224.54	165.06	184.81	470.00	350.00	369.33	48.58	30.49	41.64	33.03	22.97	24.04	290.77	205.13	252.83
14	23.22	17.51	20.32	192.71	159.60	172.44	360.00	310.00	340.42	48.92	34.99	42.80	23.47	22.44	22.90	290.20	205.94	252.12
15	20.06	17.25	19.23	181.18	150.07	163.64	360.00	330.00	331.25	49.50	33.00	46.49	22.45	20.04	21.50	291.29	230.60	265.51
16	20.64	18.81	19.88	170.24	158.45	161.47	370.00	250.00	308.75	60.34	40.12	49.01	21.46	19.98	20.80	305.18	215.31	248.35
17	18.58	17.68	18.18	174.03	138.90	154.76	380.00	260.00	315.83	41.92	30.19	36.97	20.97	19.43	20.56	290.03	200.39	238.58
18	17.89	16.74	17.44	182.41	155.28	167.78	370.00	310.00	329.17	39.52	32.02	35.05	20.45	19.22	19.97	300.16	210.66	244.88
19	20.86	16.77	17.19	155.66	145.24	149.03	360.00	290.00	302.08	49.50	30.12	34.88	20.54	19.74	19.99	230.33	200.49	212.99
20	21.32	18.46	19.22	156.48	153.24	155.11	310.00	300.00	300.83	49.21	30.18	34.30	20.15	19.45	19.77	221.39	195.53	202.64
21	18.10	16.44	16.89	155.62	143.75	146.75	310.00	280.00	293.75	35.05	30.12	30.67	19.67	18.93	19.40	219.91	185.54	201.65
22	17.75	16.57	17.13	176.36	137.02	155.24	360.00	265.00	306.25	45.16	29.99	35.78	33.00	19.41	21.84	504.83	185.66	219.32
23	25.92	14.09	17.29	176.16	130.22	149.61	360.00	270.00	301.67	60.34	40.22	50.51	21.37	19.95	20.60	320.07	199.96	261.74
24	17.02	16.61	16.89	150.87	130.36	141.11	290.00	250.00	273.75	42.25	40.09	41.09	27.00	19.46	20.05	260.20	190.10	227.45
25	21.46	15.45	16.67	140.42	129.87	133.85	270.00	250.00	261.25	48.61	33.19	41.97	19.19	18.93	19.04	320.10	220.55	251.05
26	17.13	15.55	15.99	139.96	129.15	131.79	265.00	170.00	245.21	48.79	33.20	42.15	18.96	18.45	18.78	370.72	229.74	287.21
27	22.73	16.20	17.03	140.93	120.51	128.19	265.00	230.00	251.04	61.04	34.99	43.90	19.90	7.70	18.34	359.29	185.27	293.39
28	23.18	16.75	19.42	167.32	140.56	155.07	330.00	280.00	307.92	196.45	131.22	164.87	28.98	17.99	20.80	314.93	220.43	256.66
29	20.86	16.73	17.07	146.52	143.98	144.76	340.00	170.00	298.18	60.26	33.84	40.23	26.76	18.46	19.15	250.15	210.89	242.03
30	21.48	16.69	17.15	155.33	138.60	143.58	280.00	265.00	266.88	66.00	34.70	43.31	29.99	18.94	23.39	269.76	210.84	230.14
31	0.00	No Generati	Error	0.00	No Generati	Error	265.00	265.00	265.00	0.00	No Generati	Error	0.00	No Generati	Error	0.00	No Generation	Error
Max	**33.92**			**368.16**			**820.00**			**196.45**			**45.98**			**595.22**		
Min		**0.00**			**120.51**			**170.00**			**0.00**			**7.70**			**181.18**	

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

Graph: Generation for the month April, 2022

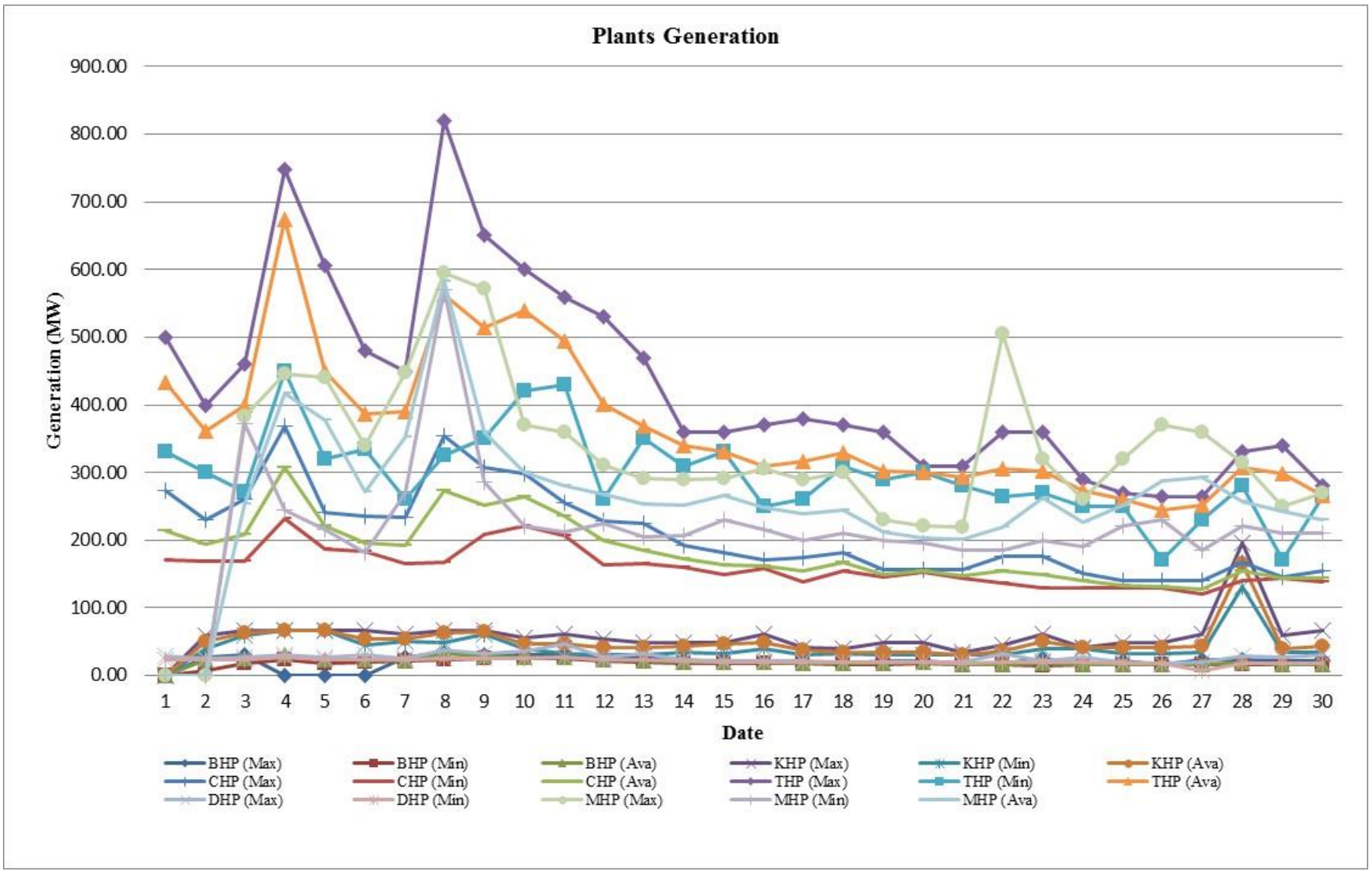


Table: Generation for the month of May, 2022

May-22	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	0.00	0.00	0.00	244.21	140.64	186.15	510.00	170.00	387.13	0.00	0.00	0.00	27.98	19.92	20.77	280.00	220.61	249.33
2	30.74	18.44	20.91	184.03	148.63	167.42	370.00	315.00	333.54	39.18	36.81	38.05	53.38	20.24	27.91	240.63	222.36	232.72
3	25.76	19.06	22.14	213.35	169.33	189.69	430.00	330.00	386.67	48.73	36.16	43.18	43.34	28.27	33.90	250.29	118.80	160.69
4	0.00	5.89	13.02	188.76	139.73	154.98	340.00	270.00	296.67	41.14	35.01	38.01	32.25	23.96	27.31	250.22	209.76	223.58
5	0.00	5.89	13.02	173.72	155.62	164.70	340.00	300.00	325.00	37.15	33.05	35.32	39.94	23.93	29.66	219.89	189.15	208.16
6	0.00	15.84	17.04	157.01	139.97	147.36	320.00	270.00	288.33	35.37	31.61	34.20	24.48	21.46	23.26	220.45	189.94	204.38
7	21.21	17.76	19.17	215.25	156.48	185.54	430.00	310.00	365.00	48.31	33.06	39.07	26.97	21.44	22.94	270.07	200.26	247.12
8	23.93	18.66	21.02	189.46	159.46	174.73	370.00	320.00	346.25	42.26	36.22	38.38	29.99	21.95	25.65	240.25	220.02	233.57
9	28.03	19.52	22.18	211.65	179.97	194.89	450.00	250.00	374.17	42.27	36.21	39.02	30.99	22.96	26.53	241.88	219.85	229.01
10	20.07	10.82	17.88	203.26	159.45	167.24	390.00	300.00	342.50	40.19	36.23	38.29	22.95	20.96	21.87	235.23	210.56	223.11
11	17.96	16.96	17.36	173.22	158.22	162.14	360.00	310.00	320.83	49.50	34.11	42.88	23.99	20.95	22.05	240.62	208.12	223.44
12	17.29	16.93	17.13	176.92	144.81	155.40	310.00	210.00	295.00	66.00	40.23	59.74	21.47	19.92	20.49	500.92	234.41	352.92
13	16.97	16.38	16.64	223.46	144.76	158.57	355.00	270.00	311.88	66.00	49.86	59.31	20.72	19.72	20.02	360.76	260.22	318.62
14	61.05	16.68	20.49	240.50	157.17	195.54	490.00	315.00	387.92	66.00	54.15	64.91	20.72	19.18	20.01	439.71	299.19	362.51
15	58.93	8.80	28.11	177.60	164.76	166.82	360.00	320.00	325.00	66.00	51.13	61.25	32.09	19.72	23.93	409.91	243.81	338.85
16	50.39	24.46	32.35	176.85	160.76	164.05	370.00	310.00	322.50	66.00	51.28	65.39	30.28	20.24	22.11	593.15	370.68	471.34
17	32.57	21.23	24.88	220.35	164.65	188.70	450.00	330.00	372.08	66.00	66.00	66.00	29.27	20.49	23.51	592.87	338.91	422.53
18	21.23	18.40	20.01	173.54	157.64	163.46	340.00	310.00	325.42	66.00	65.84	65.99	20.69	19.17	19.86	360.36	298.77	328.11
19	18.50	8.28	17.66	166.83	148.10	157.62	400.00	290.00	310.83	66.00	66.00	66.00	19.20	18.15	18.88	310.49	265.08	289.86
20	24.47	17.03	18.71	172.69	144.05	159.07	330.00	290.00	317.50	66.00	56.22	65.09	21.69	17.97	19.46	289.73	250.31	272.86
21	65.46	18.44	40.30	190.94	143.10	170.34	470.00	290.00	346.25	66.00	56.36	65.35	34.99	18.96	24.73	510.27	249.10	353.21
22	58.69	33.35	41.84	256.98	160.28	216.12	530.00	310.00	441.67	66.00	66.00	66.00	50.01	32.96	38.91	510.35	300.62	356.24
23	41.15	8.11	30.76	324.25	216.93	261.78	670.00	410.00	532.92	66.00	65.59	65.94	37.00	24.96	29.28	460.15	299.91	367.12
24	32.17	24.10	26.96	216.92	177.60	204.61	410.00	340.00	391.67	270.23	138.76	230.46	29.98	21.26	24.11	300.81	250.01	261.87
25	24.09	20.84	21.67	204.61	158.57	176.29	410.00	190.00	343.75	54.02	33.00	46.22	29.98	21.26	24.11	360.45	190.38	258.06
26	51.48	24.79	31.87	252.53	159.32	211.71	510.00	320.00	412.92	49.50	45.16	47.81	29.98	21.26	24.11	481.41	285.47	346.02
27	34.71	23.06	27.57	239.13	196.03	222.34	470.00	390.00	425.00	66.00	48.24	52.23	27.98	22.21	24.28	286.32	213.15	273.97
28	25.21	19.40	22.49	196.52	182.40	191.80	390.00	350.00	356.67	60.13	44.05	51.48	22.73	20.19	21.50	451.01	105.79	266.95
29	25.02	20.42	21.87	182.62	168.53	175.88	350.00	320.00	330.83	48.29	42.24	44.75	23.21	20.19	21.06	280.93	196.79	231.77
30	45.55	21.27	23.63	192.29	175.23	182.55	380.00	340.00	360.00	51.88	40.64	46.96	33.30	20.50	23.68	297.13	241.25	252.97
31	63.76	27.49	40.16	202.03	180.47	190.39	480.00	240.00	379.58	66.00	48.12	55.96	32.28	23.20	26.42	275.33	250.44	262.02
Max	**65.46**			**324.25**			**670.00**			**270.23**			**53.38**			**593.15**		
Min		**0.00**			**139.73**			**170.00**			**0.00**			**17.97**			**105.79**	
Source: THP, CHP, BHP, KHP,MHP (DGPC)																		

Graph: Generation for the month of May, 2022

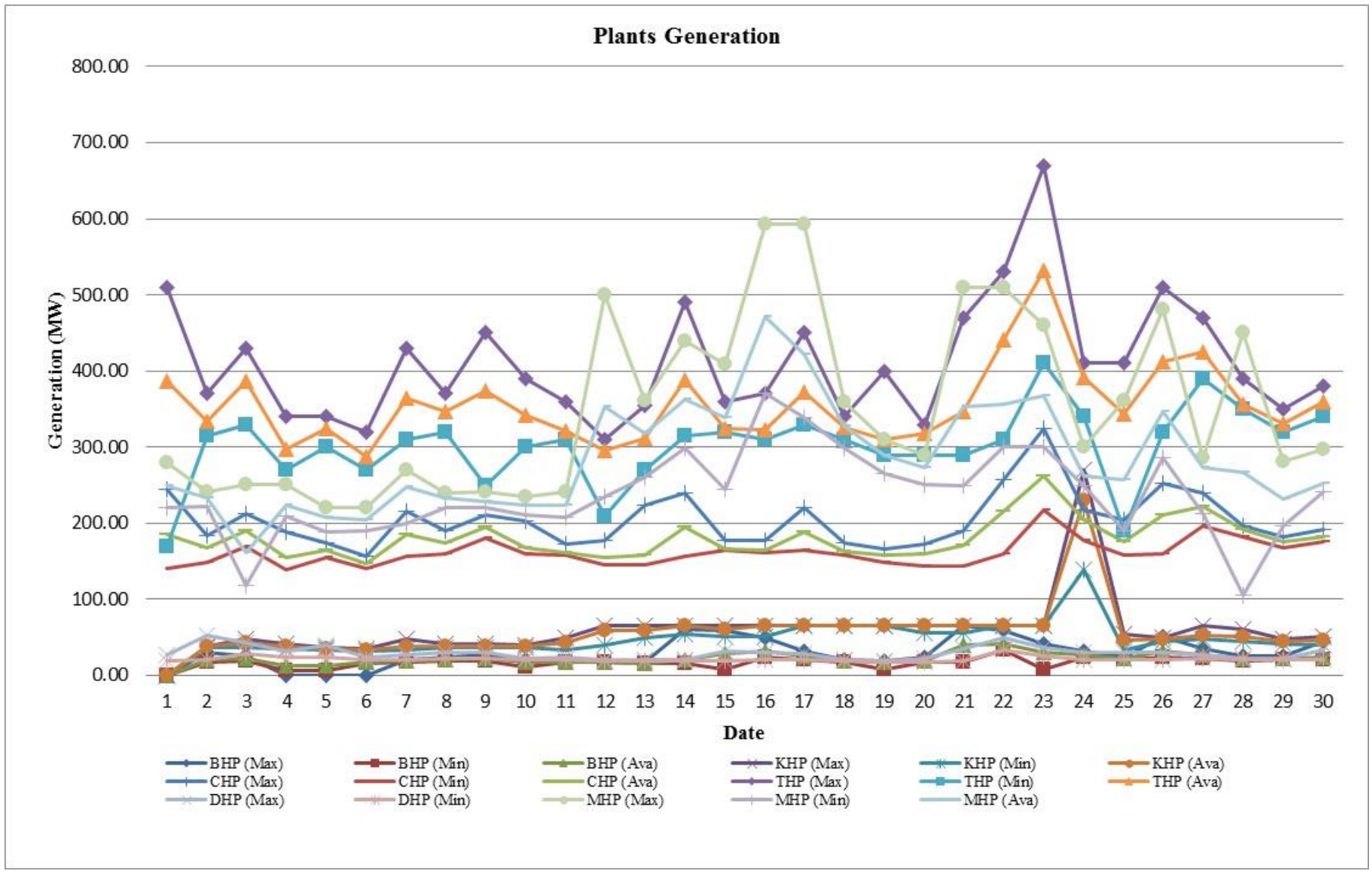


Table: Generation for the month of June, 2022

Jun-22	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	0.00	0.00	0.00	232.87	193.80	210.19	470.00	230.00	409.58	0.00	0.00	0.00	45.32	22.70	26.82	320.58	271.01	296.93
2	65.85	12.92	49.61	203.27	195.04	199.91	400.00	320.00	345.42	66.00	66.00	66.00	100.33	34.84	53.38	359.74	295.36	332.80
3	65.74	36.73	49.32	216.09	194.81	205.71	410.00	240.00	324.17	66.00	66.00	66.00	76.29	30.45	44.06	460.36	331.35	372.15
4	0.00	40.84	56.30	215.08	192.13	199.06	310.00	210.00	265.83	66.00	49.50	65.31	83.34	30.45	49.44	430.87	337.64	356.86
5	0.00	45.48	58.69	251.94	202.31	220.98	270.00	210.00	232.50	66.00	49.50	65.31	77.23	51.32	61.50	430.60	340.00	371.39
6	0.00	44.29	55.04	335.65	243.34	276.40	370.00	170.00	310.42	66.00	66.00	66.00	66.40	38.33	47.94	401.46	359.39	379.30
7	65.93	51.17	59.47	264.49	226.01	248.18	410.00	330.00	378.33	66.00	66.00	66.00	125.45	36.33	52.68	690.51	371.11	527.27
8	66.25	63.73	65.81	325.53	228.63	262.52	570.00	180.00	397.08	66.00	64.63	65.26	126.74	62.29	97.31	785.59	621.03	739.28
9	66.21	45.70	65.13	368.72	324.30	359.44	610.00	390.00	462.92	66.00	63.44	65.52	114.33	64.00	79.91	785.70	588.35	727.97
10	65.92	65.03	65.79	369.94	366.41	367.96	691.00	460.00	576.42	66.00	66.00	66.00	90.32	50.35	66.74	782.71	501.43	602.70
11	65.91	64.04	65.03	369.32	366.98	368.00	630.00	530.00	557.92	66.00	66.00	66.00	66.80	48.34	54.84	680.90	390.13	538.06
12	63.55	52.46	56.55	368.85	294.39	337.17	530.00	410.00	439.58	66.00	49.38	61.77	49.87	43.84	46.89	551.51	415.71	473.91
13	52.90	44.91	48.98	294.03	255.84	277.03	445.00	380.00	416.88	65.92	49.42	64.91	43.34	37.32	39.92	440.09	379.94	407.07
14	66.05	50.79	61.05	317.72	248.81	273.75	500.00	395.00	448.33	65.78	64.26	65.11	47.40	37.81	43.05	539.17	399.73	453.01
15	66.28	52.89	62.66	369.23	332.09	364.67	831.00	500.00	723.58	66.00	33.00	63.92	93.33	44.84	66.78	593.79	484.93	549.48
16	66.06	61.79	65.19	368.47	366.90	367.73	831.00	320.00	663.71	66.00	66.00	66.00	126.60	65.31	90.13	593.61	591.55	592.70
17	66.17	54.90	58.17	368.87	366.64	367.94	908.00	721.00	827.46	66.00	66.00	66.00	117.31	65.27	73.22	593.55	572.47	591.92
18	66.20	25.78	62.77	368.63	356.23	367.44	988.00	731.00	945.63	66.00	65.63	65.92	126.91	86.30	116.17	593.79	592.25	593.12
19	66.05	55.26	59.91	368.60	276.36	355.28	988.00	858.00	923.00	66.00	65.76	65.99	89.33	63.16	75.86	593.67	592.25	593.18
20	66.36	63.87	66.08	368.94	367.40	368.37	858.00	858.00	858.00	66.00	66.00	66.00	84.34	63.31	74.09	593.75	591.46	593.02
21	66.31	66.13	66.23	369.03	367.44	368.25	888.00	664.00	853.96	66.00	65.87	65.98	126.62	83.33	103.44	593.84	394.40	551.77
22	66.64	65.52	66.16	369.49	367.46	368.08	918.00	527.00	829.13	66.00	65.67	65.93	126.91	63.00	94.64	594.42	591.92	593.03
23	66.24	63.82	65.79	369.10	367.60	368.40	707.00	457.00	579.92	66.00	65.52	65.87	71.30	59.25	64.81	593.94	360.39	547.29
24	66.25	64.44	65.71	368.46	366.30	368.02	600.00	500.00	553.08	269.59	257.85	262.23	126.75	75.31	109.50	593.94	350.39	576.90
25	66.31	24.43	64.42	369.22	367.18	368.35	850.00	520.00	664.17	66.00	29.63	58.69	126.84	81.31	106.91	594.37	592.05	593.34
26	66.33	65.79	66.14	369.66	366.90	368.51	800.00	610.00	690.00	66.00	66.00	66.00	126.83	88.38	105.18	594.06	591.68	593.21
27	66.28	65.87	66.17	368.94	367.26	368.04	690.00	650.00	665.00	66.00	66.00	66.00	124.36	92.37	105.92	594.10	591.73	593.35
28	66.26	65.93	66.14	369.08	366.90	368.04	868.00	670.00	800.13	66.00	64.00	65.52	126.88	94.39	112.34	594.07	592.70	593.37
29	66.36	66.08	66.22	368.90	275.79	345.11	868.00	440.00	799.50	66.00	33.00	60.39	126.86	100.34	117.57	593.54	593.03	593.32
30	66.33	63.72	66.12	369.48	275.76	334.94	848.00	848.00	848.00	66.00	66.00	66.00	126.92	94.35	109.95	593.45	591.89	592.89
31	0.00	No Generatio	Error	0.00	No Generatio	Error	170.00	100.00	118.33	0.00	No Generatio	Error	0.00	No Generatio	Error	0.00	No Generation	Error
Max	66.64			369.94			988.00			269.59			126.92			785.70		
Min		0.00			192.13			100.00			0.00			22.70			271.01	
Source: THP, CHP, BHP, KHP,MHP (DGPC)																		

Graph: Generation for the month of June, 2022

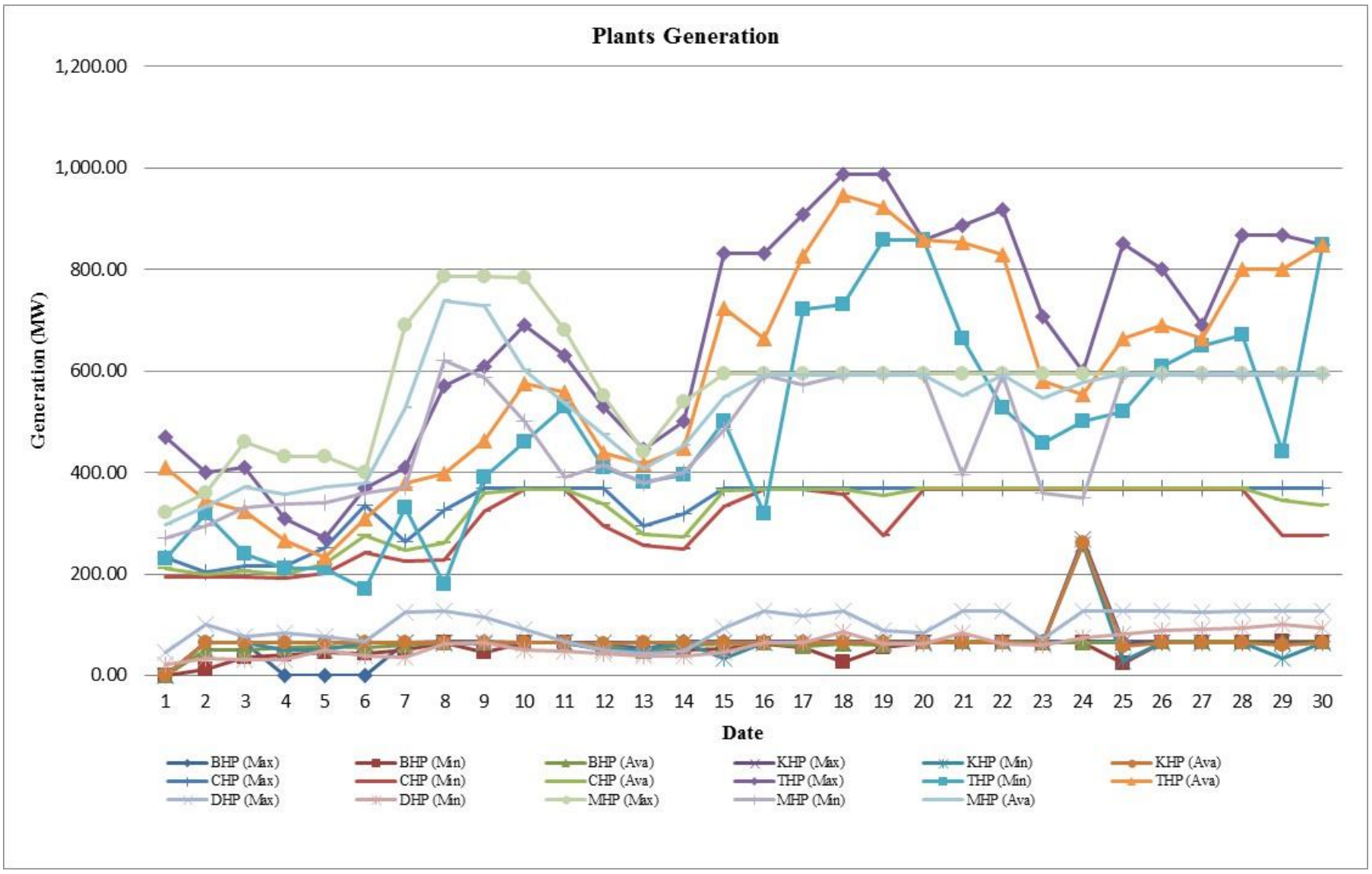


Table: National demand for April, 2022

Apr-22	Max	Min	Ava
0:00	341.31	239.55	265.93
1:00	284.91	227.89	259.67
2:00	291.61	224.92	259.52
3:00	285.21	225.61	258.64
4:00	286.18	220.85	259.26
5:00	296.13	226.19	264.11
6:00	318.05	256.83	290.25
7:00	329.85	277.02	306.37
8:00	336.59	281.08	308.16
9:00	333.33	277.33	308.13
10:00	326.39	270.97	303.12
11:00	327.50	257.02	299.97
12:00	326.81	265.53	299.66
13:00	321.77	254.62	294.34
14:00	310.70	256.02	287.80
15:00	314.41	260.37	287.58
16:00	324.72	212.23	286.43
17:00	337.57	269.68	295.53
18:00	333.09	275.86	307.83
19:00	362.47	306.37	333.69
20:00	349.15	302.43	322.50
21:00	330.82	282.61	302.73
22:00	310.90	229.71	282.97
23:00	294.87	238.48	268.02
	362.47		
		212.23	

