

Ministry Of Energy and Natural Resources

BHUTAN POWER SYSTEM OPERATOR

THIMPHU: BHUTAN



ANNUAL TRANSMISSION SYSTEM PERFORMANCE REPORT FOR THE YEAR 2022

JANUARY-2023



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1.0 INTRODUCTION

In compliance to Grid Code Regulation 2008, Clause No. 6.14.2.1, this office prepared an annual report covering the performance of the Transmission System and details as required by the Ministry and the Authority annually for development of power system master plan and formulation of other policy decisions, thus this report contains the performance of Transmission System for the year 2022.

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

2.0 PERFORMANCE OF GENERATING STATIONS

2.1 POWER GENERATION

The maximum individual plant generation was recorded as 1122.00 MW by the Tala Hydropower Plant, followed by 785.70 MW by Mangdichu Hydropower Plant.

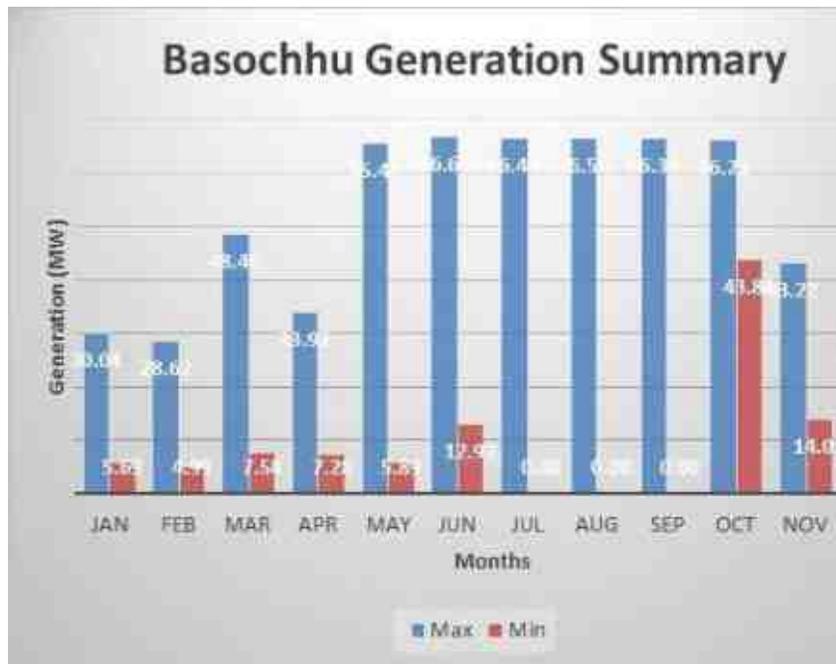


Table: 2.1.1 Monthly maximum and minimum generation summary

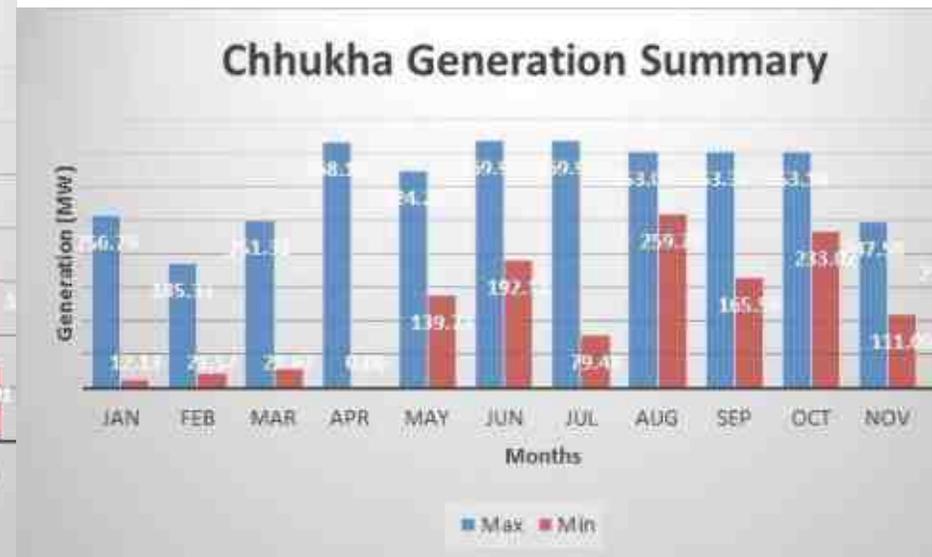
Sl. No	Hydropower Plant	Monthly Maximum and Minimum Generation (MW)												Max/Min of year (MW)		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
1	BHP	Max	30.04	28.62	48.46	33.92	65.46	66.64	66.40	66.58	66.39	66.25	43.22	31.30	66.64	0.00
		Min	5.69	4.99	7.58	7.28	5.89	12.92	0.00	0.00	0.00	43.80	14.01	22.90		
2	CHP	Max	256.79	185.33	251.31	368.16	324.25	369.94	569.99	353.00	353.39	353.14	247.58	211.65	369.99	0.00
		Min	12.13	21.57	28.67	0.00	139.73	192.13	79.47	259.79	165.59	233.02	111.09	48.38		
3	THP	Max	0.00	0.00	480.00	820.00	670.00	988.00	1,122.00	1,122.00	1,122.00	1,122.00	560.00	400.00	1,122.00	0.00
		Min	0.00	0.00	110.00	0.00	170.00	100.00	557.00	830.00	734.00	470.00	230.00	120.00		
4	KHP	Max	48.24	48.96	65.64	196.45	270.23	66.00	66.00	66.00	66.00	66.00	56.60	32.63	270.23	0.00
		Min	8.86	10.03	10.06	0.00	31.61	29.63	0.00	0.00	0.00	33.00	20.95	20.03		
5	DHP	Max	32.99	47.50	40.25	45.98	53.38	126.92	95.10	100.70	100.79	100.70	52.27	40.03	126.92	0.00
		Min	22.47	22.93	22.17	0.00	17.97	22.70	5.50	1.13	40.30	48.74	31.31	23.06		
6	MHP	Max	280.21	294.88	341.11	595.22	593.15	785.70	594.19	729.82	729.92	729.34	325.11	211.65	785.70	0.00
		Min	12.22	19.30	20.87	0.00	105.79	271.01	193.19	395.57	232.07	279.19	75.57	48.38		



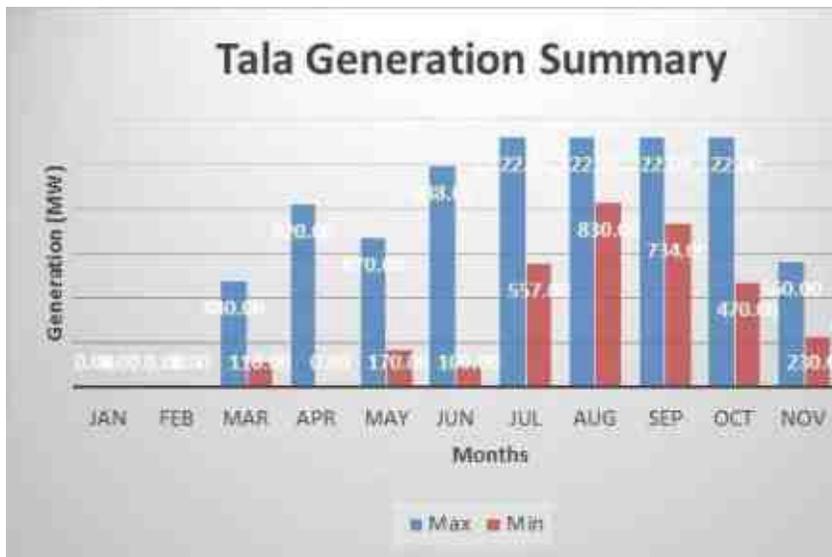
Graph: 2.1.1 Basochhu generation summary



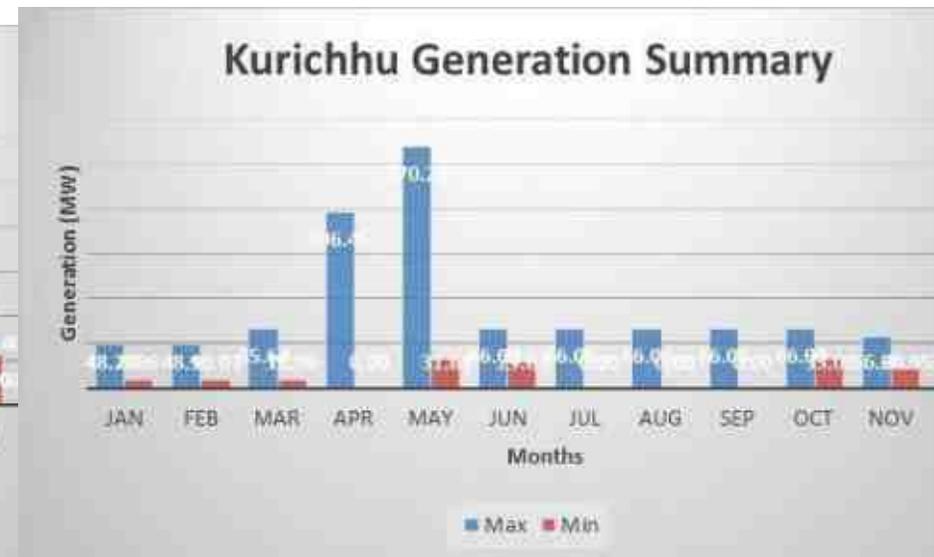
Graph: 2.1 Chhukha generation summary



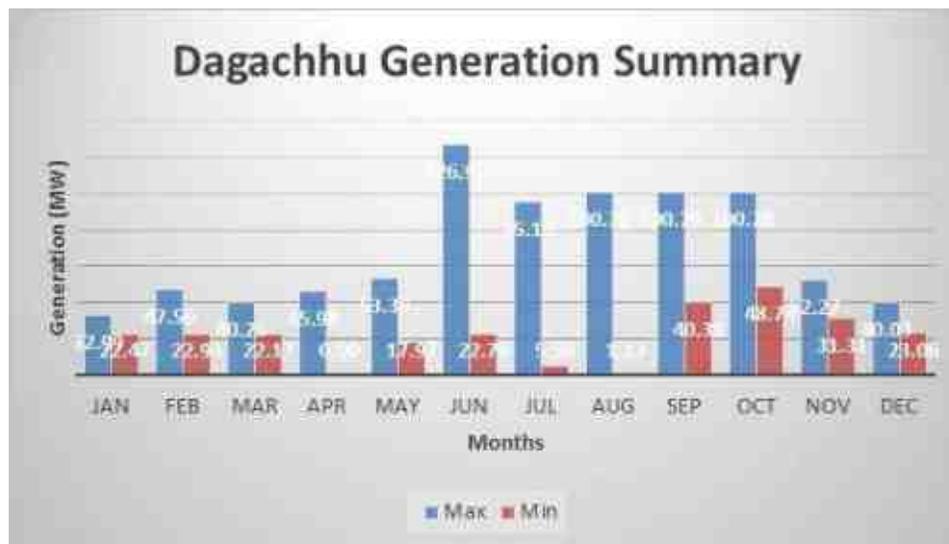
Graph: 2.1.3 Tala generation summary



Graph: 2.1.4 Kurichhu generation summary



Graph: 2.1.5 Dagachhu generation summary



Graph: 2.1.6 Mangdichu generation summary



2.2 PLANT FACTOR

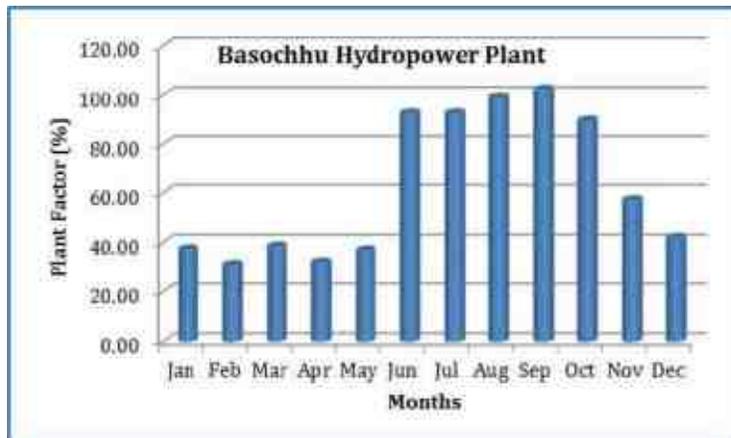
The plant factor of each generating plant was calculated as below:

$$\begin{aligned}
 \text{Plant factor} &= (\text{Actual output of a plant over a period of time}) / (\text{Output when operated at name plate rated capacity for entire time}) \\
 &= (\text{Total energy plant has produced over a period}) / (\text{Total energy plant would produce when operated at full rated capacity})
 \end{aligned}$$

Table: 2.2.1 Monthly plant factor of the hydropower plants

Sl. No	Hydropower Plant	Monthly Plant Factor (%)												Max/Min of year (%)	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
1	BHP	37.20	30.97	38.40	31.91	36.78	92.28	92.30	98.79	102.19	89.41	56.90	41.87	102.19	30.97
2	CHP	33.96	27.31	41.33	52.76	53.84	92.24	87.80	92.73	99.67	96.38	52.42	36.82	99.67	27.31
3	THP	0.00	0.00	14.70	34.78	34.96	56.63	92.25	106.34	101.93	78.29	35.11	23.84	106.34	0.00
4	KHP	35.24	29.24	55.65	82.25	95.34	104.95	106.03	109.72	103.37	104.25	61.95	43.05	109.72	29.24
5	DHP	21.43	19.23	21.43	17.54	19.21	58.65	66.56	74.36	68.47	58.97	32.35	23.22	74.36	17.54
6	MHP	30.31	28.92	23.73	23.04	34.96	44.51	27.44	28.01	91.14	28.95	5.56	0.00	91.14	0.00

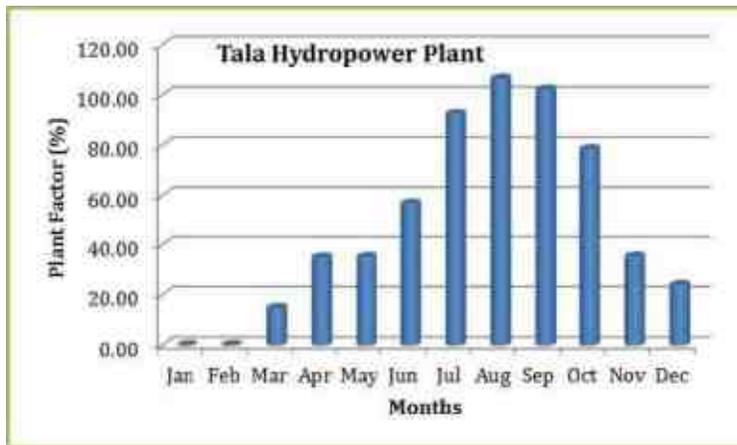
Graph: 2.2.1 Plant factor of Basochhu Hydropower Plant



Graph: 2.2.2 Plant factor of Chhukha Hydropower Plant



Graph: 2.2.3 Plant factor of Tala Hydropower Plant

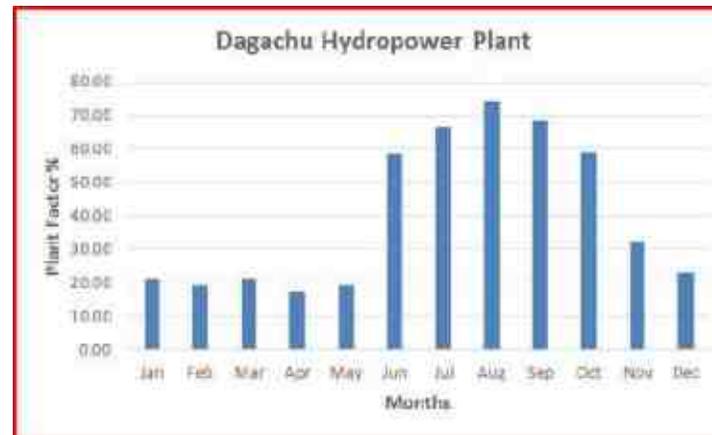


Graph: 2.2.4 Plant factor of Kurichhu Hydropower Plant



Graph: 2.2.4 Plant factor of Dagachhu Hydropower Plant

Graph: 2.2.4 Plant factor of Mangdichu Hydropower Plant



3.0 PEAK DEMAND, ENERGY AVAILABILITY AND REQUIREMENT FOR THE COUNTRY

Calculation of coincidental peak load for the eastern grid, western grid and national load, we use the following methods:

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



The national load calculated using method-1 is considered in the report.

3.1 NATIONAL LOAD

The national peak demand till now is recorded at **629.61MW** which was occurred on December 28, 2022 at 18:00 hours. This is calculated by summation of Generation minus Export/Import.

Table3.1. the National Peak Demand since 2007

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
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	629.61
% 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	44.62



Table: 3.1.2 Monthly national peak load and corresponding generation using method- 1

Sl. No	Months	Date	Time	Total Grid (MW)		Western Grid (MW)		Eastern Grid (MW)	
				Load	Generation	Load	Generation	Load	Generation
1	Jan	4-Jan-21	19:00	577.89	618.90	390.60	282.68	36.91	336.22
2	Feb	4-Feb-21	19:00	461.32	527.33	382.78	204.72	35.55	322.61
3	Mar	4-Mar-21	19:00	430.01	514.90	325.89	211.00	26.84	303.90
4	Apr	27-Apr-22	18:00	424.55	917.11	221.84	367.68	90.13	549.43
5	May	6-May-22	18:00	417.81	926.85	178.00	444.37	87.68	482.48
6	Jun	16-Jun-22	8:00	438.47	1,545.87	369.14	954.89	128.17	590.98
7	Jul	13-Jul-22	20:00	467.95	1,399.11	491.76	1,256.08	144.03	143.03
8	Aug	18-Aug-22	15:00	540.67	1,690.17	396.15	1,492.08	54.55	198.09
9	Sep	10-Sep-22	8:00	527.18	1,800.93	436.50	1,604.50	64.90	196.43
10	Oct	25-Oct-22	18:00	530.45	1,601.27	433.09	1,381.44	81.67	219.83
11	Nov	3-Nov-22	13:00	620.02	963.42	387.37	705.04	87.76	258.38
12	Dec	6-Dec-22	13:00	629.61	900.70	367.29	478.94	69.12	421.76
National Peak Load of the year (MW)				629.61					



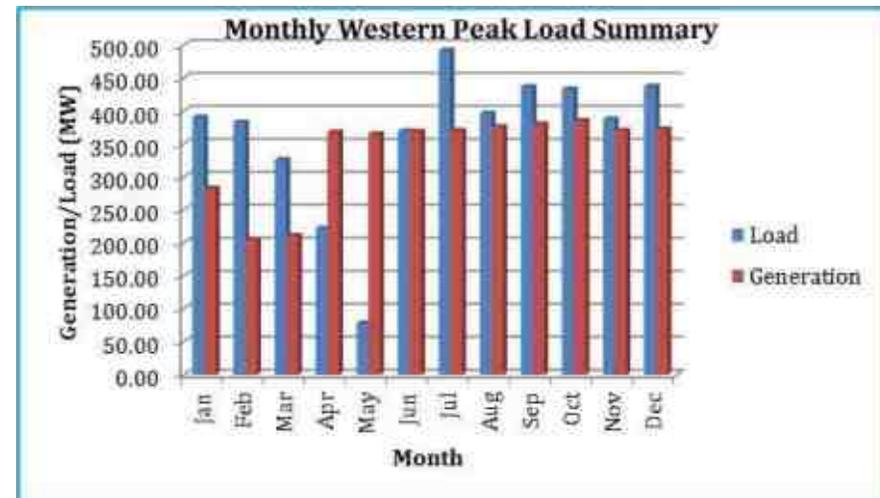
2 WESTERN GRID PEAK LOAD

Using method-1, the peak load for the western grid was 491.76 MW which occurred on July 13, 2022.

Table: 3.2.1 Monthly western peak load and corresponding generation

Sl. No	Months	Date	Time	Western Grid (MW)	
				Load	Generation
1	Jan	17-Jan-22	17:00	390.60	282.68
2	Feb	10-Feb-22	19:00	382.78	204.72
3	Mar	1-Mar-22	21:00	325.89	211.00
4	Apr	29-Apr-22	9:00	221.84	367.68
5	May	1-May-22	5:00	78.31	365.00
6	Jun	16-Jun-22	8:00	369.14	368.80
7	Jul	13-Jul-22	20:00	491.76	370.00
8	Aug	28-Aug-22	20:00	396.15	375.80
9	Sep	13-Sep-22	19:00	436.50	380.00
10	Oct	13-Oct-22	0:00	433.09	385.00
11	Nov	2-Nov-22	19:00	387.37	370.00
12	Dec	30-Dec-22	22:00	437.23	372.58
Western Peak Load of the year (MW)				491.76	

Graph: 3.2.1 Monthly western peak load and corresponding generation





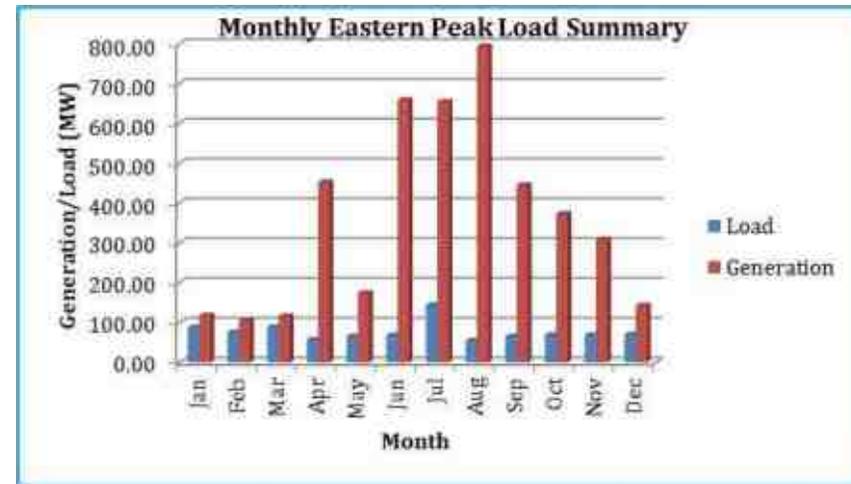
3.3 EASTERN GRID PEAK LOAD

Using method-3, the peak load for the eastern grid was 144.03 MW which occurred on July 22, 2022.

Table: 3.3.1 Monthly eastern peak load and corresponding generation

Sl. No	Months	Date	Time	Eastern Grid (MW)	
				Load	Generation
1	Jan	31-Jan-21	14:00	87.73	118.31
2	Feb	5-Feb-21	19:00	75.47	105.39
3	Mar	9-Mar-21	8:00	88.62	115.66
4	Apr	28-Apr-22	6:00	57.06	452.99
5	May	24-May-22	12:00	65.04	174.58
6	Jun	21-Jun-22	3:00	68.00	659.18
7	Jul	22-Jul-22	7:00	144.03	654.88
8	Aug	19-Aug-22	7:00	54.55	794.47
9	Sep	22-Sep-22	7:00	64.90	445.73
10	Oct	23-Oct-22	6:00	69.10	373.43
11	Nov	3-Nov-22	10:00	68.60	308.97
12	Dec	23-Dec-22	10:00	70.32	142.98
Eastern Peak Load of the year (MW)				144.03	

Graph: 3.3.1 Monthly eastern peak load and corresponding generation





4.0 EXPORT AND IMPORT OF ELECTRICITY TO/FROM NEIGHBORING COUNTRIES

4.1 EXPORT OF ELECTRICITY TO NEIGHBORING COUNTRY

Maximum export of electricity for the year was 1,280.73MW to Binaguri substation in August, 2022, followed by 310.42 MW to Birpara substation. The minimum export was 0.00 MW to Binaguri and Birpara substation.

Table: 4.1.1 Monthly power export summary

Sl. No	Substation in India	Monthly Maximum and Minimum Export (MW)												Max/Min of year (MW)	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
1	Binaguri	Max	0.00	0.00	217.46	256.45	325.09	1,108.54	1,209.00	1,280.73	1,136.36	1,071.00	496.36	332.64	1,280.73
		Min	0.00	0.00	0.09	0.55	0.09	8.00	571.03	727.27	559.00	336.00	131.91	17.00	0.00
2	Birpara	Max	0.00	39.25	100.60	194.13	159.78	310.42	232.88	260.74	281.22	224.12	93.70	85.54	310.42
		Min	0.00	0.66	0.27	0.30	0.28	31.91	51.30	52.32	4.30	56.09	0.38	9.90	0.00
3	Salakoti & Rangia	Max	18.99	25.11	51.10	56.48	67.16	96.56	77.24	77.91	95.51	97.88	43.27	30.09	97.88
		Min	0.04	0.07	0.05	0.18	1.55	50.16	2.00	13.79	0.50	4.00	0.04	0.04	0.04

4.2 IMPORT OF ELECTRICITY FROM NEIGHBORING COUNTRY

Maximum import of power was 157.91 MW from Birpara substation which occurred in January, 2022 followed by 149 MW and 47.59 MW from Binaguri, Salakati & Rangia respectively.



Table: 4.2.1 Monthly power import summary

Sl. No	Substation in India	Monthly Maximum and Minimum Import (MW)												Max/Min of year (MW)			
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
1	Binaguri	Max	120.36	110.56	88.36	127.00	62.18	149.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	149.00	
		Min	36.73	4.36	0.09	0.40	0.09	106.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
2	Birpara	Max	157.91	137.92	135.32	66.36	90.15	0.00	0.00	0.00	24.16	0.00	80.08	128.04	157.91		
		Min	1.44	0.46	0.05	0.02	0.01	0.00	0.00	0.00	24.16	0.00	0.02	1.75		0.00	
3	Salakoti & Rangia	Max	39.23	38.54	33.74	36.52	18.53	0.00	20.02	10.24	15.60	0.00	16.08	47.59	47.59		
		Min	0.05	0.29	0.05	0.37	11.52	0.00	1.29	10.24	0.06	0.00	0.01	0.06		0.00	

5.0 FREQUENCY PROFILE: MAXIMUM AND MINIMUM FREQUENCY RECORDED AND THE FREQUENCY DURATION IN DIFFERENT FREQUENCY BANDS

As per the Grid Code Regulation 2008, Clause 6.4.1 the transmission system frequency was classified into three different bands as follows:

1. *Normal state*
The transmission system frequency is within the limit of 49.5Hz to 50.5Hz
2. *Alert state*
The transmission system frequency is beyond the normal operating limit but within 49.0Hz to 51.0Hz
3. *Emergency state*
There is generation deficiency and frequency is below 49.0Hz.

We base our frequency at 220kV Bus frequency at 220/66/11kV Sementokha substation in the western grid and 132kV Bus frequency at 50Hz and Kurichhu Hydropower Plant in the eastern grid.



Table: 5.0.1 Frequency profile at Semtokha substation

220/66/11kV Semtokha Substation					
Sl. No	Months	220kV Bus Frequency Operation State (%)			
		Normal	Alert	Emergency	Blackout/Other
1	Jan	100.00	0.00	0.00	0.00
2	Feb	90.19	0.00	0.00	9.81
3	Mar	99.87	0.00	0.00	0.13
4	Apr	96.51	0.13	0.00	3.36
5	May	100.00	0.00	0.00	0.00
6	Jun	96.64	0.00	0.00	3.36
7	Jul	100.00	0.00	0.00	0.00
8	Aug	99.23	0.13	0.00	0.00
9	Sep	96.51	0.00	0.00	3.49
10	Oct	100.00	0.00	0.00	0.00
11	Nov	96.77	0.00	0.00	3.23
12	Dec	0.00	0.00	0.00	0.00
Operation State for the year		89.64%	0.02%	0.00%	1.95%



Table: 5.0.2 Frequency profile at Kurichhu Hydropower plant

60MW Kurichhu Hydropower Plant					
Sl. No	Months	132kV Bus Frequency Operation State (%)			
		Normal	Alert	Emergency	Blackout/ Other
1	Jan	99.87	0.13	0.00	0.00
2	Feb	89.52	0.00	0.54	9.95
3	Mar	100.00	0.00	0.00	0.00
4	Apr	96.37	0.00	0.00	3.63
5	May	100.00	0.00	0.00	0.00
6	Jun	96.51	0.13	0.13	3.23
7	Jul	98.79	0.00	0.00	1.21
8	Aug	100.00	0.00	0.00	0.00
9	Sep	96.37	0.40	0.00	3.23
10	Oct	100.00	0.00	0.00	0.00
11	Nov	98.66	0.00	0.00	1.34
12	Dec	0.00	0.00	0.00	0.00
Operation State for the year		89.67%	0.06%	0.06%	1.88%



6.0 VOLTAGE PROFILE OF SELECTED SUBSTATIONS

As the Grid Code Regulation 2008, Clause 6.4.1, the voltage at all connection points was classified into three different bands as follows:

1. *Normal state*
The voltages at all connection point 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 normal values
3. *Emergency state*
Transmission system voltages are outside the limits of 0.9 times and 1.1 times of nominal values.

The voltage profile of 400/220/66/11kV Malbase substation in western grid and 132/33/11kV Nangkhor substation in the eastern grid are considered in the report.



Table: 6.0.1 Voltage profile at Malbase substation

400/220/66/11kV Malbase Substation									
Sl No	Months	400kV Bus Voltage Operation State (%)				220kV Bus Voltage Operation State (%)			
		Normal	Alert	Emergency	Blackout/Other	Normal	Alert	Emergency	Blackout/Other
1	Jan	58.06	58.06	58.06	58.06	58.06	58.06	58.06	58.06
2	Feb	60.22	29.84	58.06	9.68	90.32	0.00	0.00	9.68
3	Mar	91.80	8.20	58.06	0.00	100.00	0.00	0.00	0.00
4	Apr	96.77	0.00	58.06	3.63	92.07	4.44	0.00	3.49
5	May	99.87	0.00	58.06	0.00	99.87	0.13	0.00	0.00
6	Jun	96.77	0.00	58.06	3.23	96.77	0.00	0.00	3.23
7	Jul	99.73	0.00	58.06	0.00	99.73	0.00	0.27	0.00
8	Aug	0.00	0.00	58.06	0.13	99.87	0.00	0.00	0.13
9	Sep	96.77	0.00	58.06	3.23	96.64	0.00	0.13	3.23
10	Oct	100.00	0.00	58.06	0.00	100.00	0.00	0.00	0.00
11	Nov	77.69	19.09	58.06	3.23	96.77	0.00	0.00	3.23
12	Dec	95.70	0.04	0.00	0.00	100.00	0.00	0.00	0.00
Operation State for year		81.12%	9.60%	53.23%	6.77%	94.18%	5.22%	4.87%	6.75%





Table: 6.0.2 Voltage profile at Nangkhor substation

132/33/11kV Nangkhor Substation					
Sl. No	Months	132kV Bus Voltage Operation State (%)			
		Normal	Alert	Emergency	Blackout/ Other
1	Jan	99.87	0.13	0.00	0.00
2	Feb	90.19	0.13	0.00	9.68
3	Mar	100.00	0.00	0.00	0.00
4	Apr	94.89	4.97	0.00	0.13
5	May	97.18	2.82	0.00	0.00
6	Jun	96.77	0.00	0.00	3.23
7	Jul	99.73	0.13	0.00	0.13
8	Aug	0.00	0.00	0.00	0.00
9	Sep	96.77	0.00	0.00	3.23
10	Oct	100.00	0.00	0.00	0.00
11	Nov	96.77	0.00	0.00	3.23
12	Dec	0.00	0.00	0.00	0.00
Operation State for year		81.01%	0.68%	0.00%	1.64%



7.0 MAJOR GENERATING AND TRANSMISSION OUTAGE

The summary of the major transmission outages for the eastern grid and western grid are attached as Annexure- I and Annexure- II respectively.

