Ministry Of Energy and Natural Resource

Office Of The Bhutan Power System Operator

Thimphu: Bhutan

Transmission System Performance Report

Third Quarterly Report 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). The Office of the Bhutan Power System Operator (BPSO) under Ministry of Energy and Natural Resources 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, and "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.

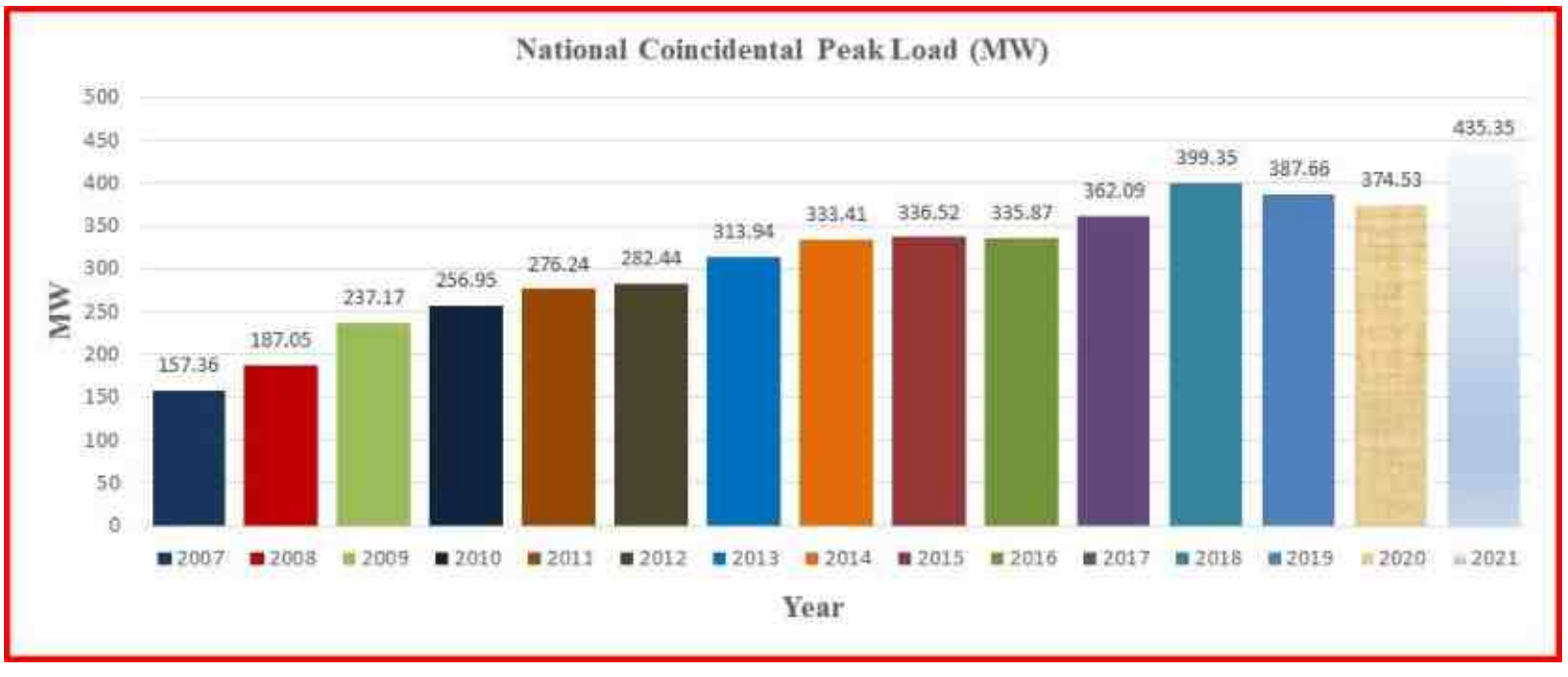
2. National Peak Demand

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.

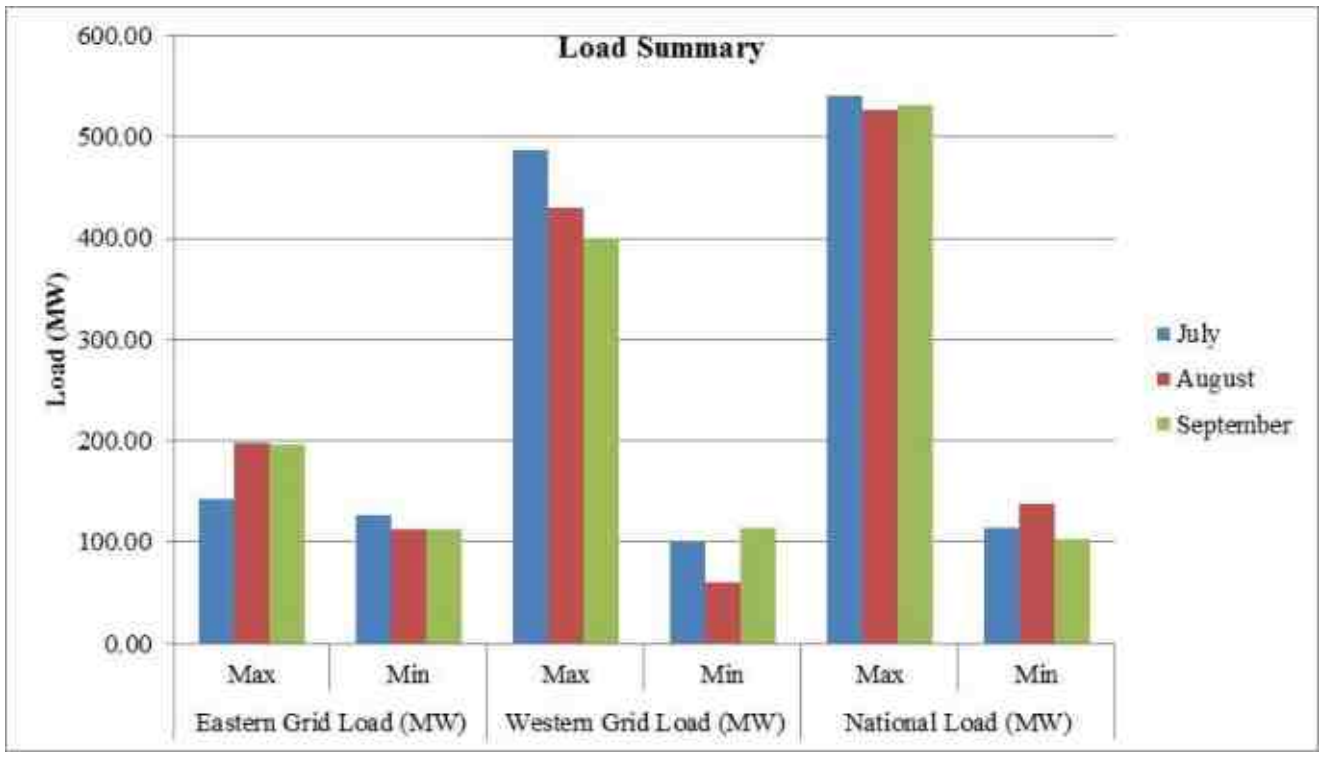
1. **National Demand** = (Sum of all total generation)-(Sum of all Export or Import)
2. **National Demand** = (Sum of all feeders loading at hydropower station) – (Sum of all Export/Import)
3. **National Demand** = (Sum of all substation loading)

For this report, the National Demand was calculated using method-1

Table 2.1.2. Domestic demand for Eastern Grid, Western Grid and National using method- 1

Grid	Eastern Grid Load (MW)		Western Grid Load (MW)		National Load (MW)	
Month	Max	Min	Max	Min	Max	Min
July	143.03	126.00	487.45	99.30	540.67	114.15
August	198.09	112.00	430.26	60.24	527.18	138.29
September	196.43	112.90	400.75	113.86	530.45	102.27

Graph 2.1.2. Domestic demand for Eastern Grid, Western Grid and National using method- 1



The national load pattern for the month of July to September, 2022 calculated using method-1 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)
July	1466.27185885	1165.18020988	302.86886546
August	1687.51443064	1368.19948924	321.19551127
September	1647.27563936	1332.65091566	316.52998178

Graph 3.1.1. Total Energy (MU) consumed

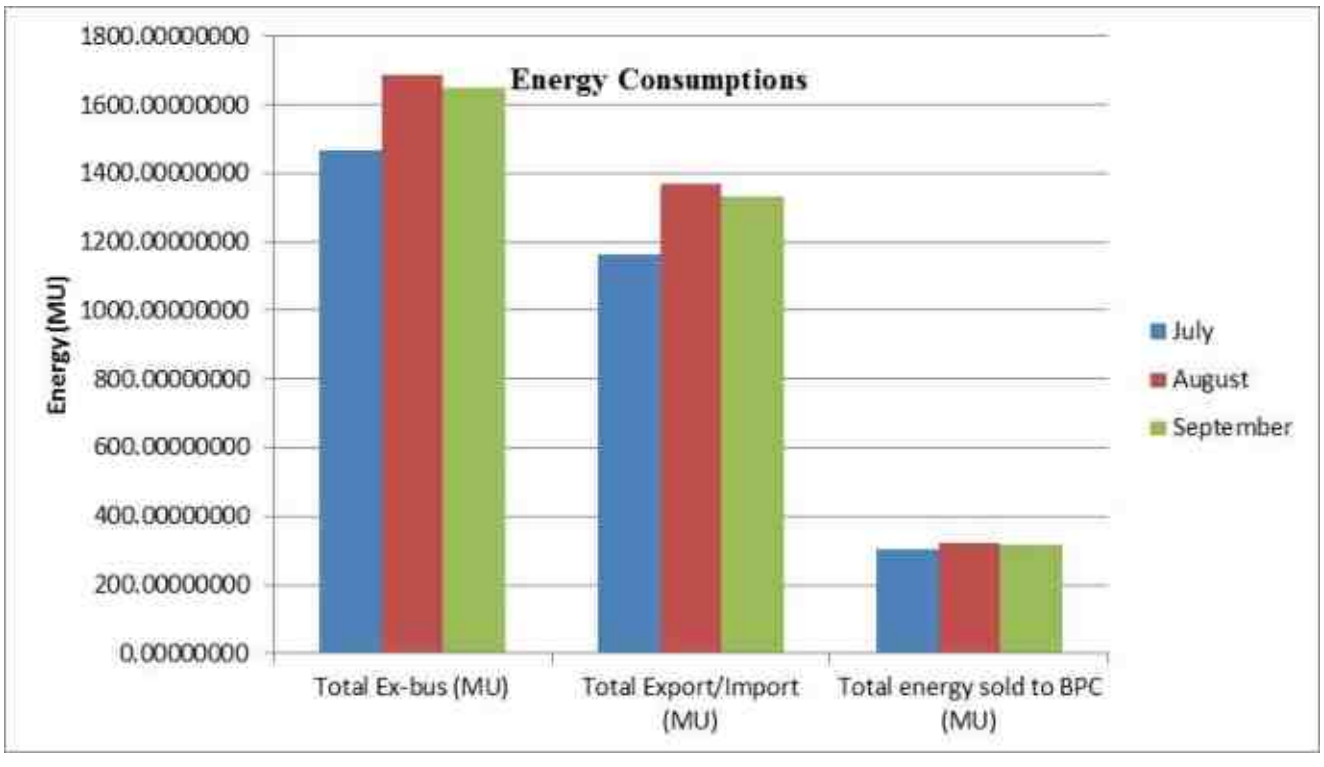
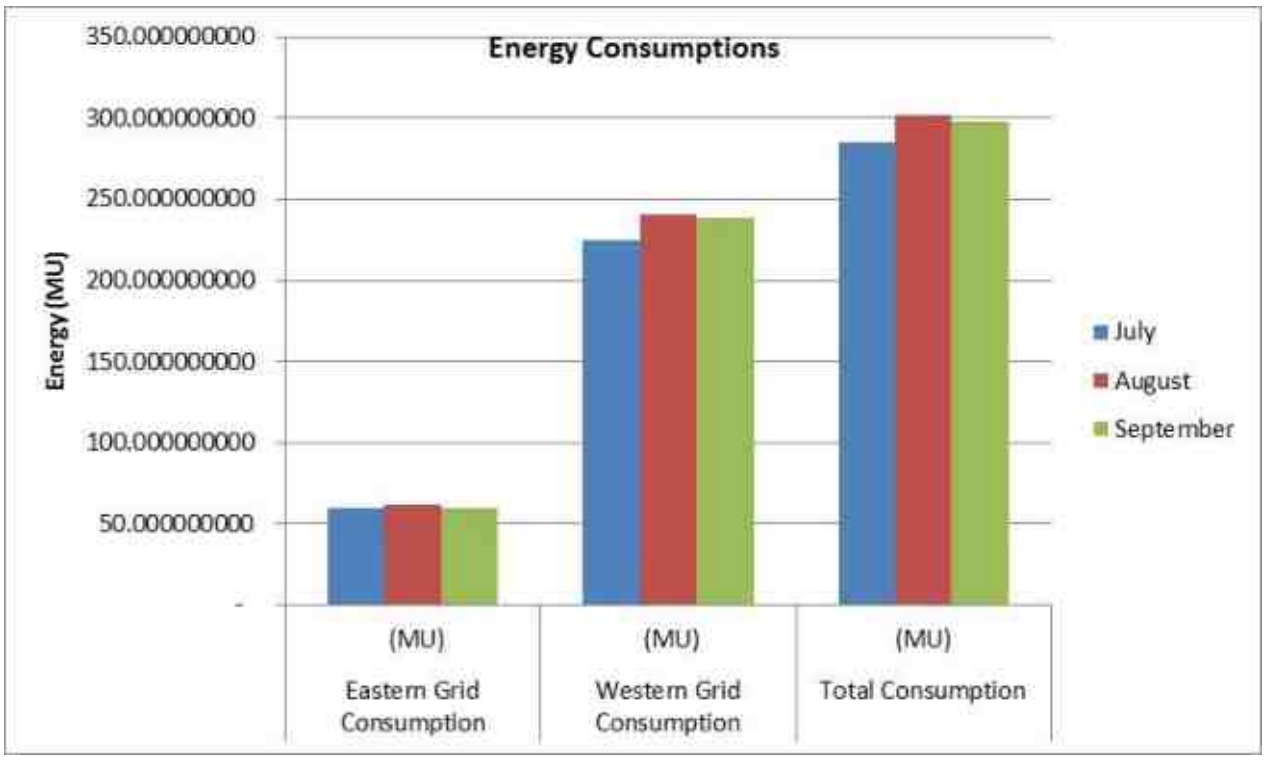


Table 3.1.2. Energy (MU) consumed

Grid	Eastern Grid Consumption	Western Grid Consumption	Total Consumption
Month	(MU)	(MU)	(MU)
July	59.728885600	224.844968	284.5738535
August	61.584417200	240.532610	302.1170268
September	60.13601145	238.081376	298.2173871

Graph 3.1.2. Energy (MU) consumed



4. Performance of generating plants

4.1. Power and Energy Generation

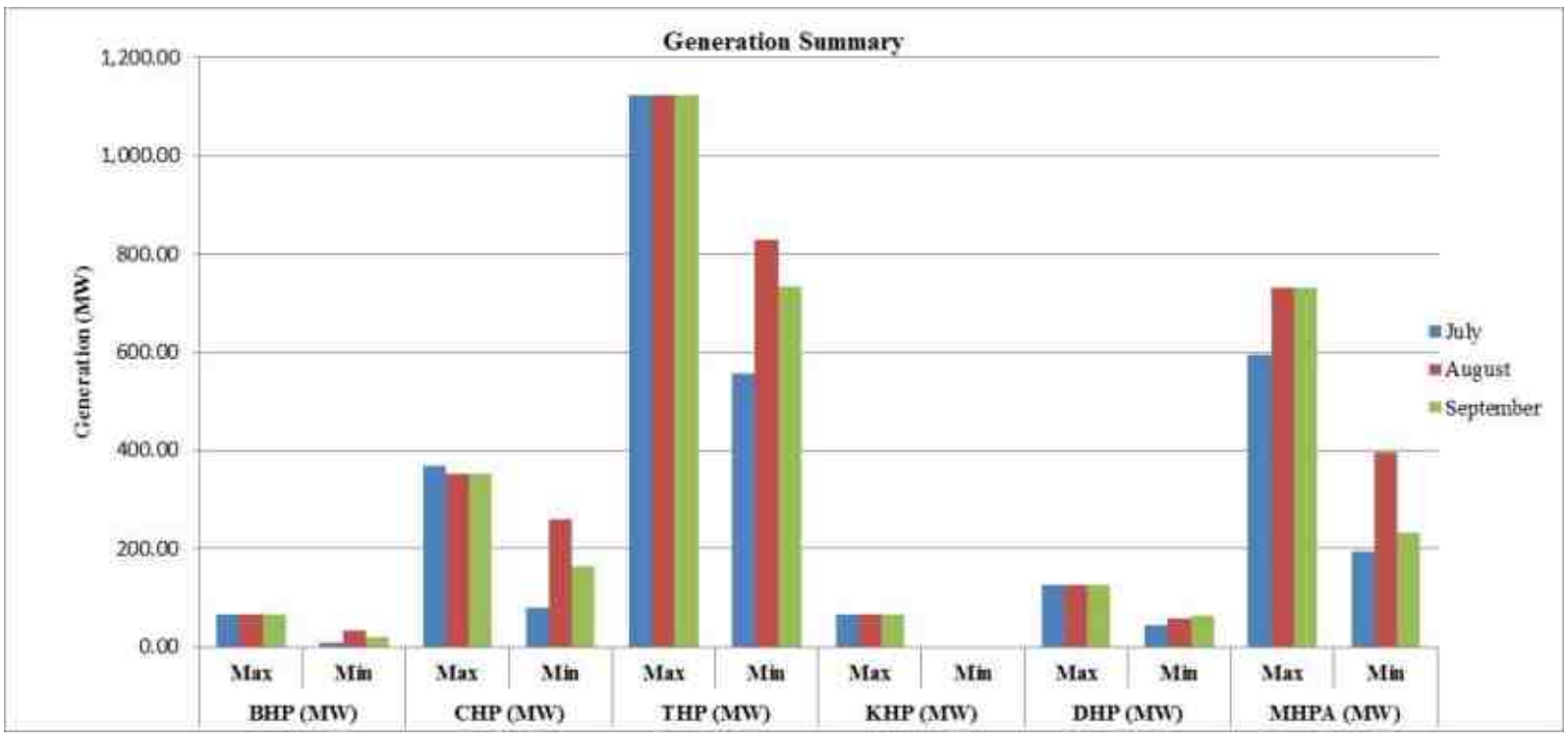
The maximum total generation for the third quarter of year 2022 was 2,465.02 MW in month of September and minimum generation was 884.67 MW in the July month.

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
July	66.40	10.70	369.99	79.47	1,122.00	557.00	66.00	0.00	127.03	44.31	594.19	193.19	2,345.61	884.67
August	66.58	33.54	353.00	259.79	1,122.00	830.00	66.00	0.00	127.07	57.38	729.82	395.37	2,464.47	1,576.08
September	66.39	21.10	353.39	165.59	1,122.00	734.00	66.00	0.00	127.32	63.37	729.92	232.07	2,465.02	1,216.13

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 July to September, 2022 is attached as **Annexure-I.**

4.2.Plant Capacity Factor

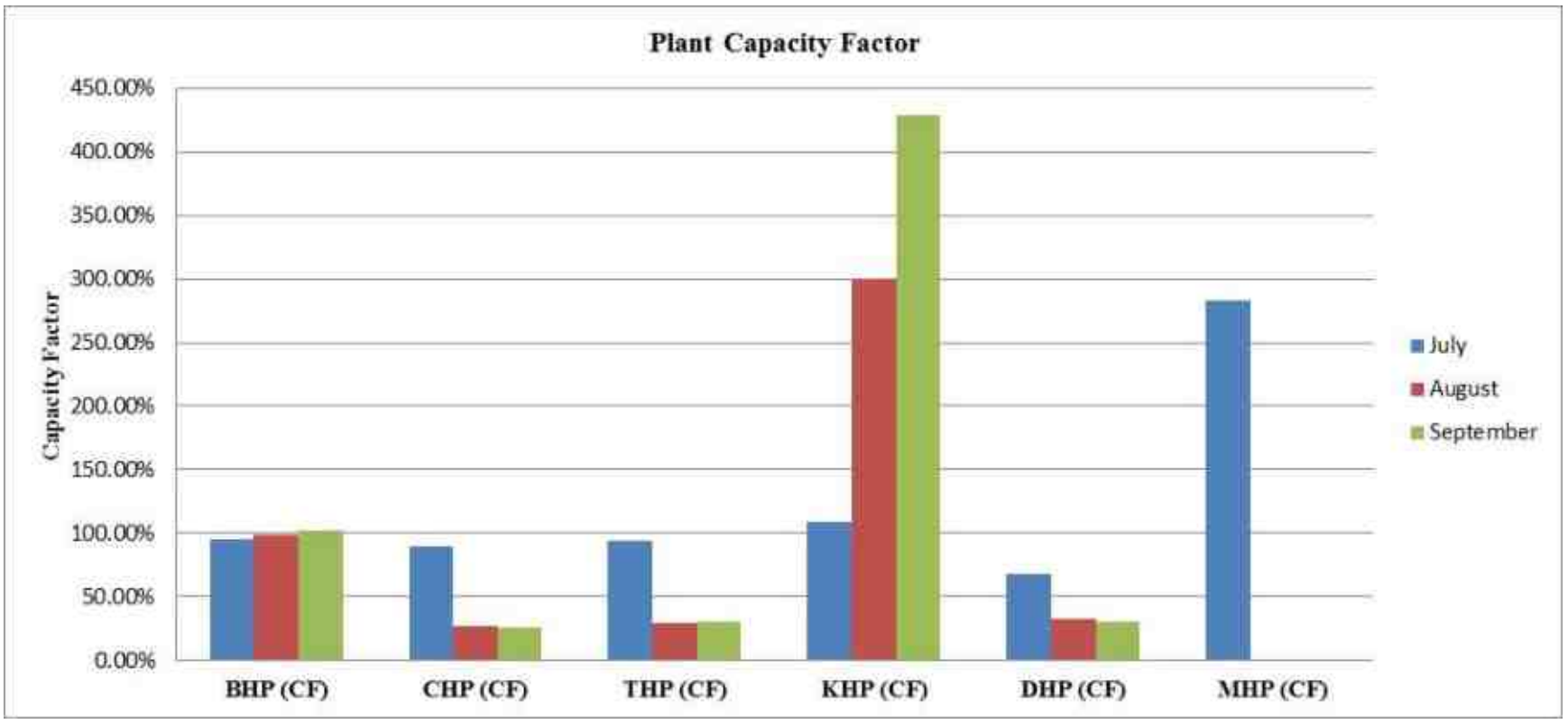
The capacity factor of each generating plant was calculated as below:

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

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)
July	43.83676	95.13%	217.85103	90.05%	692.638545	94.31%	47.016469	108.83%	62.04	68.39%	1,466.27	282.85%
August	47.02880	98.77%	68.64779	27.46%	220.88800	29.11%	134.037818	300.26%	30.752396	32.80%	0	0.00%
September	46.97590	101.94%	63.49768	26.25%	225.46300	30.70%	185.114909	428.51%	27.62	30.45%	0.00	0.00%
Source: TD, BPC												

Graph 4.2.1: Capacity factor of various hydropower plants



5. Export and Import of Electricity

Maximum export for the third quarter of year 2022 was 1,280.73 MW in the month of August to Binaguri substation in India. The minimum export recorded was 2 MW to Salakoti & Rangia substation in India during the month of July.

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
July	1,209.00	571.03	232.88	51.30	77.24	2.00
August	1,280.73	727.27	260.74	52.32	77.91	13.79
September	1,136.36	559.00	281.22	4.30	95.51	0.50

Graph 5.1. Export of electricity to India

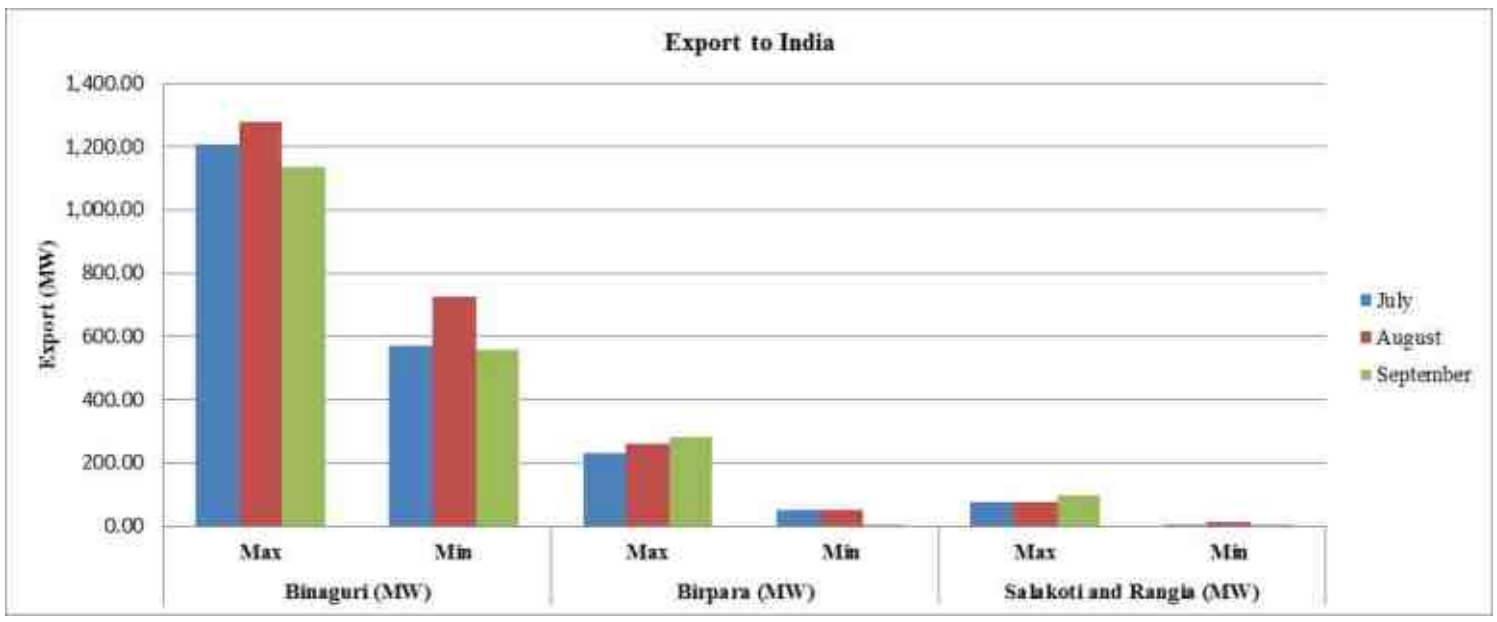
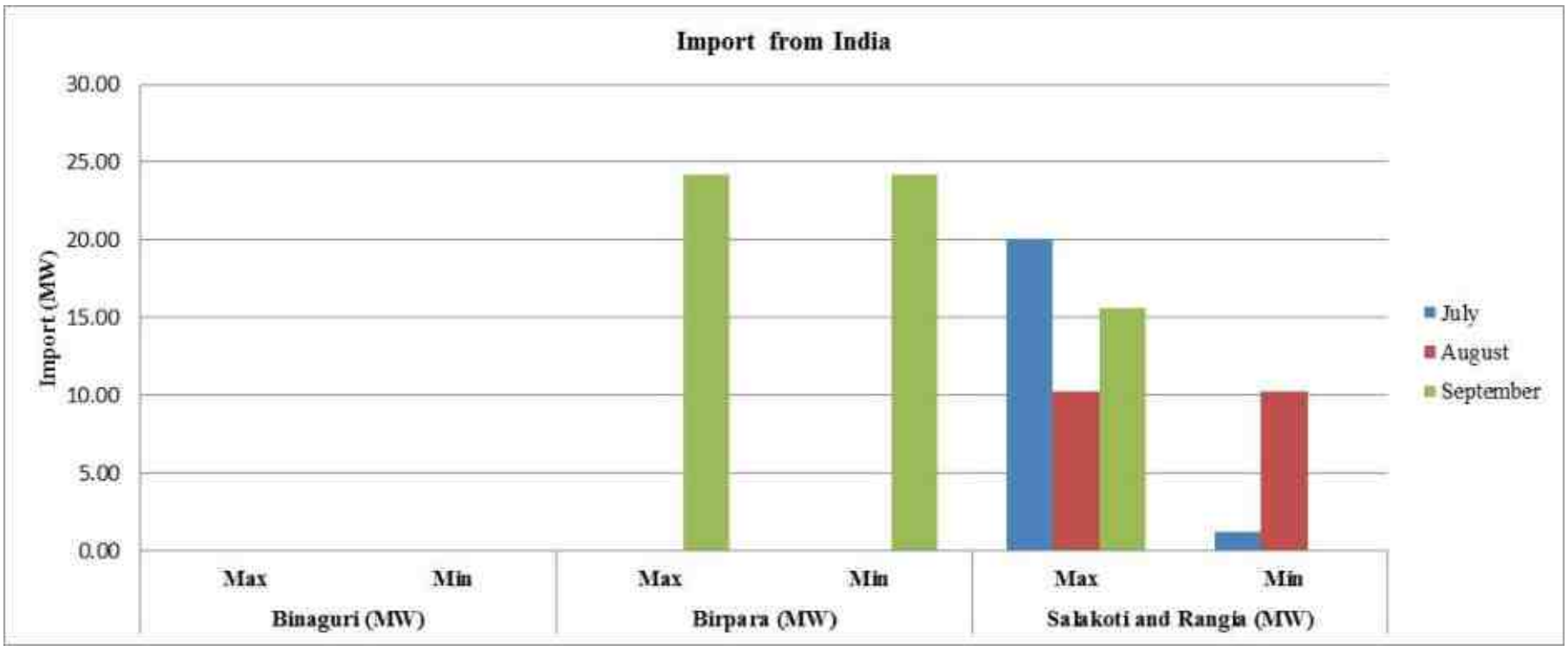


Table 5.2. Import of electricity from India.

Import From	Binaguri (MW)		Birpara (MW)		Salakoti and Rangia (MW)	
Month	Max	Min	Max	Min	Max	Min
July	0.00	0.00	0.00	0.00	20.02	1.29
August	0.00	0.00	0.00	0.00	10.24	10.24
September	0.00	0.00	24.16	24.16	15.60	0.06

Graph 5.3. 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 July, 2022

Table 6.1.1. Bus Frequency profile of Semtokha Substation

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

Graph 6.1.1. Bus Frequency of Semtokha Substation

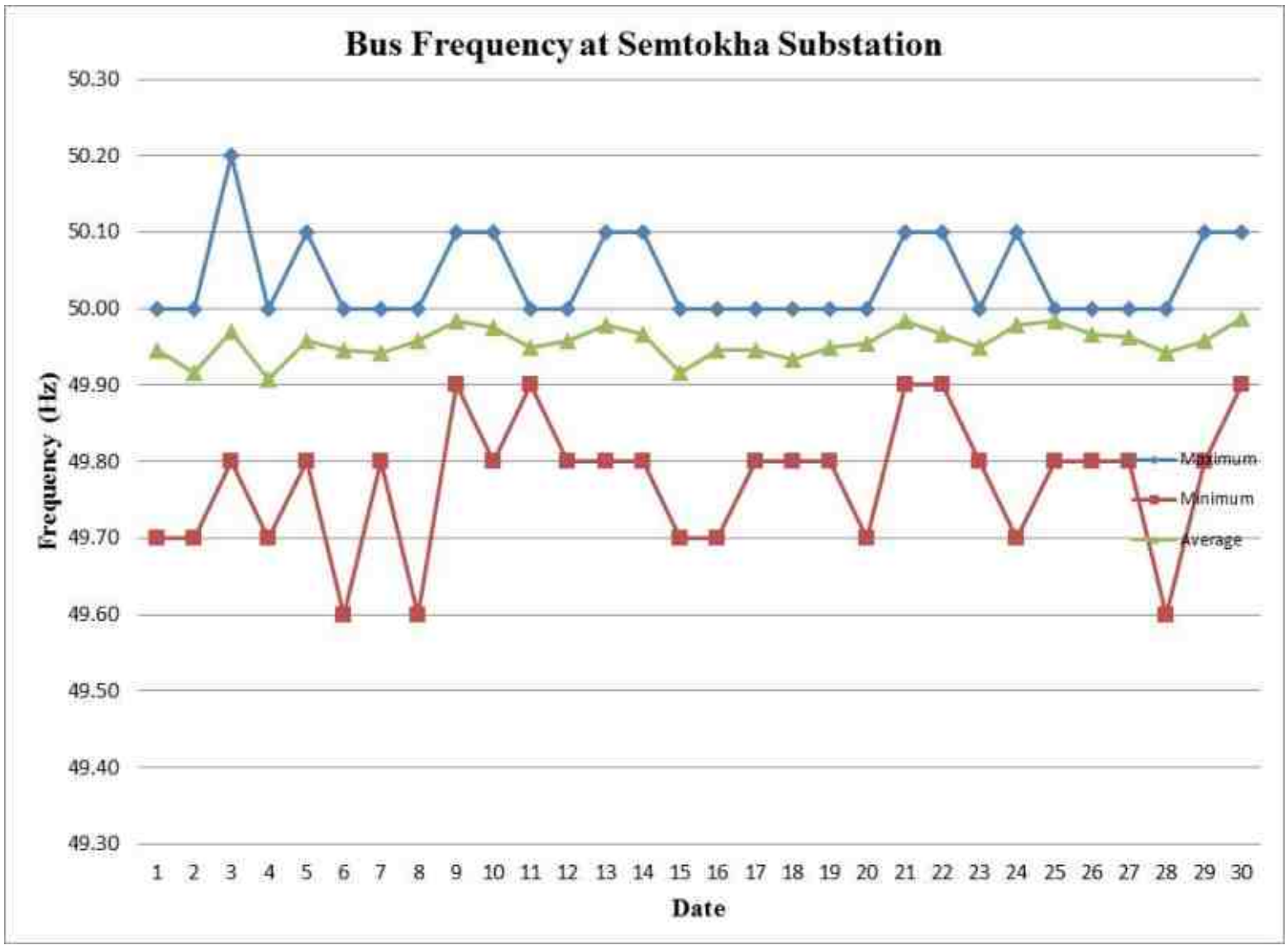
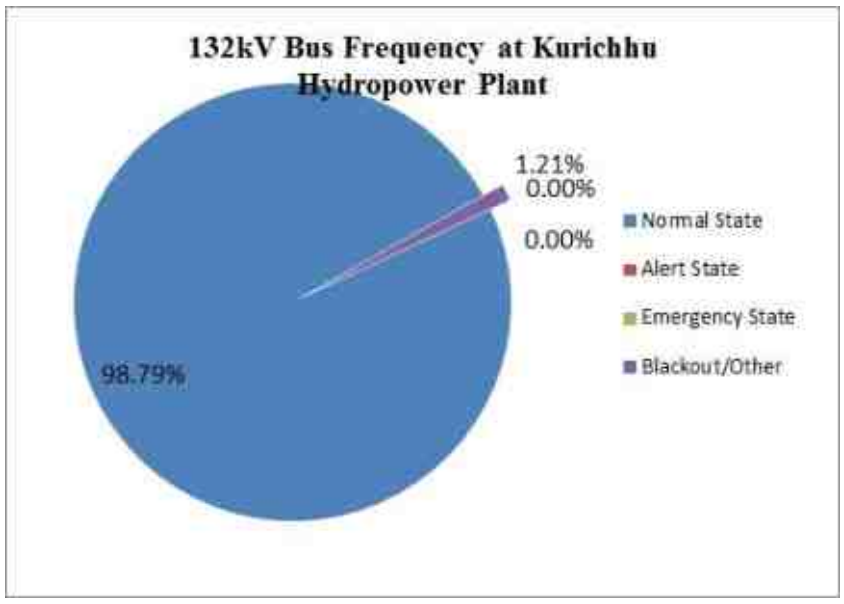


Table 6.1.2. Bus frequency of Kurichhu Hydro Power Plant

Sl. No.	Operating State	Frequency
1	Normal State	98.79%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	1.21%

Graph 6.1.2. Bus frequency of Kurichhu Hydro Power Plant



In the month of July, 2022, the Western grid has maintained the frequency within the normal operating limit of 100% and Eastern grid has maintained the normal operating limit of 98.79% and deviated 1.21% to blackout/others.

6.2.Frequency for the month of August, 2022

Table 6.2.1. Bus frequency of Semtokha Substation

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

Graph 6.2.1. Bus frequency of Semtokha Substation

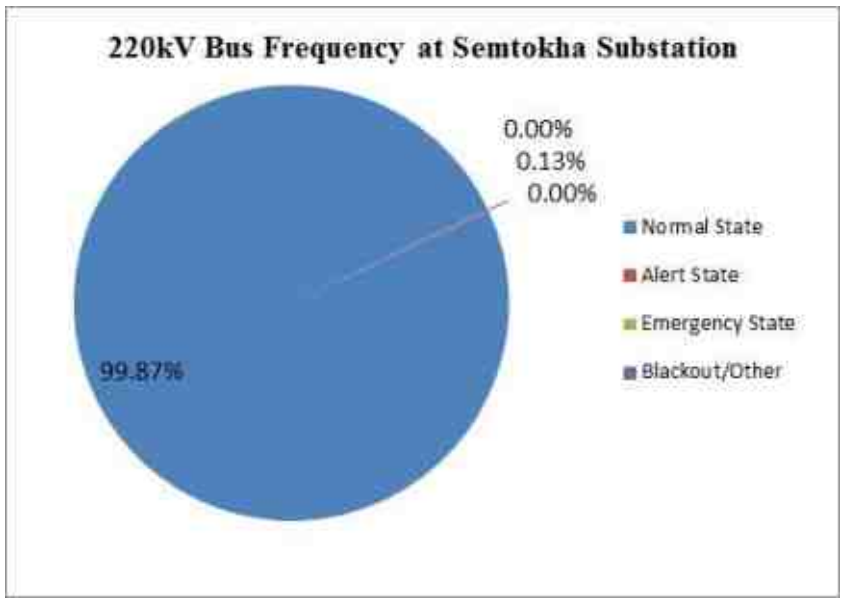
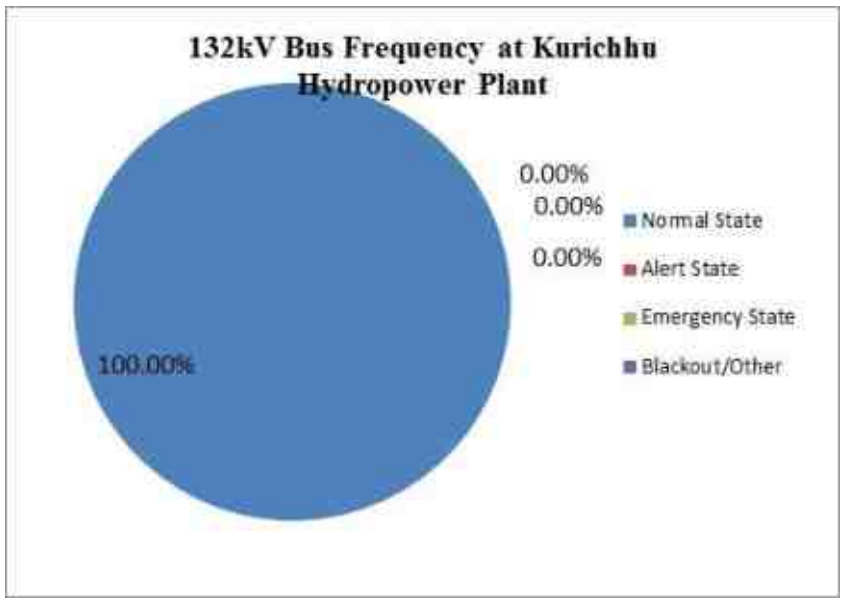


Table 6.2.2. Bus frequency of Kurichhu Hydro Power Plant

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

Graph 6.2.2. Bus frequency of Kurichhu Hydro Power Plant



In the month of August, 2022, the western grid frequency was maintained at normal operating range of 99.87% and deviated 0.13%to Alert state whereas Eastern grid was maintained at maintained at normal operating range of 100%

6.3.Frequency for the month of September, 2022

Table 6.3.1. Bus frequency of Semtokha Substation

Sl. No.	Operating State	Frequency
1	Normal State	96.51%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	3.49%

Graph 6.3.1. Bus frequency of Semtokha Substation

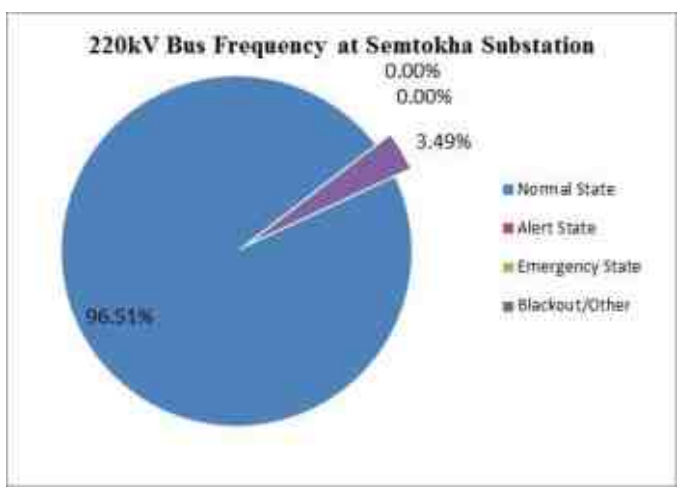
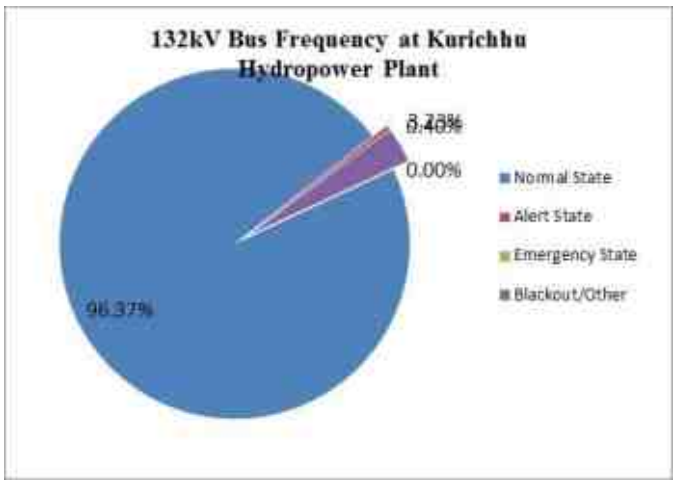


Table 6.3.2. Bus frequency of Kurichhu Hydro Power Plant

Sl. No.	Operating State	Frequency
1	Normal State	96.37%
2	Alert State	0.40%
3	Emergency State	0.00%
4	Blackout/Other	3.23%

Graph 6.3.2. Bus frequency of Kurichhu Hydro Power Plant



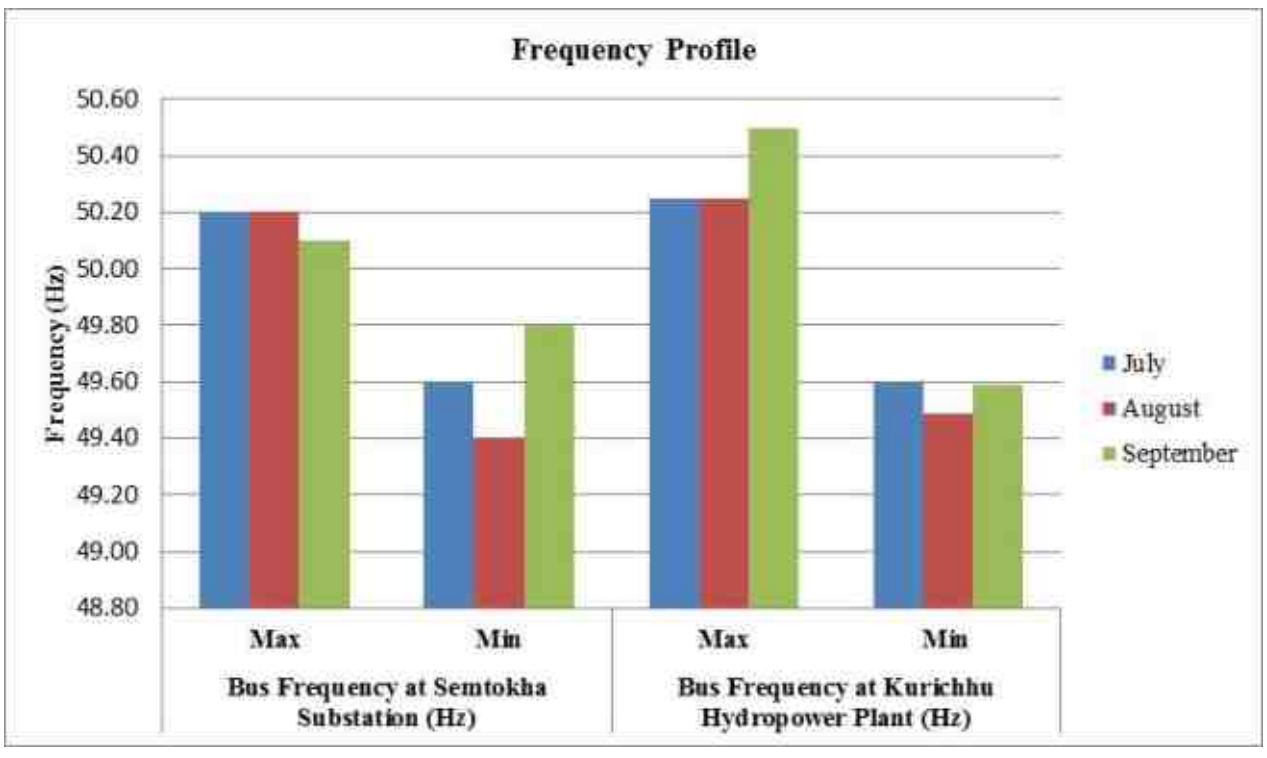
In the month of September, 2022, western gird frequency had maintained at 96.51% within the normal operating range and deviated 3.49% to blackout/other state. The eastern also maintain within normal operating range of 96.37 %, deviated 0.40% to alert state and 3.23 % to blackout/other state.