Graph: National Demand for April, 2022

Annexure-II

Table: National Demand for May, 2022

May-22	Max	Min	Ava
0:00	323.74	245.03	269.70
1:00	285.33	242.25	264.26
2:00	288.72	243.36	264.99
3:00	281.68	241.27	263.18
4:00	279.95	240.97	262.64
5:00	287.85	246.32	269.38
6:00	317.19	274.18	292.70
7:00	327.08	284.74	303.28
8:00	331.22	274.25	297.50
9:00	319.37	260.79	294.48
10:00	317.02	264.97	289.33
11:00	318.12	264.39	287.39
12:00	314.52	261.53	288.01
13:00	309.13	254.12	282.50
14:00	302.12	247.64	279.16
15:00	301.72	249.32	281.32
16:00	309.61	234.94	284.21
17:00	311.60	246.19	289.60
18:00	323.40	260.35	298.20
19:00	350.96	284.34	321.39
20:00	355.46	290.54	323.60
21:00	333.22	270.38	302.21
22:00	319.40	234.99	286.12
23:00	295.20	247.24	271.84
	355.46		
		234.94	

Graph: National Demand for May, 2022

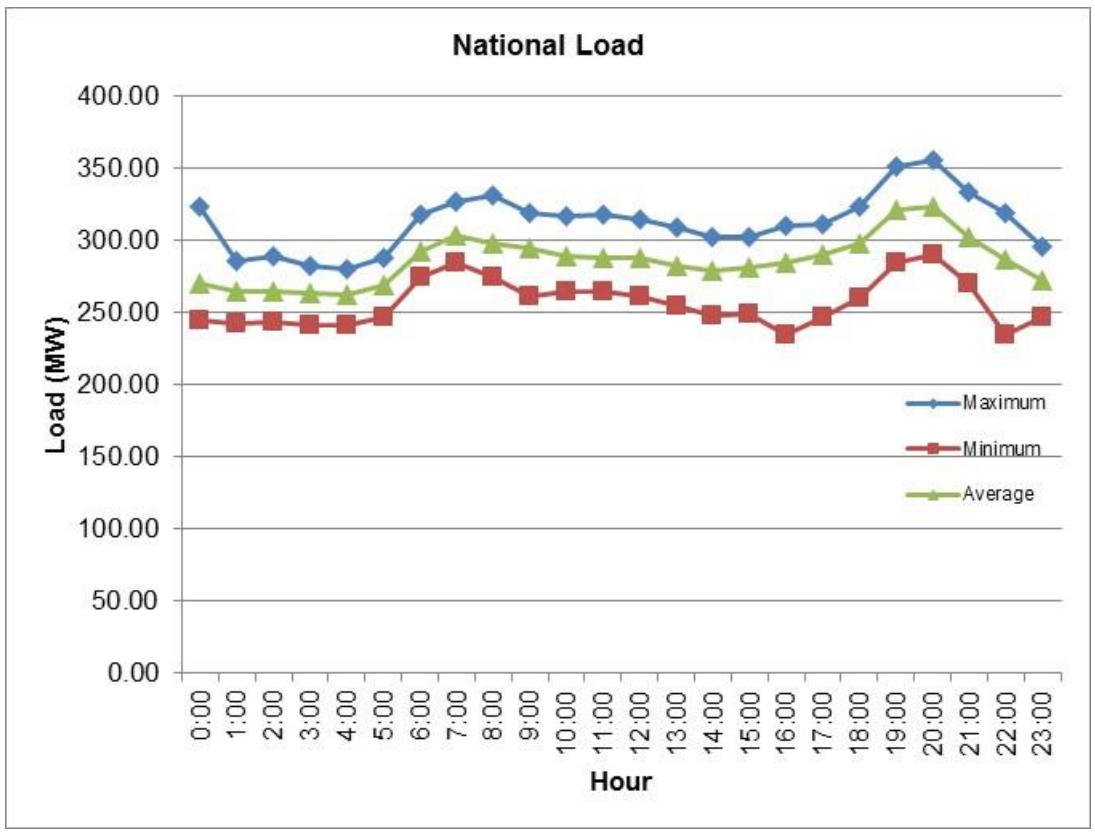
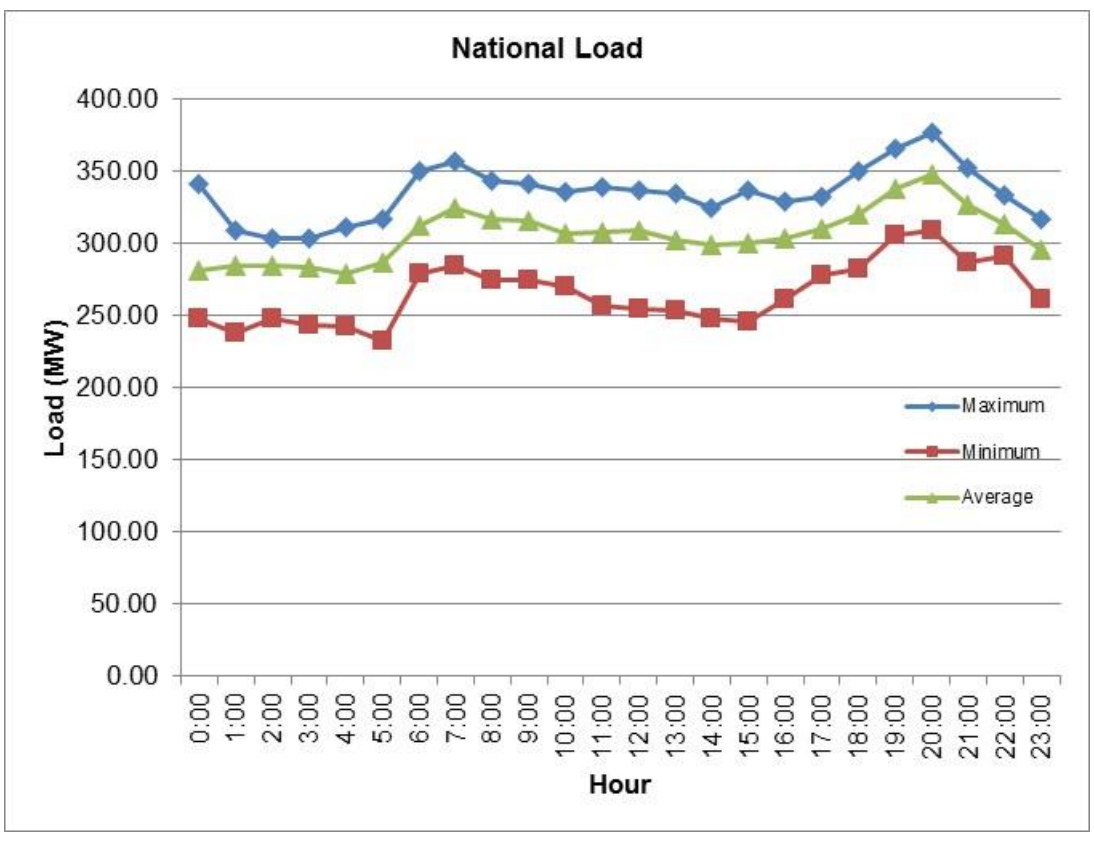


Table: National Demand for June, 2022

Jun-22	Max	Min	Ava
0:00	340.53	247.69	281.48
1:00	308.47	238.09	284.26
2:00	303.87	247.53	284.03
3:00	302.92	243.77	283.26
4:00	311.22	241.88	278.92
5:00	316.72	232.47	286.14
6:00	350.17	278.62	312.17
7:00	356.64	284.21	324.04
8:00	342.92	274.49	316.97
9:00	340.93	274.47	315.37
10:00	335.09	269.65	306.45
11:00	338.53	257.24	308.12
12:00	336.27	253.99	308.78
13:00	334.58	253.29	302.66
14:00	324.18	247.74	298.66
15:00	337.01	245.70	300.01
16:00	328.33	260.66	303.16
17:00	332.67	277.97	310.11
18:00	349.45	281.86	319.42
19:00	365.25	305.45	337.86
20:00	376.64	308.57	347.22
21:00	352.40	286.85	326.96
22:00	333.59	291.56	312.82
23:00	316.51	261.19	295.98
	376.64		
		232.47	

Graph: National Demand for June, 2022



Annexure-III

Table: Daily maximum, minimum and average frequency for the month of April, 2022

Apr-22	Bus Frequency at Semtokha Substation			Bus Frequency at Kurichhu Hydropower Plant		
Date	**Max**	**Min**	**Ava**	**Max**	**Min**	**Ava**
1	50.00	49.90	49.97	50.08	49.00	49.97
2	50.00	49.80	49.95	50.08	49.88	50.01
3	50.00	49.80	49.95	50.06	49.85	49.99
4	50.00	49.80	49.92	50.06	49.81	49.96
5	50.00	49.60	49.86	50.06	49.54	49.90
6	50.00	49.60	49.84	50.06	49.68	49.88
7	50.00	49.60	49.79	50.02	49.60	49.83
8	50.00	49.70	49.90	50.10	49.80	49.95
9	50.00	49.80	49.93	50.06	49.78	49.94
10	50.00	49.80	49.95	50.08	49.51	50.00
11	50.00	49.60	49.88	50.09	49.60	49.94
12	50.00	49.60	49.86	50.07	49.65	49.89
13	50.00	49.60	49.83	50.03	49.66	49.87
14	50.00	49.80	49.92	50.08	49.90	50.00
15	50.00	49.70	49.95	50.06	49.65	49.95
16	50.00	49.80	49.94	50.08	49.85	49.99
17	50.00	49.70	49.94	50.11	49.89	50.00
18	50.00	49.60	49.87	50.07	49.66	49.94
19	50.00	49.60	49.86	50.04	49.62	49.91
20	50.00	49.40	49.81	50.08	49.51	49.85
21	50.00	49.70	49.85	50.04	49.71	49.88
22	50.00	49.70	49.86	50.06	49.73	49.91
23	50.00	49.70	49.85	50.03	49.66	49.90
24	50.00	49.70	49.91	50.09	49.72	49.99
25	50.00	49.70	49.92	50.07	49.67	49.96
26	50.00	49.50	49.80	50.12	49.54	49.88
27	50.00	49.50	49.83	50.04	49.51	49.86
28	50.00	49.60	49.81	50.07	49.60	49.87
29	50.00	49.70	49.87	50.05	49.76	49.91
30	50.00	49.80	49.92	50.13	49.80	50.00
31	0.00	Error	Error	0.00	Error	Error
Max	**50.00**			**50.13**		
Min		**49.40**			**49.00**	
Source: TD (BPC), KHP (DGPC)						

Graph: Daily maximum, minimum and average frequency for the month of April, 2022

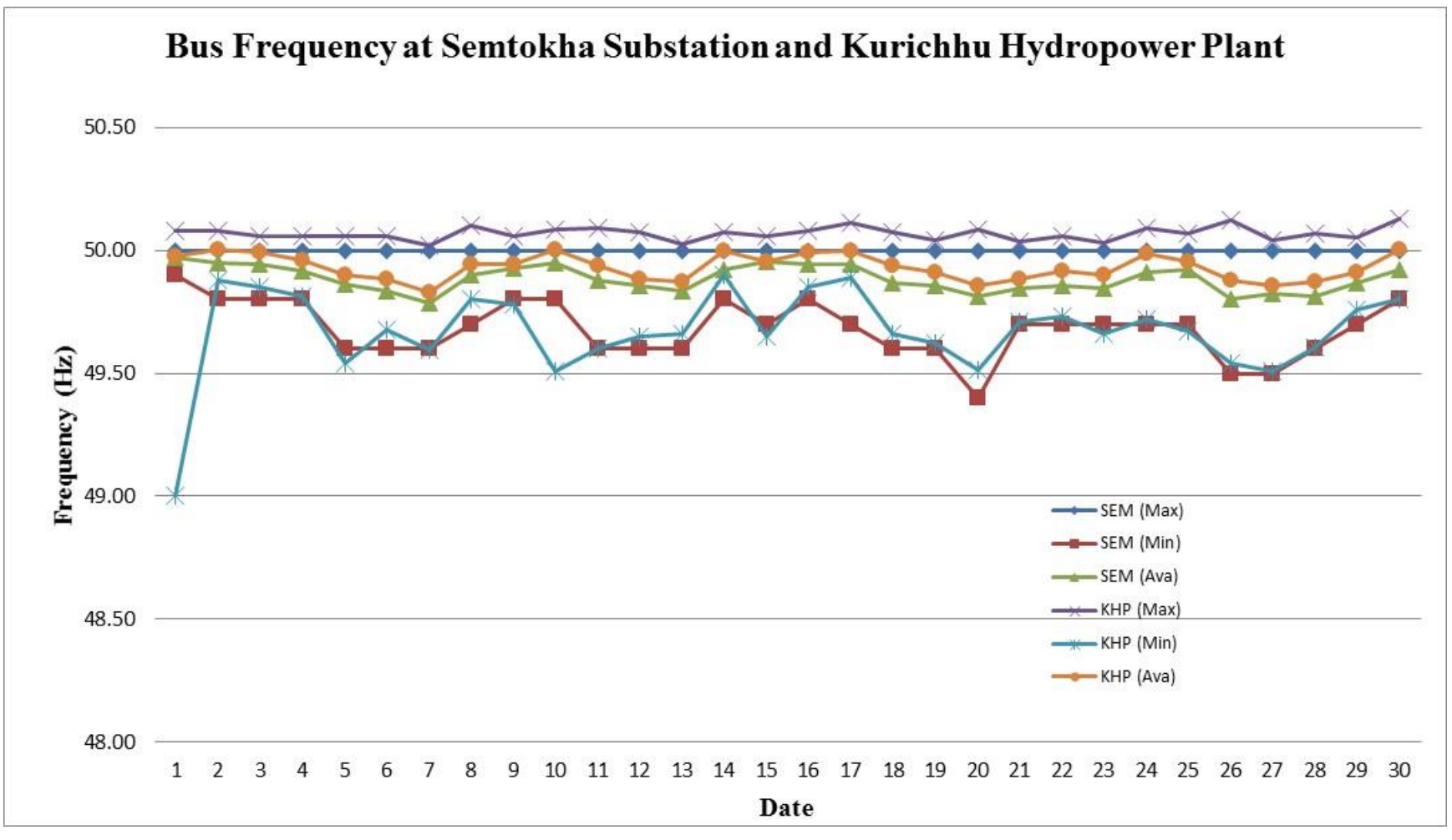


Table: Daily maximum, minimum and average frequency for the month of May, 2022

May-22	Bus Frequency at Semtokha Substation			Bus Frequency at Kurichhu Hydropower Plant		
Date	Max	Min	Ava	Max	Min	Ava
1	50.10	49.80	49.97	50.25	49.83	50.03
2	50.00	49.80	49.94	50.08	49.85	50.01
3	50.10	49.70	49.92	50.14	49.79	49.99
4	50.00	49.80	49.95	50.10	49.52	49.99
5	50.00	49.70	49.90	50.11	49.74	49.97
6	50.00	49.80	49.93	50.15	49.87	49.99
7	50.00	49.80	49.94	50.09	49.83	49.99
8	50.00	49.60	49.92	50.12	49.62	49.98
9	50.00	49.80	49.97	50.10	49.91	50.01
10	50.00	49.80	49.90	50.09	49.79	49.97
11	50.00	49.90	49.96	50.09	49.88	50.02
12	50.00	49.90	49.97	50.09	49.89	50.03
13	50.00	49.90	49.97	50.07	49.95	50.01
14	50.00	49.90	49.98	50.13	49.87	50.03
15	50.00	49.70	49.94	50.14	49.77	50.01
16	50.00	49.90	49.96	50.08	49.95	50.02
17	50.00	49.80	49.96	50.07	49.84	49.99
18	50.00	49.70	49.89	50.07	49.77	49.94
19	50.00	49.80	49.93	50.09	49.74	49.98
20	50.00	49.80	49.97	50.11	49.96	50.03
21	50.00	49.90	49.99	50.16	49.74	50.04
22	50.00	49.80	49.96	50.31	49.87	50.03
23	50.20	49.70	49.99	50.35	49.76	50.05
24	50.00	49.70	49.90	50.09	49.73	49.96
25	50.00	49.70	49.91	50.08	49.75	49.95
26	50.00	49.80	49.95	50.12	49.87	50.01
27	50.10	49.90	49.97	50.10	49.95	50.03
28	50.00	49.70	49.93	50.08	49.77	49.97
29	50.00	49.80	49.95	50.10	49.87	49.99
30	50.00	49.70	49.91	50.09	49.79	49.97
31	50.00	49.80	49.93	50.07	49.86	50.00
Max	**50.20**			**50.35**		
Min		**49.60**			**49.52**	
Source: TD (BPC), KHP (DGPC)						

Graph: Daily maximum, minimum and average frequency for the month of May, 2022

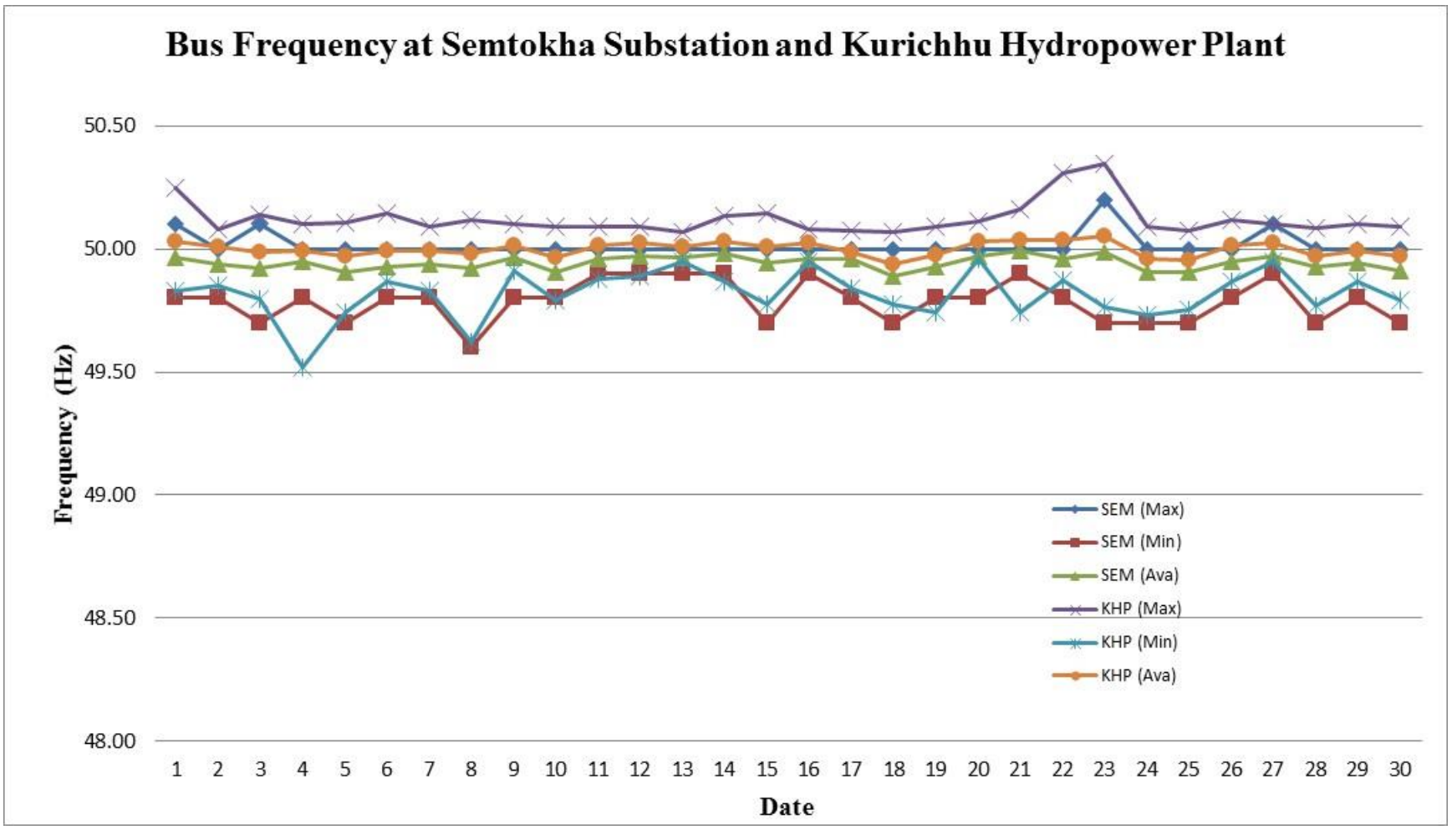
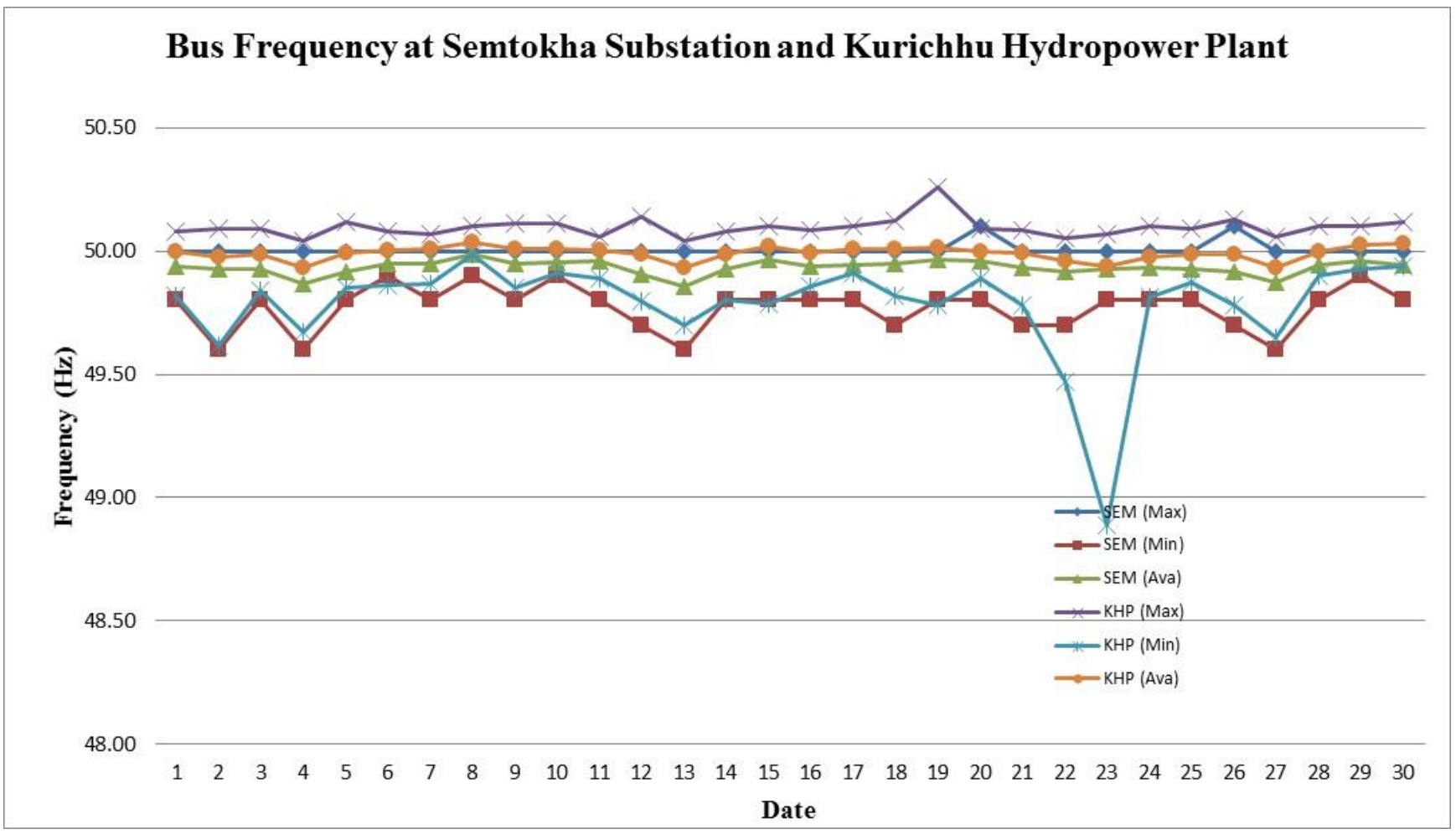


Table: Daily maximum, minimum and average frequency for the month of June, 2022

Jun-22	Bus Frequency at Semtokha Substation			Bus Frequency at Kurichhu Hydropower Plant		
Date	Max	Min	Ava	Max	Min	Ava
1	50.00	49.80	49.94	50.08	49.82	50.00
2	50.00	49.60	49.93	50.09	49.62	49.97
3	50.00	49.80	49.93	50.09	49.84	49.99
4	50.00	49.60	49.87	50.04	49.67	49.93
5	50.00	49.80	49.92	50.12	49.85	49.99
6	50.00	49.90	49.95	50.08	49.86	50.00
7	50.00	49.80	49.95	50.07	49.87	50.01
8	50.00	49.90	49.99	50.10	49.99	50.04
9	50.00	49.80	49.95	50.11	49.85	50.01
10	50.00	49.90	49.95	50.11	49.91	50.01
11	50.00	49.80	49.96	50.06	49.89	50.01
12	50.00	49.70	49.91	50.14	49.80	49.99
13	50.00	49.60	49.86	50.04	49.70	49.93
14	50.00	49.80	49.93	50.08	49.80	49.99
15	50.00	49.80	49.97	50.10	49.79	50.02
16	50.00	49.80	49.94	50.08	49.86	49.99
17	50.00	49.80	49.95	50.10	49.91	50.01
18	50.00	49.70	49.95	50.12	49.82	50.01
19	50.00	49.80	49.97	50.26	49.78	50.01
20	50.10	49.80	49.96	50.09	49.89	50.00
21	50.00	49.70	49.93	50.08	49.78	49.99
22	50.00	49.70	49.92	50.05	49.47	49.96
23	50.00	49.80	49.93	50.07	48.89	49.94
24	50.00	49.80	49.93	50.10	49.81	49.98
25	50.00	49.80	49.93	50.09	49.87	49.99
26	50.10	49.70	49.92	50.13	49.78	49.99
27	50.00	49.60	49.88	50.06	49.65	49.93
28	50.00	49.80	49.94	50.10	49.90	50.00
29	50.00	49.90	49.96	50.10	49.93	50.02
30	50.00	49.80	49.95	50.12	49.94	50.03
31	0.00	Error	Error	0.00	Error	Error
Max	**50.10**			**50.26**		
Min		**49.60**			**48.89**	
Source: TD (BPC), KHP (DGPC)						