The outages of transmission line or transformer or any power system equipment below 66kV, tripping/outage of less than 30minutes and planned shutdown which do not cause supply interruption to the customers are not reflected.

8.0 TRANSMISSION CONSTRAINTS

There are no instant of transmission constraints during normal condition in Bhutan Power System.

9.0 INSTANCES OF PERSISTENT OR SIGNIFICANT NON-COMPLIANCE WITHIN THE GRID CODE REGULATION

The instance of non-compliance with the Grid Code Regulation 2008 for the year 2019 was not recorded.

Annexure- I



Eastern Grid Outages January 2022

MONTHLY OUTAGE REPORT FOR THE MONTH OF JANUARY, 2022 (TSD: 01/01/2022 TO 31/01/2022)

Sl. No.	Name of Tracker	Voltage Level	Type of Outage (Shutdown/ Trip/ Fault)	Outage Timing		Transmission Line		Direction of Outage (km)	MW before Outage (MW)	Outage Details		Type/ Cause of Fault	Reason for Outage	Remarks
				Date	Time	Date	Time			Outage Start (MM)	Outage End (MM)			
1	HPVA Transformer 1, 110/22 KV	110KV	Shutdown	01/01/2022	08:17:00	01/01/2022	08:17:00	0	0.00	Fire Shutdown (110KV) 110KV Bus opened	110KV Bus & tapping cable fire occurred	Transformer Shutdown	-	Shutdown due to fire at 110KV Transformer
2	HPVA Transformer 2, 110/22 KV	110KV	Shutdown	01/01/2022	08:17:00	01/01/2022	08:17:00	0	0.52	Fire Shutdown (110KV) 110KV Bus opened	110KV Bus & tapping cable fire occurred	Transformer Shutdown	-	Shutdown due to fire at 110KV Transformer
3	HPVA Transformer 3, 110/22 KV	110KV	Shutdown	01/01/2022	08:17:00	01/01/2022	08:17:00	0	0.01	Fire Shutdown (110KV) 110KV Bus opened	110KV Bus & tapping cable fire occurred	Transformer Shutdown	-	Shutdown due to fire at 110KV Transformer
4	HPVA Transformer 4, 110/22 KV	110KV	Shutdown	01/01/2022	08:17:00	01/01/2022	08:17:00	0	0.24	Fire Shutdown (110KV) 110KV Bus opened	110KV Bus & tapping cable fire occurred	Transformer Shutdown	-	Shutdown due to fire at 110KV Transformer
5	Thangpo Transformer	110KV	Shutdown	01/01/2022	08:17:00	01/01/2022	08:17:00	0	11.1	110KV Bus & TPL 110KV Bus opened	110KV Bus & tapping cable fire occurred at one end 110KV Bus & tapping cable fire occurred at other end 110KV Bus & tapping cable fire occurred at third end 110KV Bus & tapping cable fire occurred at fourth end 110KV Bus & tapping cable fire occurred at fifth end 110KV Bus & tapping cable fire occurred at sixth end 110KV Bus & tapping cable fire occurred at seventh end 110KV Bus & tapping cable fire occurred at eighth end 110KV Bus & tapping cable fire occurred at ninth end 110KV Bus & tapping cable fire occurred at tenth end	Transformer Shutdown	-	Shutdown due to fire at 110KV Transformer
6	HPVA Transformer 1, 110/22 KV	110KV	Shutdown	01/01/2022	08:17:00	01/01/2022	08:17:00	0	1.00	Fire Shutdown (110KV) 110KV Bus opened	110KV Bus & tapping cable fire occurred	Transformer Shutdown	-	Shutdown due to fire at 110KV Transformer
7	HPVA Transformer 2, 110/22 KV	110KV	Shutdown	01/01/2022	08:17:00	01/01/2022	08:17:00	0	0.02	Fire Shutdown (110KV) 110KV Bus opened	110KV Bus & tapping cable fire occurred	Transformer Shutdown	-	Shutdown due to fire at 110KV Transformer



Transmission System Performance Report 2022

1. 409/220/132/33kV Jigawang Substation													
Sl. No.	Date of Tripping	Time of Outages/Time of Tripping	Date of Normalization	Time of Fault was Cleared	Duration of Outages (hrs)	MW before Outage (MW)	Name of feeder	Name of the Substation/Line Affected by the Fault	Reasons of Fault	Relay Operations	Fault Location(KM)	Type of outages	Remarks
0 66kV Above													
1	28-01-2022	18:39 hrs	28-01-2022	18:47 hrs	8	36.52	132KV Tagbit	Tagbit	Main 1, Relay General Trip, B phase trip, Line Drop B-C	DISRUPTED DSAS	Distance 47.8 km	Transient	
2. 220/66/33kV Dhangy Substation													
0 66kV and above													
1	12-01-2022	05:38:20hrs	12-01-2022	05:51:22hrs			15.96 Jigawang feed/Dhangy Feeder			Main-1=1.79A, ID=1.79A, IC=1.57A, main 2, 2e-0137.01A, Tripped			Feeder realized after as per DPFO instruction.

February 2022

Station		409/220/132/33kV Jigawang Substation														
Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Outage/Relaying)	Statistical Tripping Time		Normalizing Time		Duration of Outage		MW before Outage (MW)	Tripping Details		Type/Class of Fault	Reason for Outage	Remarks	
				Sec	Min	Sec	Min	Min	Sec		Protection Relay Used	Fault Details (As recorded by relay)				
0 66kV																
1	132KV Tagbit	132KV	Tripped	05:51:22	05:51:22	05:51:22	05:51:22	8	0	36.52	132KV	Tagbit	General	Relay	Tagbit	Tagbit
2	132KV Tagbit	132KV	Tripped	05:51:22	05:51:22	05:51:22	05:51:22	8	0	36.52	132KV	Tagbit	General	Relay	Tagbit	Tagbit
0 132KV																
1	220KV Tagbit-1	220KV	Tripped	05:51:22	05:51:22	05:51:22	05:51:22	8	0	36.52	220KV	Tagbit-1	General	Relay	Tagbit-1	Tagbit-1
2	220KV Tagbit-2	220KV	Tripped	05:51:22	05:51:22	05:51:22	05:51:22	8	0	36.52	220KV	Tagbit-2	General	Relay	Tagbit-2	Tagbit-2
3	220KV Tagbit-3	220KV	Tripped	05:51:22	05:51:22	05:51:22	05:51:22	8	0	36.52	220KV	Tagbit-3	General	Relay	Tagbit-3	Tagbit-3
0 220KV																
1	409KV Tagbit-1	409KV	Tripped	05:51:22	05:51:22	05:51:22	05:51:22	8	0	36.52	409KV	Tagbit-1	General	Relay	Tagbit-1	Tagbit-1



Transmission System Performance Report 2022

District		Name of Feeder		Voltage Level		Type of Feeder		Performance Indicators		Availability		Reliability		Remarks	
ཁོངས་ས་ཁོངས་འཛུགས་ཁུངས་		འོ་ཤར་གྲུ་ལས་ཁུངས་འཛུགས་པོ		འོ་ཤར་གྲུ་ལས་ཁུངས་འཛུགས་པོ		འོ་ཤར་གྲུ་ལས་ཁུངས་འཛུགས་པོ		འོ་ཤར་གྲུ་ལས་ཁུངས་འཛུགས་པོ		འོ་ཤར་གྲུ་ལས་ཁུངས་འཛུགས་པོ		འོ་ཤར་གྲུ་ལས་ཁུངས་འཛུགས་པོ		འོ་ཤར་གྲུ་ལས་ཁུངས་འཛུགས་པོ	
No.	Name of Feeder	Voltage Level	Type of Feeder	Maximum Capacity (kVA)	Actual Capacity (kVA)	Number of Transformers	Number of Customers	MTB Index (kWh/kVA)	Percentage of Loss	Availability (%)	Reason for Unavailability	Remarks			
District: Thimphu															
1	Thimphu (Dhachu) Sub	11kV	Feeder	15000	15000	150	150	107	0.7	100	None	Substation (PT) not changed for better output distribution			
2	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	1.3	0.3	100	None	Reported for 100% availability			
3	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
4	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
5	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
6	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
7	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
8	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
9	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
10	Thimphu (Dhachu) Sub	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Substation (PT) not changed for better output distribution			
11	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
12	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
13	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
14	PTSA Transmission E-111221145	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Reported for 100% availability			
15	Thimphu (Dhachu) Sub	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Substation (PT) not changed for better output distribution			
District: Thimphu															
16	Thimphu (Dhachu) Sub	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Substation (PT) not changed for better output distribution			
17	Thimphu (Dhachu) Sub	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Substation (PT) not changed for better output distribution			
District: Thimphu															
18	Thimphu (Dhachu) Sub	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Substation (PT) not changed for better output distribution			
District: Thimphu															
19	Thimphu (Dhachu) Sub	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Substation (PT) not changed for better output distribution			
District: Thimphu															
20	Thimphu (Dhachu) Sub	11kV	Feeder	15000	15000	150	150	0.7	0.7	100	None	Substation (PT) not changed for better output distribution			



Transmission System Performance Report 2022

1. 400/220/132kV Operating Substation													
No.	Date of Tripping	Time of Outage Time of Tripping	Date of Normalization	Time of Fault was Cleared	Duration of Outage (Hrs)	MW before Outage (MVA)	Name of feeder	Name of the Substation on line Affected by the Fault	Reasons of Fault	Relay Operation	Fault Location(KM)	Type of outages	Remarks
0.66kV Above													
1	08.02.2022	24:01 hrs	08.02.2022	11:37 hrs	1	28.28	06kV Alphabet line 1	Alphabet line 1	OLT	SAU & SAUT			
2	08.02.2022	10:16 hrs				21.9	06kV Alphabet line 1	Alphabet line 1	OLT	SAU & SAUT			
3	16.02.2022	02:11 hrs	16.02.2022	21:08 hrs	0	13.41	06kV Alphabet line 2	Alphabet line 2	OLT	SAU & SAUT			
4	17.06.2022	11:00 hrs				18.47	06kV Alphabet line 2	Alphabet line 2	DTT on L12	SAU & SAUT			
NO TRIPPING													
2. 132/33kV Tieback Substation													
0.66kV & Above													
1	04.02.2022	19:18	08.02.2022	18:52	0	24.77	112kV Tieback Nagatara line	112kV Tieback Nagatara line	Tripzone fault	Distance protection (ohm) Start phase BCN Trip Phase ABC Zone 1 Fault Location 11.61Kms	11.61KM	Tripzone	
2	06.02.2022	08:48	07.02.2022	19:08	0	18.88	112kV Tieback Nagatara line	112kV Tieback Nagatara line	Conductor sagged at CN 61800	Distance protection (ohm) Start phase AN Trip Phase ABC Zone 1 Fault Location 11.41Kms	11.41	Line fault	



Transmission System Performance Report 2022

March 2022

Sl. No.	Name of Station	Voltage Level	Type of Device (Main/Backup)	Available Capacity (MW)		Committed Capacity (MW)		Reserve Capacity (MW)		MW Below Range (MW)	Frequency Status	Tripping Details (as recorded by relay)	Type Cause of Event	Status for Protection	Tripping Location	Remarks
				Day	Time	Day	Time	Day	Time							
2022																
1	Chang	220	Tapar	21-03-2022	14:07:00	21-03-2022	14:07:00	0	0	0	OK	Power Trip of 220 kV Busbar at Chang Station due to protection operation.	Power Trip	OK	Chang	Power Trip of 220 kV Busbar at Chang Station.
<div style="border: 1px solid black; padding: 5px;"> Device 220 kV Busbar Station Chang Station Sl. No. 1 </div>																
2	WPH 3 Transformer 1 (220/110 kV)	220/110	Transformer	18-03-2022	07:23:00	18-03-2022	07:23:00	0	0	0	OK	Over-current protection operation.	Power Trip	OK	WPH 3	Over-current protection operation.
3	WPH 3 Transformer 2 (220/110 kV)	220/110	Transformer	18-03-2022	07:23:00	18-03-2022	07:23:00	0	0	0	OK	Over-current protection operation.	Power Trip	OK	WPH 3	Over-current protection operation.
4	WPH 3 Transformer 3 (220/110 kV)	220/110	Transformer	18-03-2022	07:23:00	18-03-2022	07:23:00	0	0	0	OK	Over-current protection operation.	Power Trip	OK	WPH 3	Over-current protection operation.
<div style="border: 1px solid black; padding: 5px;"> Device 220/110 kV Transformer Station WPH 3 Station Sl. No. 2, 3, 4 </div>																
5	WPH 3 Transformer 4 (220/110 kV)	220/110	Transformer	18-03-2022	07:23:00	18-03-2022	07:23:00	0	0	0	OK	Over-current protection operation.	Power Trip	OK	WPH 3	Over-current protection operation.
<div style="border: 1px solid black; padding: 5px;"> Device 220/110 kV Transformer Station WPH 3 Station Sl. No. 5 </div>																
6	WPH 3 Transformer 5 (220/110 kV)	220/110	Transformer	18-03-2022	07:23:00	18-03-2022	07:23:00	0	0	0	OK	Over-current protection operation.	Power Trip	OK	WPH 3	Over-current protection operation.
<div style="border: 1px solid black; padding: 5px;"> Device 220/110 kV Transformer Station WPH 3 Station Sl. No. 6 </div>																



Transmission System Performance Report 2022

4.100/220/111 23kV Agarding Substation													
No.	Date of Tripping	Time of Outages/ Time of Tripping	Date of Normalisation	Time of Fault was Cleared	Duration of Outages (hrs)	MW before Outage (MW)	Name of Subst.	Name of the Substation on/line Affected by the Fault	Reasons of Fault	Relay Operation	Fault Location(KM)	Type of outages	Remarks
0.66kV @ Above													
1	08-02-2022	19:11 hrs	08-02-2022	19:27 hrs	1	26.08	0.66kV Agarding	Agarding - to	OLT	TRAV & TRAV1			
2	08-02-2022	19:54 hrs				27.8	0.66kV Agarding	Agarding - to	OLT	TRAV & TRAV1			
3	16-02-2022	20:00 hrs	16-02-2022	21:04 hrs	1	15.45	0.66kV Agarding	Agarding - to	OLT	TRAV & TRAV1			
4	17-08-2022	11:08 hrs				18.47	0.66kV Agarding	Agarding - to	DET trip on LDC	TRAV & TRAV1			
4.137/23kV Taphu Substation													
0.66kV @ Above													
1	09-02-2022	19:18	09-02-2022	19:42	0	24.77	112kV Taphu	112kV Taphu - to	Transient fault	Distance protection relay/Zone 1, Trip Phase ABC, Zone 1, Fault Location: 31.62K m	11.62KM	Transient	
2	09-02-2022	19:49	07-02-2022	19:00	0	19.08	112kV Taphu	112kV Taphu - to	Conductor snap at 75-61254	Distance protection relay/Zone 1, Trip Phase ABC, Zone 1, Fault Location: 11.45K m	11.45	Line Out	

April 2022

0.66kV @ Above														
137/23kV Taphu Substation - 04-02														
No.	Name of Subst.	Voltage Level	Type of Outage (Structure/Tripout)	Scheduled Tripping Time		Normalisation Time		Duration of Outage (hrs)	MW before Outage (MW)	Tripping Details		Time/Class of Fault	Reason for Outage	Remarks
				Start	End	Start	End			Protection Relay/ Trip	Fault Details (As reported by relay)			
112kV Feeder														
1	112kV Taphu - to	112kV	Tripout	11-02-2022	11:30	11:39	11:39	0	29.74			Report	112kV Taphu - to	Report: secondary 2 and secondary 3 on Transformer out
2	112kV Taphu - to	112kV	Tripout	11-02-2022	11:39	11:44	11:44	0	11.14			Report	112kV Taphu - to	112kV Taphu - to
3	112kV Taphu - to	112kV	Tripout	11-02-2022	11:44	11:44	11:44	0	11.14			Report	112kV Taphu - to	112kV Taphu - to
4	112kV Taphu - to	112kV	Tripout	11-02-2022	11:44	11:44	11:44	0	2.47			Report	112kV Taphu - to	112kV Taphu - to



Transmission System Performance Report 2022

Station		1000 KV SUBSTATION		1000 KV Topping Substation		1000 KV Topping Substation		1000 KV Topping Substation		1000 KV Topping Substation		1000 KV Topping Substation		1000 KV Topping Substation	
No.	Name of Feeder	Voltage Level	Type of Feeder (Overhead/Underground)	Minimum Voltage (kV)	Maximum Voltage (kV)	Normal Voltage (kV)	Surge (kV)	SW Voltage (kV)	Phase Ratio (kV)	Phase Ratio (kV)	Phase Ratio (kV)	Phase Ratio (kV)	Phase Ratio (kV)	Phase Ratio (kV)	Phase Ratio (kV)
1000 KV															
1	1000 KV Topping B	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
2	1000 KV Topping C	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
3	1000 KV Topping D	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
4	1000 KV Topping E	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
5	1000 KV Topping F	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
6	1000 KV Topping G	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
7	1000 KV Topping H	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
8	1000 KV Topping I	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV

Station		1000 KV SUBSTATION		1000 KV Topping Substation		1000 KV Topping Substation		1000 KV Topping Substation		1000 KV Topping Substation		1000 KV Topping Substation		1000 KV Topping Substation	
No.	Name of Feeder	Voltage Level	Type of Feeder (Overhead/Underground)	Minimum Voltage (kV)	Maximum Voltage (kV)	Normal Voltage (kV)	Surge (kV)	SW Voltage (kV)	Phase Ratio (kV)	Phase Ratio (kV)	Phase Ratio (kV)	Phase Ratio (kV)	Phase Ratio (kV)	Phase Ratio (kV)	Phase Ratio (kV)
1000 KV															
1	1000 KV Topping J	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
2	1000 KV Topping K	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
3	1000 KV Topping L	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
4	1000 KV Topping M	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
5	1000 KV Topping N	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
6	1000 KV Topping O	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
7	1000 KV Topping P	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
8	1000 KV Topping Q	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
9	1000 KV Topping R	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
10	1000 KV Topping S	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
11	1000 KV Topping T	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
12	1000 KV Topping U	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
13	1000 KV Topping V	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
14	1000 KV Topping W	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV
15	1000 KV Topping X	110KV	Topping	11.04.2022	11.04.2022	11.04	0	11.04	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV	1000KV



Transmission System Performance Report 2022

Station		BPSO (BPC) 110KV/132KV Transmission Substation														
Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Outage/ Tripping)	Outage/ Tripping Time		Transmission Time		Severity (Dist)	MVA before (Range (MVA))	Protection Relay Used	Tripping Details		Type/ Cause of Fault	Reason for Outage	Remarks	
				Start	End	Start	End				Feeder Details (As recorded by relay)	Feeder Details (As recorded by relay)				
1	Shedding 132KV Bus	132KV	Tripping	10:54:20.01	10:55	10:54:20.01	10:55	0	12.72	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
2	Shedding 132KV Bus	132KV	Tripping	10:55:24.01	10:56	10:55:24.01	10:56	0	10.10	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
3	Shedding 132KV Bus	132KV	Tripping	10:58:22.01	11:00	10:58:22.01	11:00	0	10.58	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
Station		BPSO (BPC) 110KV/132KV Transmission Substation														
Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Outage/ Tripping)	Outage/ Tripping Time		Transmission Time		Severity (Dist)	MVA before (Range (MVA))	Protection Relay Used	Tripping Details		Type/ Cause of Fault	Reason for Outage	Remarks	
				Start	End	Start	End				Feeder Details (As recorded by relay)	Feeder Details (As recorded by relay)				
1	Shedding 132KV Bus	132KV	Tripping	10:54:20.01	11:00	10:54:20.01	11:00	0	12.72	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
2	Shedding 132KV Bus	132KV	Tripping	10:55:24.01	11:00	10:55:24.01	11:00	0	10.10	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
3	Shedding 132KV Bus	132KV	Tripping	10:58:22.01	11:00	10:58:22.01	11:00	0	10.58	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
4	Shedding 132KV Bus	132KV	Tripping	11:00:00.01	11:05	11:00:00.01	11:05	0	10.58	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
5	Shedding 132KV Bus	132KV	Tripping	11:05:00.01	11:10	11:05:00.01	11:10	0	10.58	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
6	Shedding 132KV Bus	132KV	Tripping	11:10:00.01	11:15	11:10:00.01	11:15	0	10.58	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
7	Shedding 132KV Bus	132KV	Tripping	11:15:00.01	11:20	11:15:00.01	11:20	0	10.58	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
8	Shedding 132KV Bus	132KV	Tripping	11:20:00.01	11:25	11:20:00.01	11:25	0	10.58	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
9	Shedding 132KV Bus	132KV	Tripping	11:25:00.01	11:30	11:25:00.01	11:30	0	10.58	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
10	Shedding 132KV Bus	132KV	Tripping	11:30:00.01	11:35	11:30:00.01	11:35	0	10.58	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus
11	Shedding 132KV Bus	132KV	Tripping	11:35:00.01	11:40	11:35:00.01	11:40	0	10.58	132KV Bus Overload	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus	132KV Bus



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Station		BPSO OPERATIONS										Transmission System		Performance	
Substation		2022/23 Working Substation										Transmission System		Performance	
Details		Up-33										Transmission System		Performance	
Sl. No.	Name of Feeder	Voltage Level	Type of Station (Substation/Feeder)	Scheduled Working Time		Actual Working Time		Days/Off	MVA Intake (MVA)	Protection Relay Type	Working Hours		Type/Status of Feeder	Reason for Outage	Remarks
				Start	End	Start	End				Feeder Details (As recorded by meter)				
1	Working Feeder	115kV	Feeder	04/04/2022	14/04/2022	14/04/2022	14/04/2022	0	41.00	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	The feeder was tripped after receiving the signal from the busbar (SPOT)
2	Range Feeder	115kV	Feeder	04/04/2022	14/04/2022	17/04/2022	17/04/2022	0	10.00	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
3	115kV A, 70.0kV	115kV/70kV	Feeder	04/04/2022	14/04/2022	14/04/2022	14/04/2022	0	8.77	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
4	Working Feeder	115kV	Feeder	04/04/2022	14/04/2022	14/04/2022	14/04/2022	0	26.1	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
5	Range Feeder	115kV	Feeder	04/04/2022	14/04/2022	14/04/2022	14/04/2022	0	20.00	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
6	115kV A, 70.0kV	115kV/70kV	Feeder	17/04/2022	14/04/2022	17/04/2022	17/04/2022	0	5.28	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
7	Working Feeder	115kV	Feeder	10/04/2022	21/04/2022	21/04/2022	21/04/2022	0	7.31	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
8	Range Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	1	11	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
9	115kV A, 70.0kV	115kV/70kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	9.28	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
10	Working Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	9.28	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
11	Range Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	1	11	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
12	115kV A, 70.0kV	115kV/70kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	9.28	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
13	115kV A, 70.0kV	115kV/70kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	9.28	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
14	115kV A, 70.0kV	115kV/70kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	9.28	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
15	115kV A, 70.0kV	115kV/70kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	9.28	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
16	Working Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	10.11	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
17	Range Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	17.00	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
18	Working Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	10.11	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
19	Working Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	10.11	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
20	Working Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	10.11	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
21	Working Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	10.11	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
22	Range Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	10.11	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
23	Working Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	10.11	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)
24	Working Feeder	115kV	Feeder	13/04/2022	21/04/2022	21/04/2022	21/04/2022	0	10.11	OC, 30 A & B approved	OC, 30 A & B approved	Working Feeder	-	-	Working Feeder (No change made) (As per BPSO Database, FSCD Control 221 and 204MDC Feeder 17)



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400/220/132/33kV Feeder Substation													
Sr. No.	Date of Tripping	Type of Outages Type of Tripping	Date of Restoration	Time of Fault was Cleared	Duration of Outages (hrs)	MW before Outage (MW)	Name of Feeder	Name of the Substation Affected by the Fault	Reasons of Fault	Major Operations	Feeder Location(KM)	Type of outage	Remarks
400kV Above													
1.	09/04/2022	09/04/2022	09/04/2022	09/04/2022	0	171.00 MW	400KV Transmission Line 2	Alphabet Substation	L1 to Ground and Over current. 23/1/30kA.	none 1 - Rph pick up		Transient Fault	
2.	09/04/2022	09/04/2022	09/04/2022	09/04/2022	0	180.11 MW	400KV Transmission Line 2	Alphabet Substation	L1 - Ground Zero L Over current. 23/1/30kA.	Main 1 and Main 2 pick up. Release to ground	Feeder Distance: 20km (20kV) Bus, Main (20kV) Bus	Transient Fault	
3.	09/04/2022	09/04/2022	10/04/2022	09/21/2022	0	121.08 MW	400KV Transmission Line 2	Alphabet Substation	Feeder Loop (A to Ground)	Main 2 open. Feeder Loop (A to Ground). Zone 1 open. Main 2 open. Feeder Loop (A to Ground). Zone 1 open.	Main 1 Feeder (400kV) Bus, Main 2 Feeder (400kV) Bus		
4.	14/04/2022	14/04/2022				12.74	400KV Transmission Line 2	Alphabet Substation	22kV Vb	Main 1 & Main 2 open (22kV Vb), main 1 and main 2 open (22kV Vb)			
5.	15/04/2022	09/04/2022	15/04/2022	09/04/2022	0	93.9	400KV Transmission Line 1	Alphabet Substation	High G	Main 1 - Ground Fault. Main 2 - 24/1 High pick up and Feeder loop (G)	Main 2 Feeder (400kV) Bus	Transient Fault	Line reclosed as per IEPAD (closing order: 1062, 1063, 1064)
6.	22/04/2022	22/04/2022	22/04/2022	09/04/2022	0	110.37	400KV Transmission Line 1	Alphabet Substation	High G - Feeder Over current. 40/1/30kA	Main 2 open. Feeder Loop (A to Ground). Zone 1 open. Main 2 open. Feeder Loop (A to Ground). Zone 1 open.	Feeder (400kV) Bus, Feeder (400kV) Bus		Line reclosed as per IEPAD (closing order: 1062, 1063, 1064)
7.	27/04/2022	27/04/2022	28/04/2022	05/04/2022	23	101.00 MW	400KV Transmission Line 1	Alphabet Substation	R&B phase separated	Differential relay operated			
8.	22/04/2022	22/04/2022	22/04/2022	21/22/2022	0	17.220	220KV Feeder	Alphabet Substation	23-G	Main 2 - Feeder Loop (A to Ground). 23/1/30kA. (B=1/30kA)	Feeder (220kV) Bus	Transient	Line reclosed as per IEPAD (closing order: 1062, 1063, 1064)
9.	25/04/2022	25/04/2022	25/04/2022	25/04/2022	0	11.81	220KV Feeder	Alphabet Substation	23-G	Main 1 open. 25/1/30kA. (L) and ground.	Feeder (220kV) Bus, Feeder (220kV) Bus	Transient	
10.	27/04/2022	27/04/2022	27/04/2022			44.49	400/220KV Feeder	Alphabet Substation					
220kV/132kV Feeder Substation													
400kV and above													
1.	22/04/2022	22/04/2022	22/04/2022	21/22/2022	0	95.52	Feeder Feeder	Alphabet Substation	Main 1 - 20/1/30kA, 20/1/30kA, 20/1/30kA, 20/1/30kA with 20/1/30kA with Main 2 - 20/1/30kA, 20/1/30kA, 20/1/30kA, 20/1/30kA	Distance order: Main (400kV) Bus, Main (220kV) Bus	Line response	Transient	Feeder reclosed after confirmation
2.	22/04/2022	22/04/2022	22/04/2022	21/22/2022	0	95.52	Feeder Feeder	Alphabet Substation	Main 1 - 20/1/30kA, 20/1/30kA, 20/1/30kA, 20/1/30kA with 20/1/30kA with Main 2 - 20/1/30kA, 20/1/30kA, 20/1/30kA, 20/1/30kA	Distance order: Main (400kV) Bus, Main (220kV) Bus	Line response	Transient	Feeder reclosed after confirmation



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4. 220/110V Thimphu Substation												
4.06kV & Above												
1	02-04-2022	23:59	02-04-2022	23:59	0	13.130	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase BT, Trip Phase ABC Fault case-1 trip Fault location 21.8KM	21.8KM	Tripping		
2	09-04-2022	21:09	09-04-2022	21:09	-3	12.808	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase ABC Trip Phase ABC Fault case-1 trip Fault location 51.02KM	51.02KM	Tripping		
3	09-04-2022	22:38	09-04-2022	22:47	-3	3.670	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase AN, Trip Phase ABC Fault case-1 trip Fault location 0.7KM	0.7KM	Tripping		
4	09-04-2022	23:00	09-04-2022	23:07	-3	3.720	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase ABC Trip Phase ABC Fault case-1 trip Fault location 12.8KM	12.8KM	Tripping		
5	10-04-2022	17:11	11-04-2022	17:27	4	12.898	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase BS, Trip Phase ABC Fault case-1 trip Fault location 11.1KM	11.1KM	Tripping		
6	15-04-2022	09:14	15-04-2022	09:07	4	1.220	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase CS, Trip Phase ABC Fault case-1 trip Fault location 11.8KM	11.8KM	Tripping		
7	16-04-2022	01:55	16-04-2022	02:10	3	4.800	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase AB, Trip Phase ABC Fault case-1 trip Fault location 15.1KM	15.1KM	Tripping		
8	16-04-2022	02:10	20-04-2022	09:39	07	4.800	110kV Stage 110kV TT Conductor Sag	Distance Relay Start Phase CS, Trip Phase ABC Fault case-1 trip Fault location 21.8KM	21.8KM	Tripping	Conductor Sagged/Broken	
9	22-04-2022	22:03	22-04-2022	22:12	0	26.530	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase BCN, Trip Phase ABC Fault case-1 trip Fault location 11.02KM	11.02KM	Tripping		
10	22-04-2022	22:23	22-04-2022	22:28	0	26.140	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase AN, Trip Phase ABC Fault case-1 trip Fault location 54.0KM	54.0KM	Tripping		
11	23-04-2022	00:04	23-04-2022	00:20	0	0.474	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase BCN, Trip Phase ABC Fault case-1 trip Fault location 40.8KM	40.8KM	Tripping		
12	25-04-2022	09:21	25-04-2022	09:39	0	0.720	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Protection Trip due to Fault case Non Over voltage signal	0	Tripping		
13	25-04-2022	09:23	25-04-2022	09:41	0	0.110	110kV Stage 110kV TT Over current	Over current (21.5)	0	Tripping		
14	25-04-2022	09:23	25-04-2022	09:42	0	0.240	110kV Stage 110kV TT Over current	Over current (21.5)	0	Tripping		
15	27-04-2022	17:11:36s	27-04-2022	17:29	-3	10.808	110kV Stage 110kV TT Tripping Fault	Distance Relay Start Phase ACN, Trip Phase ABC Fault case-1 trip Fault location 45.17KM	45.17KM	Tripping		
5. 220/110V Yampou Substation												
5.06kV & Above												
1	02-04-2022	0.97044444	02-04-2022	0.9701067	0	-18.7	110kV Stage 110kV Yampou S1	70		Tripping		Tripping was failed from Tripping
2	11-04-2022	0.69012777	11-04-2022	0.61108899	0	11.3	110kV Stage 110kV Yampou S1	70		Tripping		Tripping was failed from Tripping
3	25-04-2022	5.54930750	25-04-2022	5.5776989	0	-11.4	110kV Stage 110kV Yampou S1	70		Tripping		Tripping was failed from Tripping
6. 220/110V Dhangela Substation												
6.06kV & Above												
1	15-03-2022	04:17s	15-03-2022	04:06s	13	0.27	220/110V D Dhangela Fault Init	High Voltage level, high fault, MFT lock	Dhangela Substation	Tripping Fault		Cells remaining got locked and