6.4.Frequency Summary for the month of July to September 2022

Table 6.4.1. Frequency summary for the month of July to September, 2022.

Substation/Plant	Bus Frequency at Semtokha Substation (Hz)		Bus Frequency at Kurichhu Hydropower Plant (Hz)	
Month	Max	Min	Max	Min
July	50.20	49.60	50.25	49.60
August	50.20	49.40	50.25	49.49
September	50.10	49.80	50.50	49.59

Graph 6.4.1. Frequency summary for the month of July to September, 2022



Daily maximum, minimum and average Frequency of Malbase substation in western grid and Kurichhu Hydro Power Plant in eastern grid for the month of July to September, 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.

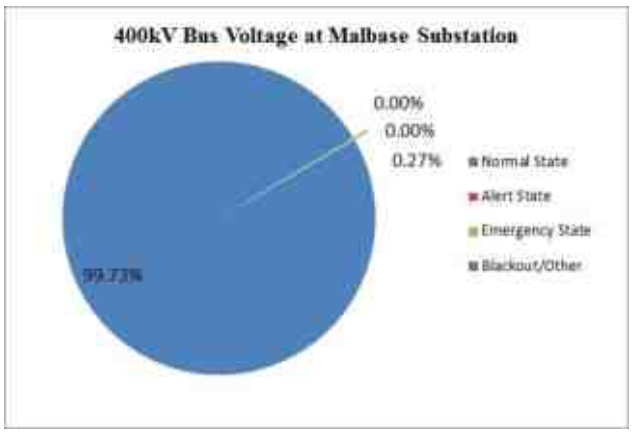
Due to the location of 400/22/66/11kV Malbase substation in western grid and 132/33/11kV Nangkhor substation in the eastern grid, the voltage profile of these substations are considered.

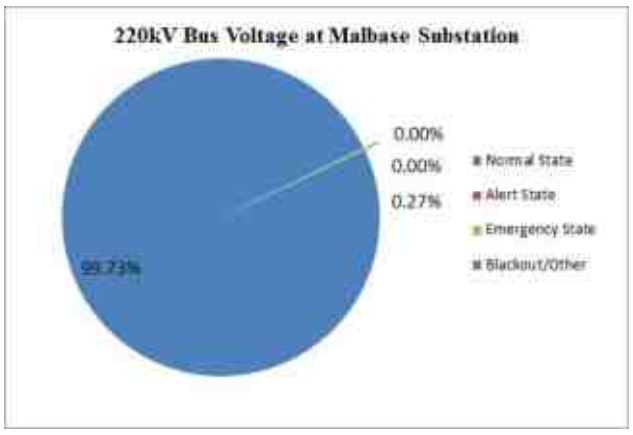
7.1.Voltage profile for the July, 2022

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	99.73%	99.73%	99.87%
2	Alert State	0.00%	0.00%	0.00%
3	Emergency State	0.27%	0.27%	0.13%
4	Blackout/Other	0.00%	0.00%	0.00%

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





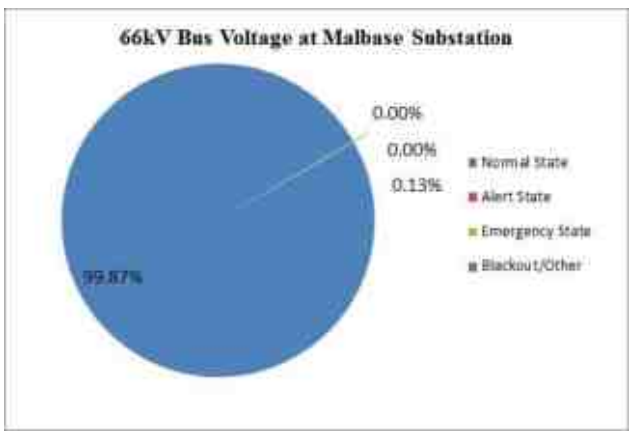
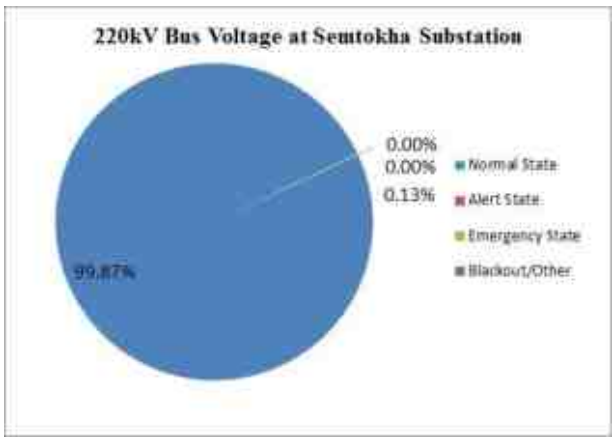


Table 7.1.2. Voltage Profile of 220/66/11kV Semtokha Substation

Sl. No.	Operating State	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	99.87%	100.00%
2	Alert State	0.00%	0.00%
3	Emergency State	0.13%	0.00%
4	Blackout/Other	0.00%	0.00%

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



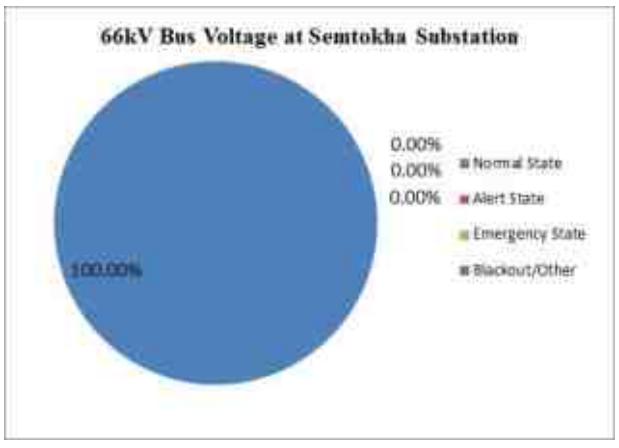
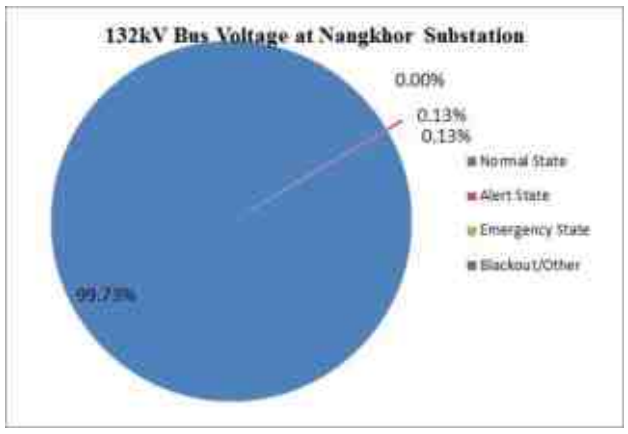


Table 7.1.3. Voltage Profile of 132/33/11kV Nangkhor Substation

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

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

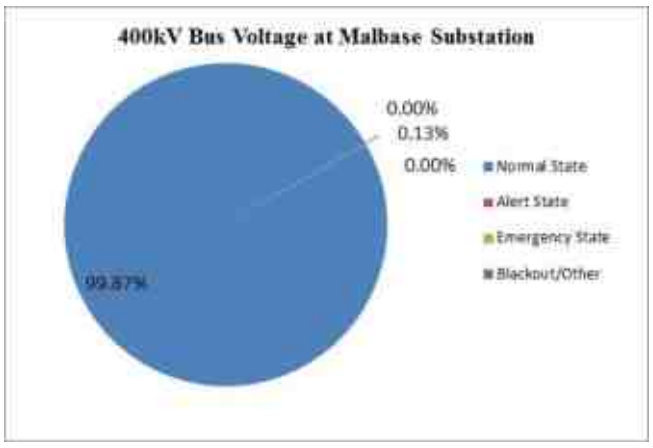


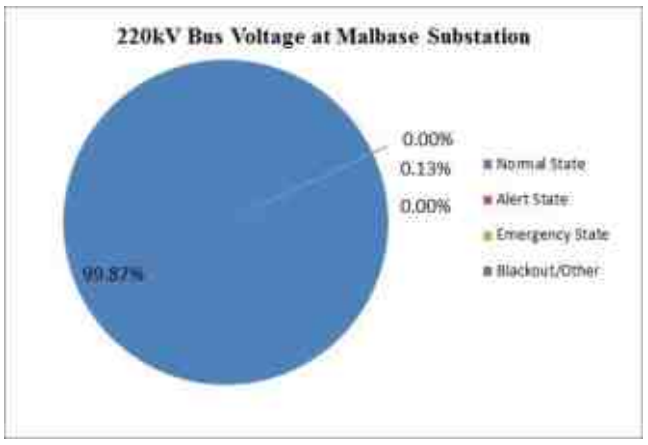
7.2.Voltage Profile for month of August, 2022

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%	99.87%	97.04%
2	Alert State	0.00%	0.00%	2.69%
3	Emergency State	0.00%	0.00%	0.13%
4	Blackout/Other	0.13%	0.13%	0.13%

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





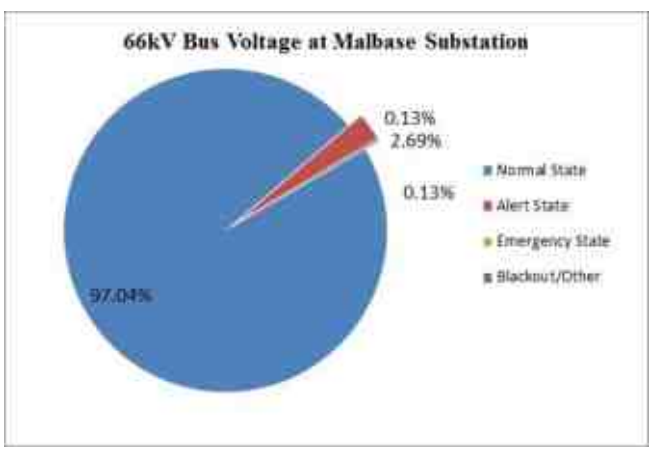
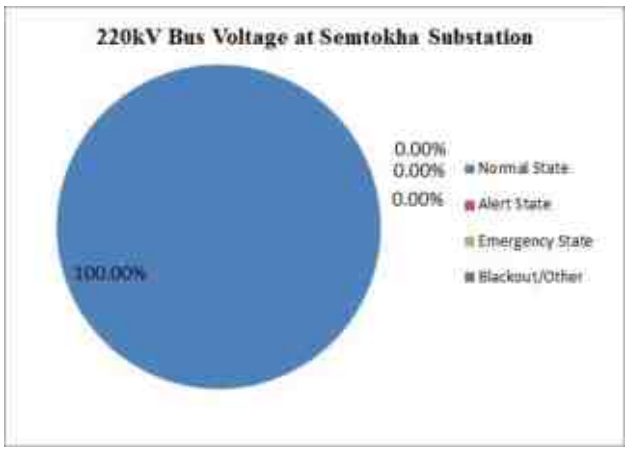


Table 7.2.2. Voltage Profile of 220/66/11kV Semtokha Substation

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

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



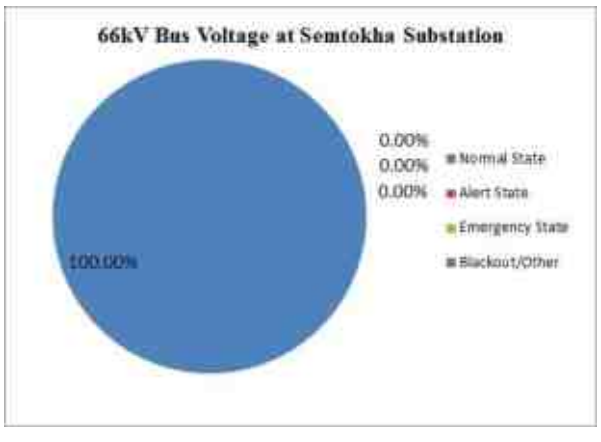
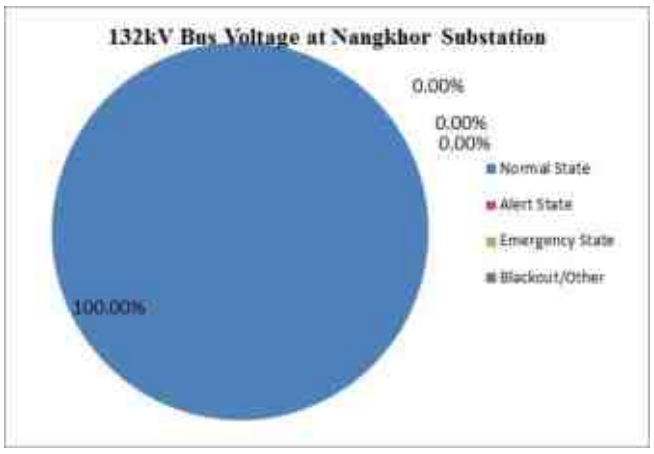


Table 7.2.3. Voltage Profile of 132/33/11kV Nangkhor Substation

Sl. No.	Operating State	132kV Bus Voltage
1	Normal State	100.00%
2	Alert State	0.00%
3	Emergency State	0.00%
4	Blackout/Other	0.00%

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

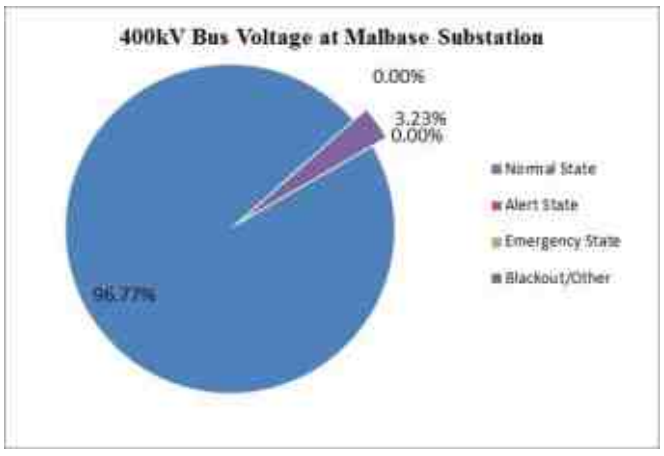


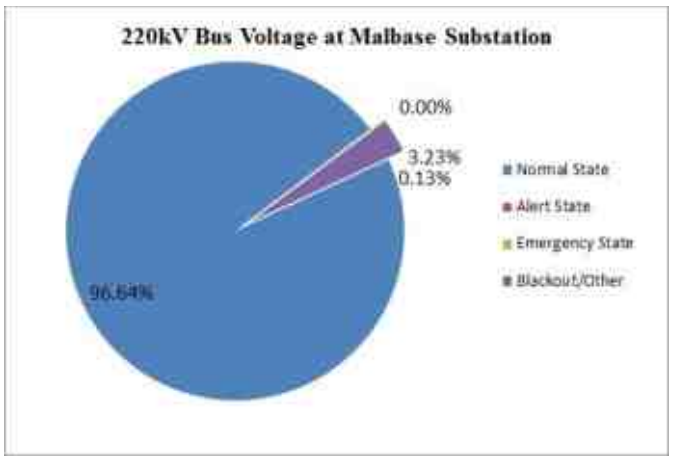
7.3.Voltage Profile for the month of September, 2022

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%	96.64%	95.97%
2	Alert State	0.00%	0.00%	0.40%
3	Emergency State	0.00%	0.13%	0.00%
4	Blackout/Other	3.23%	3.23%	3.63%

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





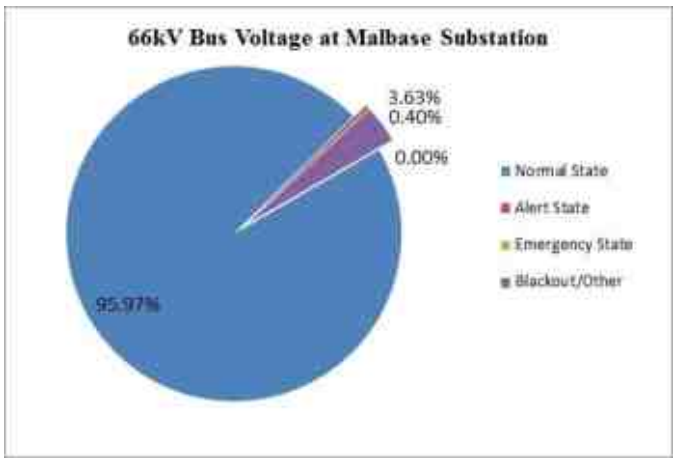
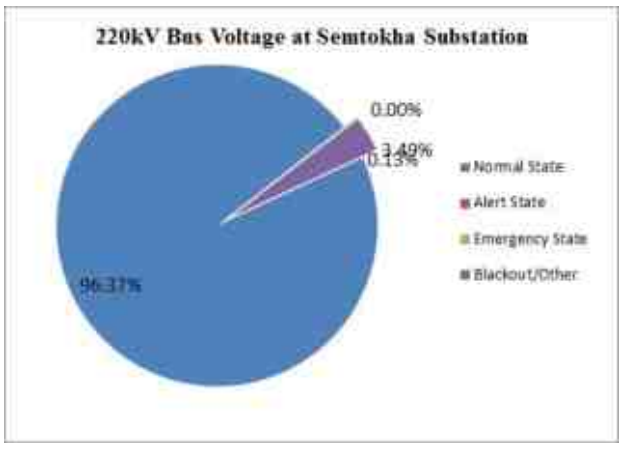


Table 7.3.2. Voltage Profile of 220/66/11kV Semtokha Substation

Sl. No.	Operating State	220kV Bus Voltage	66kV Bus Voltage
1	Normal State	96.37%	96.51%
2	Alert State	0.00%	0.00%
3	Emergency State	0.13%	0.00%
4	Blackout/Other	3.49%	3.49%

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



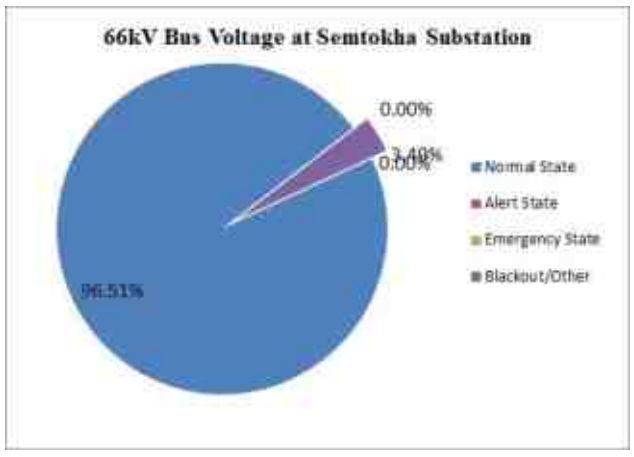
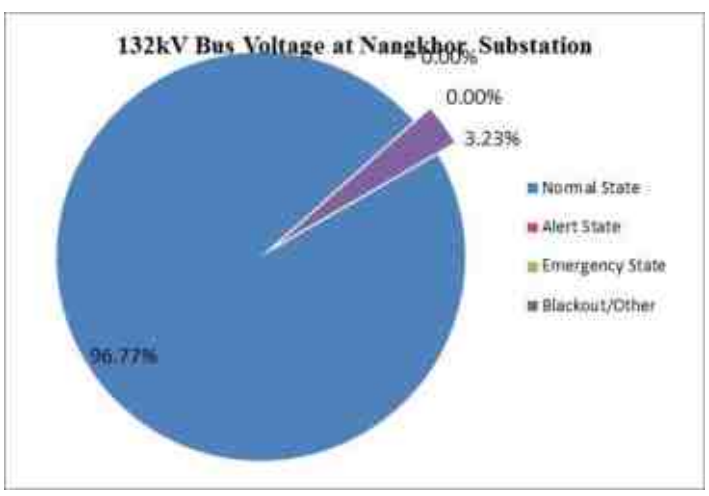


Table 7.3.3. Voltage Profile of 132/33/11kV Nangkhor Substation

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

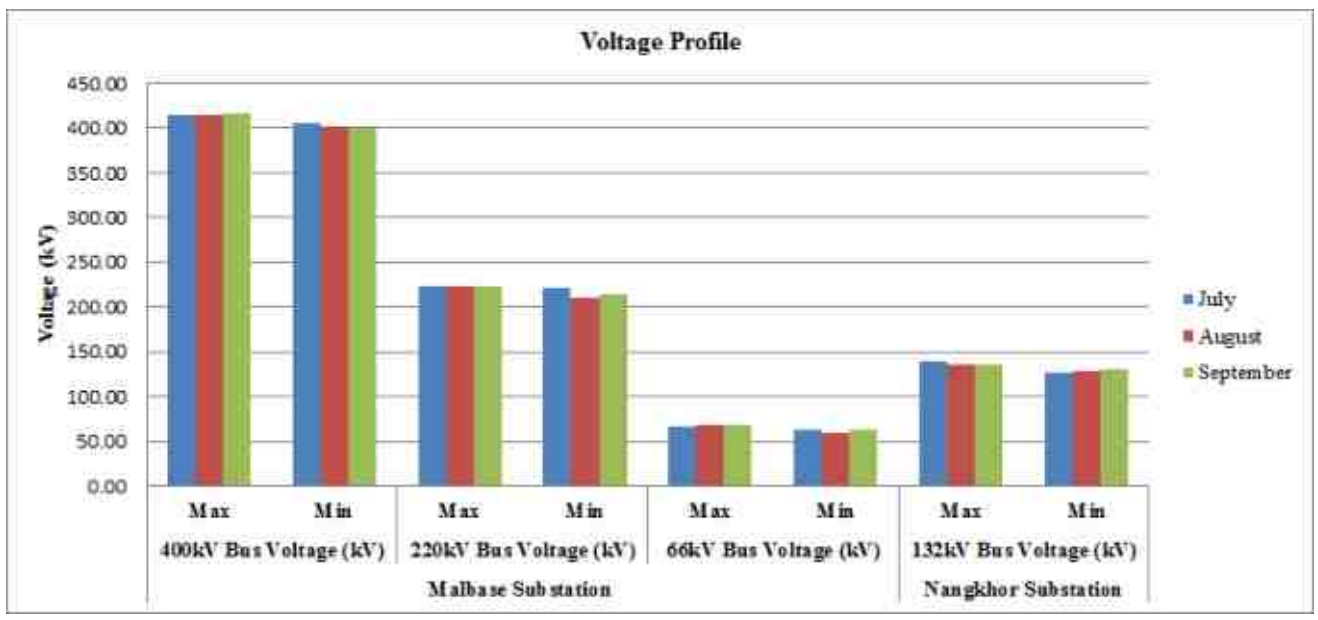


7.4.Voltage Summary for the Month of July to September, 2022

Table 7.4.1. Voltage Summary for the month of July to September, 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
July	414.00	405.00	224.00	221.00	66.35	63.10	139.87	126.34
August	414.50	402.00	222.50	209.50	68.00	60.01	136.31	129.04
September	415.50	399.00	223.00	214.50	68.00	62.00	136.10	129.45

Graph 7.4.1. Voltage Summary for the month of July to September, 2022



Daily maximum, minimum and average bus voltage of Malbase substation in western grid and Nangkhor substation in eastern grid for the month of July to September, 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 multiple major tripping occurred during the third quarter of the year compare to the previous quarter. Generally, all the tripping occurred are of transient in nature but the maximum restoration time 38hr.

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

8.2.Major Outages in Western Grid

It had been observed that there was major tripping occurred during the third quarter year as compared to the previous quarter the restoration time was ranging from 2hrs-1847hrs.

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

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

9. Annexures

Annexure-I

Table: Generation of July, 2022

Jul-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	66.33	63.72	66.12	369.32	277.26	351.03	1,122.00	1,122.00	1,122.00	0.00	0.00	0.00	126.83	95.37	104.11	595.64	591.70	592.83
2	66.34	66.08	66.20	369.56	275.58	352.38	1,122.00	1,122.00	1,122.00	65.77	64.90	65.31	126.89	95.39	110.76	594.19	592.01	593.21
3	66.24	65.97	66.09	369.97	366.82	368.16	1,122.00	935.00	1,114.21	66.00	64.59	65.33	105.31	45.00	86.29	594.06	193.19	568.54
4	0.00	65.75	66.05	369.99	367.63	368.52	1,122.00	871.00	1,001.33	66.00	66.00	66.00	97.46	82.12	81.18	593.67	394.26	580.42
5	0.00	62.10	64.52	369.40	367.05	368.26	1,021.00	777.00	887.92	66.00	66.00	66.00	74.37	66.37	70.71	593.59	591.95	593.04
6	0.00	22.05	58.83	369.07	366.70	368.26	1,078.00	699.00	867.83	66.00	66.00	66.00	87.31	82.29	84.92	593.59	538.15	578.57
7	63.35	58.20	60.87	369.26	79.47	352.51	867.00	557.00	783.63	66.00	66.00	66.00	62.33	57.46	60.36	573.08	479.48	521.21
8	60.48	40.52	57.96	277.29	272.65	275.42	747.00	557.00	707.00	66.00	65.71	65.92	63.64	59.86	58.44	540.75	358.22	504.46
9	66.11	56.12	61.80	274.55	272.84	273.87	837.00	717.00	752.13	66.00	66.00	66.00	126.41	58.41	84.76	578.26	395.50	517.33
10	57.08	51.25	55.06	274.65	272.71	273.88	817.00	617.00	722.67	66.00	66.00	66.00	64.35	55.40	59.55	538.40	460.68	497.25
11	55.84	10.70	49.75	277.00	273.82	275.00	790.00	670.00	730.00	66.00	66.00	66.00	56.46	53.37	54.83	569.55	470.83	521.93
12	54.50	49.71	50.80	276.72	275.56	276.23	824.00	630.00	721.21	66.00	66.00	66.00	53.93	51.39	52.37	585.00	479.36	526.85
13	49.69	48.05	49.13	276.98	274.87	276.04	1,122.00	696.00	890.08	66.00	66.00	66.00	52.46	48.94	51.33	566.06	500.53	535.02
14	48.15	44.26	47.05	276.82	274.69	276.15	1,122.00	774.00	1,016.34	66.00	66.00	66.00	50.52	48.00	49.00	592.90	429.05	569.19
15	48.69	45.10	46.17	276.79	275.01	276.13	931.00	607.00	829.21	66.00	65.69	65.95	59.94	48.99	50.74	593.08	465.49	521.90
16	44.94	44.20	44.59	277.22	275.32	276.39	764.00	607.00	712.88	66.00	65.34	65.70	45.77	44.32	45.28	479.92	420.70	461.43
17	44.55	43.10	43.65	277.41	275.24	276.05	1,071.00	674.00	789.13	65.91	64.99	65.42	45.77	44.32	45.28	479.91	435.43	463.55
18	46.59	43.37	44.45	276.67	275.62	276.19	940.00	680.00	747.92	66.00	33.00	62.86	45.59	44.31	45.07	473.53	419.33	443.96
19	62.06	19.71	49.93	277.11	275.52	276.22	750.00	680.00	710.00	66.00	66.00	66.00	63.23	47.01	54.87	591.99	420.93	542.59
20	66.09	45.87	56.92	277.03	274.87	276.06	1,061.00	710.00	840.79	66.00	65.61	65.95	123.30	55.96	80.97	593.89	509.47	553.59
21	66.33	66.07	66.17	277.04	274.78	276.16	1,122.00	851.00	1,002.92	65.14	47.71	63.93	126.94	88.35	113.64	593.89	591.39	592.67
22	66.30	65.71	66.17	276.74	272.85	276.00	1,122.00	1,122.00	1,122.00	65.12	31.46	62.38	126.98	107.06	122.22	593.62	591.74	593.01
23	66.33	66.08	66.22	277.19	275.42	276.03	1,122.00	955.00	1,084.29	65.04	59.45	61.83	127.03	124.40	126.56	593.65	592.53	593.27
24	66.29	66.07	66.20	277.22	274.94	275.93	1,122.00	561.00	1,075.25	66.00	29.81	59.26	124.40	86.44	101.22	593.61	592.84	593.33
25	66.26	66.05	66.17	277.00	274.66	275.95	1,122.00	935.00	1,083.04	65.83	65.03	65.40	133.35	86.57	99.88	593.68	387.51	567.37
26	66.33	66.11	66.21	276.79	274.96	276.22	1,122.00	1,122.00	1,122.00	65.50	63.41	64.40	126.95	118.33	123.40	593.13	392.10	571.52
27	66.33	24.79	63.21	276.79	275.51	276.05	1,122.00	1,122.00	1,122.00	66.00	32.00	54.02	126.95	118.33	123.40	593.62	591.09	592.53
28	66.40	66.22	66.31	277.07	273.82	276.03	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	126.90	110.28	121.40	594.01	341.68	310.19
29	66.35	66.17	66.26	276.44	274.94	275.88	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	121.40	104.38	114.26	594.16	591.49	593.16
30	66.30	66.14	66.21	276.85	274.96	276.04	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	126.89	108.30	119.79	594.12	591.69	593.54
31	66.34	66.03	66.24	277.06	184.25	272.26	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	126.93	115.38	122.98	593.73	575.48	592.44
Max	66.40			369.99			1,122.00			66.00			127.03			594.19		
Min		10.70			79.47			557.00			0.00			44.31			193.19	

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

Graph: Generation for the month July, 2022

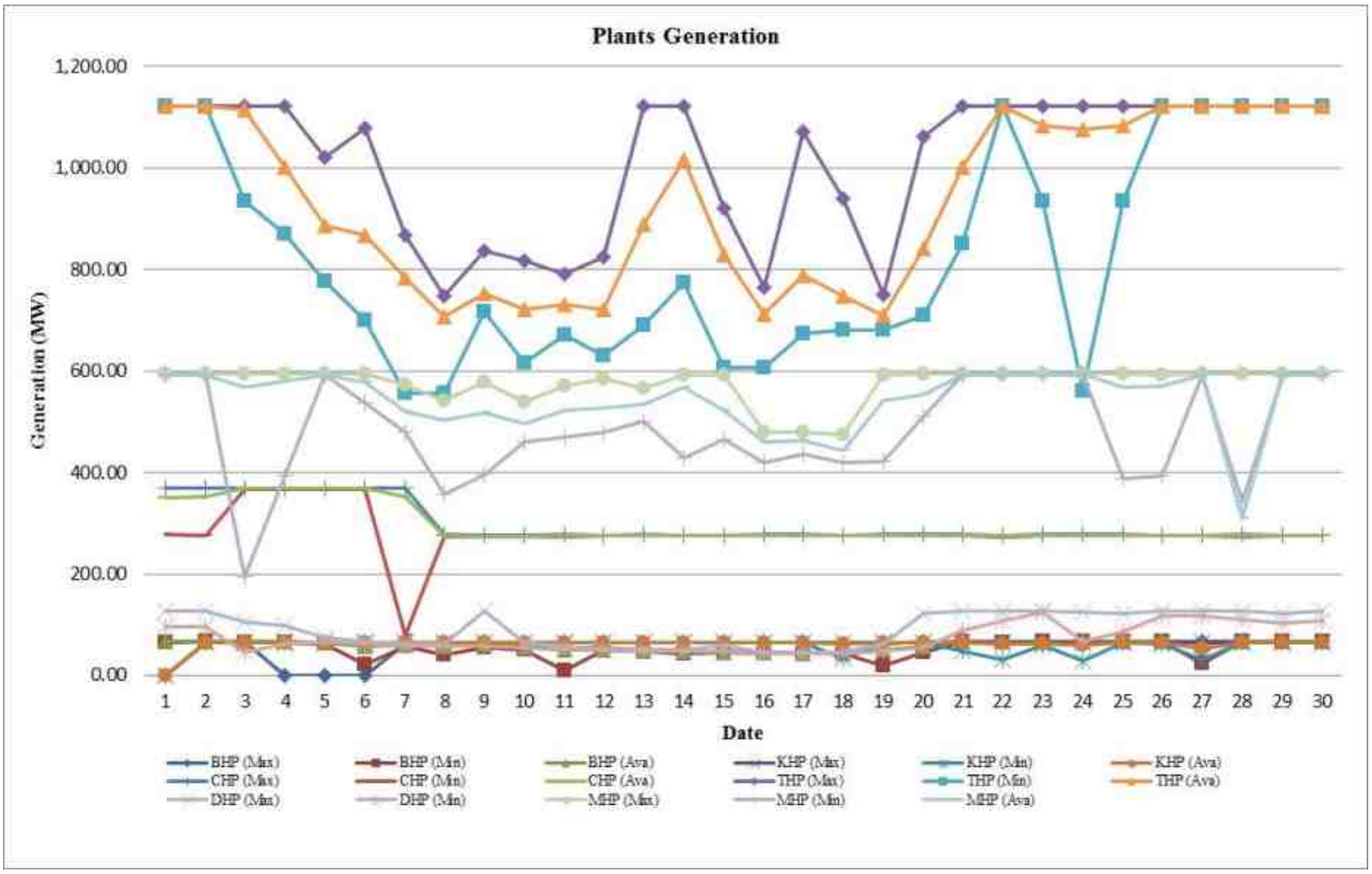


Table: Generation for the month of August, 2022

Aug-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	66.35	66.18	66.28	276.73	274.73	276.11	1,122.00	1,122.00	1,122.00	0.00	0.00	0.00	126.98	126.62	126.86	593.81	395.37	573.70
2	66.38	66.16	66.28	276.76	275.14	276.03	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	126.95	126.64	126.82	593.88	592.89	593.50
3	66.38	66.15	66.29	276.85	274.89	276.16	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	126.98	126.78	126.86	593.79	592.12	593.45
4	0.00	66.21	66.28	276.75	275.64	276.38	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	127.07	110.80	123.63	593.90	593.38	593.58
5	0.00	66.18	66.25	277.09	275.09	276.31	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	126.95	108.46	113.28	638.83	592.15	599.72
6	0.00	66.13	66.27	276.98	275.62	276.20	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	126.98	80.60	121.13	729.82	638.39	706.26
7	66.58	66.24	66.42	276.98	275.81	276.24	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	127.03	113.46	122.81	729.72	561.21	721.00
8	66.29	66.10	66.19	276.62	274.67	276.06	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	113.46	97.42	107.23	729.07	726.71	728.08
9	66.29	66.07	66.17	276.89	275.58	276.24	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	110.49	97.41	102.44	729.04	728.37	728.75
10	66.31	66.06	66.17	276.99	275.86	276.41	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	98.44	88.33	93.93	728.98	727.26	728.69
11	66.21	66.03	66.10	276.87	275.91	276.34	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	95.39	86.38	91.18	729.02	661.36	721.04
12	66.43	66.10	66.32	276.80	275.76	276.41	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	87.40	80.90	84.27	661.56	605.27	633.13
13	66.24	66.01	66.10	277.13	275.53	276.32	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	87.46	78.37	80.72	726.80	575.01	613.28
14	66.18	66.00	66.08	277.13	275.55	276.28	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	127.03	87.41	116.81	729.55	721.28	727.68
15	66.27	45.82	65.24	309.45	275.71	282.15	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	126.84	94.38	110.53	728.75	727.45	728.17
16	66.19	66.00	66.08	335.41	309.38	324.48	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	118.48	87.41	96.89	729.82	625.66	689.27
17	66.25	33.54	55.66	344.07	331.55	340.85	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	90.52	80.36	84.63	644.42	556.14	591.75
18	66.14	33.82	50.99	343.89	342.14	342.78	1,122.00	958.00	1,075.38	66.00	66.00	66.00	80.39	75.30	77.87	709.22	550.99	570.07
19	65.36	64.38	64.81	349.08	342.40	347.10	1,122.00	958.00	1,105.67	66.00	66.00	66.00	87.41	63.50	76.15	729.28	530.92	653.70
20	64.42	57.94	62.81	348.88	275.75	332.67	1,122.00	978.00	1,073.25	66.00	66.00	66.00	86.36	71.81	78.35	729.36	676.31	714.60
21	62.39	60.23	60.84	348.93	347.40	348.15	1,122.00	961.00	1,008.75	66.00	66.00	66.00	76.39	68.38	71.83	728.33	591.25	663.81
22	61.61	56.52	60.04	352.20	347.44	349.10	1,122.00	998.00	1,097.25	66.00	66.00	66.00	82.70	68.69	73.12	729.22	645.69	715.48
23	61.13	58.93	59.60	352.59	350.67	351.62	1,122.00	948.00	1,046.54	66.00	66.00	66.00	106.40	67.39	76.19	728.96	621.39	707.42
24	58.77	40.82	57.09	352.39	350.95	351.68	1,105.00	948.00	1,039.29	66.00	66.00	66.00	96.41	68.35	78.49	621.53	576.13	590.00
25	57.73	54.85	55.75	352.35	348.52	351.70	948.00	884.00	917.96	66.00	65.82	65.99	71.38	63.34	66.45	630.43	541.22	581.31
26	57.25	54.41	55.53	352.27	351.45	351.92	994.00	830.00	909.33	66.00	65.76	65.94	67.35	62.29	64.09	630.52	516.16	564.18
27	66.07	51.15	54.68	352.68	351.37	351.83	870.00	830.00	845.00	66.00	33.00	61.81	63.38	57.38	61.10	625.13	529.88	553.33
28	66.25	65.48	66.07	353.00	348.99	352.01	1,122.00	830.00	1,065.04	66.00	65.71	65.99	126.90	61.45	87.99	729.09	628.90	704.37
29	66.29	66.01	66.14	352.88	351.37	351.85	1,122.00	1,122.00	1,122.00	66.00	65.74	65.96	127.05	80.37	95.29	729.04	725.98	727.99
30	66.20	64.88	65.91	352.46	349.13	351.66	1,122.00	1,122.00	1,122.00	65.91	65.60	65.78	104.51	83.14	83.57	728.92	726.95	728.14
31	66.17	64.79	65.58	352.47	259.79	310.04	1,122.00	1,122.00	1,122.00	65.57	65.02	65.36	126.93	78.42	91.91	728.90	727.45	728.40
Max	66.58			353.00			1,122.00			66.00			127.07			729.82		
Min		33.54			259.79			830.00			0.00			57.38			395.37	
Source: THP, CHP, BHP, KHP,MHP (DGPC)																		