Graph: Daily maximum, minimum and average frequency for the month of June, 2022



Annexure-IV

Table: Daily maximum, minimum and average Voltage for the month of April, 2022

Apr-22	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	413.50	406.50	410.96	221.00	217.00	219.10	66.00	65.00	65.68	136.61	132.48	133.85
2	414.50	407.50	411.40	221.00	217.50	219.52	67.00	65.50	66.09	135.48	132.45	133.77
3	415.50	407.00	411.08	221.00	216.00	218.88	66.00	65.00	65.68	135.27	133.10	134.18
4	408.00	403.00	405.94	220.00	215.00	216.85	65.00	64.44	64.95	135.07	132.78	133.89
5	411.00	403.00	407.33	218.50	213.50	216.63	66.00	64.50	65.13	134.86	132.57	133.72
6	413.50	407.00	410.33	221.00	217.00	218.73	66.00	65.00	65.57	135.69	132.78	134.39
7	414.50	408.00	411.13	221.00	217.00	218.83	67.00	65.00	65.84	135.90	132.64	133.88
8	411.50	403.00	407.50	219.50	215.50	217.54	66.00	64.00	65.33	136.31	132.99	134.11
9	413.50	404.00	408.42	219.00	216.50	218.06	66.00	65.00	65.39	135.69	132.36	133.81
10	412.00	407.00	409.42	219.00	216.50	218.31	66.00	35.00	64.26	135.07	132.10	133.66
11	411.00	405.50	409.00	219.50	217.00	218.25	66.00	65.00	65.63	135.90	132.57	134.05
12	412.00	408.00	410.10	220.50	217.00	218.77	66.00	65.00	65.48	134.23	132.16	133.49
13	413.50	408.00	411.50	220.00	217.00	218.71	67.00	65.00	65.51	134.65	130.08	132.84
14	413.00	405.50	411.46	221.00	216.00	218.96	66.96	64.00	65.61	134.65	132.36	133.59
15	414.50	405.50	408.94	219.50	215.00	217.23	66.00	64.00	65.37	135.93	130.70	133.95
16	412.50	408.00	410.69	221.00	217.00	218.08	67.00	64.96	65.43	135.07	130.72	132.92
17	413.50	407.00	411.33	220.50	218.00	219.27	66.00	65.00	65.65	134.86	131.32	133.38
18	414.00	408.00	411.27	221.00	217.50	219.38	66.25	65.00	65.75	134.23	130.08	132.19
19	416.00	407.50	412.29	223.00	216.50	219.38	67.00	65.00	65.75	134.26	130.08	132.32
20	415.00	408.00	412.17	220.50	123.50	211.02	66.00	65.00	65.82	135.25	131.33	132.99
21	414.50	407.50	411.75	220.50	216.50	219.00	67.00	65.00	65.70	134.86	132.36	133.51
22	414.50	407.50	412.23	221.50	217.00	219.15	66.25	64.50	65.35	135.69	131.32	133.77
23	412.50	407.50	410.77	219.50	215.50	217.94	66.00	64.45	65.29	135.07	130.29	133.38
24	413.00	407.00	410.83	220.50	217.00	218.92	66.00	65.00	65.42	135.27	130.08	133.60
25	412.00	407.50	409.83	220.00	216.50	218.48	66.14	65.00	65.75	135.27	130.08	132.84
26	412.00	409.00	410.31	221.00	216.50	218.63	66.00	65.00	65.42	135.48	129.45	132.78
27	411.50	397.00	408.10	219.00	214.50	217.63	66.00	64.00	65.21	135.48	130.49	133.49
28	409.00	405.50	407.50	219.00	217.00	218.19	66.00	64.60	65.09	136.52	131.32	134.10
29	415.00	408.50	410.92	221.50	217.50	218.96	67.00	65.00	65.55	135.69	132.16	134.19
30	417.50	409.50	414.13	222.00	218.50	220.46	67.00	65.00	65.98	135.69	130.91	132.97
31	0.00	Error	Error	0.00	Error	Error	0.00	Error	Error	0.00	Error	Error
Max	**417.50**			**223.00**			**67.00**			**136.61**		
Min		**397.00**			**123.50**			**35.00**			**129.45**	
Source: TD, BPC												

Graph: Daily maximum, minimum and average Voltage for the month of April, 2022

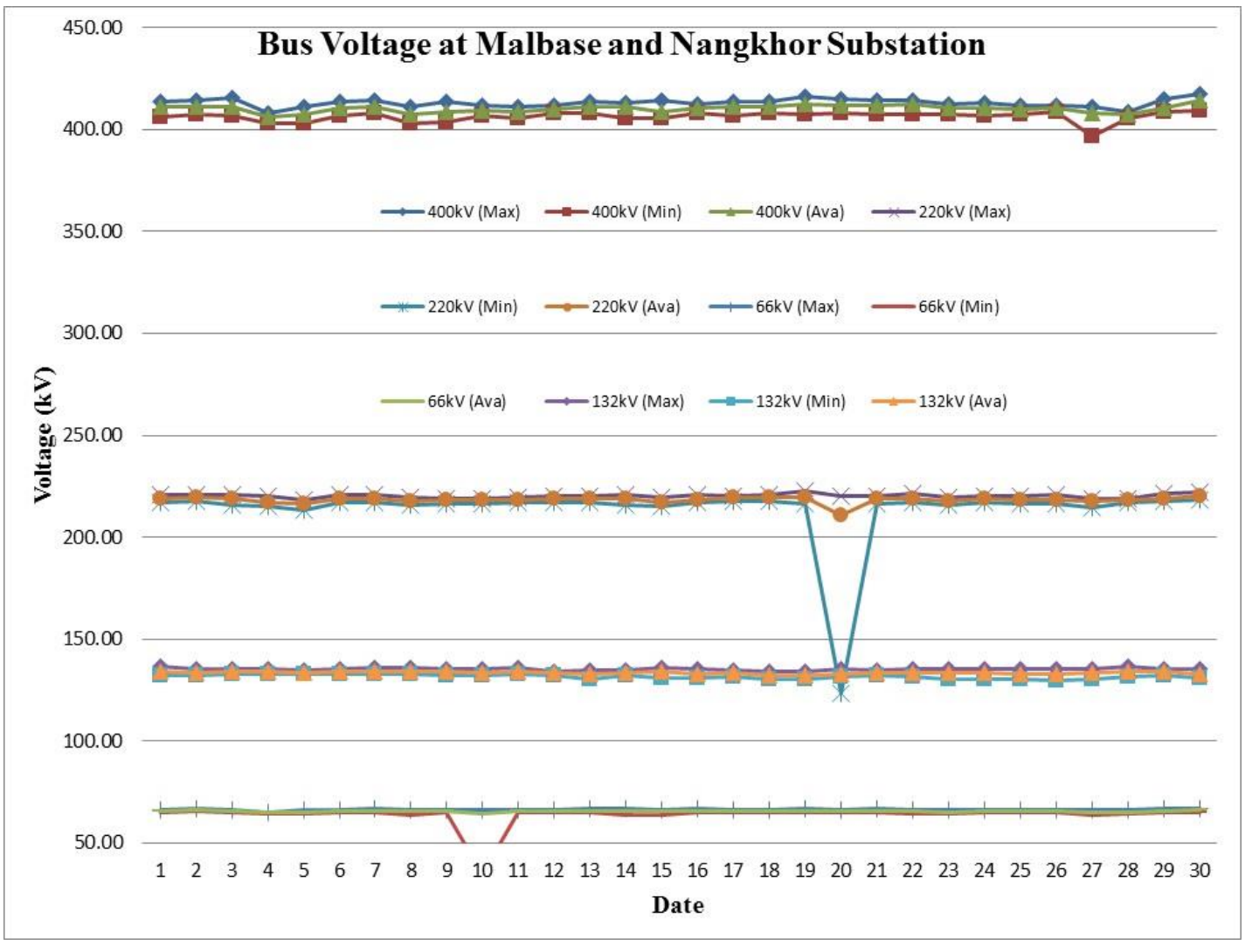


Table: Daily maximum, minimum and average Voltage for the month of May, 2022

May-22	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	415.00	406.00	410.48	221.50	215.50	219.46	67.00	64.54	65.93	135.07	131.53	133.17
2	414.50	405.50	410.13	221.00	217.00	219.35	66.00	65.00	65.72	135.07	131.32	133.22
3	412.50	404.50	408.04	220.50	216.00	218.85	66.05	65.00	65.56	134.25	132.16	133.22
4	411.50	406.50	409.40	221.00	215.50	218.65	66.11	64.00	65.63	134.65	130.29	133.23
5	411.00	405.00	408.88	219.50	215.00	218.02	65.94	64.04	65.14	133.82	130.49	132.34
6	411.00	403.00	407.27	219.50	214.00	217.17	66.00	64.00	65.08	134.65	131.12	132.92
7	410.50	403.00	407.48	220.50	216.00	217.94	66.00	65.00	65.40	136.10	128.83	133.60
8	410.50	403.00	407.79	220.00	216.00	218.25	66.00	65.00	65.31	135.27	131.32	133.42
9	413.00	405.00	408.08	220.00	216.50	218.13	66.00	65.00	65.62	135.48	130.91	134.29
10	414.00	405.00	410.13	222.00	216.00	218.48	67.00	64.50	65.58	135.48	131.95	133.88
11	416.50	405.00	409.60	226.00	216.50	220.25	66.00	65.00	65.25	135.48	131.95	133.76
12	413.25	404.50	408.14	222.50	216.00	218.69	67.00	64.50	65.63	136.10	132.99	134.23
13	413.50	408.00	410.10	222.00	218.00	219.81	67.00	65.00	65.98	135.90	130.91	133.71
14	411.50	406.50	409.08	220.50	217.00	219.26	66.00	65.00	65.83	136.31	132.10	133.72
15	415.00	258.50	403.92	222.00	217.50	220.00	66.00	64.00	65.79	135.48	132.45	133.94
16	412.50	406.50	408.58	221.50	216.50	219.21	66.38	64.00	65.44	135.90	132.16	134.40
17	411.50	405.00	408.40	221.00	217.00	218.73	66.00	64.95	65.50	135.50	132.37	134.11
18	415.00	407.00	409.73	220.50	217.50	219.27	66.65	65.00	65.75	141.71	131.74	134.12
19	416.50	410.00	412.46	224.00	218.00	220.60	67.00	65.00	65.93	136.10	132.99	134.43
20	416.00	408.00	412.04	222.50	218.00	220.23	67.00	66.00	66.20	135.69	131.74	133.45
21	416.50	408.00	411.21	223.50	218.00	220.35	67.00	65.00	66.15	134.44	131.00	132.91
22	415.50	405.50	410.33	222.50	217.00	219.79	67.00	65.00	65.73	135.07	130.70	133.12
23	411.50	405.00	408.52	221.50	217.00	219.19	67.00	65.00	65.88	134.44	131.12	133.06
24	412.50	405.00	409.06	222.50	216.00	219.77	67.00	65.00	65.83	134.89	129.66	132.45
25	417.50	405.50	410.27	221.50	216.50	219.54	66.70	65.00	65.86	136.52	131.95	134.01
26	414.50	404.50	409.40	221.50	215.50	218.79	66.00	65.00	65.71	135.27	131.53	133.22
27	412.00	405.50	408.67	220.50	216.50	218.63	66.00	65.00	65.38	135.69	131.53	133.24
28	414.50	403.50	409.17	223.00	215.50	219.79	67.20	65.00	65.99	137.48	129.87	133.17
29	413.50	405.50	409.83	222.50	216.50	219.75	67.00	65.00	65.80	135.07	131.12	133.22
30	414.00	403.50	408.58	223.50	214.50	218.75	66.00	64.00	65.48	135.48	130.91	133.37
31	411.50	404.00	407.44	221.50	216.00	218.08	66.25	64.00	65.31	135.42	131.33	133.23
Max	**417.50**			**226.00**			**67.20**			**141.71**		
Min		**258.50**			**214.00**			**64.00**			**128.83**	
Source: TD, BPC												

Graph: Daily maximum, minimum and average Voltage for the month of May, 2022

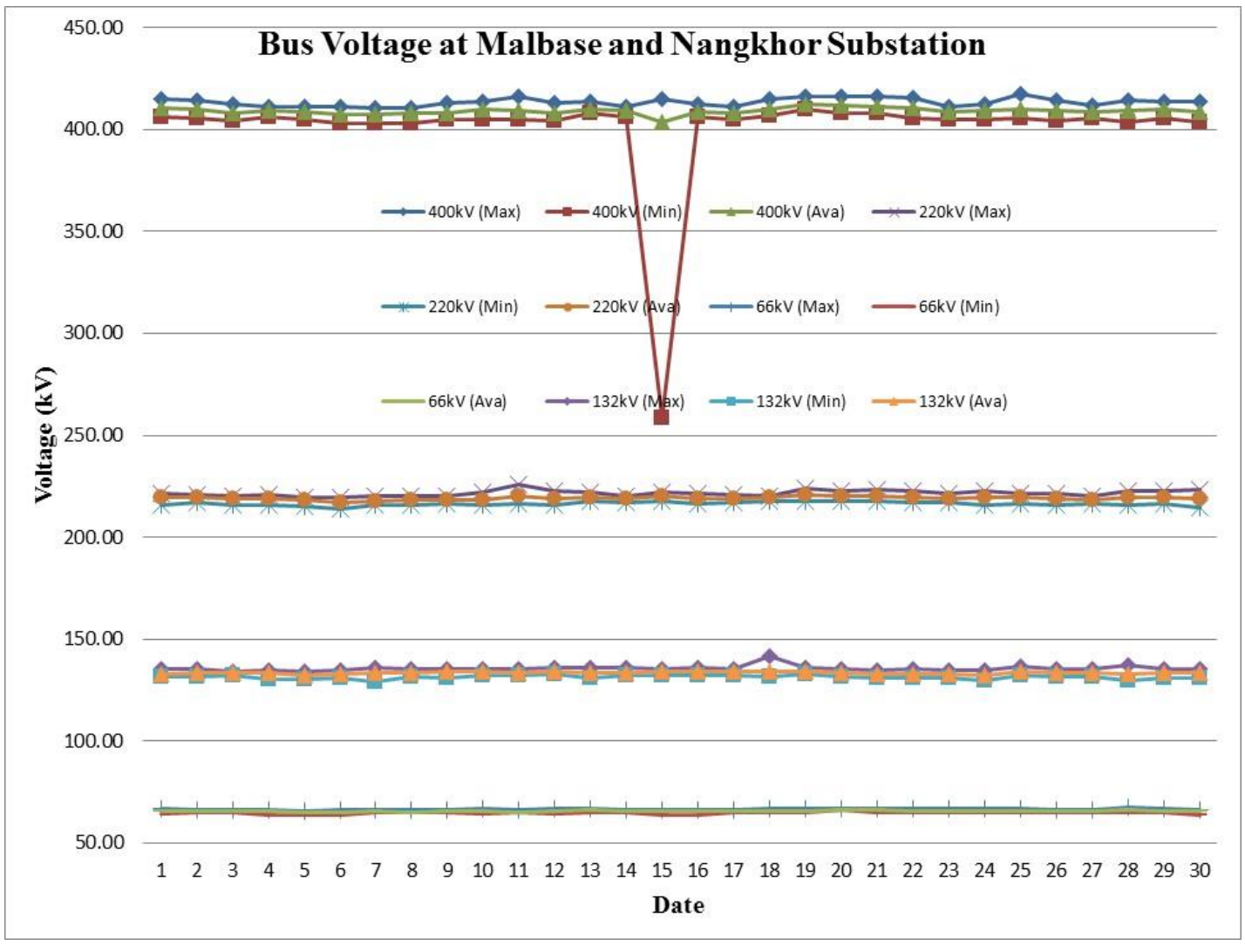
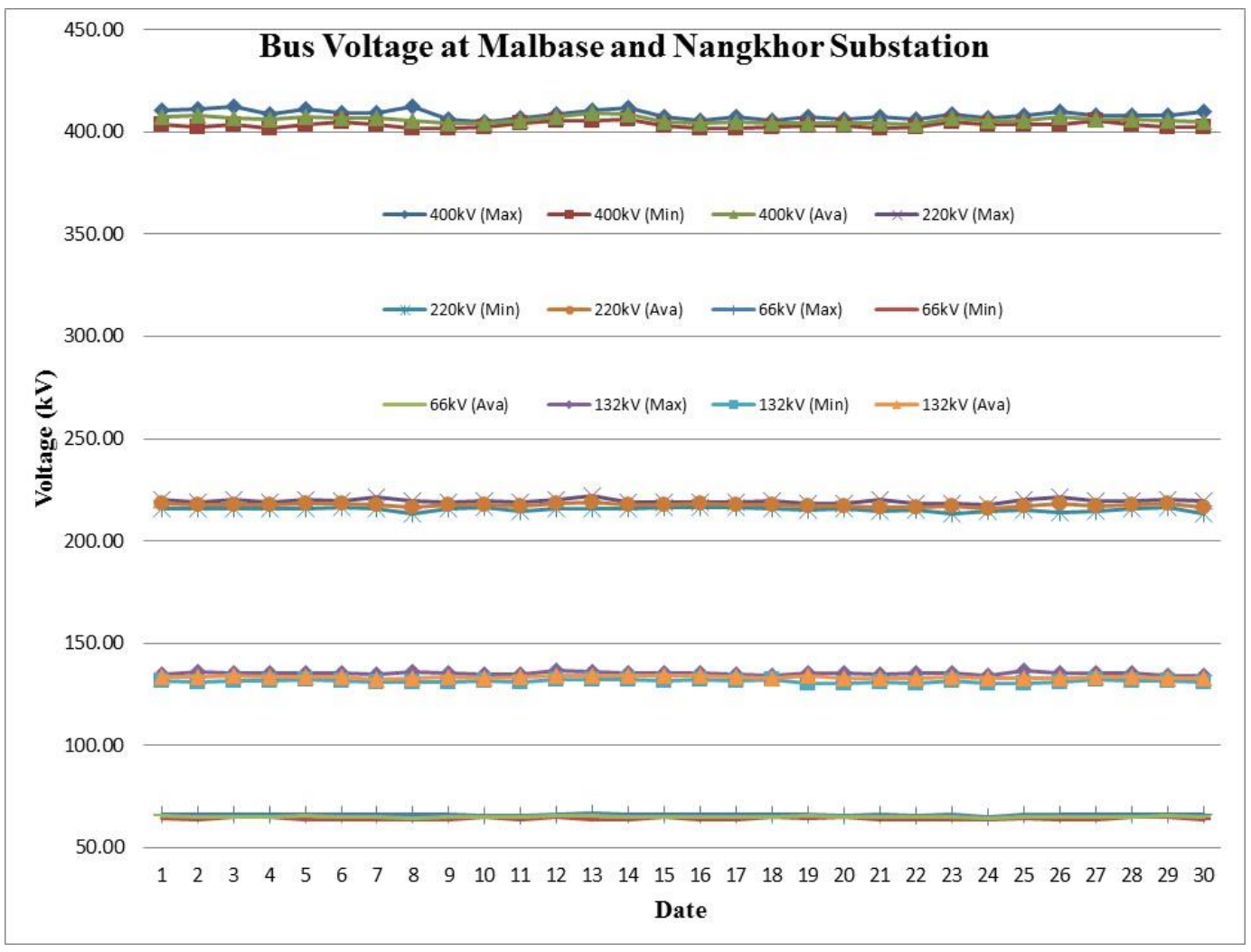


Table: Daily maximum, minimum and average Voltage for the month of June, 2022

Jun-22	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	410.50	404.00	407.60	220.50	215.50	218.15	66.00	64.50	65.46	134.86	131.74	133.58
2	411.50	402.50	407.88	219.00	215.50	217.81	66.00	64.00	65.08	135.90	131.12	133.81
3	412.50	404.00	406.75	220.00	215.50	217.42	66.00	64.95	65.08	135.69	131.32	133.94
4	408.50	402.00	406.35	219.00	215.50	217.58	66.00	65.00	65.25	135.07	131.53	133.43
5	411.50	403.50	407.54	220.00	216.00	218.02	66.00	64.00	65.34	135.48	132.16	133.40
6	409.50	405.00	406.79	219.50	216.50	218.19	66.00	64.00	65.17	135.28	131.32	133.41
7	409.50	404.00	406.54	221.50	215.50	217.98	66.00	63.80	64.96	134.65	130.91	132.51
8	412.50	402.00	405.46	219.50	213.50	216.21	66.00	64.00	64.59	135.90	130.70	133.13
9	406.00	402.00	404.42	219.00	216.00	217.44	66.00	64.00	65.00	135.63	131.12	133.55
10	405.00	402.50	404.10	219.50	216.50	217.81	65.74	65.00	65.08	134.86	131.32	132.86
11	407.00	404.50	405.50	219.00	214.50	217.35	65.67	64.00	64.94	134.86	131.16	133.22
12	408.50	405.50	407.48	220.00	216.00	218.63	66.00	65.00	65.41	136.52	132.36	134.09
13	410.50	405.50	409.04	222.00	215.50	218.73	67.00	64.00	65.44	135.90	131.95	133.81
14	412.00	406.50	408.96	219.00	215.50	217.67	66.00	64.00	65.03	135.48	131.95	134.02
15	407.50	403.00	405.04	219.00	216.50	217.79	66.00	65.00	65.13	135.69	131.53	133.89
16	405.50	401.50	404.02	219.00	216.50	218.08	66.00	64.00	65.17	135.07	132.36	133.84
17	407.50	401.50	405.25	219.00	216.50	217.94	66.00	64.00	64.99	134.65	131.33	133.23
18	405.50	402.50	404.04	219.50	215.50	218.00	66.00	64.96	65.31	134.10	131.95	133.00
19	407.50	403.00	404.46	218.50	215.00	217.23	66.00	64.23	65.32	135.69	130.29	133.83
20	406.00	403.00	404.63	218.50	215.50	217.04	65.50	64.80	65.07	135.42	130.08	132.86
21	407.50	402.00	404.48	220.00	214.50	216.58	66.32	64.00	64.95	134.85	130.70	132.58
22	406.00	402.50	403.85	218.50	215.00	216.31	65.50	64.00	64.84	135.48	130.49	132.91
23	409.00	405.00	406.69	218.50	213.50	216.88	66.00	64.00	65.04	135.07	131.53	133.48
24	407.00	404.00	405.38	218.00	214.50	215.94	65.18	64.00	64.64	134.12	130.49	132.91
25	408.00	403.50	405.33	220.50	215.00	217.38	66.00	64.50	65.21	136.40	130.29	133.00
26	410.00	403.50	407.25	221.50	214.00	218.27	66.00	64.00	65.28	135.10	130.91	133.00
27	408.00	405.50	406.23	219.50	214.50	217.33	66.00	64.00	64.98	135.48	131.95	133.50
28	408.00	403.50	405.92	219.50	216.00	217.92	66.00	65.00	65.26	135.48	131.54	133.34
29	408.00	402.50	405.40	220.50	216.50	218.52	66.00	64.80	65.50	134.03	131.71	132.83
30	410.00	402.50	405.15	219.50	213.50	216.52	66.00	64.00	64.98	134.12	131.12	132.68
31	0.00	Error	Error	0.00	Error	Error	0.00	Error	Error	0.00	Error	Error
Max	**412.50**			**222.00**			**67.00**			**136.52**		
Min		**401.50**			**213.50**			**63.80**			**130.08**	
Source: TD, BPC												

Graph: Daily maximum, minimum and average Voltage for the month of June, 2022



Annexure-V

Eastern Grid Outages for April 2022

MONTHLY OUTAGE REPORT FOR FOR EASTERN GRIDE FOR THE MONTH OF April,2022

Division:	**SMD-DEOTHANG**
Substation:	**132/33/11kV Kilikhar Substation**
Month:	**Apr-22**

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
132kV Feeders														
1	132kV Kurichu I/C	132kV	Tripped	4/19/2022	21:08hrs	4/19/2022	22:24hrs	1	10.764			Tripped	Grid fail from Motanga end.	Supply normalised and extended from Phuntshothang end.
2	132kV Kurichu I/C	132kV	Tripped	4/22/2022	22:25hrs	4/22/2022	22:30hrs		12.384			Tripped	Grid fail from Rangai end.	Grid fail from Rangai end.
3	132kV Kurichu I/C	132kV	Tripped	4/22/2022	00.13 hrs	4/22/2022	00:16hrs		13.32			Tripped	Tripped from TingtibeNanglam	Tripped from TingtibeNanglam end
4	132kV Corlung	132kV	Tripped	4/29/2022	11:37hrs	4/29/2022	11:57hrs		2.412			Tripped	Grid fail	Grid fail from Corlung, Rangia end.