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History		2022											
Substation		110KV Mangha Substation											
Month		Mar 22											
Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Scheduled/Unplanned)	Scheduled Tripping Time		Resuscitation Time		MW before Outage (MW)	MW before Outage (MW)	Tripping Results	Type/Order of Fault	Reason for Disturbance	Remarks
				Start	End	Start	End						
(110KV)													
1	Nyungbu Tugtha	110KV	Tripping	07:07:2022	10:29	07:07:2022	10:29	0	27.40	Minor cable fault	OC 110KV & B opened	Supply restored after coordination with BPSO & Tugtha end	
2	Nyungbu Mangpa	110KV	Tripping	07:07:2022	10:29	07:07:2022	10:29	0	28.60	Minor cable fault	OC 110KV & B opened	Supply restored after coordination with BPSO & Mangpa end	
3	Shangbu Shandhu	110KV	Isolated	08:00:2022	20:00	08:00:2022	20:00	0	17.20	Minor cable fault	OC 110KV & B opened	Supply restored after coordination with BPSO & Shandhu end	
4	Nyungbu Mangpa	110KV	Tripping	08:00:2022	10:00	08:00:2022	10:00	0	10.7	Minor cable fault	OC 110KV & B opened	Supply restored after coordination with BPSO & Mangpa end	
5	110KV BS-1	110KV	Isolated	08:00:2022	07:30	08:00:2022	07:30	0	0.00	OC 110KV & B opened	OC 110KV & B opened	OC 110KV & B opened	
6	110KV BS-2	110KV	Tripping	07:07:2022	10:29	07:07:2022	10:29	0	2.07	Minor cable fault	OC 110KV & B opened	Supply restored after coordination with BPSO & Mangpa end	
7	Nyungbu Mangpa	110KV	Tripping	08:07:2022	10:40	08:07:2022	10:40	0	28.20	Minor cable fault	OC 110KV & B opened	Supply restored after coordination with BPSO & Mangpa end	
8	Nyungbu DCC	110KV	Tripping	10:07:2022	11:00	10:07:2022	11:00	0	0.07	Minor cable fault	OC 110KV & B opened	Supply restored after coordination with BPSO & Mangpa end	
History		2022											
Substation		110KV Mangha Substation											
Month		Mar 22											
Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Scheduled/Unplanned)	Scheduled Tripping Time		Resuscitation Time		MW before Outage (MW)	MW before Outage (MW)	Tripping Results	Type/Order of Fault	Reason for Disturbance	Remarks
				Start	End	Start	End						
1	Range Feeder	110KV	Tripping	06:07:2022	20:19	06:07:2022	20:19	0	10.00	OC 110KV & B opened	OC 110KV & B opened	Changed the feeder with a changing order (110KV BS-1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100/101/102/103/104/105/106/107/108/109/110/111/112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000/1001/1002/1003/1004/1005/1006/1007/1008/1009/1010/1011/1012/1013/1014/1015/1016/1017/1018/1019/1020/1021/1022/1023/1024/1025/1026/1027/1028/1029/1030/1031/1032/1033/1034/1035/1036/1037/1038/1039/1040/1041/1042/1043/1044/1045/1046/1047/1048/1049/1050/1051/1052/1053/1054/1055/1056/1057/1058/1059/1060/1061/1062/1063/1064/1065/1066/1067/1068/1069/1070/1071/1072/1073/1074/1075/1076/1077/1078/1079/1080/1081/1082/1083/1084/1085/1086/1087/1088/1089/1090/1091/1092/1093/1094/1095/1096/1097/1098/1099/1100/1101/1102/1103/1104/1105/1106/1107/1108/1109/1110/1111/1112/1113/1114/1115/1116/1117/1118/1119/1120/1121/1122/1123/1124/1125/1126/1127/1128/1129/1130/1131/1132/1133/1134/1135/1136/1137/1138/1139/1140/1141/1142/1143/1144/1145/1146/1147/1148/1149/1150/1151/1152/1153/1154/1155/1156/1157/1158/1159/1160/1161/1162/1163/1164/1165/1166/1167/1168/1169/1170/1171/1172/1173/1174/1175/1176/1177/1178/1179/1180/1181/1182/1183/1184/1185/1186/1187/1188/1189/1190/1191/1192/1193/1194/1195/1196/1197/1198/1199/1200/1201/1202/1203/1204/1205/1206/1207/1208/1209/1210/1211/1212/1213/1214/1215/1216/1217/1218/1219/1220/1221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Transmission System Performance Report 2022

400/220/132/33kV Operating Substation													
No.	Date of Tripping	Time of Outage Time of Tripping	Date of Normalization	Time of Fault was Cleared	Duration of Outages (Hrs)	MW before Outage (MW)	Name of feeder	Name of Substation affected by the Fault	Reason of Fault	Relay Operation	Fault Location(KM)	Type of outage	Remarks
0.66kV - Alawa													
1	28.05.2022	22:08 hrs	28.05.2022	23:03 hrs	0	81.17	400kV HT	Sparking Substation in		Disturbed O-C at 2-F Protection Relay 404 (217)			
2	23.05.2022	08:41 hrs	23.05.2022	08:59 hrs	0	81.7	400kV HT	Sparking Substation in	Operated FWC lock in HV and LV	Disturbed O-C & EEP trip			
3	28.05.22	10:27 hrs	28.05.22	11:45 hrs	1	117.81	400kV 330kV Line	Sparking and objection in HT	DTC trip for XVT phase	Distance Relay: IMPROTECT 3A02 & 3A01			
4	28.05.22	11:00 hrs	28.05.22	14:28 hrs	2		400kV 330kV Line	Sparking and objection in HT	DTC trip for XVT phase	Distance Relay: IMPROTECT 3A02 & 3A01			
5	28.05.22	17:24 hrs	28.05.22	18:28 hrs	1	113.21	400kV 330kV Line	Sparking and objection in HT	DTC trip for XVT phase	Distance Relay: IMPROTECT 3A02 & 3A01			
6	11.07.2022	20:08hrs	11.07.2022	20:08hrs	0	94.27	220kV Tawang feeder	Tawang feeder	Ground fault	11km + 1.8.0 TRIP, 21.020 TRIP, 34km 21.020 TRIP, 21.010 TRIP	Fault Current 820-1.13KA, 910-0.96KA, 810-0-0.91KA Max 340-000-1 Bus, 310kV Fault Dist=1.13km		Lighting, Air Polluting
0.132/33kV Tashi Substation													
0.66kV & Above													
1	07-05-2022	18:25	07-05-2022	18:34	0	28.770	0.66kV Tugel 0.66kV T1 Temporary Fault		Distance Relay Trip Phase A/B/C Trip Phase A/B/C Fault zone 1 trip Fault location 0.95KM		8.96KM	Temporary	Closing Code 13760BPC0
2	15-05-2022	20:08	15-05-2022	20:15	0	28.870	0.66kV Tugel 0.66kV T1 Temporary Fault		Distance Relay Trip Phase A/B/C Trip Phase A/B/C Fault zone 1 trip Fault location 0.95KM		9.96KM	Temporary	
3	16-05-2022	21:47	16-05-2022	21:50	0	27.720	0.66kV Tugel 0.66kV T1 Temporary Fault		Distance Relay Trip Phase A/B/C Trip Phase A/B/C Fault zone 1 trip Fault location 0.95KM		54.96KM	Temporary	
0.132/33kV Yumtso Substation													
0.66kV & Above													
1	23.04.2022	0.010444444	23.04.2022	0.02291667	0	10.7	0.66kV Tugel 0.66kV Yumtso S1						Supply was failed from Tugel to Yumtso
2	23.04.2022	0.009277778	23.04.2022	0.01100000	0	12.8	0.66kV Tugel 0.66kV Yumtso S1						Supply was failed from Tugel to Yumtso
3	25.04.2022	0.140100000	25.04.2022	0.157000000	0	11.4	0.66kV Tugel 0.66kV Yumtso S1						Supply was failed from Tugel to Yumtso



Transmission System Performance Report 2022

June 2022

Division		150KV BPC Substation										Substation		Remarks	
Sl. No.	Name of Feeder	Voltage Level	Type of Feeder (Overhead/Underground)	Scheduled Working Time		Actual Working Time		Percentage of Working	SP Voltage Range (KV)	Protection Relay Type	Tripping Details		Type/Case of Fault	Reason for Disturbance	Remarks
				Start	End	Start	End				Phase/Status (as recorded by relay)				
150KV Feeder															
1	Transmission Feeder	150KV	Overhead	04-06-2022	08:00 hrs	04-06-2022	12:21 hrs	0	10.75	10A	0A	To improve the quality of power	Outage	To improve the quality of power	
2	Transmission Feeder	150KV	Tapped	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0	10.62	10A	0A	10A	Outage	Work on line, Trip and Tap out	
Division		150KV BPC Substation										Substation		Remarks	
Sl. No.	Name of Feeder	Voltage Level	Type of Feeder (Overhead/Underground)	Scheduled Working Time		Actual Working Time		Percentage of Working	SP Voltage Range (KV)	Protection Relay Type	Tripping Details		Type/Case of Fault	Reason for Disturbance	Remarks
				Start	End	Start	End				Phase/Status (as recorded by relay)				
150KV Feeder															
1	Transmission Feeder	150KV	Tap	04-06-2022	08:00 hrs	04-06-2022	08:00 hrs	0	10.60	10A	0A	10A	Outage	Work on line	
2	Tap	150KV	Underground	1-06-2022	08:00 hrs	1-06-2022	07:30 hrs	0	10.70	10A	0A	10A	Outage	Work on line	
Division		150KV BPC Substation										Substation		Remarks	
Sl. No.	Name of Feeder	Voltage Level	Type of Feeder (Overhead/Underground)	Scheduled Working Time		Actual Working Time		Percentage of Working	SP Voltage Range (KV)	Protection Relay Type	Tripping Details		Type/Case of Fault	Reason for Disturbance	Remarks
				Start	End	Start	End				Phase/Status (as recorded by relay)				
150KV Feeder															
1	150KV/150KV T&E	150KV	Overhead	04-06-2022	08:00 hrs	04-06-2022	17:21 hrs	0	10.60				To carry out Working of Transformer	Work done on the transformer, No fault occurred	
2	150KV/150KV T&E	150KV	Overhead	04-06-2022	08:00 hrs	04-06-2022	08:27 hrs	0	10.60	150KV/150KV	150KV/150KV	150KV/150KV	Outage	Checked the working of 150KV/150KV Transformer	
3	150KV/150KV T&E	150KV	Overhead	07-06-2022	08:00 hrs	07-06-2022	17:47 hrs	0	10.70				Work done on the transformer	Approved the working of 150KV/150KV transformer in the working of 150KV/150KV Transformer	
4	150KV/150KV T&E	150KV	Tapping	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0				150KV/150KV	Outage	Work done on the transformer	
5	150KV/150KV T&E	150KV	Tapping	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0	10.60	150KV/150KV	150KV/150KV	150KV/150KV	Outage	Work done on the transformer	
6	150KV/150KV T&E	150KV	Tapping	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0	10.60	150KV/150KV	150KV/150KV	150KV/150KV	Outage	Work done on the transformer	
7	150KV/150KV T&E	150KV	Tapping	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0	10.60	150KV/150KV	150KV/150KV	150KV/150KV	Outage	Work done on the transformer	
8	150KV/150KV T&E	150KV	Tapping	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0	10.60	150KV/150KV	150KV/150KV	150KV/150KV	Outage	Work done on the transformer	
9	150KV/150KV T&E	150KV	Tapping	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0	10.60	150KV/150KV	150KV/150KV	150KV/150KV	Outage	Work done on the transformer	
10	150KV/150KV T&E	150KV	Tapping	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0	10.60	150KV/150KV	150KV/150KV	150KV/150KV	Outage	Work done on the transformer	
11	150KV/150KV T&E	150KV	Tapping	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0	10.60	150KV/150KV	150KV/150KV	150KV/150KV	Outage	Work done on the transformer	
12	150KV/150KV T&E	150KV	Tapping	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0	10.60	150KV/150KV	150KV/150KV	150KV/150KV	Outage	Work done on the transformer	
13	150KV/150KV T&E	150KV	Tapping	04-06-2022	08:00 hrs	04-06-2022	08:30 hrs	0	10.60	150KV/150KV	150KV/150KV	150KV/150KV	Outage	Work done on the transformer	



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Division		Substation		Month										
BPSO		BPSO		BPSO										
Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/ Tripping)	Shutdown/Tripping Time		Restoration Time (Hrs)	MW before (MW)	MW after (MW)	Transmission Loss (%)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time					Date	Time			
1	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	
2	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	
3	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	
4	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	
5	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	

Division		Substation		Month										
BPSO		BPSO		BPSO										
Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/ Tripping)	Shutdown/Tripping Time		Restoration Time (Hrs)	MW before (MW)	MW after (MW)	Transmission Loss (%)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time					Date	Time			
1	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	
2	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	
3	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	
4	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	
5	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	

Division		Substation		Month										
BPSO		BPSO		BPSO										
Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/ Tripping)	Shutdown/Tripping Time		Restoration Time (Hrs)	MW before (MW)	MW after (MW)	Transmission Loss (%)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time					Date	Time			
1	Ngangla Feeder	110kV	Tripping	04-08-2022	15:00	04-08-2022	15:00	0	25.00	OC, EA & B operated	Transmission fault	-	The feeder was charged after obtaining the verbal instruction from BPSO.	
2	15 MVA Transformer	132/110kV	Tripping	04-08-2022	14:57:48.124	04-08-2022	14:58:00	0	2.45	OC, EA and EA operated	OC, earth fault and BA operated	Transmission fault	-	
4	11 MVA Transformer	132/110kV	Tripping	04-08-2022	14:57:48.124	04-08-2022	14:58:00	0	1.92	OC, EA and EA operated	OC, earth fault and BA operated	Transmission fault	-	
7	15 MVA Transformer	132/110kV	Tripping	04-08-2022	5:53	04-08-2022	6:20	0	3.17	OC, EA and EA operated	OC, earth fault and BA operated	Transmission fault	-	
8	11 MVA Transformer	132/110kV	Tripping	04-08-2022	5:53	04-08-2022	6:21	0	3.17	OC, EA and EA operated	OC, earth fault and BA operated	Transmission fault	-	
20	Ngangla Feeder	110kV	Tripping	04-08-2022	3:07	04-08-2022	4:23	0	62.13	over current, earth fault & BA operated	over current, earth fault and BA operated	Transmission fault	-	Ngangla feeder was charged with a clearing order (VLDG) 10123, 10124, 10125 and 10126.
21	Ngangla Feeder	110kV	Tripping	04-08-2022	3:34	04-08-2022	3:40	0	20.1	over current, earth fault & BA operated	over current, earth fault and BA operated	Transmission fault	-	charged the feeder with BPSO verbal instruction.
22	Ngangla Feeder	110kV	Tripping	04-08-2022	5:03	04-08-2022	5:46	0	52.3	over current, earth fault & BA operated	over current, earth fault and BA operated	Transmission fault	-	Information was received at 5:03 AM, Ngangla and Ngangla Feeder tripped. Ngangla not charged at 5:17 AM, did not have BPSO instruction, hand tripped. Ngangla not charged at 5:17 AM, did not have BPSO instruction, hand tripped. Ngangla not charged at 5:17 AM, did not have BPSO instruction, hand tripped. Ngangla not charged at 5:17 AM, did not have BPSO instruction, hand tripped.
23	Ngangla Feeder	110kV	Tripping	04-08-2022	5:03	04-08-2022	6:11	1	26.00	over current, earth fault & BA operated	over current, earth fault and BA operated	Transmission fault	-	Ngangla, did not charged at 5:50 AM as per BPSO instruction but did not have BPSO instruction, Ngangla not charged at 6:11 AM as per BPSO instruction but did not have BPSO instruction.
24	Ngangla Feeder	110kV	Tripping	04-08-2022	18:24	04-08-2022	18:36	21	103.3	over current, earth fault & BA operated	over current, earth fault and BA operated	Transmission fault	-	The feeder was not charged at 18:34 AM as per BPSO instruction but did not have BPSO instruction, Ngangla not charged at 18:34 AM as per BPSO instruction but did not have BPSO instruction.



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Station		VOLTAGE LEVEL		WORKING TRIPPER TIME		RECONSTRUCTION TIME		AVAILABILITY		TYPE OF FAULT		REASON FOR DISTURBANCE		REMARKS	
No.	Name of Feeder	Voltage Level	Type of Feeder (Transmission/Feeder)	Start Date	End Date	Start Date	End Date	(%)	SPV Value (Average/Min)	Phase/Line/Phase	Feeder Details (Line number/ID)	Type/Class of Fault	Reason for Disturbance	Remarks	
7	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	08-08-2022	10-01	08-08-2022	10-01	9.75	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Back/Feed	Disturbance	Checked	
8	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	08-08-2022	09-01	08-08-2022	09-01	9.52	100 and 900		Feeder 115KV, 1421047, 115KV, 1421047	Back/Feed	Disturbance	Checked	
9	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	08-08-2022	20-01	08-08-2022	20-01	9.50	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Disturbance	Disturbance	Checked	
20	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	08-08-2022	17-01	08-08-2022	17-01	9.80	100 and 900		Feeder 115KV, 1421047, 115KV, 1421047	Back/Feed	Disturbance	Checked	
24	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	07-08-2022	17-01	07-08-2022	17-01	9.65	100 and 900		Feeder 115KV, 1421047, 115KV, 1421047	Back/Feed	Disturbance	Checked	
31	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	11-08-2022	01-01	11-08-2022	01-01	9.67	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Disturbance	Disturbance	Checked	
41	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	11-08-2022	19-01	11-08-2022	19-01	9.11	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Back/Feed	Disturbance	Checked	
50	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	11-08-2022	22-01	11-08-2022	22-01	9.20	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Disturbance	Disturbance	Checked	
51	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	12-08-2022	01-01	12-08-2022	01-01	9.01	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Back/Feed	Disturbance	Checked	
44	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	11-08-2022	04-01	11-08-2022	04-01	9.80	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Disturbance	Disturbance	Checked	
46	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	11-08-2022	04-01	11-08-2022	04-01	9.80	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Back/Feed	Disturbance	Checked after working both feeds	
52	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	15-08-2022	04-01	15-08-2022	04-01	9.10	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Disturbance	Disturbance	Checked	
53	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	15-08-2022	11-01	15-08-2022	11-01	9.27	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Disturbance	Disturbance	Checked	
54	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	16-08-2022	01-01	16-08-2022	01-01	9.20	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Disturbance	Disturbance	Checked	
55	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	16-08-2022	01-01	16-08-2022	01-01	9.40	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Disturbance	Disturbance	Checked after working both feeds	
57	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	20-08-2022	11-01	20-08-2022	11-01	9.00	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Disturbance	Disturbance	Checked	
58	1421047 Transmission S (DPPPA)	115KV	Transmission Feeder	21-08-2022	20-01	21-08-2022	20-01	9.10	100 and 900		(DPPPA) Feeder 115KV, 1421047, 115KV, 1421047	Disturbance	Disturbance	Checked	



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1. 400/220/132kV Jigmechug Substation												
Sl. No.	Date of Trip/Event	Type of Outage/ Type of Tripping	Date of Normalization	Time of Fault was Cleared	Duration of Outage (Hrs)	MVA before Outage (MW)	Name of Substation	Name of the Substation where Affected by the Fault	Reasons of Fault	Relay Operations	Type of Outages	Remarks
66KV Above												
1	07.06.2022	14:47 hrs	07.06.2022	15:00 hrs	0	170.42	400KV MDEEP Line-4	Alphachug Substation	Ph-G Fault	Z1 pickup (AR closed, GO)	Transient	
2	08.06.2022	11:28 hrs	08.06.2022	11:39 hrs	0	101.5	400KV DDDO Line-3	Alphachug Substation	L-E Loop	R-2/B Phase Trip, Z1 pickup, (AR Closed, GO)	Transient	
3	29.06.2022	13:01 hrs	29.06.2022	13:03 hrs	0	106.43	400KV MDEEP Line-1	Alphachug Substation	L-E Loop	Main-1, Rph pickup, Main-2, Rph pickup, Ground pickup and Z1 open.	Transient	Line auto reclosed
4	09.06.2022	12:17 hrs	09.06.2022	13:03 hrs	0	6.770	220KV Tatumang Substation	Tatumang Substation	Ph-G Ground	Main-1 Rph Trip and Z1 Wp, Main-2 Rph Trip and Z1		
5	09.06.2022	12:57 hrs	09.06.2022	13:06 hrs	0	21.580	220KV Dagaqela Substation	Dagaqela Substation	Ph-G Ground	Main-1 Rph Trip, Rph Trip and Z1 Wp, Main-2 Rph Trip and Z1 Wp.		
6	02.06.2022	14:38 hrs	02.06.2022	14:42 hrs	0	29.809	220/132KV BHMVA ICT-1	Jigmechug Substation		SCF open.		
7	11.06.2022	08:46 hrs	11.06.2022	09:02 hrs	0	90.340	220KV Dagaqela Substation	Dagaqela Substation	Line Fault	Main-1: R & Y phase Wp, Z1 Wp (DO), Main-2: R & Y phase Wp, Z1 Wp.	Transient	
8	02.06.2022	14:27 hrs	02.06.2022	14:32 hrs	0	20	132KV Galyghe Substation	Galyghe Substation	R-Y phase Wp	R-Y phase Wp, zero 1 over 2 open.	Transient	
9	02.06.2022	14:27 hrs	02.06.2022	14:39 hrs	0	16.8	132KV Tingthi Substation	Tingthi Substation	R-Y Rph and Ground Loop	R-Y R-3 loop, Z1 pickup, Z1 open.	Transient	
10	23.06.2022	13:59 hrs	23.06.2022	14:19 hrs	0	14.64	132KV Tingthi Substation	Tingthi Substation	R-Y Rph and Ground Loop	Main-1: Relay Close of Trip and R-Y and R phase Wp, Z1-Z1B Wp.		



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3. 132/66/35/11kV Golagha Substation # 66kV and above												
1	01.06.2022	14.20hr	01.06.2022	11.00hr	0	14.4	132kV Gal-Gol	No	Heavy lightning	Speed/BV power cable open	Temporary	Charging Code: NLDC ID#-1245, NLDC ID#-130 & NLDC ID#-2904. At the same time 132kV Gal-Gol line also tripped from opposite end.
2	21.06.2022	15.25hr	21.06.2022	14.05hr	0	18	132kV Gal-Gol	No	Emergency shutdown taken by TMD Golagha	none	Temporary	TMD manager was called by Golagha Thimphu official as they were facing induction problem while stepping CCTV camera from line below crossing near 132kV Gal-Gol line. DPO opening Code: 0811 & closing code: 1029.
4. 132/33kV Tashi Substation # 66kV & Above												
1	18.06.2022	18:01	18.06.2022	18:01	0	14.71	Tashi-Nyangtshi-No	Temporary Fault		Distance Relay Start Phase-AB Trip Phase-ABC, Fault near-1 top Fault location: F60M.	Temporary Fault	
2	25.06.2022	15:50	25.06.2022	18:19	0	14.70	Tashi-Nyangtshi-No	Temporary Fault		Distance Relay Start Phase-ABC Trip Phase-ABC, Fault near-1 top Fault location: U75M.	Temporary Fault	



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July 2022

Division Information		Name		Voltage Level		Type of Outage		Maintenance Time		Duration of Outage		SVC Index		Tripping Details		Type Cause of Fault		Remarks	
Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Whether Tripping)	Start Time	End Time	Start Date	End Date	Start (Hr)	End (Hr)	SVC Index	SVC Index Range (%)	Tripping Details		Type Cause of Fault	Status of Feeder	Remarks			
												Phase	Fault Details (As recorded in data)						
110kV Feeder																			
1	Electric Feeder	110kV	Tripping	07:21:00	07:21:00	07/21/2022	07/21/2022	07:21	07:21	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
2	Electric Feeder	110kV	Tripping	06:47:00	07:01:00	06/27/2022	06/27/2022	06:47	07:01	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
132kV Feeder																			
1	Tripping to Feeding	132kV	Feeder	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
2	Overcurrent to Feeding	132kV	Tripping	01:17:00	00:00	02/07/2022	00:00	01	00	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
3	Tripping to Feeding	132kV	Feeder	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
4	Overcurrent to Feeding	132kV	Over Trip	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
5	Tripping to Feeding	132kV	Overcurrent	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
230kV Feeder																			
1	Tripping to Feeding	230kV	Feeder	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
2	Overcurrent to Feeding	230kV	Tripping	01:17:00	00:00	02/07/2022	00:00	01	00	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
3	Tripping to Feeding	230kV	Feeder	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
4	Overcurrent to Feeding	230kV	Over Trip	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
5	Tripping to Feeding	230kV	Overcurrent	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
330kV Feeder																			
1	Tripping to Feeding	330kV	Feeder	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
2	Overcurrent to Feeding	330kV	Tripping	01:17:00	00:00	02/07/2022	00:00	01	00	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
3	Tripping to Feeding	330kV	Feeder	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
4	Overcurrent to Feeding	330kV	Over Trip	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
5	Tripping to Feeding	330kV	Overcurrent	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
6	Overcurrent to Feeding	330kV	Overcurrent	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
7	Overcurrent to Feeding	330kV	Overcurrent	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
8	Overcurrent to Feeding	330kV	Overcurrent	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
9	Overcurrent to Feeding	330kV	Overcurrent	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
10	Overcurrent to Feeding	330kV	Overcurrent	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
11	Overcurrent to Feeding	330kV	Overcurrent	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			
12	Overcurrent to Feeding	330kV	Overcurrent	02:07:00	02:07	02/07/2022	02/07	02	02	0	0.00	Phase A	Phase A	Over Current	Operational	Over Current Protection (OCP) tripping			



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2. 220kV/132kV Major Substations (166kV and above)													
1	08/07/2022	18:48hr	08/07/2022	19:50hr	0	20.82	Energy Spinning	Disrupt Substation A	Main 1: Ia=1.096A, Ib=0.016A, Ic=1.175A with distance 37.96M Main 2: Ia=1.748kA, Ib=1.049kA, Ic=1.871kA with distance 39.388kV	Disrupt order: Main 1&2(2) 1& 2(2)	Line segment	Tripped	Feeder restored after BPSO instructions.
2	08/07/2022	2:18:55hr	08/07/2022	2:32:10hr	0	20.82	Energy Spinning	Disrupt Substation A	Main 1: Ia=2.016A, Ib=2.389A with distance 31.8M Main 2: Ia=2.04535A, Ib=2.02939A, Ic=2.08134A with distance 37.8M	Disrupt order: Main 1&2(2) 1& 2(2)	Line segment	Tripped	Feeder restored after BPSO instructions.
3	20/07/2022	18:52hr	20/07/2022	20:04hr	0	81.78	Energy Spinning	Disrupt Substation A	Main 1: Ia=2.246A, Ib=0.016A, Ic=0.016A with distance 17.216M Main 2: Ia=2.0813kA, Ib=1.772k, Ic=1.6813kA, Ic=1.6813kA with distance 31.8M	Disrupt order: Main 1&2(2) 1& 2(2)	Line segment	Tripped	Feeder restored after BPSO instructions.
3. 132kV/66kV/33kV/22kV Substations (166kV and above)													
1	08/07/2022	20:26hr	08/07/2022	21:14hr	1	24	EE2hr Gal-14	Galopha	Source Spinning	no on ABC - phase Ia=1.1675A, Ib=1.349kA, Ic=1.313kA		Temperature	Change Code: 50, DC B75=1800, 50, DC DND=430 & 50, DC DND=112V At the same time 132v Gal-14 has also tripped from spinning and weather was heavy raining. Another 8 Substation
2	24/07/2022	18:06hr	24/07/2022	18:45hr	1	19	EE2hr Gal-14	Galopha	Source Spinning	no on ABC - phase Ia=1.1516A, Ib=1.37446kA, Ic=1.311kA		Temperature	Change Code: 50, DC B75=1800, 50, DC DND=1275 & 50, DC DND=400 At the same time 132v Gal-14 has also tripped from spinning and 8 changes took at 14:55hrs.
3	24/07/2022	17:12hr	24/07/2022	19:26hr	2	62	EE2hr Gal-14	Yon	Isolator (Temp Heat)	See above notes to	Galopha H	Temperature	Due to heavy spurt on B phase the isolator opening code 50, DC B75=1800 & Clearing code 50, DC B75=1810 Substation was normal as the customer were not affected during that emergency situation.
4	24/07/2022	19:40hr	24/07/2022	20:50hr	1	33	EE2hr Gal-14	Yon	Isolator (Temp Heat)	See above notes to	Galopha H	Temperature	Due to heavy spurt on Y phase the isolator opening code 50, DC B75=1814 & Clearing code 50, DC B75=1815 customer was not affected as isolator was there.



Transmission System Performance Report 2022

B. 2022/23 Daily Performance											
2022/23 - All Data											
Sl. No.	Date	Time	From	To	Line	Direction	Category	Substation	Line	Capacity	Status
1	16/07/2022	06:00	16:07:2022	06:00	9	14.47	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	14.47	Operational
2	16/07/2022	06:00	16:07:2022	06:00	4	13.70	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	13.70	Operational
3	16/07/2022	07:00	16:07:2022	07:00	4	2.00	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	2.00	Operational
7	16/07/2022	07:00	16:07:2022	07:00	7	22.70	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	22.70	Operational
5	16/07/2022	07:00	16:07:2022	07:00	9	22.20	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	22.20	Operational
4	16/07/2022	07:00	16:07:2022	07:00	9	19.94	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	19.94	Operational
7	16/07/2022	07:00	16:07:2022	07:00	4	14.70	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	14.70	Operational
4	16/07/2022	07:00	16:07:2022	07:00	4	13.44	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	13.44	Operational
9	16/07/2022	08:00	16:07:2022	08:00	4	12.2	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	12.2	Operational
10	16/07/2022	08:00	16:07:2022	08:00	4	11.40	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	11.40	Operational
10	16/07/2022	08:00	16:07:2022	08:00	4	11.40	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	11.40	Operational
12	16/07/2022	09:00	16:07:2022	09:00	4	11.70	Thangka-Dzongkhagpa Sub	Thangka Sub	Thangka-Dzongkhagpa Sub	11.70	Operational



Transmission System Performance Report 2022

b. 220 kV/V Dragspa Substation													
1) 66kV & Above													
1	07/07/2022	08:13hrs	7/07/2022	08:29hrs	0	-14.50	220kV Feeding	Dragspa Substation	Earth fault	Source trip relay open	Zone 1 of the relay of 1.2 km V&B phase	Good fail	Tripped from opening and due to G.C.
2	07/07/2022	07:00hrs	07/07/2022	08:12hrs	0	-12.14	220kV Feeding	Dragspa Substation	1.5.1.7 phase to ground Earth fault	Source trip relay open		Good fail	Tripped from opening and due to G.C.
3	07/07/2022	02:22hrs	07/07/2022	02:54hrs	0	-14.42	220kV Feeding	Dragspa Substation	RAY phase	Source trip relay open	zone	Good fail	Tripped from opening and due to G.C.
4	20/07/2022	19:53hrs	20/07/2022	20:04hrs	0	-13.00	220kV Feeding	Dragspa Substation	3.BB to ground	Source trip relay open	Abnormal at 1.1 Area	Good fail	Tripped from opening and due to G.C.