Graph: Generation for the month of August, 2022

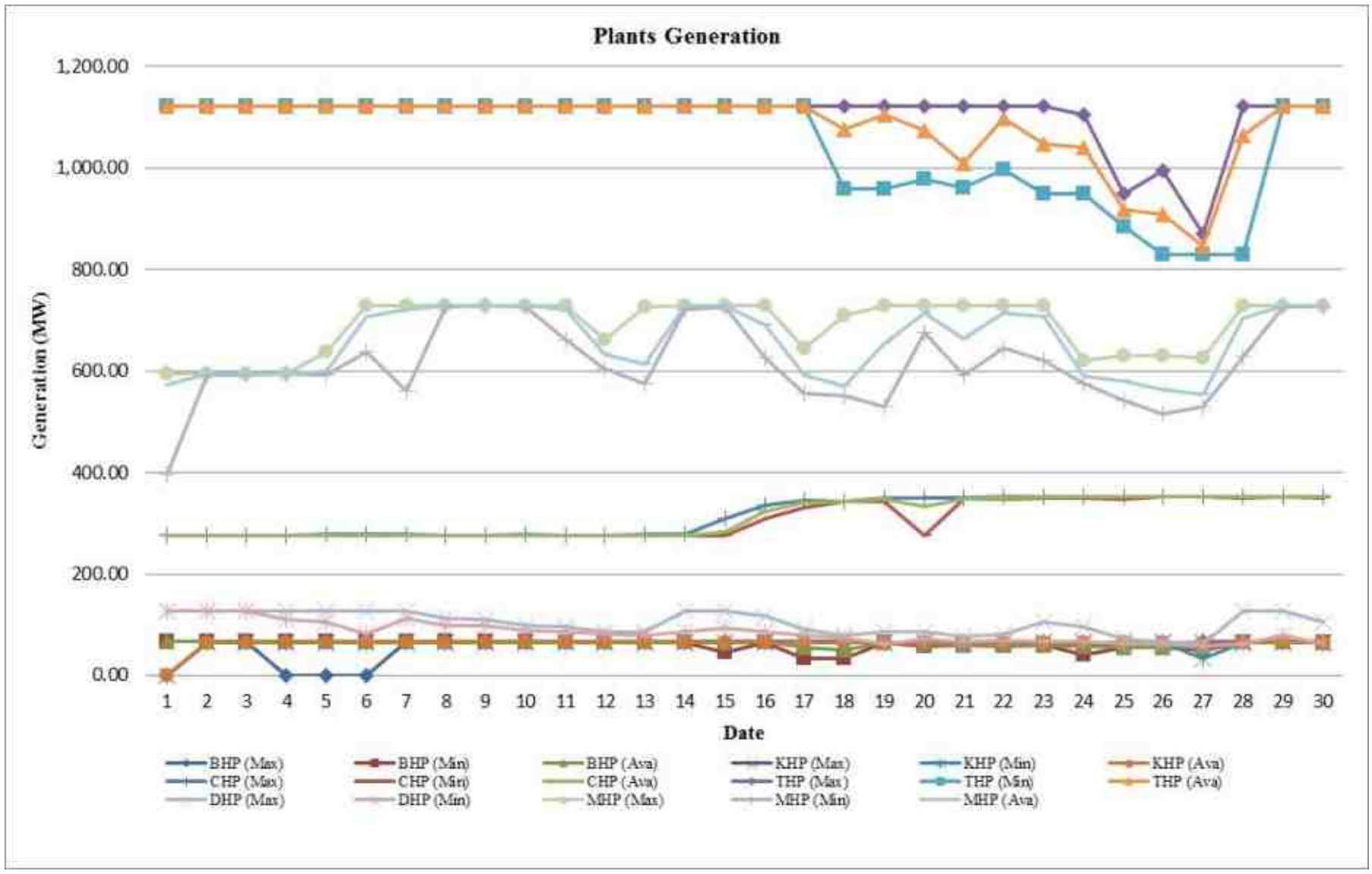


Table: Generation for the month of September, 2022

Sep-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	21.24	21.10	21.16	352.46	259.18	325.36	1,122.00	1,122.00	1,122.00	16.50	0.00	15.12	101.51	78.91	86.53	729.05	726.82	727.88
2	66.17	65.99	66.10	352.29	259.43	323.44	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	101.51	78.91	86.53	729.07	726.67	728.33
3	66.28	66.02	66.12	352.58	351.71	352.08	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	106.41	78.44	96.15	729.26	727.56	728.66
4	0.00	65.94	66.05	352.35	351.80	351.98	1,122.00	1,122.00	1,122.00	66.00	65.82	65.98	101.42	79.28	88.43	729.23	728.10	728.90
5	0.00	64.21	65.28	352.62	351.77	352.12	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	85.39	74.36	78.75	729.55	725.61	727.87
6	0.00	66.05	66.13	353.27	351.67	352.18	1,122.00	961.00	1,005.54	66.00	65.82	65.98	126.86	74.39	98.19	729.11	725.85	728.21
7	66.23	66.03	66.12	352.49	351.11	352.03	1,122.00	1,122.00	1,122.00	66.00	65.53	65.86	95.48	75.38	83.61	728.67	628.36	724.23
8	66.28	66.01	66.13	352.56	351.53	352.03	1,122.00	1,122.00	1,122.00	65.81	63.13	64.45	127.01	74.86	86.22	729.17	728.06	728.56
9	66.39	64.87	66.17	352.50	351.22	351.99	1,122.00	1,122.00	1,122.00	64.27	30.81	60.63	127.32	126.74	126.87	729.25	726.63	728.45
10	66.26	66.06	66.16	352.61	351.21	351.85	1,122.00	1,122.00	1,122.00	66.00	33.00	62.35	127.02	100.57	118.90	729.92	727.28	728.83
11	66.39	66.05	66.19	352.61	351.39	352.12	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	106.46	94.98	100.54	729.55	727.94	728.90
12	66.27	65.99	66.16	352.52	350.67	352.04	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	96.47	87.12	90.23	729.81	727.16	728.97
13	66.22	66.03	66.11	352.45	350.62	351.81	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	121.27	85.36	95.46	729.71	726.63	728.68
14	66.20	65.90	66.09	352.49	350.53	351.83	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	118.47	92.36	100.70	729.53	726.89	728.43
15	66.18	65.95	66.06	352.61	350.84	351.91	1,122.00	1,122.00	1,122.00	66.00	30.00	57.44	109.50	88.33	96.88	729.24	728.30	728.74
16	66.16	65.98	66.06	352.44	351.11	351.79	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	127.01	90.42	100.23	729.05	728.37	728.65
17	66.26	54.37	65.53	352.53	273.56	348.41	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	127.02	85.45	111.70	729.31	728.15	728.77
18	66.23	45.84	65.29	352.51	351.20	351.93	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	100.49	81.48	89.89	729.00	631.32	704.23
19	66.27	66.10	66.17	352.58	351.60	352.08	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	92.40	78.85	81.93	631.55	586.47	612.42
20	66.17	65.93	66.09	352.22	351.29	351.93	1,122.00	1,122.00	1,122.00	66.00	66.00	66.00	84.40	75.08	78.99	588.55	541.08	558.14
21	66.06	65.14	65.57	352.81	350.26	352.14	1,122.00	935.00	1,067.46	66.00	66.00	66.00	79.38	73.01	75.36	570.25	496.22	530.94
22	66.28	24.53	64.00	353.30	165.59	324.54	1,122.00	771.00	973.33	66.00	66.00	66.00	80.87	73.98	77.00	695.90	358.29	558.95
23	66.22	65.05	65.66	353.09	351.14	352.29	1,122.00	928.00	1,029.83	66.00	66.00	66.00	98.43	74.64	86.62	676.20	436.32	625.85
24	65.54	64.49	65.04	352.90	351.20	352.09	1,122.00	968.00	1,096.33	66.00	66.00	66.00	114.38	83.37	94.36	729.48	232.07	505.56
25	66.19	64.35	65.36	352.56	351.59	352.14	1,122.00	908.00	1,041.79	66.00	66.00	66.00	94.39	80.34	84.93	727.95	530.32	715.27
26	66.25	64.34	65.52	352.89	351.47	352.20	1,078.00	988.00	1,016.75	66.00	66.00	66.00	80.35	73.34	77.31	727.14	616.61	651.79
27	66.19	64.23	65.37	352.71	261.38	345.14	1,105.00	938.00	1,033.33	66.00	49.50	65.31	74.98	70.86	72.84	728.57	555.97	618.64
28	66.12	63.16	64.71	352.53	323.43	350.69	938.00	734.00	919.75	66.00	66.00	66.00	71.33	68.30	69.90	600.41	566.17	581.52
29	66.19	64.33	65.31	353.02	331.78	351.27	908.00	854.00	887.75	66.00	66.00	66.00	96.49	63.48	76.22	728.26	556.24	638.35
30	65.53	59.86	62.80	353.39	351.50	352.19	854.00	790.00	805.54	66.00	49.50	65.31	70.35	66.33	67.89	580.52	540.40	557.11
31	63.78	58.93	60.65	0.00	No Generati	Error	820.00	820.00	820.00	0.00	No Generati	Error	89.03	89.03	89.03	0.00	No Generation	Error
Max	66.39			353.39			1,122.00			66.00			127.32			729.92		
Min		21.10			165.59			734.00			0.00			63.37			232.07	
Source: THP, CHP, BHP, KHP,MHP (DGPC)																		

Graph: Generation for the month of September, 2022

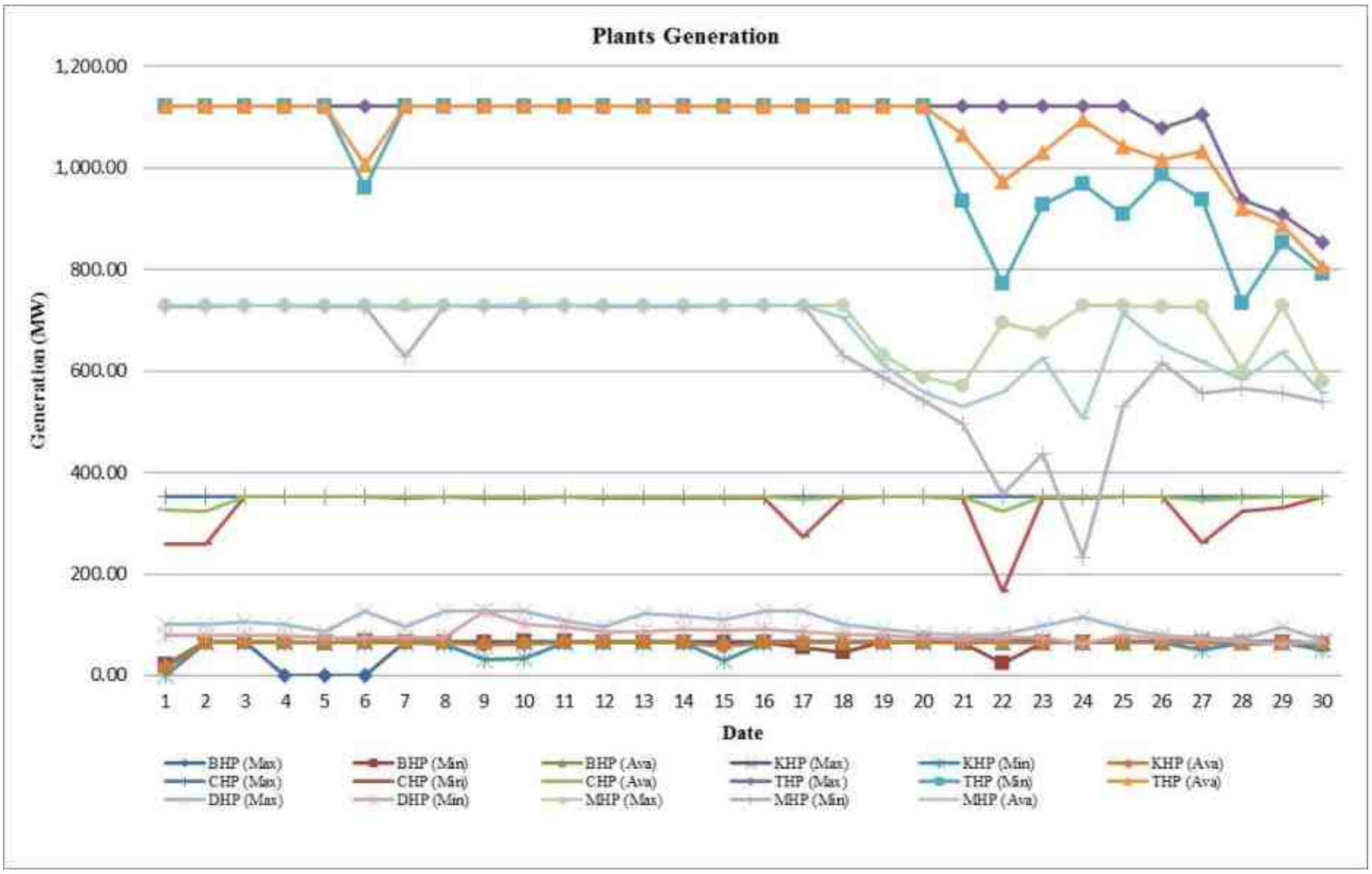
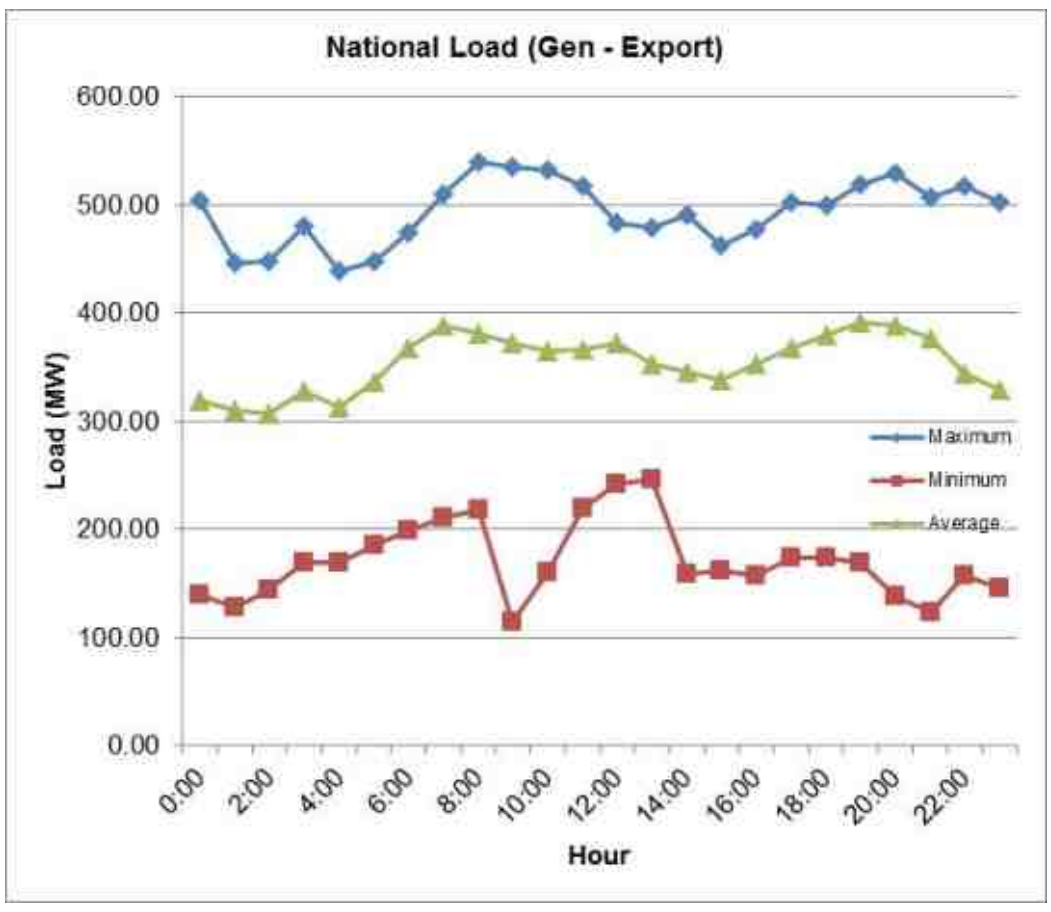


Table: National demand for July, 2022

Jul-22	Max	Min	Ava
0:00	503.95	140.28	319.37
1:00	446.84	127.90	311.02
2:00	447.61	143.74	307.12
3:00	480.90	169.46	327.89
4:00	439.26	169.23	313.08
5:00	447.58	185.74	336.40
6:00	474.43	199.90	368.67
7:00	510.34	211.01	389.22
8:00	540.67	218.82	381.79
9:00	536.16	114.15	373.17
10:00	532.18	160.49	365.54
11:00	517.90	220.66	367.17
12:00	483.64	242.61	372.29
13:00	479.54	246.46	353.12
14:00	490.60	159.46	345.17
15:00	462.87	162.55	338.45
16:00	477.06	158.15	353.68
17:00	502.37	174.69	368.08
18:00	499.42	173.29	380.47
19:00	519.85	169.29	392.14
20:00	529.99	136.54	389.31
21:00	507.27	123.07	376.58
22:00	518.04	157.12	343.66
23:00	503.47	146.00	328.86
	540.67		
		114.15	

Graph: National Demand for July, 2021



Annexure-II

Table: National Demand for August, 2022

Aug-22	Max	Min	Ava
0:00	503.57	279.43	392.16
1:00	466.40	256.11	388.51
2:00	501.55	138.29	381.48
3:00	500.49	269.10	389.96
4:00	433.90	273.91	386.85
5:00	437.96	224.61	387.44
6:00	461.42	313.43	417.62
7:00	485.66	345.36	441.02
8:00	474.33	342.46	426.55
9:00	490.41	336.28	429.08
10:00	467.82	152.08	415.66
11:00	468.04	226.36	417.91
12:00	482.51	230.31	413.43
13:00	456.99	254.76	415.96
14:00	495.80	249.62	408.14
15:00	452.70	263.77	405.96
16:00	462.41	281.94	401.88
17:00	464.29	285.62	403.97
18:00	498.11	309.35	428.43
19:00	527.18	340.93	460.61
20:00	521.26	368.90	463.12
21:00	489.76	338.75	439.40
22:00	474.56	318.77	417.32
23:00	455.99	286.47	399.24
	527.18		
		138.29	

Graph: National Demand for August, 2022

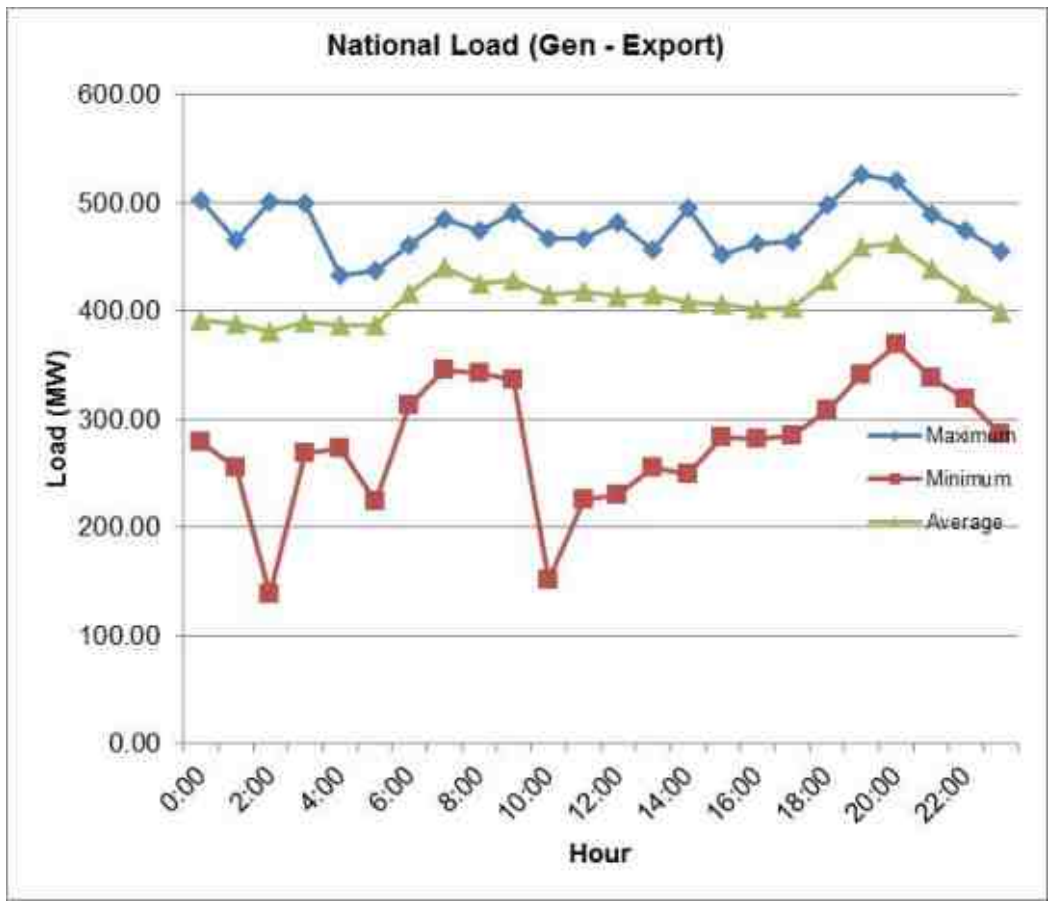
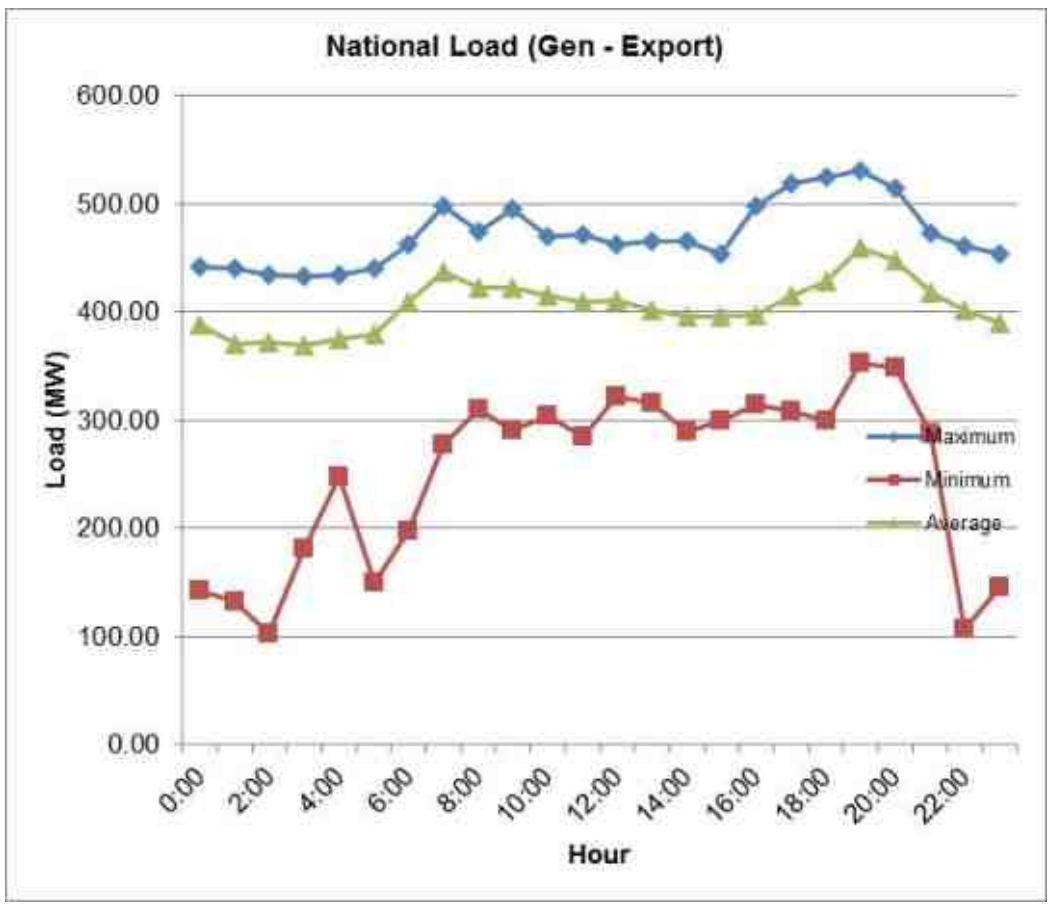


Table: National Demand for September, 2022

Sep-22	Max	Min	Ava
0:00	442.41	142.30	388.69
1:00	441.11	132.15	370.59
2:00	434.44	102.27	371.84
3:00	433.11	181.40	369.33
4:00	434.56	246.17	376.22
5:00	440.04	150.40	380.01
6:00	462.90	197.33	409.10
7:00	498.32	277.54	438.39
8:00	474.02	310.33	423.20
9:00	495.38	290.65	422.79
10:00	470.99	304.65	415.50
11:00	471.77	284.91	410.21
12:00	462.91	322.87	411.04
13:00	466.36	316.18	401.62
14:00	466.06	289.16	396.31
15:00	454.37	299.55	396.72
16:00	498.30	314.96	398.16
17:00	519.22	309.51	415.07
18:00	525.39	300.49	426.69
19:00	530.45	353.81	460.48
20:00	514.96	346.60	446.61
21:00	473.99	287.97	418.56
22:00	461.76	107.09	402.53
23:00	453.39	146.49	390.91
	530.45		
		102.27	

Graph: National Demand for September, 2022



Annexure-III

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

Jun-22	Bus Frequency at Semtokha Substation			Bus Frequency at Kurichhu Hydropower Plant		
Date	Max	Min	Ava	Max	Min	Ava
1	50.00	49.70	49.95	50.14	49.81	50.01
2	50.00	49.70	49.92	50.15	49.79	49.97
3	50.20	49.80	49.97	50.15	49.84	50.02
4	50.00	49.70	49.91	50.08	49.74	49.96
5	50.10	49.80	49.96	50.10	49.87	49.99
6	50.00	49.60	49.95	50.06	49.77	50.00
7	50.00	49.80	49.94	50.13	49.79	50.00
8	50.00	49.60	49.96	50.13	49.84	50.01
9	50.10	49.90	49.98	50.12	49.93	50.02
10	50.10	49.80	49.98	50.11	49.76	50.01
11	50.00	49.90	49.95	50.15	49.76	50.00
12	50.00	49.80	49.96	50.10	49.90	50.01
13	50.10	49.80	49.98	50.14	49.88	50.02
14	50.10	49.80	49.97	50.10	49.84	50.01
15	50.00	49.70	49.92	50.25	49.70	49.98
16	50.00	49.70	49.95	50.08	49.81	50.01
17	50.00	49.80	49.95	50.12	49.87	50.02
18	50.00	49.80	49.93	50.05	49.60	49.95
19	50.00	49.80	49.95	50.13	49.79	50.00
20	50.00	49.70	49.95	50.15	49.74	50.01
21	50.10	49.90	49.98	50.08	49.90	50.02
22	50.10	49.90	49.97	50.13	49.94	50.02
23	50.00	49.80	49.95	50.09	49.87	50.02
24	50.10	49.70	49.98	50.09	49.79	50.01
25	50.00	49.80	49.98	50.10	49.92	50.04
26	50.00	49.80	49.97	50.06	49.84	50.00
27	50.00	49.80	49.96	50.08	49.83	50.00
28	50.00	49.60	49.94	50.08	49.69	50.00
29	50.10	49.80	49.96	50.12	49.85	50.00
30	50.10	49.90	49.99	50.12	49.94	50.04
31	50.00	49.90	49.98	50.17	49.97	50.04
Max	**50.20**			**50.25**		
Min		**49.60**			**49.60**	
Source: TD (BPC), KHP (DGPC)						

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

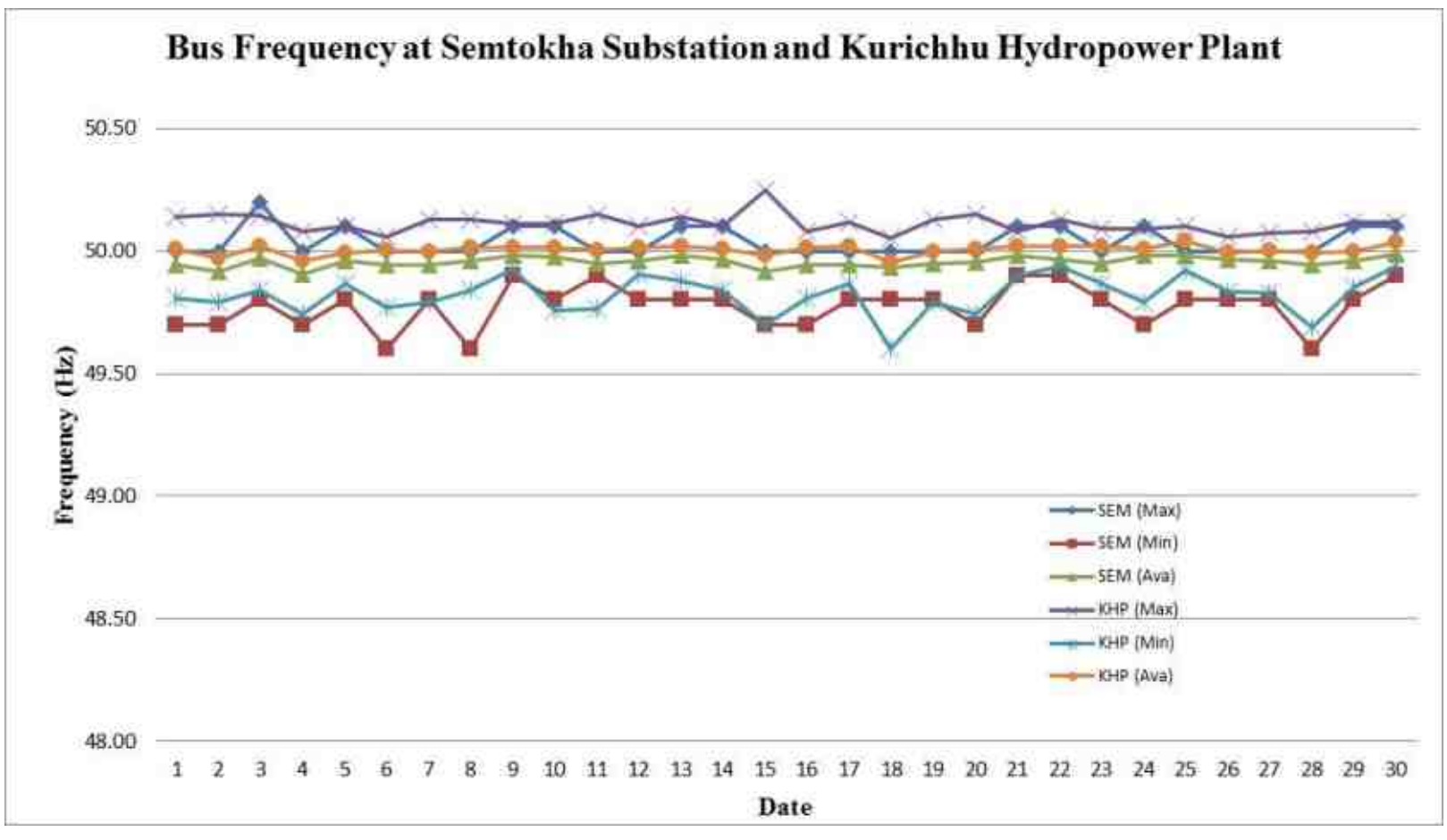


Table: Daily maximum, minimum and average frequency for the month of August, 2022

Aug-22	Bus Frequency at Semtokha Substation			Bus Frequency at Kurichhu Hydropower Plant		
Date	Max	Min	Ava	Max	Min	Ava
1	50.00	49.80	49.95	50.08	49.88	50.02
2	50.00	49.80	49.96	50.07	49.73	50.00
3	50.00	49.60	49.92	50.07	49.60	49.97
4	50.00	49.80	49.94	50.10	49.80	49.99
5	50.00	49.80	49.97	50.08	49.96	50.02
6	50.00	49.80	49.95	50.08	49.76	49.99
7	50.00	49.90	49.97	50.21	49.91	50.02
8	50.00	49.70	49.95	50.12	49.76	50.01
9	50.00	49.70	49.95	50.11	49.86	50.01
10	50.00	49.80	49.95	50.23	49.87	50.01
11	50.00	49.70	49.95	50.19	49.83	50.03
12	50.00	49.80	49.93	50.07	49.80	49.99
13	50.00	49.80	49.93	50.05	49.85	49.98
14	50.00	49.80	49.96	50.08	49.73	50.00
15	50.20	49.80	49.97	50.25	49.81	50.03
16	50.00	49.40	49.92	50.09	49.67	50.01
17	50.00	49.80	49.94	50.05	49.86	49.99
18	50.00	49.60	49.94	50.08	49.59	50.00
19	50.00	49.90	49.97	50.19	49.96	50.04
20	50.00	49.90	49.97	50.07	49.89	50.01
21	50.00	49.70	49.95	50.14	49.80	50.01
22	50.00	49.90	49.97	50.10	49.90	50.02
23	50.00	49.80	49.95	50.08	49.90	50.02
24	50.00	49.70	49.92	50.14	49.81	49.99
25	50.00	49.60	49.94	50.09	49.59	49.98
26	50.00	49.60	49.91	50.08	49.74	49.97
27	50.00	49.80	49.91	50.12	49.86	49.98
28	50.00	49.80	49.95	50.12	49.90	49.99
29	50.00	49.70	49.92	50.03	49.82	49.95
30	50.00	49.80	49.93	50.09	49.81	49.99
31	50.00	49.80	49.93	50.09	49.81	50.00
Max	**50.20**			**50.25**		
Min		**49.40**			**49.59**	
Source: TD (BPC), KHP (DGPC)						

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

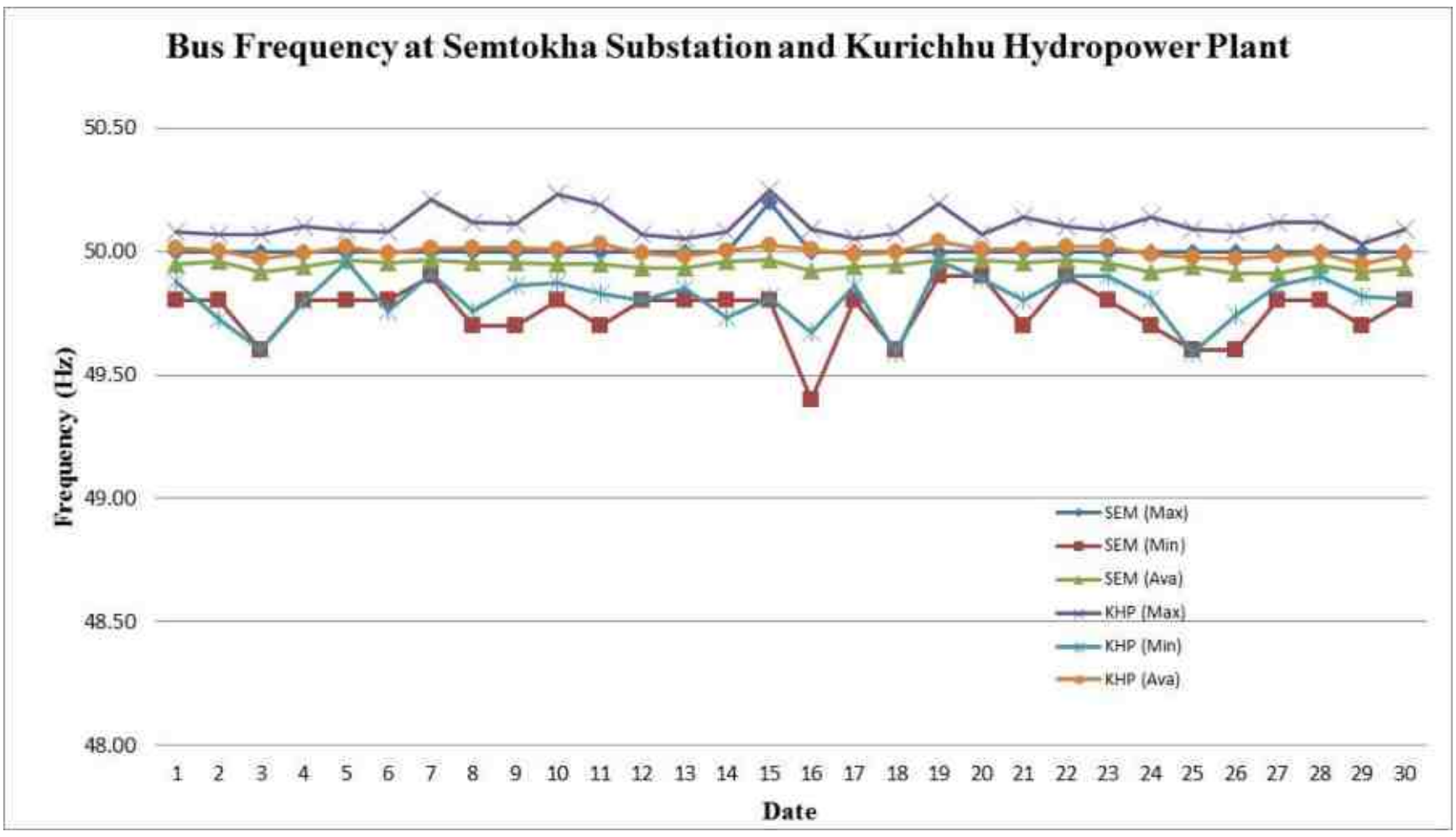
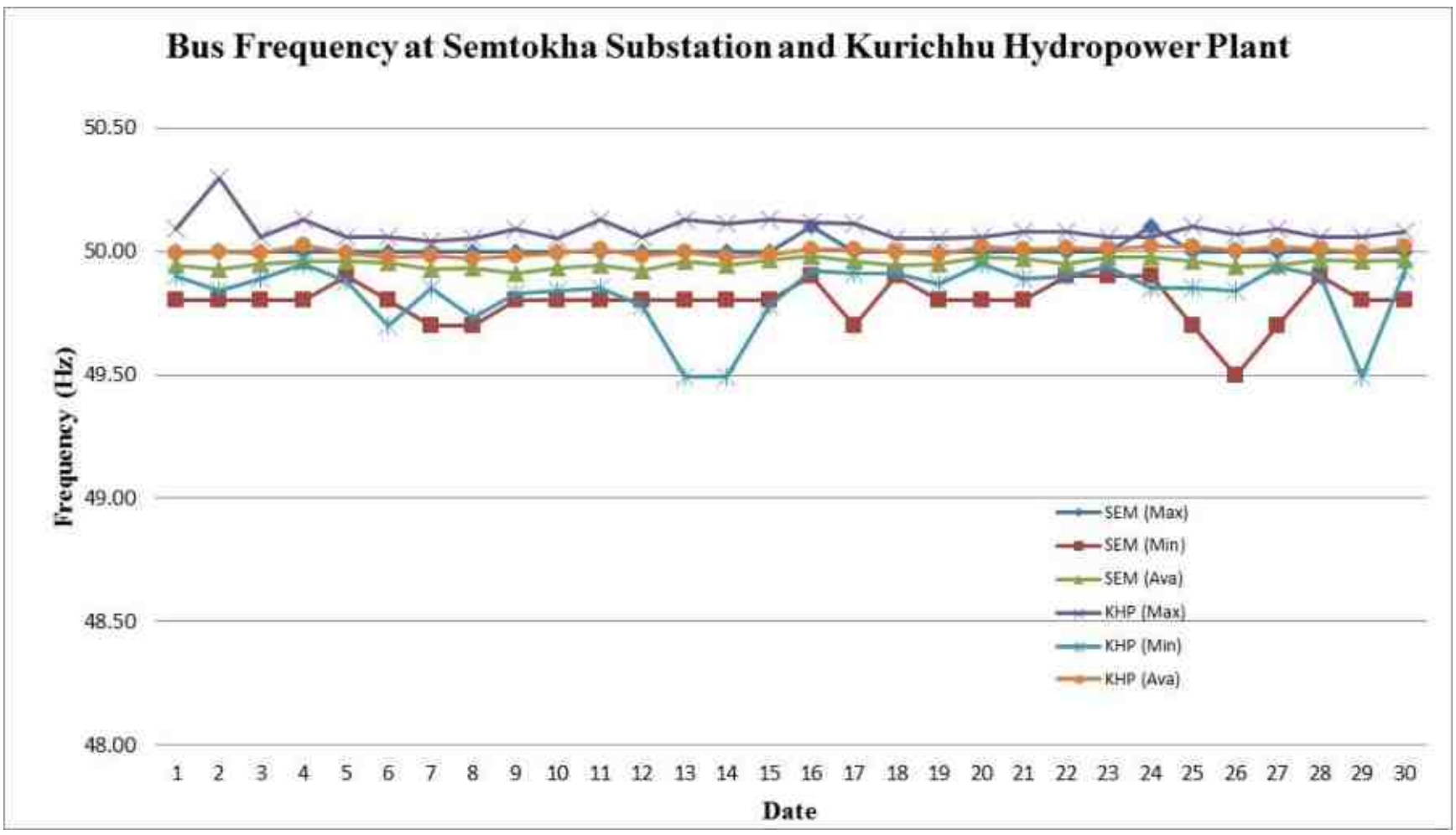


Table: Daily maximum, minimum and average frequency for the month of September, 2022

Sep-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	50.09	49.90	50.00
2	50.00	49.80	49.93	50.30	49.84	50.00
3	50.00	49.80	49.95	50.06	49.89	49.99
4	50.00	49.80	49.96	50.13	49.95	50.02
5	50.00	49.90	49.96	50.06	49.88	49.99
6	50.00	49.80	49.95	50.06	49.70	49.97
7	50.00	49.70	49.93	50.04	49.85	49.98
8	50.00	49.70	49.93	50.05	49.73	49.97
9	50.00	49.80	49.91	50.09	49.83	49.98
10	50.00	49.80	49.93	50.05	49.84	49.99
11	50.00	49.80	49.94	50.13	49.85	50.01
12	50.00	49.80	49.92	50.06	49.78	49.98
13	50.00	49.80	49.96	50.13	49.49	50.00
14	50.00	49.80	49.95	50.11	49.49	49.98
15	50.00	49.80	49.97	50.13	49.78	49.99
16	50.10	49.90	49.98	50.12	49.92	50.01
17	50.00	49.70	49.96	50.11	49.91	50.01
18	50.00	49.90	49.94	50.05	49.91	50.00
19	50.00	49.80	49.95	50.05	49.87	49.99
20	50.00	49.80	49.98	50.06	49.95	50.02
21	50.00	49.80	49.97	50.08	49.89	50.01
22	50.00	49.90	49.95	50.08	49.90	50.01
23	50.00	49.90	49.97	50.06	49.94	50.01
24	50.10	49.90	49.98	50.06	49.85	50.02
25	50.00	49.70	49.96	50.10	49.85	50.02
26	50.00	49.50	49.94	50.07	49.84	50.00
27	50.00	49.70	49.95	50.09	49.94	50.02
28	50.00	49.90	49.97	50.06	49.90	50.01
29	50.00	49.80	49.96	50.06	49.49	50.00
30	50.00	49.80	49.97	50.08	49.92	50.02
31	0.00	Error	Error	0.00	Error	Error
Max	**50.10**			**50.30**		
Min		**49.50**			**49.49**	
Source: TD (BPC), KHP (DGPC)						