Division:	**SMD-DEOTHANG**
Substation:	**132/33/11kV Kanglung Substation**
Month:	**Apr-22**

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protecton Relay Optd	Fault Details (As recorded by relay)			
	132kV													
1	5MVA Transformer II	132kV	Tripping	15.04.2022	4:02	15.04.2022	4:15	0	0.465	tripping relay 86 operated	NA	Earth Fault	NA	transformer tripped due to heavy feeder fault on 11kV Khaling feeder
2	Corlong Incomer	132KV	Grid fail from Rangia	22.04.2022	22:20	22.04.2022	22:44	0	-8.604	Tripping relay 86 operated	NA	NA	NA	Grid fail from Rangia
3	Corlong Incomer	132KV	Tripping	22.04.2022	22:45	23.04.2022	0:36	1	-8.604	NA	NA	breaker charging problem at Corlung after the Grid fail from Rangia	NA	Supply fed from Phuntshothang as the supply due to breaker problem at Corlung ss after the grid fail from Rangia
4	Kanglung - Phuntshothang	132KV	Tripping	22.04.2023	22:45	23.04.2022	0:19	1	7.218	NA	NA	breaker charging problem at Corlung after the Grid fail from Rangia	NA	Supply fed from Phuntshothang as the supply due to breaker problem at Corlung ss after the grid fail from Rangia

Division:	**SMD-DEOTHANG**
Substation:	**132/33/11kV Nangkor Substation**
Month:	**Apr-22**

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protecton Relay Optd	Fault Details (As recorded by relay)			
132kV Feeders														
1	5MVA Transformer-I 132/22/11kV	132kV	Tripping	4/3/2022	01:05 hrs	4/3/2022	01:10 hrs	0	0.33	Non directional IDMT PROTN Relay operated	Non dirO/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Yurung feeder
2	5MVA Transformer-II, 132/22/11kV	132kV	Tripping	4/3/2022	01:05 hrs	4/3/2022	01:11 hrs	0	0.17	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Yurung feeder.
3	Nangkor-Deothang Line	132kV	Tripping	4/4/2022	16:26 hrs	4/4/2022	16:34 hrs	0	44.5	MiCOMP14DB	***Directional -O/C & E/F Relay:*** Tripped Ø N : Start Ø CN,O/C start I>1, E/F1 start IN1>12, trip IN1>2.VAB=132.2kV, VBC=126.8kV,VCA=106.3kV,VAN=74.24kV,VBN=76.20kV,VCN=61.32kV,IA=183.8A,IB=187A,IC=681.9A, INDerived=525.6A, IN measured=525.1A & tripping relay 86 operated at our end.	Tripped on fault	-	Informed to BPSO, Thimphu & charged the feeder as per their instruction.
4	5MVA Transformer-I 132/22/11kV	132kV	Tripping	4/5/2022	15:28 hrs	4/5/2022	15:30 hrs	0	0.423	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Yurung feeder.
5	5MVA Transformer-II, 132/22/11kV	132kV	Tripping	4/5/2022	15:28 hrs	4/5/2022	15:31 hrs	0	0.26	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Yurung feeder.
6	5MVA Transformer-I 132/22/11kV	132kV	Tripping	4/8/2022	19:54 hrs	4/8/2022	19:57 hrs	0	0.58	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Tsebar feeder.
7	5MVA Transformer-II, 132/22/11kV	132kV	Tripping	4/8/2022	19:54 hrs	4/8/2022	20:15 hrs	0	0.58	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Tsebar feeder.
8	5MVA Transformer-I 132/22/11kV	132kV	Tripping	4/9/2022	21:40 hrs	4/9/2022	21:47 hrs	0	0.522	Non directional IDMT PROTN Relay operated	O/C relay-50A,50C & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Yurung feeder.
10	Nangkor-Nganglam Line	132kV	Tripping	4/9/2022	21:44 hrs	4/9/2022	21:50 hrs	0	-10.65	MiCOMP14DB	***Directional -O/C & E/F Relay*** : Start Ø ABC,O/C start I>1.VAB=39.87kV, VBC=38.81kV,VCA=47.05kV,VAN=29.90kV,VBN=14.34kV,VCN=28.37kV,IA=866.3A,IB=1.993kA,IC=1.371kA, INDerived=736.8A, IN measured=739.1A & tripping relay 86 operated at our end.	Tripped on fault	-	Informed to BPSO, Thimphu & charged the feeder as per their instruction.
9	5MVA Transformer-I, 132/22/11kV	132kV	Tripping	4/9/2022	21:50 hrs	4/9/2022	21:59 hrs	0	0.522	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Wamrong feeder.
11	5MVA Transformer-I 132/22/11kV	132kV	Tripping	4/9/2022	22:13 hrs	4/9/2022	22:16 hrs	0	0.522	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Tsebar feeder.
12	5MVA Transformer-I, 132/22/11kV	132kV	Tripping	4/10/2022	00:29 hrs	4/10/2022	00:31 hrs	0	0.318	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Tsebar feeder.
13	5MVA Transformer-I, 132/22/11kV	132kV	Tripping	4/15/2022	00:28 hrs	4/15/2022	00:29 hrs	0	0.31	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Nanung feeder
14	5MVA Transformer-II, 132/22/11kV	132kV	Tripping	4/15/2022	00:28 hrs	4/15/2022	00:34 hrs	0	0.14	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Nanung feeder
15	5MVA Transformer-I, 132/22/11kV	132kV	Tripping	4/15/2022	01:05 hrs	4/15/2022	01:06 hrs	0	0.33	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Nanung feeder
16	5MVA Transformer-II, 132/22/11kV	132kV	Tripping	4/15/2022	01:05 hrs	4/15/2022	01:13 hrs	0	0.09	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Nanung feeder
17	5MVA Transformer-I, 132/22/11kV	132kV	Tripping	4/15/2022	03:55 hrs	4/15/2022	03:56 hrs	0	0.249	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Tsebar feeder
18	5MVA Transformer-II, 132/22/11kV	132kV	Tripping	4/15/2022	03:55 hrs	4/15/2022	03:57 hrs	0	0.099	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Tsebar feeder
19	Nangkor-Nganglam Line	132kV	Tripping	4/15/2022	03:55 hrs	4/15/2022	04:01 hrs	0	7.99	MiCOMP14DB & MiCOMP442	***Directional -O/C & E/F Relay*** : Start Ø CN,O/C start I>1, E/F1 start IN1>12.VAB=133.1kV, VBC=95.19kV,VCA=79.58kV,VAN=73.75kV,VBN=74.31kV,VCN=25.79kV,IA=90.25A,IB=132.6A,IC=1.501kA, INDerived=1.285kA, IN measured=1.280kA & tripping relay 86 operated at our end.***Distance Relay*** : Start Ø CN, trip Ø ABC, start element distance, TOC start, SOTF TOR trip, AR lock out shot>, 49.91Hz, fault duration 70.12ms, relay trip time 80.4ms, fault location 16.62KM towards Nganglam, Zone -1, fault resistance-7.864Ω & trip relay 86 operated at our end. IA-90.15A, IB-130.5A, IC-1.513kA, VCN-73.70kV, VBN-74.29kV, VCN-25.75kV.	Tripped on fault	-	Informed to BPSO, Thimphu & charged the feeder as per their instruction.
20	5MVA Transformer-I, 132/22/11kV	132kV	Tripping	4/15/2022	03:59 hrs	4/15/2022	04:01 hrs	0	0.249	Non directional IDMT PROTN Relay operated	O/C relay-50A,50C & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Wamrong feeder
21	5MVA Transformer-II, 132/22/11kV	132kV	Tripping	4/15/2022	03:59 hrs	4/15/2022	04:10 hrs	0	0.099	Non directional IDMT PROTN Relay operated	O/C relay-50A,50C & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Wamrong feeder
22	Nangkor-Deothang Line	132kV	Tripping	4/19/2022	21:08 hrs	4/19/2022	21:11 hrs	0	8.4	MiCOMP14DB & MiCOMP442	***Directional -O/C & E/F Relay*** : Start Ø N, Trip Ø N, E/F1 start IN1>12, trip IN1>2.VAB=12.41kV,VBC=73.33kV,VCA=75.96kV,VAN=13.29kV,VBN=12.65kV,VCN=63.17kV,IA=491.7A,IB=491.1A,IC=63.85A, INDerived=668.9A, IN measured=669.2A & tripping relay 86 operated at our end.***Distance Relay :*** Start Ø ABCN, start element distance, TOC start, trip alerts-no, fault alarms-no, fault duration-200.7ms, relay trip time -0.000s, fault location 35.96KM towards Deothang, Zone -3, fault resistance-3.229Ω & trip relay 86 operated at our end. IA-496.6A, IB-532.8A, IC-59.68A, VAN-23.26kV, VBN-20.11kV, VCN-53.81kV.	Tripped on fault	-	At the same Grid failed from Rangia.Informed to BPSO, Thimphu & CB closed from our end as per the instruction from their end. Supply received at 22:24 hrs via Motonga-Phuntshothang-Kanglung Line.
23	Main Grid	132kV	Tripping	4/22/2022	22:23 hrs	4/22/2022	22:29 hrs	0	1.54	-	-	Tripped on fault	-	Grid failed from Nganglam Substation and Motonga Substation
24	Nangkor-Nganglam Line	132kV	Tripping	4/23/2022	00:12 hrs	4/23/2022	00:19 hrs	0	-0.39	MiCOMP14DB	***Directional -O/C & E/F Relay*** : Start Ø BCN, O/C start I>1, E/F1 start IN1>12.VAB=88.28kV,VBC=27.23kV,VCA=86.01kV,VAN=70.74kV,VBN=19.43kV,VCN=22.18kV,IA= 45.91A,IB=1.616kA,IC=1.398kA, IN Derived=1.327kA, IN measured=1.326kA & tripping relay 86 operated at our end	Tripped on fault	-	Informed to BPSO, Thimphu. At 00:16 hrs received supply via Motonga-Deothang & charged Nangkor-Nganglam feeder from our end as per the instruction from BPSO.
25	Kurichu-Nangkor line	132kV	Tripping	4/27/2022	18:55 hrs	4/27/2022	18:57 hrs	0	-24.33	MiCOMP442	***Distance Relay*** : Start Ø ACN,trip Ø ABC start element distance, TOC start, Distance trip Z1, AR lockout shot>, fault duration-71.96ms, relay trip time -80.33ms, fault location 17.52KM towards Kurichu,fault resistance-93.25mΩ & trip relay 86 operated at our end. IA-1.417kA, IB-120.5A, IC-1485kA, VAN-16.42kV, VBN-67.55kV, VCN-14.04kV.	Tripped on fault	-	Informed to BPSO & charged the feeder as per the instruction from their end.
26	5MVA Transformer-I 132/22/11kV	132kV	Tripping	4/27/2022	19:20 hrs	4/27/2022	19:23 hrs	0	0.86	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped due to feeder fault	-	Tripped due to fault on 33kV Tsebar feeder
27	5MVA Transformer-I 132/22/11kV	132kV	Tripping	4/27/2022	22:16 hrs	4/27/2022	22:21 hrs	0	0.387	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped due to feeder fault	-	Tripped while test charging 33kV Tsebar feeder
28	5MVA Transformer-II 132/22/11kV	132kV	Tripping	4/27/2022	22:16 hrs	4/28/2022	18:23 hrs	20	0.150	Non directional IDMT PROTN Relay operated	O/C relay-50C & tripping relay 86 operated	Tripped due to feeder fault	-	Tripped while test charging 33kV Tsebar feeder. While charging LV side, continues spark was observed from Y Ø main Isolator to CB, and there after kept under shut down and charged after rectifying the problem.
29	Nangkor-Deothang	132kV	Tripping	4/29/2022	11:37 hrs	4/29/2022	12:01 hrs	0	35.60	MiCOMP14DB	***Directional -O/C & E/F Relay*** : Start Ø BCN, O/C start I>1, E/F1 start IN1>12.VAB=88.28kV,VBC=27.23kV,VCA=86.01kV,VAN=70.74kV,VBN=19.43kV,VCN=22.18kV,IA= 45.91A,IB=1.616kA,IC=1.398kA, IN Derived=1.327kA, IN measured=1.326kA & tripping relay 86 operated at our end	Tripped on fault	-	CB operated at our end at the instant of Grid failure. Informed to BPSO.
30	Main Grid (Rangia Grid)	132kV	Tripping	4/29/2022	12:03 hrs	4/29/2022	12:04 hrs	0	35.60	-	-	Tripped on fault	-	Supply failed from Motonga Substation.
31	Nangkor-Deothang line	132kV	Tripping	4/29/2022	17:55 hrs	4/29/2022	18:04 hrs	0	19.00	MiCOMP442	***Distance Relay*** : Start Ø ACN,trip Ø ABC start element distance, TOC start, Distance trip Z1, AR lockout shot>, fault duration-65.02ms, relay trip time -80.02ms, fault location 17.06KM towards Deothang ,fault resistance-991.9mΩ & trip relay 86 operated at our end. IA-1.299kA, IB-1.306kA, IC-1.322kA, VAN-10.3kV, VBN-9.696kV, VCN-9.437kV.	Tripped on fault	-	Informed to BPSO, Thimphu and closed the CB as per the instruction from their end.
32	5MVA Transformer-I 132/22/11kV	132kV	Tripping	4/29/2022	18:14 hrs	4/29/2022	18:15 hrs	0	0.71	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Nanung feeder
33	5MVA Transformer-II 132/22/11kV	132kV	Tripping	4/29/2022	18:14 hrs	4/29/2022	21:17 hrs	3	0.5	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Nanung feeder. Charged after weather subsided to narmal.
34	5MVA Transformer-II 132/22/11kV	132kV	Tripping	4/29/2022	18:50 hrs	4/29/2022	18:53 hrs	0	0.71	Non directional IDMT PROTN Relay operated	O/C relay-50A & tripping relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Yurung feeder.

Division:	**SMD-DEOTHANG**
Substation:	**132/33/11kV Deothang Substation**
Month:	**Apr-22**

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protecton Relay Optd	Fault Details (As recorded by relay)			
1	Deothang-Montonga line	132kV	Tripping	04.04.2022	16:26	04.04.2022	16:29	0	42.732	O/C at Montonga end	Nil	NA	NA	Grid fail and at our end Breaker was in normal condition
2	Deothang-Nangkor line	132kV	Tripping	04.04.2022	16:26	04.04.2022	16:34	0	44.136	O/C and E/F at Nangkor End	Nil	NA	NA	Grid fail and at our end Breaker was in normal condition
3	Deothang-Nangkhor line	132kV	Tripping	09.04.2022	21:43	09.04.2022	21:46	0	-47.016	Diectional relay opt.	IA-784.2A, IB-1.110kA, IC-1.5kA & N-238.14	Unkown	NA	Feeder trip due to earth fault .after getting information from BPSO ,test charge were done and stand sucessfully

Division:	**SMD-DEOTHANG**
Substation:	**132/33/11kV Nganglam Substation**
Month:	**Apr-22**

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protecton Relay Optd	Fault Details (As recorded by relay)			
132kV														
1	Nganglam-Tingtibi	132kV	Tripping	02.04.2022	23:19	02.04.2022	23:30	0	-12.75	Micom relayP442	IA- 117.1A IB- 1.232KA IC- 82.92A IN- 1.422KA Zone 1 Fault location 30.54km Fauly resistance 5.620 Ohms Fault duration 65.17ms Relay Trip Time 80.21ms A/R lock out	Earth Fault/Trasient Fault		Line restored after coodination to BPSO and Tingtibi substation
2	Nganglam-Tingtibi	132kV	Tripping	09.04.2022	21:44	09.04.2022	21:50	0	-11.89		Grid Fail	Grid Fail		
3	Nangkhor-Nganglam	132kV	Tripping	15.04.2022	3:55	15.04.2022	4:01	0	-9.32		Grid Fail	Grid Fail		
4	Nganglam-Tingtibi	132kV	Tripping	22.04.2022	22:23	22.04.2022	22:25	0	-26.53	Micom relayP442	IA- 16.54A IB- 18.35A IC- 18.24A VAN- 83.22kV VBN- 83.5kV VCN- 82.08kV A/R lockout	Over Voltage		
5	Nangkhor-Nganglam	132kV	Tripping	22.04.2022	22:22	22.04.2022	22:29	0	9.82	Micom relayP442	IA- 23.36A IB- 24.74A IC- 23.41A VAN-83.31kV VBN- 83.59kV VCN- 82.08kV A/R lockout	Over Voltage		
6	Nganglam-Motanga	132kV	Tripping	22.04.2022	22:22	22.04.2022	9:45	11	19.1	REL650/REF615 opted	Line-1 Pre fault Mag- 0.1A pre fault Angle- -93.29deg Fault Mag- 0.33A Fault Angle- -37.48deg Line 2 preFault Mag- 0.07A Pre fault Angle- -24.03deg Fault Mag- 0.11A Fault- Mag- 44.37deg	Over Voltage		Line normalized after getting clear confirmation fro BPSO with vide closing code# 1056 issued by Madam Tshering Choden and coodination to Motanga end.
7	Nganglam-Tingtibi	132kV	Tripping	23.04.2022	0:12	23.04.2022	0:19	0	-10.09		Grid Fail	Grid Fail		
8	Nganglam-Tingtibi	132kV	Tripping	27.04.2022	17:11	27.04.2022	17:27	0	-31.45	Protecton Relay Optd	IA- 1.630KA IB- 283.2A IC- 1.466KA Fault location 4.861km Zone 1	Over Voltage		
9	Nganglam-Motanga	132kV	Tripping	27.04.2022	17:11	27.04.2022	17:15	0	23.94	REL650/REF615 opted	NA	Earth Fault/ Over current		

Division:	SMD-DEOTHANG
Substation:	132/33kV Motanga Substation
Month:	Apr-22

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duratio (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protecton Relay Optd	Fault Details (As recorded by relay)			
1	Deothang Feeder	132kV	Tripping	4/4/2022	16:26	4/4/2022	16:29	0	-43.05	OC, 86 A & B operated.	OC, 86 A & B operated.	transient fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.
2	Rangia Feeder	132kV	Tripping	4/4/2022	16:26	4/4/2022	17:11	0	31.65	OC, 86 A & B operated.	OC, 86 A & B operated.	transient fault	_	Charged the feeder with a charging code 194 from BPSO(Bhutan), NLDC(India) 221 and NERLDC(India) 176
3	15 MVA, TR-1(HV)	132/33kV	Tripping	4/4/2022	16:30	4/4/2022	16:33	0	0.12	86A & 86B OPTD	OC, 86 A & B operated. SEF protection operated.	transient fault	_	Charged from BPSO instruction verbally.
4	Deothang Feeder	132kV	Tripping	4/9/2022	14:28	4/9/2022	14:31	0	-39.7	OC, 86A & 86B OPTD	over current and earth fault relay operated.	transient fault	_	Charged from BPSO instruction verbally.
5	Rangia Feeder	132kV	Tripping	4/9/2022	14:28	4/9/2022	15:33	1	28.82	OC, 86A & 86B OPTD	over current and earth fault relay operated.	_	_	Charged the feeder with a charging code 1434 from BPSO(Bhutan), NLDC(India) 644 and NERLDC(India) 419. Long time taken for obtaining closing code from BPSO, hence more outage.
6	15 MVA, TR (HV)	132/33kV	Tripping	4/15/2022	16:57	4/15/2022	17:03	0	0.29	OC, 86A OPTD	SEF protection operated.	transient fault	_	Charged the transformer with closing code, 1012 from BPSO.
7	Deothang Feeder	132kV	Tripping	4/19/2022	21:06	4/19/2022	21:14	0	-7.13	OC & Ef, 86 A&B	Zone-1 trip on R & Y phase. 86A&B operated.	transient fault	_	Deothang feeder was charged with BPSO verbal instruction.
8	Rangia Feeder	132kV	Tripping	4/19/2022	21:06	4/19/2022	22:15	1	-16	OC, 86A & 86B operated	OC, 86A & 86B operated	_	_	At 21:06 hrs whole eastern grid failed, tripped Rangia & Deothang feeder on same time. Deothang feeder charged at 21:14hrs, at 21:40hrs Rangia feeder charge but did not hold due to faulty E/s indication at relay panel. Earth switch was rectified & CB spring charged. 21:53hrs - test charged Rangia feeder but still didnot hold. Hand tripped deothang & phuntshothang feeder to try for sectional charging, and charged Rangia feeder at 22:15hrs from our end with instruction from BPSO.
9	15 MVA, TR (HV)	132/33kV	Tripping	4/19/2022	22:15	4/19/2022	22:17	0	0.16	OC and E/f	OC, E/f and 86A relay operated	transient fault	_	Charged with BPSO verbal instruction.
10	15 MVA, TR (HV)	132/33kV	Tripping	4/20/2022	7:56	4/20/2022	8:01	0	0.22	OC and E/f, 86 A operated	OC and E/f, 86 A operated	transient fault	_	Charged the transformer with clearance received from BPSO verbally
11	15 MVA, TR (HV)	132/33kV	Tripping	4/20/2022	9:01	4/20/2022	9:05	0	0.08	OC and E/f, 86 A operated	OC and E/f, 86 A operated	transient fault	_	Charged the transformer with clearance received from BPSO verbally
12	15 MVA, TR (HV)	132/33kV	Tripping	4/20/2022	16:18	4/20/2022	16:26	0	0.12	OC and E/f, 86 A operated	OC and E/f, 86 A operated	transient fault	_	Charged the transformer with clearance received from BPSO verbally
13	Nganglam	132kV	Tripping	4/22/2022	22:03	4/22/2022	22:10	0	-18.57	86 A & B operated.	86 A & B operated.	transient fault	-	The feeder was charged after obtaining closing code, 1052, from BPSO.
14	Rangia Feeder	132kV	Tripping	4/22/2022	22:23	4/22/2022	22:54	0	17.61	OC, 86 A & B operated.	OC, 86 A & B operated.	transient fault	_	Charged the feeder with a charging code 1054 from BPSO(Bhutan), NLDC(India) 1184 and NERLDC(Indi) 1685
15	Nganglam Feeder	132kV	Tripping	4/22/2022	22:23	4/23/2022	7:45	9	-18.57	OC, 86 A & B operated.	OC, 86 A & B operated.	transient fault	_	The breaker was kept open from few hrs as per instruction from BPSO. Later it was charged at 7:45am on next day with closing code, 1056 by tshering choden, BPSO.
16	Deothang Feeder	132kV	Tripping	4/27/2022	17:11	4/27/2022	17:13	0	-23.16	OC, E/f, 86 A & B operated.	OC, E/f, 86 A & B operated.	transient fault	_	charged by verbal instruction from BPSO
17	Nganglam Feeder	132kV	Tripping	4/27/2022	17:11	4/27/2022	17:15	0	-28.18	OC, E/f, 86 A & B operated.	OC, E/f, 86 A & B operated.	transient fault	_	charged by verbal instruction from BPSO
18	Deothang Feeder	132kV	Tripping	4/29/2022	11:36	4/29/2022	11:58	0	-34.19	OC, E/f, 86 A & B operated.	OC, E/f, 86 A & B operated.	transient fault	_	Verbal instruction obtained from Tshering choden, BPSO & charged feeder.
19	Rangia Feeder	132kV	Tripping	4/29/2022	11:36	4/29/2022	12:05	0	24.24	OC, E/f, 86 A & B operated.	OC, E/f, 86 A & B operated.	transient fault	_	At 11:36hrs grid failed. Deothang, Rangia/Nganglam feeder tripped due to oc & E/f.At 11:43hrs Nganglam CB test charged but did not hold. At 11:49hrs test charged Rangia feeder as per closing code, 1110(BPSO), 2187(NLDC) & 1500(NERLDC) but did not hold. At 11:56hrs Nganglam CB closed from motanga and grid restored. At 11:58hrs Deothang fdr charged, at 12:05hrs Rangia charged & at 12:27hrs Nganglam closed.
20	Nganglam Feeder	132kV	Tripping	4/29/2022	11:36	4/29/2022	12:27	0	-12.35	OC, E/f, 86 A & B operated.	OC, E/f, 86 A & B operated.	transient fault	_	closing code from BPSO was 1112 given by karma dema.
21	Phuntshothang feeder	132kV	Tripping	4/29/2022	14:52	4/29/2022	15:02	0	-8.62	OC, E/f, 86 A & B operated.	OC, E/f, 86 A & B operated.	transient fault	_	closing code from BPSO was 1116 given by Pema Lhamo.

Division:	SMD-DEOTHANG
Substation:	132/33kV Corlung Substation
Month:	Apr-22

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duratio (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protecton Relay Optd	Fault Details (As recorded by relay)			
1	132 kV Khilikhar Feeder and Kanglung Feeder	132 kV	Grid fail	19.04.2022	21:06 hrs	19.04.2022	22:32 hrs	1	-8.250	Nil	Nil	Grid fail		At 21:06 hrs there was no Incomming supply from khilikar substation due to grid and Corlung substation was blckout but no breaker tripping has occoured at Corlung substation.
2	132 kV Khilikhar-Corlung Line	132 kV	Tripping	22.04.2022	22:23 hrs	22.04.2022	22:37 hrs	0	-10.730	Distance Relay (P442)	Distance Relay (P442) operated on Over Voltage, Recorded fault values : Started phase-ABC, Tripped phase-ABC, Over Voltage start V > 1 2, Over Voltage Trip V>2, fault duration-2.496s, relay trip time-79.62 ms, IA-13.41A, IB-15.06A, IC-14.67A, VAN-83.13 kV, VBN-84.18 kV, VCN-82.47 kV. Fault in Zone-None	Over Voltage		132 kV Khilikhar-Corlung Line and 132 kV Corlung-Kanglung Line triped at 22:23 hrs on over Voltage. Both the line was charged as per the instruction from BPSO at 22:37 hrs and 22:43 hrs reapectively.
3	132 kV Corlung-Kanglung Line	132 kV	Tripping	22.04.2022	22:23 hrs	22.04.2022	22: 43 hrs	0	9.950	Distance Relay (P442)	Distance Relay (P442) operated on Over Voltage, Recorded fault values : Started phase-ABC, Tripped phase-ABC, Over Voltage start V > 1 2, Over Voltage Trip V>2, fault duration-2.496s, relay trip time-79.62 ms, IA-13.41A, IB-15.06A, IC-14.67A, VAN-83.13 kV, VBN-84.18 kV, VCN-82.47 kV. Fault in Zone-None	Over Voltage		
4	132 kV Khilikhar-Corlung Line	132 kV	Tripping	22.04.2022	22:47 hrs	23.04.2022	0:23 hrs	1	-10.730	Distance Relay (P442)	Distance Relay (P442) operated on Over Voltage, Recorded fault values : Started phase-ABC, Tripped phase-ABC, Over Voltage start V > 1 2, Over Voltage Trip V>2, VT fail Alarm, V>1 Alarm, Frequency 50.02, fault duration-333.2 ms, relay trip time-79.96 ms, IA-12.83A, IB-14.76A, IC-13.73A, VAN-79.41kV, VBN-127.4 kV, VCN-80.30 kV. Fault in Zone-None	Over Voltage		132 kV Khilikhar-Corlung Line triped at 22:47 hrs on over Voltage.The line was charged as per the instruction from BPSO at 00:23 hrson 23.04.2022
5	132 kV Khilikhar Feeder and Kanglung Feeder	132 kV	Grid fail	29.04.2022	11:36 hrs	29.04.2022	11:57 hrs	0	-3.510	Nil	Nil	Grid fail		At 11:36 hrs there was no Incomming supply from khilikar substation due to grid and Corlung substation was blckout but no breaker tripping has occoured at Corlung substation.
6	132 kV Khilikhar Feeder and Kanglung Feeder	132 kV	Grid fail	29.04.2022	12:02 hrs	29.04.2022	12:06 hrs	0	-3.920	Nil	Nil	Grid fail		At 12:02 hrs there was no Incomming supply from khilikar substation due to grid and Corlung substation was blckout but no breaker tripping has occoured at Corlung substation.
7	132 kV Khilikhar Feeder and Kanglung Feeder	132 kV	Triped from Khilikhar SS	29.04.2022	14:49 hrs	29.04.2022	14:53 hrs	0	-11.590	Nil	Nil	Triped at Khilikhar Substation		At 14:49 hrs132 kV Khilikhar-Corlung line was triped at Khilikhar Substation and Corlung substation was blckout but no breaker tripping has occoured at Corlung substation.