August 2022

1) 220kV Dragspa Substation													
1) 66kV & Above													
Sl. No.	Date of Event	Feeding Point	Type of Fault	Faulted Feeding Line		Transmission Line		Receiver of Fault		Fault Voltage (kV)	Faulted Zone (km)	Feeding Point	Remarks
				Sl. No.	Name	Sl. No.	Name	Sl. No.	Name				
220kV													
1	07/07/2022	08:13hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	08/01	14.50	0.0	Dragspa Substation	Zone 1 of the relay of 1.2 km V&B phase
2	07/07/2022	07:00hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	12.14	0.0	Dragspa Substation	1.5.1.7 phase to ground Earth fault	
3	07/07/2022	02:22hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	14.42	0.0	Dragspa Substation	RAY phase	
4	20/07/2022	19:53hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	13.00	0.0	Dragspa Substation	3.BB to ground	

2) 110kV Dragspa Substation													
1) 66kV & Above													
Sl. No.	Date of Event	Feeding Point	Type of Fault	Faulted Feeding Line		Transmission Line		Receiver of Fault		Fault Voltage (kV)	Faulted Zone (km)	Feeding Point	Remarks
				Sl. No.	Name	Sl. No.	Name	Sl. No.	Name				
1	07/07/2022	08:13hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	14.50	0.0	Dragspa Substation	Zone 1 of the relay of 1.2 km V&B phase	
2	07/07/2022	07:00hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	12.14	0.0	Dragspa Substation	1.5.1.7 phase to ground Earth fault	
3	07/07/2022	02:22hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	14.42	0.0	Dragspa Substation	RAY phase	
4	20/07/2022	19:53hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	13.00	0.0	Dragspa Substation	3.BB to ground	

3) 110kV Dragspa Substation													
1) 66kV & Above													
Sl. No.	Date of Event	Feeding Point	Type of Fault	Faulted Feeding Line		Transmission Line		Receiver of Fault		Fault Voltage (kV)	Faulted Zone (km)	Feeding Point	Remarks
				Sl. No.	Name	Sl. No.	Name	Sl. No.	Name				
1	07/07/2022	08:13hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	14.50	0.0	Dragspa Substation	Zone 1 of the relay of 1.2 km V&B phase	
2	07/07/2022	07:00hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	12.14	0.0	Dragspa Substation	1.5.1.7 phase to ground Earth fault	
3	07/07/2022	02:22hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	14.42	0.0	Dragspa Substation	RAY phase	
4	20/07/2022	19:53hrs	Phase to ground	08/01	08/01	08/01	08/01	08/01	13.00	0.0	Dragspa Substation	3.BB to ground	



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Sl.No	Substation Name (Subst Name Key)	Feeder Name (Feeder Name Key)	Feeder Status (Feeder Status Key)	Feeder Location (Subst Name Key)	Tripping Date & Time (dd/mm/yyyy hh:mm:ss)	Re-energization Date & Time (dd/mm/yyyy hh:mm:ss)	Customer affected (Yes/No)	Remarks	Outage Duration (Minutes)	Damage in (MWD)	No. of Customers Impacted (No)
10	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 06:11:00	01/09/2022 06:11:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		1
11	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 09:11:00	01/09/2022 09:11:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		100
12	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 09:11:00	01/09/2022 09:11:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		0
13	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		0
14	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		0
15	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		000
16	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		000
17	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		000
18	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		000
19	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		1400
20	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		100
21	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		000
22	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		000
23	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		000
24	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		0
25	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		0
26	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		0
27	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		0
28	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		0
29	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		0
30	Ngangphel	0101/001/00101 Ngangphel	Feeder	Transmission Line	01/09/2022 13:41:00	01/09/2022 13:41:00	Yes	Tripping on maintenance at Ngangphel Subst. (01/09/2022)	00:00:00		0



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September 2022

BPC (BPS) Line														
Sl. No.	Line Abbrev.	Voltage Level	Type of Line (Transmission/Feeder)	Number of Span		Transmission Span		Number of Tower		MVA Rating (kVA)	Transmission Loss (kWh/Day)	Voltage Drop (kV)	Power Factor (%)	Remarks
				Span	Line	Span	Tower	Tower	Span					
110KV Lines														
1	Chang	110	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
2	Thimphu	110	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
220KV Lines														
1	Thimphu-Paro	220	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
2	Thimphu-Paro	220	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
3	Thimphu-Paro	220	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
4	Thimphu-Paro	220	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
5	110KV-220KV	220	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
6	110KV-220KV	220	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
7	110KV-220KV	220	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
8	110KV-220KV	220	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
9	Thimphu-Paro	220	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.
10	Thimphu-Paro	220	Feeder	10/10	10	10/10	10	10	10	10000	10000	10	100	Report approved on 2022-09-01. The transmission performance was good. The voltage drop was within the limit. The power factor was 100%. The transmission loss was 10000 kWh/day.



Transmission System Performance Report 2022

Division		SMD-DEOTHANG										
Substation		132KV/11KV Nganglam Substation (BTP)										
Month												
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 (No)	
3	Nganglam	132/11KV, 3MVA Transformer 2	Fault	Transmission Line	02-09-2022 18:01	02-09-2022 18:08	No	Tapped due to 15kv Feeder feeder	00:04:00	4	0	
14	Nganglam	112KV Nganglam-Tashi	Fault	Transmission Line	08-09-2022 11:29	08-09-2022 11:42	No	Feeder tripped due to earth fault. 58 relay operated, LA=422.7A, IB=57.17A, IC=71.45A, I 70=119.1A, VAN=109.5kv, VIB=77.08kv, VCN=123.2kv	00:13:00	13	0	
15	Nganglam	112KV Nganglam-Tashi	Fault	Transmission Line	08-09-2022 12:01	08-09-2022 12:09	No	FA Tripped due to Earth fault. 58 relay operated, LA=381.7A, IB=55.57A, IC=60.53A, I 70=138.7A	00:08:00	8	0	
52	Nganglam	112KV Nganglam-Tashi	Fault	Transmission Line	21-09-2022 05:18	21-09-2022 05:23	No	Tapped on Overcurrent Fault details: LA: 1.435KA IB: 1.368KA IC: 1.372KA IN: 253.5A Fault duration: 73.11sec Relay Trip Time: 78.58sec Fault Location: 4.650km Fault resistance: 511.6ohm, R/R Location	00:05:00	5	0	
53	Nganglam	112KV Nganglam-Tashi	Fault	Transmission Line	21-09-2022 05:30	21-09-2022 12:48	No	Tapped on Overcurrent Fault details: LA: 1.352KA IB: 1.279KA IC: 1.283KA IN: 118.9A Fault duration: 77.25sec Relay Trip Time: 79.94sec Fault Location: 4.913km Fault Resistance: 541.3ohm	07:18:00	438	0	
55	Nganglam	112KV Nganglam-DCCI Factory	Fault	Transmission Line	21-09-2022 09:47	21-09-2022 09:51	Yes	Over Current	00:04:00	4	1	
62	Nganglam	112KV Nganglam-Tashi	Fault	Transmission Line	25-09-2022 02:38	25-09-2022 02:49	No	Earth Fault	00:11:00	11	0	



Transmission System Performance Report 2022

BPC (Bhutan Power System Operator)														
Sl. No.	Name of Substation	Voltage Level	Type of Substation (Generator/Transformer)	Scheduled Output (MW)		Actual Output (MW)		Production Efficiency (%)		MW Output (MW)	Transmission Loss (%)	Capacity Status	Remarks	Priority
				Max	Min	Max	Min	Max	Min					
1	Hydro Substation	220kV	Hydro	3000-4000	2270	4000-5000	3500	8	0	2270	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
2	Hydro Substation	110kV	Hydro	1000-1500	1200	1500-2000	1800	7	0	1200	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
3	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1500	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
4	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
5	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
6	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
7	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
8	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
9	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
10	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
11	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
12	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
BPC (Bhutan Power System Operator)														
13	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
BPC (Bhutan Power System Operator)														
14	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High
BPC (Bhutan Power System Operator)														
15	Hydro Substation	110kV	Hydro	1000-1500	1000	1500-2000	1000	6	0	1000	0.00	Capacity exceeded	Capacity exceeded due to high demand	High



Transmission System Performance Report 2022

B.202204 Transmission													
B.2022.4.1000													
ID	Start Date	End Date	Start Date	End Date	Days	Loss (%)	From	To	Direction	Remarks	Loss (%)	From	To
1	08/08/2022	11/08/2022	08/08/2022	11/08/2022	3	12.41	XV Thaple-substation	XXV Thaple-substation F	Thaple-substation	Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	12.41%		
2	08/08/2022	11/08/2022	08/08/2022	11/08/2022	3	11.7%	XV Thaple-substation	XXV Thaple-substation F	Thaple-substation	Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	11.7%		
3	22/08/2022	04/09/2022	22/08/2022	04/09/2022	5	10.7%	XV Thaple-substation	XXV Thaple-substation F	Thaple-substation	Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	10.7%		
4	22/08/2022	04/09/2022	22/08/2022	04/09/2022	5	10.7%	XV Thaple-substation	XXV Thaple-substation F	Thaple-substation	Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	10.7%		
5	22/08/2022	04/09/2022	22/08/2022	04/09/2022	5	10.7%	XV Thaple-substation	XXV Thaple-substation F	Thaple-substation	Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	10.7%		
6	25/08/2022	04/09/2022	25/08/2022	04/09/2022	5	2.7%	XV Thaple-substation	XXV Thaple-substation F	Thaple-substation	Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	2.7%		
7	25/08/2022	04/09/2022	25/08/2022	04/09/2022	5	11.41	XV Thaple-substation	XXV Thaple-substation F	Thaple-substation	Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	11.41%		
8	11/08/2022	04/09/2022	11/08/2022	04/09/2022	5	11.41	XV Thaple-substation	XXV Thaple-substation F	Thaple-substation	Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	11.41%		
9	25/08/2022	04/09/2022	25/08/2022	04/09/2022	5	25.7%	XV Thaple-substation	XXV Thaple-substation F	Thaple-substation	Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	25.7%		
10	25/08/2022	04/09/2022	25/08/2022	04/09/2022	5	10.07	XV Thaple-substation	XXV Thaple-substation F	Thaple-substation	Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	10.07%		
B.202204 Supply Substation													
B.2022.4.1000													
ID	Start Date	End Date	Start Date	End Date	Days	Loss (%)	From	To	Direction	Remarks	Loss (%)	From	To
1	08/08/2022	08/08/2022	08/08/2022	08/08/2022	1	14.0	XXV Thaple-Substation	XXV Thaple-Substation	XXV Thaple-Substation	XXV Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	14.0%		
2	11/08/2022	08/08/2022	11/08/2022	08/08/2022	1	14.0	XXV Thaple-Substation	XXV Thaple-Substation	XXV Thaple-Substation	XXV Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	14.0%		
3	11/08/2022	08/08/2022	11/08/2022	08/08/2022	1	14.0	XXV Thaple-Substation	XXV Thaple-Substation	XXV Thaple-Substation	XXV Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	14.0%		
4	25/08/2022	04/09/2022	25/08/2022	04/09/2022	5	14.0	XXV Thaple-Substation	XXV Thaple-Substation	XXV Thaple-Substation	XXV Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	14.0%		
B.202204 Supply Substation													
B.2022.4.1000													
ID	Start Date	End Date	Start Date	End Date	Days	Loss (%)	From	To	Direction	Remarks	Loss (%)	From	To
1	11/08/2022	11/08/2022	11/08/2022	11/08/2022	1	14.0	XXV Thaple-Substation	XXV Thaple-Substation	XXV Thaple-Substation	XXV Thaple-Substation Phase-ABC Tap Phase-ABC Tap over 1 tap Tap Location: XV 11/11/2022	14.0%		



Transmission System Performance Report 2022

Sl. No.	Name of Project	Voltage Level	Type of Project (Transmission/Supply)	Approved Capacity (MW)		Transmission Capacity (MW)		Capacity Utilization (%)	OT System Status (Y/N)	Transmission Status	Transmission Details		Key Issues/Remarks	Remarks
				Year	Phase	Year	Phase				Year	Phase		
1	100% Transmission	22.0KV	Supply	10.00	10.00	10.00	10.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
2	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
3	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
4	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
5	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
6	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
7	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
8	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
9	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
10	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
11	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
12	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
13	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
14	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
15	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
16	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
17	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
18	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
19	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
20	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
21	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
22	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
23	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
24	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	
25	100% Transmission	11.0KV	Supply	5.00	5.00	5.00	5.00	100%	Y	100% Transmission	100% Transmission		100% Transmission	



Transmission System Performance Report 2022

Transmission System Performance Report 2022												
Sl. No.	Line Name	Line Length (km)	Voltage (kV)	Phase	Year of Construction	Type of Line	Type of Tower	Type of Insulator	Type of Pole	Type of Span	Type of Protection	Remarks
2.1000-2021 Heavy Substation												
1	2021-2021	100km	230kV	3	2021	230kV Heavy Substation	Steel Tower	String Insulator	Steel Pole	230kV Heavy Substation	230kV Heavy Substation	230kV Heavy Substation
2	2021-2021	100km	230kV	3	2021	230kV Heavy Substation	Steel Tower	String Insulator	Steel Pole	230kV Heavy Substation	230kV Heavy Substation	230kV Heavy Substation
2.1000-2022 Heavy Substation												
1	2022-2022	100km	230kV	3	2022	230kV Heavy Substation	Steel Tower	String Insulator	Steel Pole	230kV Heavy Substation	230kV Heavy Substation	230kV Heavy Substation
2	2022-2022	100km	230kV	3	2022	230kV Heavy Substation	Steel Tower	String Insulator	Steel Pole	230kV Heavy Substation	230kV Heavy Substation	230kV Heavy Substation



Transmission System Performance Report 2022

December 2022

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

Division:	SMD-DEOTHANG
Substation:	132/33/11kV Nganglam Substation
Month:	#REF!

Sl. No.	Name of Feeder	Voltage Level	Type of Outage (Shutdown/Fault)	Shutdown/Tripping Time		Normalization Time		Duration of Outage (Hrs)	MW before Outage (MW)	Tripping Details		Type/Cause of Fault	Reason for Shutdown	Remarks
				Date	Time	Date	Time			Protection Relay Oper	Fault Details (As recorded by relay)			
132kV														
1	132/33kV, 5MVA Transformer-1	132kV	Fault	03-12-2022	09:34:00	03-12-2022	09:39:00	00:05:00	0.518	O/C & E.F Relay	tripped due to O/C 86 opt			Test charged was done and line stand.
4	132kV Nganglam-Tintibi	132kV	Fault	22-12-2022	15:43:00	22-12-2022	15:58:00	00:15:00	-19.33	O/C & E.F Relay	Tripped due to earth fault IA65.02A,IB72L0A,IC:114.6A,IN:702.7A			Test charged was done and line stand.
1. 400/220/132/33kV Jigmeing Substation														
Sl. No.	Date of Tripping	Time of Outages/ Time of Tripping	Date of Normalization	Time of Fault was Cleared	Duration of Outages (Hrs)	MW before Outage (MW)	Name of feeder	Name of the Substation/Lines Affected by the Fault	Relay Operations	Fault Location(KM)	Type of outages	No. of Customers Affected	Customer * Hours Affected	Remarks
() 132kV Above														
1	17/12/2022	02.09 hrs	17/12/2022	02.16 hrs	0	75.86	400/220kV ICT	Jigmeing Substation	87T tripped					

Annexure- II

Western Grid Outages
January 2022



Transmission System Performance Report 2022

February 2022

Sl No.	Date of Tripping	Time of tripping	Time of Restoration (hr)	Time of Fault cleared	Duration of Outage (hrs)	Area affected (MW)	Feeder Name	Name of the Substation/Area affected by the fault	Reason of Fault	Backup operations	Report location of fault (Area equipment/ Substation)	Type of outage	Remarks
132 kV/230/330/33 kV Malpas Substation													
132 kV & Above													
1	01.02.2022	14:08	01.02.2022	15:00	0	98	132KV Chukka Feeder	Malpas Substation	Overcurrent on R phase	Distance Zone 2, All 132KV Feeder Trip	132KV Bus	Overcurrent Tripping	At 14:08:08, 132KV Busbar at Malpas Substation tripped due to overcurrent on R phase.
2	01.02.2022	14:08	01.02.2022	15:13	0	22	132KV Thangka Feeder II	Malpas Substation	Overcurrent on R phase	Distance Zone 2, All 132KV Feeder Trip	132KV Bus	Overcurrent Tripping	At 14:08:08, 132KV Busbar at Malpas Substation tripped due to overcurrent on R phase. At 14:13:00, 132KV Thangka Feeder II tripped due to overcurrent on R phase.
3	08.02.2022	15:57	08.02.2022	16:00	0	3	132KV Pasakha Feeder I	Industrial Site	Overcurrent on R phase	Distance Zone 2, All 132KV Feeder Trip	132KV Bus	Overcurrent Tripping	At 15:57:00, 132KV Pasakha Feeder I tripped due to overcurrent on R phase.
4	08.02.2022	16:07	08.02.2022	16:08	0	29	132KV Pasakha Feeder II	Industrial Site	Overcurrent on R phase	Distance Zone 2, All 132KV Feeder Trip	132KV Bus	Overcurrent Tripping	At 16:07:00, 132KV Pasakha Feeder II tripped due to overcurrent on R phase.
5	08.02.2022	16:07	08.02.2022	16:08	0	27	132KV Pasakha Feeder III	Industrial Site	Overcurrent on R phase	Distance Zone 2, All 132KV Feeder Trip	132KV Bus	Overcurrent Tripping	At 16:07:00, 132KV Pasakha Feeder III tripped due to overcurrent on R phase.
6	08.02.2022	16:07	08.02.2022	16:08	0	-	132KV Pasakha Feeder	Industrial Site	Overcurrent on R phase	Distance Zone 2, All 132KV Feeder Trip	132KV Bus	Overcurrent Tripping	At 16:07:00, 132KV Pasakha Feeder tripped due to overcurrent on R phase.
7	08.02.2022	16:12	08.02.2022	16:24	0	12	132KV Chukka Feeder	Malpas Substation	Overcurrent on R phase	Distance Zone 2, All 132KV Feeder Trip	132KV Bus	Overcurrent Tripping	At 16:12:00, 132KV Chukka Feeder tripped due to overcurrent on R phase.
132 kV/230/330/33 kV Sengpheng Substation													
1	08.02.2022	15:40	08.02.2022	15:40	0	30	132KV Sengpheng Feeder	Malpas Substation	Overcurrent on R phase	O/C Trip, DR Time delay on DR 132KV Bus Trip	Drak wood Factory	Overcurrent Tripping	At 15:40:00, 132KV Sengpheng Feeder tripped due to overcurrent on R phase.
132 kV/230/330/33 kV Phuntsholing Substation													
1	01.02.2022	14:08	01.02.2022	15:13	0	6.5	132KV Chukka Feeder	132KV Chukka Feeder	Overcurrent	At 14:08:08, 132KV Chukka Feeder tripped due to overcurrent on R phase. At 15:13:00, 132KV Chukka Feeder resumed operation after getting clearance from BPC.	Substation	Tripped on fault	132KV Chukka Feeder tripped at both end (i.e. Phis & Chukka end). At 15:13:00, 132KV Chukka Feeder resumed operation after getting clearance from BPC.
2	01.02.2022	09:44	01.02.2022	09:51	0	6.66	132KV Chukka Feeder	132KV Chukka Feeder	Overcurrent	At 09:44:00, 132KV Chukka Feeder tripped due to overcurrent on R phase. At 09:51:00, 132KV Chukka Feeder resumed operation after getting clearance from BPC.	Substation	Tripped on fault	132KV Chukka Feeder tripped at both end (i.e. Phis & Chukka end). At 09:51:00, 132KV Chukka Feeder resumed operation after getting clearance from BPC.
3	01.02.2022	09:58	01.02.2022	09:59	0	6.68	132KV Chukka Feeder	132KV Chukka Feeder	Overcurrent	At 09:58:00, 132KV Chukka Feeder tripped due to overcurrent on R phase. At 09:59:00, 132KV Chukka Feeder resumed operation after getting clearance from BPC.	Substation	Tripped on fault	132KV Chukka Feeder tripped at both end (i.e. Phis & Chukka end). At 09:59:00, 132KV Chukka Feeder resumed operation after getting clearance from BPC.
4	01.02.2022	15:43	01.02.2022	15:50	0	7.30	132KV Chukka Feeder	132KV Chukka Feeder	Distance relay	General Trip, DR & DR	Substation	Tripped on fault	132KV Chukka Feeder tripped at both end (i.e. Phis & Chukka end). At 15:43:00, 132KV Chukka Feeder resumed operation after getting clearance from BPC.
5	01.02.2022	01:04	01.02.2022	01:05	0	0.01	132KV Chukka Feeder	132KV Chukka Feeder	Distance relay	General Trip, DR & DR	Substation	Tripped on fault	132KV Chukka Feeder tripped at both end (i.e. Phis & Chukka end). At 01:04:00, 132KV Chukka Feeder resumed operation after getting clearance from BPC.
6	23.02.2022	15:38	23.02.2022	15:40	0	2.90	132KV Phis Feeder	132KV Phis Feeder	Overcurrent	Distance relay	Phuntsholing Substation	Tripped on fault	At 15:38:00, 132KV Phis Feeder tripped due to overcurrent on R phase. At 15:40:00, 132KV Phis Feeder resumed operation after getting clearance from BPC.
7	23.02.2022	15:46				6.6	132KV Phis Feeder	132KV Phis Feeder	Overcurrent	Distance relay	Phuntsholing Substation	Tripped on fault	At 15:46:00, 132KV Phis Feeder tripped due to overcurrent on R phase. At 15:52:00, 132KV Phis Feeder resumed operation after getting clearance from BPC.
8	23.02.2022	16:07	23.02.2022	16:13	0	6.90	132KV Chukka Feeder	132KV Chukka Feeder	Distance relay	General Trip, DR & DR	Substation	Tripped on fault	At 16:07:00, 132KV Chukka Feeder tripped due to overcurrent on R phase. At 16:13:00, 132KV Chukka Feeder resumed operation after getting clearance from BPC.
9	23.02.2022	16:17	23.02.2022	16:40	0	2.20	132KV Phis Feeder	132KV Phis Feeder	Distance relay	General Trip, DR & DR	Substation	Tripped on fault	At 16:17:00, 132KV Phis Feeder tripped due to overcurrent on R phase. At 16:40:00, 132KV Phis Feeder resumed operation after getting clearance from BPC.
10			23.02.2022	16:30	0	6.6	132KV Phis Feeder	132KV Phis Feeder	Distance relay	General Trip, DR & DR	Substation	Tripped on fault	At 16:30:00, 132KV Phis Feeder tripped due to overcurrent on R phase. At 16:40:00, 132KV Phis Feeder resumed operation after getting clearance from BPC.



Transmission System Performance Report 2022

Transmission System Performance Report 2022													
(D) 66/33/11 KV Gedu Substation													
1	01.02.2022	16:08	01.02.2022	17:12	0	2.78	66KV Incoming	Gedu Substation	Bad weather condition		Line segment	Tripped on both the 66KV Chokha and Phentshing end. Charged from Chokha end	
2	02.02.2022	8:04	02.02.2022	8:42	0	2.8	66KV Incoming	Gedu Substation	Bad weather condition		Line segment	Tripped on both the 66KV Chokha and Phentshing end. Charged from Phentshing end	
3	03.02.2022	5:25	03.02.2022	5:32	0	1	66KV Incoming	Gedu Substation	Bad weather condition		Line segment	Tripped on both the 66KV Chokha and Phentshing end. Charged from Chokha end	
4	20.02.2022	23:00	20.02.2022	23:25	0	1.58	66KV Incoming	Gedu Substation	Bad weather condition		Line segment	Tripped on both the 66KV Chokha and Phentshing end. Charged from Chokha end	
5	21.02.2022	1:56	21.02.2022	2:21	0	0.91	66KV Incoming	Gedu Substation	Bad weather condition		Line segment	Tripped on both the 66KV Chokha and Phentshing end. Charged from Phentshing end	
6	21.02.2022	18:00	21.02.2022	18:05	0	2.33	66KV Incoming	Gedu Substation	Bad weather condition		Line segment	Tripped on both the 66KV Chokha and Phentshing end. Charged from Phentshing end	
7	25.02.2022	16:16	25.02.2022	16:34	0	2.9	66KV Incoming	Gedu Substation	Bad weather condition		Line segment	Tripped on both the 66KV Chokha and Phentshing end. Charged from Chokha end	
(E) 66/33/11 KV Guntu Substation													
1	08.02.2022	10:57	09.02.2022	20:29	1	2.673	66/11KV 10MVA Transformer	Nil	Sparking occurred on LV terminal	Nil	Guntu Substation	Shutdown	Taken shutdown for new replacement of LV cable termination by maintenance team.
2	09.02.2022	00:11	09.02.2022	00:29	0	4.15	66/11KV 5MVA Transformer	Guntu Substation	Over load	06 & 30AB Aux Operated	Guntu Substation		Due to over loading of Transformer got tripped.
3	21.02.2022	15:27	21.02.2022	15:40	0	6.42	66KV Damdum feeder	Guntu Substation	Nil	Nil	Dhamdum substation	Transient fault	66KV supply tripped from Damdum Substation, supply fed from P/Bus at 15:45 hrs. 66KV Damdum resumed at 17:01 hrs.
(F) 220/66/33 KV Dhamdum Substation													
1	21.02.2022	15:27	21.02.2022	16:00	0	5.25	90/66MVA TRF 1 (20%)	Dhamdum	Transient Fault	RET878	N/A	N/A	Fault Mag:128.11KV and Fault angle - 7.55Deg
2	21.02.2022	15:27	21.02.2022	15:59	0	8.32	60/63 MVA TRF 2 (20%)	Dhamdum	Transient Fault	RET870	N/A	N/A	Fault Mag:138.11KV and Fault angle - 7.55Deg
3	21.02.2022	16:27	21.02.2022	17:01	1	8.1	66KV Guntu fdr.	Guntu	Transient Fault	REL670 General trip, Zone 1 trip, B phase and 9H relay trip.	N/A	-	Fault value: B phase fault mag: 3400.74amp and fault angle - 74.25 deg.
Sl. No.	Date of Tripping	Time of outages	Date of Normalization	Time of fault occurrence	Duration of Outages (Hrs)	MW before outages (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 Chokha switching station													
1	04.02.2022	22:28	05.02.2022	24:05	10hr	1.32MW	66KV Paigasa Feeder	Paigasa substation		OC trip, Y&B ph. CB open.			
2		00:28		00:58		4.22MW							
3		01:06		01:16		0.88MW	66KV Jemsa Feeder	Feeder from 66KV Chokha Feeder		OC trip, Y&B ph. CB open.			
4		01:28		02:28		6.22MW							
5		02:08		14:28	12hr	1.26MW	66KV Pava Feeder	Pava substation	Short circuit near EB	OC trip, Y&B ph. CB open.	66KV transmission line	Tripping	
6	05.02.2022	00:28	05.02.2022	00:58		1.83MW							
7		01:08		14:08	13hr	4.03MW							
8		21:08		02:08		1.27 MW							
9		02:08		04:08	2hr	1.31 MW	66KV Chokha Feeder	Feeder from 66KV Jemsa Feeder		OC trip, Y&B ph. CB open. 2x0 ph. open			
10		07:08	08.02.2022	07:28	40min	1.31 MW							
11	08.02.2022	1:08	08.02.2022	1:48	40min	0.25MW	66KV Chokha Feeder	Feeder from 66KV Jemsa Feeder	Fire jumping on at Whse T-01. Fire extinguisher used near Whse T-01	CB open, Lock, Fire isolate open, Firelock closed			
12	09.02.2022	14:48	09.02.2022	17:08	2hr	6.43MW							
13		02:08		02:28		1.83MW							
14	14.02.2022	06:08	14.02.2022	06:28		2.03MW	66KV Pava Feeder	Pava substation	Transient fault.	CB open, OC	Chokha end	Tripping	
15		07:08		07:28		7.63MW							
16		08:08	20.02.2022	08:28		0.31 MW							
17	20.02.2022	21:08	21.02.2022	22:08	1hr	1.01 MW	66KV Chokha Feeder	Feeder from 66KV Jemsa Feeder	Tripping	CB open, Fire protection system, fire alarm	Chokha end	Tripping	
18		21:08	20.02.2022	21:18		1.01 MW	66KV Paigasa Feeder	Paigasa substation	Tripping	4x0 ph. Out protection system, fire alarm	Chokha end	Tripping	
19	21.02.2022	04:08	21.02.2022	04:08		0.84 MW	66KV Jemsa Feeder	Pava/Paigasa Whse	Tripping	No operation at chokha end	Chungkhela end	Tripping	



Transmission System Performance Report 2022

Sl. No.	Line No./Name	Capacity (MW)	Length (km)	Year of Commissioning	Operator	Category	Remarks	Status	Remarks
1	100-101-20000	1000	100.00	2000	BPSO	Transmission		Operational	
2	100-102-20000	1000	100.00	2000	BPSO	Transmission		Operational	
3	100-103-20000	1000	100.00	2000	BPSO	Transmission		Operational	
4	100-104-20000	1000	100.00	2000	BPSO	Transmission		Operational	
5	100-105-20000	1000	100.00	2000	BPSO	Transmission		Operational	
6	100-106-20000	1000	100.00	2000	BPSO	Transmission		Operational	
7	100-107-20000	1000	100.00	2000	BPSO	Transmission		Operational	
8	100-108-20000	1000	100.00	2000	BPSO	Transmission		Operational	
9	100-109-20000	1000	100.00	2000	BPSO	Transmission		Operational	
10	100-110-20000	1000	100.00	2000	BPSO	Transmission		Operational	
11	100-111-20000	1000	100.00	2000	BPSO	Transmission		Operational	
12	100-112-20000	1000	100.00	2000	BPSO	Transmission		Operational	
13	100-113-20000	1000	100.00	2000	BPSO	Transmission		Operational	
14	100-114-20000	1000	100.00	2000	BPSO	Transmission		Operational	
15	100-115-20000	1000	100.00	2000	BPSO	Transmission		Operational	
16	100-116-20000	1000	100.00	2000	BPSO	Transmission		Operational	
17	100-117-20000	1000	100.00	2000	BPSO	Transmission		Operational	
18	100-118-20000	1000	100.00	2000	BPSO	Transmission		Operational	
19	100-119-20000	1000	100.00	2000	BPSO	Transmission		Operational	
20	100-120-20000	1000	100.00	2000	BPSO	Transmission		Operational	
21	100-121-20000	1000	100.00	2000	BPSO	Transmission		Operational	
22	100-122-20000	1000	100.00	2000	BPSO	Transmission		Operational	
23	100-123-20000	1000	100.00	2000	BPSO	Transmission		Operational	
24	100-124-20000	1000	100.00	2000	BPSO	Transmission		Operational	
25	100-125-20000	1000	100.00	2000	BPSO	Transmission		Operational	
26	100-126-20000	1000	100.00	2000	BPSO	Transmission		Operational	
27	100-127-20000	1000	100.00	2000	BPSO	Transmission		Operational	
28	100-128-20000	1000	100.00	2000	BPSO	Transmission		Operational	
29	100-129-20000	1000	100.00	2000	BPSO	Transmission		Operational	
30	100-130-20000	1000	100.00	2000	BPSO	Transmission		Operational	
31	100-131-20000	1000	100.00	2000	BPSO	Transmission		Operational	
32	100-132-20000	1000	100.00	2000	BPSO	Transmission		Operational	
33	100-133-20000	1000	100.00	2000	BPSO	Transmission		Operational	
34	100-134-20000	1000	100.00	2000	BPSO	Transmission		Operational	
35	100-135-20000	1000	100.00	2000	BPSO	Transmission		Operational	
36	100-136-20000	1000	100.00	2000	BPSO	Transmission		Operational	
37	100-137-20000	1000	100.00	2000	BPSO	Transmission		Operational	
38	100-138-20000	1000	100.00	2000	BPSO	Transmission		Operational	
39	100-139-20000	1000	100.00	2000	BPSO	Transmission		Operational	
40	100-140-20000	1000	100.00	2000	BPSO	Transmission		Operational	
41	100-141-20000	1000	100.00	2000	BPSO	Transmission		Operational	
42	100-142-20000	1000	100.00	2000	BPSO	Transmission		Operational	
43	100-143-20000	1000	100.00	2000	BPSO	Transmission		Operational	
44	100-144-20000	1000	100.00	2000	BPSO	Transmission		Operational	
45	100-145-20000	1000	100.00	2000	BPSO	Transmission		Operational	
46	100-146-20000	1000	100.00	2000	BPSO	Transmission		Operational	
47	100-147-20000	1000	100.00	2000	BPSO	Transmission		Operational	
48	100-148-20000	1000	100.00	2000	BPSO	Transmission		Operational	
49	100-149-20000	1000	100.00	2000	BPSO	Transmission		Operational	
50	100-150-20000	1000	100.00	2000	BPSO	Transmission		Operational	