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



Annexure-IV

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

Jul-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	412.50	402.00	404.06	218.00	214.00	216.00	66.00	64.00	64.96	134.23	130.29	132.64
2	406.00	401.50	404.17	219.00	213.00	215.77	66.00	64.00	65.03	134.65	130.70	132.83
3	406.00	401.00	404.35	217.50	213.50	216.04	65.90	64.00	64.84	135.28	130.50	132.91
4	406.00	402.50	404.33	218.00	121.00	211.91	65.50	64.00	64.92	134.44	131.23	132.65
5	405.50	403.50	404.63	217.00	213.50	215.31	65.25	64.00	64.69	135.48	130.08	132.99
6	407.50	402.50	404.52	218.00	212.00	215.38	65.10	63.10	64.60	134.20	131.32	132.85
7	408.50	402.50	405.50	218.50	212.50	215.81	65.20	63.68	64.55	134.44	131.12	132.82
8	406.50	404.50	405.65	217.50	213.00	215.42	65.00	64.00	64.65	134.44	131.74	133.08
9	409.00	404.50	406.81	219.50	213.00	215.85	66.00	64.00	64.70	135.69	132.57	134.33
10	410.50	406.00	408.79	218.50	214.00	216.73	66.00	64.00	65.15	136.31	131.57	134.38
11	410.00	407.00	408.46	219.00	215.50	217.23	66.00	64.00	65.36	135.90	130.29	132.99
12	411.50	405.00	407.77	219.00	213.50	216.35	66.00	63.65	64.78	135.69	129.66	132.88
13	407.00	405.00	406.56	219.00	213.50	216.92	66.00	63.65	64.95	134.21	130.29	132.63
14	411.00	406.00	407.65	219.00	214.00	216.90	66.00	64.50	65.01	134.03	131.12	132.42
15	411.00	405.00	407.78	220.00	217.00	218.21	66.00	65.00	65.48	135.48	130.02	132.34
16	411.00	405.00	408.50	220.00	216.50	218.49	65.25	64.00	64.95	134.86	130.29	132.20
17	414.00	405.00	394.46	223.00	218.00	219.00	65.23	65.00	65.04	135.27	130.08	132.73
18	413.00	405.00	408.79	222.50	216.00	218.63	65.23	64.00	64.74	134.03	130.70	132.45
19	410.50	406.00	407.10	220.50	216.50	218.08	65.45	64.75	64.99	135.69	130.49	132.42
20	409.00	402.00	406.60	220.50	217.00	218.56	66.00	64.00	65.12	134.65	130.29	132.77
21	409.50	404.00	407.33	220.50	217.00	218.88	66.35	64.50	65.56	136.31	130.49	132.82
22	407.50	404.00	405.88	219.50	216.00	217.73	66.00	64.00	65.07	134.65	130.08	132.22
23	411.00	403.00	405.67	219.00	216.00	217.60	66.00	64.00	65.09	134.23	130.50	132.22
24	408.50	402.50	405.25	218.50	215.00	216.77	65.00	64.00	64.63	135.28	129.25	132.64
25	410.00	404.50	405.98	219.33	122.00	213.51	66.00	64.55	65.01	135.90	131.32	133.35
26	408.00	405.00	405.96	222.00	216.00	219.23	66.00	64.00	64.96	139.87	129.87	133.31
27	413.50	406.00	410.39	222.50	218.50	220.94	66.00	65.00	65.24	134.10	126.34	131.76
28	413.00	405.00	408.54	224.00	216.00	219.69	66.00	64.00	65.29	135.48	129.90	132.96
29	408.50	405.50	406.94	219.50	216.00	218.15	66.00	64.00	64.94	138.39	131.12	132.85
30	408.00	405.50	406.96	220.00	217.00	218.27	65.00	64.88	64.99	135.07	131.12	133.32
31	410.00	406.00	407.67	220.75	217.00	219.30	65.87	64.50	65.10	135.69	131.53	133.13
Max	**414.00**			**224.00**			**66.35**			**139.87**		
Min		**401.00**			**121.00**			**63.10**			**126.34**	
Source: TD, BPC												

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

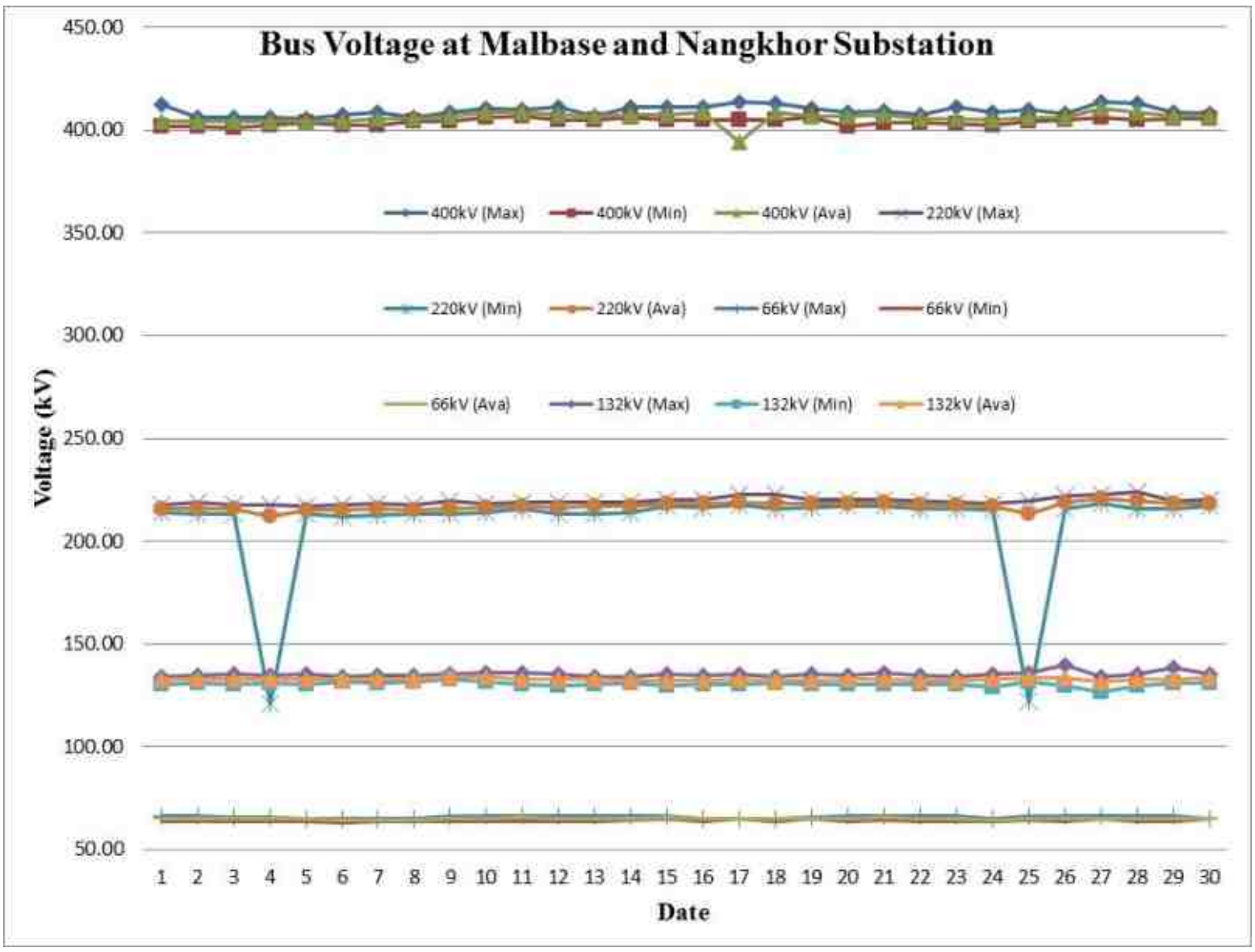


Table: Daily maximum, minimum and average Voltage for the month of August, 2022

Aug-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	409.50	405.50	407.56	221.00	213.00	218.42	66.00	64.00	64.95	134.23	130.89	132.58
2	408.50	404.00	406.71	219.50	215.00	217.98	65.50	64.00	64.74	134.86	130.08	132.50
3	410.00	404.00	406.73	219.50	215.50	217.67	65.00	64.00	64.67	135.28	129.04	132.24
4	410.50	404.50	407.02	220.50	214.50	217.52	65.75	63.00	64.31	135.07	131.32	132.62
5	408.50	404.50	406.83	218.50	215.00	216.98	65.13	64.00	64.48	134.44	130.08	132.30
6	410.00	404.50	407.40	219.50	215.50	217.25	65.00	63.00	64.32	135.48	130.98	132.76
7	410.00	404.50	407.45	219.00	215.00	217.21	65.00	64.00	64.57	133.89	129.10	132.68
8	409.50	406.00	407.77	219.00	216.00	217.60	65.28	64.00	64.77	135.07	130.56	132.82
9	410.50	405.50	408.13	220.50	215.50	217.65	66.01	64.25	65.04	133.82	131.16	132.61
10	412.00	405.50	408.85	219.00	216.00	217.75	65.00	64.00	64.56	134.86	129.66	132.88
11	413.00	404.00	408.50	219.50	213.50	217.25	66.00	63.00	64.53	135.69	131.12	133.06
12	413.00	405.00	407.67	218.50	216.00	217.15	65.30	63.89	64.66	135.27	131.53	132.96
13	409.00	406.00	407.79	219.00	216.50	217.46	65.00	64.15	64.79	134.65	131.45	132.73
14	412.00	407.00	409.88	220.50	217.00	218.81	65.45	64.00	64.96	133.82	131.42	132.91
15	410.50	404.00	407.90	221.00	216.00	218.54	66.00	64.00	65.13	134.03	130.80	132.89
16	408.50	403.50	405.81	219.50	215.50	217.44	66.00	64.00	64.93	134.44	129.66	132.35
17	406.50	403.00	404.54	219.00	215.00	216.79	65.30	64.00	64.59	134.86	130.08	132.49
18	408.00	404.00	405.81	219.50	214.50	217.17	66.00	62.70	64.51	134.44	130.29	132.35
19	407.50	404.50	405.89	216.00	209.50	214.67	64.00	60.01	62.81	134.65	130.80	132.25
20	409.00	403.00	406.25	217.50	213.50	215.71	63.45	62.00	62.93	134.65	130.70	132.90
21	409.00	404.00	406.63	222.50	215.00	217.63	68.00	62.70	64.15	136.31	130.45	133.60
22	406.50	402.50	405.31	220.00	216.50	217.58	65.00	64.00	64.34	135.07	130.19	132.52
23	407.50	402.00	405.31	218.50	216.00	217.65	65.00	63.00	64.04	135.90	130.70	132.87
24	409.00	404.50	406.60	219.50	215.50	218.05	65.00	63.00	64.11	133.82	130.49	132.36
25	408.00	405.00	406.24	218.00	214.00	215.90	64.45	61.00	62.94	135.48	131.32	133.19
26	409.80	405.00	406.87	218.00	215.00	216.53	65.00	62.65	63.75	133.00	130.49	131.92
27	410.00	407.00	408.63	219.50	215.50	217.52	65.25	63.00	64.42	134.80	129.10	132.24
28	414.50	404.50	410.17	221.50	215.00	218.25	65.85	65.00	63.43	135.07	130.70	133.27
29	407.50	405.00	405.77	218.00	214.00	216.33	65.00	63.00	63.97	135.48	130.25	132.99
30	408.50	403.50	405.48	219.00	215.00	217.23	65.00	62.60	64.38	134.44	130.08	133.00
31	406.00	403.50	404.98	218.50	215.50	217.19	65.50	63.50	64.55	135.27	132.16	133.17
Max	**414.50**			**222.50**			**68.00**			**136.31**		
Min		**402.00**			**209.50**			**60.01**			**129.04**	
Source: TD, BPC												

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

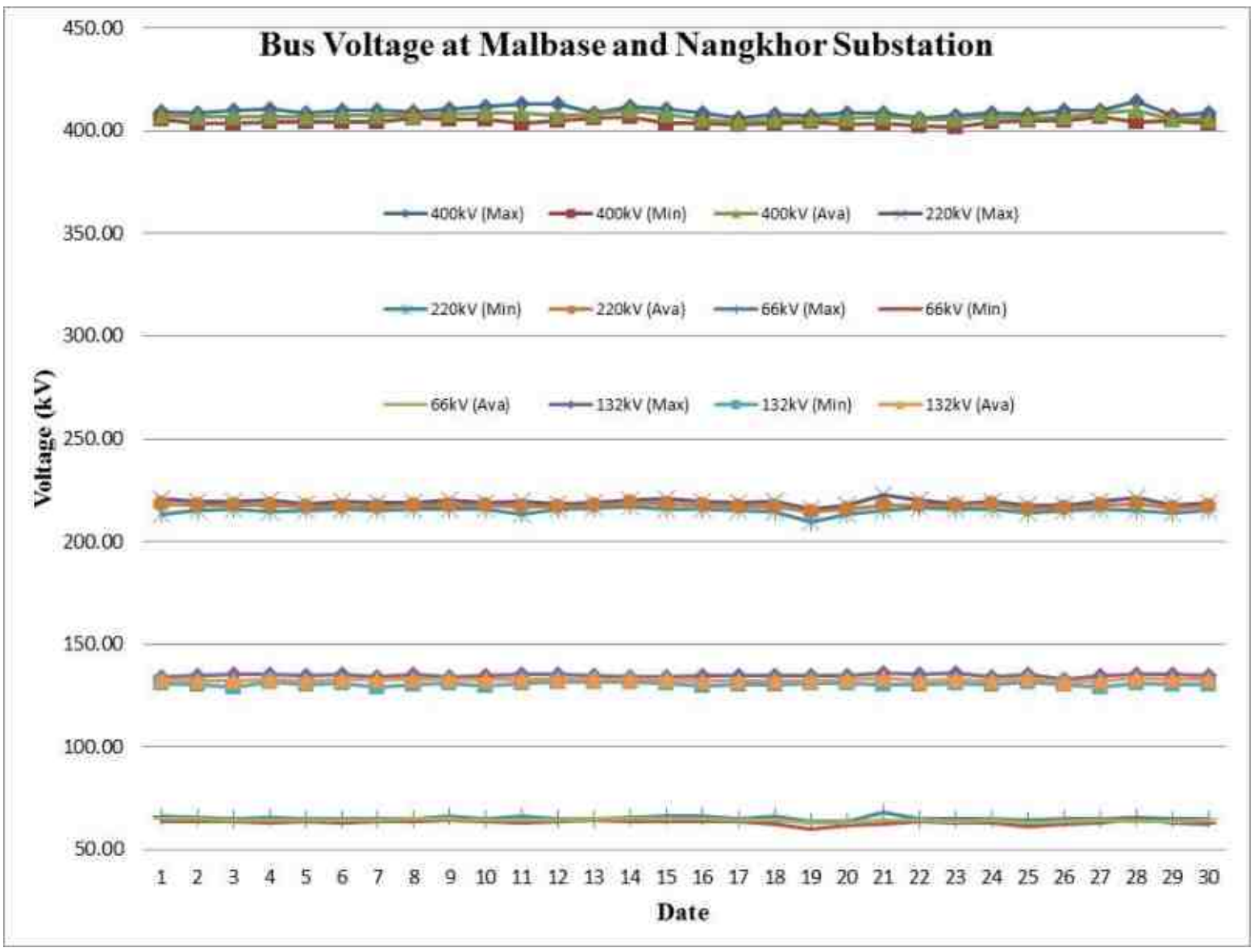
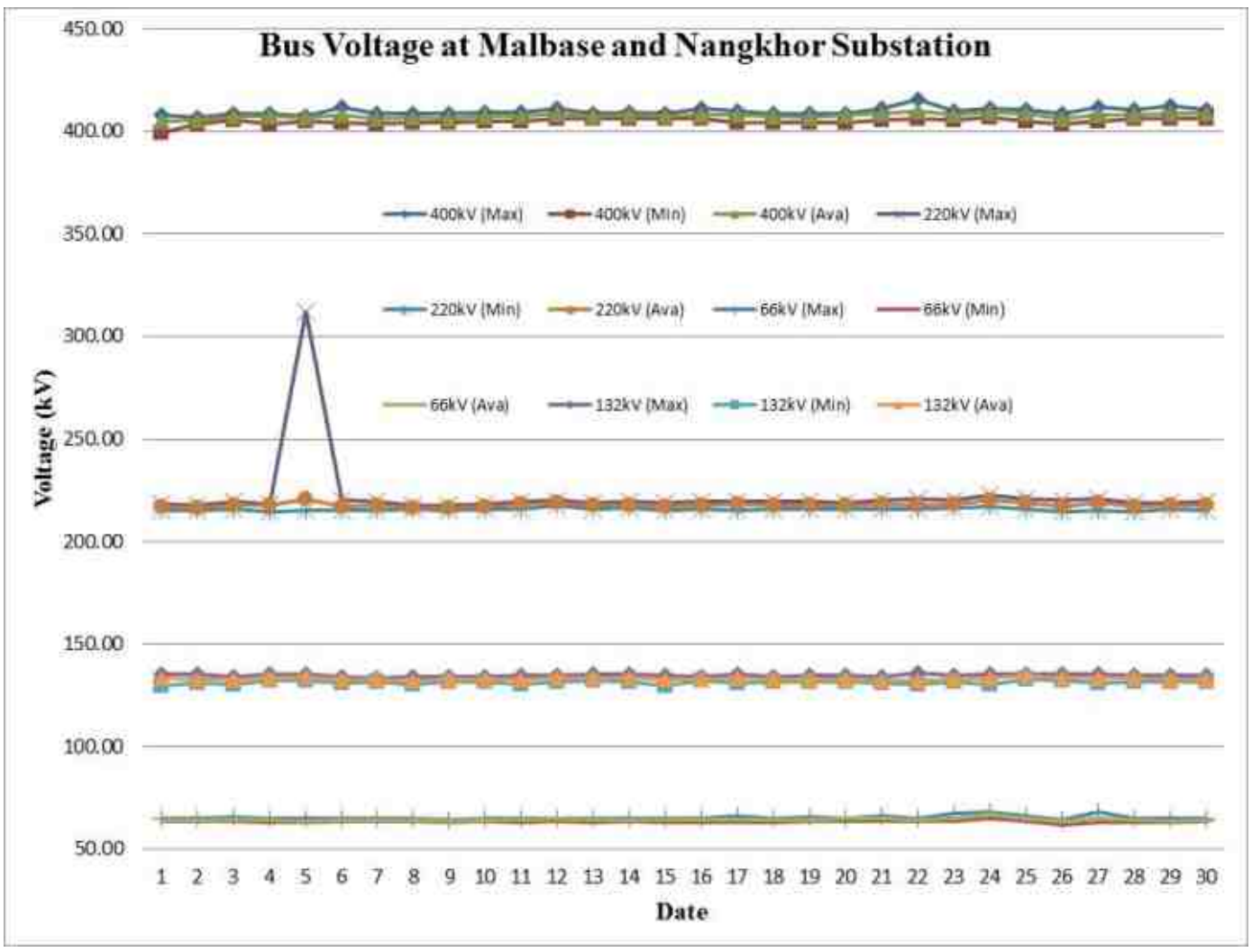


Table: Daily maximum, minimum and average Voltage for the month of September, 2022

Sep-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	408.00	399.00	405.13	218.50	215.00	217.15	65.00	64.00	64.53	135.69	129.45	133.41
2	407.00	404.00	405.54	218.00	215.00	216.69	65.00	63.50	64.20	135.07	131.10	132.99
3	408.50	405.50	407.56	219.50	215.50	217.77	65.85	63.50	64.65	134.03	130.08	132.88
4	409.00	403.50	407.17	218.50	214.50	217.39	65.25	63.00	64.31	135.28	132.00	133.58
5	407.50	405.00	406.98	312.00	215.00	220.69	65.00	63.00	63.95	135.48	132.16	133.89
6	412.00	404.50	408.13	220.00	215.00	217.33	65.00	63.65	64.12	133.82	131.12	132.63
7	408.50	404.00	406.29	219.50	215.00	217.52	65.00	64.00	64.55	133.61	131.32	132.60
8	408.50	404.50	406.67	217.50	215.50	216.52	65.00	63.75	64.34	134.03	130.10	132.28
9	408.50	404.50	406.17	218.00	215.00	216.29	64.65	63.00	63.96	133.82	131.50	132.58
10	409.50	405.00	407.25	218.50	215.50	217.38	65.00	63.45	64.47	134.03	131.50	132.79
11	409.50	405.00	407.75	219.50	216.00	218.02	65.05	63.00	64.40	134.44	130.40	132.89
12	411.00	406.50	408.90	220.00	217.50	218.69	65.15	64.00	64.79	134.65	131.75	133.20
13	409.00	406.00	407.60	219.00	216.00	217.59	65.00	63.00	64.14	135.10	132.37	133.47
14	409.50	406.00	408.04	219.50	216.50	217.55	65.00	63.90	64.35	135.07	131.79	133.53
15	409.00	406.50	407.69	219.00	215.00	217.38	65.00	63.00	64.36	134.86	129.45	132.55
16	411.00	406.00	408.33	219.50	216.00	217.81	65.00	63.00	64.53	134.23	132.50	133.17
17	410.00	404.50	407.96	219.50	215.00	218.19	66.00	63.00	64.43	135.69	131.10	133.47
18	409.00	404.50	407.23	219.50	215.50	217.79	65.00	63.00	64.21	134.24	131.30	132.87
19	408.50	404.50	406.82	219.50	216.00	217.73	65.35	64.00	64.55	134.86	131.53	133.18
20	409.00	404.50	407.83	219.00	215.50	217.67	65.00	64.00	64.77	134.52	131.32	132.82
21	411.50	405.50	408.52	220.00	215.50	218.04	66.00	64.00	64.74	134.00	131.12	132.49
22	415.50	406.00	409.88	221.00	216.00	217.79	65.00	64.00	64.51	136.10	130.29	132.49
23	410.00	405.50	407.88	220.00	216.50	218.17	67.60	64.00	65.31	134.86	131.30	132.88
24	411.00	407.00	409.19	223.00	217.00	220.31	68.00	65.25	67.01	135.48	130.49	133.64
25	410.50	405.00	408.88	221.00	215.50	218.85	66.00	64.00	65.08	135.69	132.70	134.47
26	408.50	403.50	406.50	220.50	214.50	217.19	64.69	62.00	63.66	135.69	132.16	133.55
27	412.00	405.00	408.19	221.00	215.00	218.69	68.00	63.00	64.79	135.48	131.12	133.55
28	410.50	406.00	408.21	219.00	214.50	217.38	65.00	63.00	64.30	134.56	131.80	133.28
29	412.50	406.00	408.67	219.00	216.00	217.60	65.00	62.90	64.04	134.65	131.89	133.13
30	410.50	406.00	408.46	219.50	215.00	217.67	65.00	63.50	64.10	134.86	131.60	132.99
31	0.00	Error	Error	0.00	Error	Error	0.00	Error	Error	0.00	Error	Error
Max	**415.50**			**312.00**			**68.00**			**136.10**		
Min		**399.00**			**214.50**			**62.00**			**129.45**	
Source: TD, BPC												

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



Annexure-V

Eastern Grid Outages
July Month 2022

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Optd	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Remarks
220kV Feeders:															
1	Kurichu Juvenile	132kV	Tripped	07.07.22	10.12 hrs	07.07.22	10.18 hrs		7	4.516	NA	NA	Unit Failed	Tripped	Unit Failed from Thaphi
2	Kurichu Juvenile	132kV	Tripped	08.07.22	12.55 hrs	08.07.22	13.13 hrs		18	37.305	NA	NA	Unit Failed	Tripped	Unit failed from both the unit(Thaphi and Yakrin)

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Optd	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Remarks
132kV															
1	Corbang to Kanglung	132	Tripping	03.07.2022	15:51	03.07.2022	18:05	0	2	18.820	distance protection opt tripping relay opt			NA	line charged the breaker, as the breaker withstood
2	phuntsholing to Kanglung	132	Tripping	03.07.2022	15:51	03.07.2022	18:56	3	23	21.149	DR, O/C & Trip relay opted			NA	line charged the breaker at 18:23 hrs with changing code 1035020923 line condition withstood the breaker showing cause fault
3	Corbang to Kanglung	132	Tripping	05.07.2022	9:41	05.07.2022	9:52	0	10	22.980	distance protection opt tripping relay opt	3A 345.7A, DR 542 mA, EC 99.64A,	Earth fault	NA	line charged, then it withstood
4	phuntsholing to Kanglung	132	Tripping	05.07.2022	9:41	05.07.2022	9:52	0	11	20.775	DR, O/C Trip relay opted			NA	Line charged after getting information from BPSO, then withstood
5	Corbang to Kanglung	132	Grid Fail	06.07.2022	22:52	06.07.2022	23:05	0	13	31.100	distance protection opt tripping relay opt	NA		NA	Grid Fail
6	Corbang to Kanglung	132	Intel tripped	20.07.2022	14:24	20.07.2022	19:50	0	17	20.526	NA	NA(Intel tripped)	11 nos transfer line isolator disk punctured and conductor snapped	NA	There is disk punctured and conductor snapped at 17 nos tank line, isolators caught fire and an emergency no-count fault is in trip

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Optd	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Remarks
220kV Feeders:															
1	Nanglam-Deothang Line	132kV	Tripping	01.07.22	18.02 hrs	02.07.22	20.54 hrs	4	52	54.5	94CODIP1458	Directional +O/C & E/F Relay: Start IC,RN Trip 0.74, O/C start 1>1, E/F1 start IN1>1.2, trip IN1>1.2 3.68<47.49A% VBC=96.72kV, VCA=128kV, VAN=70.6kV, VBN=61.18kV, VCN=74.69kV, IA=149.8A, IB=1.3kA, IC=27.7A, 3I0fund=1.260kA, 3I0 measured=1.203kA & tripping relay 94 operated in our end.	Accident generated at Deothang Substation end	-	-	Charged after rectifying DPS01, Thaphu
2	Main Grid	132kV	Tripping	03.07.22	20.13 hrs	03.07.22	20.13 hrs	0	0	-	-	-	Transient fault	-	Tripped, failed from Thaphu & Deothang SS
3	Nanglam-Nyemjdrm	132kV	Tripping	03.07.22	16.13 hrs	03.07.22	16.21 hrs	0	8	4.5	94CODIP1458 & Distance relay	Directional +O/C & E/F Relay: Start IB 60KV, IOC start 1>1, TARI=103.97kV, VBC=93.84kV, VCA=97.23kV, VAN=47.94kV, VBN=46.28kV, VCN=50.97V, IA=892.5A, IB=1.049kA, IC=1.576kA, 3I0measured=974.1A, 3I0 measured=975.1A & tripping relay 94 operated at our end. Distance Relay: Start IB 60KV, Trip IB 60KV, Start element distance, AR lockout short fault duration 75.17sec, relay trip time 79.02sec, Fault location 9.0150KM towards Nyemjdrm, IA=1.594kA, IB=1.077kA, IC=1.857kA, VAN=46.94kV, VBN=46.18kV, VCN=50.82kV, Fault resistance=1.245.2ohM & Fault at Zone-1.	Tripped on fault	-	Tripped at the instant of Grid failure. Charged after re-wiring instruction from BPSO, Thaphu
4	132/33kV, 5MVA Tr#1	132kV	Tripping	05.07.22	10.08 hrs	05.07.22	10.13 hrs	0	4	5.231	Non directional 32N1T relay opted	O/C relay 50A & trip relay 86 operated	Tripped on Inrush fault	-	Tripped due to fault on 33kV Nanang feeder
5	132/33kV, 5MVA Tr#2	132kV	Tripping	05.07.22	10.09 hrs	05.07.22	10.13 hrs	0	4	5.155	Non directional 32N1T relay opted	O/C relay 50A & trip relay 86 operated	Tripped on Inrush fault	-	Tripped due to fault on 33kV Nanang feeder
7	132/33kV, 5MVA Tr#3	132kV	Tripping	08.07.22	10.41 hrs	08.07.22	10.48 hrs	0	6	5.622	Non directional 32N1T relay opted	O/C relay 50A & trip relay 86 operated	Tripped on Inrush fault	-	Tripped due to fault on 33kV Nanang feeder
8	132/33kV, 5MVA Tr#4	132kV	Tripping	08.07.22	10.41 hrs	08.07.22	10.46 hrs	0	5	5.468	Non directional 32N1T relay opted	O/C relay 50A, 50E & trip relay 86 operated	Tripped on Inrush fault	-	Tripped due to fault on 33kV Nanang feeder
9	132/33kV, 5MVA Tr#1	132kV	Tripping	08.07.22	10.55 hrs	08.07.22	10.57 hrs	0	2	5.621	Non directional 32N1T relay opted	O/C relay 50A, 50E & trip relay 86 operated	Tripped on Inrush fault	-	Tripped while test charging 33kV Nanang feeder
10	132/33kV, 5MVA Tr#2	132kV	Tripping	08.07.22	10.55 hrs	08.07.22	10.58 hrs	0	3	5.607	Non directional 32N1T relay opted	O/C relay 50A, 50E & trip relay 86 operated	Tripped on Inrush fault	-	Tripped while test charging 33kV Nanang feeder
11	132/33kV, 5MVA Tr#3	132kV	Tripping	08.07.22	15.14 hrs	08.07.22	15.18 hrs	0	4	5.521	Non directional 32N1T relay opted	O/C relay 50A, 50E & trip relay 86 operated	Tripped on Inrush fault	-	Tripped while closing LBS for 33kV Nanang feeder from Kilorai inc
12	132/33kV, 5MVA Tr#4	132kV	Tripping	08.07.22	15.14 hrs	08.07.22	15.18 hrs	0	4	5.191	Non directional 32N1T relay opted	O/C relay 50A, 50E & trip relay 86 operated	Tripped on Inrush fault	-	Tripped while closing LBS for 33kV Nanang feeder from Kilorai inc
13	Nanglam-Deothang Line	132kV	Tripping	08.07.22	17.28 hrs	08.07.22	17.33 hrs	0	5	62.8	Distance Relay	Distance Relay: Start IB ACR, Trip IB 60KV, Start element distance, Distance trip 27, AR lockout short, fault duration 70.29sec, relay trip time: 74.89sec, Fault location: 10.18KM towards Deothang, IA=1.628kA, IB=1.01 kA, IC=1.698kA, VAN=36.19kV, VBN=46.19kV, VCN=51.1kV, Fault resistance=1.07Ω, fault & tripping relay 86 operated	Transient fault	-	Informed to BPSO & charged as per their instruction.
14	Nanglam-Deothang Line	132kV	Tripping	08.07.22	17.47 hrs	08.07.22	17.52 hrs	0	5	62.8	Distance Relay	Distance Relay: Trip IB ABC, Start 50EC trip, AR lockout short, fault duration 69.94sec, relay trip time: 79.93sec, IA=1491.2A, IB=1011.1A, IC=1101.3A, VAN=75.98kV, VBN=76.19kV, VCN=77.12kV, IA=1.491kA, IB=1.011kA, IC=1.101kA, 3I0=0.2kA, 3V0=77.12kV & tripping relay 86 operated	Transient fault	-	Informed to BPSO & charged as per their instruction.
15	Nanglam-Deothang Line	132kV	Tripping	08.07.22	17.54 hrs	08.07.22	21.59 hrs	4	5	62.8	-	Tripping relay 86 operated	Tripped while closing CB from Deothang SS end	-	Informed to BPSO & as instructed kept CB in open position and at the same informed to THEL Nanglam as there was reported tripping of the said feeder. Charged as per the instruction from BPSO, Thimphu at 21.59 hrs.
16	Kurichu-Nanglam Line	132kV	Tripping	08.07.22	17.58 hrs	08.07.22	18.13 hrs	0	15	42.25	Distance Relay	Distance Relay: Trip IB ABC, 50EC start, 50EC trip, AR lockout short, fault duration 61 Sec, relay trip time: 79.85sec, IA=179.5A, IB=109.1A, IC=465.42A, VAN=77.52kV, VBN=76.25kV, VCN=75.15kV & tripping relay 86 operated	Tripped while closing CB from Deothang SS end	-	Informed DPSO & as instructed closed the CB from our end.
17	Kurichu-Nanglam	132kV	Tripping	08.07.22	22.59 hrs	08.07.22	23.08 hrs	0	10	4.9	Distance Relay	Distance Relay: Trip IB 60KV, Start 50EC trip, AR lockout short, fault duration 80 Sec, relay trip time: 79.91sec, IA=195.1A, IB=104.6A, IC=143.5A, VAN=76.09kV, VBN=74.18kV, VCN=77.87kV & tripping relay 86 operated	Tripped at the instant of Grid failure.	-	Informed DPSO & as instructed closed the CB from our end.
18	Main Grid	132kV	Tripping	08.07.22	22.59 hrs	08.07.22	23.03 hrs	0	4	-	-	-	Transient fault	-	Grid failed from Ranjan SS & Salakati Grid revived at 23.03 hrs.
19	Nanglam-Deothang Line	132kV	Tripping	08.07.22	22.59 hrs	08.07.22	23.12 hrs	0	13	9.07	Distance Relay	Distance Relay: Trip IB ABC, Start 50EC trip, AR lockout short, fault duration 67.26sec, relay trip time: 79.91sec, IA=175.6A, IB=171.9A, IC=132.39A, VAN=79.88kV, VBN=74.84kV, VCN=76.59kV & tripping relay 86 operated	Tripped at the instant of Grid failure.	-	Informed DPSO & as instructed closed the CB from our end.
20	Nanglam-Nyemjdrm	132kV	Tripping	08.07.22	08.55 hrs	08.07.22	09.44 hrs	2	49	14.91	-	-	Transient fault. CB tripped without any relay indication CB problem	-	Informed to BPSO & not charged done at 07.08 hrs and 07.17 hrs, but CB didn't stand. Checked the CB & charged after checking & tightening the trip circuit.
21	Nanglam-Nyemjdrm	132kV	Tripping	11.07.22	08.55 hrs	11.07.22	08.15 hrs	0	0	-0.33	-	-	Transient fault	-	CB operated without any relay indication, Informed the DPSO & closed the CB
22	Nanglam-Nyemjdrm	132kV	Tripping	11.07.22	12.40 hrs	11.07.22	12.42 hrs	0	0	-4.88	-	-	Transient fault	-	CB operated without any relay indication, Informed to DPSO & closed the CB
23	Nanglam-Nyemjdrm	132kV	Tripping	11.07.22	12.04 hrs	12.07.22	13.07 hrs	25	3	5.55	-	-	Transient fault	-	CB operated without any relay indication, Informed to DPSO & due to repeated tripping Sweden taken under shutdown for CB rectification work.CB closed after informing to BPSO.
24	132/33kV, 5MVA Tr#1	132kV	Tripping	14.07.22	15.28 hrs	14.07.22	15.28 hrs	0	3	5.6	Non directional 32N1T relay opted	O/C 50A & tripping relay 86 operated	Tripped on Inrush fault	-	Tripped due to fault on 33kV Nanang feeder
25	132/33kV, 5MVA Tr#2	132kV	Tripping	14.07.22	15.28 hrs	14.07.22	15.30 hrs	0	2	5.35	Non directional 32N1T relay opted	O/C 50A & tripping relay 86 operated	Tripped on Inrush fault	-	Tripped due to fault on 33kV Nanang feeder
26	132/33kV, 5MVA Tr#3	132kV	Tripping	14.07.22	16.04 hrs	14.07.22	16.05 hrs	0	1	5.503	Non directional 32N1T relay opted	O/C 50A & tripping relay 86 operated	Tripped on Inrush fault	-	Tripped while test charging 33kV Tsirang feeder
27	132/33kV, 5MVA Tr#4	132kV	Tripping	14.07.22	16.04 hrs	14.07.22	16.05 hrs	0	1	5.332	Non directional 32N1T relay opted	O/C 50A & tripping relay 86 operated	Tripped on Inrush fault	-	Tripped while test charging 33kV Tsirang feeder
28	Nanglam-Nyemjdrm	132kV	Tripping	20.07.22	21.29 hrs	20.07.22	21.31 hrs	0	2	20.7	-	-	Transient fault	-	Tripped without any relay indication, Informed to BPSO & closed the CB

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Optd	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Remarks
1	Deothang-Nanglam line	132kV	Tripping	03.07.2022	16:23	03.07.2022	20:17	4	54	54.446	NA	NA	Tripped due to Dist. picuvered on 'Y' phase of Sarsk Ti-31 main line side	NA	Charged after the open consent of this incident with the closing code 1018 from BPSO1 given by Sangchuck Subba.
4	Deothang-Motanga line	132kV	Tripping	03.07.2022	16:23	03.07.2022	20:51	4	27	51.524	NA	NA	Tripped due to Dist. picuvered on R phase of Sarsk Ti-32 main line side		Charged after the open consent of this incident with the closing code 1017 from BPSO given by Sangchuck Subba.
7	Deothang-Nanglam line	132kV	Tripping	03.07.2022	16:53	03.07.2022	16:59	0	5	42.209	Over current	$I_A = 1.076kA$, $IB = 1.295kA$, $I_C = 1.092kA$, $3I_0 = 0.71kA$	Transient fault	NA	Tripped at Deothang end only. No supply interruption at the supply end from Motanga substation.
12	Deothang-Nanglam line	132kV	Shutdown	04.07.2022	9:13	04.07.2022	12.30	3	16	42.776	NA	NA	NA	Emergency shutdown.	Shutdown as per upcoming code 1018 by BPSO1 From Chamo- zeing 66kV spot as the isolator R phase Clamp as per the closing code 1042 by BPSO1 kamna.
16	5 MVA Transformer 6	132/33kV	Tripping	07.07.2022	4:09	07.07.2022	4:15	0	6	5.582	Oak 86 operated	NR	Due to Jungsar Hr transformer got tripped		Test charge done and found normal.
21	Deothang-Nanglam line	132kV	Tripping	08.07.2022	17.28	08.07.2022	17.34	0	6	42.766	O/C	Fault 21 tripped, fault location 11.95km,3A: 1.107kA,3B:1022.8A,IC:1.042kA, Directional relay fault value:3A:1.391kA,IB:193.1A,IC:1.147kA	Unknown	NA	Test charge done and found normal.
24	Deothang-Motanga line	132kV	Tripping	08.07.2022	17.28	08.07.2022	17.32	0	4	42.28	NA	NA	NA	NA	as our end breaker is opened and supply restored from motanga end
25	Deothang-Nanglam line	132kV	Tripping	08.07.2022	17.46	08.07.2022	22.03	4	7	42.766	O/C	Distance relay fault value :3A:195.8A,3B:192.8A,IC:22.49A Fore charged value:84.389 3A,3B:193.7A,IC:12.57A	Unknown	NA	Test charge done 17.52 but couldn't stand As information given by BPSO, lightning and Shutdown at Tsirang as well.
26	Deothang-Nanglam line	132kV	Tripped	08.07.2022	22.58	08.07.2022	23.15	0	17	42.766	distance relay	earlier voltage	earlier voltage		Test charge done 23.15hrs with the closing code 1045 given by the BPSO Kamna chooka and line stand.
27	Deothang-Motanga line	132kV	Shutdown	08.07.2022	22.11	08.07.2022	22.40	0	0	0.0	NR	NR			Deothang hand tip w.r.t charge from Motanga information due to substation w. voltage. Closing code from BPSO 1040 by Shah Zam Closing code 1039 by BPSO Kamna R Jumbo and line stand.
31	Nanglam-Deothang line	132kV	Tripping	23.07.2022	23.41	23.07.2022	23.48	0	7	46.892	Distance relay	3A:2.109kA, 3B:-211A, IC:-1.107kA	Transient fault	NA	Line charged as per informed by the BPSO and line held
36	Transformer 1 (5MVA)	132kV	Tripped	25.07.2022	15.03	30.07.2022	15.14	0	6	5.5	NA	relay 86 operated	due to Jungsar Jhorlm	NA	Tripped by Jhangsar Hr.
37	Transformer 2 (5MVA)	132kV	Tripped	30.07.2022	15.03	30.07.2022	15.17	0	7	5.5	NA	relay 86 operated	due to Jungsar Jhorlm	NA	Tripped by Jhangsar Hr.