Division:	SMD-DEOTHANG
Substation:	132/33kV Phuntshothang Substation
Month:	Apr-22

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duratio (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protecton Relay Optd	Fault Details (As recorded by relay)			
1	132/33kV Transformer-II (10MVA)	132kV	Transient fault	4/2/2022	5:56	4/2/2022	5:59		0.37	86A and 86B	(DPHLPDOC1) Trip value; L1: 60.6A, L2: 39.6A, L3: 84A, Lr: 0A.	er current and Earthf fa	Unknown	Charged
2	132/33kV Transformer-II (10MVA)	132kV	Transient fault	4/4/2022	18:00	4/4/2022	18:07		0.64	86A and 86B	(DPHLPDOC1) Trip value; L1: 151.05A, L2: 29.65A, L3: 144.9A, Lr: 0A.	Over current	Unknown	Charged
3	132/33kV Transformer-II (10MVA)	132kV	Transient fault	4/6/2022	2:42	4/6/2022	2:46		0.21	86A and 86B	(DPHLPDOC1) Trip value; L1: 53.25A, L2: 119.7A, L3: 103.2A, Lr: 0A.	er current and Earthf fa	Unknown	Charged
4	132/33kV Transformer-II (10MVA)	132kV	Transient fault	4/9/2022	16:46	4/9/2022	16:50		0.58	86A and 86B	(DPHLPDOC1) Trip value; L1: 40.35A, L2: 81.75A, L3: 55.05A, Lr: 0A.	Earthf fault	Unknown	Charged
5	132/33kV Transformer-II (10MVA)	132kV	Transient fault	4/10/2022	17:20	4/10/2022	17:24		0.46	86A and 86B	(DPHLPDOC1) Trip value; L1: 40.35A, L2: 81.75A, L3: 55.05A, Lr: 0A.	Earthf fault	Unknown	Charged
6	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/12/2022	9:50	4/12/2022	9:53		0.44	86A and 86B	(DPHLPDOC1) Trip value; L1: 191.4A, L2: 4.2A, L3: 195A, Lr: 0A.	er current and Earthf fa	Unknown	Charged
7	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/13/2022	12:56	4/13/2022	12:58		0.53	86A and 86B	(DPHLPDOC1) Trip value; L1: 53.25A, L2: 10.2A, L3: 55.8A, Lr: 0A.	Over current	Unknown	Charged
8	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/13/2022	14:25	4/13/2022	14:28		0.20	86A and 86B	(DPHLPDOC1) Trip value; L1: 53.7A, L2: 33.6A, L3: 73.05A, Lr: 0A.	Earthf fault	Unknown	Charged
9	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/14/2022	18:28	4/14/2022	18:30		0.62	86A and 86B	(DPHLPDOC1) Trip value; L1: 181.5A, L2: 184.5A, L3: 366.15A, Lr: 0A.	Earthf fault	Unknown	Charged
10	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/15/2022	1:35	4/15/2022	1:38		0.36	86A and 86B	(DPHLPDOC1) Trip value; L1: 45.6A, L2: 86.4A, L3: 40.8A, Lr: 0A.	Over current	Unknown	Charged
11	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/15/2022	3:01	4/15/2022	3:09		0.06	86A and 86B	(DPHLPDOC1) Trip value; L1: 170.85A, L2: 171.3A, L3: 342.15A, Lr: 0A.	Over current	Unknown	Charged
12	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/15/2022	3:35	4/15/2022	3:39		0.06	86A and 86B	(DPHLPDOC1) Trip value; L1: 180.6A, L2: 181.2A, L3: 361.8A, Lr: 0A.	Over current	Unknown	Charged
13	132/33kV Transformer-I(10MVA)	132kV	Transient fault	4/16/2022	1:59	4/16/2022	2:06		0.19	86A and 86B	(DPHLPDOC1) Trip value; L1: 132.45A, L2: 130.95A, L3: 1.35A, Lr: 0A.	Earthf fault	Unknown	Charged
14	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/16/2022	18:25	4/16/2022	18:30		0.86	86A and 86B	(DPHLPDOC1) Trip value; L1: 161.25A, L2: 170.4A, L3: 331.8A, Lr: 0A.	Over current	Unknown	Charged
15	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/17/2022	21:40	4/17/2022	21:44		0.64	86A and 86B	(DPHLPDOC1) Trip value; L1: 164.7A, L2: 169.2A, L3: 334.05A, Lr: 0A.	Over current	Unknown	Charged
16	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/19/2022	14:53	4/19/2022	14:57		0.54	86A and 86B	(DPHLPDOC1) Trip value; L1: 45.6A, L2: 86.4A, L3: 40.8A, Lr: 0A.	Over current	Unknown	Charged
17	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/19/2022	15:27	4/19/2022	15:29		0.08	86A and 86B	(DPHLPDOC1) Trip value; L1: 47.85A, L2: 58.35A, L3: 18A, Lr: 0A.	Over current	Unknown	Charged
18	132kV Motanga	132kV	Grid Fail	4/22/2022	22:25	4/22/2022	23:33	1	7.43	Nill	Nill	Nill	Grid Fail	Grid Fail at 22:25, however at first breaker are all normal but at 22:30 breaker got open and after receving information from BPSO,test charged the line,but line didnot withstand and spring got discharged and due to abnormal weather took time to reset.After reseting and receving information from BPSO, line charged at 23:33.
19	132kV Kanglung	132kV	Grid Fail	4/22/2022	22:25	4/22/2022	23:37	1	8.19	Nill	Nill	Nill	Grid Fail	Grid Fail at 22:25, however at first breaker are all normal but at 22:33 breaker got open and after receving information from BPSO, line charged at 23:37.
20	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/24/2022	13:33	4/24/2022	13:36		0.56	86A and 86B	(DPHLPDOC1) Trip value; L1:263.7A, L2:127.8A, L3:135.9A, Lr: 0A.	Over current	Unknown	Charged
21	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/24/2022	13:39	4/24/2022	13:42		0.56	86A and 86B	(DPHLPDOC1) Trip value; L1: 52.2A, L2:57.45A, L3:24.6A, Lr: 0A.	Over current	Unknown	Charged
22	132/33kV Transformer-II (10MVA)	132kV	Transient fault	4/29/2022	13:01	4/29/2022	13:03		0.57	86A and 86B	(DPHLPDOC1) Trip value; L1: 52.2A, L2:57.45A, L3:24.6A, Lr: 0A.	Earth fault	Unknown	Charged
23	132kV Kanglung	132kV	Trip on fault	4/29/2022	19:03	4/29/2022	19:22		7.56	89A and 89B	(DPHLPDOC1)Zone-1OPTD (R,Y,B Phase trip) Trip value; L1: 1733.03A , L2; 1766.32A, L3; 1628.4A,Lr; 0A	Zone-1OPTD (R,Y,B Phase trip)	Unknown	Zone-1OPTD (R,Y,B Phase trip) at the distance of 14.45 Km and line charge at 19:22 with charging code#1120 issued by miss: Pema Lhamo(BPSO).
24	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/29/2022	19:12	4/29/2022	19:14		1.07	86A and 86B	(DPHLPDOC1) Trip value; L1: 74.25A, L2: 113.55A, L3: 60.15A, Lr: 0A.	Over current	Unknown	Charged
25	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	4/29/2022	19:22	4/29/2022	19:23		1.07	86A and 86B	(DPHLPDOC1) Trip value; L1: 154.2A, L2: 288.75A, L3: 134.55A, Lr: 0A.	Over current	Unknown	Charged
26	132/33kV Transformer-I (10MVA)	132kV	Trip on fault	4/29/2022	19:16	4/29/2022	19:18		0.44	50 and 86OPTD	(DPHLPDOC1) Trip value; L1: 97.8A, L2: 101.7A, L3: 52.05A, Lr: 0A.	Over current	Unknown	Charged

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) 66kV Above													
1	04.04.2022	05:33 hrs	04.04.2022	06:03 hrs	0	171.62 MW	400kV Interim circuit 2	Alipurduar Substation	L1 to Ground and Over current , IA=1.18KA	main 1 = Rph pick up		Transient Fault	
2	06.04.2022	05:20 hrs	06.04.2022	05:57 hrs	0	160.17 MW	400kV Interim circuit 2	Alipurduar Substation	L1- Ground, Zone 1, Over current , IA=0.96KA	Main 2 and Main 1 pick up, Rphase to ground	Fault Distance: Main 2(dist)=190.7km, Main 1(dist)=B190.5km	Transient Fault	
3	10.04.2022	00:30 hrs	10.04.2022	00:55 hrs	0	125.08 MW	400kV Interim circuit 2	Alipurduar Substation	Fault Loop(Rph to Ground)	Main 1 optd ,Fault Loop(Rph to Ground) Zone 1 optd. Main 2 optd ,Fault Loop(Rph to Ground) , Zone 1 optd.	Main 1 Fault dist(161.7 km), Main 2 Fault dist(161.5)		
4	14.04.2022	19:28 hrs				52.36	400kV Interim circuit 2	Alipurduar Substation	YBph trip	Main 1 & Main2 optd.(YBph trip), zone 1 and Zone2 optd. (YB ph trip)			
5	15.04.2022	02:15 hrs	15.04.2022	3:00	0	83.4	400kV Interim circuit 1	Alipurduar Substation	Rph-G	Main-1; Ground Pickup . Main-2; RYBph pick up and Fault loop R-G.	Main 2 Fault dist 136.2 km	d as per following Charging code: NLDC Bhutan: 1005, NLD	
6	22.04.2022	23:15 hrs	22.04.2022	0:00	0	116.35	400kV MHEP Line-4	Jigmeling SS and Alipurduar SS	Bph-G Fault current main -1&2 fault current 5.9kA	Main 1 optd ,Fault Loop(Bph to Ground) , Zone 1 optd. Main 2 optd ,Fault Loop(Bph to Ground) Zone 1 optd.	Fault dist(16.1 km) Fault dist(13.2),		Line auto reclosed
7	27.04.2022	17:11hrs	28.04.2022	18:58 hrs	25	101.5MW	500MVA ICT	Jigmeling SS	R&B phase operated	Differentail relay operated			
8	22.04.2022	21:14 hrs	22.04.2022	21:22 hrs	0	57.520	220kV Tsirang	Dhajey SS	L3-G	Main 2: Fault Loop Bph to Ground, Z1 Trip. Ib=1.91kA	Fault dist: 39.3km.	Transient	**Line restored as per BPSO closing code: 1052, Tsherin Choden**
9	22.04.2022	21:14 hrs	22.04.2022	21:26 hrs	0	-13.81	220kV Dagapela	Dagapela S	L2-L3-G	Main 1 optd, Z1 Trip, Fault Loop(L2-L3 and ground),	Fault dist(36.km) Fault current Ia=0.20ka Ib=4.91ka Ic=2.50ka	Transient	
10	27.04.2022	17:11hrs	27.04.2022			-34.09	400/220kV ICT	Jgmeling SS					

2. 220/66/33kV Dhajay Substation

i) 66kV and above

1	22.04.2022	21:14hrs	22.04.2022	21:22hrs		56.52	Tsirang-Jigmeling	Dhajay Subsation	Main 1- Ia=0.13kA, Ib=0.76KA, Ic=1.47KA with distance 15.5KM. Main 2- Ia=160.28A, Ib=834.37A, Ic=1455.55A, In=1012.99A	Distance relay Main 1&2(21.1&21.2)	Line segment	Tripped	Feeder restored after confirmation
2	22.04.2022	23:30hrs	22.04.2022	23:43hrs		54.1	Tsirang-Jigme	Dhajay Su	Main 2- Ia=220.5	Distance relay Main 2(21.2)	Line segment	Tripped	Feeder restored after confirmation

4. 132/33kV Tintibi Substation

i) 66kV & Above

1	4/2/2022	23:19	4/2/2022	23:29	0	13.130	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:BN,Trip Phase:ABC,Fault zone-1 trip,Fault location:28.86kM.	28.86kM	Tempoary	
2	4/9/2022	21:19	4/9/2022	21:55	0	12.600	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:ABC,Trip Phase:ABC,Fault zone-1 trip,Fault location:54.28kM.	54.28kM	Tempoary	
3	4/9/2022	22:38	4/9/2022	22:47	0	3.670	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:AN,Trip Phase:ABC,Fault zone-1 trip,Fault location:30.75kM.	30.75kM	Tempoary	
4	4/9/2022	23:00	4/9/2022	23:07	0	9.720	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:ABCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:12.80kM.	12.80kM	Tempoary	
5	4/10/2022	17:11	4/11/2022	17:17	0	12.890	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:AB,Trip Phase:ABC,Fault zone-1 trip,Fault location:31.53kM.	31.53kM	Tempoary	
6	4/15/2022	5:54	4/15/2022	4:05	0	-1.220	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:CN,Trip Phase:ABC,Fault zone-1 trip,Fault location:51.83kM.	51.83kM	Tempoary	
7	4/16/2022	1:55	4/16/2022	2:10	0	4.900	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:AB,Trip Phase:ABC,Fault zone-1 trip,Fault location:33.33kM.	33.33kM	Tempoary	
8	4/16/2022	2:10	4/20/2022	19:55	87	4.900	132kV Tingtil	132kV Ti	Conductor Snaped	Distance Relay:Start Phase:CN,Trip Phase:ABC,Fault zone-1 trip,Fault location:28.68kM.	28.68kM	Tempoary	Conductor Snaped/Broken
9	4/22/2022	22:03	4/22/2022	22:13	0	26.300	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:BCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:33.82kM.	33.82kM	Tempoary	
10	4/22/2022	22:23	4/22/2022	22:25	0	26.340	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:AN,Trip Phase:ABC,Fault zone-1 trip,Fault location:54.02kM.	54.02kM	Tempoary	
11	4/23/2022	0:01	4/23/2022	0:20	0	0.474	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:BCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:46.8kM.	46.8kM	Tempoary	
12	4/25/2022	8:21	4/25/2022	8:39	0	9.720	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Satrt element:no,Trip elts:NO,Fault zone-None,Over voltage triped	0	Tempoary	
13	4/25/2022	8:21	4/25/2022	8:41	0	0.310	3MVA transfi	3MVA tr	Over current	Over current (251A)	0	Tempoary	
14	4/25/2022	8:21	4/25/2022	8:42	0	0.240	3MVA transfi	3MVA tr	Over current	Over current (251C)	0	Tempoary	
15	4/27/2022	17:11 Hrs	4/27/2022	17:29	0	38.800	132kV Tingtil	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:ACN,Trip Phase:ABC,Fault zone-1 trip,Fault location:40.37kM.	40.37kM	Tempoary	

5. 132/33kV Yurmoo Substation

i) 66kV & Above

1	22.04.2022	0.919444444	22.04.2022	0.92291667	0	-10.7	132kV Tingtil	132kV Yurmoo Ss	Nill	Tingtibi ss		Supply was failed from Tingtibi ss
2	23.04.2022	0.009027778	23.04.2022	0.01388889	0	-11.8	132kV Tingtil	132kV Yurmoo Ss	Nill	Tingtibi ss		Supply was failed from Tingtibi ss
3	25.04.2022	0.349305556	25.04.2022	0.35763889	0	-11.4	132kV Tingtil	132kV Yurmoo Ss	Nill	Tingtibi ss		Supply was failed from Tingtibi ss

6. 220/33kV Dagapela Substation

i) 66kV & Above

1	15.03.2022	06:15hrs	15.03.2022	19:08hrs	13	8.17	220/33kV 10	Dagapela	Earth fault	IA	Trip Relay optd,buch trip, SEF optd, I	Dagapela Substation	Transient Fault	Cable termination got burned and F

May 2022

MONTHLY TRIPPING REPORT FOR EASTERN GRIDE FOR THE MONTH OF MAY,2022.

Division:	SMD-DEOTHANG
Substation:	132/33/11kV Kilikhar Substation
Month:	May-22

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
132kV Feeders														
14	132KV Kurichu	132KV	Tripped	5/18/2022	09:47hrs	5/18/2022	09:51hrs	0	21.852	Nil	Nil	Tripped	Grid Fail	Grid fail From Motangga ,Rangya And Tingtibi

Division:	SMD-DEOTHANG
Substation:	132/33/11kV Kanglung Substation
Month:	May-22

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
	132kV													
5	Corlung	132	Grid fail	18.05.2022	21:48	18.05.2022	21:50	0	-17.964	NA	NA	Grid Fail	NA	Grid fail

Division:	SMD-DEOTHANG
Substation:	132/33/11kV Nangkor Substation
Month:	May-22

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
132kV Feeders														
1	Nangkor-Nganglam Line	132kV	Tripping	5/7/2022	16:25 hrs	5/7/2022	16:37 hrs	0	3.24	MiCOMP14DB	***Directional -O/C & E/F Relay:*** Tripped Ø N : Start Ø N. E/F1 start IN1>1, trip IN1>1.VAB=106.8kV, VBC=100.8kV,VCA=170.27kV,VAN=45.57kV,VBN=73.36kV,VCN=46.38kV,IA=423.3A,IB =14.10A,IC=447.9A, INDerived=326.9A, IN measured=325.9A & tripping relay 86 operated at our end.	Tripped on fault	-	Informed to BPSO, Thimphu & charged the feeder as per their instruction.
5	Main Grid	132kV	Tripping	5/18/2022	21:48 hrs	5/18/2022	21:51 hrs	0	-	-	-	Grid faill	-	Supply failed form Nganglam SS & Motonga SS.

Division:	SMD-DEOTHANG
Substation:	132/33/11kV Deothang Substation
Month:	May-22

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
1	Gomdar line	33kV	Tripping	30.04.2022	18:15	01.05.2022	11:25	17	0.156	O/C	IA=808.2A,IB=801.6A,IC=2.304A,IN=284.0A	Conductor snaped at Viewpoint	NA	Line charged as per line maintenance team & line got stand
14	Motanga Line	132kV	Tripping	18.05.2022	21:48	18.05.2022	21:55	0	32.256	E/Fand O/C at Motanga end	Nil	E/F and O/C	NA	Grid fail and at our end breaker was in normal.

Division:	SMD-DEOTHANG
Substation:	132/33/11kV Nganglam Substation
Month:	May-22

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
132kV														
1	Nganglam-Tingtibi	132kV	Tripping	07.05.2022	16:25	07.05.2022	16:34	0	-27.49	Micom relayP442	IA- 1.113KA IB- 138.9A IC- 1.113KA VAN- 37.97kV VBN- 76.97kV VCN- 38.1kV Fault location 104.3km Relay Trip Time 941.6ms Fault resistance 1.737Ohms Trip Phase ABC A/R lockout Zone 2	Overcurrent		Supply restored after coodination to BPSO & Tingtibi end.
2	Nganglam-Motanga	132kV	Tripping	07.05.2022	16:25	07.05.2022	16:45	0	20.08	Mincom relay REF650 REL615	L1 Fault Mag 104.49A/ -0.45deg L2 Fault Mag 95.44A/-121.61deg L3 Fault Mag 105.58A/125.02deg IN Fault Mag 228.0A/173.31deg	Earth Fault		Supply restored after coodination to BPSO & Motanga end.
4	Nganglam- Nangkhor	132kV	Tripping	15.05.2022	20:08	15.05.2022	20:22	0	-7.13	Mincom relay REF650 REL615	IA=86.51A IB=1.273kA IC=131.1A, IN=1.063kA VAN=90.58kV VBN= 85.78kV VCN=127.5kV, 86operated, Trip Phase ABC, fault distance-Zone 2 Trip, fault location 38.59kms, fault Resistance 5.056 ohms,	Overcurrent		Supply restored after coodination to BPSO & Nangkhor end.
5	Nganglam-Motanga	132kV	Tripping	15.05.2022	20:08	15.05.2022	20:23	0	18.7	Mincom relay REF650 REL615	86A operated, L1-Fault mag = 9.16A / -95.05deg, L2 - Fault mag = 8.76A / -36.03deg, L3 - Fault mag = 7.67A / -158.52deg, IN - Fault mag = .45A / 153.91deg	Earth Fault		Supply restored after coodination to BPSO & Motanga end.
6	3MVA TR-II	132kV	Tripping	16.05.2022	7:32	16.05.2022	16:37	0	0.936	O/C & E/F Relay	Tripped due to 33kV DCCL feeder fault	O/C & E/F		33kV DCCL feeder CB not Operated and made hand tripped.
7	3MVA TR-II	132kV	Tripping	17.05.2022	21:19	17.05.2022	21:27	0	0.837	Micom relayP442	86A operated. No fault recorded	NA		
8	Nganglam-Motanga	132kV	Tripping	18.05.2022	21:49	18.05.2022	22:34	0	29.23	Mincom relay REF650 REL615	86A operated, L1-Fault mag = .19A / 168.73deg, L2 - Fault mag = .13A / 41.33deg, L3 - Fault mag = .05A / 74.48deg, IN - Fault mag = .19A / 113.77deg	Earth Fault		Supply restored after coodination to BPSO & Motanga end.
9	Nganglam-DCCL	132kV	Tripping	24.05.2022	13:00	24.05.2022	13:01	0	6.97	No relay is Operated	No fault is recorded	Under Voltage		Feeder tripped at their end due to under voltage, the supply was normalized by opening Motanga- Rangia line

Division:	SMD-DEOTHANG
Substation:	132/33kV Motanga Substation
Month:	May-22

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
1	Rangia Feeder	132kV	Tripping	5/6/2022	23:25	5/7/2022	0:14	0	34.02	OC, 86 A & B operated.	OC, 86 A & B operated.	transient fault	-	Charged the feeder with a charging code 1155 from BPSO(Bhutan), NLDC(India) 489 and NERLDC(Indi) 1862
3	Nganglam Feeder	132kV	Tripping	5/7/2022	16:25	5/7/2022	16:42	0	-20.01	OC, 86 A & B operated.	OC, 86 A & B operated.	transient fault	_	The feeder was charged after obtaining the verbal instruction from BPSO.
4	Rangia Feeder	132kV	Tripping	5/13/2022	12:29	5/13/2022	12:45	0	28.33	86A & 86B OPTD	OC, 86 A & B operated.	transient fault	_	Charged the feeder with a charging code 0619from BPSO(Bhutan), NLDC(India) 601 and NERLDC(Indi) 1980
5	Nganglam Feeder	132kV	Tripping	5/15/2022	20:10	5/15/2022	20:24	0	-18.11	over current trip	OC, 86 A & B operated.	transient fault	_	Charged after getting verbal instruction from BPSO..
7	Deothang Feeder	132kV	Tripping	5/18/2022	21:48	5/18/2022	21:55	0	32.99	over current trip	OC, 86 A & B operated.	transient fault	_	Charged after getting verbal instruction from BPSO..
8	Rangia Feeder	132kV	Tripping	5/18/2022	21:48	5/18/2022	22:20	0	50.15	OC, 86A & 86B OPTD	over current and earth fault relay operated.	transient fault	_	Charged the feeder with a charging code 0619from BPSO(Bhutan), NLDC(India) 601 and NERLDC(Indi) 1980
9	Nganglam Feeder	132kV	Tripping	5/18/2022	21:48	5/18/2022	22:33	0	30.13	OC, 86A & 86B OPTD	over current and earth fault relay operated.	_	_	Charged after getting verbal instruction from BPSO..

Division:	SMD-DEOTHANG
Substation:	132/33kV Corlung Substation
Month:	May-22

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
34	132 kV Khilikhar Feeder and 132 kV Kanglung feeder	132 kV	Grid fail	18.05.2022	21:48 hrs	18.05.2022	21:55 hrs	0	-19.050	Nil	Nil	Breaker triped at Khilikhar End.		There was no 132 kV incomming supply from khilikhar due to grid fail but no breaker tripping has occurred at courlung end.