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[D] 66KV/11KV Load shedding calculation										
66KV/11KV - Drukpa Substation										
1	09.02.2022	11.02.2022	09.02.2022	11.02.2022	0	-1.10	66KV/11KV - Drukpa Substation	09.02.18.00 Load shedding calculation	NA	66KV/11KV - Drukpa Substation tripped at 11.02.2022 and changed the line to per BPSO at 11.02.2022 after reenergizing substation.
66KV/11KV - Drukpa Substation										
1	09.02.2022	09.02.2022	09.02.2022	09.02.2022	0	12.620	66KV/11KV - Drukpa Substation	NA	Due to BSS relay operation	66KV/11KV - Drukpa Substation tripped at 09.02.2022 and addressed to BPSO and changed at 09.02.2022 as per BPSO.
2	09.02.2022	09.02.2022	09.02.2022	09.02.2022	0	2.420	66KV/11KV - Drukpa Substation	NA	Due to BSS relay operation	66KV/11KV - Drukpa Substation tripped at 09.02.2022 and addressed to BPSO and changed at 09.02.2022 as per BPSO with clearing code 2211.
3	09.02.2022	09.02.2022	09.02.2022	09.02.2022	0		66KV/11KV - Drukpa Substation	NA	Due to BSS relay operation	66KV/11KV - Drukpa Substation tripped at 09.02.2022 and addressed to BPSO and changed at 09.02.2022 as per BPSO.
4	09.02.2022	09.02.2022	09.02.2022	09.02.2022	0		66KV/11KV - Drukpa Substation	NA	Due to BSS relay operation	66KV/11KV - Drukpa Substation tripped at 09.02.2022 and addressed to BPSO and changed at 09.02.2022 as per BPSO.
5	09.02.2022	09.02.2022	09.02.2022	09.02.2022	12	8.000	66KV/11KV - Drukpa Substation	NA	Due to BSS relay operation	66KV/11KV - Drukpa Substation tripped at 09.02.2022 and addressed to BPSO and changed at 09.02.2022 as per BPSO.
6	15.02.2022	15.02.2022	15.02.2022	15.02.2022	0	-0.010	66KV/11KV - Drukpa Substation	09.22.18.00 Load shedding calculation	NA	66KV/11KV - Drukpa Substation tripped at 15.02.2022 and addressed to BPSO and changed at 15.02.2022 as per BPSO with clearing code 2211.
7	15.02.2022	15.02.2022	15.02.2022	15.02.2022	23	-7.000	66KV/11KV - Drukpa Substation	09.22.18.00 Load shedding calculation	Due to BSS relay operation	66KV/11KV - Drukpa Substation tripped at 15.02.2022 and addressed to BPSO and changed at 15.02.2022 as per BPSO with clearing code 2211. The supply was restored from Drukpa Substation at 15.02.2022 and the supply was restored from Drukpa Substation at 15.02.2022 after reenergizing at 15.02.2022 with the clearing code 1011.
66KV/11KV - Drukpa Substation										
1	09.02.2022	09.02.2022	09.02.2022	09.02.2022	12		66KV/11KV - Drukpa Substation	NA		
2	09.02.2022	09.02.2022	09.02.2022	09.02.2022	2		66KV/11KV - Drukpa Substation	Power on	Due to BSS relay operation	Power on
3	15.02.2022	15.02.2022	15.02.2022	15.02.2022	4		66KV/11KV - Drukpa Substation	Power on	Tripped from Drukpa Substation	Power on
4	21.02.2022	21.02.2022	21.02.2022	21.02.2022	10		66KV/11KV - Drukpa Substation	Power on	Tripped from Drukpa Substation	Power on
66KV/11KV - Drukpa Substation										
1	09.02.2022	09.02.2022	09.02.2022	09.02.2022	21	4.42	66KV/11KV - Drukpa Substation	Power on	G/C	66KV/11KV - Drukpa Substation tripped at 09.02.2022 and addressed to BPSO and changed at 09.02.2022 as per BPSO with clearing code 2211.
2	23.02.2022	23.02.2022	23.02.2022	23.02.2022	0		66KV/11KV - Drukpa Substation	Power on	Due to BSS relay operation	66KV/11KV - Drukpa Substation tripped at 23.02.2022 and addressed to BPSO and changed at 23.02.2022 as per BPSO with clearing code 2211.
66KV/11KV - Drukpa Substation										
1	09.02.2022	09.02.2022	09.02.2022	09.02.2022	0	-17.27	66KV/11KV - Drukpa Substation	Power on	Supply failed from Drukpa Substation	Power on
2	09.02.2022	09.02.2022	09.02.2022	09.02.2022	0	0.707	66KV/11KV - Drukpa Substation	Power on	Tripped from Drukpa Substation	Power on
3	09.02.2022	09.02.2022	09.02.2022	09.02.2022	107	0	66KV/11KV - Drukpa Substation	Power on	Tripped from Drukpa Substation	Power on
4	09.02.2022	09.02.2022	09.02.2022	09.02.2022	0	-1.520	66KV/11KV - Drukpa Substation	Power on	Tripped from Drukpa Substation	Power on
5	09.02.2022	09.02.2022	09.02.2022	09.02.2022	0	-1.520	66KV/11KV - Drukpa Substation	Power on	Tripped from Drukpa Substation	Power on
6	09.02.2022	09.02.2022	09.02.2022	09.02.2022	0	-1.520	66KV/11KV - Drukpa Substation	Power on	Tripped from Drukpa Substation	Power on
7	15.02.2022	15.02.2022	15.02.2022	15.02.2022	0	-17.27	66KV/11KV - Drukpa Substation	Power on	Tripped from Drukpa Substation	Power on
66KV/11KV - Drukpa Substation										
1	04.02.2022	04.02.2022	04.02.2022	04.02.2022	0	-2.20	66KV/11KV - Drukpa Substation	Power on	G/C	Supply failed from Drukpa Substation on 04.02.2022. The cause was investigated and the cause was corrected from that time.
2	04.02.2022	04.02.2022	04.02.2022	04.02.2022	0	-2.20	66KV/11KV - Drukpa Substation	Power on	G/C on three phases	Supply failed from Drukpa Substation on 04.02.2022. The cause was investigated and the cause was corrected from that time.
3	04.02.2022	04.02.2022	04.02.2022	04.02.2022	100	-2.01	66KV/11KV - Drukpa Substation	Power on	G/C on three phases	Supply failed from Drukpa Substation on 04.02.2022. The cause was investigated and the cause was corrected from that time.
4	04.02.2022	04.02.2022	04.02.2022	04.02.2022	0	-2.7	66KV/11KV - Drukpa Substation	Power on	G/C on three phases	Supply failed from Drukpa Substation on 04.02.2022. The cause was investigated and the cause was corrected from that time.
5	04.02.2022	04.02.2022	04.02.2022	04.02.2022	0	-2.5	66KV/11KV - Drukpa Substation	Power on	G/C on three phases	Supply failed from Drukpa Substation on 04.02.2022. The cause was investigated and the cause was corrected from that time.



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(f) 220kV Substation Simultaneous 60kV and above Tripping											
1	08/02/2022	06:13hrs	06/02/2022	10:27hrs	-09.92%	220kV Bus-IIIIP	Imechika Substation	Phase to Phase Fault	Main 1 Zone 1 Trip, fault loop-1,2-L2	Distance=18.30KM	Tripped
2	08/02/2022	01:43hrs	08/02/2022	01:40hrs	17.080kV	From: Drukula Line	Drukula Substation	Fault Loop=1,1-1	Dist. Prot. Optd. fault loop-1,1 N.S.V Trip	Distance=0.00KM	Tripped
3	08/02/2022	03:12hrs	08/02/2022	02:30hrs	1.440kV	From: Drukula Line	Drukula Substation	Fault Loop=1,1-1	Dist. Prot. Optd. fault loop-1,1-1,1	Distance=0.00KM	Tripped
4	08/02/2022	08:15hrs	08/02/2022	08:20hrs	51.460kV	From: Drukula Line	Drukula Substation	Fault Loop=1,1-1	Dist. Prot. Optd. 1-2 Trip, Y.B.Rpt. Trip, fault loop-1,1-L1	Distance=0.00KM	Tripped
5	08/02/2022	08:30hrs	08/02/2022	08:40hrs	9.470kV	From: Drukula Line	Drukula Substation	Fault Loop=1,1-1	Dist. Prot. Optd. 1-2 Trip, Y.B.Rpt. Trip, fault loop-1,1-L1	Distance=0.00KM	Tripped
6	08/02/2022	10:10hrs	08/02/2022	10:40hrs	0.420kV	From: Drukula Line	Drukula Substation	Fault Loop=1,1-1	Dist. Prot. Optd. 1-2 Trip, Y.B.Rpt. Trip, fault loop-1,1-L2	Distance=0.00KM	Tripped
7	08/02/2022	10:30hrs	08/02/2022	11:12hrs	0.420kV	From: Drukula Line	Drukula Substation	Fault Loop=1,1-1	Dist. Prot. Optd. 1-2 Trip, Y.B.Rpt. Trip, fault loop-1,1-L2	Distance=0.00KM	Tripped
8	08/02/2022	11:40hrs	08/02/2022	12:10hrs	0.420kV	From: Drukula Line	Drukula Substation	Fault Loop=1,1-1	Dist. Prot. Optd. 1-2 Trip, Y.B.Rpt. Trip, fault loop-1,1-L2	Distance=0.00KM	Tripped
9	08/02/2022	15:37hrs	15/02/2022	16:13hrs	84.820kV	From: Drukula Line	Drukula Substation	Fault Loop=1,1-1	Dist. Prot. Optd. fault loop-1,1-1,2, (low 520.5A, I=525.8A, I=540.0A)	Distance=0.00KM	Tripped
10	15/02/2022	16:27hrs	15/02/2022	16:39hrs	60kV	From: Drukula Line	Drukula Substation	Fault Loop=1,1-1	Dist. Prot. Optd. fault loop-1,1-1,2	Distance=12.00KM	Tripped
11	08/02/2022	16:40hrs	17/02/2022	16:30hrs	60kV	From: Drukula Line	Drukula Substation	Fault Loop=1,1-1	Dist. Prot. Optd. Trip, fault loop-1,1-2	Distance=6.76KM	Tripped
12	08/02/2022	02:20hrs	08/02/2022	02:13hrs	9.120kV	From: Chakha Line	Chakha Substation	Overcurrent Trip	Back Up Relay Optd. Trip, Y.B.Rpt. Trip		Tripped
13	08/02/2022	02:15hrs	08/02/2022	02:14hrs	6.00kV	From: Chakha Line	Chakha Substation	Overcurrent Trip	Back Up Relay Optd. Trip, Y.B.Rpt. Trip		Tripped
14	08/02/2022	3:20hrs	08/02/2022	03:10hrs	6.00kV	From: Chakha Line	Chakha Substation	Overcurrent Trip	Back Up Relay Optd. Trip, Y.B.Rpt. Trip		Tripped
15	08/02/2022	04:00hrs	08/02/2022	04:13hrs	6.110kV	From: Chakha Line	Chakha Substation	Overcurrent Trip	Back Up Relay Optd. Trip, Y.B.Rpt. Trip		Tripped
16	08/02/2022	06:30hrs	08/02/2022	07:00hrs	7.120kV	From: Chakha Line	Chakha Substation	Overcurrent Trip	Back Up Relay Optd. Trip, Y.B.Rpt. Trip		Tripped
17	08/02/2022	08:52hrs	08/02/2022	08:55hrs	15.170kV	From: Chakha Line	Chakha Substation	Overcurrent Trip	Back Up Relay Optd. Trip, Y.B.Rpt. Trip		Tripped
18	08/02/2022	16:40hrs	08/02/2022	17:00hrs	10.040kV	From: Drukcheling Line	Drukcheling Substation	Under Voltage	Dist. Prot. Optd. Right Under Voltage Trip		Tripped
19	08/02/2022	10:40hrs	08/02/2022	10:40hrs	60kV	From: Drukcheling Line	Drukcheling Substation	Overcurrent Trip	Dist. Prot. Optd. Overcurrent Trip		Tripped
20	08/02/2022	10:10hrs	08/02/2022	10:10hrs	4.780kV	From: Drukcheling Line	Drukcheling Substation	Overcurrent Trip	Dist. Prot. Optd. Overcurrent Trip		Tripped
21	08/02/2022	10:10hrs	08/02/2022	10:10hrs	4.780kV	From: Drukcheling Line	Drukcheling Substation	Under Voltage	Dist. Prot. Optd. Under Voltage Trip		Tripped
22	08/02/2022	10:30hrs	08/02/2022	10:30hrs	5.210kV	From: Drukcheling Line	Drukcheling Substation	Under Voltage	Dist. Prot. Optd. Under Voltage Trip		Tripped
23	08/02/2022	10:40hrs	08/02/2022	10:40hrs	4.410kV	From: Drukcheling Line	Drukcheling Substation	Under Voltage	Dist. Prot. Optd. Under Voltage Trip		Tripped
24	08/02/2022	11:40hrs	08/02/2022	11:40hrs	5.010kV	From: Drukcheling Line	Drukcheling Substation	Under Voltage	Dist. Prot. Optd. Under Voltage Trip		Tripped
25	08/02/2022	10:40hrs	08/02/2022	10:40hrs	5.010kV	From: Drukcheling Line	Drukcheling Substation	Under Voltage	Dist. Prot. Optd. Under Voltage Trip		Tripped
26	08/02/2022	10:30hrs	08/02/2022	10:00hrs	11.300kV	From: Drukcheling Line	Drukcheling Substation	Broken Conductor	Dist. Prot. Optd. Broken conductor Trip		Tripped



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066/33/11kV Pangnasa substation												
1	04.02.2022	20.37hr	04.02.2022	20.29hr	0	2.29	Has line out	Has substation	Due to heavy snow fall	Disturb		Restart
2	04.02.2022	20.57hr	04.02.2022	21.00hr	0	2.18	Has line out	Has substation	Due to heavy snow fall	Disturb		Restart
3	04.02.2022	22.27hr	05.02.2022	14.19hr	18		66kV circuit breaker	Pangnasa Has substation	Due to heavy snow fall	No relay operation		Long
4	05.02.2022	22.27hr	05.02.2022	14.25hr	18		66kV circuit breaker	Pangnasa Has substation	Due to heavy snow fall	No relay operation		Long
5	05.02.2022	22.58hr 02.09hr	05.02.2022	03.02hr 04.10hr	0		66kV circuit breaker	Dagthang Has substation	Due to heavy snow fall	No relay operation		Long
6	20.02.2022	21.13hr	20.02.2022	21.43hr			66kV circuit breaker	Pangnasa Has substation	Tripped from circuit breaker			Restart
5	21.02.2022	21.87hr	20.02.2022	22.43hr			66kV circuit breaker	Pangnasa Has substation	Tripped from circuit breaker	No relay operation		Restart
066/33kV Changdaga Substation												
1	07.02.2022	04.17hr	05.02.2022	06.01hr	1		66kV Changdaga - Jomsa Line	Changdaga, Jomsa, Chomk, Pato and Has Substation	Grid fault	CB fault triggered from Jomsa end as per RPSG advice		Restart
2	21.02.2022	06.49hr	21.02.2022	06.58hr		18.3	66kV Changdaga - Jomsa Line	Changdaga	Grid fault	Dist. Pto trip, Zone 1 Y&B trip		Restart
3	09.02.2022	06.00hr	09.02.2022	06.19hr	2		66kV Changdaga - Chakha Line	Chakha, Changdaga, Jomsa, Chomk, Pato and Has Substation	Over Current	Dist. Pto trip, Zone 1 RY&B trip, Over Current trip		Restart
066/33kV Daang Substation												
1	01.02.2022	16.54 hr	01.02.2022	17.07 hr	0	-4.45	66 kV Incoming Line	Whebe Substation	Tripping	NA		Line trip from Jomsa Substation due to under voltage
2	05.02.2022	06.01 hr	11.02.2022	11.15 hr	0 0 hr @ 11 hr	-2.72	66 kV Incoming Line	Whebe Substation	Tripping	NA		66 kV Line Fault between Daang & Jomsa Substation, Auto feeder open
3	19.02.2022	19.59 hr	18.02.2022	16.07 hr	0	-3.47	66 kV Incoming Line	Whebe Substation	Tripping	NA		Line trip from Jomsa Substation
066/11kV Dochula Substation												
1	16/2/2022	14:40	16/2/2022	16:07		8.50/0.7MW		Site driven wire to connect jumpering at Dochula Tower location SW31 with opening code 8701 and closing code 1281			Tower location SW31	Connection of jumper



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Sl No.	Date of Tripping	Time of outages	Date of Normalization	Time of fault was cleared	Duration of Outage (Hrs)	MW before outage (MW)	Feeder Name	Name of the Substation/lines affected by the fault	Reasons of fault	Relay operations	Exact location of fault [Line segment/ Substation]	Remarks
(A) 400/220/66/11 kV Malhase Substation												
66kV & Above												
1	10.04.2022	13:02	10.04.2022	13:07	0	7	220kV samta feeder	Malhase s/s		O/C trip, I >> trip	IL1= 44.40A<234.0deg, IL2=90.3A<235.5deg, IL3=7301A<42.27 deg IL4=7149A<42.70deg	
2	10.04.2022	13:02	10.04.2022	13:10	0	26	50/63MVA transformer 3	Malhase s/s		Diff trip	IB= 327.52A<65.09deg, IC= 298.26A<173.79deg, ID= 25.9A<95.23deg IN= 242.13A<-124.45deg	
3	14.04.2022	18:12	14.04.2022	18:25	0	-	220kV Bus Coupler	220kV samta and singhiyan feeder and Malhase s/s		IB trip, 06A and 50/50N trip	Earthfault	
4	14.04.2022	18:12	14.04.2022	18:34	0	8	220kV samta feeder	220kV Bus Coupler		Diff start L3 06 relay optd	IL1=293.6A<289.2deg, IL2=87.22A<382.2deg, IL3=28478<53.11deg IL4=1800A<387.0deg	
5	14.04.2022	18:12	14.04.2022	18:27	0	26	50MVA transformer III(HV/LV) side	220kV buscoupler and samta feeder		Diff start L3 06 relay optd, Diff alarm 0/s	malhase Substation	IL1=55.56A< 89.49deg, IL2=57.65A<- 10.34deg,IL3=60.02A<162.0deg,IL4=10.07A155.23deg
6	15.04.2022	01:04	15.04.2022	01:44	0	106	400kV Tala feeder	Malhase s/s	O/C VBD phase(Transition fault)	Air lockout shot, zone 1 trip, PL=18.57kV	18.57AM	IL1=186.5A, IL2=4.0728A, IL3=4.3738A
7	15.04.2022	14:00	15.04.2022	14:05	0	28	66kV Parakha feeder 4	Malhase s/s	O/C on B phase	Relay 06 optd, general trip DEF 50N trip		IL1=137.37A< 5.37.0deg, IL2= 111.05A<-134.17deg,IL3=3029.25A<72.90deg
8	16.04.2022	19:15	16.04.2022	19:24	0	7	220kV samta feeder	Malhase s/s	Earthfault	Main 1 trip, Zone 1 trip	L3-L1 Dist=48.2KM	IL1=2995A<273.0deg, IL2=68.78A<106.2deg,IL3=2035A<51.5deg,IL4=2001A<314.6deg
9	19.04.2022	17:18	19.04.2022	18:08	0	8	220kV samta feeder	Malhase s/s		O/C on 3phase	22.1km	IL1=1773A<382.2deg,IL2=4005A<194.9deg,IL3=5088A<37.26deg,IL4=1283A<56.50deg
10	27.04.2022	11:03	27.04.2022	11:22	0	9.1	220kV samta feeder	Malhase s/s	O/C & Z/F trip	Main 1 trip, Zone 1 trip, Trip Y R, R/U trip	fault loop L1-N=2.8km	IL1=8143A<385.9deg,IL2=7917A<115.4deg,IL3=9411A<110.0deg,IL4=7931A<291.5deg
11	27.04.2022	11:03	27.04.2022	11:17	0	23	50/63MVA transformer 1	Malhase s/s		LBDtrip, general trip, relay06 optd		IL1=73.68A<-10.22deg,IL2=82.54A<-64.24deg,IL3=154.96A<-1.72deg
12	27.04.2022	11:08	27.04.2022	11:19	0	25	50/63MVA transformer 2	Malhase s/s		Diff trip, 27trip and R/U trip		IL1=100.55A<115.19deg,IL2=96.6A<179.17deg,IL3=74.83A<121.3deg,IL4=342.73A<129.47deg
13	28.04.2022	08:11	28.04.2022	08:16	0	97	200MVA ICT	Malhase s/s		Diff Y phase< O/C, 06 optd.		IL1=33.06A<139.7deg,IL2=34.71A<15.7deg,IL3=32.8A<-108.3deg
14	30.04.2022	13:45	30.04.2022	12:48	0	47	200MVA ICT	Malhase s/s		Diff trip, diff B phaseM & T CB optd, 06 opt		IL1=81.84A<103.3deg,IL2=113.9A<-12.59deg,IL3=113.4A<-172.1deg
(B) 220/66/11 kV Singhiyan Substation												
1	14.04.2022	10:12	14.04.2022	23:19	4	1.9	220kV Singhi samta feeder	Singhi s/s	O/C	06 optd O/C relay	Ins	IL1=2140A, IL2=8491A, IL3=2511A, IL4=1454A
2	16.04.2022	14:00	16.04.2022	15:08	1	35	66kV BPAL feeder	Singhi s/s	O/C on B phase	General trip, O/C trip, Dist Time O/C trip, IB >> DIR trip, I >> IB trip, DEF 50N TRIP		IL1=1108A,IL2=1.246A,IL3=11.746A



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BHW/3/11kV Phuntsholing Substation																								
1		01.04.2022	10:10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	At 10:10hrs charged 66kV Phing-Malkase feeder which was under life charged condition with closing code 1376 from BPSO, since there was shutdown on 66kV Chukha Phing (Chukha Gedu section for ROW clearing and replacement of the insulators at PC 135 & 136. At 17:30hrs 66kV Phing-Malkase feeder kept under life condition with opening code 0475 from BPSO. [CB opened at our end].			
2		01.04.2022	10:30	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	At 10:30hrs charged 66kV Phing-Malkase feeder which was under life charged condition with closing code 1382 from BPSO, since there was shutdown on 66kV Phing-Gomtu feeder for carrying out re-alignment of insulators, checking of control circuit and resetting of oil coverage from PT. At 20:30hrs 66kV Phing-Malkase feeder kept under life condition with opening code 0484 from BPSO. [CB opened at our end].				
##	04.04.2022	04:02	04.04.2022	04:05	0			66kV Chukha and 66kV Gomtu feeder	66kV Chukha and 66kV Gomtu feeder	Tripped at their end	Nil			Tripped at their end							Photovoltaic got black-out, since both 66kV Chukha and 66kV Gomtu feeder got tripped from their end.			
##		07.04.2022	13:00	13	0			66kV Phing-Malkase feeder													At 13:00hrs charged 66kV Phing-Malkase feeder which was under life charged condition with closing code 1420 from BPSO, since there was shutdown on 66kV Phing-Gomtu feeder for excitation of Bus insulator of SMVA transformer at Gomtu end. At 20:55hrs 66kV Phing-Malkase feeder kept under life condition with opening code 0505 from BPSO. [CB opened at our end].			
##		10.04.2022	16:50	16	0			66kV Phing-Malkase feeder													At 16:50hrs charged 66kV Phing-Malkase feeder which was under life charged condition with closing code 1444 from BPSO, since there was shutdown on 66kV Phing-Gomtu feeder for carrying out maintenance on 66kV Bus insulator of SMVA transformer at Gomtu end. At 19:00hrs 66kV Phing-Malkase feeder kept under life condition with opening code 0517 from BPSO. [CB opened at our end].			
##	14.04.2022	18:20	14.04.2022	18:20	0			66kV Chukha and 66kV Gomtu feeder	66kV Chukha and 66kV Gomtu feeder	Tripped at their end	Nil			Tripped at their end							Photovoltaic got black-out, since both 66kV Chukha and 66kV Gomtu feeder got tripped from their end.			
##	14.04.2022	15:32	14.04.2022	15:45	0	-1.97		66kV Chukha Phing feeder	66kV Chukha Phing feeder	Tripped at both end	Dist Optd. 106 & 96		Substation								The cause of tripping was due to transformer fault.			
##	16.04.2022	20:25	16.04.2022	20:30	0	-1.50		66kV Chukha Phing feeder	66kV Chukha Phing feeder	Overcurrent	Dist Optd. 106 & 96 I _{ph} = 1.055KA, I _{0-1037RA} = 51.26A, V _{ph} = 11.09kV, V _{0-1037RA} = 57.00kV, I _{0-1037RA} = 7.000A, I _{0-1037RA} = 7.182A, V _{0-1037RA} = 20.26kV, V _{0-1037RA} = 18.67kV, V _{0-1037RA} = 18.38kV & 86		Substation											The cause of tripping was due to transformer fault.
##	25.04.2022	00:11	25.04.2022	00:10	0	-1.90		66kV Chukha Phing feeder	66kV Chukha Phing feeder	Tripped at both end	Dist Optd. 106 & 96		Substation								The cause of tripping was due to transformer fault.			
D/106/3/11kV Gedu Substation																								
1	01.04.2022	10:25	01.04.2022	17:00	6	2020		66kV Chukha-Gedu section	Nil	Critical tree falling within the BHW and replacement of the insulators at PC 135 and 136.			Line segment								Shutdown taken by TMO DPC Chukha for Critical tree falling within the BHW and replacement of the insulators at PC-135 and 136.			
2	04.04.2022	4:00	04.04.2022	4:05	0	2		66kV Chukha-Phing supply tripped	Blackout	Bad weather			Line segment								Charged from Chukha			
3	14.04.2022	10:20	14.04.2022	10:30	0	1945		66kV Chukha-Phing supply tripped	Blackout	Bad weather			Line segment								Charged from Chukha			
4	16.04.2022	15:24	16.04.2022	15:47	0	0.00		66kV Chukha-Phing supply tripped	Blackout	Bad weather			Line segment								Charged from Chukha			
5	16.04.2022	20:22	16.04.2022	20:31	0	140		66kV Chukha-Phing supply tripped	Blackout	Bad weather			Line segment								Charged from Chukha			



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B) 66/33/11 kV Gumba Substation												
1	03.04.2022	10:44	03.04.2022	12:40	2	3.06	66/11kV 3MVA Transformer	NI	For sealing bus PT leakage	NI	Gumba Substation	Shutdown for sealing bus PT leakage against work permit NO. 12
2	03.04.2022	10:44	03.04.2022	20:25	9	3.06	66kV Plug feeder	NI	Maintenance	NI	Gumba Substation	Allowed shutdown by DMO for sealing Bus PT leakage, Ra line scissor alignment and CT and breaker testing Against work permit NO. 12
3	04.04.2022	08:37	04.04.2022	08:10	0	2.068	66kV Dhamdhum feeder	NI	General trip	Yoke L-L-Case & Y-FM fault	Damdon Substation	Supply failed from Dhamdhum end
4	04.04.2022	08:02	04.04.2022	08:25	0	2.28	66kV Plug feeder	Gumba	General trip	NI	Line segment	Grid failed
**	14.04.2022	18:28	14.04.2022	18:01	0	-7.137	66kV Dhamdhum feeder	Gumba	Grid failed	NI	Line segment	Grid failed and supply resumed at 18:01 hrs.
**	14.04.2022	18:28	14.04.2022	18:28	0	3.58	66kV Plug feeder	Gumba	Grid failed	NI	Line segment	Grid failed and supply resumed at 18:28 hrs.
**	16.04.2022	19:22	16.04.2022	19:35	0	-6.154	66kV Dhamdhum feeder	NI	General trip	NI	Line segment	Charged against charging code no.1021 provided by BPSO and charge withdrawn
**	23.04.2022	14:25	23.04.2022	16:25	2	0.01	66/33/11kV 3MVA Transformer	NI	Oil leakage	NI	Gumba Substation	Allowed shutdown by Substation Head against Work Permit No. 004 for sealing oil leakage from OLTC tank
**	27.04.2022	11:25	27.04.2022	11:41	0	6.266	66kV Plug feeder	NI	Transient fault	NI	Gumba Substation	Charged the line after informing BPSO and charge withdrawn. Charging code 1014
F) 220/66/33 kV Dhamdhum Substation												
1	14.04.2022	18:32	14.04.2022	18:50	0	-8.35	220KV Malpas	Dhamdhum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to O/C on RBDS Zone 1(General trip)
2	14.04.2022	18:32	14.04.2022	18:40	16	-1.66	Singgyesta	Dhamdhum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to O/C on RBDS Zone 1(General trip) Fdr charged against charging code no 1007 from Karma Yangden from BPSO
3	16.04.2022	19:14	16.04.2022	19:21	0	-1.70	220KV Singgyesta	Dhamdhum	heavy rain with thunder storm and windy	REL 670 trip	NA	Line tripped due to O/C on RBDS Zone 1(General trip) Fdr charged against charging code no 1020 from Karma Yangden from BPSO
4	16.04.2022	19:22	16.04.2022	19:30	0	8.42	220KV Malpas	Dhamdhum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to O/C on RBDS Zone 1(General trip) Fdr charged against charging code no 1018 from Karma Yangden from BPSO
5	16.04.2022	19:22	16.04.2022	19:30	0	6.65	66kV Gumba feeder	Dhamdhum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to O/C on RBDS Zone 1(General trip) Fdr charged against charging code no 1022 from Karma Yangden from BPSO
6	19.04.2022	17:13	19.04.2022	17:25	0	-3.63	Singgyesta Feeder	Dhamdhum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to O/C on RBDS Zone 1(General trip) and over voltage OPTD.Fdr charged against charging code no 1016 from BPSO T/Phu
7	19.04.2022	17:18	19.04.2022	18:07	0	-9.63	220KV Malpas feeder	Dhamdhum	heavy rain with thunder storm and wind	REL 670 trip	NA	Line tripped due to General trip, zone 1 trip, WVD Phase trip and Over voltage OPTD. Fdr charged against charging code no 1031 from BPSO
8	04.03.2022	08:37	04.03.2022	08:10	0	2.98	66kV Gumba feeder	Gumba substation	Trip	General trip, zone 1 trip, R and Y phase fault	NA	Heavy lightning and thunder. The feeder was tripped at 8:37hrs, test charge at 8:47hrs with the charging code from BPSO (101) but the feeder could not stand as no informed to BPSO and suggested as to charge after weather improves since there is no power interruption in Gumba substation as power supply is from Phuntsholing substation. As weather improved, so 66kV Gumba feeder was charged at 8:12hrs with charging code (101) from BPSO
9	14.04.2022	18:32	14.04.2022	18:50	0	7.13	66kV Gumba feeder	Gumba substation	Trip	N/A	N/A	Line tripped due to O/C on RBDS(General trip)
10	14.04.2022	22:55	14.04.2022	23:10	0	3.63	66kV Gumba feeder	Gumba substation	Trip	General trip, zone 1 trip, R and Y phase fault	NA	Heavy lightning and thunder. The feeder was tripped at 22:55hrs, test charge at 23:10hrs