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Optd	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Remarks
33kV															
1	Nganglam-Taklai feeder	132kV	Tripping	01.07.2022	14:13	01.07.2022	18:10	3	5	14.71	Silicon relay(P442	3A: 952.2A IB: 902.8A IC: 952.6A VAN: 12.19kV VBN: 13.16kV VCN: 12.71kV Fault location 51.81km Relay Trip Time: 0.04sec Fault resistance: 69.99ohm Trip Phase ABCN Zone 1	Earth Fault	CB operated both end from Thaphli-ss & Nganglam ss. No CB operated at our end only Silicon relay operated	Supply restored from Thaphli end.
2	Nganglam-Taklai feeder	132kV	Tripping	06.07.2022	7:51	06.07.2022	7:57	0	7	0.4	Silicon relay(P441	Line tripped on Earth fault	Earth Fault		
3	Nganglam-Taklai feeder	132kV	Tripping	08.07.2022	22.15	08.07.2022	2:00	4	45	2.71	Silicon relay(P441	3A: 1.024kA 3B: 0.995A IC: 1.107kA VAN: 12.19kV VBN: 1.16kV VCN: 12.22kV Fault location:8.77km Relay Trip Time:66.59ms Fault resistance: 5.91 Fault trace Trip Phase ABC Zone 1	Earth Fault	CB operated both end from Thaphli-ss & Nganglam ss. No CB operated at our end only Silicon relay operated	Supply restored from Thaphli end.
4	5MVA Transformer 1 (HV &LV	132kV	Tripping	08.07.2022	22.15	08.07.2022	22.26	0	11	0.884	O/C & E/F Silicon relay	Tripped on Fault	Earth Fault		Supply restored from ss 11
7	5MVA Transformer	132kV	Tripping	14.07.2022	7:54	14.07.2022	12:04	4	10		Silicon O/C & E/F	Tripped on O/C and observed Dev SF6 and Normalized after refilling the Gas	Overcurrent		
8	5MVA Transformer	132kV	Tripping	18.07.2022	8:58	18.07.2022	9:01	0	3	5.75	Silicon O/C & E/F	Tripped on O/C due to 33kV Deothang feeder	Overcurrent		
10	5MVA Transformer	132kV	Tripping	24.07.2022	3:54	24.07.2022	3:55	0	1	0.425	O/C & E/F Silicon relay	Tripped on Overcurrent while Test charging 33kV Deothang feeder	Overcurrent		
11	Nganglam-Taklai feeder	132kV	Tripping	25.07.2022	2:05	25.07.2022	2:21	0	16	15.59	Silicon relay(P442	Tripped on Overcurrent, Fault details 3A: 57.22A IB: 1.969kA IC: 1.151kA 3I0: 112.0kV VBN: 30.92kV VCN: 169.9kV A/R lock out Zone2 Fault duration 450.8ms Relay Trip time 79.98ms Fault Location 89.12km Fault resistance: 180.7ohm ms Trip phase ABC	Overcurrent		
12	5MVA Transformer 11 kV side	132kV	Tripping	25.07.2022	20:09	25.07.2022	20:21	0	5	1.21	O/C & E/F Silicon relay	Powder trapped on earth fault. Megarock 5/25 operated	Earth Fault		
13	5MVA Transformer	132kV	Tripping	27.07.2022	11:53	27.07.2022	11:57	0	3	0.79	O/C & E/F Silicon relay	Tripped Transformer(LV side) on O/C & E/F by 33kV Deothang feeder fault.	Overcurrent Earth Fault		
14	5MVA Transformer	132kV	Tripping	31.07.2022	7:20	31.07.2022	7:23	0	3	0.693	O/C & E/F Silicon relay	Tripped on Overcurrent due to 33kV Deothang feeder fault.	Overcurrent		

Division:	PSOD DEOTHANG
Substation:	132/33kV Motanga Substation
Month:	Jul-22

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW Indoor Outage (MW)	Tripping Details: Protection Relay Opd	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Remarks
1	Nanga Feeder	132kV	Tripping	02.07.22	10:22 hrs	02.07.22	10:59hrs	0	36	44.92	DEHPT01CL, REF615	*Directional +O/C & E/F Relay:* Tripped on E/F & O/C : I_a= 46.5A, I_b= 457.2A, I_c= 211.6A, Frequency= 49.98Hz & tripping relay 86 & 21 operated at our end.	Tripped by transient fault	-	Informed to BPSO and charged via code: 1836(DPS1), 1837(LDC, Jaibir), 1915(DEHLDC).
2	Deothang Feeder	132kV	Tripping	02.07.22	14:32 hrs	02.07.22	20:22hrs	6	0	85.62	DEHPT01CL, REF615	*Directional +O/C & E/F Relay:* Tripped on E/F & O/C : I_a= 1141.6A, I_b= 1301.6A, I_c= 592.4A, Frequency= 49.97Hz & tripping relay 86 & 21 operated at our end.	Tripped by transient fault	-	Tango & Deothang feeder tripped at same time but Deothang 66 kV/ could not hold as per BPSO, Tango charged. One incident generated at deothang end as per BPSO. Feeder was charged after replacement of the insulator.
3	Phuntsholing feeder	132kV	Tripping	03.07.22	17:15 hrs	03.07.22	21:51 hrs	0	8	18.22	DEHPT01CL, REF615	*Directional +O/C & E/F Relay:* Tripped on E/F & O/C : I_a= 411.4A, I_b= 48.7A, I_c= 448.2A, Frequency= 50.12Hz & tripping relay 86 & 21 operated at our end.	Tripped by transient fault	-	charged the feeder by verbal instruction from BPSO
4	Phuntsholing feeder	132kV	Tripping	05.07.22	09:54 hrs	05.07.22	10:54 hrs	0	6	13.66	DEHPT01CL, REF615	*Directional +O/C & E/F Relay:* Tripped on E/F & O/C : I_a= 890.1A, I_b= 59.1A, I_c= 912.2A, Frequency= 49.97Hz & tripping relay 86 & 21 operated at our end.	Tripped by transient fault	-	charged the feeder by verbal instruction from BPSO
5	Deothang Feeder	132kV	Tripping	05.07.22	08:54 hrs	05.07.22	14:22 hrs	5	28	51.56	DEHPT01CL, REF615	*Directional +O/C & E/F Relay:* Tripped on E/F & O/C : I_a= 890.6A, I_b= 169.5A, I_c= 1203., Frequency= 49.95Hz & tripping relay 86 & 21 operated at our end.	-	-	Charged the feeder by verbal instruction from BPSO
6	Jangsa Feeder	132kV	Tripping	07.07.22	09:25 hrs	07.07.22	09:47 hrs	0	24	28.11	Distance protection REL650	*O/C & E/F Relay mentioned:* Tripped on E/F & O/C : I_a= 199.47A, I_b= 671.16A, I_c= 111.91A, Frequency= 50.36Hz & tripping relay 86 & 21 operated at our end.	Transient fault	-	charging code: BPS1011071, 5122C, 1920A, 111 and 5020L22C, 2410A(1000)
7	Deothang Feeder	132kV	Tripping	08.07.22	17:29 hrs	08.07.22	17:31 hrs	0	2	42.18	DEHPT01CL, REF615	*Directional +O/C & E/F Relay:* Tripped on E/F & O/C : I_a= 1405.6A, I_b= 215.5A, I_c= 1365.1A, Frequency= 49.97Hz & tripping relay 86 & 21 operated at our end.	Tripped by transient fault	-	charged the feeder by verbal instruction from BPSO
8	Jangsa Feeder	132kV	Tripping	08.07.22	17:29 hrs	08.07.22	17:46 hrs	0	17	32.19	DEHPT01CL, REF615	*Directional +O/C & E/F Relay:* Tripped on E/F & O/C : I_a= 833.1A, I_b= 154.5A, I_c= 836A, Frequency= 49.92Hz & tripping relay 86 & 21 operated at our end.	Transient fault	-	charging code: BPS1011021, 5122C, 1920A, 127 and 5020L22C, 2410A(1121)
9	Deothang Feeder	132kV	Tripping	08.07.22	22:08 hrs	08.07.22	22:47 hrs	0	47	1.83	DEFLPRF1, REF615	*Directional +O/C & E/F Relay:* Tripped on E/F & O/C : I_a= 2134A, I_b= 225.2A, I_c= 1.2A ,Frequency= 50.03Hz & tripping relay 86 & 21 operated at our end.	Transient fault	-	At 22:14hrs wet damps was done at our end but CB did not hold & got tripped on same fault. Yard inspection carried out for any abnormalities. Informed BPSO and charged feeder vide code: 1891
10	Deothang Feeder	132kV	Tripping	09.07.22	02:13 hrs	10.07.22	15:17 hrs	36	4	7.47	DEFLPRF1, REF615	*Directional +O/C & E/F Relay:* Tripped on E/F & O/C : I_a= 2654A, I_b= 247.2A, I_c= 1.2A, Frequency= 50.03Hz, Fuse Fail(DEC shown in REL650 distance protection relay) & tripping relay 86 & 21 operated at our end.	Feeder tripped on permanent fault	-	Feeder was tripped and there was low voltage shown on B phase. Fuse fallbroken conductor indicated by REL650 relay. Informed BPSO & TSHD team. Deothang Line patrolling carried out by TSHD team and found that B Phase jumper was cut at location no. TPC 21/1. Replaced jumper and charged the feeder via next day upon coordination with BPSO.
11	150MVA Transformer	132/33kV	Tripping	12.07.22	00:05 hrs	12.07.22	00:09 hrs	0	3	3.65	Distance protection REL650	tripping relay 86A and B and SEF operated.	-	-	charged the transformer by verbal instruction from BPSO
12	150MVA Transformer	132/33kV	Tripping	13.07.22	09:17 hrs	13.07.22	14:39 hrs	5	22	3.92	protection Relay 86 A&B operated.	tripped on 51C & S/F, 50/51 trip	Transient fault	-	coordinated with BPSO and charged.
13	Jangsa Feeder	33kV	shutdown	13.07.22	12:20 hrs	19.07.22	13:58 hrs	2	37	3.68	-	-	-	For 33/0.4V cleaning works	Shutdown taken by Jangsa and for 33/0.4V cleaning works
14	150MVA Transformer	132/33kV	Tripping	14.07.22	14:12 hrs	14.07.22	14:34 hrs	0	5	2.56	protection Relay 86 A&B operated	tripped on 51C & S/F, 50/51 trip, SEF protection trip	Transient fault	-	charged the feeder by verbal instruction from BPSO
15	150MVA Transformer	132/33kV	Tripping	21.07.22	08:57 hrs	21.07.22	09:03 hrs	0	6	0.38	Directional E/F Relay, DEFLPRF1, & 86 A&B operated	tripped on 51C & S/F, 50/51 trip, SEF protection trip	Transient fault	-	-
16	Deothang Feeder	33kV	Tripping	21.07.22	21:44 hrs	21.07.22	21:52 hrs	0	8	45.41	DEHPT01CL, REF615	*Directional +O/C & E/F Relay:* Tripped on S/F & O/C : I_a= 1986A, I_b= 256.2A, I_c= 1224.6A, Frequency= 49.94Hz, tripping relay: 86ABE operated at our end.	Transient fault	-	Charged as per the instruction from BPSO
17	Jangsa Feeder	33kV	Tripping	23.07.22	23:44 hrs	24.07.22	00:31 hrs	0	49	57.3	DEHPT01CL, REF615	*Directional +O/C & E/F Relay:* Tripped on S/F & O/C : I_a= 1848 A, I_b= 207.6A, I_c= 1745.2A ,Frequency= 49.88Hz, tripping relay: 86ABE operated at our end.	Transient fault	-	charging code: BPS1011795, 5122C, 1920A, 1129 and 5020L22C, 2920A(1002).
18	Jangsa Feeder	33kV	shutdown	26.07.22	09:25 hrs	26.07.22	13:20 hrs	3	55	57.3	-	-	-	For 33/0V cleaning works by TSHD, P/dung	Shutdown taken by TSHD, P/dung for 33/0V cleaning works

Division:	PSOD DEOTHANG
Substation:	132/33kV Gedung Substation
Month:	Jul-22

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW Indoor Outage (MW)	Tripping Details: Protection Relay Opd	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Remarks
1	Gedung	132 kV	Tripping	08.07.22	22:54 hrs	08.07.22	23:47 hrs	0	53	-	Nil	Nil	Grid fail	-	132 kV Incomer was tripped on under voltage due to 132 kV grid fail.

Division:	[illegible]
Substation:	132/33/11kV Phuentsholing Substation
Month:	Jul-22

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	AIR Index Outage (AIR)	Tripping Details: Protection Relay Operated	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Remarks
06	132/33kV Transformer-II (10MVA)	132kV	Transient fault	06-07-22	17:11	06-07-22	17:11		1	0.08	86A and 86B	(DIRECTOC1)Fault Value:I-1: 7.05A, I-2: 105.25A,I-3: 179.74, I-N: 0		Unknown	Charged
8	11kV Kanglung Line	11kV	Transient fault	08-07-22	8:44	08-07-22	8:46		22	20.66	Zone-1 (OPTD, R-PH and B-PH TRIP, 69/51V TRIP, 86A and 86B	Fault Value:I-1: 1698.91A, I-2: 1742.19A,I-3: 108.38A, I-N: 1071.11A	Zone-1 (OPTD, R-PH and B-PH TRIP, 69/51V TRIP	Unknown	Until Fail at 8:44,at 9:44 breaker got open and after receiving information from BPSO, line charged at 9:59
13	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	08-07-22	17:59	08-07-22	18:00		1	0.16	86A and 86B	(DIRELPDOC1) Fault value: I-1: 201.9A, I-2: 89.85A, I-3: 91A,I-n: 0A		Overcurrent	Charged
19	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	09-07-22	10:57	09-07-22	10:59		2	0.32	86A and 86B	(DIRELPDOC1) Fault value: I-1: 192.05A, I-2: 87.45A, I-3: 89A,I-n: 0A		Overcurrent	Charged
27	132/33kV Transformer-II (10MVA)	132kV	Transient fault	07-07-22	18:11	07-07-22	18:14		3	0.48	86A and 86B	(DIRELPDOC1) Fault value: I-1: 144.6A, I-2: 1.8A, I-3: 146.45A,I-n: 0A,		Over current and earth fault	Charged
31	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	06-07-22	22:36	06-07-22	22:38		2	0.32	86A and 86B	(DIRELPDOC1) Fault value: I-1: 123.75A, I-2: 81.1A, I-3: 79.45A,I-n: 0A		Overcurrent	Charged
39	11kV Mirnga Line	11kV	Transient fault	06-07-22	23:15	06-07-22	23:31		16	47.33	67/51V TRIP, 86A and 86B	Fault Value:I-1: 0.12A, I-2: 0.16A,I-3: 0.09A, I-N: 0.12A	67/51V TRIP	Unknown	Until Fail at 23:58 on 22/23 breaker got open While charging from Mirnga end. Last November on 23/11 from charging and after receiving information from BPSO, Mirnga has charged at 23:31
43	132/33kV Transformer-I (10MVA)	132kV	Transient fault	08-07-22	23:30	08-07-22	23:40		3	0.24	86A and 86B	(DIRELPDOC1)Fault Value:I-1: 75.05A, I-2: *1.66A,I-3: 1.19A, I-N: 0		Over current and earth fault	Charged
50	132/33kV Transformer-I (10MVA)	132kV	Transient fault	09-07-22	17:11	09-07-22	17:14		3	0.08	86A and 86B	(DIRELPDOC1)Fault Value:I-1: 7.05A, I-2: 105.25A,I-3: 179.74, I-N: 0		Over current and earth fault	Charged
58	132/33kV Transformer-II (10MVA)	132kV	Transient fault	10-07-22	8:11	10-07-22	8:14		3	0.72	86A and 86B	(DIRELPDOC1) Fault value: I-1: 82.05A, I-2: 71.75A, I-3: 69.19 A,I-n: 0A,		Earth fault	Charged
64	132/33kV Transformer-II (10MVA)	132kV	Transient fault	10-07-22	9:18	10-07-22	9:21		3	0.72	86A and 86B	(DIRELPDOC1)Fault Value:I-1: 195.25A, I-2: 2.25A,I-3: 187.76A, I-N: 0		Over current and earth fault	Charged
67	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	10-07-22	10:57	10-07-22	10:59		2	0.80	86A and 86B	(DIRELPDOC1) Fault value: I-1: 99.95A, I-2: 81.95A, I-3: 34.2A,I-n: 0A,		Over current and earth fault	Charged
75	132/33kV Transformer-II (10MVA)	132kV	Transient fault	12-07-22	12:46	12-07-22	12:48		2	0.56	86A and 86B	Did not reflect on SEM15 relay	Earth fault	Unknown	Charged
78	132/33kV Transformer-II (10MVA)	132kV	Transient fault	12-07-22	16:56	12-07-22	16:58		2	0.32	86A and 86B	(DIRELPDOC1) Fault value: I-1: 131.75A, I-2: 7.4A, I-3: 137.95A,I-n: 0A		over current and Earth fault	Charged
84	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	14-07-22	10:16	14-07-22	10:18		2	0.80	86A and 86B	(DIRELPDOC1) Fault value: I-1: 81.45A, I-2: 87.85A, I-3: 62.85A,I-n: 0A,		Earth fault	Charged
87	132/33kV Transformer-II (10MVA)	132kV	Transient fault	14-07-22	22:13	14-07-22	22:15		2	0.80	86A and 86B	(DIRELPDOC1) Fault value: I-1: 81.45A, I-2: 87.85A, I-3: 62.85A,I-n: 0A,		Over Current	Charged
90	132/33kV Transformer-II (10MVA)	132kV	Transient fault	15-07-22	9:46	15-07-22	9:47		1	0.40	86A and 86B	(DIRELPDOC1) Fault value: I-1: 104.05A, I-2: 101.1A, I-3: 7.9A,I-n: 0A,		over current and Earth fault	Charged
99	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	15-07-22	16:23	15-07-22	16:28		5	0.82	86A and 86B	Fault Value did not reflect on Relay (BSP015)	Earth fault	Unknown	Charged
101	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	16-07-22	17:16	16-07-22	17:21		5	0.87	86A and 86B	Fault Value did not reflect on Relay (BSP015)	Earth fault	Unknown	Charged
104	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	16-07-22	9:58	16-07-22	9:00		2	0.97	86A and 86B	(DIRELPTOC1) Fault value: I-1: 59.25A,I-2: 119.5A,I-3: 106.95A,I-n: 0A,	Earth fault	Unknown	Charged
109	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	16-07-22	7:34	16-07-22	7:38		4	0.91	86A and 86B	Not reflected on BSP015	Earth fault	Unknown	Charged
112	132/33kV Transformer-II (10MVA)	132kV	Transient fault	16-07-22	23:07	16-07-22	23:10		3	0.44	86A and 86B	(DIRELPDOC1) Fault Value: I-1: 16A, I-2: 96.75A,I-3: 99 mA, I-N: 0		Over current and earth fault	Charged
116	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	17-07-22	9:58	17-07-22	9:44		6	0.83	86A and 86B	(DIRELPTOC1) Fault value: I-1: 112.97,I-2: 117.6A,I-3: 82.7A,I-n: 0A	Earth fault	Unknown	Charged
121	132/33kV Transformer-II (10MVA)	132kV	Transient fault	17-07-22	10:57	17-07-22	10:59		2	0.41	86A and 86B	(DIRELPDOC1) Fault value: I-1: 5.4A, I-2: 197.35A, I-3: 191.9A,I-n: 0A,	over current and Earth fault	Unknown	Charged
125	132/33kV Transformer-II (10MVA)	132kV	Transient fault	17-07-22	12:33	17-07-22	12:35		3	0.59	86A and 86B	(DIRELPDOC1) Fault value: I-1: 147.85A, I-2: 141.95A, I-3: 0.95A,I-n: 0A,	over current and Earth fault	Unknown	Charged
128	132/33kV Transformer-II (10MVA)	132kV	Transient fault	17-07-22	14:31	17-07-22	14:33		2	0.37	86A and 86B	(DIRELPDOC1) Fault value: I-1: 5.45A, I-2: 84.46A, I-3: 81.64,I-n: 0A,	over current and Earth fault	Unknown	Charged
134	132/33kV Transformer-II (10MVA)	132kV	Transient fault	18-07-22	9:41	18-07-22	9:52		5	0.87	86A and 86B	Fault value not detected or reflect on BSP015	Earth fault	Unknown	Charged
139	132/33kV Transformer-II (10MVA)	132kV	Transient fault	18-07-22	17:32	18-07-22	17:34		2	0.60	86A and 86B	(DIRELPDOC1) Fault value: I-1: 179.15A, I-2: 155.4A, I-3: 4.35A,I-n: 0A,	earth fault and Overcurrent	Unknown	Charged
142	132/33kV Transformer-II (10MVA)	132kV	Transient fault	19-07-22	10:09	19-07-22	10:11		2	0.91	86A and 86B	(DIRELPDOC1) Fault value: I-1: 86.75A, I-2: 92.6A, I-3: 20.95A,I-n: 0A,	Earth fault	Unknown	Charged
145	132/33kV Transformer-II (10MVA)	132kV	Transient fault	19-07-22	14:51	19-07-22	14:59		8	3.50	86A and 86B	(DIRELPDOC1) Fault value: I-1: 89.34,I-2: 92A,I-3: 84A,I-n: 0A,	Earth fault	Unknown	Charged
148	132/33kV Transformer-II (10MVA)	132kV	Transient fault	19-07-22	16:21	19-07-22	16:22		1	0.47	96B	(DIRELPDOC1) Fault value: I-1: 91.95A,I-2: 101.1A,I-3: 89.1A,I-n: 0A,	Earth fault	Unknown	Charged
152	132/33kV Transformer-II (10MVA)	132kV	Transient fault	20-07-22	9:21	20-07-22	9:29		4	0.59	86A And 86B	(DIRELPDOC1) Fault value: I-1: 119.54,I-2: 113.8A,I-3: 77.7A,I-n: 0A,	earth fault and Overcurrent	Unknown	Charged
158	132/33kV Transformer-II (10MVA)	132kV	Transient fault	21-07-22	11:22	20-07-22	11:24		2	0.32	86A and 86B	(DIRELPDOC1) Fault value: I-1: 105A,I-2: 119.1A,I-3: 89.6A,I-n: 0A,	Over current	Unknown	Charged
161	132/33kV Transformer-II (10MVA)	132kV	Transient fault	20-07-22	14:30	20-07-22	14:48		3	0.52	86A and 86B	Fault value not detected or reflect on BSP015	Earth fault	Unknown	Charged
165	132/33kV Transformer-II (10MVA)	132kV	Transient fault	20-07-22	17:50	20-07-22	17:08		2	0.61	86A and 86B	Fault value not detected or reflect on BSP015	Earth fault	Unknown	Charged
169	132/33kV Transformer-II (10MVA)	132kV	Transient fault	21-07-22	10:11	21-07-22	10:14		3	1.34	86A and 86B	(DIRELPDOC1) Fault value: I-1: 59.1A,I-2: 70.95A,I-3: 61.35A,I-n: 0A,	Over current	Unknown	Charged
180	132/33kV Transformer-II (10MVA)	132kV	Transient fault	22-07-22	1:34	22-07-22	1:35		2	0.51	86A and 86B	(DIRELPDOC1) Fault value: I-1: 3.1A,I-2: 77.8A,I-3: 92.45A,I-n: 0A,	Over current	Unknown	Charged
177	132/33kV Transformer-II (10MVA)	132kV	Transient fault	21-07-22	14:23	21-07-22	14:25		2	0.56	86A and 86B	(DIRELPDOC1) Fault value: I-1: 98.9A,I-2: 70.95A,I-3: 46.95A,I-n: 0A,	Earth fault	Unknown	Charged
181	132/33kV Transformer-II (10MVA)	132kV	Transient fault	21-07-22	23:41	21-07-22	23:42		1	0.74	86A and 86B	Fault Value did not reflect on Relay (BSP015)	Earth fault	Unknown	Charged
183	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	21-07-22	23:33	21-07-22	23:35		3	0.58	86A and 86B	(DIRELPDOC1) Fault value: I-1: 91.95A,I-2: 110A,I-3: 75.75A,I-n: 0A	Earth fault	Unknown	Charged
188	132/33kV Transformer-II (10MVA)	132kV	Transient fault	25-07-22	8:59	25-07-22	10:01		2	0.27	86A and 86B	(DIRELPDOC1)Fault Value:I-1: 16A, I-2: 17.6A,I-3: 17.1A, I-N: 0	Over current	Unknown	Charged
192	132/33kV Transformer-II (10MVA)	132kV	Transient fault	25-07-22	15:58	25-07-22	15:01		1	0.59	86A and 86B	Fault Value did not reflect on Relay (BSP015)	Earth fault	Unknown	Charged
196	132/33kV Transformer-II (10MVA)	132kV	Transient fault	25-07-22	16:59	25-07-22	17:00		1	0.10	86A and 86B	Fault Value did not reflect on Relay (BSP015)	Earth fault	Unknown	Charged
200	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	25-07-22	23:29	25-07-22	23:33		3	0.74	86A and 86B	Not reflected on BSP015	Earth fault	Unknown	Charged
205	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	27-07-22	2:29	27-07-22	2:33		4	0.41	86A and 86B	(DIRELPDOC1)Fault Value:I-1: 209.25A,I-2: 195.75A,I-3: 180.95A,I-N: 0	Over current	Unknown	Charged
209	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	27-07-22	7:55	27-07-22	8:00		5	0.10	86A and 86B	(DIRELPDOC1)Fault Value:I-1: 9.25A,I-2: 130.45A,I-3: 116.6A, I-N: 0	over current and Earth fault	Unknown	Charged
215	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	27-07-22	18:04	27-07-22	18:08		4	0.55	86A and 86B	(DIRELPDOC1)Fault Value:I-1: 7.2*.05A,I-2: 5.1A,I-3: 110.45A, I-N: 0	Over current	Unknown	Charged
225	132/33kV Transformer-II (10MVA)	132kV	Transient fault	28-07-22	3:51	28-07-22	3:55		3	0.51	86A and 86B	Fault Value did not reflect on Relay (BSP015)	Earth fault	Unknown	Charged
230	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	28-07-22	13:51	28-07-22	13:55		5	0.70	86A and 86B	Not reflected on BSP015	Earth fault	Unknown	Charged
234	132/33kV Transformer-II (10MVA)	132kV	Trip on Fault	28-07-22	19:25	28-07-22	19:27		2	1.00	86A and 86B	Not reflected on BSP015	Earth fault	Unknown	Charged
239	132/33kV Transformer-II (10MVA)	132kV	Transient fault	31-07-22	9:28	31-07-22	9:30		1	0.31	86A and 86B	(DIRELPDOC1)Fault Value:I-1: 1.95A,I-2: 100A,I-3: 100.9A, I-N: 0	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 Solars Outage (MW)	Name of feeder	Name of the Substation/ outlines Affected by the Fault	Reasons of Fault	Relay Operations	Fault Location(KM)	Type of outages	Remarks
i) 132kV Above													
1	29.07.2022	5:48 hrs	29.07.2022	8:19 hrs	0	-4.05	400/220 kV ICT	Jigmeling Substation		87/87SLV			
2	01.07.2022	13:40 hrs	01.07.2022	18:26 hrs	0	-38.259	220kV ICT-1	Jigmeling Substation		Main 1&2 86 1&2 trip and RYBph trip	Main 1 Fault current Ir = 2.94KA at distance 10.8km Main 2 Fault distance 10.4Km		
3	07.07.2022	08:17 hrs	07.07.2022	08:23 hrs	0	32.189	220kV Dagapela Feeder	Dagapela Substation	Earth fault(YBph to Ground)	Main 1 &2 (YBph Trip and Z1 trip, Zone1 trip.	Main 1 &2 Fault Current Ia = 10 kA,Ib=7.45kA, Ic=7.35kA, Fault distance 7.2km		
4	08.07.2022	19:48 hrs	08.07.2022	19:59 hrs	0	-13.788	220kV Tsirang Feeder	Jigmeling Substation	Earth fault(L1L3- Ground)	Main 1 &2 (L1L3 G Trip), Zone1 trip.	Main 1 &2 Current Ia =0.71kA, Ib=0.14kA, Ic=1.97kA, Fault distance (21.13)km		
5	08.07.2022	19:50 hrs	08.07.2022	20:00 hrs	0	32.470	220kV Dagapela Feeder	Dagapela Substation	Earth fault(L1L3- Ground)	Main 1 &2 (L1L3 G Trip),Zone1 trip.	Main 1 &2 Current Ia =1.80 kA, Ib=0.11kA, Ic=1.8kA, Fault distance 1.8km(21.1)& 3.79(21.1)		
6	08.07.2022	02:18 hrs	08.07.2022	02:33 hrs	0	48.349	220kV Tsirang Feeder	Jigmeling Substation	Earth fault(B phase to Ground)	Main 1 (R,Y & B phase trip, Zone1 trip Main 2 (R,Y & B phase trip , Zone1 trip	Main 1 Fault distance 17.4km Main 2 Fault distance 17.5Km		
7	08.07.2022	02:26 hrs	08.07.2022	02:34 hrs	0		220kV Dagapela Feeder	Dagapela Substation	Earth fault(Y phase to Ground)	Main 1 (R & Y phase trip , Zone1 trip Main 2 (R & Y phase trip , Zone1 trip	Main 1 Fault distance 10.8km Main 2 Fault distance 14.45km		
8	08.07.2022	19:54 hrs	08.07.2022	20:02 hrs	0	81.480	220kV Tsirang Feeder	Jigmeling Substation	R,Bphase to ground loop	R,B phase (Z1 trip, Ia 1.85kA,Ib 0.17kA,Ic 1.46kA,105C51S trip,) main 1&2 trip.	Fault Dist 11.8km		
9	20.07.2022	19:14 hrs	20.07.2022	20:01 hrs	0	44.270	220kV Dagapela Feeder	Dagapela Substation	R,B phase to ground loop	R,B phase trip(Z1 trip,Ia 1.47kA,Ib 0.21kA, Ic 8.15kA,105C51Stop,) main 1 and 2 86 1 &2 trip.	Fault Dist 9.4KM		
10	21.07.2022	10:15hrs	21.07.2022	20:25hrs	1		220kV Bus Coupler	Jigmeling Substation	Over Current	50 trip			
11	22.07.2022	10:08hrs	22.07.2022	19:15hrs			220kV Bus Coupler	Jigmeling Substation	Over Current	50 trip			
12	01.07.2022	14:05 hrs	01.07.2022	14:12 hrs	0	45.66	132kV Tingtibi feeder	Tingtibi Substation	RYB phase trip	Main 1&2 86 1&2 trip, RYB phase trip,Z1 trip,	fault Current Ia=5.74kA, Ib=4.95kA,Ic=5.81 kA, Distance=6.80 km	Transient	
13	01.07.2022	13:40 hrs	01.07.2022	18:20	0	39.49	132kV ICT-1	Jigmeling Substation		Main 1&2 86 1&2 trip and RYBph trip		Transient	
14	08.07.2022	20:28 hrs	08.07.2022	20:36 hrs	0	35.17	132kV Tingtibi feeder	Tingtibi Substation	Earth fault (L2L3-G)	Main 1 optd, L2L3-G) Trip. Zone1 trip.	Main 1 Current Ia =0.17kA, Ib=2.05kA, Ic=2.18kA, Fault distance 0.80km(21.1)	Transient	
15	08.07.2022	20:30 hrs	08.07.2022	20:35 hrs	0	29.94	132kV Gelephu feeder	Gelephu Substation	Earth fault (L2L3-G)	Main 1&2 optd, L2L3-Ground Trip, Zone1 trip.	Fault distant (21.1)7.50km	Transient	
16	24.07.2022	10:09hrs	24.07.2022	10:20hrs	0	31.68	132kV Tingtibi feeder	132kV Tingtibi feeder	Earth fault (L1L2-G)	Main 1&2 optd, L1L2-Ground Trip, Zone1 optd.	Fault distant 1.08km	Transient	
17	24.07.2022	10:11hrs	24.07.2022	10:17hrs	0	19.93	132kV Gelephu feeder	Gelephu Substation	Earth fault (L1L2L3)	Main 1&2 optd, L1 L2L3 Trip. Zone1 optd.	Fault distant 6.4km	Transient	

2. 220/40/33kV Dhajay Substation													
i) 66kV and above													
1	08.07.2022	19:40hrs	08.07.2022	19:58hrs	0	20.82	Tsirang-Jgmeling	Dhajay Substation	Main I- Ia=1.96KA, Ib=0.01kA, Ic=1.87kA with distance 30.1KM. Main 2- Ia=1745.84A, Ib=103.88A, Ic=1873.25A with distance 30.18KM.	Distance relay Main 1&2(21.1& 21.2)	Line segment	Tripped	Feeder restored after SPSO instructions.
2	09.07.2022	2:18:05hrs	09.07.2022	2:32:30hrs	0	20.82	Tsirang-Jgmeling	Dhajay Substation	Main I- Ia=2.01kA, Ib=1.25kA, Ic=2.05kA with distance 31kM. Main 2- Ia=2043.95A, Ib=1029.94A, Ic=2093.24A with distance 17KM.	Distance relay Main 1&2(21.1& 21.2)	Line segment	Tripped	Feeder restored after SPSO instructions.
3	20.07.2022	19:52hrs	20.07.2022	20:00hrs	0	41.58	Tsirang-Jgmeling	Dhajay Substation	Main I- Ia=2.24kA, Ib=0.01kA, Ic=0.01kA with distance 47.2IKM. . 30in 2- Ia=2051.34A, Ib=177.28, Ic=1681.48A, Ia=1663.12A with distance 31KM.	Distance relay Main 1&2(21.1& 21.2)	Line segment	Tripped	Feeder restored after SPSO instructions.
3. 132/40/33/11kV Gelephu Substation													
i) 66kV and above													
1	08.07.2022	20:29hrs	08.07.2022	21:39hrs	1	24	132kv Sol-Ge	Gelephu s	heavy lightening	o/c on ABC - phase IA=160.5A,IB=1 595KA,IC=1.44 8KA		Temporary	Charging Code, NLDC BTN=1689, NLDC DND=630 & NERLDC=4125. At the same time 132kv Gel-Jig line also tripped from Jgmeling end weather was heavy raining,thunder & lightning
2	24.07.2022	16:09hrs	24.07.2022	16:55hrs		15	132kv Sol-Ge	Gelephu s	heavy lightening	o/c on ABC - phase IA=1.818KA,IB =1.703KA,IC=1 741KA		Temporary	Charging Code, NLDC BTN=1808, NLDC DND=1275 & NERLDC=4681. At the same time 132kv Gel-Jig line also tripped from Jgmeling end & charged back at 18.38hrs.
3	24.07.2022	17.12hrs	24.07.2022	19.26hrs	2	12	132kv Gel-Jel	Nos	Isolator clamp burnt	fuse down taken by	Gelephu ss	Temporary	Due to burnt (spark) on R phase line isolator Opening code:NLDC BTN=0892 & Closing code:NLDC BTN=1810 Salakati was normal as the customer were not affected during that emergency shutdow.
4	24.07.2022	19.40hrs	24.07.2022	20.50hrs	1	12	132kv Gel-Jel	Nos	Isolator clamp burnt	fuse down taken by	Gelephu ss	Temporary	Due to burnt (spark) on Y phase line isolator Opening code:NLDC BTN=0894 & Closing code:NLDC BTN=1815 customer was not affected as salakati was there

4. 132/33kV Tintibi Substation

i) 66kV & Above

1	03.07.2022	14:04	03.07.2022	14:13	0	-44.57	Tingkhi-3gen	ingkhi-3ga	Temporary Fault	Distance Relay Start Phase:ABCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:10.84kM	10.84kM	Temporary	
2	03.07.2022	16:13	03.07.2022	16:18	0	14.90	Tingkhi-tsirang	ingkhi-tsir	Temporary Fault	Distance Relay Start Phase:ABCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:55.01kM	55.10kM	Temporary	
3	06.07.2022	7:50	06.07.2022	8:05	0	2.16	Tingkhi-tsirang	ingkhi-tsir	Temporary Fault	Distance Relay Start Phase:ABCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:35.91kM	35.91kM	Temporary	
4	08.07.2022	20:28	08.07.2022	20:28	0	-23.54	Tingkhi-3gen	ingkhi-3ga	Temporary Fault	Distance Relay Start Phase:BCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:22.88kM	22.88kM	Temporary	
5	08.07.2022	22:16	08.07.2022	22:26	0	22.26	Tingkhi-tsirang	ingkhi-tsir	Temporary Fault	Distance Relay Start Phase:ABCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:32.17kM	32.17kM	Temporary	
6	08.07.2022	22:34	08.07.2022	22:43	0	15.54	Tingkhi-tsirang	ingkhi-tsir	Temporary Fault	Distance Relay Start Phase:BN,Trip Phase:ABC,Fault zone-1 trip,Fault location:10.29kM	10.29kM	Temporary	
7	08.07.2022	22:47	08.07.2022	22:59	0	14.54	Tingkhi-tsirang	ingkhi-tsir	Temporary Fault	Distance Relay Start Phase:ABN,Trip Phase:ABC,Fault zone-1 trip,Fault location:53.47kM	53.47kM	Temporary	
8	08.07.2022	15:15	08.07.2022	15:31	0	32.44	Tingkhi-3gen	ingkhi-3ga	Temporary Fault	Distance Relay Start Phase:BCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:17.34kM	17.34kM	Temporary	
9	08.07.2022	15:32	08.07.2022	16:21	0	32.2	Tingkhi-3gen	ingkhi-3ga	Temporary Fault	Distance Relay Start Phase:BCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:17.70kM	17.70kM	Temporary	
10	24.07.2022	2:10	24.07.2022	2:20	0	19.66	Tingkhi-tsirang	ingkhi-tsir	Temporary Fault	Distance Relay Start Phase:ABN,Trip Phase:ABC,Fault zone-1 trip,Fault location:19.08kM	19.08kM	Temporary	
11	24.07.2022	14:36	24.07.2022	14:47	0	13.63	Tingkhi-tsirang	ingkhi-tsir	Temporary Fault	Distance Relay Start Phase:AN,Trip Phase:ABC,Fault zone-1 trip,Fault location:XY 19.76kM	19.76kM	Temporary	
12	24.07.2022	16:09	24.07.2022	16:19	0	30.01	Tingkhi-3gen	ingkhi-3ga	Temporary Fault	Distance Relay Start Phase:ABCN,Trip Phase:ABC,Fault zone-1 trip,Fault location:24.49kM	24.49kM	Temporary	

5. 132/33kV Yurmoo Substation

i) 66kV & Above

1	08.07.2022	10:49	08.07.2022	10:56	0	-28.8	132kV Tingkhi I/C	Yurmoo Ss	Broken conductor optd	86 relay	Nil	Transient Fault	
2	09.07.2022	12:23	09.07.2022	12:28	0	-28.8	132kV Tingkhi I/C	Yurmoo Ss	Broken conductor optd	86 relay	Nil	Transient Fault	
3	18.07.2022	12:09	18.07.2022	12:11	0	-33.7	132kV Tingkhi I/C	Yurmoo Ss	Broken conductor optd	86 relay	Nil	Transient Fault	
4	19.07.2022	19:55	19.07.2022	19:57	0	-31.8	132kV Tingkhi I/C	Yurmoo Ss	Broken conductor optd	86 relay	Nil	Transient Fault	
5	23.07.2022	23:44	23.07.2022	23:54	0	-31.1	132kV Tingkhi I/C	Yurmoo Ss	Broken conductor optd	86 relay	Nil	Transient Fault	
6	24.07.2022	2:10	24.07.2022	2:17	0	-30.5	132kV Tingkhi I/C	Yurmoo Ss	Broken conductor optd	Breaker	Nil	Transient Fault	
7	24.07.2022	10:09	24.07.2022	10:10	0	-32	132kV Tingkhi I/C	Yurmoo Ss	Broken conductor optd	Breaker	Nil	Transient Fault	

6. 220/33kV Dagapela Substation

i) 66kV & Above

1	07.07.2022	06:15hrs	7.07.2022	06:29hrs	0	-34.89	220kV Jurmling	Dagapela Substation	Earth fault	Master trip relay optd	zone 1 at the distance of 7.2 km(Y-E fault phase)	Grid fail	Tripped from Jigmeling end due to
2	8.07.2022	17:48hrs	8.07.2022	20:02hrs	2	32.13	220kV Jurmling	Dagapela Substation	L1 L3 phase to ground(Earth fault)	Master trip relay optd		Grid fail	Tripped from Jigmeling end due to
3	9.07.2022	02:22hrs	9.07.2022	02:34hrs	0	-34.43	220kV Jurmling	Dagapela Substation	R&Y phase	Master trip relay optd	zone	Grid fail	Tripped from Jigmeling end due to
4	20.07.2022	19:53hrs	20.07.2022	20:04hrs	0	-43.84	220kV Jurmling	Dagapela Substation	R&B to ground	Master trip relay optd	distance at 9.4km	Grid fail	Tripped from Jigmeling end due to

Month of August 2021

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

SL.No	Substation Name (Select from list)	Feeder Name (Select from list)	Outage Reason (Select from list)	Fault Location (Select from list)	Tripping Date & Time (dd/mm/yyyy hh:mm:ss)	Normalization Date & Time (dd/mm/yyyy hh:mm:ss)	Customers affected (Yes/No)?	Remarks	Outage Duration(hh:mm:ss)	Outage in Minute(s)	No. of Customers Interrupted (Ni)
02	Nganglam	132kV Nganglam-DCCL Factory	Fault	Transmission Line	01-08-2022 05:11:00	01-08-2022 05:14:00	Yes	Tripped on Overcurrent & Earth Fault (50A & 50C)	00:03:00		1
03	Nganglam	132kV Nganglam-DCCL Factory	Fault	Transmission Line	01-08-2022 07:14:00	01-08-2022 07:26:00	Yes	Tripped on Overcurrent & Earth Fault (50A & 50C)	00:12:00		130
09	Nganglam	132kV Nganglam-Tintibi	Fault	Transmission Line	03-08-2022 10:44:00	03-08-2022 10:53:00	No	Tripped on Earth Fault. Fault details: IA= 447.5A IB= 7.227A IC= 6.750A IN= 437.4A VAN= 111.8kV VBN= 131.5kV VCN= 125.2kV	00:09:00		0
14	Nganglam	132kV Nganglam-Tintibi	Fault	Transmission Line	06-08-2022 13:10:00	06-08-2022 13:22:00	No	Tripped on over current.Realy opted 06.Fault Zone=1 Fault Duration=76.74ms.Relay trigiped time=80.00ms.Fault loc=15.23km.IA=1.579KA.IB=1.607KA.IC=137.7A.VAN=137.7A. VBN=9.091KV.VCN=83.07KV.Fault Resistance=160.5ms	00:12:00		0
15	Nganglam	132/33kV, 5MVA Transformer-1	Fault	Substation	06-08-2022 13:10:00	06-08-2022 13:14:00	Yes	Tripped due to 132 kV Nganglam-Tingtibi	00:04:00		3244
29	Nganglam	132/33kV, 5MVA Transformer-1	Fault	Distribution Line	14-08-2022 14:24:00	14-08-2022 14:27:00	Yes	Tripped on Overcurrent	00:03:00		3244
30	Nganglam	132/33kV, 5MVA Transformer-1	Fault	Substation	14-08-2022 14:27:00	14-08-2022 14:30:00	Yes	Tripped on overcurrent due to 33kV Druk GYP feeder (Feeder CB not Operated)	00:03:00		3244
36	Nganglam	132/33kV, 5MVA Transformer-1	Fault	Substation	15-08-2022 15:16:00	15-08-2022 15:18:00	Yes	5MVA trs (LV) side triped due to 33kV DGCL fdr on E/F	00:02:00		3244
37	Nganglam	132/33kV, 5MVA Transformer-1	Fault	Distribution Line	18-08-2022 06:45:00	18-08-2022 06:47:00	Yes	5MVA trs-1 (HV & LV)triped due to 33kV Dechaling feeder	00:02:00		1458
42	Nganglam	132/33kV, 5MVA Transformer-1	Fault	Distribution Line	20-08-2022 07:18:00	20-08-2022 07:22:00	Yes	Tripped on Overcurrent due to 33kV Panbang feeder fault while extending supply from Thinlegang LDS	00:04:00		339
51	Nganglam	132/33kV, 5MVA Transformer-1	Fault	Distribution Line	23-08-2022 11:41:00	23-08-2022 11:52:00	Yes	Tripped due to 33kV Dechaning Feeder Fault	00:11:00		3244
52	Nganglam	132/33kV, 5MVA Transformer-1	Fault	Distribution Line	23-08-2022 22:12:00	23-08-2022 22:13:00	Yes	Tripped on Overcurrent. The 5MVA Tr-1 is kept in Idle Charged and 3MVA Transformer is put inservice	00:01:00		3244
53	Nganglam	132/33kV, 5MVA Transformer-2	Shutdown	Distribution Line	23-08-2022 18:25:00	23-08-2022 18:26:00	No	5MVA Transformer was put in Parallel with 3MVA transformer after the installation of 2Nos. of CB Interrupter at 5MVA Tr-1 LV side and 3MVA Transformer was kept in Idle charged	00:01:00		0
67	Nganglam	132kV Nganglam-Nangkhor	Shutdown	Transmission Line	31-08-2022 04:02:00	31-08-2022 05:50:00	No	CB could not Closed at Nangkhor end after tripping. BPSO instructed us to Open CB at our end and Closed first at Nangkhor end.	01:48:00		0
68	Nganglam	132kV Nganglam-Nangkhor	Shutdown	Transmission Line	31-08-2022 13:30:00	31-08-2022 15:03:00	No	To do CB maintance at Nangkhor S/S.	01:33:00		0

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Maintenance/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Restoration Time: Date	Restoration Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW before Outage (MW)	Tripping Details: Fault Details (as recorded by relays)	Type/Cause of Fault	Reason for Shutdown	Weather Condition	Remarks
220kV Feeders															
1	132kV S. Transformer	132kV	Tripping	01-08-22	07:55 hrs	01-08-22	09:50 hrs	1	55	5.22	[illegible]	Transient to resumed fault		rainy	Intimated Tendrong, Kanpu and P.Nangi SS Jaigaon to be taken shut.
2	Dhorlabag Feeder	132kV	Tripping	01-08-22	08:49 hrs	01-08-22	09:49 hrs	1	0	47.1	[illegible]	Transient to resumed fault		Rainy	charged in coordination with BPSO
3	Phuentsholing-2 Feeder	132kV	Tripping	01-08-22	08:50 hrs	01-08-22	08:50 hrs	0	14	17.73	[illegible]	Transient to resumed fault		Rainy/ Foggy	coordinated with BPSO after the charging clearance of feeder. Charged in first attempt.
4	Deothang Feeder	132kV	Tripping	01-08-22	09:09 hrs	01-08-22	09:09 hrs	0	52	46.25	[illegible]	Transient to resumed fault		Rainy/ Foggy	charging code BPSO:LSTN_SLDC_TSOkm_ 167 and SLDC:DC_1000ms/1ms).
5	132kV S. Transformer	132/33kV	Tripping	08-08-22	08:50 hrs	08-08-22	09:50 hrs	0	0	5.31	[illegible]	Transient to resumed fault		Foggy	Charged in coordinated time BPSO
6	132kV S. Transformer	132/33kV	Tripping	12:49:22	12:49:22	12:49:22	12:55 hrs	0	6	5.17	Phase to ground, Neutral, 0.5 kA, 0.5 kA, 0.5 kA