Division:	SMD-DEOTHANG
Substation:	132/33kV Phuntshothang Substation
Month:	May-22

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
1	132/33kV Transformer-I (10MVA)	132kV	Transient	5/7/2022	6:16	5/7/2022	6:20		0.34	50 and 86OPTD	(DPHLPDOC1) Trip value; L1: 170.25A, L2: 177.45A, L3: 347.4A, Ln: 0A.	Over current	Unknown	Charged
2	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/8/2022	2:28	5/8/2022	2:31		0.44	86A and 86B	(DPHLPDOC1) Trip value; L1: 43.05A, L2: 5.51A, L3: 99.75A, Ln: 0A.	Earthf fault	Unknown	Charged
3	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/8/2022	6:09	5/8/2022	6:11		0.97	86A and 86B	(DPHLPDOC1) Trip value; L1: 83.1A, L2: 33.75A, L3: 82.8A, Ln: 0A.	Over current	Unknown	Charged
4	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	5/8/2022	18:44	5/8/2022	18:50		0.67	86A and 86B	(DPHLPDOC1) Trip value; L1:193.35 A, L2: 91.65A, L3: 101.7, Ln: 0A.	Over current	Unknown	Charged
5	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	5/9/2022	20:07	5/9/2022	20:10		0.54	86A and 86B	(DPHLPDOC1) Trip value; L1:126.9 A, L2: 203.4A, L3: 123.4A, Ln: 0A.	Over current	Unknown	Charged
6	132/33kV Transformer-I (10MVA)	132kV	Transient fault	11.05-22	5:23	5/11/2022	5:26		0.27	86A and 86B	(DPHLPDOC1) Trip value; L1:369 A, L2: 360.3A, L3: 362.55A, Ln: 0A.	Over current	Unknown	Charged
7	132/33kV Transformer-II (10MVA)	132kV	Trip on fault	5/11/2022	12:44	5/11/2022	12:47		0.26	86A and 86B	(DPHLPDOC1) Trip value; L1:130.65 A, L2: 258.45A, L3: 127.67A, Ln: 0A.	Over current	Unknown	Charged
8	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/12/2022	5:59	5/12/2022	6:02		0.31	86A and 86B	Fault Value did not reflect on Relay (REF615)	Earthf fault	Unknown	Charged. DR did not triggered on Relay
9	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/12/2022	12:10	5/12/2022	12:14		0.29	86A and 86B	(DPHLPDOC1) Trip value; L1: 87.75A, L2: 1.8A, L3: 89.25A, Ln: 0A.	rthf fault and Overcurre	Unknown	Charged
10	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/14/2022	15:29	5/14/2022	15:32		0.47	86A and 86B	(DPHLPDOC1) Trip value; L1: 54.6A, L2: 51.15A, L3: 24.75A, Ln: 0A.	Earthf fault	Unknown	Charged
11	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/15/2022	1:57	5/15/2022	2:01		0.45	86A and 86B	(DPHLPDOC1) Fault value; L1: 130.5A, L2: 3A, L3: 133.2A, Ln: 0A.	rthf fault and Overcurre	Unknown	Charged
12	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/16/2022	4:26	5/16/2022	4:29		0.50	86A and 86B	Fault Value did not reflect on Relay (REF615)	Earthf fault	Unknown	Charged
13	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/17/2022	8:55	5/17/2022	8:58		0.62	86A and 86B	(DPHLPDOC1) Fault value; L1: 41.1A, L2: 96.15A, L3: 85.2A, Ln: 0A.	rthf fault and Overcurre	Unknown	Charged
14	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/18/2022	16:32	5/18/2022	16:37		0.45	86A and 86B	(DPHLPDOC1) Fault value; L1: 100.65A, L2: 122.1A, L3: 63.9A, Ln: 0A.	Earthf fault	Unknown	Charged
15	Kanglung (1K7LA)	132kV	Transient fault	5/18/2022	21:47	5/18/2022	22:06		15.66	86A and 86B	(OV2PTOV) Fault value; L1: 5.85A, L2: 7A, L3: 6.94A, Ln: 0.52A.	Over voltage & Under Voltage.	Unknown	Coordination with BPSO and line charged after Voltage get Normalized.
16	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/21/2022	9:03	5/21/2022	9:06		0.48	86A and 86B	(DPHLPDOC1) Fault value; L1: 123.15A, L2: 129.75A, L3: 121.65A, Ln: 0A.	Over current	Unknown	Charged
17	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/23/2022	6:31	5/23/2022	6:33		1.03	86A and 86B	(DPHLPDOC1) Fault value; L1: 56.25A, L2: 33A, L3: 33A, Ln: 0A.	Earthf fault	Unknown	Charged
18	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/24/2022	15:30	5/24/2022	15:33		0.56	86A and 86B	Fault Value did not reflect on Relay (REF615)	Earthf fault	Unknown	Charged
19	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/29/2022	12:09	5/29/2022	12:10		0.43	86A and 86B	Fault Value did not reflect on Relay (REF615)	Earthf fault	Unknown	Charged
20	132/33kV Transformer-II (10MVA)	132kV	Transient fault	5/29/2022	19:31	5/29/2022	19:32		0.74	86A and 86B	(DPHLPDOC1) Trip value; L1:4.2A, L2: 64.2A, L3: 60.45A, Ln: 0A.	arthf fault & overcurre	Unknown	Charged

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
1. 400/220/132/33kV Jigmeling Substation													
i) 66kV Above													
1	20.05.2022	22:48 hrs	20.05.2022	23:03 hrs	0	82.17	400/220kV ICT	Jigmeling Substation		Directional O/C & E/F Protection Relay optd (HV).			
2	21.05.2022	19:47 hrs	21.05.2022	19:54 hrs	0	82.7	400/220kV ICT	Jigmeling Substation	Operated PRV both on HV and LV.	Directional O/ C & E/F trip,			
3	28-May-22	10:27 hrs	28-May-22	11:41 hrs	1	-117.81	400kV MHPA Line-4	Jigmeling and Alipurduar SS	DTT trip for RYB phase	Distance Relay: SIPROTECT 7SA52 & 7SA611			
4	28-May-22	11:43 hrs	28-May-22	14:26 hrs	2		400kV MHPA Line-4	Jigmeling and Alipurduar SS	DTT trip for RYB phase	Distance Relay: SIPROTECT 7SA52 & 7SA611			
5	29-May-22	17:24 hrs	29-May-22	18:28 hrs	1	-113.21	400kV MHPA Line-4	Jigmeling and Alipurduar SS	DTT trip for RYB phase	Distance Relay: SIPROTECT 7SA52 & 7SA611			
6	11.05.2022	20:33hrs	11.05.2022	20:39hrs	0	44.23	220kV Tsirang feeder	Tsirang SS	Ground fault	Main -1 Y&B TRIP, Z1/Z1B tripped, Main -2Y&B TRIP, Z1/Z1B tripped	Fault Current Rph=0.15kA, Yph=4.99kA, Bph=4.85kA Main 1 fault dist=11.8km, Main 2 Fault Dist=11.82km		lightning &Rainning
2. 220/66/33kV Dhajay Substation													
i) 66kV and above													
1	11.05.2022	20:33hrs	11.05.2022	20:39hrs		-43.84	Tsirang-Jigmeling	Dhajay Subsation	Main 2- Ia=146.36A, Ib=1724.19A, Ic=1841.84A,In=10.96A with distance 18.81KM.	Distance relay Main 2(21.2)	Line segnment	Tripped	Feeder restored after BPSO instru
3. 132/66/33/11kV Gelephu Substation													
i) 66kV and above													
Nill													
4. 132/33kV Tintibi Substation													
i) 66kV & Above													
1	5/7/2022	16:25	5/7/2022	16:34	0	28.370	132kV Tingtibi	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:ACN,Trip Phase:ABC,Fault zone-1 trip,Fault location:9.99kM.	9.99kM	Tempoary	Closing Code:1159(BPSO)
2	5/15/2022	20:09	5/15/2022	20:15	0	28.870	132kV Tingtibi	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:ABC,Trip Phase:ABC,Fault zone-1 trip,Fault location:59kM.	59kM	Tempoary	
3	5/18/2022	21:47	5/18/2022	21:50	0	27.720	132kV Tingtibi	132kV Ti	Tempoary Fault	Distance Relay:Start Phase:AN,Trip Phase:ABC,Fault zone-1 trip,Fault location:54.56kM.	54.56kM	Tempoary	
5. 132/33kV Yurmoo Substation													
i) 66kV & Above													
1	22.04.2022	0.919444444	22.04.2022	0.92291667	0	-10.7	132kV Tingtibi	132kV Yurmoo Ss	Nill	Tingtibi ss			Supply was failed from Tingtibi ss
2	23.04.2022	0.009027778	23.04.2022	0.01388889	0	-11.8	132kV Tingtibi	132kV Yurmoo Ss	Nill	Tingtibi ss			Supply was failed from Tingtibi ss
3	25.04.2022	0.349305556	25.04.2022	0.35763889	0	-11.4	132kV Tingtibi	132kV Yurmoo Ss	Nill	Tingtibi ss			Supply was failed from Tingtibi ss

For June 2022

MONTHLY OUTAGE REPORT FOR THE MONTH OF JUNE,2022 UNDER SMD DEOTHANG, TD, BPC.

Division:	**SMD-DEOTHANG**
Substation:	**132/33/11kV Kilikhar Substation**
Month:	**Jun-22**

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
132kV Feeders														
1	I/commer Kurichu	132Kv	Tripped	6/9/2022	05:02 hrs	6/9/2022	05:20 hrs		-20.624	Nill	Nil	Grid fail form Rangia	Tripped	Gried fail from Rangia and Tingtibi end

Division:	**SMD-DEOTHANG**
Substation:	**132/33/11kV Kanglung Substation**
Month:	**Jun-22**

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protection Relay Optd	Fault Details (As recorded by relay)			
132kV														
1	132kV Corlung	132 kV	Trip	09.06.2022	05:01	09.06.2022	05:21	0	-17.424	NA	NA	Grid Fail	NA	Grid Fail
1	Corlung	132	Hand tripped	11.06.2022	15:08	11.06.2022	15:34	0	-17.28	NA	NA	NA	Transformer did not get trip when fault occur.	Wild animal[Weasel] clamb on 2.5MVA Trs CT.

Division:	**SMD-DEOTHANG**
Substation:	**132/33/11kV Nangkor Substation**
Month:	**Jun-22**

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	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
132kV Feeders														
2	Nangkor-Nganglam Line	132kV	Tripping	6/3/3033	03:21 hrs	6/3/2022	03:27 hrs	0	9.43	MiCOMP14DB	***Directional -O/C & E/F Relay*** : Tripped Ø N : Start Ø ABCN. E/F1 start IN1>12, trip IN1>2.VAB=35.82kV, VBC=32.93kV,VCA=33.28kV,VAN=21.16kV,VBN=20.59kV,VCN=17.12kV,IA=771.5A,IB=830.6A,IC=856.1A, INDerived=98.19A, IN measured=96.06A & tripping relay 86 operated at our end. ***Distance Relay:*** Start Ø ABCN, start elements distance. TOC start, tripped alerts :No. Fault alarms: No,Fault duration: 275.7ms, Relay trip time:0.00s. Fault location: 58.65KM towards Nganglam, fault resistance:1.555Ω. IA=815.8A, IB=838.7A, IC=880.6A, VAN=21.92kV, VBN=21.36A, VCN=18.08kV.	Transient fault	-	Charged after informing BPSO, Thimphu
4	Main Grid	132kV	Tripping	6/9/2022	05:01 hrs	6/9/2022	05:22 hrs	0	-	-	-	Tripped on fault	-	Supply failed from Tintibi & Motonga SS
5	Nangkor-Deothang Line	132kV	Tripping	6/9/2022	05:34 hrs	6/9/2022	05:35 hrs	0	28	MiCOMP14DB	***Directional -O/C & E/F Relay:*** Tripped Ø N : Start Ø AN. E/F1 start IN1>12, trip IN1>2.VAB=87.34kV, VBC=136.6kV,VCA=91.56kV,VAN=28.19kV,VBN=75.03V,VCN=73.96kV,IA=1.265kA,IB=125.6A,IC=133.3A, INDerived=1.007kA, IN measured=1.007kA & tripping relay 86 operated at our end.	Transient fault	-	Informed to BPSO & charged the feeder
6	132/33kV, 5MVA Trf-I	132kV	Tripping	6/18/2022	01:22 hrs	6/18/2022	01:24 hrs	0	0.18	Non directional IDMT relay optd	O/C relay-50A & trip relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Nanung feeder
7	132/33kV, 5MVA Trf-II	132kV	Tripping	6/18/2022	01:22 hrs	6/18/2022	01:52 hrs	0	0.11	Non directional IDMT relay optd	O/C relay-50A & trip relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Nanung feeder
8	132/33kV, 5MVA Trf-I	132kV	Tripping	6/18/2022	06:31 hrs	6/18/2022	06:33 hrs	0	0.291	Non directional IDMT relay optd	O/C relay-50A & trip relay 86 operated	Tripped on feeder fault	-	Tripped while test charging 33kV Wamrong feeder
9	132/33kV, 5MVA Trf-II	132kV	Tripping	6/18/2022	06:31 hrs	6/18/2022	06:34 hrs	0	0.129	Non directional IDMT relay optd	O/C relay-50A & trip relay 86 operated	Tripped on feeder fault	-	Tripped while test charging 33kV Wamrong feeder
10	132/33kV, 5MVA Trf-I	132kV	Tripping	6/27/2022	07:23 hrs	6/27/2022	07:25 hrs	0	0.606	Non directional IDMT relay optd	O/C relay-50A & trip relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Tsebar feeder
11	132/33kV, 5MVA Trf-II	132kV	Tripping	6/27/2022	07:23 hrs	6/27/2022	07:40 hrs	0	0.408	Non directional IDMT relay optd	O/C relay-50A & trip relay 86 operated	Tripped on feeder fault	-	Tripped due to fault on 33kV Tsebar feeder
12	132/33kV, 5MVA Trf-I	132kV	Tripping	6/28/2022	13:21 hrs	6/28/2022	13:24 hrs	0	0.456	Non directional IDMT relay optd	O/C relay-50A & trip relay 86 operated	Tripped on feeder fault	-	Tripped while test charging 33kV Nanung feeder
13	132/33kV, 5MVA Trf-II	132kV	Tripping	6/28/2022	13:21 hrs	6/28/2022	13:25 hrs	0	0.264	Non directional IDMT relay optd	O/C relay-50A & trip relay 86 operated	Tripped on feeder fault	-	Tripped while test charging 33kV Nanung feeder

Division:	**SMD-DEOTHANG**
Substation:	**132/33/11kV Deothang Substation**
Month:	**Jun-22**

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protecton Relay Optd	Fault Details (As recorded by relay)			
12	Nangkor-Deothang line	132kV	Tripping	09.06.2022	5:01	09.06.2022	5:23	0	-34.056	NA	Nil	Grid fail	NA	Grid fail from Rangia. Our end both the breaker is normal.
13	Nangkor-Deothang line	132kV	Tripping	09.06.2022	5:34	09.06.2022	5:35	0	-34.056	NA	Nil	Grid fail	NA	Supply fail from Nangkor.our end is normal
40	5MVA Transformer II	132/33kV	Tripping	19.06.2022	4:43	19.06.2022	4:45	0	0.54	NA	Nil	Due to Bangtar line	NA	Test charge done and found normal

Division:	**SMD-DEOTHANG**
Substation:	**132/33/11kV Nganglam Substation**
Month:	**Jun-22**

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protecton Relay Optd	Fault Details (As recorded by relay)			
132kV														
1	Nganglam-Tintibi feeder	132kV	Tripping	03.06.2022	3:20	03.06.2022	3:32	0	25.96	Micom relay P442	IA- 1.932KA IB- 1.987kA IC- 12.127KA VAN- 10.87kV VBN- 10.28kV VCN- 3.491kV Fault location 22.08km Relay Trip Time 275.7ms Fault resistance 596.0Ohms Trip Phase ABC A/R lockout Zone 1	Overcurrent		Supply restored after coodination to BPSO & Tingitbi end.
2	Nganglam-Motanga feeder	132kV	Tripping	03.06.2022	3:20	03.06.2022	3:35	0	25.9	Micom relay REF650 REL615	L1 Fault Mag 114.82A/ 10.69deg L2 Fault Mag 116.3A/113.5deg L3 Fault Mag 110.99A/129.25deg IN Fault Mag 3.85A/170.87deg	Earth Fault		Supply restored after coodination to BPSO & Motanga end.
4	Nganglam-Tintibi feeder	132kV	Tripping	08.06.2022	12:06	08.06.2022	12:17	0	-35.08	Micom relay P442	IA= 1.736kA IB=1.849kA IC=1.789kA, VAN=10.26kV VBN= 10.12kV VCN=9.825kV, 86operated, Trip Phase ABC, Fault location 27.84kms, Zon =1, Fault Resistance 9.99m ohms, Fault duration 76.66, A/R Lock Out	Overcurrent		Supply normalised after coordination with Tingitbi Substation, and NLDC/BPSO (closing Code :1403 by karmachoden NLDC)
5	Nganglam-Tintibi feeder	132kV	Tripping	09.06.2022	3:34	09.06.2022	3:55	0	-26.48	Micom relay P442	IA= 1.795kA IB=203.5kA IC=1.767kA, VAN=17.95kV VBN= 79.66kV VCN=16.80kV, 86operated, Trip Phase ABC, Fault location 35.30kms, Zon =1, Fault Resistance 163.6m ohms, Fault duration 76.55ms	Overcurrent		Supply normalised after coordination with Tingitbi Substation, and NLDC/BPSO (closing Code :1411 by kezang wangmo NLDC)
6	Nganglam-Motanga feeder	132kV	Tripping	09.06.2022	4:59	09.06.2022	5:20	0	-26.48		L1 Fault Mag 125.64A/ 9.63deg L2 Fault Mag 127.34A/113.75deg L3 Fault Mag 77841.93A/119.35deg IN Fault Mag 3.81A/165.72deg	Earth Fault		Supply normalised after coordination with Motanga Substation, and NLDC/BPSO (Grid fail)
9	5MVA Tr-I	132kV	Tripping	15.06.2022	7:09	15.06.2022	7:20	0	0.917	Micom relay P442	NA	Earth Fault/Tripped due to 33kV Druk GYP feeder fault		3MVA Tr LV side CB closed at 07:11hrs. At 07:31hrs 5MVA Tr LV side CB closed and open LV side CB of 3MVA Tr-and kept in Idle Charged.
10	5MVA Tr-I	132kV	Tripping	15.06.2022	8:51	15.06.2022	11:31	3	0.796	REL650/REF615 opted	Continues shutdown is taken by Mainatenance team to attend for LV side CT sparking and tightening of Nut & bolt	Tripped due to 33kV Dechenling feeder		3MVA Transformer was put in service at 08:54hrs(Both the Transformer are run in parrel in service)
13	Nganglam-Motanga feeder	132kV	Tripping	18.06.2022	19:01	18.06.2022	19:38	0	17.8	Micom relay REF650 REL615	Fault details; Zone 1 Fault Loop L1-L2 General trip R Y B Fault AbsDist. 22.993 Fault RelDist. 0.668 Recording Time 2.085s GR-A/B trip L1- 1154.04A L2- 1094.5A L3- 67.84A LN- 10.33A	Over Current(L1-L2)		At our end the CB is closed at 19:09hrs but from Motanga end they couldn't close and we have open CB at 19:16hrs at our end as per the BPSO's Instruction to close CB first from Motanga end. The CB is Closed at 19:38hrs from our end and the line was kept in Idle
14	Nganglam-Motanga feeder	132kV	Tripping	18.06.2022	20:01	19.06.2022	16:13	20	17.8	Micom relay REF650 REL616	Fault details; Zone 1 Fault Loop L1-L2 General trip R Y B Fault AbsDist. 22.652 Fault RelDist. 0.658 Recording Time 2.105s FF/BRC GR-A/B trip L1- 1774.34A L2- 1772.06A L3-7.43A LN- 1.59A	Over Current(L1-L2)		After clearing the Fault at location TN# 34 & TN# 35 by TMD and vide BPSO switch On code# 1592 the CB is closed at our end and witstood but from Motanga side they couldn't close. At 15:01hrs BPSO instructed us to open CB at our end to Closed first from their side but still they faces the same problem

Division:	**SMD-DEOTHANG**
Substation:	**132/33kV Motanga Substation**
Month:	**Jun-22**

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Tim		Normalization Time		Durati	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time	(Hrs)		Protecton Relay Optd	Fault Details (As recorded by relay)			
1	Nganglam Feeder	132kV	Tripping	6/3/2022	15:21	6/3/2022	15:38	0	-25.91	OC, 86 A & B operated.	OC, 86 A & B operated.	transient fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.
2	15 MVA Transformer	132/33kV	Tripping	6/3/2022	14:37:00 pm	6/3/2022	14:40	0	2.43	OC, e/f and 86 A operated.	OC, earthfault and 86 A operated.	transient fault	-	-
4	15 MVA Transformer	132/33kV	Tripping	6/5/2022	14:27:00 pm	6/5/2022	14:32	0	1.92	o/c, ef, 86A and SEF protection operated.	o/c, ef, 86A and SEF protection operated.	transient fault	_	-
7	15 MVA Transformer	132/33kV	Tripping	6/8/2022	5:51	6/8/2022	6:20	0	0.17	OC, e/f and 86 A operated.	OC & earth fault relay operated.	_	_	-
8	15 MVA Transformer(LV)	33kV	Tripping	6/8/2022	5:51	6/8/2022	6:21	0	0.17	OC, e/f relay operated.	over current and earth fault relay operated.	transient fault	_	-
10	Rangia Feeder	132kV	Tripping	6/8/2022	5:57	6/8/2022	6:32	0	52.13	over current, earth fault & 86A operated.	over current, earth fault & 86A operated.	transient fault	_	Rangia feeder was charged with a closing code of NLDC(1402), NLDC, India(548) and NERLDC(3258.
11	Nganglam Feeder	132kV	Tripping	6/9/2022	3:34	6/9/2022	3:40	0	-30.1	over current, earth fault & 86A/B operated.	overcurrent, earthfault and 86A&B operated.	transient fault	_	charged the feeder with BPSO verbal instruction.
12	Rangia Feeder	132kV	Tripping	6/9/2022	5:01	6/9/2022	5:46	0	50.3	over current, earth fault & 86A/B operated.	overcurrent, earthfault and 86A&B operated.	_	_	Substation was blackout at 5:01hrs.Rangia and Nganglam feeder tripped. Rangia test charged at 5:17hrs, did not hold, Nganaglam test charged at 5:18hrs but didnot hold. As per BPSO instruction, hand tripped Deothang fdr at 5:19hrs, Silicon fdr at 5:20hrs & P/thang fdr at 5:21hrs. Rangia charged at 5:46hrs with codes, 1412, NLDC, 636(NLDC,India), NERLDC(3312. And charged other fdrs too simultaneously. Nganglam feeder was charged only at 6:31hrs thereby station supply normalised.
13	Nganglam Feeder	132kV	Tripping	6/9/2022	5:01	6/9/2022	6:31	1	-28.48	over current, earth fault & 86A/B operated.	overcurrent, earthfault and 86A&B operated.	_	_	Nganglam fdr test charged at 5:59hrs as per BPSO instruction but did not hold. Again test charged at 6:01hrs as per BPSO instruction but did not hold. Nganglam fdr charged at 6:31hrs.
14	Nganglam Feeder	132kV	Tripping	6/18/2022	19:03	6/19/2022	16:10	21	-18.58	over current, earth fault & 86A/B operated.	Zone -1 trip, R,Y & B Phase trip	_	_	The feeder was test charged at 19:11hrs but did not hold. Again test charged at 19:17hrs, 19:38hrs and 19:52 hrs but did not hold. Fault distance was shown by distance relay at 12.29km beyond Motanga substation. Upon line patrolling by TMD team next day, a tree was found fallen and hanging on the conductor. Tree was cleared and the line was charged.

Division:	**SMD-DEOTHANG**
Substation:	**132/33kV Corlung Substation**
Month:	**Jun-22**

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duration of Outage (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protecton Relay Optd	Fault Details (As recorded by relay)			
1	132 kV Grid	132 kV	Grid fail	09.06.2022	05:01 hrs	09.06.2022	05:28 hrs	0						Grid fail but no breaker trip at Corlung End
2	132 kV, 10 MVA Transformer-I	132/33 kV	Tripping	13.06.2022	11:26 hrs	13.06.2022	11:33 hrs	0	0.070	Diffential Relay (P643) and 86 A	Started Phase AB,Triped phase AB, Diff proctection Start, Diff protection bias trip, Fault type-Internal, System frequency 49.96, Fault duration 55.00ms, CB operated Time 50.00 ms, Relay Trip time 0.00 ms,IA -1 magnitude 12.28A, IB-1 magnitude 12.33 A, IC-1 Magnitude 19.04 A, IA -2 magnitude 0.00 A, IB-2 magnitude 0.00 A, IC-2 magnitude 0.00A, IA -3 magnitude 80.00 A,IB-3 magnitude 57.33 A, IC-3 magnitude 62.26 A, IA-HV magnitude 12.28 A, IB-HV magnitude 12.33 A, IC-HV magnitude 19.04 A, IA-LV magnitude 80.00A, IB-LV magnitude 57.33, IC-LV magnitude 62.26 A, I2-HV magnitude 1.754 A, I2- LV magnitude 15.23 A, IN-HV measd mag 0.00 A , IN-LV measd mag 0.0 A , VAN magnitude 0.00 V,VBN 0.00 V,VCN 0.00V, Vx magnitude 134.0 kV, V1 magnitude 0.00V, V2 nagnitude 0.00 V, VN derived mag 0.00 V, VAB magnitude 0.00 V, VBC magnitude 0.00 V, VCA magnitude 0.00 V, IA diff 0.245PU, IB diff 0.187 PU, IC diff 0.002 PU, IA bais 0.345 PU, IB bas 0.295 PU, IC bais 0.436 PU, REFLV HiZ Diff 0.00 A.	Transient fault		Test charged was done and stand.

Division:	**SMD-DEOTHANG**
Substation:	**132/33kV Phuntshothang Substation**
Month:	**Jun-22**

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time		Normalization Time		Duratio	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time	(Hrs)		Protection Relay Optd	Fault Details (As recorded by relay)			
2	132/33kV Transformer-II (10MVA)	132kV	Transient fault	6/1/2022	11:52	6/1/2022	11:55		0.75	86A and 86B	(DPHLPDOC1) Trip value; L1:87.15A, L2:114.9A, L3: 57.3A, Ln: 0A.	Earthf fault	Unknown	Charged
15	132/33kV Transformer-II (10MVA)	132kV	Transient fault	6/3/2022	9:57	6/3/2022	9:59		0.52	86A and 86B	Fault Value did not reflect on Relay (REF615)	Earthf fault	Unknown	Charged
23	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	6/3/2022	23:47	6/3/2022	23:48		0.50	86A and 86B	(DPHLPDOC1) Fault value; L1: 121.05A, L2: 59.55A, L3:68.55A, Ln: 0A.	Overcurrent	Unknown	Charged
28	132/33kV Transformer-II (10MVA)	132kV	Transient fault	6/5/2022	17:40	6/5/2022	17:42		0.63	86A and 86B	Fault Value did not reflect on Relay (REF615)	Earthf fault	Unknown	Charged
36	132/33kV Transformer-II (10MVA)	132kV	Transient fault	6/7/2022	17:43	6/7/2022	17:46		0.58	86A and 86B	Fault Value did not reflect on Relay (REF615)	Earthf fault	Unknown	Charged
44	132/33kV Transformer-II (10MVA)	132kV	Transient fault	6/11/2022	3:58	6/11/2022	4:06		0.47	86A and 86B	(DPHLPDOC1)Fault Value L1:173.4A; L2:341.7A; L3:168.3A; LN:0	Over current	Unknown	Charged
47	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	6/11/2022	16:58	6/11/2022	17:14		0.10	86A and 86B	(DPHLPDOC1)Fault Value L1:33.75A; L2:51.6A; L3:73.2A; LN:0	Earthf fault	Unknown	Charged
51	132/33kV Transformer-I(10MVA)	132kV	Transient fault	6/11/2022	22:56	6/11/2022	22:59		0.26	86A and 86B	(DPHLPDOC1)Fault Value L1: 338.7A, L2: 347.7A,L3: 302.55A, LN: 0	Over current	Unknown	Charged
55	132/33kV Transformer-II (10MVA)	132kV	Transient fault	6/12/2022	1:52	12-0-22	1:54		0.47	86A and 86B	(DPHLPDOC1)Fault Value L1:96.15A; L2:59.1A; L3:53.85A; LN:0	Earthf fault	Unknown	Charged
58	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	6/12/2022	9:40	12-0-22	9:43		0.64	86A and 86B	(DPHLPDOC1)Fault Value L1:211.4A; L2:77.25A; L3:81.3A; LN:0	Over current	Unknown	Charged
69	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	6/15/2022	9:46	6/15/2022	9:50		0.58	86A and 86B	(DPHLPDOC1) Fault value; L1: 45A, L2:60.45A, L3:23.1A,Ln: 0A.Test charge fault value;L1:45A;L2:59.7A;L3:21.3A;LN:0A	Earthf fault	Unknown	Charged after isolating faulty feeder.
72	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	6/16/2022	9:57	6/16/2022	9:59		0.33	86A and 86B	(DPHLPDOC1) Fault value; L1:174.6 A, L2:346.5A, L3:171.9A,Ln: 0A.	Overcurrent	Unknown	Charged.
75	132/33kV Transformer-I(10MVA)	132kV	Trip on Fault	6/17/2022	11:21	6/17/2022	11:25		0.27	86A and 86B	(DPHLPDOC1) Fault value; L1: 163.2A, L2: 320.4A, L3: 156.75A,Ln: 0A.Test charge fault value;L1: 318.6A;L2: 328.65A;L3: 348.8;LN:0A	Over current	Unknown	Charged
78	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	6/18/2022	3:11	6/18/2022	3:17		0.23	86A and 86B	(DPHLPDOC1) Fault value; L1: 402.3 A, L2: 379.8A, L3: 385.35A,Ln: 0A.	Overcurrent	Unknown	Charged.
83	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	6/19/2022	8:46	6/19/2022	8:49		0.46	86A and 86B	(DPHLPDOC1) Fault value; L1: 192.15A, L2:373.65A, L3:181.65A,Ln: 0A.Test charge fault value;L1:201.15A;L2:368.85A;L3:167.85A;LN:0A	Overcurrent	Unknown	Charged after isolating faulty feeder.
87	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	6/21/2022	13:19	6/21/2022	13:27		0.09	86A and 86B	(DPHLPDOC1) Fault value; L1: 85.95 A, L2: 0.30A, L3: 86.25A,Ln: 0A.	rth fault and Overcurre	Unknown	Charged.
97	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	6/27/2022	20:15	6/27/2022	20:22		0.14	86A and 86B	(DPHLPDOC1) Fault value; L1: 34.05A, L2: 79.85A, L3: 82.35A,Ln: 0A.	Overcurrent	Unknown	Charged.