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Sl. No.	Date of Tripping	Time of outages	Date of Resumption	Time of full recovery obtained	Duration of Outage (hrs)	MW before outage (MW)	Feeder Name	Name of the Substation/Buses affected by the fault	Severity of fault	Relay operation	Error location of fault (Line segment/ Substation)	Type of outages	Remarks
(A) 66KV Classy switching station													
1	20/04/2022	14:50hr	15/04/2022	15:00hr	7:10PM	7497W	66KV Pasa Feeder	Bus 11	vacated fault	1st CB open	Chanda	Tripping	
2	20/4/2022	14:50hr	20/4/2022	17:00hr	4:00PM	66KV SPS feeder	Bus 1 and II	OC, OCLEP and CBI on ABC phase	OC, OCLEP and CBI on ABC phase	Bus 1 & II	Chanda	Tripping	CBCT line support at 100m to get 250V fault
3	20/4/2022	16:10hr	20/4/2022	16:50hr	2:00	66KV SPS feeder	Bus 1 and II	Over current	Over Current relay operated			Tripping	As the CT ratio is 1000:500 and when the load reach max, get tripped. After finding the relay setting is not changed after changing CT ratio. Low charging relay protection (low current relay) set.
(B) 66KV Classy Substation													
4	26/04/2022	12:20	16/04/2022	12:27	21:00	66KV Chakra Transmission Line	CHAKA 02	VTM-tripping	NA	CHAKA 02	CHAKA 02	Feeding	66KV Chakra transmission line got tripped while feeding of 2000VA transformer (3 MVA transformer) when CT primary tap was changed out.
5	12/04/2022	12:00	12/04/2022	12:10	Discontinue SCADA	66KV The center	(Substation)	While doing 10 relay connection and using the TOCD	1st CBCT 1 VLV Ratio: 100:100 CBCT 2 VLV Ratio: 200:50 Trip ratio SCP Ratio: 60:90	Substation	Substation	Tripping	Power all the operation return & changed for bus, to be normal
6	14/04/2022	12:30	14/04/2022	12:55	9:0	200VA Transformer - I	Chakra Substation		200 D.C. & E.F. 2000VA Ratio=07 Operational indication: 1 & 2, 10 second Trip: 3 Over Current & Earth Fault Operational along with ratio 08	Chakra 02	66KV The Chakra 02 Feeder	Feeding	As per normal operation on normal from Upper Tap (Chakra 02 Substation Feeder) and the 100V increase tripped at that with 60 second which support 20 MVA transformer. 1 at one end point of the operational ratio & indication & changed to be normal.
7	14/04/2022	12:40	14/04/2022	12:44	8:0	200VA Transformer - I	Chakra Substation		200 D.C. & E.F. 2000VA Ratio=07 Operational indication: 1 & 2, 10 second Trip: 3 Over Current & Earth Fault Operational along with ratio 08	Chakra 02	66KV The Chakra 02 Feeder	Feeding	As per normal operation on normal from Upper Tap (Chakra 02 Substation Feeder) and the 100V increase tripped at that end & immediately support 20 MVA transformer. 1 at one end point of the operational ratio & indication & changed to be normal.
(C) 66KV Classy Laboratory Substation													
66KV LSA - Grounding Feeder													
1	19/04/2022	20:00hr	17/04/2022	21:10hr	0	-19.400	66KV LSA - Grounding Feeder	NA		The relay operated (SA-107 SA-20-107 2000V:100VA)			66KV LSA - Grounding Feeder tripped at 20:00hr and changed for bus at 21:10hr. Supply as interruption was limited from Chakra 02.
2	18/04/2022	00:17hr	18/04/2022	00:12hr	4	-14.800	66KV LSA - Grounding Feeder	66KV VLV Laboratory substation		The relay operated			66KV LSA - Grounding Feeder tripped at 00:17hr and changed for bus at 00:12hr at 00:12hr.
3	22/04/2022	23:00hr	22/04/2022	21:20hr	4	-17.200	66KV LSA - Grounding Feeder	66KV VLV Laboratory substation		The relay operated			66KV LSA - Grounding Feeder tripped at 23:00hr and changed for bus at 21:20hr at 21:20hr.
4	27/04/2022	13:02hr	28/04/2022	00:07hr	7	-14.100	66KV LSA - Grounding Feeder	NA		The relay operated (SA-107 SA-20-107 2000V:100VA)			66KV LSA - Grounding Feeder tripped at 13:02hr and advised to BPSO. As 2000V:100VA ratio to check the location but reading held and same changed at 21:20hr reading held. After opening breaker at Chakra 02 and closed the breaker at Laboratory and with closing back 100V, the reset at 00:07hr and breaker closed at Chakra 02 at 00:07hr.
66KV LSA - Protection Feeder													
1	20/04/2022	00:17hr	18/04/2022	00:12hr	0	12.200	66KV LSA - Protection Feeder	NA		The relay operated			66KV LSA - Protection Feeder tripped at 00:17hr and changed for bus at 00:12hr at 00:12hr with closing back 100V.
2	22/04/2022	23:04hr	22/04/2022	21:20hr	0	12.200	66KV LSA - Protection Feeder	66KV VLV Laboratory substation		The relay operated			66KV LSA - Protection Feeder tripped at 23:04hr and changed for bus at 21:20hr at 21:20hr.
(D) 66KV Classy Pasa Substation													
1	20/4/2022	16:30	18/4/2022	15:00	0		66KV Chakra Line 02	Pasa substation and its own supply	IBCO E.F. & OC Feeds, Chakra 02 and				



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(A) 66/33kV Paro Substation													
No.	Date of Tripping	Time of Tripping	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
(B) 66/33kV Dzongkhag Substation													
1	22/04/2022	23:04hr	22/04/2022	21:00hr	0	-22.65	66KV Samskha IC	Whole IC	Insulator tripped on broken conductors	Distance relay and Breaker	Not known	Tripped	Time changed of the line found healthy
2	27/04/2022	23:04hr	27/04/2022	23:00hr	0	-27.11	66KV Samskha IC	Whole IC	Insulator tripped on broken conductors	Distance relay and Breaker	Not known	Tripped	Time changed of the line found healthy
(C) 66/33kV Maa Substation													
(D) 33kV Substation Samskha													
1	22/04/2022	22:17hr	22/04/2022	22:00hr	0	00.00	66KV Samskha Dzongkhag Line	Dzongkhag substation	Distance relay tripped due to 100% I _{sc} (200A, I _{sc} =4000A, I _{sc} =4000A)	Distance relay and Breaker	Tripped	Distance	
2	28/04/2022	22:00hr	28/04/2022	21:00hr	0	00.00	No description	Substation control by BPSO for finding wrong meter at BPSO end					
(E) 33/11kV Panglha Substation													
(K) 66/33kV Changthang Substation													
(L) 66/33kV Paro Substation													
1	18/05/2022	22:00hr	18/05/2022	21:50hr	0	-2.24	66KV Samskha Line	Whole Substation	Tap	NA			Line raised from Samskha Substation
2	22/05/2022	21:30hr	22/05/2022	21:12hr	0	-4.55	66KV Samskha Line	Whole Substation	Tap	NA			Line tripped from Samskha Substation
3	27/05/2022	23:00hr	27/05/2022	23:00hr	0	-7.22	66KV Samskha Line	Whole Substation	Tap	NA			Line tripped from Dzongkhag Substation
(M) 66/33kV Dochula Substation													
1	22/04/2022	21:10	22/04/2022	21:23	0	01.74	Samskha Substation	44 17070(A) and 142 101(A) Transformer	Under Voltage	60 Rate	Tripped, 1 phase and overvoltage of another phase	Temperature fault	
2	27/04/2022	19:08	27/04/2022	19:44	0	21.75	Samskha Substation	44 17070(A) and 142 101(A) Transformer	Under Voltage	60 Rate	Tripped and breaker open	Temperature fault	All HV Fuse blown
3	22/04/2022	21:18	22/04/2022	21:30	0	30.10	Loksa	44 17070(A) and 142 101(A) Transformer	Under Voltage	60 Rate	Tripped, 1 phase and overvoltage of another phase	Temperature fault	
4	27/04/2022	19:08	27/04/2022	19:38	0	30.07	Loksa	44 17070(A) and 142 101(A) Transformer	Under Voltage	60 Rate	Tripped and 1 phase and overvoltage of another phase	Temperature fault	

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Sl No.	Date of Tripping	Time of Tripping	Date of Normalization	Time of fault was cleared	Duration of Outages (Hrs)	MW before outage (MW)	Feeder Name	Name of the Substation/lines affected by the fault	Reasons of fault	Relay operations	Exact location of fault [Line segment/ Substation]	Type of outages	Remarks
(A) 400/110/66/11 kV Malhae Substation													
66kV & Above													
1	17/5/2022	12:03	17/5/2022	12:10	0	24	66KV Parakha feeder I	Malhae Ss	O/C & E/F	General trip O/C & E/F			IL1=2319.32 /5237deg IL2=1284/ 8826deg IL3=198.06A/94.01deg IL4=2332.57A/ 126.94deg
2	17/5/2022	13:03	17/5/2022	12:10	0	24	66KV Parakha feeder II	Malhae Ss	O/C & E/F	General trip O/C & E/F			IL1=0.11A/107.34deg IL2=1244.25A/86.83deg IL3=688.86A/106.94deg IL4=0.11A/107.34deg
3	11-09-2022	03:14	21-09-2022	02:48	0	106.18	400KV Malhae- Biligat line	Malhae Ss	transient fault	General trip 386(HTR) tripped			IL1=190.7A/51.77deg IL2=139.6A/311.7deg IL3=1364A/65.23deg IL4=1646 A/58.38 deg
(B) 66/33kV Warea Substation													
1	05-08-2022	13:20hr	05-08-2022	12:20hr	0	1.23(MW)	66KV W90 feeder	Fe. I and II	WTI tripped	WTI tripped	EMVA transformer	Tripped	WTI tripped and reset the temperature to 75 with consultation with Mr. Head OMD, and the line changed
(C) 66/33kV Olakha Substation													
(D) 66/33/11kV Loksa Substation													
66KV LSA - Gewathang feeder													
1	10-05-2022	17:11hr	10-05-2022	17:11hr	0	-14.040	66KV LSA - Gewathang feeder	66/33/11kV Loksa substation		OC & EF relay operated			66KV LSA - Gewathang feeder tripped at 17:11hr and supply resumed at 17:11hr
2	11-05-2022	20:33hr	11-05-2022	20:30hr	0	-18.280	66KV LSA - Gewathang feeder	66/33/11kV Loksa substation		OC & EF relay operated			66KV LSA - Gewathang feeder tripped at 20:33hr advised to BPSO and line changed at 20:38hr from Gewathang to and line extended to Dochula at 20:41hr
3	13-05-2022	14:20hr	13-05-2022	14:25hr	0	-17.240	66KV LSA - Gewathang feeder	66/33/11kV Loksa substation		OC & EF relay operated			66KV LSA - Gewathang feeder tripped at 14:20hr and changed the line as per BPSO at 14:55hr



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66kV LSA - Dochula feeder												
1	10/05/2022	15:11hrs	10/05/2022	15:10hrs	0	10.470	66kV LSA - Dochula feeder	NA	OC & EF relay operated	66kV LSA - Dochula feeder tripped at 15:11hrs and supply resumed at 15:10hrs.		
2	11/05/2022	20:37hrs	11/05/2022	20:30hrs	0	-18.200	66kV LSA - Dochula feeder	NA	OC & EF relay operated	66kV LSA - Dochula feeder tripped at 20:37hrs followed by BPSO and line changed at 20:30hrs from Generating to and line extended to Dochula at 20:41hrs.		
3	28/05/2022	22:00hrs	28/05/2022	22:30hrs	0	12.200	66kV LSA - Dochula feeder	NA	Dist. relay operated (A-5 T41 B-879.3A 6278.1A)	66kV LSA - Dochula feeder tripped at 22:00hrs followed by BPSO and line changed at 22:30hrs from Generating to and line extended to Dochula at 22:30hrs.		
66.3kV 66kV Transmission & 6.6/33kV GO feeders connected together												
1	10/05/2022	07:23hrs	10/05/2022	16:00hrs	0	1.300	33kV O/G-1	33kV O/G-1	Line fault IDMT- E/F CA 100.1A B-171.8A C-130.8A D-217.8A	NA	Line fault	66.3kV Transmission - 4 feeder trip on IDMT E/F at 07:23hrs and line changed at 15:12hrs could not meet and followed by ESD Franklin regarding the line fault and line changed at 16:00hrs and line used thereafter after opening GO at Franklin area.
2	14/05/2022	09:02hrs	14/05/2022	09:17hrs	0	0.800	33kV O/G-2	33kV O/G-2	Line fault IDMT- B/F A O/C	NA	Line fault	66.3kV Transmission - 4 feeder trip on IDMT B/F A O/C at 09:02hrs and line changed at 09:17hrs could not meet and followed by ESD Wangphel regarding the line fault and line changed at 09:17hrs and line used thereafter.
3	14/05/2022	11:57hrs	14/05/2022	12:00hrs	0	1.170	33kV O/G-2	33kV O/G-2	Line fault IDMT- B/F A O/C	NA	Line fault	66.3kV Transmission - 4 feeder trip on IDMT B/F A O/C at 11:57hrs and line changed at 11:59hrs could not meet and followed by ESD Wangphel regarding the line fault and line changed at 12:00hrs and line used thereafter.
(I) 66.3kV Dandi Substation												
1	11/05/2022	20:53 hrs	11/05/2022	20:58 hrs	0	-4.17	66 kV Incoming Line	Whole Substation	Trip	NA		Grid Failure
2	15/05/2022	14:27 hrs	15/05/2022	14:24 hrs	0	-4.17	66 kV Incoming Line	Whole Substation	Trip	NA		Line tripped from Sengkha Substation
3	15/05/2022	10:35 hrs	15/05/2022	10:05 hrs	0	-4.13	66 kV Incoming Line	Whole Substation	Trip	NA		Line tripped from Dochula Substation Grid Failure
(II) 66.3kV Dochula Substation												
1	09/05/2022	07:41	09/05/2022	15:21	0	-32.3	Sengkha	All Feeds Home	Under voltage	00		Under voltage and 10 relays operated at Dochula and supply fed from Sengkha.
2	11/05/2022	20:38	05/31/2022	20:30	0	-32.38	Sengkha	All Feeds Home	Under voltage	00		Under voltage and 10 relays operated at Dochula and supply fed from Sengkha.
3	15/5/2022	14:19	15/5/2022	14:32	0	-30.98	Sengkha	All Feeds Home	Under voltage	00		Under voltage and 10 relays operated at Dochula and supply fed from Sengkha.
4	20/5/2022	22:09	20/5/2022	22:23	0	-32.1	Sengkha	All Feeds Home	Under voltage	00		Under voltage and 10 relays operated at Dochula and supply fed from Sengkha.
5	26/05/2022	18:11	26/05/2022	18:31		-30.41	Lithara	All Feeds Home	Under voltage	00		Under voltage and 10 relays operated at Dochula and supply fed from Sengkha.
6	11/05/2022	20:35	05/31/2022	20:45	6	-30.42	Lithara	All Feeds Home	Under voltage	00		Under voltage and 10 relays operated at Dochula and supply fed from Sengkha and Lithara.
7	15/5/2022	14:19	15/5/2022	14:37	0	-28.28	Lithara	All Feeds Home	Under voltage	00		Under voltage and 10 relays operated at Dochula and supply fed from Sengkha and Lithara.
8	28/5/2022	22:09	28/5/2022	22:36	0	-30.17	Lithara	All Feeds Home	Under voltage	00		Under voltage and 10 relays operated at Dochula and supply fed from Sengkha and Lithara.



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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 Malhase Substation													
1	01.07.22	07:46	01.07.22	08:06	0	551.27	400kV Malhase- Sligon's ldr	Malhase Ss	O/C & E/F	Main 1 trip, Main II Call RCY, 2ND trip, Bus fall	190km		IL1=1672A<301.7deg,IL2=740.2A<233.3deg,IL3=718.4A<133.1deg,IL4=1599A<170.5deg
2	03.07.22	17:20	03.07.22	17:57	0	131.9	300kV Malhase - Chukha feeder	Malhase Ss	O/C & E/F	Zone 1 trip, All back out abut	Zone 1= 0.001km		IA=1.67kA, IL=5.967kA, I2=3.772kA
**	10.07.22	03:06	10.07.22	04:35	1	5.4	200kV Malhase - Luntse feeder	Dhankhem Ss	O/C on B phase	60 oped			IL1=79.95A<230.7deg,IL2=116.5A<235.1deg,IL3=25584<41.95deg,IL4=2347A<41.5deg
**	10.07.22	00:20	20.07.22	09:09	0	226	400kV Malhase- Sligon's ldr	Malhase Ss & Sligon's Ss	O/C on Y & B phase	Zone 1 trip	30.50km		IL1=750A, I2= 3979A, I3=5621A
**	23.07.22	17:11	23.07.22	17:23	0		66kV Bus Coupler	Malhase Ss	O/C				B=13737.34A, Y=11401.02A, I0=14710.29A
**	23.07.22	17:11	23.07.22	17:25	0	27	66kV Parakha feeder I	Malhase Ss	O/C				R=129.11A<-203.10deg, Y=1796.66A<139.38deg, B=1230.16A<27.55A
**	23.07.22	17:11	23.07.22	10:24	1	0	66kV piling feeder	Malhase Ss	O/C				R=11.36kA, Y=11.72kA, B=1.32kA
**	20.07.22	11:28	20.07.22	13:55	3	20	66kV Parakha feeder I	Malhase Ss		REF SON, trip, 06 oped, general trip			IL1=219.5kA<-82.05deg, IL2=935.15A<150.5deg, IL3=279.19A<90.05deg, IL4=978.52A<-156.85 deg
**	20.07.22	11:38	20.07.22	23:47	12	22	66kV Parakha feeder II	Malhase Ss		SI Trip, 06 oped, General trip			IL1=0.19A< 0.05deg, IL2=0.03A<-156.39deg, IL3=0.0270A<21.20deg, IL4=0.29A< 0.0 deg
**	20.07.22	11:38	20.07.22	23:47	12	23	66kV Parakha feeder IV	Malhase Ss		REF SON, trip, 06 oped, general trip			IL1=0.01A< 14.74deg, IL2=1.067.00A<17.40deg, IL3=200.51A<51.29deg, IL4=0.09125A< 14.34 deg
**	20.07.22	11:38	20.07.22	23:47	12		66kV Bus Coupler	Malhase Ss		REF SON, trip, 06 oped, general trip, REF, 30 trip			IL1=048.57A< 113.40deg,IL2=12461.06A<-171.23deg,IL3=238.82A<98.24deg,IL4=12947.79A<-121.30deg
**	20.07.22	11:38					66kV piling feeder	Malhase Ss	O/C	Trip phase N, Earth Fault 1, Trip IN1>3			IL1= 8.397A, IL2= 8.697kA, IL3= 3.560kA, IL4= 9.690kA. The feeder still under breakdown due to 400kV Tala feeder 1 conductor got snapped and touched on transmission line of said feeder.
(B) 220/66/11kV Singgagan Substation													
1	17.07.22	03:22	17.07.22	03:43	0	0.097	220kV Singh-Santse Feeder	Singgagan ss					couldnt download fault due to Dign software communication problem.
**	20.07.22	23:39	20.07.22	23:44	0	4	66kV S/C Connet feeder	Singgagan ss					IL1=11.04kA, IL2= 18.97kA, IL3= 35.53kA
(B) 66/33/11 kV Phuntsholing Substation													
1	03.07.2022	17:19	03.07.2022	17:36	0	-3.70	66kV Chukha-Ping feeder	66kV Chukha-Ping Co-		DETN OPTD, 156&0s		Tripped at both end	At 17:19hrs 66kV Chukha-Ping feeder got tripped from both end. At 17:20hrs normalized the above feeder after getting clearance from IPSD with charging mode 1652.
**	12.07.2022	06:30	12.07.2022	06:34	0	1.15	10MVA Voltamps TRF (66/33kV)	10MVA Voltamps TRF (66/33kV)		Tripped		Substation	10 MVA Transformer and 33kV Incoming II got tripped due to fault on 33kV ldr IV, Luma Buzukha.
**	14.07.2022	17:29	14.07.2022	17:24	0	-3.23	66kV Chukha-Ping feeder and 66kV Ping-Gomtu feeder	Blck out at Ping ss		Tripped at their end		Tripped at their end	66kV Chukha-Ping and 66kV Ping-Gomtu feeder got tripped at their end, no breaker operation at our end. At 17:24hrs normalized 66kV Chukha-Ping feeder from Chukha and at 17:27hrs normalized 66kV Gomtu feeder from Gomtu end.
**	15.07.2022	15:42	15.07.2022	15:44	0	1.93	10MVA Voltamps TRF (66/33kV)	10MVA Voltamps TRF (66/33kV)		Tripped		Substation	10 MVA Transformer and 33kV Incoming II got tripped due to fault on 33kV ldr IV, Luma Buzukha.
(D) 66/33/11 kV Gedu Substation													
1	03.07.2022	17:00	03.07.2022	17:08	0	1.72	66kV Gedu- Chukha	Blackout	Bad weather			Line segment	66kV supply failed from CHP. At 17:27hrs 66kV supply changed from Phuntsholing Substation.
	06.07.2022	9:02	06.07.2022	9:45	0	1.31	66/11kV SIVA Tr: I		Tighten transformer NCT			Substation	Work pending on T8 issued to Substation Head for NCT tightening work.
2	16.07.2022	18:08	16.07.2022	19:10	0	1.69	66kV Gedu- Chukha	Blackout				Line segment	66kV supply failed from CHP. At 18:10hrs 66kV supply restored from Chukha
3	31.07.2022	9:12	31.07.2022	9:27	0	1.5	66kV Gedu (Phuntsholing)			Emergency shutdown at Phuntsholing end		Line segment	Emergency shutdown taken at Phuntsholing substation to rectify the issue caused from line isolate.



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11) 66KV HV Gumba Substation													
1	11.07.2022	17:30	12.07.2022	18:02	LF	0.61	66/33KV S/MVA Transformer	Nil	over current	O/C with IDMT relay set 30s and trip order 80.	Gumba to	Fault	Fractured bus incidence
2	14.07.2022	17:09	14.07.2022	17:29	0	-4.224	66KV Dhandum feeder	Gumba 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	2.68	66KV Phuntscholing feeder	Gumba Substation	Earth fault	IDMT BF 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 Dhandum feeder	Gumba Substation	Tripped from Dhandum end	Nil	Line segment	Transient fault	Tripped from Dhandum end and supply resumed at 19:11hrs
3	16.07.2022	19:01	16.07.2022	19:14	0	3.81	66KV Phuntscholing feeder	Phuntscholing substation	Earth fault	R/V 52N6	Line segment	Transient fault	Tripped on earth fault and charged the line as requested by BPSO and charge returned
4	19.07.2022	09:15	19.07.2022	10:55	1	2.82	66KV Phuntscholing feeder	Nil	Spark on B phase CB terminal	Nil	Gumba substation	Disturbance Shutdown	Accided emergency shutdown by substation team against Work Permit No. 374, opening code 4048 and closing code 1751 from BPSO.
4	20.07.2022	10:56	20.07.2022	12:56	0	-7.524	66KV Dhandum feeder	Nil	B-Phase fault	Distance Relay Operated & A/R Operated, General trip Done Once, trip 2 - Case trip & B-Phase fault	Line segment	Transient fault	Auto recloser operated and charged from Dhandum end at 13:09hrs of date 20.07.2022 against closing code 4154 from BPSO
12) 220/33KV Dhandum Substation													
1	14.7.2022	17:10	14.7.2022	17:29	0	3.08	66KV Gumba HR	Gumba	Heavy thundering/lightning, strong wind and raining at Gumba area	General trip, Case 2 trip, Y phase fault, vt fuse fail	Heavy thundering/lightning, only and raining at Gumba area.	Line fault	Feeder lost after stopping the weather at gumba area and consult with BPSO for test charging.
2	20.07.2022	10:16	20.07.2022	10:09	0	7.41	66KV Gumba HR	Gumba	Thundering/lightning, strong wind and raining at Gumba	General trip, Case 1 trip, Y phase fault	NA	Line fault	REPA70 General trip, Case 1 O/C on TP also Dist: 2.35 SA 1 Dist: 15.8216 Fault type - LLR → Charged the feeder based upon the charging Gumba:334, BPSO V/phase, however after normalisation of rain fall.
Sl. No.	Date of Tripping	Time of outages	Date of Normalisation	Time of fault was cleared	Duration of Outages (Hrs)	MW before outages (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
13) 66KV Chedra switching station													
1	01.07.2022	11:05	01.07.2022	10:10	0	0.111 MW	66KV Chedra Feeder	Fuse substation	0 fault	Dist to 5.71A, 11.6A, 20.11A, 30.12.5A	66KV Dhandum Line	Tap	
2				10:15		0.240	66KV Panghara Feeder	Panghara substation	Transient fault	J/Fs and General trip	66KV Dhandum Line	Tap	
3				10:15		0.111 MW	66KV Jemba Feeder	Fuse and Panghara	Transient fault	J/Fs and General trip	66KV Dhandum Line	Tap	
4	20.07.2022	09:05	10.07.2022	10:15	0	0.111 MW	66KV Jemba Feeder	Fed Base 66V Chedra Feeder	0-fault	CB open, Line & Bus isolator open, 2 switch closed	Jemba substation	0-fault	5-faults by CNSD for checking the operation of Line and Bus isolator electrically as SCADA installation is in process at Jemba
14) 66KV Water Substation													
1	07-01-2022	10:30hrs	07-01-2022	10:30hrs	0	0.20MW	66KV IC	Ph 1 and II	66KV IC tripped at chidke end	66KV IC tripped at chidke end	66KV IC tripped at chidke end	Tripped	WT tripped and reset the transformer to 70 with consultation with Jhr, Head O&M, and the line charged.
15) 66KV Otaksa Substation													
1	21-07-2022	17:55	21-07-2022	17:55	0	8.10	66KV 20MVA Transformer 1	066KV 20MVA Transformer 1 was affected	Over current and earth fault	Earth Fault Over Current Operated	Line Segment	Tripped	The 66KV Otaksa Chagphaga was taken clear down by Manager Chedra Operator of TSD, with work permit no 2557 and also with the (shutdown) approval from BPSO. Thought for removal of flag pole installed at the last tower Dago in Jango area with busbar opening code 3820. The line was charged after completion of the work with closing code 1617 at 17:55hrs and closed normal.



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(D) 66/33/11kV Lobsara Substation												
66kV LSA - Gewalhang feeder												
1	07.07.2022	06:37hrs	07.07.2022	06:20hrs	0	-20.620	66kV LSA - Gewalhang feeder	66/33/11kV Lobsara substation	NA		66kV LSA - Gewalhang feeder tripped at 06:37hrs and supply resumed at 06:20hrs and at the time of tripping No breaker or relay operated at Lobsara end.	
2	08.07.2022	18:49hrs	08.07.2022	18:50hrs	0	-17.876	66kV LSA - Gewalhang feeder	66/33/11kV Lobsara substation	NA		66kV LSA - Gewalhang feeder tripped at 18:49hrs followed by BPSO and line charged at 18:50hrs from Gewalhang in and line extended to Dochula at 19:53hrs.	
3	09.07.2022	02:35hrs	09.07.2022	02:18hrs	0	-18.728	66kV LSA - Gewalhang feeder	66/33/11kV Lobsara substation	Dist relay operated Zone 3 signal.		66kV LSA - Gewalhang feeder tripped at 02:35hrs followed by BPSO and line charged at 02:18hrs from Gewalhang in and line extended to Dochula at 02:23hrs.	
4	09.07.2022	12:24hrs	09.07.2022	12:24hrs	0	-20.240	66kV LSA - Gewalhang feeder	66/33/11kV Lobsara substation	Dist relay operated Zone 3 signal.		66kV LSA - Gewalhang feeder tripped at 12:23hrs followed by BPSO and line charged at 12:24hrs from Gewalhang in and line extended to Dochula at 13:10hrs.	
5	20.07.2022	18:53hrs	20.07.2022	19:58hrs	0	-21.056	66kV LSA - Gewalhang feeder	66/33/11kV Lobsara substation	Dist relay operated Trip II AC Zone 3 signal, 1A-110 FA, 2D-017, 1, 2C-086, 1A-V		66kV LSA - Gewalhang feeder tripped at 18:53hrs followed by BPSO and line charged at 19:58hrs from Gewalhang in and line extended to Dochula at 20:01hrs.	
66kV LSA - Dochula feeder												
1	07.07.2022	06:37hrs	07.07.2022	06:23hrs	0	18.470	66kV LSA - Dochula feeder		NA		66kV LSA - Dochula feeder tripped at 06:37hrs and supply resumed at 06:23hrs and at the time of tripping No breaker or relay operated at Dochula end.	
2	08.07.2022	18:49hrs	08.07.2022	18:53hrs	0	18.840	66kV LSA - Dochula feeder		NA		66kV LSA - Dochula feeder tripped at 18:49hrs followed by BPSO and line charged at 18:53hrs from Gewalhang in and line extended to Dochula at 18:53hrs.	
3	08.07.2022	02:35hrs	08.07.2022	02:18hrs	0	18.120	66kV LSA - Dochula feeder		NA		66kV LSA - Dochula feeder tripped at 02:35hrs followed by BPSO and line charged at 02:18hrs from Gewalhang in and line extended to Dochula at 02:23hrs.	
4	09.07.2022	12:27hrs	09.07.2022	12:20hrs	0	-20.240	66kV LSA - Dochula feeder		NA		66kV LSA - Dochula feeder tripped at 12:27hrs followed by BPSO and line charged at 12:24hrs from Gewalhang in and line extended to Dochula at 12:23hrs.	
5	20.07.2022	06:42hrs	20.07.2022	06:25hrs	0	18.850	66kV LSA - Dochula feeder		Dist Trip D & Dist Trip C Zone 3 signal.		Supply was resumed from Gewalhang in at 06:42hrs. 66kV LSA - Dochula feeder tripped at 06:42hrs followed by BPSO and line extended at 06:25hrs.	
6	20.07.2022	12:42hrs	20.07.2022	12:57hrs	0	18.850	66kV LSA - Dochula feeder		Dist Trip D & Dist Trip C Zone 3 signal.		Supply was resumed from Gewalhang in at 06:42hrs. 66kV LSA - Dochula feeder tripped at 06:42hrs followed by BPSO and line extended at 06:25hrs.	
7	21.07.2022	17:36hrs	21.07.2022	17:28hrs	0	17.200	66kV LSA - Dochula feeder		Dist Trip D & Dist Trip C Zone 3 signal.		66kV LSA - Dochula feeder tripped at 17:36hrs followed by BPSO and supply was resumed from Gewalhang at 17:28hrs and line extended at 17:28hrs towards Dochula.	
(E) 66/33/11kV Pazu Substation												
Nil												
(F) 66/33/11kV Jomira Substation												
66 kV side tripping												
1	01.07.2022	18:40	01.07.2022	19:45	0	-3.270	66kV Chagapolya	Black out	Back out	Non-Structural EIT operated	Line Segment	Transient
2	01.07.2022	18:34	01.07.2022	19:26	0	1.945	66kV Chagapolya	Black out	Back out	Non-Structural EIT operated	Line Segment	Transient
(G) 66/33/11kV Dochula substation												
1	01.07.2022	18:20hrs	01.07.2022	18:17hrs	0	-21.04	66kV IC	All whole in				Supply failed from source
2	28.07.2022	09:42hrs	28.07.2022	09:40hrs	0	-21.28	66kV IC	All whole in				Supply failed from source
(H) 66/11kV Haas Substation												
1	10.07.2022	18:08	01.07.2022	18:00	0	-1.88	AB	unknown	O/C	panthers		Tripped from Pangtsha end
2	14.07.2022	08:01	14.07.2022	08:09	0	-0.96	AB	unknown	O/C	panthers		Tripped from Pangtsha end
3	14.07.2022	08:17	14.07.2022	08:25	0	-0.56	AB	unknown	O/C	panthers		Tripped from Pangtsha end
4	15.07.2022	07:57	15.07.2022	08:00	0	-0.61	AB	unknown	O/C	panthers		Tripped from Pangtsha end
5	16.07.2022	08:25	16.07.2022	08:32	0	-0.91	AB	unknown	O/C	panthers		Tripped from Pangtsha end