Month of September 2022

Sl. No	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Operated (name of relay)	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault (Lightning/Equipment failure/Human error/Unknown)	Reason for Shutdown	Weather Condition during the shutdown	Remarks
132kV																
1	[illegible]	132	Tripped	[illegible]	[illegible]	[illegible]	[illegible]	1	31	[illegible]		Distance Relay Operated Vintech phase I at 31 [illegible]	3 phase fault isolated and Isolated on R phase CT isolated and made live. No	N/A	Clear	Supply tripped on Distance relay operated and R phase fuse blow isolated and made live. At final earth tripped at yellow and blue fuse so, emergency work. Changing Croft from 30MVA 132/33kv Kuruwa Transfmer
2	[illegible]ang	132	Tripped	[illegible]	[illegible]	[illegible]	[illegible]	1	31	11.249		[illegible]	3 phase fuse isolated attempted and tripped on R phase CT isolated and made live. No	N/A	Clear	Supply tripped on Distance relay operated and R phase CT isolated and made live. At final earth tripped at yellow and blue fuse so, emergency work. Changing Croft from 30MVA 132/33kv Kuruwa Transfmer
Meeting: [illegible] Substation: 132/33kV Tsirang Substation Month: Sep-22																
Sl. No	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Signal	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Weather Condition during the shutdown	Remarks
132kV Feeders																
1	Tsirang-Dunlop Line	132kV	Tripping	01-09-22	13:53 hrs	01-09-22	14:39 hrs	0	46	8.6	DEF/SOTF/3I>Sgh	Distance Relay Relay Trip R-ph/E, Loop Impedance, Distance, 0.52 Ohm, Fault location 0.7 Kms, Fault to ground, Distance, 0.52 Ohm, Relay Operating Time, 0.046 Sec, Fault current Ir=1.07 kA, Ib=1.07 kA, Ic=0.98 kA, In=0.0 kA, Fault Type, R-N, Fault Phase, R-ph, Relay Trip Time, 13:53 hrs, Fault Clearance Time, 14:39 hrs, Fault resistance=1.1 Ohm,	Tripped on fault		Direct tripped with Breaker & Isolator	Informed to SPPD to charged the feeder.
2	Tsirang-Dunlop Line	132kV	Tripping	01-09-22	19:51 hrs	01-09-22	20:10 hrs	0	19	8.6	DEF/SOTF/3I>Sgh	Distance Relay Relay Trip R-ph/E, Loop Impedance, Distance, 0.52 Ohm, Fault location 0.7 Kms, Fault to ground, Distance, 0.52 Ohm, Relay Operating Time, 0.046 Sec, Fault current Ir=1.07 kA, Ib=1.07 kA, Ic=0.98 kA, In=0.0 kA, Fault Type, R-N, Fault Phase, R-ph, Relay Trip Time, 19:51 hrs, Fault Clearance Time, 20:10 hrs, Fault resistance=1.1 Ohm,	Tripped on fault		Direct tripped with Breaker & Isolator	Informed to SPPD to charged the feeder.
3	Tsirang-Dunlop Line	132kV	Tripping	01-09-22	23:53 hrs	02-09-22	23:17 hrs	0	38	8.6	DEF/SOTF/3I>Sgh	Distance Relay Relay Trip R-ph/E, Loop Impedance, Distance, 0.52 Ohm, Fault location 0.7 Kms, Fault to ground, Distance, 0.52 Ohm, Relay Operating Time, 0.046 Sec, Fault current Ir=1.07 kA, Ib=1.07 kA, Ic=0.98 kA, In=0.0 kA, Fault Type, R-N, Fault Phase, R-ph, Relay Trip Time, 23:53 hrs, Fault Clearance Time, 23:17 hrs, Fault resistance=1.1 Ohm,	Tripped on fault		Direct Tripped	Informed to SPPD. At no auto-reset time changed as 0.5 Kv/sec at 16:59 hrs due conductor sound and flash
4	Tsirang-Dunlop Line	132kV	Tripping	01-09-22	23:53 hrs	01-09-22	23:02 hrs	15	11	40.3	DEF/SOTF/3I>Sgh	Distance Relay Relay Trip R-ph/E, Loop Impedance, Distance, 0.52 Ohm, Fault location 0.7 Kms, Fault to ground, Distance, 0.52 Ohm, Relay Operating Time, 0.046 Sec, Fault current Ir=1.07 kA, Ib=1.07 kA, Ic=0.98 kA, In=0.0 kA, Fault Type, R-N, Fault Phase, R-ph, Relay Trip Time, 23:53 hrs, Fault Clearance Time, 23:02 hrs, Fault resistance=1.1 Ohm,	Tripped on fault		Direct Tripped	Informed to SPPD. At no auto-reset time changed as 0.5 Kv/sec at 17:59 hrs due conductor sound and flash
5	[illegible]	132kV	Tripping	01-09-22	11:22 hrs	01-09-22	11:26 hrs	0	4	8.59		Tripped due to fault	Tripped on fault		Clear	Tripped at the instant on 132kV Tsirang-Dunlop tripping.
6	[illegible]	132kV	Tripping	01-09-22	11:22 hrs	01-09-22	11:27 hrs	0	5	8.59	Time delay(50/51TD) Fuse operated	132 volts, 50 Hz & line volts 30v operated	Tripped on fault		Clear	Tripped at the instant on 132kV Tsirang-Dunlop tripping.
7	[illegible]	132kV	Tripping	01-09-22	11:52 hrs	01-09-22	11:57 hrs	0	5	8.59	Time delay(50/51TD) Fuse operated	132 volts, 50 Hz & line volts 30v operated	Tripped on fault		Clear	Tripped at the instant on 132kV Tsirang-Dunlop tripping.
8	[illegible]	132kV	Tripping	01-09-22	12:26 hrs	01-09-22	12:32 hrs	0	6	8.27	Time delay(50/51TD) Fuse operated	132 volts, 50 Hz & line volts 30v operated	Tripped on fault		Clear	Tripped at the instant on 132kV Tsirang-Dunlop tripping.
9	Tsirang-Dunlop Line	132kV	Tripping	01-09-22	13:53 hrs	01-09-22	14:39 hrs	0	46	8.6	DEF/SOTF/3I>Sgh	Distance Relay Relay Trip R-ph/E, Loop Impedance, Distance, 0.52 Ohm, Fault location 0.7 Kms, Fault to ground, Distance, 0.52 Ohm, Relay Operating Time, 0.046 Sec, Fault current Ir=1.07 kA, Ib=1.07 kA, Ic=0.98 kA, In=0.0 kA, Fault Type, R-N, Fault Phase, R-ph, Relay Trip Time, 13:53 hrs, Fault Clearance Time, 14:39 hrs, Fault resistance=1.1 Ohm,	Tripped on fault		Direct tripped with Breaker & Isolator	Informed to SPPD to charged the feeder.
10	Tsirang-Dunlop Line	132kV	Tripping	01-09-22	19:51 hrs	01-09-22	20:10 hrs	0	19	8.6	DEF/SOTF/3I>Sgh	Distance Relay Relay Trip R-ph/E, Loop Impedance, Distance, 0.52 Ohm, Fault location 0.7 Kms, Fault to ground, Distance, 0.52 Ohm, Relay Operating Time, 0.046 Sec, Fault current Ir=1.07 kA, Ib=1.07 kA, Ic=0.98 kA, In=0.0 kA, Fault Type, R-N, Fault Phase, R-ph, Relay Trip Time, 19:51 hrs, Fault Clearance Time, 20:10 hrs, Fault resistance=1.1 Ohm,	Tripped on fault		Direct tripped with Breaker & Isolator	Informed to SPPD to charged the feeder.
11	[illegible]	132kV	Tripping	01-09-22	23:53 hrs	02-09-22	23:17 hrs	0	38	8.6	DEF/SOTF/3I>Sgh	Distance Relay Relay Trip R-ph/E, Loop Impedance, Distance, 0.52 Ohm, Fault location 0.7 Kms, Fault to ground, Distance, 0.52 Ohm, Relay Operating Time, 0.046 Sec, Fault current Ir=1.07 kA, Ib=1.07 kA, Ic=0.98 kA, In=0.0 kA, Fault Type, R-N, Fault Phase, R-ph, Relay Trip Time, 23:53 hrs, Fault Clearance Time, 23:17 hrs, Fault resistance=1.1 Ohm,	Tripped on fault		Direct Tripped	Informed to SPPD. At no auto-reset time changed as 0.5 Kv/sec at 16:59 hrs due conductor sound and flash
12	[illegible]	132kV	Tripping	01-09-22	23:53 hrs	01-09-22	23:02 hrs	15	11	40.3	DEF/SOTF/3I>Sgh	Distance Relay Relay Trip R-ph/E, Loop Impedance, Distance, 0.52 Ohm, Fault location 0.7 Kms, Fault to ground, Distance, 0.52 Ohm, Relay Operating Time, 0.046 Sec, Fault current Ir=1.07 kA, Ib=1.07 kA, Ic=0.98 kA, In=0.0 kA, Fault Type, R-N, Fault Phase, R-ph, Relay Trip Time, 23:53 hrs, Fault Clearance Time, 23:02 hrs, Fault resistance=1.1 Ohm,	Tripped on fault		Direct Tripped	Informed to SPPD. At no auto-reset time changed as 0.5 Kv/sec at 17:59 hrs due conductor sound and flash
13	[illegible]	132kV	Tripping	01-09-22	11:22 hrs	01-09-22	11:26 hrs	0	4	8.59		Tripped on fault	Tripped on fault		Clear	Tripped at the instant on 132kV Tsirang-Dunlop tripping.
14	[illegible]	132kV	Tripping	01-09-22	11:52 hrs	01-09-22	11:57 hrs	0	5	8.59		132 volts, 50 Hz & line volts 30v operated	Tripped on fault		Clear	Tripped at the instant on 132kV Tsirang-Dunlop tripping.
15	[illegible]	132kV	Tripping	01-09-22	12:26 hrs	01-09-22	12:32 hrs	0	6	8.27	Time delay(50/51TD) Fuse operated	132 volts, 50 Hz & line volts 30v operated	Tripped on fault		Clear	Tripped at the instant on 132kV Tsirang-Dunlop tripping.
16	[illegible]	132kV	Tripping	01-09-22	19:51 hrs	01-09-22	20:10 hrs	0	19	8.6	DEF/SOTF/3I>Sgh	Tripped due to fault	Tripped on fault		Faulted	Informed to SPPD At no charged at 19:51 hrs At 132 kv, line couldn't closed
17	[illegible]	132kV	Tripping	01-09-22	23:53 hrs	02-09-22	23:17 hrs	0	38	8.6	DEF/SOTF/3I>Sgh	Distance Relay Relay Trip R-ph/E, Loop Impedance, Distance, 0.52 Ohm, Fault location 0.7 Kms, Fault to ground, Distance, 0.52 Ohm, Relay Operating Time, 0.046 Sec, Fault current Ir=1.07 kA, Ib=1.07 kA, Ic=0.98 kA, In=0.0 kA, Fault Type, R-N, Fault Phase, R-ph, Relay Trip Time, 23:53 hrs, Fault Clearance Time, 23:17 hrs, Fault resistance=1.1 Ohm,	Tripped on fault		Direct Tripped	Informed to SPPD. At no auto-reset time changed as 0.5 Kv/sec at 16:59 hrs due conductor sound and flash
Meeting: [illegible] Substation: 132/33kV Tsirang Substation Month: Sep-22																
Sl. No	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Tripping)	Shutdown/Tripping Time: Date	Shutdown/Tripping Time: Time	Normalization Time: Date	Normalization Time: Time	Duration of Outage: (Hrs)	Duration of Outage: (Min)	MW before Outage (MW)	Tripping Details: Protection Relay Signal	Tripping Details: Fault Details (As recorded by relay)	Type/Cause of Fault	Reason for Shutdown	Weather Condition during the shutdown	Remarks
1	132/33 Tsirang Feeder	132kV	Tripping	01-09-22	17:53 hrs	01-09-22	20:46 hrs	2	53	14.726	Distance Relay (DEF) and Back up Relay (51/GS)	Distance Relay (DEF) operated on Time, Trip, Over current fault, phase - fault relays, 50/51 Operation, A - Earth element, Distance, Over voltage time 51/51, Distance Trip, F, 3 51 Ohms, System Frequency, 49.89, fault duration, 2.163 ms, relay trip time 50/51 ms, fault location, 24.1 Kms, Ia=0.0A, Ib=0.11A, Ic=0.0A, In=0.11A pri, VAB=74.9 kV, VCA=75.0 kV, Fault Resistance = 27.2Ohm, Fault to Line, Line 1 Backup Relay (51/GS) - Earth Fault, 0.0, (50 second (A - 1, 50 = 1 sec(51) = 1, 0 time, Frequency=49.89 Hz, IA=0.0 kA, IB=70.0kA, IC=0.1 kA, VAB=0.0kV, VBC=0.0 kV, VCA=0.0kV, IN=0.77 kA, 0.0 Ohm, 0.0 Ohm, 0.0 Ohm

1. 220/66/33kV Dhajay Substation													
i) 66kV and above													
1	12.09.2022	09:19hrs	12.09.2022	09:35hrs	0		220kV Bus Coupler	Dhajay Substation		No 87/21 Relay	Substation	Tripped	Feeder restored after D4/66 bread. ESD Tsirang confirmed the clearance
2	24.09.2022	5.18hrs	24.09.2022	5.23hrs	0	19.72	Tsirang-Jigmeling Feeder	Dhajay Substation		error current	Distance relay trade 2(21.2)= Ia=454.03A, Ib=445.05A, Ic=728.24A, Ia=11.01A	Substation	Tripped	Feeder restored after D4/66 bread. ESD Tsirang confirmed the clearance
2. 132/66/33/11kV Gelephu Substation													
i) 66kV and above													
1	07.09.2022	09:05hrs	09.09.2022	10.45hrs	31	35	Gelephu-Jigmeling	Nil	Abnormal noise in SSG, Jigmeling	Nil	Gelephu Substation	Temporary	Shutdown taken to shift the Jigmeling Panel towards Salakati Panel (Overcrowdment of Panels due to Substation upgradation work)
2	24.09.2022	03:09hrs	24.09.2022	03:29hrs		10	gelu Salakati & Jigm	Gelephu & Jigmeling	Grid fail	Nil relay operated	Salakati Sub	Temporary	Supply extended from Jigmeling at 03.22hrs
3. 132/33kV Tsirang Substation													
i) 66kV & Above													
1	08.09.2022	11:29hrs	08.09.2022	11:49hrs	0	12.63	33kV Tsirang-Jigmeling-1	33kV Tsirang-Jigmeling-1	Temporary Fault	Distance Relay Start Phase:ABC,Trip Phase:ABC,Fault zone-1 trip,Fault location,XY 22.10 KM	22.10KM	Temporary	
2	08.09.2022	12:04hrs	08.09.2022	12:12hrs	0	12.74	33kV Tsirang-Jigmeling-1	33kV Tsirang-Jigmeling-1	Temporary Fault	Distance Relay Start Phase:AN,Trip Phase:ABC,Fault zone-1 trip,Fault location,XY 12.75 KM.	XY 12.75	Temporary	
3	22.09.2022	04:50hrs	22.09.2022	05:08hrs	0	20.72	33kV Tsirang-Jigmeling-1	33kV Tsirang-Jigmeling-1	Temporary Fault	Distance Relay Start Phase:ABN,Trip Phase:ABC,Fault zone-1 trip,Fault location,XY 22KM	20.22	Temporary	
4	22.09.2022	05:25hrs	22.09.2022	05:39hrs	0	30.79	33kV Tsirang-Jigmeling-1	33kV Tsirang-Jigmeling-1	Temporary Fault	Distance Relay Start Phase:ABC,Trip Phase:ABC,Fault zone-1 trip,Fault location,XY 30.80KM	17.64	Temporary	
5	22.09.2022	09:01hrs	22.09.2022	09:17hrs	0	18.58	33kV Tsirang-Jigmeling-1	33kV Tsirang-Jigmeling-1	Temporary Fault	Distance Relay Start Phase:ACN,Trip Phase:ABC,Fault zone-1 trip,Fault location,XY 9.0KM	17.64	Temporary	
6	22.09.2022	03:45hrs	22.09.2022	03:53hrs	0	27.3	33kV Tsirang-Jigmeling-1	33kV Tsirang-Jigmeling-1	Temporary Fault	Distance Relay Start Phase:BN,Trip Phase:ABC,Fault zone-1 trip,Fault location,XY 22 KM	35.22	Temporary	
7	23.09.2022	05:10hrs	23.09.2022	05:21hrs	0	21.61	33kV Tsirang-Jigmeling-1	33kV Tsirang-Jigmeling-1	Temporary Fault	Distance Relay Start Phase:ABC,Trip Phase:ABC,Fault zone-1 trip,Fault location,XY 22KM	41.29	Temporary	
8	23.09.2022	05:16hrs	23.09.2022	12.49hrs	7	23.41	33kV Tsirang-Jigmeling-1	33kV Tsirang-Jigmeling-1	Temporary Fault	Distance Relay Start Phase:ABCN,Trip Phase:ABC,Fault zone-1 trip,Fault location,XY 8.0KM	37.48	Temporary	
9	25.09.2022	02:39hrs	25.09.2022	02.59hrs	0	24.52	33kV Tsirang-Jigmeling-1	33kV Tsirang-Jigmeling-1	Temporary Fault	Distance Relay Start Phase:AN,Trip Phase:ABC,Fault zone-1 trip,Fault location,XY 24.53KM	34.53	Temporary	
10	28.09.2022	22:39hrs	28.09.2022	22:54hrs	0	41.27	33kV Tsirang-Jigmeling-1	33kV Tsirang-Jigmeling-1	Temporary Fault	Distance Relay Start Phase:AN,Trip Phase:ABC,Fault zone-1 trip,Fault location,XY 41KM	40.1	Temporary	
4. 132/33kV Samtse Substation													
i) 66kV & Above													
1	08.09.2022	16:49hrs	08.09.2022	16:47hrs	0	12.9	132kV Tingkhi-1/C	Samtse Sc	132/33kV, 20MVA Auto Transformer-1	50 relay oper	Samtse Sc		
2	17.09.2022	12:15hrs	17.09.2022	12:41hrs	0	15.9	132kV Tingkhi-1/C	Samtse Sc	Undervoltage	50 relay oper	Samtse Sc		Charged as per the SP
3	21.09.2022	09:31hrs	21.09.2022	09:24hrs	0	10.3	400/132kV, 315MVA Auto Transformer-3	Samtse Sc	WCT voltag	50 relay oper	Samtse Sc		Charged as per the SP
4	22.09.2022	08:02hrs	22.09.2022	08:07hrs	0	17.9	132kV Tingkhi-1/C	Samtse Sc	Undervoltage	50 relay oper	Samtse Sc		Charged as per the SP
5	23.09.2022	04:49hrs	23.09.2022	05:03hrs	0	27.4	400/132kV, 315MVA Auto Transformer-3	Samtse Sc	WCT voltag	50 relay oper	Samtse Sc		Charged as per the SP
6	23.09.2022	04:47hrs	23.09.2022	04:49hrs	0	34.5	132kV SHIRA Line-2	Samtse Sc	Grid fail	Nil	MSPS		On dated : 24.09.2022
5. 220/33kV Deothang Substation													
i) 66kV & Above													
1	23.09.2022	14:19hrs	23.09.2022	15.12hrs	0	16.28	Transformer II	Deothang SS	Alarm	Alarm trip relay A & B	Deothang SS Switchyard		Transformer II restored

Western grid Outages

July 2021

Sl No.	Date of Tripping	Time of outages	Date of Normalization	Time of fault was cleared	Duration of Outages (Hrs)	MW before outage (MW)	Feeder Name	Name of the Substation/lines affected by the fault	Reasons of fault	Relay operations	Exact location of fault [Line segment/ Substation]	Type of outages	Remarks
66kV & Above													
(A) 400/220/66/11 kV Malbase Substation													
1	01.07.22	7:46	01.07.22	8:06	0	551.27	400kV Malbase- Siliguri fdr.	Malbase Ss	O/C & E/F	Main I trip, Main II CAR RCV, 2M.I trip, fuse fail	193km		IL1=1672A<303.7deg,IL2=748.2A<255.3deg,IL3=718.4A<133.1deg,IL4=1599 A<270.9deg
2	03.07.22	17:20	03.07.22	17:27	0	151.9	200kV Malbase - Chukha feeder	Malbase Ss	O/C & E/F	Zone 1 trip, AR lock out shot	Zone 1= 8.001km		IA=3.679kA, I1=3.967kA, I3=3.732kA
##	10.07.22	3:06	10.07.22	4:35	1	5.6	200kV Malbase - Santse feeder	Dhamdum Ss	O/C on B phase	86 optd			IL1=75.95A<220.7deg,IL2=116.5A<235.3deg,IL3=2538A<41.95deg,IL4=2347 A<41.59deg
##	20.07.22	8:20	20.07.22	9:09	0	226	400kV Malbase- Siliguri fdr.	Malbase Ss & Siliguri Ss	O/C on Y & B phase	Zone 1 trip	38.35km		IL1=750A, I2= 3939A, I3=3623A
##	23.07.22	17:11	23.07.22	17:23	0		66kV Bus Coupler	Malbase Ss	O/C				R=13737.24A, Y=11481.81A, B=14715.29A
##	23.07.22	17:11	23.07.22	17:25	0	22	66kV Pasakha feeder I	Malbase Ss	O/C				R=129.11A<-103.18deg, Y=1796.66A<139.38deg, B=1230.16A<17.55A
##	23.07.22	17:11	23.07.22	18:24	1	0	66kV pling feeder	Malbase Ss	O/C				R=11.26kA, Y=11.72kA, B=1.32kA
##	28.07.22	11:38	28.07.22	13:55	2	20	66kV Pasakha feeder I	Malbase Ss		IEF SON_trip, 86 optd, general trip			IL1=210.56A<-82.05deg, IL2=925.15A<19.81deg, IL3=279.19A<98.05deg, IL4=976.52A<-156.05 deg
##	28.07.22	11:38	28.07.22	23:47	12	21	66kV Pasakha feeder II	Malbase Ss		51 Trip, 86 optd, General trip			IL1=0.19A< 0.05deg, IL2=656.03A<-156.39deg, IL3=662.70A<23.20deg, IL4=0.19A< 0.9 deg
##	28.07.22	11:38	28.07.22	23:47	12	23	66kV Pasakha feeder IV	Malbase Ss		IEF SON_trip, 86 optd, general trip			IL1=80%15< 14.74deg, IL2=1657.84A<17.40deg, IL3=208.51A<53.29deg, IL4=80%15< 14.74 deg
##	28.07.22	11:38	28.07.22	23:47	12		66kV Bus Coupler	Malbase Ss		IEF SON_trip, 86 optd, general trip, IEF_SO_trip			IL1=648.57A<-115.40deg,IL2=1246.04A<-131.24deg,IL3=256.83A<98.24deg,IL4=1294.29A< -131.26deg
##	28.07.22	11:38					66kV pling feeder	Malbase Ss	O/C	Trip phase N, Earth Fault I, Trip IN1>3			IL1= 8.397A, IL2= 9.697kA, IL3= 3.560kA, IL4= 9.699kA, The feeder still under breakdown due to 400kV Tala feeder I conductor got snapped and touched on transmission line of said feeder
(B)220/66/11 kV Singhigaon Substation													
1	17.07.22	5:32	17.07.22	5:45	0	0.897	220kV Singhi-Santse Feeder	Singyegaon ss					couldnt download fault due to Digsi software communication problem.
##	28.07.22	23:39	28.07.22	23:44	0	4	66kV B/Convent feeder	Singyegaon ss					IL1=113.84kA, IL2= 58.93kA, IL3= 95.53kA
(B)66/33/11 kV Phuntsholing Substation													
1	03.07.2022	17:19	03.07.2022	17:26	0	3.70	66kV Chukha-Pling feeder	66kV Chukha-Pling fdr		DSTN OPTD: 186&86	Tripped at both end		At 17:19hrs 66kV Chukha Pling feeder got tripped from both end. At 17:26hrs normalised the above feeder after getting clearance from BPSO with charging code 1652.
##	12.07.2022	6:30	12.07.2022	6:54	0	1.15	10MVA Voltamps TRF (66/11kV)	10MVA Voltamps TRF (66/11kV)	Tripped		Substation		10 MVA Transformer and 33kV Incomer II got tripped due to fault on 33kV fdr IV,Serina Bonokha.
##	14.07.2022	17:09	14.07.2022	17:24	0	3.27	66kV Chukha-Pling feeder and 66kV Pling-Gomtu feeder	Black out at Pling ss	Tripped at their end	Nill	Tripped at their end		66kV Chukha-Pling and 66kV Pling-Gomtu feeder got tripped at their end, no breaker operation at our end. At 17:24hrs normalised 66kV Chukha-Pling feeder from Chukha and at 17:27hrs normalised 66kV Gomtu feeder from Gomtu end.
##	15.07.2022	15:42	15.07.2022	15:44	0	1.93	10MVA Voltamps TRF (66/11kV)	10MVA Voltamps TRF (66/11kV)	Tripped	Nill	Substation		10 MVA Transformer and 33kV Incomer II got tripped due to fault on 33kV fdr IV,Serina Bonokha.
(D) 66/33/11 kV Gedu Substation													
1	03.07.2022	17:20	03.07.2022	17:28	0	1.72	66kV Gedu- Chukha	Blackout	Bad weather		Line segment		66kV supply failed from CHP. At 17:27hrs 66kV supply charged from Phuentsholing Substation.
	06.07.2022	9:02	06.07.2022	9:45	0	1.33	66/11kV 5MVA Tr- I	Nil	Tighten transformer NUT		Substation		Work permit no 78 issued to Substation Head for NUT tightening work.
2	14.07.2022	18:58	14.07.2022	19:10	0	1.69	66kV Gedu- Chukha	Blackout			Line segment		66kV supply failed from CHP. At 19:10hrs 66kV supply restored from Chukha.
3	31.07.2022	9:12	31.07.2022	9:27	0	1.5	66kV Gedu-Phuentsholing	Nil	Emergency shutdown at Phuentsholing end		Line segment		Emergency shutdown taken at Phuntsholing substation to rectify the faising sound from line isolator
(E) 66/33/11 kV Gomtu Substation													
1	11.07.2022	17:30	12.07.2022	10:50	17	0.01	66/33kV 5 MVA Transformer	Nil	over current	O/C with IDMT highset 50y and trip relay 86	Gomtu ss	Fault	Punctured line insulator
2	14.07.2022	17:09	14.07.2022	17:29	0	-6.824	66kV Dhamdhum feeder	Gomtu Substation	Transient fault	Distance Relay Operated	Line segment	Transient fault	Charged the feeder as per the instruction given by BPSO
2	14.07.2022	17:09	14.07.2022	17:27	0	2.66	66kV Phuentsholing feeder	Gomtu Substation	Earth fault	IDMT EF operated	Line segment	Transient fault	Charged the feeder as per the instruction given by BPSO
3	16.07.2022	19:01	16.07.2022	19:11	0	-5.362	66kV Dhamdhum feeder	Gomtu Substation	Tripped from Dhamdhum end	Nil	Line segment	Transient fault	Tripped from Dhamdhum end and supply resumed at 19:11hrs
3	16.07.2022	19:01	16.07.2022	19:14	0	3.61	66kV Phuentsholing feeder	Phuentsholing substation	Earth fault	E/F 37NX	Line segment	Transient fault	Tripped on earthfault and charged the line as requested by BPSO and charge withstand
4	19.07.2022	09:15	19.07.2022	10:25	1	2.82	66kV Phuentsholing feeder	Nil	Spark on R phase CB terminal	Nil	Gomtu substation	Emmergency Shutdown	Availed emergency shutdown by Substation Head against Work Permit No. 074, opening code 6868 and closing code 1751 from BPSO.
4	28.07.2022	18:56	28.07.2022	18:56	0	-7.634	66kV Dhamdhum feeder	Nil	B-Phase fault	Distance Relay Operated & A/R Operated; General trip,Zone One, trip, Z-Com trip & B-Phase fault	Line segment	Transient fault	Auto recloser operated and charged from Dhamdhum end at 19:09hrs of date 28.07.2022 against closing code 1854 from BPSO
(F) 220/66/33 kV Dhamdum Substation													
1	14.7.2022	17:10	14.7.2022	17:29	0	3.09	66kv Gomtu fdr	Gomtu	Heavy thundering,lightning,windy and raining at Gomtu area.	General trip,Zone 2 trip, Y phase faulty, vt fuse fail.	Heavy thundering,lightning,windy and raining at Gomtu area.	line fault	Feeder test after stopping the weather at gomtu area and consult with BOSO for test charging.
2	28.07.2022	18:56	28.07.2022	19:09	0	7.41	66kv Gomtu fdr	Gomtu	thundering,lightning,windy and raining at Semtse	General trip,Zone 1 trip, Y phase faulty	NA	line fault	REF670:General trip Zone 1,O/C on Y@ Abs Dist: 2.39 Re 1 Dist: 15.91% Fault loop - L2N # Charged the feeder based upon the charging Code:1854, BPSO T/phn, moreover after normalization of rain fall
Sl. No.	**Date of Tripping**	**Time of outages**	**Date of Normalization**	**Time of fault was cleared**	**Duration of Outages (Hrs)**	**MW before outage (MW)**	**Feeder Name**	**Name of the Substation/lines affected by the fault**	**Reasons of fault**	**Relay operations**	**Exact location of fault [Line segment/ Substation]**	**Type of outages**	**Remarks**
	(A) 66kV Chumdo switching station												
1	01.07.2022	1838hrs	01.07.2022	1845hrs		(-) 11.32MW	66kV Chukha Feeder	Paro substation	E/fault	Due to E/F 3A 151.4A IB 681.6A IC 157.5A	66kV Transmission Line	Trip	
2						7.65MW	66kV Panghara Feeder	Panghara Substation	Transient fault	IPh and General trip	66kV Transmission Line	Trip	
3				1922hrs		(-) 1.94MW	66kV Semtse Feeder	Paro and Panghara	Transient fault	IPh and General trip	66kV Transmission Line	Trip	Kept feeder open as per BPSO
4	28.07.2022	0958hrs	28.07.2022	2358hrs	4hrs	(-) 0.5MW	66kV Semtse Feeder	Fed from 66kV Chukha Feeder	S/down	CB open, Line&Bus isolator open, E/switch closed	Semtse substation	S/down	S/down by CNPD for checking the operation of Line and Bus isolators electrically as SCADA installation is in process at Jemina.
	(B) 66/33kV Watsa Substation												
1	07-01-22	18P.08hrs	07-01-22	18:47hrs		62.0MW	66KV IC	Feb I and II	66KV IC tripped at chukha end	66KV IC tripped at chukha end	66KV IC tripped at chukha end	Tripped	WTI tripped and reset the temperature to 75 with consultation with Mr. Head SMD, and the line charged.
	(C) 66/33kV Olakha Substation												
1	21-07-22	17:15	21-07-22	17:15	0	6.19	66/33kV 20MVA, Transformer I	Only 66/33kV 20MVA, Transformer I was effected	Over current and earth fault	Earth Fault Over Current Operated	Line Segment	Taken Shut down	The 66kV Chukha-Changidgkha was taken shut down by Manager Chandu Gyemtsho of THD, with work permit no 2507 and also with the shutdown approval from BPSO Thimphu for removal of flag pole installed at the line near Dogar Ex bypso area with breaker opening code 0820. The line was charged after completion of the work with closing code 1617 at 17:38hrs and stood normal.
	(D) 66/33/11kV Lobeysa Substation												
	66kV LSA - Gewathang feeder												
1	07.07.2022	06:15hrs	07.07.2022	06:20hrs	0	-20.620	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		NA			66kV LSA - Gewathang feeder tripped at 06:15hrs and supply resumed at 06:20hrs and at the time of tripping No breaker or relay operated at Lobeysa end
2	08.07.2022	19:40hrs	08.07.2022	19:50hrs	0	-17.970	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		NA			66kV LSA - Gewathang feeder tripped at 19:40hrs informed to BPSO and line charged at 19:50hrs from Gewathang ss and line extended to Dochula at 19:53hrs
3	09.07.2022	02:18hrs	09.07.2022	02:18hrs	0	-18.720	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		Dist relay operated(Zone 3 optd)			66kV LSA - Gewathang feeder tripped at 02:18hrs informed to BPSO and line charged at 02:19hrs from Gewathang ss and line extended to Dochula at 02:33hrs
4	09.07.2022	12:23hrs	09.07.2022	12:24hrs	0	-20.240	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		Dist relay operated(Zone 3 optd)			66kV LSA - Gewathang feeder tripped at 12:23hrs informed to BPSO and line charged at 12:24hrs from Gewathang ss and line extended to Dochula at 12:30hrs
5	20.07.2022	19:53hrs	20.07.2022	19:58hrs	0	-23.050	66kV LSA - Gewathang feeder	66/33/11kV Lobeysa substation		Dist relay operated(Trip B &C Zone 3 optd, IA-119.8A,IB-815.3,IC-696.1A)			66kV LSA - Gewathang feeder tripped at 19:53hrs informed to BPSO and line charged at 19:58hrs from Gewathang ss and line extended to Dochula at 20:03hrs
	66kV LSA - Dochula feeder												
1	07.07.2022	06:15hrs	07.07.2022	06:20hrs	0	15.470	66kV LSA - Dochula feeder			NA			66kV LSA - Dochula feeder tripped at 06:15hrs and supply resumed at 06:20hrs and at the time of tripping No breaker or relay operated at Lobeysa end
2	08.07.2022	19:40hrs	08.07.2022	19:53hrs	0	15.840	66kV LSA - Dochula feeder			NA			66kV LSA - Dochula feeder tripped at 19:40hrs informed to BPSO and line charged at 19:50hrs from Gewathang ss and line extended to Dochula at 19:53hrs
3	09.07.2022	02:18hrs	09.07.2022	02:18hrs	0	16.120	66kV LSA - Dochula feeder			NA			66kV LSA -Dochula feeder tripped at 02:18hrs informed to BPSO and line charged at 02:19hrs from Gewathang ss and line extended to Dochula at 02:33hrs
4	09.07.2022	12:23hrs	09.07.2022	12:24hrs	0	-20.240	66kV LSA - Dochula feeder			NA			66kV LSA - Dochula feeder tripped at 12:23hrs informed to BPSO and line charged at 12:24hrs from Gewathang ss and line extended to Dochula at 12:30hrs
5	20.07.2022	00:42hrs	20.07.2022	00:51hrs	0	14.850	66kV LSA - Dochula feeder			Dist Trip B & Dist Trip C,Zone 3 optd			Supply was resumed from Gewathang ss at 00:47hrs .66kV LSA - Dochula feeder tripped at 00:42hrs informed to BPSO and line extended at 00:51hrs
6	20.07.2022	12:42hrs	20.07.2022	12:51hrs	0	14.850	66kV LSA - Dochula feeder			Dist Trip B & Dist Trip C,Zone 3 optd			Supply was resumed from Gewathang ss at 00:47hrs .66kV LSA - Dochula feeder tripped at 00:42hrs informed to BPSO and line extended at 00:51hrs
7	21.07.2022	17:16hrs	21.07.2022	17:20hrs	0	17.200	66kV LSA - Dochula feeder			Dist Trip B & Dist Trip C,Zone 3 optd			66kV LSA - Dochula feeder tripped at 17:16hrs informed to BPSOand supply was extended from Gewathang at 17:17hrs and line extended at 17:20hrs towards Dochula

	(F) 66/33/11kV Jemina Substation												
66 kV side Tripping													
1	01.07.2022	18:39	01.07.2022	18:45	0	-3.870	66 kV Changedigba	Black out	Earth fault	Non directional E/F operated	Line Segment	Transient	
2	01.07.2022	18:39	01.07.2022	19:26	0	1.950	66 kV Chamdo	Black out	Earth fault	Non directional E/F operated	Line Segment	Transient	Wheather lightning at Chamdo end as per the BPSO personnel.
	(G) 66/33/11kV Dechencholing substation												
1	01.07.2022	18:20Hrs	01.07.2022	18:37hrs	0	-21.48	66KV 3C	All while ss	Supply failed from source				
2	20.07.2022	00:42Hrs	20.07.2022	00:48hrs	0	-21.29	66KV 3C	All while ss	Supply failed from source				
	(H) 66/11kV Haa Substation												
1	01-07-22	18:30	01-07-22	18:48	0	-1.68	All	unknown	O/C	pangbesa	Tripped from Pangbesa end		
2	14-07-22	0:44	14-07-22	0:59	0	-0.66	All	unknown	O/C	pangbesa	Tripped from Pangbesa end		
3	14-07-22	3:57	14-07-22	4:23	0	-0.56	All	unknown	O/C	pangbesa	Tripped from Pangbesa end		
4	15-07-22	1:57	15-07-22	2:10	0hr	-0.63	All	unknown	O/C	pangbesa	Tripped from Pangbesa end		
5	18-07-22	3:55	18-07-22	4:12	0	-0.51	All	unknown	O/C	pangbesa	Tripped from Pangbesa end		
	(I) 220kV Substation Semtokha												
1	01-07-22	18:21hrs	01-07-22	18:29hrs			66/33kV 20MVA-1 transformer	Semtokha Substation	REF Trip	REF Trip	Transient fault	Transer	
2	01-07-22	18:27hrs	01-07-22	18:57hrs		22.81	66kv Semtokha- Dechencholing Line	Dechencholing and Damji Substation	Distance protection Optd., Zone 1, Trip B	Distance protection Optd., Zone 1, Trip B	Transient fault	Transer	
3	07-07-22	06:15hrs	07-07-22	06:21hrs		49.05	66kv Semtokha-Dechula Line	Dechula s/s	Directional earth fault protection operated	OC/EF Optd. IN>>2 trip	Transient fault		
4	07-07-22	08:15hrs	07-07-22	08:21hrs		48.05	66kv Semtokha- Dechencholing Line	Dechencholing and Damji Substation	Broken Conductor	Distance protection Optd., BRC Trip	Transient fault		
5	08-07-22	19:49hrs	08-07-22	19:52hrs		45.90	66kv Semtokha-Dechula Line	Dechula s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip	Transient fault		
6	09-07-22	02:16hrs	09-07-22	02:26hrs		47.18	66kv Semtokha-Dechula Line	Dechula s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip	Transient fault		
7	09-07-22	12:23hrs	09-07-22	12:25hrs		45.81	66kv Semtokha-Dechula Line	Dechula s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip	Transient fault		
8	20-07-22	00:44hrs	20-07-22	00:53hrs			66kv Semtokha-Dechula Line	Dechula s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip , fault Current Ia=225.9A, Ib=1.345kA, Ic=1.174kA, In=17.49	Transient fault		
9	20-07-22	00:44hrs	20-07-22	00:53hrs			66kv Semtokha- Dechencholing Line	Dechencholing and Damji Substation	Broken Conductor	Tripped on Broken Conductor, Fault Current Ir=131.3A, Ib=89.83A, Ic=84.01A			
10	20-07-22	19:33hrs	20-07-22	19:38hrs			66kv Semtokha-Dechula Line	Dechula s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip , fault Current Ia=6.926A, Ib=1.734kA, Ic=1.544kA, In=0.00	Transient fault		
11	21-07-22	17:16hrs	21-07-22	17:31hrs			66kv Semtokha-Dechula Line	Dechula s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip , fault Current Ia=111.7A, Ib=1.761kA, Ic=1.681kA, In=0.00	Transient fault		
)66/33/11kV Pangbesa substation													
1	01.07.2022	18:36Hrs	01.07.2022	18:48Hrs	0		Haa Line	Haa	Shutdown	Tripped on E/F & O/C	Pan-Haa	Transient	Replacement of HT Fuse
2	14..07.2022	00:44Hrs	14..07.2022	1:00Hrs	0	0.7	Haa Line	Haa	Tripping	Dir.O/C	Pan-Haa	Transient	Cloudy
3	14..07.2022	3:58Hrs	14..07.2022	4:13Hrs	0	0.7	Haa Line	Haa	Tripping	Dir.O/C	Pan-Haa	Transient	Cloudy
4	14..07.2022	4:16Hrs	14..07.2022	4:22Hrs	0		Haa Line	Haa	Tripping	Dir.O/C	Pan-Haa	Transient	Cloudy
5	15..07.2022	1:56Hrs	15..07.2022	2:10Hrs	0		Haa Line	Haa	Tripping	Dir.O/C	Pan-Haa	Transient	Cloudy; Charged did not again
6	15..07.2022	2:10Hrs	15..07.2022	2:17Hrs	0		Haa Line	Haa	Tripping	Dir.O/C	Pan-Haa	Transient	Cloudy; Charged again,did not stand
7	15..07.2022	2:19Hrs	15..07.2022	2:39Hrs	0		Haa Line	Haa	Tripping	Dir.O/C	Pan-Haa	Transient	Cloudy; Charged again,did not stand
8	15..07.2022	2:39Hrs	15..07.2022	2:49Hrs	0		Haa Line	Haa	Tripping	Dir.O/C	Pan-Haa	Transient	Cloudy; Charged again,did not stand
9	15..07.2022	2:56Hrs	15..07.2022	3:08Hrs	0		Haa Line	Haa	Tripping	Dir.O/C	Pan-Haa	Transient	Cloudy; Charged Fault from Haa 11kV fdr
10	18..07.2022	3:58Hrs	18..07.2022	4:07Hrs	0		Haa Line	Haa	Tripping	Dir.O/C	Pan-Haa	Transient	Cloudy
	(L) 66/33kV Damji Substation												
1	01.07.2022	1821 hrs	01.07.2022	1851 hrs	0	-4	66 kV Incoming Line	Whole Substation	Trip	NA			Transmission Line tripped from Semtokha Substation (II Phase Tripped)
2	07.07.2022	0615 hrs	07.07.2022	0621 hrs	0	-4.13	66 kV Incoming Line	Whole Substation	Trip	NA			Transmission Line tripped from Semtokha Substation
3	08.07.2022	1113 hrs	08.07.2022	1114 hrs	0	-4.02	66 kV Incoming Line	Whole Substation	Trip	NA			Transmission Line tripped from Dechencholing Substation due to installation of starter
4	20.07.2022	0044 hrs	20.07.2022	0048 hrs	0	-4.05	66 kV Incoming Line	Whole Substation	Trip	NA			Transmission Line tripped from Semtokha Substation
	(M) 66/11kV Dochula Substation												
1	07-07-22	6:15	07-07-22	6:21		-31.83	66kV Semtokha	Semtokha - Dochula	Transit fault	under voltage and fd relay	Semtokha	Temporary	DHI
2	07-07-22	6:15	07-07-22	6:27		-30.24	66kV lobeysa	Lobeysa - Dochula	Transit fault	under voltage and fd relay	Lobeysa	Temporary	DHI
3	09-07-22	19:48	09-07-22	19:57		-31.16	66kV Semtokha	Semtokha - Dochula	Transit fault	under voltage and fd relay	Semtokha	Temporary	DHI
4	09-07-22	19:48	09-07-22	20:09		-29.55	66kV Lobeysa	Lobeysa - Dochula	Transit fault	under voltage and fd relay	Lobeysa	Temporary	DHI
5	09-07-22	2:20	09-07-22	2:33		-31.92	66kV Semtokha	Semtokha - Dochula	Transit fault	under voltage and fd relay	Semtokha	Temporary	DHI
6	09-07-22	2:20	09-07-22	2:47		-30.34	66kV lobeysa	Lobeysa - Dochula	Transit fault	under voltage and fd relay	Lobeysa	Temporary	DHI
7	09-07-22	12:23	09-07-22	12:25		-31.88	66kV Semtokha	Semtokha - Dochula	Transit fault	under voltage and fd relay	Semtokha	Temporary	DHI
8	09-07-22	12:23	09-07-22	12:35		-30.17	66kV lobeysa	Lobeysa - Dochula	Transit fault	under voltage and fd relay	Lobeysa	Temporary	DHI
9	20-07-22	0:43	20-07-22	0:53		-29.67	66kV lobeysa	Lobeysa - Dochula	Transit fault	under voltage and fd relay	Lobeysa	Temporary	DHI
10	20-07-22	0:43	20-07-22	0:55		-31.42	66kV Semtokha	Semtokha - Dochula	Transit fault	under voltage and fd relay	Semtokha	Temporary	DHI
11	20-07-22	19:33	20-07-22	20:08		-29.96	66kV lobeysa	Lobeysa - Dochula	Transit fault	under voltage and fd relay	Lobeysa	Temporary	DHI
12	20-07-22	19:33	20-07-22	19:59		-31.65	66kV Semtokha	Semtokha - Dochula	Transit fault	under voltage and fd relay	Semtokha	Temporary	DHI
13	21-07-22	17:16	21-07-22	17:22		-30.28	66kV lobeysa	Lobeysa - Dochula	Transit fault	under voltage and fd relay	Lobeysa	Temporary	DHI
14	21-07-22	17:16	21-07-22	17:32		-31.84	66kV Semtokha	Semtokha - Dochula	Transit fault	under voltage and fd relay	Semtokha	Temporary	DHI