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	Type of outages	Remarks
1. 400/220/132/33kV Jigmeling Substation												
i) 66kV Above												
1	02.06.2022	14:47 hrs	02.06.2022	15:06 hrs	0	171.62	400kV MHEP Line-4	Alipurduar Substation	Rph-G Fault	Z1 pickup, (AR comd. ON)	Transient	
2	02.06.2022	15:28 hrs	02.06.2022	15:39 hrs	0	331.6	400kV MHEP Line-3	Alipurduar Substation	L3-E Loop	R &B Phase Trip, , Z1 pick up. . (AR Comd. ON)	Transient	
3	23.06.2022	15:03 hrs	23.06.2022	15:03 hrs	0	-289.43	400kV MHEP Line-3	Alipurduar Substation	L3-E Loop	Main-1; Bph pick up, Main-2; Bph pick up, Ground pickup and Z1 optd,	Transient	**Line auto reclosed**
4	01.06.2022	12:57 hrs	01.06.2022	13:03 hrs	0	6.320	220kV Tsirang	Tsirang Substation	Bph to Ground	Main 1 Bph Trip and Z1 trip. Main 2 Bph Trip and Z1		
5	01.06.2022	12:57 hrs	01.06.2022	13:06 hrs	0	21.560	220kV Dagapela	Dagapela Substation	Bph to Ground	Main 1 (Yph trip, Bph Trip and Z1 trip. Main 2 Bph Trip and Z1 trip.		
6	02.06.2022	14:28 hrs	02.06.2022	14:42 hrs	0	29.050	220/132kV 80MVA ICT-1	Jigmeling Substation		SEF optd.		
7	11.06.2022	08:48 hrs	11.06.2022	09:02 hrs	0	30.340	220kV Dagapela	Dagapela Substation	Line Fault	Main 1; R & Y phase trip, Z1 trip (BG), Main 2: R & Y phase trip, Z1 trip	Transient	
8	02.06.2022	14:27 hrs	02.06.2022	14:32 hrs	0	20	132kV Gelephu	Gelephu Substation	RY phase trip.	RY phase trip, zone 1 zone 2 optd.	Transient	
9	02.06.2022	14:27 hrs	02.06.2022	14:39 hrs	0	38.6	132kV Tingtibi	Tingtibi Substation	RYBph and Ground Loop.	RYB-E loop, Z1pick up. Z1 optd.	Transient	
10	23.06.2022	15:50 hrs	23.06.2022	16:19 hrs	0	34.64	132kV Tingtibi	Tingtibi Substation	RYBph and Ground Loop.	Main 1: Relay General Trip and R,Y and B phase trip, Z1/Z1B trip		
3. 132/66/33/11kV Gelephu Substation												
i) 66kV and above												
1	02.06.2022	14.29hrs	02.06.2022	15.16hrs	0	14.4	132kV Sal-Ge	Non	Heavy lightening.	ripped,86 master relay oppe	Teporary	Charging Code; NLDC BTN=1365, NLDC IND=130 & NERLDC=2984. At the same time 132kv Gel-Jig line also tripped from Jigmeling end.
4. 132/33kV Tintibi Substation												
i) 66kV & Above												
1	18.06.2022	19:03	18.06.2022	19:08	0	16.78	Tingtibi-Nngl	ingtibi-Nar	Temporary Fault	Distance Relay:Start Phase:AB,Trip Phase:ABC,Fault zone-1 trip,Fault location:58.60kM.	Temporary Fault	
2	23.06.2022	15:50	23.06.2022	16:19	0	18.79	Tingtibi-Nangl	ingtibi-Nar	Temporary Fault	Distance Relay:Start Phase:ABCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:18.75kM.	Temporary Fault	

Annexure-VI

Western grid Outages for April 2022

MONTHLY OUTAGE REPORT FOR WESTERN GRIDE FOR THE MONTH OF April,2022

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]	Remarks
(A) 400/220/66/11 kV Malbase Substation												
66kV & Above												
1	10.04.2022	13:02	10.04.2022	13:07	0	7	220kV samtse feeder	Malbase s/s		O/C trip, I >> trip		Il1= 44.48A<234.8deg, IL2=90.3A<235.5deg, IL3=7301A<42.27 deg IL4=7149A<42.78deg
2	10.04.2022	13:02	10.04.2022	13:10	0	25	50/63MVA transformer 3	Malbase s/s		Diff trip		IR=327.52A<-65.89deg, IY=298.26A<173.79deg, IB=25.9A<95.63deg IN=292.13A<-124.45deg
3	14.04.2022	18:22	14.04.2022	18:25	0	-	220kV Bus Coupler	220kV samtse and singhigoan feeder and Malbase s/s		I0>trip, 86A and 50/50N trip		Earthfault
4	14.04.2022	18:22	14.04.2022	18:54	0	8	220kV samtse feeder	220kV Bus Coupler		Diff start L3 86 relay optd		Il1=2924A<269.2deg, IL2=87.22A<182.2deg, IL3=2847A<53.11deg IL4=1800A<337.8deg
5	14.04.2022	18:22	14.04.2022	18:27	0	26	50MVA transformer III(HV/LV) side	220kV buscoupler and Samtse feeder		Diff start L3 86 relay optd, Diff alaram b/k	malbase Substation	I1=55.56A< 89.49deg, I2=57.63A<-35.36deg,I3=60.02A<162.8deg,I4=10.87A155.22deg,
6	15.04.2022	1:34	15.04.2022	1:44	0	-186	400kV Tala feeder	Malbase s/s	O/C Y&B phase(Transient fault)	Air lockout shot, zone 1 trip, FL=18.57kM	18.57kM	IL1=186.5A, IL2=4.072kA, IL3=4.273KA
7	15.04.2022	14:00	15.04.2022	14:05	0	28	66kV Pasakha feeder 4	Malbase S/s	O/C on B phase	Relay 86 optd, general trip IEF 50N trip		IL1=137.27A<-5.27.8deg, IL2=311.69A<-134.17deg,IL3=2029.25A<72.98deg
8	16.04.2022	19:15	16.04.2022	19:24	0	7	220kV samtse feeder	Malbase S/s	Earthfault	Main I trip, Zone 1 trip	L3-L1 Dist=40.2kM	IL1=2995A<273.8deg, IL2=68.79A<186.2deg,IL3=2035A<51.5degIL4=2001A<314.6deg
9	19.04.2022	17:13	19.04.2022	18:08	0	8	220kV samtse feeder	Malbase S/s		O/C on 3phase	22.1km	I1=3778A<285.2deg,I2=4005A<164.9deg,I3=5084A<37.26deg,I4=1283A<26.58deg
10	27.04.2022	11:03	27.04.2022	11:22	0	9.1	220kV samtse feeder	Malbase S/s	O/C & E/F trip	Main I trip, Zone 1 trip, Trip Y B, B/U trip	flault loop L1-N=2.8km	IL1=8343A<285.9deg,IL2=39.17A<113.4deg,IL3=94.11A<110.8deg,IL4=7931A<293.5deg
11	27.04.2022	11:03	27.04.2022	11:17	0	23	50/63MVA transformer 1	Malbase S/s		LBBtrip, general trip, relay86 optd		IL1=73.68A<-18.22deg,IL2=82.54A<-64.24deg,IL3=154.98A<-1.72deg
12	27.04.2022	11:03	27.04.2022	11:19	0	25	50/63MVA transformer 3	Malbase S/s		Diff trip, 27trip and B/U trip		IL1=108.55A<115.19deg,Il2=96.4A<170.17deg,IL3=74.83A<121.3deg,IL4=342.73A<129.47deg
13	29.04.2022	8:11	29.04.2022	8:16	0	97	200MVA ICT	Malbase S/s		Diff Y phase,67 O/C, 86 opted		IL1=33.08A<139.7deg,IL2=34.71A<15.76deg,Il3=32.8A<-108.3deg
14	30.04.2022	12:45	30.04.2022	12:48	0	67	200MVA ICT	Malbase S/s		Diff trip, diff B phase,M & Ti CB open, 86 opt		IL1=81.84A<103.3deg,Il2=113.9A<-13.39deg,Il3=113.4A<-172.1deg

(B)220/66/11 kV Singhigoan Substation												
1	14.04.2022	18:22	14.04.2022	23:19	4	1.9	220kV Singhi-samtse feeder	Singhi S/s	O/C	86 opted,O/C relay	line	I1=2140A, I2=84.91A, I3=2513A, I4=1454A
2	16.04.2022	14:00	16.04.2022	15:08	1	35	66kV BFAL feeder	Singhi S/s	O/C on B phase	General trip, O/C trip, Dir Time O/C trip, IE >> DIR trip, I>> Dir trip, IEP DIR TRIP		II1=1.18kA,IL2=1.24kA,IL3=11.74kA
(B)66/33/11 kV Phuntsholing Substation												
1			01.04.2022	10:18	10	idle	66kV Pling-Malbase feeder					At 10:18hrs charged 66kV Pling-Malbase feeder which was under idle charged condition with closing code 1376 from BPSO, since there was shutdown on 66kV Chukha-Pling (Chukha-Gedu section for RoW clearing and replacement of disc insulators at PC 135 & 136. At 17:35hrs 66kV Pling-Malbase feeder kept under idle condition with opening code 0475 from BPSO (CB opened at our end).
2			01.04.2022	10:38	10	idle	66kV Pling-Malbase feeder					At 10:38hrs charged 66kV Pling-Malbase feeder which was under idle charged condition with closing code 1382 from BPSO, since there was shutdown on 66kV Pling-Gomtu feeder for carrying out re-alingment of isolators, checking of control circuit and arresting of oil seepage from PT. At 20:38hrs 66kV Pling-Malbase feeder kept under idle condition with opening code 0484from BPSO. (CB opened at our end).
##	04.04.2022	4:02	04.04.2022	4:05	0		66kV Chukha and 66kV Gomtu feeder	66kV Chukha and 66kV Gomtu feeder	Tripped at their end	Nil	Tripped at their end	Phuentsholing got black out, since both 66kV Chukha and 66kV Gomtu feeder got tripped from their end.
##			07.04.2022	13:08	13	idle	66kV Pling-Malbase feeder					At 13:08hrs charged 66kV Pling-Malbase feeder which was under idle charged condition with closing code 1420 from BPSO, since there was shutdown on 66kV Pling-Gomtu feeder for rectification of Bus isolator of 5MVA transformer at Gomtu end. At 20:59hrs 66kV Pling-Malbase feeder kept under idle condition with opening code 0508 from BPSO. (CB opened at our end).
##			10.04.2022	16:56	16	idle	66kV Pling-Malbase feeder					At 16:56hrs charged 66kV Pling-Malbase feeder which was under idle charged condition with closing code 1444 from BPSO, since there was shutdown on 66kV Pling-Gomtu feeder for carrying out maintenace on 66kV Bus isolator of 5MVA transformer at Gomtu end. At 19:08hrs 66kV Pling-Malbase feeder kept under idle condition with opening code 0517 from BPSO. (CB opened at our end).
##	14.04.2022	18:20	14.04.2022	18:28	0		66kV Chukha and 66kV Gomtu feeder	66kV Chukha and 66kV Gomtu feeder	Tripped at their end	Nil	Tripped at their end	Phuentsholing got black out, since both 66kV Chukha and 66kV Gomtu feeder got tripped from their end.
##	16.04.2022	15:32	16.04.2022	15:45	0	-1.87	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at both end	Dist Optd, 186 & 86	Substation	The cause of tripping was due to trainsent fault.
##	16.04.2022	20:25	16.04.2022	20:30	0	-1.50	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Overcurrent	I>>, Ia-1.055kA, Ib-1.037kA, Ic-51.26A Vab-11.89kV, Vbc-56.37kV, Vca-57.98kV In measured- 7.003A In derived- 7.182A, Van-20.24kV, Vbv-18.67kV, Vcn-38.38kV & 86	Tripped at their end	The cause of tripping was due to trainsent fault.
##	29.04.2022	8:11	29.04.2022	8:18	0	-1.98	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at both end	Dist Optd, 186 & 86	Tripped at both end	The cause of tripping was due to trainsent fault.
(D) 66/33/11 kV Gedu Substation												
1	01.04.2022	10:25	01.04.2022	17:08	6	2.023	66kV Chukha -Gedu section	Nil	Critical tree falling within the ROW and replacement of disc insulators at PC-135 and 136.		Line segment	Shutdown taken by TMD BPC Olakha for Critical tree falling within the ROW and replacement of disc insulators at PC-135 and 136.
2	04.04.2022	4:00	04.04.2022	4:05	0	2	66kV Chukha-Pling Supply tripped.	Blackout	Bad weather		Line segment	Charged from Chukha
3	14.04.2022	18:20	14.04.2022	18:30	0	2.045	66kV Chukha-Pling Supply tripped.	Blackout	Bad weather		Line segment	Charged from Chukha
4	16.04.2022	15:34	16.04.2022	15:43	0	0.88	66kV Chukha-Pling Supply tripped.	Blackout	Bad weather		Line segment	Charged from Chukha
5	16.04.2022	20:22	16.04.2022	20:31	0	1.68	66kV Chukha-Pling Supply tripped.	Blackout	Bad weather		Line segment	Charged from Chukha
(E) 66/33/11 kV Gomtu Substation												
1	03.04.2022	10:44	03.04.2022	12:49	2	3.06	66/11kV 5MVA Tramsformer	Nil	For sealing bus PT leakage	Nil	Gomtu Substation	Shutdown for sealing bus PT leakahe against work permit NO. 12
2	03.04.2022	10:44	.03.04.2022	20:25	9	3.06	66kV Pling feeder	Nil	Maintenance	Nil	Gomtu Substation	Availed shutdown by SMG for sealing Bus PT leakage, fix line isolator alignment and CT and breaker testing. Against work permit NO. 12
3	04.04.2022	03:37	04.04.2022	04:10	0	-2.068	66kV Dhamdhum feeder	Nil	General trip	Zone I, Z-Com & Y PH fault	Damdum Substation	Supply failed from Dhamdhum end
4	04.04.2022	04:02	04.04.2022	04:05	0	-2.06	66kV Pling feeder	Gomtu	General trip	Nil	Line Segment	Grid failed
##	14.04.2022	18:23	14.04.2022	19:01	0	-7.137	66kV Dhamdhum feeder	Gomtu	Grid failed	Nil	Line Segment	Grild failed and supply resumed at 19.01 hrs.
##	14.04.2022	18:23	14.04.2022	18:28	0	3.58	66kV Pling feeder	Gomtu	Grid failed	Nil	Line Segment	Grid failed and supply resumed at 18.28 hrs.
##	16.04.2022	19:22	16.04.2022	19:39	0	-6.184	66kV Dhamdhum feeder	Nil	General trip	Nil	Line Segment	Charged against charging code no.1021 provided by BPSO and charge withstand
##	25.04.2022	14:25	25.04.2022	16:25	2	0.01	66/33/11kV 5MVA Transformer	Nil	Oil leakage	Nil	Gomtu Substation	Availed shutdown by Substation Head against Work Permit No. 031 for sealing oil leakage form OLTC tank
##	27.04.2022	11:25	27.04.2022	11:41	0	-8.268	66kV Pling feeder	Nil	Transient fault	Nil	Gomtu Substation	Charged the line after informing BPSO and charge withstand. Charging code 1083
(F) 220/66/33 kV Dhamdum Substation												
1	14.04.2022	18:32	14.04.2022	18:58	0	-8.35	220KV Malbase	Dhamdum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to O/C on R&BØ, Zone: 1(General trip)
2	14.04.2022	18:32	15.04.2022	10:48	16	-1.66	Singeygoan	Dhamdum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to O/C on R&BØ, Zone: 1(General trip) Fdr charged against charging code no 1007 from Karma Yangden from BPSO.
3	16.04.2022	19:14	16.04.2022	19:21	0	-1.76	220kV Singeygoan	Dhamdum	heavy rain with thunder storm and windy	REL 670 trip	NA	Line tripped due to O/C on R&BØ, Zone: 1(General trip) Fdr charged against charging code no 1020 from Karma Yangden from BPSO.
4	16.04.2022	19:22	16.04.2022	19:30	0	-8.42	220KV Malbase	Dhamdum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to (General trip) Over voltage OPTD Fdr charged against charging code no 1019 from Karma Yangden from BPSO.
5	16.04.2022	19:22	16.04.2022	19:38	0	6.65	66KV Gomtu feeder	Dhamdum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to 86 tc faulty and CB trouble Fdr charged against charging code no 1021 from Karma Yangden from BPSO.
6	19.04.2022	17:13	19.04.2022	17:25	0	-3.65	Singeygoan Feeder	Dhamdum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to O/C on R&YØ, Zone: 1(General trip) and over voltage OPTD.Fdr charged against charging code no : Nill from BPSO T/Phu.
7	19.04.2022	17:18	19.04.2022	18:07	0	-9.82	220KV Malbase feeder	Dhamdum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to General trip, zone:1 trip, RYB Phase trip and Over voltage OPTD. Fdr charged against charging code no: 1031 from BPSO.
8	04.03.2022	3:37	04.03.2022	4:10	0	2.46	66KV Gomtu feeder	Gomtu substation	Trip	General trip,zone1 trip,R and Y phase fault	NA	Heavy lightening and thunder ,The feeder was triped at 3:37hrs, test charge at 3:47hrs with the charging code from BPSO 1391 but the feeder could not stand so as informed to BPSO and suggested us to charge after weather improves since there is no power interruption in Gomtu substation as power supply is from Phuntsholing substation. As weather improved, so 66kv Gomtu feeder was charged at 4:10hrs with charging code 1392 from BPSO
9	14.04.2022	18:32	14.04.2022	18:59	0	7.13	66KV Gomtu feeder	Gomtu substation	Trip	N/A	N/A	Line tripped due to O/C on R&yØ(General trip)
10	14.04.2022	22:55	14.04.2022	23:10	0	3.65	66KV Gomtu feeder	Gomtu substation	Trip	General trip,zone1 trip,R and Y phase fault	NA	Heavy lightening and thunder ,The feeder was triped at 22:55hrs, test charge at 23:10hrs

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
	(A) 66kV Chumdu switching station												
1	19.04.2022	1453hrs	19.04.2022	1502hrs		5.0MW	66kV Paro Feeder	Paro SS	transient fault	3ph, CB open	Chumdo	Trip	
	(B) 66/33kV Watsa Substation												
1	26/4/2022	14:54hrs	26/4/2022	15:08hrs		.436MW	66KV SF6 breaker	Fdr. I and II	OC, OCH,EF and EFH on ABC phase	OC, OCH,EF and EFH on ABC phase	Fdr. I Wanakha		33KV line snapped at betikha as per ESD betikha
3	29/4/2022	16:14hrs	29/4/2022	16:16hrs		2.49	66KV SF6 breaker	Fdr. I and II	Over current	Over Current relay operated		Tripped	As the CT ratio is set to full load and when the load reach max. got tripped. After finding the relay setting is not changed after changing CT ratio. Line charged after increasing Over current relay set.
	(C) 66/33kV Olakha Substation												
5	4/6/2022	12:25	4/6/2022	12:27		-20.95	66kV Olakha-Semtokha Line	Olakha SS	While testing	NA	Olakha SS	Testing	66kV Olakha-Semtokha line got tripped while testing of 20MVA-transformer-I SF6 Breaker when CT primary injection was carried out.
8	4/12/2022	12:08	4/12/2022	12:13		No record at SCADA	66KV Bus coupler	Olakha Substation	While doing 86 relays connection and wiring by TCCD	Trip CKT-1 SUP Relay 195,Trip CKT-2 SUP. Relay 295 & Trip relay SUP Relay 86/95	Substation	Transient	Reset all the operated relays & charged the line, hold normal.
9	4/14/2022	12:30	4/14/2022	12:32		9.9	20MVA Transformer - I	Olakha Substation		DIR.O/C & E /F.PROTN.Relay-67 Operated. Indication : 1 & 5,.General Trip,5.Over Current & Earth Fault Operated along with relay 86	Lungtenphu SS	33kV line Lungtenphu feeder	As per verbal message received from Ugyen Lepcha (Lungtenphu Substation Incharge) said that 33kV Incomer tripped at their end & simantinously tripped 20 MVA transformer - I at our end ,reset all the operated relays & indications & charged ,hold normal.
10	4/14/2022	12:42	4/14/2022	12:44		9.9	20MVA Transformer - I	Olakha Substation		DIR.O/C & E /F.PROTN.Relay-67 Operated. Indication : 1 & 5,.General Trip,5.Over Current & Earth Fault Operated along with relay 86	Lungtenphu SS	33kV line Lungtenphu feeder	As per verbal message received from Ugyen Lepcha (Lungtenphu Substation Incharge) said that 33kV Incomer tripped at their end & simantinously tripped 20 MVA transformer - I at our end ,reset all the operated relays & indications & charged ,hold normal.

	(D) 66/33/11kV Lobeysa Substation												
	66kV LSA - Gewathang feeder												
1	15.04.2022	20:09hrs	15.04.2022	20:18hrs	0	-19.440	66kV LSA - Gewathang feeder	NA		Dist relay operated(IA-107.2A,IB-145.2A&IC-138.9A)			66kV LSA - Gewathang feeder tripped at 20:09hrs and charged the line as per BPSO at 20:18hrs .Supply no interruption was feeded from Dochula end.
2	19.04.2022	00:37hrs	19.04.2022	00:42hrs	0	-14.920	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		Dist relay operated			66kV LSA - Gewathang feeder tripped at 00:37hrs and charged the line as per BPSO at 00:42hrs .
3	22.04.2022	21:14hrs	22.04.2022	21:28hrs	0	-17.220	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		Dist relay operated			66kV LSA - Gewathang feeder tripped at 21:14hrs and charged the line as per BPSO at 21:29hrs.
4	27.04.2022	23:02hrs	28.04.2022	00:07hrs	1	-14.180	66kV LSA - Gewathang feeder	NA		Dist relay operated(IA-71.61A,IB-104.8A&IC-85.43A)			66kV LSA - Gewathang feeder tripped at 23:02hrs and informed to BPSO.At 23:09hrs BPSO ask to closed the breaker but couldnot hold and again charged at 23:27hrs couldnot hold. After opening breaker at Gewathang end and closed the breaker at Lobeysa end with closing code 1094, line stand at 00:07hrs and breaker closed at Gewathang end at 00:11hrs.
	66kV LSA - Dochula feeder												
1	19.04.2022	00:37hrs	19.04.2022	00:51hrs	0	12.340	66kV LSA - Dochula feeder	NA		Dist relay operated			66kV LSA - Dochula feeder tripped at 00:37hrs and charged the line as per BPSO at 00:51hrs with closing code 1029 .
2	22.04.2022	21:14hrs	22.04.2022	21:29hrs	0	12.020	66kV LSA - Dochula feeder	66/33/11kV Lobeysa substation		Dist relay operated			66kV LSA - Gewathang feeder tripped at 21:14hrs and charged the line as per BPSO at 21:29hrs.
	(E) 66/33/11 kV Paro Substation												
1	19.4.2022	14.46	19.4.2022	15.01	0		66kV Chumdo Line IN	Paro subation and its out goings	IDMT E/F & OC from chumdo end				
	(G) 66/33/11kV Dechencholing substation												
1	22.04.2022	21:14hrs	22.04.2022	21:16Hrs	0	-23.61	66KV Sesmtokha IC	whole s/s fdr.	Incomer tripped on broken conductor	Distance relay and 86relay.	Not known	tripped	Test charged the line found healthy.
2	27.04.2022	23:04hrs	27.04.2022	23:07hrs	0	-25.31	66KV Sesmtokha IC	whole s/s fdr.	Incomer tripped on broken conductor	Distance relay and 86relay.	Not known	tripped	Test charged the line found healthy.
	(H) 66/11kV Haa Substation												
									Nill				
	(I) 220kV Substation Semtokha												
1	22.04.2022	21:15hrs	22.04.2022	21:19hrs			66kV Semtokha-Dochula Line	Dochula substation		Distance relay optd, Zone-1 trip (Ia=399A, Ib=4980A, Ic=4643A)	Distance=0.00km	Trasient	
2	29.04.2022	10:08hrs	29.04.2022	11:33hrs	1.00	-60.190	No Interruption	Shutdown avialed by BHP for testing energy meter at BHP end				Trasient	
	(L) 66/33kV Damji Substation												
1	16.04.2022	1346 hrs	16.04.2022	1354 hrs	0	-4.14	66 kV Incoming Line	Whole Substation	Trip	NA			Line tripped from Semtokha Substation
2	22.04.2022	2115 hrs	22.04.2022	2118 hrs	0	-4.33	66 kV Incoming Line	Whole Substation	Trip	NA			Line tripped from Semtokha Substation
3	27.04.2022	2304 hrs	27.04.2022	2309 hrs	0	-1.22	66 kV Incoming Line	Whole Substation	Trip	NA			Line tripped from Dechencholing Substation
	(M) 66/11kV Dochula Substation												
1	22/04/2022	21:16	22/04/2022	21:21	0	-31.74	Semtokha	All 15x5MVA and 1x2.5MVA Transfomer	Under Voltage	86 Relay	Dochula, Lobesa and semtokha all end breaker open	Temporary fault	All DHI Farm House
2	27/04/2022	15:08	27/04/2022	15:14	0	-31.75	Semtokha		Under Voltage	86 Relay	Dochula end breaker open	Temporary fault	
3	22/04/2022	21:16	22/04/2022	21:30	0	-30.18	Lobesa		Under Voltage	86 Relay	Dochula, Lobesa and semtokha all end breaker open	Temporary fault	
4	27/04/2022	15:08	27/04/2022	15:26	0	-30.07	Lobesa		Under Voltage	86 Relay	Dochula end & Lobesa end breaker open	Temporary fault	