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0) 220kV Substation Samtshika													
1	01-07-2022	18:38hs	01-07-2022	18:38hs			3631kV DMS/A 1 transformer	Samtshika Substation	REF Trip	REF Trip	Transient fault	Transient	
2	04-07-2022	14:23hs	04-07-2022	14:23hs	21.99		06kV Samtshika- Dechencholing Line	Dechencholing and Damsi Substation	Distance protection Opdt. Zone 1, Trip #	Distance protection Opdt. Zone 1, Trip #	Transient fault	Transient	
3	07-07-2022	00:13hs	07-07-2022	00:23hs	49.01		06kV Samtshika-Dochula Line	Dochula s/s	Directional earth fault protection operated	OC/EF Opdt. Zone 1 Trip	Transient fault	Transient	
4	07-07-2022	00:13hs	07-07-2022	00:23hs	49.01		06kV Samtshika- Dechencholing Line	Dechencholing and Damsi Substation	Breaker Contactor	Distance protection Opdt. -BHC Trip	Transient fault	Transient	
5	08-07-2022	19:46hs	08-07-2022	19:52hs	61.91		06kV Samtshika-Dochula Line	Dochula s/s	V & Rph OC Trip	Backup OC/EF relay opdt. V&Rph D-2 Trip	Transient fault	Transient	
6	08-07-2022	00:16hs	08-07-2022	00:26hs	47.02		06kV Samtshika-Dochula Line	Dochula s/s	V & Rph OC Trip	Backup OC/EF relay opdt. V&Rph D-2 Trip	Transient fault	Transient	
7	08-07-2022	12:23hs	08-07-2022	12:23hs	61.91		06kV Samtshika-Dochula Line	Dochula s/s	V & Rph OC Trip	Backup OC/EF relay opdt. V&Rph D-2 Trip	Transient fault	Transient	
8	20-07-2022	00:44hs	20-07-2022	00:53hs			06kV Samtshika-Dochula Line	Dochula s/s	T & Rph OC Trip	Backup OC/EF relay opdt. V&Rph D-2 Trip, fault Current I=117.9A, I=0.76kA, I=0.176kA, I=0.17.0h	Transient fault	Transient	
9	20-07-2022	09:46hs	20-07-2022	09:53hs			06kV Samtshika- Dechencholing Line	Dechencholing and Damsi Substation	Breaker Contactor	Tripped on Broken Conductor. Fault Current I=11.1A, I=0.093kA, I=0.013kA			
10	20-07-2022	19:45hs	20-07-2022	19:53hs			06kV Samtshika-Dochula Line	Dochula s/s	V & Rph OC Trip	Backup OC/EF relay opdt. V&Rph D-2 Trip, fault Current I=109.9A, I=0.716kA, I=0.154kA, I=0.15.0h	Transient fault	Transient	
11	21-07-2022	17:18hs	21-07-2022	17:23hs			06kV Samtshika-Dochula Line	Dochula s/s	T & Rph OC Trip	Backup OC/EF relay opdt. V&Rph D-2 Trip, fault Current I=111.7A, I=0.76kA, I=0.176kA, I=0.17.0h	Transient fault	Transient	
0)6623/11kV Pangnasa substation													
1	01-07-2022	18:16hs	01-07-2022	18:08hs	0		Line Line	Line	Tripping	Tripped on E/F & OC	Pos-Pos	Transient	Replacement of HV Fuse
2	14-07-2022	09:44hs	14-07-2022	10:09hs	0	0.7	Line Line	Line	Tripping	On O/C	Pos-Pos	Transient	Check
3	14-07-2022	09:06hs	14-07-2022	07:31hs	0	0.7	Line Line	Line	Tripping	On O/C	Pos-Pos	Transient	Check
4	14-07-2022	09:06hs	14-07-2022	07:31hs	0		Line Line	Line	Tripping	On O/C	Pos-Pos	Transient	Check
5	15-07-2022	1:50hs	15-07-2022	2:20hs	0		Line Line	Line	Tripping	On O/C	Pos-Pos	Transient	Check, Changed again did not again
6	17-07-2022	2:30hs	17-07-2022	2:17hs	0		Line Line	Line	Tripping	On O/C	Pos-Pos	Transient	Check, Changed again did not again
7	17-07-2022	2:38hs	17-07-2022	2:38hs	0		Line Line	Line	Tripping	On O/C	Pos-Pos	Transient	Check, Changed again did not again
8	17-07-2022	2:39hs	17-07-2022	2:40hs	0		Line Line	Line	Tripping	On O/C	Pos-Pos	Transient	Check, Changed again did not again
9	17-07-2022	2:50hs	17-07-2022	3:08hs	0		Line Line	Line	Tripping	On O/C	Pos-Pos	Transient	Check, Changed Fuse from Han 11kV/6h
10	18-07-2022	3:08hs	18-07-2022	0:37hs	0		Line Line	Line	Tripping	On O/C	Pos-Pos	Transient	Check



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[L] 66/33kV Damji Substation											
1	01-07-2022	1821 hrs	01-07-2022	1951 hrs	0	-4	66 kV Incoming Line	Whole Substation	Tripping	NA	Transmission Line tripped from Semsokha Substation (B Phase Topcord)
2	07-07-2022	0615 hrs	07-07-2022	0621 hrs	0	-4.13	66 kV Incoming Line	Whole Substation	Tripping	NA	Transmission Line tripped from Semsokha Substation
3	08-07-2022	1117 hrs	08-07-2022	1118 hrs	0	-4.62	66 kV Incoming Line	Whole Substation	Tripping	NA	Transmission Line tripped from Dochula Substation due to availability of water
4	20-07-2022	0044 hrs	20-07-2022	0048 hrs	0	-4.65	66 kV Incoming Line	Whole Substation	Tripping	NA	Transmission Line tripped from Semsokha Substation

[M] 66/11kV Dochula Substation													
1	30-07-2022	08:11	31-07-2022	08:11		-11.83	66kV Semsokha	Semsokha - Dochula	Transient fault	under voltage and 80 relay	Semsokha	Temporary	DRI
2	31-07-2022	08:11	01-08-2022	08:29		-0.24	66kV Lohrysa	Lohrysa - Dochula	Transient fault	under voltage and 80 relay	Lohrysa	Temporary	DRI
3	08-07-2022	19:08	08-07-2022	19:27		-11.18	66kV Semsokha	Semsokha - Dochula	Transient fault	under voltage and 80 relay	Semsokha	Temporary	DRI
4	09-07-2022	19:46	09-07-2022	20:03		-29.23	66kV Lohrysa	Lohrysa - Dochula	Transient fault	under voltage and 80 relay	Lohrysa	Temporary	DRI
5	08-07-2022	02:56	08-07-2022	02:55		-11.92	66kV Semsokha	Semsokha - Dochula	Transient fault	under voltage and 80 relay	Semsokha	Temporary	DRI
6	09-07-2022	02:20	09-07-2022	02:47		-08.34	66kV Lohrysa	Lohrysa - Dochula	Transient fault	under voltage and 80 relay	Lohrysa	Temporary	DRI
7	09-07-2022	12:21	09-07-2022	12:27		-11.88	66kV Semsokha	Semsokha - Dochula	Transient fault	under voltage and 80 relay	Semsokha	Temporary	DRI
8	09-07-2022	12:21	09-07-2022	12:25		-02.17	66kV Lohrysa	Lohrysa - Dochula	Transient fault	under voltage and 80 relay	Lohrysa	Temporary	DRI
9	20-07-2022	0:43	20-07-2022	0:33		-28.67	66kV Lohrysa	Lohrysa - Dochula	Transient fault	under voltage and 80 relay	Lohrysa	Temporary	DRI
10	20-07-2022	0:43	20-07-2022	0:35		-11.62	66kV Semsokha	Semsokha - Dochula	Transient fault	under voltage and 80 relay	Semsokha	Temporary	DRI
11	20-07-2022	19:23	20-07-2022	20:06		-29.96	66kV Lohrysa	Lohrysa - Dochula	Transient fault	under voltage and 80 relay	Lohrysa	Temporary	DRI
12	20-07-2022	19:53	20-07-2022	19:59		-11.81	66kV Semsokha	Semsokha - Dochula	Transient fault	under voltage and 80 relay	Semsokha	Temporary	DRI
13	21-07-2022	17:16	21-07-2022	17:22		-08.28	66kV Lohrysa	Lohrysa - Dochula	Transient fault	under voltage and 80 relay	Lohrysa	Temporary	DRI
14	21-07-2022	17:16	21-07-2022	17:52		-11.84	66kV Semsokha	Semsokha - Dochula	Transient fault	under voltage and 80 relay	Semsokha	Temporary	DRI

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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 Malhase Substation													
1	01.08.2022	19:07	01.08.2022	21:05	2	125	200MVA ICT	Malhase Ss	PRD OPTD	PRD Y-Phase, R6 OPTD			IL1=276.34,IL2=239.44,IL3=231.3
2	08.08.2022	07:23	08.08.2022	07:29	0	25	66kV Pasakha I	Malhase Ss	O/C on R-phase	R6 OPTD, General trip IEF 50N trip	line		IL1=1825.83A<15.31, IL2=219.37A<130.54, I3=525.41A<151.14, IL4=1176.04A<164.80
3	08.08.2022	07:23	08.08.2022	07:50	0	26	66kV Pasakha II	Malhase Ss	O/C on Y-phase	R6 OPTD, General trip IEF 50N trip	line		IL1=20A<132.92, IL2=742.12A<55.73, I3=228.20A<106.15
4	08.08.2022	07:23	08.08.2022	07:30	0	5.4	66kV Pasakha IV	Malhase Ss	O/C on R-phase	R6 OPTD, General trip IEF 50N trip	line		IL1=2315.08A<50.57, IL2=291.77A<95.58,IL3=100.51A<38.88
5	18.08.2022	14:57	18.08.2022	15:17	0	22	30/9.3 MVA Transformer I	Malhase Ss		R6 OPTD IEF-50N trip			IL1=110.88A<114.2 IL2=78.28A<174.68,IL3=91.186A<92.28
6	18.08.2022	14:57	18.08.2022	01:12	10	23	30/9.3 MVA Transformer III	Malhase Ss		O/C on H-phase, TRIP R6 OPTD			IL1=140.56A,IL2=119.04,IL3=108.47A,166.25,IL3=109.88<120.21
7	18.08.2022	14:57	20.08.2022	16:04	199	39.1	220kV Malhase- Birjara Hlr	Malhase Ss Birjara SS		Zone 1 trip, AR OPTD	1.533KM		IL1=7.4039A, IL2= 919.3A, I3=571.5A
8	18.08.2022	14:57	20.08.2022	17:12	194	78	220kV Malhase- Singhigmon, Hlr	Malhase Ss Birjara SS		Tripping Pickup II OR, Loop 1.3 EF	7/6km		IL1=5064,IL2=0.016A,IL3=7.766A
9	18.08.2022	14:57	18.08.2022	15:17	0	22	66kV LV 606	Malhase Ss		SIN START	5/5		R=171.26A<97.6, Y=182A<130, B=210A<119, W=488.93A<117.99
10	19.08.2022	06:55	19.08.2022	06:50	0	64	200MVA ICT	Malhase Ss	Temporary fault	R6 OPTD	5/5		IL1=5314,IL2=3044,IL3=2956



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11	18.08.2022	06:15	18.08.2022	07:51	3	11	220KV Malhase-Santse Ibr	Malhase to Santse	Temporary fault	B7 OPTD	low	IL1=98.774A<=927.12=16.41A<=25.41L1=59.17A<=107.2L1=4=53.82A<=167.2
12	18.08.2022	06:15	18.08.2022	19:28	3	79	220KV Malhase-Chukha Ibr	Malhase to Chukha I/S	Short 3 phase	B7 OPTD	low	IL1=764.2A<=249.8L1=223.4A<=17.2A<=67.8L1=5.6A<=38.7L1=4=52.55A<=33.17
13	18.08.2022	06:35	18.08.2022	07:09	1	84	50/62 MVA Transformer 1	Malhase to		B6 OPTD/BSP OPTD	0/0	IL1=21A<=249.8L1=26A<=91.0L1=2=318<=141.0L1=1A<=305A<=172.94
14	18.08.2022	06:35	18.08.2022	07:10	0	42	66kV Parakha feeder 1	Malhase to	O/C 2/F	BC 50 Trip, BFTSM Trip, General Trip, B6 OPTD	low	IL1=54.74A<=48.0L1=316.74A<=170.6L1=3=825.3A<=74.7L1=9157.57A<=166.07
15	18.08.2022	06:35	18.08.2022	06:45	0			Malhase to	O/C, 5/F	BP 50N, rtp, 56 optd, general trip, B7, B3, rtp		IL1=84.32A<=54.24L1=409.18A<=128.2L1=4485.52A<=109.52A<=754.73A<=113.68
16	20.08.2022	01:45	20.08.2022	05:03	3	194	220KV Malhase-Santse Ibr	Malhase to Santse	E/F	M1 Trip, 2 phase Trip, Zone 1 Trip, R/U Trip	80.3 KM	IL1=184.6AL1=2302AL1=1522A, B=8286A
17	21.08.2022	05:12	21.08.2022	05:42	0	17	220KV Malhase-Santse Ibr	Malhase to Santse	O/C on 3 phase and 1 phase	M1 Trip, Zone 1 Trip		IL1=4083AL1=26477A, IL2=211.6AL1=5177A
18	21.08.2022	05:13	21.08.2022	05:46	0	44	300MVA ICT	Malhase to	Temporary fault	B7 OPTD		IL1=199.3A<=1070.0L1=180.0A<=44.74L1=3=158.1A<=152.3
19	21.08.2022	11:00				41	50/67 MVA Transformer 1	Malhase to	LBR 6 FRU separated and not charged, keypad under maintenance	LBR Trip, B6 OPTD	0/0	IL1=209.54A<=2.71L1=209.18A<=24.6L1=3=14.23A<=118.06
20	21.08.2022	11:00	21.08.2022	11:17	3		88kV Zur Conjuror	Malhase to	O/C on 3, Y & B Phase	E1 Trip, B6 OPTD	0/0	IL1=1762.35AL1=1763.75A<=119.75L1=1777.81<=130.93L1=4=1751A<=90.98
21	21.08.2022	11:00	21.08.2022	14:19	3	50	80kV parakha IV	Malhase to	O/C	E1 Trip, B6 OPTD	low	IL1=706.4AL1=709.52A<=120.4L1=3=759.03A<=120.11
22	21.08.2022	11:09	21.08.2022	14:18	3	44	66kV parakha II	Malhase to	B/C	E1 Trip, B6 OPTD	low	IL1=224.96L1=577.30A<=75.72L1=3=901.76A<=102.18
23	21.08.2022	18:10	21.08.2022	18:16	0	34	300MVA ICT	Malhase to	Temporary fault	B6 OPTD	0	IL1=8716<=192.6L1=847A<=72.17L1=3=357A<=154.3
24	21.08.2022	11:20	21.08.2022	12:21	3	12.63	66kV malhase-Phuntsholing	Malhase to Phuntsholing I/S	O/C	O/C Trip 1=1E/1	low	IA=510.4A, IB=605AL1=581.2A, B=4467A
25	21.08.2022	18:10	21.08.2022	18:52	0	51	220KV Malhase-Chukha Ibr	Malhase to Chukha I/S	Temporary fault	56 optd	low	IL1=80.69A<=148.1L1=63.89A<=21.9L1=3=67.44A<=216L1=4=983A<=19.3
26	21.08.2022	18:10	21.08.2022	18:50	0	15	66kV parakha IV	Malhase to	O/C	BP 50N ON trip, General trip, B6 trip	low	IL1=1345.35A<=82.88deg, IL2=172.65A<=91.88deg, IL3=231.55A<=1.17deg
27	21.08.2022	18:10	21.08.2022	18:19	0	23	50/63 MVA Transformer 2I	Malhase to	Temporary fault	BP optd, Differential optd.	0/0	IL1=26A<=11.32deg, IL2=118.14A<=138deg, IL3=383.78A<=178.97deg
28	21.08.2022	18:10	21.08.2022	18:23	0	13	220KV Malhase-Santse Ibr	Malhase to Santse	Temporary fault	R/U Trip	low	IL1=52.70A<=71.05deg, IL2=31.99A<=102.8deg, IL3=44.16A<=139.34deg, IL4=51.50A<=118.8deg
29	21.08.2022	18:12	21.08.2022	18:16	0	31	50/63 MVA Transformer 2I	Malhase to	Temporary fault	BP optd, Differential optd.	0/0	IL1=181.05A<=6.41deg, IL2=72.46A<=70.01deg, IL3=101.05A<=81.75deg, IL4=282.19A<=10.1deg
30	21.08.2022	18:12	23.08.2022	14:47	0	3	220KV Malhase-Santse Ibr	Malhase to Santse	O/C on 3 phase and with E/F	Main protection trip=O/C (60s) trip=1amp 12.5s	low	IL1=92.18A<=138.7deg, IL2=272.3A<=160.8deg, IL3=33.5A<=11.3deg, IL4=380.1A<=161.5deg
31	23.08.2022	18:46	23.08.2022	18:18	3	3	220KV Malhase-Santse Ibr	Malhase to Santse	O/C on Y & B phase and with E/F	General trip=Main 1 trip	low	IL1=86.79A<=123.8deg, IL2=435.8A<=171.9deg, IL3=4075A<=19.8deg, IL4=2153A<=112.4deg
32	24.08.2022	18:14	24.08.2022	18:47	0	33	50/63 MVA Transformer 2I	Malhase to	Temporary fault	B6 OPTD, B7 Trip, Diff Trip	0/0	IL1=80.67A<=55.03 deg, IL2=764.11A<=53.87 deg, IL3=370.86A<=170.42 deg, IL4=300.41A<=90.03 deg
33	24.08.2022	18:25	27.08.2022	14:41	0	26.38	120kV Malhase-Repure Ibr	Malhase to Repure I/S	Repure line LA got punctured.	Phase ABC distance zone 1 triggered, AR Lockout, Fault location= 549.3m.	low	IA=772.5A, IB=479.9A, IC=7.4428A
34					0							
35					0							



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Bhutan/11 kV Shekpa Substation												
1	17.07.22	01:32	17.07.22	01:42	0	0.007	210kV Single Circuit Feeder	Integration in			Insulator disconnected from due to Digital software communication problem.	
2	18.07.22	12:00	18.07.22	12:30	1	0.01	11kV Feeder 5	Integration in			IC1= 4.07kA, IL1= 2.07kA, IL2= 1.77kA	
3	20.07.22	17:00	20.07.22	20:20	2	2.220	11kV Feeder 9	Integration in			IC2= 8.07kA, IL2= 2.97kA, IL3= 2.07kA	
4	19.07.22	10:40	19.07.22	10:45	0	0.13	11kV Feeder 1	Integration in		Yrased Fault	IC1= 0.1kA, IL1= 0.01kA, IL2= 0.19kA	
5	20.07.22	16:54	20.07.22	17:01	0	0.125	11kV Feeder 1	Integration in			IL1= 0.08kA, IL2= 0.01kA, IL3= 1.10kA	
6	28.07.22	09:09	28.07.22	09:10	0	0.037	11kV Feeder 1	Integration in	a/v & S/EABT Trig. General Mfg		IL1= 0.29kA, IL2= 0.01kA, IL3= 0.01kA	
7	26.07.22	20:50	26.07.22	21:51	0	0.061	11kV Feeder 11	Integration in		Tripped on O/C SBR Phase	IL1= 0.07kA, IL2= 0.00kA, IL3= 0.11kA	
8	28.07.22	23:29	28.07.22	23:44	0	0	6kV B/Circuit Feeder	Integration in			IL1= 1.07kA, IL2= 0.07kA, IL3= 0.07kA	
Bhutan/11 kV Phuntsholing Substation												
1	13.08.2022	10:50	13.08.2022	10:50	0	-4.27	6kV Chukha Ping feeder	Black out at Ping st			Tripped at chukha end	
2	12.08.2022	10:30	12.08.2022	10:40	0	-1.24	6kV Ping Gentsa Fe	Black out at Ping st	Overcurrent	IC= 195.7A, IL= 1.03kA, IL= 51.31kA, IL= 4.50kV/VIC= 34.00kV/VIC= 42.91kV, IIN= 11.75A IIN= 12.00A	Tripped at our end	
3	14.08.2022		14.08.2022	14:24			6kV Ping Malasa Fe	6kV Ping Malasa Fe				At 10:24hrs charged 6kV Ping Malasa feeder which was under idle charge condition with closing code 111 from BPSO. At 10:50hrs opened CB of above Fe with opening code 0943 from BPSO and said feeder kept under idle charged condition.
4	14.08.2022	14:26	14.08.2022	18:50	0	-1.57	6kV Ping Gentsa Fe	6kV Ping Gentsa Fe	Shutdown	Nil	Line	At 1:00hrs 6kV Ping Gentsa feeder taken shut down by TSD/Trig against work permit on 04 with opening code 0912 from BPSO for safe clearing between location PPH 2 to PPH 3. At 10:50hrs normalised with closing code 114 from BPSO.
5	08.08.2022	15:20	08.08.2022	16:22	0	-0.87	6kV Chukha Ping feeder	Black out at Ping st	Tripped at their end	Nil	Tripped at their end	Tripped at Chukha end.
6	10.08.2022	15:25	10.08.2022	15:40	0	-0.10	6kV Ping Gentsa Fe	Black out at Ping st	Earthfault	IC= 34.24kA, IL= 1.02kA, IL= 1.02kA, IL= 1.02kA, IL= 66.21kV/VIC= 9.14kV/VIC= 44.51kV, IIN= 40.84A IIN= 40.81A, Vm= 01.27kV, Vm= 17.13kV, Vm= 13.89kV	Substation	Tripped at our end. At 15:40hrs was charged after getting clearance from BPSO and stand normal.
7	08.08.2022		08.08.2022	15:28			6kV Ping Malasa Fe	6kV Ping Malasa Fe				At 15:20hrs charged 6kV Ping Malasa feeder which was under idle charge condition with closing code 134 from BPSO, also 6kV Chukha-Ping supply 2nd from Chukha end and 6kV Ping-Gentsa tripped at our end. At 15:37hrs opened CB of above Fe with opening code 0954 from BPSO and said feeder kept under idle charged condition.
8	09.08.2022		09.08.2022	06:34			6kV Ping Malasa Fe	6kV Ping Malasa Fe				At 09:24hrs as per instruction from BPSO charged 6kV Ping Malasa feeder which was under idle charge condition with closing code 134 from BPSO due to voltage fluctuation. On closed 23.08.2022 at 11:09hrs opened CB of 6kV Ping Malasa feeder with opening code 0943 from BPSO and feeder kept under idle charged condition.
9	21.08.2022	11:00	21.08.2022	11:30	0	-0.87	6kV Chukha Ping feeder	6kV Chukha Ping feeder		DEN OPTIC 100kVA		Test charged as per instruction from BPSO with charging code 110 but didn't settlement. Informed to BPSO. At 11:30hrs test charged with same charging code as per instruction from BPSO and stand normal.
10	21.08.2022	13:00	21.08.2022	13:10	0	-0.57	6kV Ping Gentsa Fe	6kV Ping Gentsa Fe				At 11:20hrs was charged as per instruction from BPSO with charging code 107 and stand normal.
11	21.08.2022		21.08.2022	17:24			6kV Ping Malasa Fe	6kV Ping Malasa Fe				At 15:24hrs as per instruction from BPSO charged 6kV Ping Malasa feeder which was under idle charge condition with closing code 100 from BPSO. At 17:12hrs opened CB of 6kV Ping Malasa feeder with opening code 0962 as per instruction from BPSO and feeder was put back to idle charged condition.
12	05.08.2022		05.08.2022	16:00			6kV Ping Malasa Fe	6kV Ping Malasa Fe				At 16:05hrs as per instruction from BPSO charged 6kV Ping Malasa feeder which was under idle charge condition with closing code 170 from BPSO. At 16:11hrs opened CB of 6kV Ping Malasa feeder with opening code 0904 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	20.08.2022		20.08.2022	09:51			6kV Ping Malasa Fe	6kV Ping Malasa Fe				At 09:31 6kV Ping Malasa feeder charged from our end with charging code 106 from BPSO due to high rise in starting temperature of 40/10kVA transformer. It is at Malasa end. At 17:31hrs opened CB of 6kV Ping Malasa feeder with opening code 0906 from BPSO and said feeder was put back to idle charged condition.



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IDN 66/33/11 kV Gedu Substation												
1	12.08.2022	10:35	13.08.2022	10:40	0	4.3	66kV Gedu-Chalkha Feeder	Black out	Tripped from Chalkha end		Line segment	66kV supply restored from Chalkha end
2	10.08.2022	15:36	10.08.2022	15:32	0	1.55	66kV Gedu-Chalkha Feeder	Black out	Tripped from Chalkha end		Line segment	66kV supply restored from Chalkha end
(E) 66/33/11 kV Guntu Substation												
1	13.08.2022	10:33	13.08.2022	10:44	0	-4.279	66kV Dhamdum feeder	Whole Guntu	Grid failed	NO	Chalkha	tripped from Dhamdum end
2	13.08.2022	10:33	13.08.2022	10:43	0	0.96	66kV Guntu-Phomdoling	Whole Guntu	Grid failed	NO	Chalkha	Tripped from plug end
66	10.08.2022	15:25	10.08.2022	15:37	0	-7.704	66kV Dhamdum Line	Guntu	Tripped	General tripped	Guntu SS	Supply charged as per the BPSO instruction
(F) 220/66/33 kV Dhamdum Substation												
1	10.08.2022	14:26	24.08.2022	10:02	3	-0.16	Shinggom	Dhamdum	heavy rain with wind	REL 670 trip	NA	Line tripped due to S/F on B0 fault, Zone: 1 (General trip) 400kV conductors snap and fall on 220kV bus. In Fdr. kept under short down.
2	23.08.2022	14:33	23.08.2022	14:47	0	-1.112	220kV Malbase feeder	Dhamdum	heavy rain with wind	REL 670 trip	NA	Feeder tripped due to Zone 1 (General trip) B7B Fault and VT fuse fail but only Breaker trip from Malbase end
3	23.08.2022	14:40	23.08.2022	14:38	1	-1.112	220kV Malbase feeder	Dhamdum	heavy rain with wind	REL 670 trip	NA	Feeder tripped from Malbase end Relay indicated: Zone: 1 (General trip) B7B Fault and VT fuse fail only
4	24.08.2022	15:25	25.08.2022	15:34	22	0.74	50/6.5MVA Transformer II	Dhamdum	stump	short down	NA	50/6.5MVA transformer II taken emergency short down due to abnormal sound produced from the Circuit breaker RB against work permit No.1596. BPSO shutdown code no. 0965
5	13.08.2022	10:35	13.08.2022	10:44	0	9.24	Guntu	-	Transient fault	RECH70	NA	Tripped on O/C Fault current value 1) I1 = 2.200A 2) I2 = 2.434A 3) I3 = 2.318A 4) I0 = 0.001A
6	10.08.2022	15:43	10.08.2022	15:53	0	0.2	Guntu	-	Transient fault	RECH70	NA	Tripped on O/C Fault current value (T & B0) 1) I1 = 0.294A 2) I2 = 1.008A 3) I3 = 1.965A 4) I0 = 0.001A
7	23.08.2022	14:53	23.08.2022	14:05	0	9.2	66kV Guntu Feeder	-	Transient fault	REL 670 General trip, Zone 2 trip, B phase fault	NA	Fault current value (RB) I1= Fault mag=162.25A, Fault angle=14.75deg, I2= Fault mag= 42.19A, Fault angle=245.51deg, I3=1881.43A, Fault angle= 43.85deg.
8	23.08.2022	14:53	23.08.2022	14:11	0	0	66kV Bus coupler	-	Transient fault	no relay operation	NA	Tripped same time with Guntu feeder
(B) 66/33kV Watsa Substation												
1	08-01-2022	9:46hrs	08-01-2022	10:06hrs		5.630MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped
2	08-02-2022	7:19hrs	08-02-2022	7:50hrs		5.900MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped
3	08-02-2022	10:49hrs	08-02-2022	11:15hrs		5.555MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped
4	08-03-2022	13:04hrs	08-03-2022	13:22hrs		5.304MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped
5	08-03-2022	19:40hrs	08-03-2022	19:52hrs		5.810MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped
6	08-05-2022	8:19hrs	08-05-2022	8:40hrs		5.380MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped
7	08-05-2022	9:39hrs	08-05-2022	10:02hrs		5.280MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped
8	08-05-2022	10:56hrs	08-05-2022	11:22hrs		5.280MW	66/33KV, 8MVA transformer	Fdr. I and II	WTI tripped	WTI tripped	8MVA WTI tripped	Tripped
9	13/8/2022	17:50hrs	13/8/2022	17:56hrs		450MW	66KV SF6 breaker	Fdr. I and II	Earth fault on Y phase	Earth fault on Y phase	Fdr. II Chapcha	Tripped
10	26/8/2022	8:45hrs	26/8/2022	8:50hrs		850MW	66KV SF6 breaker	Fdr. I and II	Earth Fault	EF relay operated	Fdr. I Chashi	Tripped
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