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Sl No.	Date of Tripping	Time of outages	Date of Normalizati on	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
66kV & Above													
(A) 400/220/66/11 kV Malbase Substation													
1	01.08.2022	19:07	01.08.2022	21:05	2	139	200MVA ICT	Malbase Ss	PRD OPTD	PRD Y- Phase, 86 OPTD			IL1=276.3A,IL2=259.4A,IL3=231.3
2	08.08.2022	7:23	08.08.2022	7:29	0	25	66kV Panakha I	Malbase Ss	O/C on R-phase	86 OPTD, General trip IEF 50N trip	line		IL1=1825.53A<-13.31, I2=219.37A<-130.54, I3=505.41A<151.16, IL4=1176.84a<164.00
3	08.08.2022	7:23	08.08.2022	7:30	0	26	66kV Panakha II	Malbase Ss	O/C on Y-phase	86 OPTD, General trip IEF 50N trip	line		IL1=.20A<132.92, I2=742.12A<-55.73, I3=220.20A<-106.15
4	08.08.2022	7:23	08.08.2022	7:30	0	5.6	66kV Panakha IV	Malbase Ss	O/C on R-phase	86 OPTD, General trip IEF 50N trip	line		IL1=2315.03A<-50.57, I2=292.37A<-90.58,IL3=180.51A<38.88
5	18.08.2022	14:57	18.08.2022	15:17	0	22	50/63 MVA Transformer I	Malbase Ss		86 OPTD,LBB-Trip,general Trip			IL1=110.88A<114.2 IL2=75.28A<174.65,IL3=313.88A<-52.28
6	18.08.2022	14:57	18.08.2022	1:12	10	23	50/63 MVA Transformer III	Malbase Ss		OLTC BUCH Trip,DEF Trip,86 OPTD			IL1=140.56A,119.04,IL2<104.47A,166.39,IL3<189.88<120.21
7	18.08.2022	14:57	26.08.2022	16:59	194	59.2	220kV Malbase- Birpara fdr	Malbase Ss& Birpara SS		Zone 1 trip, AR OPTD	1.533KM		IL1=7.602KA, I2= 919.3A, I3=571.2A
8	18.08.2022	14:57	26.08.2022	17:12	194	70	220kv Malbase- Singhigaon fdr	Malbase Ss& Birpara SS		Dis Pickup I3 ON, Loop L3-Ef	7Km		IL1=20kA,IL2=0.01KA,IL3=7.76KA
9	18.08.2022	14:57	18.08.2022	15:17	0	22	66kV LV 606	Malbase Ss		51N START	E/S		R=171.26A<97.6, Y=182A<-130, B=310A<119, N=408.93A<127.89
10	19.08.2022	6:35	19.08.2022	6:50	0	64	200MVA ICT	Malbase Ss	Temporary fault	86 OPTD	E/S		IL1=.131A,IL2=.004A,IL3=.095A
11	19.08.2022	6:35	19.08.2022	7:51	1	11	220kVMalbase-Samtse fdr	Malbase Ss-Samtse	Temporary fault	87 OPTD	line		IL1=58.774A<69.27,IL2=36.41A<254.4,IL3=59.17A<187.2,IL4=58.52A<187.3
12	19.08.2022	6:35	19.08.2022	10:26	3	79	220kVMalbase-Chukha fdr	Malbase Ss- Chukhal/S	Strart R-phase,	87 OPTD	line		IL1=384.2A<249.9,IL2=221.4A<57.86<57.86,IL3=568A<38.75IL4=58.52A<330.3
13	19.08.2022	6:35	19.08.2022	7:59	1	44	50/63 MVA Transformer I	Malbase Ss		86 OPTD,BBP OPTD	E/S		IL1=.01A<249.9,IL2=.06A<-91.03,IL3=.03A<-140.11,IL4=.00A<-173.34
14	19.08.2022	6:35	19.08.2022	7:32	0	42	66kV Panakha feeder I	Malbase Ss	O/C, E/F	IOC 50 Trip,IEF50N Trip,General Trip,86 OPTD	line		IL1=54.74A<-48.83,IL2=316.74A<-120.62,IL3=5859.39A<74.71,IN=5157.37A<-166.02
15	19.08.2022	6:35	19.08.2022	6:49	0			Malbase Ss	O/C, E/F	IEF 50N_trip, 86 optd, general trip, IEF_50_trip			IL1=6430.49A<54.29,IL2=639.18A<128.62,IL3=6485.32A<109.52,IN=7519.76A<113.68
16	20.08.2022	1:45	20.08.2022	5:03	3	18.4	220kVMalbase-Samtse fdr	Malbase Ss-Samtse	E/F	M1 Trip, R phase Trip,Zone 1 Trip, R/U Trip	30.3 KM		IL1=184.6A,IL2=3503A,IL3=163.3A,IN=3286A
17	21.08.2022	5:32	21.08.2022	5:42	0	17	220kVMalbase-Samtse fdr	Malbase Ss-Samtse	O/C on B phase and Y -phase	M1 Trip, Zone 1 Trip,			IL1=6883A,IL2=6477A,IL=131.4A,IN=5197A
18	21.08.2022	5:32	21.08.2022	5:40	0	66	200MVA ICT	Malbase Ss	Temporary fault	87 OPTD			IL1=199.5A<30.96,IL2=185.6A<-84.24,IL3=158.1A<-155.3
19	21.08.2022	11:09				41	50/63 MVA Transformer I	Malbase Ss	LBB & PRD operated did not charged, keped under shutdown	LBB Trip, 86POTD	S/S		LI1=289.54A<-2.17,LI2=280.11A<24.48,IL3=314.28A<110.06
20	21.08.2022	11:09	21.08.2022	14:17	3		66kV Bus Coupler	Malbase Ss	O/C on R,Y& B Phase	51 Trip, 86OPTD	S/S		IL1=1762.53A,IL2=1743.75A<-119.75,IL3=1772.81<120.53,IL4=175.1A<-90.38
21	21.08.2022	11:09	21.08.2022	14:19	3	50	66kV panakha IV	Malbase Ss	O/C	51 Trip, 86OPTD	line		IL1=706.4A,IL2=289.53A<-120.42,IL3=790.83A<120.11
22	21.08.2022	11:09	21.08.2022	14:18	3	44	66kV panakha II	Malbase Ss	O/C	51 Trip, 86OPTD	line		IL1=.22A<.00,IL3=577.20A<-75.72,IL3=601.78A<-102.18
23	24.08.2022	18:10	24.08.2022	18:16	0	24	200MVA ICT	Malbase Ss	Temporary fault	86 OPTD	I		IL1=.073A<192.4,IL2=.047A<72.17,IL3=.057A<-134.3
24	21.08.2022	11:29	21.08.2022	15:21	3	-12.65	66kV malbase- Phuntsholing	Malbase Ss-Phuntsholing S/S	O/C	O/C Trip I> I,E/F I	line		IA=530.4A,IB=505A,IC=503.2A,IN=4467A
25	21.08.2022	18:10	21.08.2022	18:32	0	-31	220kVMalbase-Chukha fdr	Malbase Ss- Chukhal/S	Temporary fault	86 optd>	line		IL1=80.05A<145.1,IL2=65.98A<21.98,IL3=67.44A<276,IL4=5087A<70.5
26	21.08.2022	18:10	21.08.2022	18:30	0	15	66kV Panakha IV	Malbase Ss	O/C	IEF-50N-ON-trip,General trip,86trip	line		IL1=2345.65A<123Bdeg,IL2=372.65A<73.8deg,IL3=215.33A<1.47deg
27	21.08.2022	18:10	21.08.2022	18:19	0	23	50/63 MVA Transformer III	Malbase Ss	Temporary fault	BBP optd,Differential optsd,	S/S		IL1=.36A<11.32deg,IL2=.218.14A<120deg,IL3=203.7BA<110.97deg
28	21.08.2022	18:10	21.08.2022	18:33	0	13	220kVMalbase-Samtse fdr	Malbase Ss-Samtse	Temporary fault	B/B Trip	line		IL1=52.76A<71.85deg,IL2=32.99A<262.8deg,IL3=44.16A<139.2degIL4=51.50A<114.8deg
29	23.08.2022	14:32	23.08.2022	14:35	0	31	50/63 MVA Transformer III	Malbase Ss	Temporary fault	86 optd,Differential optsd,	S/S		IL1=183.66A<6.41deg,IL2=72.46A<20.01deg,IL3=102.86A<81.95degIL4=282.29A<20.16deg
30	23.08.2022	14:32	23.08.2022	14:47	0	3	220kVMalbase-Samtse fdr	Malbase Ss-Samtse	O/C on y phase and with E/F	Main-1protection trip>O/C relay trip<Loop L2-N	line		IL1=92.18A<350.7deg,IL2=3733A<160.8deg,IL3=33.3A<14.36degIL4=3603A<161.5deg
31	23.08.2022	14:48	23.08.2022	16:18	1	3	220kVMalbase-Samtse fdr	Malbase Ss-Samtse	O/C on Y & B phase and with E/F	General trip<Main-1 trip	line		IL1=56.29A<323.0deg,IL2=4350A<171.9deg,IL3=4075A<34.8degIL4=3153A<103.6deg
32	26.08.2022	18:35	26.08.2022	18:47	0	35	50/63 MVA Transformer III	Malbase Ss	Temporary fault	86OPTD, 027 Trip, Diff Trip,	S/S		IL1=40.63A<59.53 deg, IL2<364.11A<-52.67 deg, IL3<279.86A<-170.42 deg IL4< 300.45A<-80.05 deg
33	26.08.2022	18:35	27.08.2022	14:47	20	36.00	220kV Malbase- Birpara fdr	Malbase Ss& Birpara SS	Birpara line LA got punctured.	Phase ABC, Distance zone 1 trtpped, AR Lockout., Fault location= 509.3m.	line		IA= 772.5A, IB= 639.9A, IC= 7.441kA
34					0								
35					0								
(B)220/66/11 kV Singhigaon Substation													
1	17.07.22	3:32	17.07.22	3:45	0	0.897	220kV Singhi-Samtse Feeder	Singyegaon ss					couldnt download fault due to Digsi software communication problem.
2	18.07.22	12:00	18.07.22	13:58	1	0.02	11kV Feeder 1	Singyegaon ss					IL1= 9.05kA, IL2= 7.87kA IL3= 1.7 kA
3	18.07.22	17:50	18.07.22	20:35	2	3226	11kV feeder II	Singyegaon ss					IL1= 0.03kA, IL2= 7.95kA IL3= 0.05kA
4	19.07.22	10:40	19.07.22	10:42	0	0.13	11kV Feeder I	Singyegaon ss		Transit Fault			IL1= .01kA, IL2= 0.01kA, IL3= 0.1%A
5	23.07.22	16:59	23.07.22	17:31	0	0.122	11kV Feeder 1	Singyegaon ss					IL1= 1.05kA, IL2= 0.01kA, IL3= 1.16kA
6	24.07.22	9:09	24.07.22	9:10	0	0.057	11kV feeder I	Singyegaon ss	o/c & E/F,IEF Trip, General trip				IL1=8.29kA, IL2= 0.01kA, IL3= 0.01kA
7	26.07.22	20:58	26.07.22	21:15	0	0.953	11kV feeder II	Singyegaon ss		Tripped on O/C T&B Phase			IL1= 9.07kA, IL2= 5.54kA, IL3= 3.11kA
8	28.07.22	15:39	28.07.22	15:44	0	8	66kV B/Concast feeder	Singyegaon ss					IL1=113.04kA, IL2= 58.93kA, IL3= 95.53kA

(B)66/33/11 kV Phuntsholing Substation														
1	13.08.2022	18:36	13.08.2022	18:40	0	-4.77	66kV Chukha-Pling feeder	Black out at Pling ss			Tripped at chukha end		At 18:36hrs 66kV Chukha-Pling feeder got tripped from chukha end and 66kV Pling-Gomtu feeder got tripped at our end causing black out at Pling. At 18:40hrs normalised the 66kV Chukha-Pling from Chukha end and at 18:45hrs normalised 66kV Pling-Gomtu feeder after getting clearance from BPSO.
2	13.08.2022	18:36	13.08.2022	18:45	0	-1.04	66kV Pling-Gomtu fdr	Black out at Pling ss	Overcurrent	Ia- 995.7A, Ib- 1.038kA,Ic- 51.71A,VAB- 4.560kV,VBC- 54.08kV,VCA 57.51kV, INM-11.72A IND-12.38A	Tripped at our end		
3	14.08.2022		14.08.2022	14:24		Idle charge	66kV Pling Malbase fdr	66kV Pling Malbase fdr					At 18:24hrs charged 66kV Pling-Malbase feeder which was under idle charge condition with closing code 111 from BPSO. At 18:59hrs opened CB of above fdr with opening code 0943 from BPSO and said feeder kept under idle charged condition.
4	14.08.2022	14:26	14.08.2022	18:56	4	-1.57	66kV Pling-Gomtu fdr	66kV Pling-Gomtu fdr	Shutdown	Nill	Line		At 14:26hrs 66kV Pling-Gomtu feeder taken shut down by TMD,Pling against work permit no 004 with opening code 0941 from BPSO for RoW clearing between location PP# 2 to PP# 3. At 18:56hrs normalised with closing code 114 from BPSO.
5	18.08.2022	15:25	18.08.2022	15:32	0	-2.97	66kV Chukha-Pling feeder	Black out at Pling ss	Tripped at their end	Nill	Tripped at their end		Tripped at Chukha end.
6	18.08.2022	15:25	18.08.2022	15:45	0	-3.15	66kV Pling-Gomtu fdr	Black out at Pling ss	Earthfault	Ib>>, Ia- 34.61A, Ib- 1.036kA,Ic- 1.052kA,VAB- 46.21kV,VBC- 9.162kV,VCA-44.53kV, INM-638.4A IND-638.1A, Van-21.37kV, Vbn- 17.13kV, Vcn--13.69kV	Substation		Tripped at our end. At 15:45hrs test charged after getting clearance from BPSO and stood normal.
7	18.08.2022		18.08.2022	15:28		Idle charge	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 15:28hrs charged 66kV Pling-Malbase feeder which was under idle charge condition with closing code 134 from BPSO, since 66kV Chukha-Pling supply fail from Chukha end and 66kV Pling-Gomtu tripped at our end. At 15:57hrs opened CB of above fdr with opening code 0934 from BPSO and said feeder kept under idle charged condition.
8	19.08.2022		19.08.2022	9:34		Idle charge	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 09:34hrs as per instruction from BPSO charged 66kV Pling-Malbase feeder which was under idle charge condition with closing code 134 from BPSO due to voltage fluctuation. On dated 21.08.2022 at 11:39hrs opened CB of 66kV Pling-Malbase feeder with opening code 0943 from BPSO and feeder kept under idle charged condition.
9	21.08.2022	11:09	21.08.2022	11:29	0	-0.87	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder		DSTN OPTD: 186&86			Test charged as per instruction from BPSO with charging code 186 but didn't withstand. Informed to BPSO. At 11:39hrs test charged with same charging code as per instruction from BPSO and stood normal.
10	21.08.2022	11:09	21.08.2022	11:16	0	-0.97	66kV Pling-Gomtu fdr	66kV Pling-Gomtu fdr		operated only 186 & 86			At 11:16hrs test charged as per instruction from BPSO with charging code 157 and stood normal.
11	21.08.2022		21.08.2022	15:24		Idle charge	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 15:24hrs as per instruction from BPSO charged 66kV Pling-Malbase feeder which was under idle charge condition with closing code 160 from BPSO. At 17:13hrs opened CB of 66kV Pling-Malbase feeder with opening code 0962 as per instruction from BPSO and feeder was put back to idle charged condition.
12	25.08.2022		25.08.2022	16:05		Idle charge	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 16:05hrs as per instruction from BPSO charged 66kV Pling-Malbase feeder which was under idle charge condition with closing code 190 from BPSO. At 16:11hrs opened CB of 66kV Pling-Malbase feeder with opening code 09684 as per instruction from BPSO and feeder was put back to idle charged condition. The operation was carried out to build up the voltage.
13	26.08.2022		26.08.2022	9:51		Idle charge	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 09:51 66 kV Pling -Malbase feeder charged from our end with charging code 196 from BPSO due to high rise in winding temperature of 50/63MVA transformer II & III at Malbase end. At 17:31hrs opened CB of 66kV Pling-Malbase feeder with opening code 0986 from BPSO and said feeder was put back to idle charged condition.
(D) 66/33/11 kV Gedu Substation														
1	13.08.2022	18:55	13.08.2022	18:40	0	1.3	66kV Gedu-Chukha Feeder	Black out	Tripped from Chukha end.		Line segment		66kV supply restored from Chukha end.
2	18.08.2022	15:26	18.08.2022	15:32	0	1.53	66kV Gedu-Chukha Feeder	Black out	Tripped from Chukha end.		Line segment		66kV supply restored from Chukha end.
(E) 66/33/11 kV Gomtu Substation														
1	13.08.2022	18:55	13.08.2022	18:44	0	-9.279	66kV Dhamdhum feeder	Whole Gomtu	Grid failed	Nil	Chukha		tripped from Dhamdhum end
2	13.08.2022	18:55	13.08.2022	18:43	0	0.96	66kV Gomtu-Phuntsholing	Whole Gomtu	Grid failed	Nil	Chukha		Tripped from pling end
##	18.08.2022	15:25	18.08.2022	15:57	0	-7.784	66kV Dhamdhum Line	Gomtu	Tripped	General tripped.	Gomtu SS	Tripped	Supply charged as per the BPSO Instruction.
(F) 220/66/33 kV Dhamdhum Substation														
1	18.08.2022	14:56	24.08.2022	18:02	3	-3.16	Singaygaon	Dhamdhum	heavy rain with wind	REL 670 trip	NA		Line tripped due to E/F on BØ faulty, Zone: 1(General trip) 400KV conductor snap and fall on 220KV line. So Fdr: Kept under shut down
2	23.08.2022	14:53	23.08.2022	14:47	0	-13.12	220kV Malbase feeder	Dhamdhum	heavy rain with wind	REL 670 trip	NA		Feeder tripped due to, Zone 1(General trip)R,Y,B Fault and VT fuse fail but only Breaker trip from Malbase end
3	23.08.2022	14:48	23.08.2022	16:18	1	-13.12	220kV Malbase feeder	Dhamdhum	heavy rain with wind	REL 670 trip	NA		Feeder tripped from Malabase end.Relay indicated, Zone: 1(General trip),R,Y,B Fault and VT fuse fail only
4	24.08.2022	15:15	25.08.2022	13:34	22	6.74	50/63mva Transformer II	Dhamdhum	sunny	shut down	NA		50/63MVA transformer II taken emergency shut down due to abnormal sound produced from the Circuit breaker BØ against work permit No:1598. BPSO shutdown code no. 0965
5	13.08.2022	18:55	13.08.2022	18:44	0	9.24	Gomtu	-	Transient fault	REC670	NA	-	Tripped on O/C.Fault current value 1) I.1 = 2.250A 2) I.2= 2.424A 3) I.3= 2.318A 4) I0= 0.001A
6	18.08.2022	15:43	18.08.2022	15:53	0	0.2	Gomtu	-	Transient fault	REC670	NA	-	Tripped on O/C.Fault current value(Y & BØ) 1) I.1 = 0.294A 2) I.2 =1.998A 3) I.3 = 1.965A 4) I0= 0.001A
7	23.08.2022	14:02	23.08.2022	14:05	0	9.2	66kV Gomtu feeder	-	Transient fault	REL 670 General trip,Zone2 trip,Bphase fault.	NA	-	Fault current value(BØ) I1= Fault mag.=162.22A, Fault angle=14.75deg. I2= Fault mag= 42.19A,Fault angle=145.81deg. I3=1882.45A,Fault angle= 43.65deg.
8	23.08.2023	14:02	23.08.2023	14:12	0	0	66kV Bus coupler	-	Transient fault	no relay operation	NA	-	Trip same time with Gomtu feeder.
	(B) 66/33kV Wanza Substation													
1	08-01-22	9:46hrs	08-01-22	10:06hrs		5.630MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped		
2	08-02-22	7:10hrs	08-02-22	7:50hrs		5.900MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped		
3	08-02-22	10:49hrs	08-02-22	11:15hrs		5.555MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped		
4	08-03-22	13:04hrs	08-03-22	13:22hrs		5.304MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped		
5	08-03-22	19:40hrs	08-03-22	19:52hrs		5.810MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped		
6	08-05-22	8:19hrs	08-05-22	8:40hrs		5.380MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped		
7	08-05-22	9:39hrs	08-05-22	10:02hrs		5.280MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped		
8	08-05-22	10:56hrs	08-05-22	11:22hrs		5.280MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped		
9	11/8/2022	17:50hrs	11/8/2022	17:56hrs		450MW	66KV SF6 breaker	Fdr. I and II	Earth fault on Y phase	Earth fault on Y phase	Fdr. II Chapcha	Tripped	Tree fallen on line	
10	26/8/2022	8:45hrs	26/8/2022	8:50hrs		350MW	66KV SF6 breaker	Fdr. I and II	Earth Fault	EF relay operated	Fdr. I Chuzi	Tripped	Tree fallen on 33KV line so put ESD betikha. Line charged after opening faulty section as per ESD betikha.	
11	28/8/2022	00.20hrs	28/8/2022	00.30hrs		245MW	66KV SF6 breaker	Fdr. I and II	OC and EF on ABC phase	OC and EF on ABC phase	Fdr. II Chapcha	Tripped	Test charged at 00.23hrs but line could not hold and breaker charged after opening isolator of fdr. II chapcha	
	(C) 66/33kV Olakha Substation													
1	01-08-22	2:33	01-08-22	2:42	0	2.86	66/33kV 20MVA, Transformer I	All the 33kV was effected as the 20MVA Transformer I & II was tripped	Over current and earth fault	Earth Fault Over Current Operated	Distribution line	Transient fault	Reset the relays and test charged the feeders and stood normal.	
2	03-08-22	2:33	03-08-22	2:42	0	2.86	66/33kV 20MVA, Transformer II	All the 33kV was effected as the 20MVA Transformer I & II was tripped	Over current and earth fault	Earth Fault Over Current Operated	Distribution line	Transient fault	Reset the relays and test charged the feeders and stood normal.	
3	04-08-22	5:04	04-08-22	5:25	0	3.15	66/33kV 20MVA, Transformer I	All the 33kV was effected as the 20MVA Transformer I & II was tripped	Over current and earth fault	Earth Fault Over Current Operated	Distribution line	Transient fault	Reset the relays and test charged the feeders and stood normal.	
4	04-08-22	5:04	04-08-22	5:29	0	3.13	66/33kV 20MVA, Transformer II	All the 33kV was effected as the 20MVA Transformer I & II was tripped	Over current and earth fault	Earth Fault Over Current Operated	Distribution line	Transient fault	Reset the relays and test charged the feeders and stood normal.	
	(G) 66/33/11kV Deothangkha substation													
1	23.08.2022	08.46Hrs	23.08.2022	09.56Hrs	0	4.213	66KV Dantj line	only Dantj line	Tripped on Distance relay.	Dist relay: IA-44.02A, IB-1.55KA, & IC 1.515KA, Fault resistance -2.049Ω	Fault location: 29.23KM, Zone-1	Tripped	charged the fdr as per the BPSO charging code No 163 and hold the fdr normally.	
	(H) 66/11kV Haa Substation													
1	21.08.2022	15:35	21.08.2022	15:46	0	-0.91	66kV incomer	All	unknown	O/C	Paugbesa	The supply was normalised after resetting the relay.		
2	26.08.2022	6:06	26.08.2022	6:22	0	-0.81	66kV incomer	All	unknown	O/C & E/F	Paugbesa	The supply was normalised after resetting the relay.		

(J) 220kV Substation Semtokha													
1	01-08-22	16:21hrs	01-08-22	18:23hrs		48.46	66kv Semtokha-Dechnila Line	Dechnila s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip.IA=240.1A,IB=5.36kA, IC=5.80(kA&IN=17.39A		Transnt	
2	04-08-22	05:09hrs	04-08-22	05:10:00hrs		48.46	66kv Semtokha-Dechnila Line	Dechnila s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip.IA=211.7A,IB=5.39kA, IC=5.81(kA&IN=16.88A		Transnt	
3	10-08-22	07:31hrs	10-08-22	07:34hrs		46.83	66kv Semtokha-Dechnila Line	Dechnila s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip.IA=271A.7A,IB=5.71(k A,IC=5.52(kA&IN=17.99A		Transnt	
4	21-08-22	05:13hrs	21-08-22	05:47hrs		47.31	66kv Semtokha-Dechnila Line	Dechnila s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip.IA=303.5A.7A,IB=5.68k A,IC=5.45kA&IN=17.13A		Transnt	
5	26-08-22	18:34hrs	21-08-22	18:40hrs		47.22	66kv Semtokha-Dechnila Line	Dechnila s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>2 Trip O/C.IA=285.2A,IB=5.79kA, IC=5.60(kA		Transnt	
(K) 66/33kV Changidaphu Substation													
1	26-08-22	18:34hrs	26-08-22	18:50hrs		-5.05	66kV Changidaphu-Olakha Line	66kV Changidaphu-Olakha Line		Distance Protection, Zone 2 Yph Trip, R=120.162, Y=566.032, B=625.669		Transnt	
(L) 66/33kV Damji Substation													
1	23.08.2022	0844 hrs	23.08.2022	0858 hrs	0	-3.83	66 kV Incoming Line	Whole Substation	Trip	NA			Transmission Line tapped from Dechencholing Substation
(M) 66/11kV Dochula Substation													
1	01.08.22	16:21	01.08.22	16:25		-32.06	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and I0 relay	Semtokha	Temporary	1
2	01.08.22	17:21	01.08.22	18:31		-30.67	66kV Lobeyna	Lobeyna - Dochula	Transit fault	Under voltage and I0 relay	Lobeyna	Temporary	1
3	04.08.22	5:05	04.08.22	5:11		-31.70	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and I0 relay	Semtokha	Temporary	1
4	04.08.22	5:05	04.08.22	5:18		-30.24	66kV Lobeyna	Lobeyna - Dochula	Transit fault	Under voltage and I0 relay	Lobeyna	Temporary	1
5	10.08.22	7:31	10.08.22	7:33		-32.04	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and I0 relay	Semtokha	Temporary	1
6	10.08.22	7:31	10.08.22	7:37		-30.42	66kV Lobeyna	Lobeyna - Dochula	Transit fault	Under voltage and I0 relay	Lobeyna	Temporary	1
7	21.08.22	5:32	21.08.22	5:48		-32.89	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and I0 relay	Semtokha	Temporary	1
8	21.08.22	5:32	21.08.22	5:52		-30.29	66kV Lobeyna	Lobeyna - Dochula	Transit fault	Under voltage and I0 relay	Lobeyna	Temporary	1
9	26.08.22	18:34	26.08.22	18:48		-25.84	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and I0 relay	Semtokha	Temporary	1
10	26.08.22	18:34	26.08.22	18:43		-27.90	66kV Lobeyna	Lobeyna - Dochula	Transit fault	Under voltage and I0 relay	Lobeyna	Temporary	1

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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
66kV & Above													
(A) 400/220/66/11 kV Malbase Substation													
1	06-09-2022	0:08	06-09-2022	0:12	0	33	50 MVA transformer III	Malbase Substation	Tripping	86optd, Diff Harm Blk			IL1= 85.52<-167.70deg , IL2= 152.33A<-64.93deg,IL3= 317.11A<-61.26deg,IL4= 178.63<-61.14deg. Transformer charged with charging code 252/BPSO
2	06-09-2022	0:08	06-09-2022	0:22	0	-134	220kV Chukha feeder III	Malbase Substation	Tripping	MiCOM Relay, START RN, Tripped Phase,ABC,Start Element Distance, Distance trip Zone ,AR lockout shot ,system frequency 49.93, fault duration:53.41ms, Relay time :81.78ms.	11.42 km		IA= 488.8A ,IB=5.40kA,IC=267.1A, Charged with Code 251/BPSO
3	07-09-2022	15:51	07-09-2022	15:59	0	-	66kV Bus Coupler	Malbase Substation	Tripping	86 optd ,REF_SUN Trip,IOC_50-TRIP,GENERAL TRIP			IL1=11.2928A/-59.91deg,IL2=125.07A/-61.57deg,IL3=13239.57A/82.06deg, IL4= 9495.09A/20.76deg
4	07-09-2022	15:51	07-09-2022	15:59	0	17	66kV Panakha fdr no I	Malbase Substation	Tripping	86 optd ,REF_SUN Trip,IOC_50-TRIP,GENERAL TRIP			IL1=1101.08A/107.54deg,IL2=65.25A/-61.16deg, IL3=1079.85A/-93.43deg, IL4= 373.73A/13.4deg
5	15-09-2022	22:41	15-09-2022	22:46	0	10	220kV Malbase-Samtse	Malbase Substation	Tripping	M1 trip,Zone1 trip	10.3km		I1= 24.26A<-232.2, I2-56.69A<-238.5, I3-2208A<39.5ff, I4-2134A<38.7ff
6	15-09-2022	22:38	15-09-2022	22:44	0		220kV bus coupler	Malbase Substation	Tripping	86OPTD,			
7	15-09-2022	22:41	15-09-2022	22:48	0	34	50 MVA transformer III	Malbase Substation	Tripping	OLTC trip,Diff Restrain,Diff Trip,Diff WARM,Diff WAVM Trip			IL1=91.66A<-27.56,IL2=151.47A<-120.59,IL3=65.52A<-126.9,IL4=227.62<-99.8S
8	16-09-2022	23:28	16-09-2022	23:47	0	-119	220kV Chukha feeder III	Malbase Substation	Tripping	86 optd, Zone 1 Tripped			IA =463.3A,IB =419.9A,IC=4.718kA
9	16-09-2022	23:28	16-09-2022	23:49	0	27	50 MVA transformer III	Malbase Substation	Tripping	DIFF, TRIP,27 TRIP,86 Optd			IL1 =91.99 A< -41.13 DEG,IL2 =151.66 A< 112.19 DEG,IL3=63.07A <-119.95DEG,IL4=56.3A<-94.36DEG
10	16-09-2022	10:28	16-09-2022	10:31	0		50 MVA transformer III	Malbase Substation	Tripping	EXT. TRIP, 86 OPTD.			IL1 = 106.82 A, IL2= 423.8 A, IL3= 284.97A,IL4= 217.19A
11	16-09-2022	19:34	16-09-2022	19:50	0	10.4	220kV Malbase-Samtse	Malbase Substation	Tripping	B/U Trip			I1=30.11A,<270.4,I2=100.8A<102.32I=2961A<51.30,I4=1006A<337.9
12	16-09-2022	19:34	16-09-2022	19:39	0	26	50 MVA transformer III	Malbase Substation	Tripping	EXT TRIP, BUCH Trip			I1+13.15A<-47,I2+111.5A<-132.39,I3=67.5SA<144.37
13	16-09-2022	22:28	16-09-2022	22:31	0	28	50 MVA transformer III	Malbase Substation	Tripping	EXT. TRIP, 86 OPTD OLTC, BUCH trip			IL1 = 106.82 A, IL2= 423.8 A, IL3= 284.97A,IL4= 217.19A
14	20-09-2022	8:31	20-09-2022	8:34	0	0	220 kV Bus coupler	Malbase Substation	Tripping	86 optd.			No data displayed
15	22-09-2022	2:55	22-09-2022	3:00	0	115	220kV Chukha feeder III	Malbase Substation	Tripping	0/C,Zone 1 trip ; R,Y,B phase Trip, fault location :9.1579Km,	fault location :9.1579Km,Fd=80.02ms		IR=10.94A,IL2=7.15KA,IL3=6.471KA
16	22-09-2022	2:55	22-09-2022	3:01	0	28	50 MVA transformer III	Malbase Substation	Tripping	Diff trip, 86 optd			IL1=153.55A<-19.74,IL2=96.02A<-34.56,IL3=76.86A,<-41.4RIL4=322.34A,<-29.22
17	22-09-2022	3:55	22-09-2022	3:00	0	-	220kV bus coupler	Malbase Substation	Tripping	CBFP			1A=11.6A,IB=6846A, IC=5810A,IE=5393AE/F IDMT IE=5393A
18	22-09-2022	3:04	22-09-2022	3:06	0	-	220kV bus coupler	Malbase Substation	Tripping	CBFP			-
19	22-09-2022	3:04	22-09-2022	3:08	0	28	50 MVA transformer III	Malbase Substation	Tripping	DIFF, TRIP,86 Optd			IL1=404.52A<95.38deg,IL2=176.33A,<-30.73deg,IL3=142.81A<-134.32deg,IL4=210.85A<86.04deg
20	22-09-2022	3:04	22-09-2022	4:04	1	-111	220kV Chukha feeder III	Malbase Substation	Tripping	Zone 1 trip,86 optd	Zone 1 trip, fault location =11.598km,		IA=10.56A,IB=7.023kA,IC=5.829kA
21	22-09-2022	4:04	22-09-2022	4:12	0	115	220kV Malbase-Samtse	Malbase Substation	Tripping	M1--trip,zone1 trip,	Fault loop=L1-L2,distance 6.2kM,IL1=4972A<-284.6deg,IL2=8654A<164.7deg,IL3=4900A<38.75deg,IL4=994.7A<165.7deg		IL1=177.4A<40.06deg,IL2=183.4A<164.8deg,IL3=159.1A<66.85deg
22	22-09-2022	4:04	22-09-2022	4:11	0	66	400/220kV, 200MVA ICT	Malbase Substation	Tripping	Buchholz trip			IL1= 0.63A<15.65deg, IL2= 166.43A<-14.35deg,IL3= 163.86A<162.42deg, IL4=0.52A<15.65deg
23	23-09-2022	1:57	23-09-2022	2:07	0	19	66kV Panakha fdr no II	Malbase Substation	Tripping	67_Trip, 86 OPTD, General Trip, 67N_Trip			IL1= 519.61A<-96.07deg,IL2= 666.2A<-124.6deg, I3=2509.85A<81.22deg, I4=519.61A<-96.07deg
24	23-09-2022	1:57	23-09-2022	2:06	0	19	66kV Panakha fdr no IV	Malbase Substation	Tripping	67N Trip, General Trip			IL1=919.04A<80.79deg, IL2=487.09A<125.7deg, I3=4758.81A<66.85deg,I4=2940.01A<72.8deg
25	23-09-2022	1:57	23-09-2022	2:05	0	-	66kV Bus Coupler	Malbase Substation	Tripping	General Trip, 67 Trip, 67_ST2L3			
26	23-09-2022	17:27	23-09-2022	17:35	0	73	400/220kV, 200MVA ICT	Malbase Substation	Tripping				
27	23-09-2022	17:27	23-09-2022	17:37	0	-	220 kV Bus coupler	Malbase Substation	Tripping				
28	23-09-2022	17:27	23-09-2022	17:45	0	27	50 MVA transformer II	Malbase Substation	Tripping				I1=711.85A-2.71deg,I2=734.69A -134.06deg,I3=704.74A .97deg
29	23-09-2022	17:27	24-09-2022	17:46	24	19	66kV Panakha fdr no II	Malbase Substation	Tripping				"IL1=0.29A/-1.11deg,IL2=806.11 A/18.89deg,IL3=829.52 A/-162.02deg. Test charge done at 10-25hrs. date 23/09/2022 but could not hold and kept on open condition. Taken shutdown for OPG wire resting by TMD/pling (work permit number 288) on 24/09/2022 at 8:45 hours and Test charged at 24/09/2022 @15.39 but could not hold. Test charge done @ 14:45 hold in idle charge with no load given"
30	23-09-2022	17:27	24-09-2022	17:46	24	20	66kV Panakha fdr no IV	Malbase Substation	Tripping				"IL1=814.97A/149.39deg,IL2=573.27A /-156.57deg IL3=2202.32A/07.25deg. Test charge done at 10-25hrs @ 23/09/2022. but could not hold and kept on open condition.Taken shutdown for OPG wire resting by TMD/pling (work permit number 288) on 24/09/2022 at 8:45 hour and test charged at 24/09/2022 @13:40 but could not hold - Test charged hold @14:45 on 24/09/2022 in Idle Charge condition"
31	23-09-2022	17:27	24-09-2022	17:46	24	19	66kV Panakha fdr no I	Malbase Substation	hand tripped				"Handtripped during charging of 220/66kV 50 MVA Transformer 2, test charged at 20:48 on 23/09/2022 but could not hold in ring system with 66kV bhutan Concast.Taken shutdown for OPG wire resting by TMD/pling (work permit number 308)on 24/09/2022 at 8:45 hour and test charged & hold at 24/09/2022 13:59 dated 24/09/2022 but hand tripped at 14:00 hrs dated 24/09/2022 due to mixing Y phase current and is currently being attended by TMD pling (Work Permit Number 290 loaned to TMD p/ling) at 15:35 hrs. and at 17:30 hrs Work permit no 290 was returned by TMD PLING and all 66kV out going feeder Charged at 17:45 hrs."
32	23-09-2022	17:27	24-09-2022	18:23	24	-7.2	66kV Phuentsholing fdr	Malbase Substation	Tripping	N1 trip,86optned			IL1=1.2358kI2=197.5k,I3=1.228kN=2.031k,Kept in oped condition.
33	23-09-2022	20:48	23-09-2022	20:53	0	-	220 kV Bus coupler	Malbase Substation	Tripping	86 optd.	line		No data displayed
34	23-09-2022	20:48	23-09-2022	20:55	0	59	400/220kV, 200MVA ICT	Malbase Substation	Tripping	86 optd.	line		IL1=0.058A/35.35DEG,IL2=0.160A/28.57DEG,IL3=0.005A/173.4DEGtripped due to test charge of 66kv feeder Tripped while doing test charge on 66kV Panakha I and 66kV bhutan Concast fdr.
35	23-09-2022	20:48	23-09-2022	20:58	0	0.42	50 MVA transformer II	Malbase Substation	Tripping	86 optd.	line		IA=0.06A, IB=0.03A, IC=0.02A(no load 66KV feeders not Tripped while doing test charge on 66kV Panakha I and 66kV bhutan Concast fdr.)
36	23-09-2022	21:42	23-09-2022	22:38	0	88	220kV Birpara feeder	Malbase Substation	Tripping	0/C on R&B phase,general trip,zone 3 trip	fault location Distance=55.94KM.		IA=2.157kA, IB=170.6A, IC=2.650kA
38	28-09-2022	18:40	28-09-2022	18:44	0	-108	220kV Chukha feeder III	Malbase Sc	Tripping		line		General Trip, Zone 1 Trip, Fault loop=L3-N, Dist.= 9.00 Km. Trip value I1=378.8A/200.1deg, I2=132.9A/71.22deg, IL3=5504A/44.84deg, IL4=5284A/47.50deg
39	28-09-2022	18:40	28-09-2022	18:45	0	25	50MVA Transformer III	Malbase Sc	Tripping				027 TRIP, DIFF TRIP, Tripped value IL1=76.52A/-61.44deg, IL2=139.94A/-119.29deg,IL3=86.52A/-125.68deg, IL4=273.19A/-107.0deg
40	30-09-2022	12:32	30-09-2022	12:39	0	-117.44	220kV Malbase-Chhukha	Malbase Sc	Tripping				tripped (BB protection)
41	30-09-2022	12:32	30-09-2022	12:57	0	70	400/220kV, 200MVA ICT	Malbase Sc	Tripping				tripped (BB protection)
42	30-09-2022	12:32	30-09-2022	12:41	0	14.56	220kV Malbase-Samtse	Malbase Sc	Tripping				tripped (BB protection)
43	30-09-2022	12:32	30-09-2022	15:26	0	30.08	220kV Malbase-Birpara.	Malbase Sc	Tripping				tripped (BB protection)
44	30-09-2022	12:32	30-09-2022	12:38	0		220 kV Bus coupler	Malbase Sc	Tripping				
45	30-09-2022	13:05	30-09-2022	13:12	0	36	400/220kV, 200MVA ICT	Malbase Sc	Tripping				tripped (BB protection)
46	30-09-2022	13:05	30-09-2022	13:17	0		220 kV Bus coupler	Malbase Sc	Tripping				tripped (BB protection)
47	30-09-2022	13:05	30-09-2022	13:18	0	-75.84	220kV Malbase-Chhukha	Malbase Sc	Tripping				BB trip,I1=91.72A<204deg,I2=113A<79.05deg,I3=101.32A,312.1deg,I4=6.067A<153.4deg
48	30-09-2022	13:05	30-09-2022	13:22	0	9.9	220kV Malbase-Samtse	Malbase Sc	Tripping				BB trip,I1=27.72A<28.85deI2=28.2AA<296.4degI3=28.82A,144.5degI4=0.2A<12deg