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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	17/5/2022	12:03	17/5/2022	12:10	0	24	66kV Pasakha feeder I	Mlabase Ss	O/C & E/F	General trip O/C & E/F			IL1=2319.32 /52.57deg,IL2=228A/ 88.26deg,IL3=198.06A/94.03deg,IL4=2332.57A/ 126.94deg
2	17/5/2022	12:03	17/5/2022	12:10	0	24	66kV Pasakha feeder II	Mlabase Ss	O/C & E/F	General trip O/C & E/F			IL1=0.11A/107.34deg,IL2=1144.25A/86.83deg,IL3=680.86A/106.94deg,IL4=0.11A/107.34deg
3	21/05/2022	2:14	21/05/2022	2:45	0	106.18	400kV Malbase- Siliguri fdr.	Mlabase Ss	transient fault	General trip,186(RYB) optd			IL1=290.7A/51.77deg,IL2=119.4A/331.7deg,IL3=1364A/65.23deg,IL4=1646A/58.34 deg.
(B)220/66/11 kV Singhigoan Substation													
1	30/5/2022	11:22	30/5/2022	11:31	0	12	bhutan concast	Singyegoan ss		O/C & E/F			L1=5.69kV,L2=58kA,L3=36kA

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
	(D) 66/33/11kV Lobeysa Substation												
	66kV LSA - Gewathang feeder												
1	10.05.2022	15:11hrs	10.05.2022	15:18hrs	0	-14.040	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		OC & EF relay operated			66kV LSA - Gewathang feeder tripped at 15:11hrs and supply resumed at 15:18hrs.
2	11.05.2022	20:33hrs	11.05.2022	20:38hrs	0	-18.280	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		OC & EF relay operated			66kV LSA - Gewathang feeder tripped at 20:33hrs informed to BPSO and line charged at 20:38hrs from Gewathang ss and line extended to Dochula at 20:41hrs.
3	15.05.2022	14:20hrs	15.05.2022	14:55hrs	0	-17.240	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		OC & EF relay operated			66kV LSA - Gewathang feeder tripped at 14:20hrs and charged the line as per BPSO at 14:55hrs.
	66kV LSA - Dochula feeder												
1	10.05.2022	15:11hrs	10.05.2022	15:18hrs	0	10.470	66kV LSA - Dochula feeder	NA		OC & EF relay operated			66kV LSA - Dochula feeder tripped at 15:11hrs and supply resumed at 15:18hrs.
2	11.05.2022	20:33hrs	11.05.2022	20:38hrs	0	-18.280	66kV LSA - Dochula feeder	NA		OC & EF relay operated			66kV LSA - Dochula feeder tripped at 20:33hrs informed to BPSO and line charged at 20:38hrs from Gewathang ss and line extended to Dochula at 20:41hrs.
3	29.05.2022	22:08hrs	29.05.2022	22:36hrs	0	12.200	66kV LSA - Dochula feeder	NA		Dist. relay operated(IA-6.543,IB-979.5A &976.4A)			66kV LSA - Dochula feeder tripped at 22:08hrs informed to BPSO and line charged at 22:10hrs from Gewathang ss and line extended to Dochula at 22:36hrs.
66/33kV,5MVA Transformer-4(All 33kV OG feeders connected together)													
1	10.05.2022	15:21hrs	10.05.2022	16:08hrs	0	1.380	33kV O/G-1	33kV O/G-1	Line fault	IDMT- E/F (IA-168.1A IB-272.8A IC-130.8A IN-217.9A)	NA	Line fault	66/33kV Transformer -4 feeder trip on IDMT E/F at 15:11hrs and test charged at 15:12hrs could not stand and informed to ESD Punakha regarding the line fault and line charged at 16:08hrs and line stand thereafter after opening GO at Punakha area.
2	14.05.2022	05:02hrs	14.05.2022	05:37hrs	0	0.800	33kV O/G-2	33kV O/G-2	Line fault	IDMT- E/F& O/C	NA	Line fault	66/33kV Transformer -4 feeder trip on IDMT E/F & OC at 05:36hrs and test charged at 05:37hrs could not stand and informed to ESD Wangdue regarding the line fault and line charged at 05:37hrs and line stand thereafter.
3	14.05.2022	11:53hrs	14.05.2022	12:09hrs	0	1.170	33kV O/G-2	33kV O/G-2	Line fault	IDMT- E/F& O/C	NA	Line fault	66/33kV Transformer -4 feeder trip on IDMT E/F & OC at 11:53hrs and test charged at 11:54hrs could not stand and informed to ESD Wangdue regarding the line fault and line charged at 12:09hrs and line stand thereafter.
	(G) 66/33/11kV Dechencholing substation												
1	05.05.2022	20:33Hrs	05.05.2022	20:38Hrs	0	-27.79	66KV Sesmtokha IC	whole s/s fdr.	Tripped on broken conductor trip function operation.	Distance relay and 86relay. (IA=191.3A; IB 126.5A & IC= 137.5A	Not known	tripped	Test charged the line and stand normal.
2	15.05.2022	14:19Hrs	15.05.2022	14:23Hrs	0	-24.65	66KV Sesmtokha IC	whole s/s fdr.	Same relay opt.	Distance relay and 86relay. IA= 169.3A;IB= 109.3A & IC= 117.4A	Not known	tripped	Test charged the line found healthy.
3	19.05.2022	10:32hrs	19.05.2022	10:42hrs	0	-24.21	66KV Sesmtokha IC	whole s/s fdr.	Same relay opt.	Distance relay and 86relay. IA= 145.8A;IB= 85.54A & IC= 161.1A	Not known	tripped	Test the feeder stand normal.
	(I) 220kV Substation Semtokha												
1	10.05.2022	15:11hrs	10.05.2022	15:18hrs		53.1	66kV Semtokha-Dochula	Dochula Substation	Fault Loop= L1-L2	Relay General Trip, RYBph start, Zone 1 trip, Fault loop: L1-L2	Dist.-0.00km	Trasient	
2	11.05.2022	20:33hrs	11.05.2022	20:44hrs		52.010	66kV Semtokha-Dochula	Dochula Substation	Fault Loop= L1-L2	Relay General Trip, RYBph start, Zone 1 trip, Fault loop: L1-L2	Dist.-0.00km	Trasient	
3	15.05.2022	14:19hrs	15.05.2022	14:25hrs		63.850	66kV Semtokha-Dochula	Dochula Substation	Fault Loop= L1-L2	Relay General Trip, RYBph start, Zone 1 trip, Fault loop: L1-L2	Dist.-0.00km	Trasient	
4	29.05.2022	22:07hrs	29.05.2022	22:19hrs		50.850	66kV Semtokha-Dochula	Dochula Substation	Fault Loop= L1-L2	Relay General Trip, RYBph start, Zone 1 trip, Fault loop: L1-L2	Dist.-0.00km	Trasient	
	(L) 66/33kV Damji Substation												
1	11.05.2022	2033 hrs	11.05.2022	2038 hrs	0	-4.17	66 kV Incoming Line	Whole Substation	Trip	NA			Grid Failure
2	15.05.2022	1420 hrs	15.05.2022	1425 hrs	0	-4.17	66 kV Incoming Line	Whole Substation	Trip	NA			Line tripped from Semtokha Substation
3	19.05.2022	1035 hrs	19.05.2022	1040 hrs	0	-4.13	66 kV Incoming Line	Whole Substation	Trip	NA			Line tripped from Dechencholing Substation/Grid Failure

	(M) 66/11kV Dochula Substation													
1	5/10/2022	15:11	10/5/2022	15:21	0	-32.3	Semtokha	All Farm House	Under voltage	86	Under voltage and 86 relay operated at Dochula end. Supply fail from Semtokha.			
2	5/11/2022	20.33	11/5/2022	20.58	0	-32.33	Semtokha	All Farm House	Under voltage	86	Under voltage and 86 relay operated at Dochula end. Supply fail from Semtokha.			
3	15/5/2022	14.19	15/5/2022	14:32	0	-30.36	Semtokha	All Farm House	Under voltage	86	Under voltage and 86 relay operated at Dochula end. Supply fail from Semtokha.			
4	29/5/2022	22:09	29/5/2022	22:23	0	-32.1	Semtokha	All Farm House	Under voltage	86	Under voltage and 86 relay operated at Dochula end. Supply fail from Semtokha			
5	5/10/2022	15:11	10/5/2022	15:31		-30.41	Lobesa	All Farm House	Under voltage	86	Under voltage and 86 relay operated at Dochula end. Supply fail from Semtokha.			
6	5/11/2022	20.33	11/5/2022	20.45	0	-30.42	Lobesa	All Farm House	Under voltage	86	Under voltage and 86 relay operated at Dochula end. Supply fail from Semtokha and lobeysa.			
7	15/5/2022	14:19	15/5/2022	14:37	0	-28.25	Lobesa	All Farm House	Under voltage	86	Under voltage and 86 relay operated at Dochula end. Supply fail from Semtokha and lobeysa.			
8	29/5/2023	22:09	29/5/2023	22:39	0	-30.17	Lobesa	All Farm House	Under voltage	86	Under voltage and 86 relay operated at Dochula end. Supply fail from Semtokha and lobeysa.			

For June 2022

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	02/06/2022	0:56	02/06/2022	1:17	0	141.09	400kV Malbase- Siliguri fdr.	Malbase Ss	O/C & E/F	Main I trip,Main II trip, ZM1 trip, 86 optd.	93.8km		IL1=349.6A<124.2deg,IL2=1751A<163.8deg,IL3=710.2A<155.8deg,IL4=2728A<156.8deg
2	03/06/2022	23:49	04/06/2022	0:15		9.12	200kV Malbase - Birpara feeder	Malbase Ss	O/C & E/F	Zone 1 trip, OC &EF	30.35km		IA=3.64kA, I2=3.858kA, I3=382.5A
3	03/06/2022	23:49	03/06/2022	23:59	0	23	50 MVA Transformer III	Malbase Ss		OLTC BUCH Trip,027 trip			IL1=55.83A<47.30deg,IL2=21.78A<12.95deg,IL3=104.06A<99.06deg.
4	04/06/2022	0:24	04/06/2022	1:05	0	171.64	400kV Malbase- Siliguri fdr.	Malbase Ss		86 optd, AR lockout, Zone I trip	89.5km		IL1=359.4A, I2= 1.78kA, I3=718.5A
##	12/06/2022	2:03	12/06/2022	2:13	0	372.36	400kV Malbase- Siliguri fdr.	Malbase Ss	O/C on R phase.	O/C on R phase,86 optd,AR lockout,Zone 2 optd	171.1km		IL1=2.21kA, I2=595.4A, I3=338.3A
##	15/06/2022	4:19	15/06/2022	4:48	0	5	220kV Dhumdum feeder	Malbase Ss	O/C on Y & B phase	Main I trip,OC on	7.7km		IL1=54.91A<316.9deg,IL2=5773A< 174.5deg,IL3=5718A<36.26deg,IL4=4038A< 106deg
##	15/06/2022	4:19	15/06/2022	4:52	0	26	50 MVA Transformer III	Malbase Ss		Diff Start,27 trip, Diff restrain			IL1=123.56A<-20.02deg,IL2=72.09A<-53.73deg,IL3=51.77A<-8.726deg,IL4=231.55A< 39.94deg
##	15/06/2022	7:02	16/06/2022	19:30	36	-545	400kV Malbase- Siliguri fdr.	Malbase Ss		OC, zone1 trip.	177.5Km		IL1=1.033kA, I2= 3.144kA, I3=2.231kA
##	17/06/2022	23:07	17/06/2022	23:41	0	-160	220kV Chukha feeder	Malbase Ss		OC, zone1 trip, AR lockout	11.27km		IL1=3.458kA, I2= 270A, I3=605.4kA
##	17/06/2022	23:07	17/06/2022	23:26	0	25	50 MVA Transformer III	Malbase Ss		OC, 86optd.			IL1=A/118.4deg,IL2=86.6A/ 174.34deg,IL3=156.13A/122.21deg,IL4=308.47A/ 133.88deg
##	17/06/2022	23:40	18/06/2022	0:12		23	50 MVA Transformer II	Malbase Ss		EXT Trip, BUCH Trip, 27 Trip			IL1=0.02A<0deg,IL2=0.12A< 67.5deg,IL3=0.09A<18.18deg,IL4=0.21A< 41.37deg
##	21/06/2022	3:01	21/06/2022	3:05	0	-	220kV bus coupler	Malbase Ss		OC, 50/50N,86 optd			
##	21/06/2022	3:01	21/06/2022	3:10	0	4	220kV Dhumdum feeder	Malbase Ss		86 optd, OC			IL1=3073A, I2= 2966A, I3=78.838A, I4=1715A
##	22/06/2022	20:33	22/06/2022	21:05	0	-	220kV bus coupler	Malbase Ss		Neutral fault, b(I>>)%			
##	22/06/2022	20:41	22/06/2022	20:49	0	23	50 MVA Transformer III	Malbase Ss					IL1=20.95A<-103deg,IL2=107.6A< 177.64deg,IL3=202.25A<47.52deg,IL4=135.39A< 79.70deg
##	22/06/2022	22:01	22/06/2022	22:19	0	-86	220kV Chukha feeder	Malbase Ss		Zone I trip	7.241km		IL1=3.782kA, I2= 231.7A, I3=641.2A
##	22/06/2022	22:01	22/06/2022	22:30	0	20	50 MVA Transformer I	Malbase Ss		86 trip,LBB trip			IL1=76.55A<-12.08deg,IL2=76.4A<0.8deg,IL3=143.38A<.871deg.
##	22/06/2022	22:01	22/06/2022	22:40	0	21	50 MVA Transformer III	Malbase Ss		OLTC BUCH trip			IL1=40.19A<-124.79deg,IL2=348.91A<147.06deg,IL3=383.92A<26.84deg.
(B)220/66/11 kV Singhigoan Substation													
1	04.06.2022	23:31	05.06.2022	10:37	10	0.842	11kV Feeder 2	Singyegoan ss	punchured of pin insulator	Time o/c Trip,lep trip,General trip			IL 1= 0.18kA, IL 2=0.04kA, IL 3=0.04kA
2	03.06.2022	12:50	03.06.2022	13:07	0	0.142	11kV Feeder 1	Singyegoan ss	Shutdown				Shutdown availed by ESD Tshewangchuk for reaighning the jampering RST
3	17.06.2022	3:26	17.06.2022	14:40	11	0.047	11kV Feeder 1	Singyegoan ss	Disc Insulation Blast/puncture at rangtung	86optd			IL1=0.16kA, IL2=0.01kA, IL3=0.01kA.
4	21.06.2022	3:01	21.06.2022	9:32	6	0.56	220kV Singhi-Samtse Feeder	Singyegoan ss	o/c & E/F	86 optd			IL1=2563A,Il2=2525A,Il3= 57.39A,IL4=1527A
##	22.06.2022	20:33	23.06.2022	10:10		2	220kV Singhi-Samtse Feeder	Singyegoan ss	o/c & E/F				IL1=66.23A,Il2=2470A,Il3= 2276A,IL4=1326A
(B)66/33/11 kV Phuntsholing Substation													
1	07.06.2022		07.06.2022	9:12	9	idle	66kV Malbase-Pling feeder	66kV Malbase-Pling feeder			Substation		At 09:12hrs charged 66kV Malbase feeder which was under idle charged condition with closing code 0781 from BPSO, since there was shutdown at Chukha end for arresting red hot spot on wave trap, B phase. At 12:17hrs after complection of work at Chukha end 66kV Malbase fdr was put back to idle charged with opening code 0782 from BPSO.
##	15.06.2022	2:19	15.06.2022	2:34	0	-3.70	66kV Chukha-Pling feeder	66kV Chukha-Pling fdr		DSTN OPTD, 186&86	Tripped at both end		At 02:19hrs 66kV Chukha-Pling feeder got tripped from both end. At 02:34hrs normalised the above feeder after getting clearance from BPSO.
##	22.06.2022	20:33	22.06.2022	20:59	0	-3.40	66kV Pling-Gomtu fdr	66kV Pling-Gomtu fdr		DSTN OPTD, 186&86	Tripped at our end		At 20:33hrs 66kV Pling-Gomtu feeder got tripped at our end. At 20:35hrs test charged after clearance from BPSO but got tripped on same fault. At 23:59hrs charged after opening CB from Gomtu end with instruction from BPSO and stood normal.
##	22.06.2022		22.06.2022	20:40	20	idle	66kV Malbase-Pling feeder	66kV Malbase-Pling feeder					At 20:40hrs charged 66kV Malbase feeder as per instruction from BPSO. At 21:11hrs opened CB from with opening code 0841 from BPSO and supply was put back to idle charged condition.
##	25.06.2022	22:43	25.06.2022	22:50	0	-3.65	66kV Chukha-Pling feeder	66kV Chukha-Pling fdr		DSTN OPTD, 186&86	Tripped at both end		At 22:43hrs 66kV Chukha-Pling feeder got tripped from both end. At 22:50hrs normalised the above feeder after getting clearance from BPSO.
(D) 66/33/11 kV Gedu Substation													
1	07.06.2022	9:29	07.06.2022	12:12	2	1.73	66kV Chukha - Gedu section	Nil	Attend redspot		CHP		To attend the red hot spot on wave trap, B-phase at CHP.
2	15.06.2022	2:21	15.06.2022	2:34	0	1.19	66kV Chukha - Gedu section	Blackout			CHP		Charged from CHP
3	25.06.2022	22:43	25.06.2022	22:50	0	1.71	66kV Chukha - Gedu section	Blackout			CHP		Charged from CHP
(E) 66/33/11 kV Gomtu Substation													
1	04.06.2022	12:26	04.06.2022	12:33	0	-2.641	66kV Dhamdum feeder	Gomtu	Grid faild	Nil	Malbase Substation	Transient fault	Supply failed from Malbase substation
2	04.06.2023	12:26	04.06.2023	12:34	0	0.18	66kV Pling feeeder	Gomtu	Over current	51 IDMTL O/C 51 AX	Line segment	Transient fault	Supply tripped from Gomtu end and test charge after consulting with P/ling Substation.
3	22.06.2022	20:34	22.06.2022	20:41	0	-3.489	66kV Dhamdhum feeder	Gomtu ss	Tripped from Dhamdhum end	Nil	Dhamdhum Substation	Transient fault	Supply failed from Malbase substation
4	22.06.2022	20:34	22.06.2022	21:00	0	3.36	66kV Pling feeeder	Gomtu ss	Tripped from Pling end	Nil	Phuentsholing substation	Transient fault	Tripped from phuentsholing end and charege didn't withstand when they test charged from their end. As informed by BPSO Pling breaker hand tripped from our end at 20:57hrs for Closing the breaker from pling end and charged the breaker from our end at 21:00hrs as informed by BPSO
5	22.06.2022	20:47	22.06.2022	21:13	0	3.948	66kV Dhamdhum feeder	Gomtu ss	Grid faild	Nil	Malbase substation	Transient fault	Supply failed from Malbase affecting Dhamdhum and Gomtu substation
(F) 220/66/33 kV Dhamdum Substation													
1	15.06.2022	4:29	15.06.2022	4:48	0	-4.97	Malbase feeder	Dhamdum ss		general trip,zone1 trip,Y and B phase trip	0		malbase feeder triped from Malbase substation only,no equipment was operated from Dhamdum ss.
2	21.06.2023	2:55	15.06.2023	3:09	0	-4.66	Malbase feeder	Dhamdum ss	Lightining, thundering and raining	general trip,zone1 trip,Y and B phase trip	0	Trainsent fault	Malbase feeder triped due to O/C on R&YØ(General trip,Zone I) 1) Abs Dist : 40.00 2) REL Dist : 100%
3	22.06.2022	20:35	22.06.2022	20:41	0	-8.12	Malbase feeder	Dhamdum ss	Lightining, thundering and raining	General trip,zone4 trip,Y and B phase trip	0	Trainsent fault	Trip from malbse end.No breaker operate from Damdum end.
4	22.06.2022	20:45	22.06.2022	21:05	0	-8.12	Malbase feeder	Dhamdum ss	Lightining, thundering and raining	General trip,zone4 trip,Y and B phase trip	0	Trainsent fault	Trip from malbase end
5	21.06.2023	2:55	21.06.2023	3:14	0	1.92	Gomtu	Gomtu ss	Lightining, thundering and raining	general trip,zone1 trip,Y and B phase trip	0	Trainsent fault	Gomtu fdr. Trip due to O/C on R&YØ(Zone I, General trip)

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
	(B) 66/33kV Watsa Substation												
1	8/5/2022	11:59hrs	8/5/2022	12:26hrs		5.230MW	66KV SF6 breaker	Fdr. I and II	WTI tripped	WTI tripped	8MVA transforemer	Tripped	WTI tripped and reset the temperature to 75 with consultation with Mtc. Head SMD, and the line charged.
	(D) 66/33/11kV Lobeysa Substation												
	66kV LSA - Gewathang feeder												
1	03.06.2022	23:49hrs	10.05.2022	23:51hrs	0	-20.140	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		NA			66kV LSA - Gewathang feeder tripped at 23:49hrs and supply resumed at 23:51hrs from Gewathang ss, since Lobeysa was under blacked out. At the time of tripping breaker towards Dochula got open at our end and open at Gewathang end.
2	15.06.2022	04:29hrs	15.06.2022	04:33hrs	0	-17.970	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		OC & EF relay operated & 86 relay			66kV LSA - Gewathang feeder tripped at 04:29hrs informed to BPSO and line charged at04:33hrs from Gewathang ss and line extended to Dochula at 04:40hrs.
3	17.06.2022	11:22hrs	17.06.2022	11:28hrs	0	-20.610	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		OC & EF relay operated			66kV LSA - Gewathang feeder tripped at 11:22hrs informed to BPSO and line charged at 11:28hrs from Gewathang ss and line extended to Dochula at 11:33hrs.
	66kV LSA - Dochula feeder												
1	03.06.2022	23:49hrs	10.05.2022	00:14hrs	0	17.080	66kV LSA - Dochula feeder	NA		Dist.relay operated along with 86 relay			66kV LSA - Gewathang feeder tripped at 23:49hrs and supply resumed at 23:51hrs from Gewathang ss, since Lobeysa was under blacked out. At the time of tripping breaker towards Dochula got open at our end and open at Gewathang end. The supply was extended to Dochula at 00:14hrs as per BPSO.
2	15.06.2022	04:29hrs	15.06.2022	04:33hrs	0	-17.970	66kV LSA - Dochula feeder	NA		NA			66kV LSA - Gewathang feeder tripped at 04:29hrs informed to BPSO and line charged at04:33hrs from Gewathang ss and line extended to Dochula at 04:40hrs.
3	17.06.2022	11:22hrs	17.06.2022	11:33hrs	0	17.480	66kV LSA - Dochula feeder	NA		OC & EF relay operated			66kV LSA - Gewathang feeder tripped at 11:22hrs informed to BPSO and line charged at 11:28hrs from Gewathang ss and line extended to Dochula at 11:33hrs.
	(I) 220kV Substation Semtokha												
1	15/06/2022	04.29hr	15/06/2022	04.32hr		46.52 mw	66kv SEM- Lobeysa feeder	Dochula s/s	Directional earth fault protection operated & 86 operated	OC/EF Optd, IN<<2 trip	Transient fault	Trasient	
2	17/6/2022	23:22hr	17/6/2022	23:30hr		31.46 mw	66kv SEM- Lobeysa feeder	Dochula s/s	Directional earth fault protection operated & 86 operated	OC/EF Optd, IN<<2 trip	Transient fault	Trasient	
3	22/6/2022	20:50hr	22/6/2022	20:54hr		46.33 mw	66kv SEM- Lobeysa feeder	Dochula s/s	Directional earth fault protection operated & 86 operated	OC/EF Optd, IN<<2 trip	Transient fault		
	(M) 66/11kV Dochula Substation												
1	6/3/2022	23:49	6/3/2022	23:58	0	-31.73	66kV Semtokha	Semtokha - Dochula	Supply fail from Semtokha	Under Voltage ,86 relay		Temporary fault	
2	6/3/2022	23:49	6/4/2022	0:07	0	-29.52	66kV lobeysa	Lobeysa - Dochula	Supply fail from Semtokha	Under Voltage ,86 relay		Temporary fault	
3	6/5/2022	18:00	6/5/2022	18:08	0	-31.98	66kV Semtokha	Semtokha - Dochula	Supply fail from Semtokha	Under Voltage ,86 relay		Temporary fault	
4	6/5/2022	18:00	6/5/2022	18:15	0	-29.74	66kV lobeysa	Lobeysa - Dochula	Supply fail from Semtokha	Under Voltage ,86 relay		Temporary fault	
5	6/15/2022	4:29	6/15/2022	4:38	0	-30.41	66kV Semtokha	Semtokha - Dochula	Supply fail from Semtokha	Under Voltage 86 relay		Temporary fault	
6	6/15/2022	4:29	6/15/2022	4:43	0	-28.76	66kV lobeysa	Lobeysa - Dochula	Supply fail from Semtokha	Under Voltage 86 relay		Temporary fault	
7	6/17/2022	23:23	6/17/2022	23:32	0	-31.78	66kV Semtokha	Semtokha - Dochula	Supply fail from Semtokha	Under Voltage 86 relay		Temporary fault	
8	6/17/2022	23:23	6/17/2022	23:40	0	-30.22	66kV lobeysa	Lobeysa - Dochula	Supply fail from Semtokha	Under Voltage 86 relay		Temporary fault	
9	6/22/2022	20.47	6/22/2022	20.55	0	-31.32	66kV Semtokha	Semtokha - Dochula	Supply fail from Semtokha	under voltage and 86 relay	Semtokha	temporary	DHI
10	6/22/2022	20.47	6/22/2022	20.57	0	-29.75	66kV lobeysa	Lobeysa - Dochula	Supply fail from Semtokha	under voltage and 86 relay	Lobeysa	temporary	DHI