(B)220/66/11 kV Singhigaon Substation													
##	07.09.2022	15:51	7.9.22	15:54	0	32	66kV Bhutan Concast fdr.	Singhigaon Ss	O/C	Directional Time O/C trip;IE>>DIRECTIONAL TRIP,GENERAL TRIP, 86 OPTO.	line		IL1=1.14kA,IL2=0.26kA,IL3=0.34kA
##	07.09.2022	15:51	7.9.22	15:54	0	-	66kV Bus 1	Singhigaon Ss	-	86 optd., IEp trip	-		-
##	16.9.22	19:34	16.9.22	20:58	1	3	220kVSinghigaon- Samtse	Singhigaon Ss	tripped	zone 1 trip/ fault loop:13-N 14.46Km	line		I1=41.31A<194.2,I2=45.02A<248.1,I3=135.8A<40.05,I4=1.004A<40.84
##	16.9.22	22:20	16.9.22	22:36	0	0.1	220kVSinghigaon- Samtse	Singhigaon Ss	tripped	General Trip, Zone 1 Trip, F/L=11-N, Distance= 33Km	line		I1=2891A<-38.6deg,I2=86.15A<96.58deg,I3=89.81A<11.7deg,I4=2714A,285.6deg.
##	17.9.22	22:16	17.9.22	22:17	0	0.067	11kV feeder no 1	Singhigaon Ss	O/C	General trip,Time O/C trip, IP trip	line		IL1=1.36KA, IL2=1.45KA, IL3=1.39KA
##	18.9.22	16:46	18.9.22	16:48	0	0.06	11kV feeder no 1	Singhigaon Ss	O/C	General trip, O/C trip, IEp trip	line		IL1=1.08kA IL2=0.01kA IL3=0.01kA
##	18.9.22	21:01	19.9.22	10:10	13	0.861	11KV Feeder III	Singhigaon Ss	O/C	IEp,time over current trip	line		Fault Current IL1=0.02KA IL2=0.02KA IL3=0.39KA
##	20.9.22	14:53	20.9.22	17:29	2	1.25	11KV Feeder III	Singhigaon Ss	O/C	IEp,time over current trip	line		IL1=0.03kA, IL2=0.02kA, IL3=0.39kA
##	21.9.22	2:04	21.9.22	11:52	9	0.458	11KV Feeder III	Singhigaon Ss	O/C	General trip, O/C trip, IEp trip	line		IL1=0.01kA, IL2=0.01kA, IL3=0.39kA
##	21.9.22	11:45	21.9.22	16:51	#NUM!	0.58	11KV Feeder III	Singhigaon Ss	O/C	General trip, O/C trip, IEp trip	line		IL1=0.06kA,IL2=0.07kA,IL3=0.44kA,
##	22.9.22	0:56	22.9.22	13:46	12	0.643	11KV Feeder III	Singhigaon Ss	O/C	General trip ,O/C trip,IEP trip,			IL1=0.05kA,IL2=0.05kA,IL3=0.43kA
##	22.9.22	4:04	22.9.22	4:32	0	2.09	220kVSinghigaon- Samtse	Singhigaon Ss	tripped	-	line		IL1=525.1A<159.3deg,IL2=2342A<277.5deg,IL3=2308<46.32deg,IL4=1475A<341.7deg.
##	23.9.22	1:57	23.9.22	3:06	0	27.5	66kV Bhutan Concast fdr.	Singhigaon Ss	tripped	directional time OC trip, IE>>Directional trip, I>> Directional Trip,General trip,	line		IL1=0.46kA, IL2=1.11kA, IL3=5.62kA
##	23.9.22	17:27	24.9.22	15:47	20	26	66kV Bhutan Concast fdr.	Singhigaon Ss	tripped	Diff.time O/C trip,IE>>diff trip,I>>diff trip,	line		I1=4.35kA,I2=0.08kA,I3=6.38kA test charge at 20:49 hrs.but could not hold and kept on open condition.
##	25.9.22	10:03	25.9.22	10:21	0	0.779	11KV Feeder II	Singhigaon Ss	O/C	General trip, Time O/C trip, Iep>> trip	line		IL1=0.05kA,IL2=0.04kA,IL3=1.54kA
(B)66/33/11 kV Phuntsholing Substation													
1	07.09.2022	18:23	07.09.2022	19:28	0	3.45	66kV Chukha-Pling feeder	Black out at Pling ss			Tripped at chukha end		At 18:34hrs 66kV Chukha-Pling feeder got tripped from chukha end and 66kV Pling-Gomtu feeder got tripped at Gomtu end (i.e 66kV Dhamdhum-Gomtu feeder got tripped at Gomtu end) causing black out at Pling. At 18:59hrs normalised the 66kV Chukha-Pling from Chukha end and at 18:32hrs normalised 66kV Dhamdhum-Gomtu feeder from Gomtu feeder.
2	07.09.2022	18:23	07.09.2022	18:52	0	2.07	66kV Pling-Gomtu fdr	Black out at Pling ss			66kV Dhamdhum-Gomtu fdr tripped from Dhamdhum Ss		
3	11.09.2022	20:35	11.09.2022	20:43	0	3.09	66kV Chukha-Pling feeder	Black out at Pling ss			Tripped at chukha end		At 20:35hrs 66kV Chukha-Pling feeder got tripped from chukha end and 66kV Pling-Gomtu feeder got tripped at Gomtu end (i.e 66kV Dhamdhum-Gomtu feeder got tripped at Gomtu end) causing black out at Pling. At 20:43hrs normalised the 66kV Chukha-Pling from Chukha end and at 20:42hrs normalised 66kV Dhamdhum-Gomtu feeder from Gomtu feeder.
4	11.09.2022	20:35	11.09.2022	20:42	0	3.05	66kV Pling-Gomtu fdr	Black out at Pling ss			66kV Dhamdhum-Gomtu fdr tripped from Dhamdhum Ss		
5			11.09.2022	20:38	20	Idle charge	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 20:38hrs charged 66kV Pling-Malbase feeder which was under idle charge condition with closing code 271 from BPSO. At 20:45hrs opened CB of above fdr with opening code 1015 from BPSO and said feeder kept under idle charged condition after normalising 66kV Chukha and Gomtu feeder.
##	15.09.2022	22:15	15.09.2022	22:22	0	3.67	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at both end	DISTN OPTD, 186&86	Tripped at both end	Tripped on fault	The cause of tripping was due to transient fault. At 22:22hrs normalised with charging code 287 from BPSO.
##	15.09.2022	22:58	15.09.2022	23:07	0	1.58	66kV Pling-Gomtu fdr	Black out at Pling ss	Tripped at both end	DISTN OPTD, 186&86	Tripped at both end	Tripped on fault	Tripped at both end. At 23:07hrs test charged after getting clearance from BPSO and stood normal.
##	15.09.2022	22:38	15.09.2022	22:46	0	3.67	66kV Chukha-Pling feeder	Black out at Pling ss	Tripped at chukha end		Tripped at chukha end		At 22:38hrs 66kV Chukha-Pling feeder got tripped from chukha end and 66kV Pling-Gomtu feeder got tripped at both end causing black out at Pling. At 22:46hrs normalised 66kV Chukha-Pling fdr from Chukha end with charging code 290.
##	16.09.2022	19:33	16.09.2022	19:41	0	1.89	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at chukha end		Tripped at chukha end		At 19:33hrs 66kV Chukha-Pling feeder got tripped from chukha end causing black out at Pling. At 19:41hrs normalised 66kV Chukha-Pling fdr from Chukha end.
##	16.09.2022	19:33	16.09.2022	20:02	0	4.70	66kV Pling-Gomtu fdr	66kV Pling-Gomtu fdr	Tripped at their end		66kV Dhamdhum-Gomtu fdr tripped from Dhamdhum Ss		At 19:33hrs 66kV Pling-Gomtu feeder got tripped at Gomtu end (i.e. 66kV Dhamdhum-Gomtu fdr tripped at Dhamdhum end) causing black out at Pling. At 20:02hrs normalised 66kV Pling-Gomtu fdr from Dhamdhum end.
##	16.09.2022	23:28	17.09.2022	0:50	1	4.06	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at chukha end		Tripped at chukha end		At 23:28hrs 66kV Chukha-Pling fdr tripped from chukha end (Pling black out) and as per instruction from BPSO opened CB for said fdr at 23:50hrs at our end. At 00:50hrs charged from our end as per instruction from BPSO with charging code 296 and stood normal.
##	16.09.2022	23:38	17.09.2022	11:04	10	0.15	66kV Pling-Gomtu fdr	66kV Pling-Gomtu fdr	Tripped at their end		66kV Dhamdhum-Gomtu fdr tripped from Dhamdhum Ss		At 23:38hrs 66kV Pling-Gomtu feeder got tripped at Gomtu end (i.e. 66kV Dhamdhum-Gomtu fdr tripped at Dhamdhum end) causing black out at Pling. At 23:57hrs test charged from Gomtu end but got tripped at our end operating distance relay. As per instruction from BPSO test charged from our end but again got tripped actuating same relay. On dated 17.09.2022 at 11:04hrs as per instruction from BPSO against closing code 300 66kV Pling-Gomtu fdr charged and stood normal.
##			16.09.2022	23:53		Idle charge	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 23:53hrs as per instruction from BPSO charged 66kV Pling-Malbase feeder which was under idle charged condition, since 66kV Chukha-Pling fdr and 66kV Pling-Gomtu fdr couldn't stand while test charging. On dated 17.09.2022 at 11:04hrs opened CB of 66kV Pling-Malbase feeder with opening code 1019 as per instruction from BPSO and feeder was put back to idle charged condition.
##	20.09.2022	8:31	20.09.2022	8:37	0	3.02	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at chukha end		Tripped at chukha end		At 08:31hrs 66kV Chukha-Pling fdr tripped from chukha end (Pling black out) and at 08:37hrs normalised the supply from Chukha end with charging code 316.
##	20.09.2022	8:31	20.09.2022	9:41	0	2.11	66kV Pling-Gomtu fdr	66kV Pling-Gomtu fdr	Tripped at our end	DISTN OPTD, 186&86	Tripped at our end		At 08:31hrs 66kV Pling-Gomtu feeder got tripped at our end causing black out at Pling. At 09:41hrs as per instruction from BPSO charged Pling-Gomtu fdr against closing code 318.
##	22.09.2022	3:49	22.09.2022	3:15	0	4.86	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at our end	DISTN OPTD, 186&86	Tripped at our end	Tripped on fault	At 03:15hrs test charged the feeder as per instruction from BPSO and stood normal.
##	22.09.2022	3:53	22.09.2022	9:53	6	4.86	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at both end	DISTN OPTD, 186&86	Tripped at both end	Tripped on fault	66kV Pling Chukha fdr tripped at both end. Relay OPTD Dist OPTD. As per instruction from BPSO test charged at 05:05hrs but tripped on same fault and said feeder kept under shutdown (grid fail). At 09:53hrs as per instruction from BPSO normalised the 66kV Pling-Chukha fdr.
##			22.09.2022	4:15			66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 04:15hrs as per instruction from BPSO charged 66kV Pling-Malbase feeder which was under idle charged condition.
##	20.09.2022	12:31	20.09.2022	12:34	0	2.23	66kV Pling-Gomtu fdr	66kV Pling-Gomtu fdr	Tripped at our end	DISTN OPTD, 186&86	Tripped at our end		The cause of tripping was due to transient fault. (Pling black out)
##	23.09.2022	1:57	23.09.2022	2:07	0	3.01	66kV Pling-Gomtu fdr	66kV Pling-Gomtu fdr	Tripped at our end	DISTN OPTD, 186&86	Tripped at our end		The cause of tripping was due to transient fault. (Pling black out)
##	23.09.2022	1:57	23.09.2022	2:10	0	7.43	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at chukha end		Tripped at chukha end		The cause of tripping was due to transient fault. (Pling black out)
##	23.09.2022	1:57	23.09.2022	2:04	0	6.12	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr	Tripped at Malbase end		Tripped at Malbase end		The cause of tripping was due to transient fault. (Pling black out)
##	23.09.2022	17:27	23.09.2022	17:35	0	7.36	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at chukha end		Tripped at chukha end		The cause of tripping was due to transient fault. (Pling black out)
##	23.09.2022	17:27	23.09.2022			7.20	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr	Tripped at Malbase end		Tripped at Malbase end		The cause of tripping was due to transient fault. (Pling black out). As per instruction of BPSO 66kV Pling-Malbase feeder kept open at our end with opening code 033.
##	23.09.2022	17:27	23.09.2022	17:43	0	3.94	66kV Pling-Gomtu fdr	66kV Pling-Gomtu fdr	Tripped at our end	DISTN OPTD, 186&86	Tripped at our end		The cause of tripping was due to transient fault. (Pling black out).At 17:37hrs test charged as per instruction from BPSO but couldn't withstand. At 17:43hrs again test charged as per instruction from BPSO and stood normal.
##	27.09.2022	7:42	27.09.2022	7:50	0	3.00	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at both end		Tripped at both end		The cause of tripping was due to transient fault.
##	28.09.2022	10:42	28.09.2022	10:52	0	2.53	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at both end	Tripping relay 186& 86	Tripped at both end		The cause of tripping was due to transient fault. Test charged after getting clearance from BPSO with charging code 1442.
##	28.09.2022	19:12	28.09.2022	22:46	3	0.84	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at both end	Tripping relay 186& 86	Tripped at both end		As per instruction from BPSO CB kept openend for 66kV Pling at our end.
##			28.09.2022	19:16		Idle charge	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 19:16hrs charged 66kV Pling-Malbase with charging code 1444 since CB kept open for 66kV Pling-chukha feeder at our end as per instruction from BPSO. At 22:30hrs CB opened for said feeder with opening code 046 from BPSO and feeder kept under idle charged.
##			29.09.2022	10:23		Idle charge	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 10:23hrs charged 66kV Pling-Malbase with charging code 1452 as per instruction from BPSO. At 22:30hrs CB opened for said feeder with opening code 046 from BPSO and feeder kept under idle charged.
##	29.09.2022	13:30	29.09.2022	13:37	0	6.27	66kV Pling-Gomtu fdr	66kV Pling-Gomtu fdr	Tripped at both end	186&86	Tripped at both end		The cause of tripping was due to transient fault.
##	30.09.2022	12:52	30.09.2022	12:58	0	9.19	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at our end	DISTN OPTD, 186&86	Tripped at our end	Tripped on fault	Pling blackout since 66kV Pling-Malbase and Pling-Gomtu feeder got interrupted due to 220kV supply failure from Malbase end
##	30.09.2022	13:05	30.09.2022	13:18	0	2.26	66kV Chukha-Pling feeder	66kV Chukha-Pling feeder	Tripped at our end	DISTN OPTD, 186&86	Tripped at our end	Tripped on fault	Pling blackout since 66kV Pling-Malbase and Pling-Gomtu feeder got interrupted due to 220kV supply failure from Malbase end
##			30.09.2022	13:19		5.07	66kV Pling-Malbase fdr	66kV Pling-Malbase fdr					At 13:19hrs CB opened for 66kV Pling-Malbase feeder with opening code 064 from BPSO and feeder kept under idle charged.

(D) 66/33/11 kV Gedu Substation													
1	15.09.2022	22:15	15.09.2022	22:22	0	1.06	66kV Chukha-P/ling	Balckout	Bad weather condition		Line segment		66kV supply charged from Chukha end.
2	16.09.2022	22:39	15.09.2022	22:46	0	1.06	66kV Chukha-P/ling	Balckout	Bad weather condition		Line segment		66kV supply charged from Chukha end.
3	16.09.2022	19:34	16.09.2022	19:42	0	2.71	66kV Chukha-P/ling	Balckout	Bad weather condition		Line segment		66kV supply charged from Chukha end.
4	16.09.2022	23:39	16.09.2022	23:47	0	1.41	66kV Chukha-P/ling	Balckout	Bad weather condition		Line segment		66kV supply charged from Chukha end.
5	22.09.2022	5:49	22.09.2022	5:55	0	1.1	66kV Chukha-P/ling	Balckout	Bad weather condition		Line segment		66kV supply charged from Chukha end.
6	22.09.2022	5:53	22.09.2022	5:13	1	1.1	66kV Chukha-P/ling	Balckout	Bad weather condition		Line segment		66kV supply charged from Chukha end.
7	23.09.2022	1:58	23.09.2022	2:05	0	1.36	66kV Chukha-P/ling	Balckout	Bad weather condition		Line segment		66kV supply charged from Chukha end.
8	28.09.2022	7:43	28.09.2022	7:47	0	2.03	66kV Chukha-P/ling	Balckout	Bad weather condition		Line segment		66kV supply charged from Chukha end.
9	28.09.2022	18:42	28.09.2022	18:52	0	1.07	66kV Chukha-P/ling	Balckout	Bad weather condition		Line segment		66kV supply charged from Chukha end.
10	28.09.2022	19:12	28.09.2022	19:24	0	1.69	66kV Chukha-P/ling	Balckout	Bad weather condition		Line segment		66kV supply charged from Chukha end.
(E) 66/33/11 kV Gomtu Substation													
1	07.09.2022	17:21	07.09.2022	17:28	0	2.23	66kV Phuentsholing feeder	Gomtu substation	Tripped from Chukha	Nil	Line segment	grid fail	Tripped from chukha end and supply resumed at 17:28hrs
2	07.09.2022	17:23	07.09.2022	17:32	0	-6.956	66kV Dhamdhum feeder	Gomtu substation	B-phase & Y-Phase fault	Nil	Line segment	Transient fault	Charged as per the instruction from BPSO and charge withstand
3	11.09.2022	20:35	11.09.2022	20:39	0	3.51	66kV Phuentsholing feeder	Gomtu substation	Grid failed	Nil	Line segment	grid fail	Grid failed and supply resumed at 20:39hrs
4	11.09.2022	20:35	11.09.2022	20:42	0	-9.924	66kV Dhamdhum feeder	Gomtu substation	Three Phase fault	General Trip, Zone 4 Trip, R phase Fault, Y Phase Fault, B Phase fault & Distance relay operated	Line segment	Transient fault	Charged the line as per the instruction received from BPSO and charge withstand
5	15.09.2022	22:39	15.09.2022	23:08	0	1.54	66kV Phuentsholing feeder	Nil	Over current	51 Cs and 51 Bs	Gomtu substation	Transient fault	Charged the line as per the instruction received from BPSO and charge withstand charging code 290
6	15.09.2022	22:41	15.09.2022	22:48	0	-6.54	66kV Dhamdhum feeder	Gomtu substation	Grid failed	Nil	Malbase substation	grid fail	Grid failed and supply resumed at 22:48hrs
7	16.09.2022	23:28	16.09.2022	23:37	0	-0.22	66kV Phuentsholing feeder	Nil	Over current	51 Cs and 51 Bs	Line segment	Transient fault	Test charged the line as per the instruction of BPSO and kept breaker opned at pling end at charged on 17.09.2022 at 11:04 hrs from pling end
8	16.09.2022				0								
9	20.09.2022	8:31	20.09.2022	8:41	0	2.11	66kV Phuentsholing feeder	Gomtu substation	Grid failed	Nil	Line segment	Transient fault	Tripped from source
10	20.09.2022	8:31	20.09.2022	8:41	0	-6.229	66kV Dhamdhum feeder	Gomtu substation	Grid failed	Nil	Line segment	Transient fault	Tripped from source
11	22.09.2022	4:05	22.09.2022	4:15	0	-7.44	66kV Dhamdhum feeder	Gomtu substation	Grid failed	Nil	Malbase substation	Transient fault	Tripped from Malbasey end and supply resumed at 04:15hrs.
12	22.09.2022	13:30	22.09.2022	13:33	0	2.48	66kV Phuentsholing feeder	Gomtu substation	Grid failed	Nil	Line segment	Transient fault	Tripped from pling end and supply resumed at 13:33hrs
13	22.09.2022	13:30	22.09.2022	13:38	0	-11.096	66kV Dhamdhum feeder	Gomtu substation	Y phase fault	Distance relay operated, General trip, Zone 4 trip, Y phase fault.	Line segment	Transient fault	Charged the line as per the instruction of BPSO and charge withstand.
14	23.09.2022	9:27	23.09.2022	9:05	5	0.01	66/33kV 5MVA Transformer	Nil	Over current	IDMTL 50R & 50B	Line segment	Feeder fault	Tripped along with 33kV Samtse feeder and charged the transformer after keeping 33kV feeder in trip position.
15	23.09.2022	17:27	23.09.2022	17:42	0	-10.977	66kV Dhamdhum feeder	Gomtu substation	Grid failed	Nil	Line segment	Grid Failed	Grid failed from Malbase substation.
16	23.09.2022	17:43	23.09.2022	17:45	0	4.98	66 KV Phuentsholing feeder.	Gomtu substation	Hand tripped as per BPSO	Nil	Gomtu substation	Hand tripped.	Breaker opened as per BPSO instruction , as P/Ling SS could not charge Line.
17	23.09.2022	20:35	23.09.2022	20:45	0	3.25	66 KV Phuentsholing feeder.	Gomtu substation	Grid failed	Grid failed	Line segment	Grid Failed	Grid failed from Malbase substation.
18	23.09.2022	20:35	23.09.2022	20:45	0	-0.049	66kV Dhamdhum feeder	Gomtu substation	Grid failed	Grid failed	Line segment	Grid Failed	Grid failed from Malbase substation.
19	26.09.2022	10:04	26.09.2022	11:20	1	1.55	66kV Phuentsholing feeder	Nil	Shutdown as per BPSO	Nil	Pling ss	Shutdown	Availed shutdown for arresting sparking from Y phase GT terminal pad at Phuentsholing S/S Against opening code No 048 and shutdown withdrawn at 11:20 after charging code No 1423 given from BPSO
20	30.09.2022	12:52	30.09.2022	12:58	0	-16.056	66kV Dhamdhum feeder	Gomtu substation	Grid failed	Nil	Malbasey substation	Transient fault	Tripped from Malbasey end and supply resumed at 12:58hrs.
21	30.09.2022	13:05	30.09.2022	13:17	0	-10.204	66kV Dhamdhum feeder	Gomtu substation	Grid failed	Nil	Malbasey substation	Transient fault	Tripped from Malbasey end and supply resumed at 13:17hrs.
(F) 220/66/33 kV Dhamdum Substation													
1	15.09.2022	22:41	15.09.2022	22:46	0	-8.8	Malabase	Samtse	-	-	-	-	Grid supply fail.
2	16.09.2022	19:29	16.09.2022	19:50	0	-16.28	220kV Malabase fdr.	Samtse	Lightning/thunder and heavy rainfall	REL 670	Dhamdum Substation		General trip, Zone 1, Y phase fault supply failed from Malbase end.
3	16.09.2022	19:29	16.09.2022	20:03	0	-3.09	220kV Singye fdr.	Samtse	Lightning/thunder and heavy rainfall	REL 670	Dhamdum Substation		General trip, Zone 1 trip,R phase fault,supply failed from Malbase end.
4	16.09.2022	22:31	16.09.2022	22:35	0	-0.07	Singaygaun	Samtse	Lightning/thunder and heavy rainfall	REL 670	Dhamdum Substation		General trip, Zone 1, Over current on BB
5	23.09.2022	17:27	23.09.2022	17:42	0	-11.27	malbase	Samtse			Dhamdum Substation		line tripped from malbase end .No equipment was operated from dhamdum s/s.
6	23.09.2022	20:34	23.09.2022	20:44	0	-8.82	220kV Malabase fdr.	Samtse	Cloudy				line tripped from malbase end .No equipment was operated from dhamdum s/s.
7	23.09.2023	21:34	23.09.2023	21:44	0	-4.04	220kV Singye fdr.	Samtse	Cloudy		Dhamdum Substation		line tripped from malbase end .No equipment was operated from dhamdum s/s.
8	30.09.2022	12:51	30.09.2022	12:57	0	-14.49	220Kv malbase feeder	Samtse	sunny		Dhamdum Substation		line tripped from malbase end .No equipment was operated from dhamdum s/s.
9	30.09.2022	13:05	30.09.2022	13:17	0	-10.06	220Kv malbase feeder	Samtse	sunny		Dhamdum Substation		line tripped from Malbase end .No equipment was operated from dhamdum s/s.

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 operation	Exact location of fault [Line segment / Substation]	Type of outages	Remarks
	(A) 66kV Chumdo switching station												
1	16.09.2022	2328hrs	16.09.2022	2347hrs		(-) 7.85MW							
2	22.09.2022	0240hrs	22.09.2022	0259hrs		(-) 7.85MW	66kV Chukha Feeder	Paro,Punhaza, Jemina	Grid Fail	Not operation at chumdo	Generatio n end	Grid fail	Grid fail
3	22.09.2022	0315hrs	22.09.2022	0415hrs		(-) 5.22MW							
4	24.09.2022	0815hrs	25.09.2022	1100hrs	9hrs	6.46MW	66kV Paro Feeder	Fed from Punhaza Substation	S/down	CB open Line s & Bus isolator open, E/switch closed.	For 220kV LILO crossing	s/down	S/down by TPO Chukha aspar the shutdown approval no 226
5	24.09.2022	1822hrs	24.09.2022	1837hrs		10.01MW	66kV Punhaza Feeder	Punhaza substation	Transient fault	CB open ,IPh	Chumdo	Tripped	Trip due to over
6	24.09.2022	1840hrs	24.09.2022	1847hrs		10.01MW							
7	28.09.2022	0712hrs	29.09.2022	1140hrs	9hrs	8.37MW		Fed from Paro Substation	S/down	CB open Line s & Bus isolator open, E/switch closed.	For 220kV LILO crossing	s/down	S/down by TPO Chukha aspar the shutdown approval no 226
	(B) 66/33kV Watsa Substation												
1	16/9/2022	23:28hrs	16/9/2022	23:47hrs		320MW	66KV IC	Fdr. I and II	66KV IC failed from chukha end	66KV IC failed from chukha end	66KV IC failed from chukha end	Tripped	
2	22/9/2022	2:40hrs	22/9/2022	2:55hrs		250MW	66KV IC	Fdr. I and II	66KV IC failed from chukha end	66KV IC failed from chukha end	66KV IC failed from chukha end	Tripped	
3	22/9/2022	1:55hrs	22/9/2022	4:53hrs		250MW	66KV IC	Fdr. I and II	66KV IC failed from chukha end	66KV IC failed from chukha end	66KV IC failed from chukha end	Tripped	
4	28/9/2022	15:03hrs	28/9/2022	15:10hrs		1.57	66KV SF 6 breaker	Fdr. I and II	Over current on ABC phase	Over current relay operated	Fdr. II Chapcha/ Shemaga ngkha	Tripped	Line tripped due to tree fallen on 33KV dumchu line at watsa while TMD Tamalok ha cleaning 66Kv JIOW

	(C) 66/33kV Olakha Substation												
1	16-09-22	23:28	16-09-22	23:47	0	-7.92	66kV Olakha-Semtokha	All 66kV Olakha-Semtokha and 66kV Olakha-Changidaphu was effected	Grid fail	Under Voltages operated	Transmission line	Grid fail	Grid fail from Chukha and Basochu Charged from Chukha end and Basochu end stood normal.
2	16-09-22	23:28	16-09-22	23:47	0	2.41	66kV Olakha-Changidaphu	All 66kV Olakha-Semtokha and 66kV Olakha-Changidaphu was effected	Grid fail	Under Voltages operated	Transmission line	Grid fail	Grid fail from Chukha and Basochu Charged from Chukha end and Basochu end stood normal at Olakha end.
3	21-09-22	6:29	21-09-22	6:53	0	4.39	66kV Olakha-Changidaphu	All 66kV Olakha-Semtokha and 66kV Olakha-Changidaphu was effected	Fault	Nil	Transmission line	Transient fault	The supply was mapped from Changidaphu end. There was no relay operation and only under voltage Indication was operated at Olakha Substation.
4	22-09-22	2:29	22-09-22	2:56	0	-5.8	66kV Olakha-Semtokha	All 66kV Olakha-Semtokha and 66kV Olakha-Changidaphu was effected	Grid fail	Under Voltages operated	Transmission line	Grid fail	Grid fail from Chukha and Basochu Charged from Chukha end and Basochu end stood normal.
5	22-09-22	3:55	22-09-22	4:18	0	-8.34	66kV Olakha-Semtokha	All 66kV Olakha-Semtokha and 66kV Olakha-Changidaphu was effected	Grid fail	Under Voltages operated	Transmission line	Grid fail	Grid fail from Chukha and Basochu Charged from Chukha end and Basochu end stood normal.
6	22-09-22	4:27	22-09-22	4:51	0	-8.34	66kV Olakha-Semtokha	All 66kV Olakha-Semtokha and 66kV Olakha-Changidaphu was effected	Grid fail	Under Voltages operated	Transmission line	Grid fail	Grid fail from Chukha and Basochu Charged from Chukha end and Basochu end stood normal.
7	22-09-22	2:29	22-09-22	2:56	0	2.41	66kV Olakha-Changidaphu	All 66kV Olakha-Semtokha and 66kV Olakha-Changidaphu was effected	Grid fail	Under Voltages operated	Transmission line	Grid fail	Grid fail from Chukha and Basochu Charged from Chukha end and Basochu end stood normal.
8	22-09-22	3:55	22-09-22	4:18	0	2.56	66kV Olakha-Changidaphu	All 66kV Olakha-Semtokha and 66kV Olakha-Changidaphu was effected	Grid fail	Under Voltages operated	Transmission line	Grid fail	Grid fail from Chukha and Basochu Charged from Chukha end and Basochu end stood normal.
9	22-09-22	4:27	22-09-22	4:51	0	3.09	66kV Olakha-Changidaphu	All 66kV Olakha-Semtokha and 66kV Olakha-Changidaphu was effected	Grid fail	Under Voltages operated	Transmission line	Grid fail	Grid fail from Chukha and Basochu Charged from Chukha end and Basochu end stood normal.
10	23-09-22	3:48	23-09-22	3:53	0	2.92	66kV Olakha-Changidaphu	Only 66kV Olakha-Changidaphu was effected	Fault	Under Voltages operated	Transmission line	Transient fault	No relays was operated at Olakha Substation and charged from Changidaphu and stood normal.
11	23-09-22	4:56	23-09-22	5:02	0	5.87	66kV Olakha-Changidaphu	Only 66kV Olakha-Changidaphu was effected	Fault	Under Voltages operated	Transmission line	Transient fault	No relays was operated at Olakha Substation and charged from Changidaphu and stood normal.

	(F) 66/33/11kV Jomina Substation												
1	16.09.2022	23:28	16.09.2022	23:47	0	2.76 & 1.86 (both imports). Changedaphu & Chundo respectively	66 kV Line Changedaphu & Chundo	Black out	Supply failed from source, no operation at the Substation end	Nil	Generation source	–	Supply failed from generation sources & no operation at the Substation end.
2	22.09.2022	2:50	22.09.2022	2:57	0	1.29 & -1.68, Changedaphu & Chundo respectively	66 kV Line Changedaphu & Chundo	Black out	Supply failed from source, no operation at the Substation end	Nil	Generation source	–	Supply failed from generation sources & no operation at the Substation end.
3	22.09.2022	3:56	22.09.2022	4:54	0	1.20	66 kV Line Chundo	Black out	Grid fail also tripped the breaker at the Substation end	SOTF	Grid fail		Supply failed from generation & also tripped the breaker at the Substation end.
4	22.09.2022	3:56	22.09.2022	6:30	2	-1.68	66 kV Line Changedaphu	Black out till 04:54 Hrs	Grid fail also tripped the breaker at the Substation end.	SOTF	Grid fail		Supply failed from generation & also tripped the breaker at the Substation end. As per the recommendation of BPSO, the line charged only at 06:30 Hrs.
	(G) 66/33/11kV Dechencholing substation												
1	16.09.2022	23:26Hrs	16.09.2022	23:46Hrs	0	-22.30	66KV Semtokha Incomer	Whole system blackout	Supply failed from source.				
2	22.09.2022	02:49Hrs	22.09.2022	02:54Hrs	0	20.90	66KV Semtokha Incomer	Whole system blackout	Supply failed from source.				
3	22.09.2022	03:55Hrs	22.09.2022	04:18Hrs	0	-21.61	66KV Semtokha Incomer	Whole system blackout	Supply failed from source.				
4	22.09.2022	04:26Hrs	22.09.2022	04:52Hrs	0	-21.61	66KV Semtokha Incomer	Whole system blackout	Supply failed from source.				
	(H) 66/11kV Haa Substation												
1	16.09.2022	23:28	16.09.2022	23:47	0	-0.97	66kV incomer	All	grid fail	O/C	Chukha power house	Supply tripped from the source	
2	18.09.2022	13:42	18.09.2022	13:50	0	-1.63	66kV incomer	All	grid fail	O/C & E/F	Chukha power house	Supply tripped from the source	
3	22.09.2022	2:49	22.09.2022	2:57	0	-0.68	66kV incomer	All	grid fail	O/C & E/F	Chukha power house	Supply tripped from the source	
4	22.09.2022	3:55	22.09.2022	4:45	0	-0.66	66kV incomer	All	grid fail	O/C & E/F	Chukha power house	Supply tripped from the source	
5	24.09.2022	10:10	24.09.2022	10:28	0	-1.64	66kV incomer	All	grid fail	O/C & E/F	Chukha power house	Supply tripped from the source	
6	24.09.2022	18:22	24.09.2022	18:46	0	-2.14	66kV incomer	All	grid fail	O/C	Chukha power house	Supply tripped from the source	
7	28.09.2022	7:32	28.09.2022	17:30	33	-2.23	66kV incomer	All	220 LILO crossing for Jampey substation	Nil	Chumdo switching station	Shutdown taken by TOP Olakha, Thimphu for 220kV LILO crossing for Jampey substation with the opening code No. 784 by BPSO. The same was normalized after getting the clear information with a closing code No. 7853 by	

(i) 220kV Substation Semtokha

1	15.09.2022	18:10hrs	15.09.2022	18:20hrs		66kv Semtokha-Dechuka	Dechuka s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I> Trip. IA=263.2A,IB=5.799KA,IC=5.605KA,IN=17.26A		Transient			
2	16.09.2022	23:28hrs	16.09.2022	23:47hrs		220kV Semtokha-Chukha	Semtokha s/s	Grid Failed	Chukha black-out R-PHA-288.6A Y-PHA-70.19A B-PH-670.7A		Transient			
3	21.09.2022	06:20hrs	21.09.2022	06:40hrs		66kv Semtokha-Dechuka	Dechuka s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I> Trip.IA=263.24,IB=5.799KA,IC=5.605KA,IN=17.26A		Transient			
4	22.09.2022	02:40hrs	22.09.2022	02:56hrs		220kV Semtokha-Basochu	Semtokha s/s	Grid Failed	Main-2 Optd., RYBph trip		Transient			
5	22.09.2022	02:40hrs	22.09.2022	03:08hrs		66kv Semtokha-Dechuka	Dechuka s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I>1 Trip O/C		Transient			
6	22.09.2022	03:55hrs	22.09.2022	04:11hrs		220kV Semtokha-Chukha	Semtokha s/s	Grid Fade	Main 2, RYB tripped		Transient			
7	23.09.2022	03:48hrs	23.09.2022	03:52hrs		66kv Semtokha-Dechuka	Dechuka s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I> Trip. IA=174.A IB=5.74 9KA IC=5.62 1KA IN= 17.05A		Transient			
8	23.09.2022	04:59hrs	23.09.2022	05:01hrs		66kv Semtokha-Dechuka	Dechuka s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I> Trip.IA=172.1A IB=5.21 2KA IC=5.02 6KA IN=17.0 1A		Transient			
9	23.09.2022	21:42hrs	23.09.2022	22:07hrs		220kV Semtokha-Basochu	Semtokha s/s		Main 2 protection Optd., RYBph trip		Transient			
10	23.09.2022	21:42hrs	23.09.2022	22:04hrs		66kv Semtokha-Dechuka	Dechuka s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I> Trip.1		Transient			
11	24.09.2022	02:47hrs	24.09.2022	02:54hrs		66kv Semtokha-Dechuka	Dechuka s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I> Trip.1		Transient			
12	27.09.2022	10:04hrs	27.09.2022	11:19hrs	1	66kv Semtokha-Dechuka	Dechuka s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I> Trip.1		Transient			
13	28.09.2022	18:37hrs	28.09.2022	18:45hrs		66kv Semtokha-Dechuka	Dechuka s/s	Y & Bph OC Trip	Backup OC/EF relay optd., Y&Bph I> Trip.1		Transient			

	(K) 66/33kV Changidaphu Substation												
1	15.09.2022	18:10hrs	15.09.2022	18:32hrs			66kV Changidaphu-Olakha Line	66kV Changidaphu-Olakha Line		Distance Protection, Zone 2 RYBph Trip		Transient
2	16.09.2022	23:28hrs	16.09.2022	00:18hrs			66kV Changidaphu-Olakha Line	66kV Changidaphu-Olakha Line		Distance Protection, Zone 2 RYBph Trip		Transient
3	21.09.2022	06:28hrs	21.09.2022	06:53hrs			66kV Changidaphu-Olakha Line	66kV Changidaphu-Olakha Line		Distance Protection, Zone 2 RYBph Trip		Transient
4	22.09.2022	03:55hrs	22.09.2022	04:23hrs			66kV Changidaphu-Olakha Line	66kV Changidaphu-Olakha Line		Distance Protection, Zone 2 RYBph Trip		Transient
5	23.09.2022	03:40hrs	23.09.2022	03:51hrs			66kV Changidaphu-Olakha Line	66kV Changidaphu-Olakha Line		Distance Protection, Zone 2 RYBph Trip		Transient
6	23.09.2022	04:56hrs	23.09.2022	05:02hrs			66kV Changidaphu-Olakha Line	66kV Changidaphu-Olakha Line		Distance Protection, Zone 2 RYBph Trip		Transient
7	23.09.2022	21:42hrs	23.09.2022	22:05hrs			66kV Changidaphu-Olakha Line	66kV Changidaphu-Olakha Line		Distance Protection, Zone 2 RYBph Trip		Transient
8	24.09.2022	02:47hrs	24.09.2022	02:56hrs			66kV Changidaphu-Olakha Line	66kV Changidaphu-Olakha Line		Distance Protection, Zone 2 RYBph Trip		Transient
9	28.09.2022	18:37hrs	28.09.2022	18:44hrs			66kV Changidaphu-Olakha Line	66kV Changidaphu-Olakha Line		Distance Protection, Zone 2 RYBph Trip		Transient
	(L) 66/33kV Damji Substation												
1	16.09.2022	2328 hrs	16.09.2022	2348 hrs	0	-3.91	66 kV Dechencholing Damji Line	Whole Substation	Trip	NA	NA		Tripped from Semtokh a Substatio n.
2	19.09.2022	1008 hrs	19.09.2022	1513 hrs	5	0.01	Power Transformer I	NA	Shutdow n	NA	NA		Avail shutdown by Chuki Rinchen for annual maintenan ce of Transfor mer
3	21.09.2022	0945 hrs	21.09.2022	1835 hrs	8	3.84	Power Transformer II	NA	Shutdow n	NA	NA		Avail shutdown by Chuki Rinchen for annual maintenan ce of Transfor mer
4	22.09.2022	0249 hrs	22.09.2022	0254 hrs	0	-4.13	66 kV Dechencholing Damji Line	Whole Substation	Trip	NA	NA		Western Grid Failure
5	22.09.2022	0356 hrs	22.09.2022	0418 hrs	0	-4.12	66 kV Dechencholing Damji Line	Whole Substation	Trip	NA	NA		Western Grid Failure
6	22.09.2022	0936 hrs	22.09.2022	1159 hrs	2	2.19	Power Transformer I	NA	Shutdow n	NA	NA		Avail shutdown by Chuki Rinchen for annual maintenan ce of Transfor mer i.e. testing of transform er
7	22.09.2022	1214 hrs	22.09.2022	1720 hrs	5	2.02	Power Transformer II	NA	Shutdow n	NA	NA		Avail shutdown by Chuki Rinchen for annual maintenan ce of Transfor mer i.e. testing of transform er

	(M) 66/11kV Dochula Substation														
1	02-09-22	11:35	02-09-22	12:46	1	-12.31	Dochula				Shut down taken by GE with work permit no 2321,i s replace by direction energy metre Op rating code no.1005 issued by BPSO F eeder charged at 12:46hrs with closing code no 230 given by	Tempora ry		
2	02-09-22	12:50	02-09-22	13:43		-38.54	Dochula				Shut down taken by GE with work permit no 2322,i s replace by direction energy metre Op rating code no.1006 issued by BPSO F eeder charged at 13:43hrs with closing code no 237 given by	Tempora ry		
3	15-09-22	18:10	15-09-22	18:20		-32.25	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and 86 relay	Semtokha	Tempora ry	DHI	
4	15-09-22	18:10	15-09-22	18:27		-30.55	66kV Lobeysa	Lobeysa - Dochula	Transit fault	Under voltage and 86 relay	Lobeysa	Tempora ry	DHI	
5	16-09-22	23:28	17-09-22	0:12		-31.82	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and 86 relay	failed from	Tempora ry	DHI	
6	16-09-22	23:28	17-09-22	0:12		-30.28	66kV Lobeysa	Lobeysa - Dochula	Transit fault	Under voltage and 86 relay	failed from	Tempora ry	DHI	
7	21-09-22	6:20	21-09-22	6:46		-31.38	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and 86 relay	Semtokha	Tempora ry	DHI	
8	21-09-22	6:20	21-09-22	6:44		-30.34	66kV Lobeysa	Lobeysa - Dochula	Transit fault	Under voltage and 86 relay	Lobeysa	Tempora ry	DHI	
9	22-09-22	2:49	22-09-22	3:10		-31.19	66kV Semtokha	Semtokha - Dochula	Grid Fail from Chukha	Under voltage and 86 relay	kha Black	Tempora ry	DHI	
10	22-09-22	2:49	22-09-22	3:05		-29.64	66kV Lobeysa	Lobeysa - Dochula	Grid Fail from Chukha	Under voltage and 86 relay	kha Black	Tempora ry	DHI	
11	22-09-22	3:56	22-09-22	5:00	1	-29.02	66kV Semtokha	Semtokha - Dochula	Grid Fail from Chukha	Under voltage and 86 relay	kha Black	Tempora ry	DHI	
12	22-09-22	3:56	22-09-22	4:23		-28.12	66kV Lobeysa	Lobeysa - Dochula	Grid Fail from Chukha	Under voltage and 86 relay	kha Black	Tempora ry	DHI	
13	22-09-22	4:28	22-09-22	4:57		-2.17	66kV Lobeysa	Lobeysa - Dochula	Lobeysa Substatio n hand tripped Dochula Feeder due to overloadi ng at Basochu	Under voltage and 86 relay	kha Black	Tempora ry	DHI	
14	23-09-22	3:48	23-09-22	3:57		-30.05	66kV Lobeysa	Lobeysa - Dochula	Transit fault	Under voltage and 86 relay	Lobeysa	Tempora ry	DHI	
15	23-09-22	3:48	23-09-22	3:54		-31.25	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and 86 relay	Lobeysa	Tempora ry	DHI	
16	23-09-22	4:56	23-09-22	5:05		-19.05	66kV Lobeysa	Lobeysa - Dochula	Transit fault	Under voltage and 86 relay	Lobeysa	Tempora ry	DHI	
17	23-09-22	4:56	23-09-22	5:05		-21.11	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and 86 relay	Lobeysa	Tempora ry	DHI	
18	23-09-22	21:43	23-09-22	22:04		-20.2	66kV Lobeysa	Lobeysa - Dochula	Transit fault	Under voltage and 86 relay	Semtokha	Tempora ry	DHI	
19	23-09-22	21:43	23-09-22	22:04		-28.25	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and 86 relay	Semtokha	Tempora ry	DHI	
20	24-09-22	2:47	23-09-22	2:55		-26.31	66kV Lobeysa	Lobeysa - Dochula	Transit fault	Under voltage and 86 relay	Semtokha	Tempora ry	DHI	
21	24-09-22	2:47	23-09-22	2:55		-28.68	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and 86 relay	Semtokha	Tempora ry	DHI	
22	28-09-22	18:36	28-09-22	18:49		-28.78	66kV Lobeysa	Lobeysa - Dochula	Transit fault	Under voltage and 86 relay	Semtokha	Tempora ry	DHI	
23	28-09-22	18:36	23-09-22	18:46		-30.29	66kV Semtokha	Semtokha - Dochula	Transit fault	Under voltage and 86 relay	Semtokha	Tempora ry	DHI	