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10) 66/33KV Oshila Substation													
1	03-04-2022	2:33	03-08-2022	2:42	0	2.38	66/33KV 20MVA, Transformer I	All the 33KV was affected 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 stand normal.
2	03-04-2022	2:35	03-08-2022	2:42	0	2.58	66/33KV 20MVA, Transformer II	All the 33KV was affected 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 stand normal.
3	04-08-2022	5:01	04-08-2022	5:25	0	3.15	66/33KV 20MVA, Transformer I	All the 33KV was affected 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 stand normal.
4	04-08-2022	5:01	04-08-2022	5:25	0	3.33	66/33KV 20MVA, Transformer II	All the 33KV was affected 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 stand normal.
10) 66/33/11KV Docks/along substation													
1	23-06-2022	08:46:54	23-06-2022	09:50:05	0	4.213	66KV Damphor	only Damphor line	Tripped on Distance relay	Dist relay: IA-44.02K, IB-3.55KA, A1 IC 1.515KA, Fault resistance: 2.04KΩ	Fault location: 29.21KM Zone-1	Tripped	changed the file as per the RPSO (keeping code No 24) and hold the file normally.
10) 66/11KV Bhaa Substation													
1	21-06-2022	15:23	21-06-2022	15:46	0	-0.91	66KV increase	A2	unknown	O/C	Phongtse	The supply was terminated after starting the relay.	
2	24-06-2022	09:05	24-06-2022	09:22	0	-0.31	66KV increase	A2	unknown	O/C & EF	Phongtse	The supply was terminated after starting the relay.	
10) 220KV Substation Samskha													
1	01-08-2022	16:20hrs	01-08-2022	16:27hrs		46.46	220KV Samskha-Dochula Line	Dochula sv	V & High OC Trip	Backup OC/EF relay opfd, V&High 3-2 Trip IA=03.3A,IB=0.70KA, IC=1.075A,ADN=17.3KA Backup OC/EF relay opfd, V&High 3-2 Trip IA=03.3A,IB=0.70KA, IC=1.075A,ADN=16.8KA		Tripped	
2	04-08-2022	01:05hrs	04-08-2022	01:1000hrs		46.46	220KV Samskha-Dochula Line	Dochula sv	V & High OC Trip	Backup OC/EF relay opfd, V&High 3-2 Trip IA=03.3A,IB=0.71KA, A.R=1.125A,ADN=17.3KA Backup OC/EF relay opfd, V&High 3-2 Trip IA=03.3A,IB=0.71KA, A.R=1.125A,ADN=17.3KA		Tripped	
3	16-09-2022	07:30hrs	16-09-2022	07:34hrs		46.03	220KV Samskha-Dochula Line	Dochula sv	V & High OC Trip	Backup OC/EF relay opfd, V&High 3-2 Trip IA=03.3A,IB=0.71KA, A.R=1.125A,ADN=17.3KA Backup OC/EF relay opfd, V&High 3-2 Trip IA=03.3A,IB=0.71KA, A.R=1.125A,ADN=17.3KA		Tripped	
4	21-09-2022	01:13hrs	21-09-2022	01:47hrs		47.31	220KV Samskha-Dochula Line	Dochula sv	V & High OC Trip	Backup OC/EF relay opfd, V&High 3-2 Trip IA=03.3A,IB=0.71KA, A.R=1.125A,ADN=17.3KA Backup OC/EF relay opfd, V&High 3-2 Trip IA=03.3A,IB=0.71KA, A.R=1.125A,ADN=17.3KA		Tripped	
5	26-08-2022	14:10hrs	21-08-2022	14:40hrs		41.21	220KV Samskha-Dochula Line	Dochula sv	V & High OC Trip	Backup OC/EF relay opfd, V&High 3-2 Trip IA=03.3A,IB=0.70KA, IC=1.02KA		Tripped	



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(K) 66/33kV Changtaphu Substation												
Sl. No.	Date	Time	Duration	Severity	Impact	Line	Location	Type	Remarks	Substation	Zone	Notes
1	26-06-2022	18:34hr	26-08-2022	18:50hr	0.05	66kV Changtaphu-Orakha Line	66kV Changtaphu-Orakha Line		Distance Protection, Zone 2 3ph Trip, R=120.152, T=566.002, B=625.660		Taxtar	
(L) 66/33kV Dampi Substation												
1	23-08-2022	09:44 hrs	23-08-2022	09:59 hrs	0	66 kV Incoming Line	Whole Substation	Tripping	SA			Transmission Line tripped from Dharma-Nelung Substation
(M) 66/11kV Dochula Substation												
1	01-08-2022	16:31	01-08-2022	16:39	-01.06	66kV Samskha	Samskha - Dochula	Transient fault	Under voltage and 50 relay	Samskha	Tengpoor	1
2	01-08-2022	17:31	01-08-2022	16:31	-01.47	66kV Lohrysa	Lohrysa - Dochula	Transient fault	Under voltage and 50 relay	Lohrysa	Tengpoor	1
3	06-08-2022	09:00	04-08-2022	09:10	-01.78	66kV Samskha	Samskha - Dochula	Transient fault	Under voltage and 50 relay	Samskha	Tengpoor	1
4	06-08-2022	09:00	06-08-2022	09:18	-01.26	66kV Lohrysa	Lohrysa - Dochula	Transient fault	Under voltage and 50 relay	Lohrysa	Tengpoor	1
5	10-08-2022	7:51	09-08-2022	7:59	-01.09	66kV Samskha	Samskha - Dochula	Transient fault	Under voltage and 50 relay	Samskha	Tengpoor	1
6	14-08-2022	7:31	06-08-2022	7:17	-01.07	66kV Lohrysa	Lohrysa - Dochula	Transient fault	Under voltage and 50 relay	Lohrysa	Tengpoor	1
7	22-08-2022	09:11	21-08-2022	09:46	-01.35	66kV Samskha	Samskha - Dochula	Transient fault	Under voltage and 50 relay	Samskha	Tengpoor	1
8	21-08-2022	09:11	21-08-2022	09:51	-01.28	66kV Lohrysa	Lohrysa - Dochula	Transient fault	Under voltage and 50 relay	Lohrysa	Tengpoor	1
9	28-08-2022	08:41	28-08-2022	09:18	-01.64	66kV Samskha	Samskha - Dochula	Transient fault	Under voltage and 50 relay	Samskha	Tengpoor	1
10	28-08-2022	08:34	28-08-2022	08:42	-01.06	66kV Lohrysa	Lohrysa - Dochula	Transient fault	Under voltage and 50 relay	Lohrysa	Tengpoor	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 Malhasa Substation													
1	06-09-2022	00:08	06-09-2022	00:11	0	11	50 MVA transformer III	Malhasa Substation	Tripping	Biased Diff Harm Bk			IL1= 85.51<147.78deg, IL2= 152.51A<94.93deg, IL3= 317.51A<81.26deg, IL4= 178.61<41.14deg. Transformer charged with charging code 257/BPSO
2	06-09-2022	00:08	06-09-2022	00:11	0	134	220kV Chukha feeder III	Malhasa Substation	Tripping	MCCB Relay, START BN, Tripped Phase, ABC, Start Element Distances, Distance trip Zone All, lockout slot, system frequency 48.91, fault duration: 53.41ms, Relay time 81.79ms	11.62 km		IA= 488.8A, IB= 548.6A, IC= 267.1A. Charged with Code 251/BPSO.
3	07-09-2022	15:51	07-09-2022	15:59	0	-	66kV Bus Coupler	Malhasa Substation	Tripping	B6 optd, JBF, 50N Trip, IOC, 50-TRIP/GENERAL TRIP			IL1=11.2920A<59.91deg, IL2=125.07A<61.57deg, IL3=18239.57A<83.06deg, IL4= 9495.89A<20.76deg
4	07-09-2022	15:51	07-09-2022	15:59	0	17	66kV Pasakha line no 1	Malhasa Substation	Tripping	B6 optd, JBF, 50N Trip, IOC, 50-TRIP/GENERAL TRIP			IL1=1101.88A<107.54deg, IL2= 85.25A<61.16deg, IL3=1079.83A<43.43deg, IL4= 373.73A<13.46deg
5	15-09-2022	22:41	15-09-2022	22:46	0	19	220kV Malhasa-Santus	Malhasa Substation	Tripping	M1 trip, zone 1 trip	10.3km		IL=24.28A<232.2, IL2=56.88A<238.3, IL3=2266A<29.38, IL4=2134A<38.78
6	15-09-2022	22:38	15-09-2022	22:44	0	-	220kV bus coupler	Malhasa Substation	Tripping	86OPTL			
7	15-09-2022	22:41	15-09-2022	22:46	0	34	50 MVA transformer III	Malhasa Substation	Tripping	OLTG trip, Diff Section, Diff Trip, Diff WARM, Diff WARM Trip			IL1=91.60A<27.36, IL2=151.47A<120.59, IL3=85.52A<136.91, IL4=127.62<96.88
8	16-09-2022	23:28	16-09-2022	23:47	0	114	220kV Chukha feeder III	Malhasa Substation	Tripping	B6 optd, Zone 1 Tripped			IA=443.2A, IB=419.9A, IC=47.18A
9	16-09-2022	23:28	16-09-2022	23:49	0	23	50 MVA transformer III	Malhasa Substation	Tripping	DIFF TRIP, Z7 TRIP, B6 Optd			IL1=91.99 A< 41.13 DEG, IL2=131.66 A< 112.19 DEG, IL3=85.07A< 119.95 DEG, IL4=56.36< 94.36 DEG
10	16-09-2022	19:28	16-09-2022	19:31	0	-	50 MVA transformer III	Malhasa Substation	Tripping	EXT TRIP, B6 OPTD			IL3= 106.87 A, IL2= 421.8 A, IL4= 284.97A, IL1= 217.25A
11	16-09-2022	19:34	16-09-2022	19:50	0	10.4	220kV Malhasa-Santus	Malhasa Substation	Tripping	B/U Trip			IL=2031A<270.42, IL2=100.8A<102.32<2061A<51.30, IL4=1909A<33.79
12	16-09-2022	19:34	16-09-2022	19:39	0	26	50 MVA transformer III	Malhasa Substation	Tripping	EXT TRIP, BUCH Trip			IL=13.10A<47.12<13.10A<132.39, IL3=67.55A<144.27
13	16-09-2022	22:28	16-09-2022	22:31	0	28	50 MVA transformer III	Malhasa Substation	Tripping	EXT TRIP, B6 OPTD, OLTG, BUCH trip			IL1= 106.87 A, IL2= 422.8 A, IL3= 284.87A, IL4= 217.19A
14	20-09-2022	08:31	20-09-2022	08:34	0	0	220 kV bus coupler	Malhasa Substation	Tripping	B6 optd			No data displayed
15	22-09-2022	07:55	22-09-2022	08:00	0	115	220kV Chukha feeder III	Malhasa Substation	Tripping	B6 optd, G/C Zone 1 trip, R.T.B phase Trip, fault location: 9.157km, Fd=00.02km	9.157km, Fd=00.02km		IL1=10.94A, IL2=7.158A, IL3=6.471A
16	22-09-2022	02:55	22-09-2022	03:01	0	28	50 MVA transformer III	Malhasa Substation	Tripping	DIFF trip, B6 optd			IL1=153.55A<19.74, IL2=96.02A<34.24, IL3=74.26A<41.48, IL4=122.34A<78.22
17	22-09-2022	02:55	22-09-2022	03:00	0	-	220kV bus coupler	Malhasa Substation	Tripping	CRFP			IA=11.66A, IB=08.66A, IC=58.10A, ID=339.1A, IF=10MT, IG=139.0A
18	22-09-2022	03:04	22-09-2022	03:06	0	-	220kV bus coupler	Malhasa Substation	Tripping	CRFP			
19	22-09-2022	03:04	22-09-2022	03:06	0	28	50 MVA transformer III	Malhasa Substation	Tripping	DIFF TRIP, B6 Optd			IL1=404.32A<90.28deg, IL2=178.33A<30.73deg, IL3=142.01A<134.22deg, IL4=219.83A<86.04deg
20	22-09-2022	03:04	22-09-2022	04:04	1	111	220kV Chukha feeder III	Malhasa Substation	Tripping	Zone 1 trip, B6 optd	Zone 1 trip, fault location=11.59km		IA=10.56A, IB=7.018A, IC=5.829A
21	22-09-2022	04:04	22-09-2022	04:12	0	115	220kV Malhasa-Santus	Malhasa Substation	Tripping	M1-trip, zone 1 trip	Fault loop=IL1-IL2, distance=6.3km		M1-trip, zone 1 trip, Fault loop=IL1-IL2, distance=6.3km, IL1=477.1A<28.6deg, IL2=605.4A<164.7deg, IL3=4900A<35.75deg, IL4=994.7A<165.7deg
22	22-09-2022	04:04	22-09-2022	04:11	0	66	400/220kV, 300MVA ICT	Malhasa Substation	Tripping	Buch trip			IL1=177.4A<40.06deg, IL2=181.4A<164.5deg, IL3=159.1A<66.05deg, IL4= 98.8A<15.85deg, IL2= 186.43A<14.28deg, IL3= 165.88A<162.52deg, IL4= 85.2A<15.85deg
23	23-09-2022	01:07	23-09-2022	02:07	0	19	66kV Pasakha line no II	Malhasa Substation	Tripping	67_Trip, B6 OPTD, General Trip, 67N Trip			



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24	23-09-2022	01:57	23-09-2022	02:04	0	19	66kV Pasakha fdr to IV	Malkasa Substation	Tripping	678 Trip, General Trip			IL1=51V61A/96.07deg,IL2=644.2A/-124.6deg, I3=3599.85A/01.23deg, I4=518.61A/-96.07deg
25	23-09-2022	01:57	23-09-2022	02:08	0	-	66kV Bus Coupler	Malkasa Substation	Tripping	General Trip, 67 Trip, 67 STLS			IL1=919.04A/80.79deg, IL2=967.09A/125.7deg, I3=4758.81A/-66.85deg, I4=3748.81A/-72.8deg
26	23-09-2022	17:27	23-09-2022	17:35	0	73	400/220KV, 200MVA ICT	Malkasa Substation	Tripping				
27	23-09-2022	17:27	23-09-2022	17:37	0	-	220 kV Bus coupler	Malkasa Substation	Tripping				
28	23-09-2022	17:27	23-09-2022	17:45	0	27	50 MVA transformer II	Malkasa Substation	Tripping				I1=711.85A/2.71deg,I2=734.09A/124.6deg,I3=704.74A/-97deg
29	23-09-2022	17:27	24-09-2022	17:46	24	19	66kV Pasakha fdr to II	Malkasa Substation	Tripping				IL1=0.29A/-1.11deg,IL2=856.11 A/13.89deg,IL3=629.52 A/-162.83deg Test charge done at 18:25hrs. date 23/09/2022 but could not hold and kept on open condition. Taken shutdown for OPG wire setting by TMD/plng (work permit number 288) on 24/09/2022 at 8:45 hours and. Test charged on 24/09/2022 @13:39 but could not hold. Test charge done @ 14:45 hold in full charge with no load given
30	23-09-2022	17:27	24-09-2022	17:46	24	28	66kV Pasakha fdr to IV	Malkasa Substation	Tripping				IL1=814.97A/149.30deg,IL2=573.27A/-156.57deg, IL3=2382.33A/87.25deg Test charge done at 18:25hrs @ 23/09/2022, but could not hold and kept on open condition.Taken shutdown for OPG wire setting by TMD/plng. (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 full charge condition
31	23-09-2022	17:27	24-09-2022	17:46	24	19	66kV Pasakha fdr to I	Malkasa 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 Concept.Taken shutdown for OPG wire setting by TMD/plng (work permit number 288)on 24/09/2022 at 8:45 hour and test charged & hold at 24/09/2022 13:29 (dated 24/09/2022 but hand tripped at 14:00 hrs dated 24/09/2022 due to missing T phase current, and is currently being attended by TMD plng (Work Permit Number 290 issued to TMD plng) at 15:15 hrs. and at 17:30 hrs. Work permit no 290 was returned by TMD PLNG and all 66kV out going feeder Charged at 17:45 hrs.
32	23-09-2022	17:27	24-09-2022	18:23	24	72	66kV Phuntsholing fdr.	Malkasa Substation	Tripping	31 trip,30mgnd			IL1=1.23kA/2=197.5kA/I3=1.222kA/I2=2.071kA kept in open condition.
33	23-09-2022	20:48	23-09-2022	20:53	0	-	220 kV Bus coupler	Malkasa Substation	Tripping	36 cgd.	line		No data displayed
34	23-09-2022	20:48	23-09-2022	20:55	0	59	400/220KV, 200MVA ICT	Malkasa Substation	Tripping	36 cgd.	line		IL1=4.058A/15.35deg,IL2=0.166A/38.57deg,IL3=0.905A/173.40deg tripped due to test charge of 66hr feeder Tripped while doing test charge on 66kV Pasakha I and 66kV bhutan Concept fdr.
35	23-09-2022	20:48	23-09-2022	20:58	0	0.43	50 MVA transformer II	Malkasa Substation	Tripping	36 cgd.	line		IA=0.06A, IB=0.03A, IC=0.00A, no load. 66kV feeders out Tripped while doing test charge on 66kV Pasakha I and 66kV bhutan Concept fdr.
36	23-09-2022	21:42	23-09-2022	22:38	0	88	230kV, Birpara feeder	Malkasa Substation	Tripping	O/C on 888 phase,general trip,zone 2 trip	Each Inverter Distance=55.54KM		IA=2.157kA, IB=179.6A, IC=3.050kA
38	20-09-2022	18:40	20-09-2022	18:44	0	108	220kV Chukha feeder III	Malkasa Ss	Tripping		line		General Trip, Zone-1 Trip, Fault loop=L3-N, Ibus= 8.00 km, Trip value I1=378.8A/290.1deg, I2=132.9A/71.23deg, I3=559.6A/44.84deg, I4=529.4A/47.33deg
39	28-09-2022	18:40	28-09-2022	18:45	0	25	50MVA Transformer III	Malkasa Ss	Tripping				027 TRIP, DIFF TRIP, Tripped value IL1=78.52A/-21.44deg, IL2=139.94A/-119.29deg,IL3=86.52A/-123.88deg, I4=273.19A/-107.8deg
40	30-09-2022	12:52	30-09-2022	12:59	0	117.44	230kV Malkasa-Chukha	Malkasa Ss	Tripping				tripped (RR protection)
41	30-09-2022	12:52	30-09-2022	12:57	0	79	400/220KV, 200MVA ICT	Malkasa Ss	Tripping				tripped (RR protection)
42	30-09-2022	12:52	30-09-2022	12:41	0	14.56	220kV Malkasa-Seripa	Malkasa Ss	Tripping				tripped (RR protection)
43	30-09-2022	12:52	30-09-2022	13:26	0	30.88	220kV Malkasa-Birpara	Malkasa Ss	Tripping				tripped (RR protection)
44	30-09-2022	12:52	30-09-2022	13:26	0	-	220 kV Bus coupler	Malkasa Ss	Tripping				
45	30-09-2022	13:05	30-09-2022	13:12	0	36	400/220KV, 200MVA ICT	Malkasa Ss	Tripping				tripped (RR protection)
46	30-09-2022	13:05	30-09-2022	13:17	0	-	220 kV Bus coupler	Malkasa Ss	Tripping				tripped (RR protection)
47	30-09-2022	13:05	30-09-2022	13:18	0	-75.86	230kV Malkasa-Chukha	Malkasa Ss	Tripping				RR trip,I1=91.72A/-10deg,I2=113A/-79.85deg,I3=181.72A,31.2 deg,I4=6067A/-155.4deg.
48	30-09-2022	13:05	30-09-2022	13:22	0	0.9	230kV Malkasa-Santa	Malkasa Ss	Tripping				RR trip,I1=27.72A/-28.33deg,I2=28.26A/-296.4deg,I3=28.82A,144.5deg,I4=0.28/-5.3deg.



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B12046/11 kV Singhiyasa Substation											
#8	07.09.2022	15:51	15:54	0	32	66kV Shunt Capacitor Br.	Singhiyasa Sr.	O/C	Direction Time O/C trip, D= DIRECTIONAL TRIP GENERAL TRIP, 36 OPTD	See	IL1=1.14KA, IL2=0.28KA, IL3=0.34KA
#9	07.09.2022	15:51	15:54	0	-	44kV Bus 1	Singhiyasa Sr.	-	8k optd, 10p trip	-	-
#9	16.9.22	20:34	20:38	1	3	220kV Singhiyasa - Gomsa	Singhiyasa Sr.	tripped	Zone 1 trip fault loop (3-9) 2.64Sec	See	(I1=42.23A, I2=22.23A, I3=45.02A, I4=24.23A, I5=1.250A, I6=0.075A, I7=1.204A, I8=0.04)
#8	16.9.22	22:28	22:56	0	0.4	220kV Singhiyasa - Gomsa	Singhiyasa Sr.	tripped	General Trip, Zone 1 Trip, 7.1411 Sec, Distance= 53Km	See	(I1=2093A, I2=203.86pA, I3=96.15A, I4=96.50pA, I5=30.01A, I6=13.7pA, I7=2714A, I8=94pA)
#8	17.9.22	22:08	22:17	0	0.067	11kV Feeder no 1	Singhiyasa Sr.	O/C	General trip, Zone O/C trip, 10p trip	See	IL1=1.38KA, IL2=1.45KA, IL3=1.39KA
#9	18.9.22	16:46	16:48	0	0.05	11kV Feeder no 1	Singhiyasa Sr.	O/C	General trip, O/C trip, 10p trip	See	IL1=1.20KA, IL2=0.81KA, IL3=0.81KA
#8	18.9.22	11:01	11:10	13	2.94	11kV Feeder III	Singhiyasa Sr.	O/C	Explosion over current trip	See	Fault Current: IL1=0.02KA, IL2=0.02KA, IL3=0.29KA
#8	20.9.22	14:23	14:29	2	1.25	11kV Feeder III	Singhiyasa Sr.	O/C	Explosion over current trip	See	IL1=0.02KA, IL2=0.02KA, IL3=0.29KA
#8	21.9.22	03:04	03:03	9	0.458	11kV Feeder III	Singhiyasa Sr.	O/C	General trip, O/C trip, 10p trip	See	IL1=0.01KA, IL2=0.01KA, IL3=0.20KA
#8	21.9.22	11:40	11:52	10	0.58	11kV Feeder III	Singhiyasa Sr.	O/C	General trip, O/C trip, 10p trip	See	IL1=0.06KA, IL2=0.073A, IL3=0.44KA
#8	22.9.22	00:36	00:48	12	0.643	11kV Feeder III	Singhiyasa Sr.	O/C	General trip, O/C trip, 10p trip	See	IL1=0.05KA, IL2=0.05KA, IL3=0.43KA
#8	22.9.22	04:04	04:02	8	2.01	220kV Singhiyasa - Gomsa	Singhiyasa Sr.	tripped	-	See	IL1=625.1A, I2=108.2deg, I3=2742A, I4=277.5deg, I5=2100, I6=46.32deg, I7=1475A, I8=141.7deg
#9	23.9.22	08:57	09:06	6	27.5	66kV Shunt Capacitor Br.	Singhiyasa Sr.	tripped	Directional time O/C trip, D= Directional trip, 36 OPTD	See	IL1=0.46KA, IL2=1.11KA, IL3=0.56KA
#9	23.9.22	17:27	17:47	16	34	66kV Shunt Capacitor Br.	Singhiyasa Sr.	tripped	Directional O/C trip, D= Directional trip, 36 OPTD	See	(I1=4.15KA, I2=0.28KA, I3=4.38KA test charge at 20:49 hrs as could not hold and kept on open condition)
#8	28.9.22	18:03	18:21	0	0.779	11kV Feeder II	Singhiyasa Sr.	O/C	General trip, Time O/C trip, 10p trip	See	IL1=0.05KA, IL2=0.04KA, IL3=1.34KA

B1602/11 kV Phuntsholing Substation											
1	07.09.2022	18:23	18:28	0	2.44	66kV Chukha-Phing feeder	Black out at Phing sr			Tripped at chukha end	At 18:30hrs 66kV Chukha-Phing feeder got tripped from chukha end and 66kV Phing-Gomsa feeder got tripped at Gomsa end (i.e 66kV Phuntsholing-Gomsa feeder got tripped at Gomsa end) causing black out at Phing. At 18:29hrs normalised the 66kV Chukha-Phing from Chukha end and at 18:43hrs normalised 66kV Phuntsholing-Gomsa feeder from Gomsa feeder.
2	07.09.2022	18:23	18:28	0	2.47	66kV Phing-Gomsa Sr	Black out at Phing sr			66kV Phuntsholing-Gomsa Sr tripped from Phuntsholing Sr	
3	11.09.2022	20:25	20:42	0	2.09	66kV Chukha-Phing feeder	Black out at Phing sr			Tripped at chukha end	At 20:35hrs 66kV Chukha-Phing feeder got tripped from chukha end and 66kV Phing-Gomsa feeder got tripped at Gomsa end (i.e 66kV Phuntsholing-Gomsa feeder got tripped at Gomsa end) causing black out at Phing. At 20:43hrs normalised the 66kV Chukha-Phing from Chukha end and at 20:43hrs normalised 66kV Phuntsholing-Gomsa feeder from Gomsa feeder.
4	11.09.2022	20:25	20:42	0	2.08	66kV Phing-Gomsa Sr	Black out at Phing sr			66kV Phuntsholing-Gomsa Sr tripped from Phuntsholing Sr	
5		11.09.2022	20:36	20	life charge	66kV Phing-Malassa Sr	66kV Phing-Malassa Sr				At 20:00hrs charged 66kV Phing-Malassa feeder which was under life charge condition with closing code 271 from BPSO. At 20:45hrs opened CB at above Sr with closing code 1813 from BPSO and said feeder kept under life charge condition after normalising 66kV Chukha and Gomsa feeder.



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6	15.09.2022	22:15	15.09.2022	22:22	0	-3.67	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at both end	DSTN OPTD, 106&85	Tripped at both end	Tripped on fault	The cause of tripping was due to transient fault. At 22:22hrs normalised with charging code 367 from BPSO.
7	15.09.2022	22:38	15.09.2022	23:07	0	-1.50	66kV Ping-Gemtu fir	Black out at Ping en	Tripped at both end	DSTN OPTD, 106&85	Tripped at both end	Tripped on fault	Tripped at both end. At 23:07hrs test charged after getting clearance from BPSO and stood normal.
8	15.09.2022	23:38	15.09.2022	23:46	0	-3.67	66kV Chukha-Ping feeder	Black out at Ping en	Tripped at chukha end		Tripped at chukha end		At 23:38hrs 66kV Chukha-Ping feeder got tripped from chukha end and 66kV Ping-Gemtu feeder got tripped at both end causing black out at Ping. At 23:46hrs normalised 66kV Chukha-Ping fir from Chukha end with charging code 290.
9	16.09.2022	19:33	16.09.2022	19:41	0	-1.89	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at chukha end		Tripped at chukha end		At 19:33hrs 66kV Chukha-Ping feeder got tripped from chukha end causing black out at Ping. At 19:41hrs normalised 66kV Chukha-Ping fir from Chukha end.
10	16.09.2022	19:33	16.09.2022	20:01	0	-4.70	66kV Ping-Gemtu fir	66kV Ping-Gemtu fir	Tripped at their end		66kV Dhandum-Gemtu fir tripped from Dhandum 3a		At 19:33hrs 66kV Ping-Gemtu feeder got tripped at Gemtu end (i.e. 66kV Dhandum-Gemtu fir tripped at Dhandum end) causing black out at Ping. At 20:01hrs normalised 66kV Ping-Gemtu fir from Dhandum end.
11	16.09.2022	23:20	17.09.2022	00:50	2	-4.06	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at chukha end		Tripped at chukha end		At 23:20hrs 66kV Chukha-Ping fir tripped from chukha end (Ping black out) and as per instruction from BPSO opened CB for end fir 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.
12	16.09.2022	23:28	17.09.2022	11:04	10	-0.15	66kV Ping-Gemtu fir	66kV Ping-Gemtu fir	Tripped at their end		66kV Dhandum-Gemtu fir tripped from Dhandum 3a		At 23:28hrs 66kV Ping-Gemtu feeder got tripped at Gemtu end (i.e. 66kV Dhandum-Gemtu fir tripped at Dhandum end) causing black out at Ping. At 23:28hrs test charged from Gemtu end but got tripped at our end operating distance relay. As per instruction from BPSO test charged from our end but again got tripped reclosing same relay. De closed 17.09.2022 at 11:04hrs as per instruction from BPSO again closing rods 300 66kV Ping-Gemtu fir charged and stood normal.
13			16.09.2022	23:53		Idle charge	66kV Ping-Malbasa fir	66kV Ping-Malbasa fir					At 23:53hrs as per instruction from BPSO charged 66kV Ping-Malbasa feeder which was under idle charged condition, since 66kV Chukha-Ping fir and 66kV Ping-Gemtu fir couldn't stand while test charging. On dated 17.09.2022 at 11:06hrs opened CB of 66kV Ping-Malbasa feeder with opening rods 403 as per instruction from BPSO and feeder was put back to idle charged condition.
14	20.09.2022	00:31	20.09.2022	00:37	0	-3.02	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at chukha end		Tripped at chukha end		At 00:31hrs 66kV Chukha-Ping fir tripped from chukha end (Ping black out) and at 00:37hrs normalised the supply from Chukha end with charging code 316.
15	20.09.2022	00:31	20.09.2022	00:41	0	-2.11	66kV Ping-Gemtu fir	66kV Ping-Gemtu fir	Tripped at our end	DSTN OPTD, 106&85	Tripped at our end		At 00:31hrs 66kV Ping-Gemtu feeder got tripped at our end causing black out at Ping. At 00:41hrs as per instruction from BPSO charged Ping-Gemtu fir again closing rods 318.
16	22.09.2022	02:49	23.09.2022	03:02	0	-4.86	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at our end	DSTN OPTD, 106&86	Tripped at our end	Tripped on fault	At 03:15hrs test charged the feeder as per instruction from BPSO and stood normal.
17	22.09.2022	03:53	22.09.2022	04:53	6	-4.86	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at both end	DSTN OPTD, 106&85	Tripped at both end	Tripped on fault	66kV Ping-Chukha fir 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 Ping-Chukha fir.
18			22.09.2022	04:15			66kV Ping-Malbasa fir	66kV Ping-Malbasa fir					At 04:15hrs as per instruction from BPSO charged 66kV Ping-Malbasa feeder which was under idle charged condition.
19	20.09.2022	12:31	20.09.2022	12:34	0	-2.23	66kV Ping-Gemtu fir	66kV Ping-Gemtu fir	Tripped at our end	DSTN OPTD, 106&85	Tripped at our end		The cause of tripping was due to transient fault. (Ping black out)
20	23.09.2022	01:07	23.09.2022	02:07	0	-3.01	66kV Ping-Gemtu fir	66kV Ping-Gemtu fir	Tripped at our end	DSTN OPTD, 106&85	Tripped at our end		The cause of tripping was due to transient fault. (Ping black out)
21	23.09.2022	01:57	23.09.2022	02:10	0	-7.43	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at chukha end		Tripped at chukha end		The cause of tripping was due to transient fault. (Ping black out)
22	23.09.2022	01:57	23.09.2022	02:04	0	-6.12	66kV Ping-Malbasa fir	66kV Ping-Malbasa fir	Tripped at Malbasa end		Tripped at Malbasa end		The cause of tripping was due to transient fault. (Ping black out)
23	23.09.2022	17:27	23.09.2022	17:35	0	-7.36	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at chukha end		Tripped at chukha end		The cause of tripping was due to transient fault. (Ping black out)
24	23.09.2022	17:27	23.09.2022			7.20	66kV Ping-Malbasa fir	66kV Ping-Malbasa fir	Tripped at Malbasa end		Tripped at Malbasa end		The cause of tripping was due to transient fault. (Ping black out). As per instruction of BPSO 66kV Ping-Malbasa feeder kept open at our end with opening rods 033.
25	23.09.2022	17:27	23.09.2022	17:43	0	-3.94	66kV Ping-Gemtu fir	66kV Ping-Gemtu fir	Tripped at our end	DSTN OPTD, 106&85	Tripped at our end		The cause of tripping was due to transient fault. (Ping black out). At 17:43hrs test charged as per instruction from BPSO but couldn't withstand. At 17:44hrs again test charged as per instruction from BPSO and stood normal.



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26	27.09.2022	07:42	27.09.2022	07:50	0	3.00	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at both end		Tripped at both end		The cause of tripping was due to transient fault.
27	28.09.2022	18:43	28.09.2022	18:52	0	2.53	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at both end	Tripping relay 186A 90	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	28.09.2022	19:13	28.09.2022	22:06	1	0.94	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at both end	Tripping relay 186A 90	Tripped at both end		As per instruction from BPSO CI kept opened for 66kV Ping at our end.
29			28.09.2022	19:36			Idle charge	66kV Ping Malhasa fir	66kV Ping Malhasa fir				At 15:15hrs charged 66kV Ping Malhasa with charging code 1444 since CI kept open for 66kV Ping Chukha feeder at our end as per instruction from BPSO. At 22:00hrs CI opened for said feeder with opening code 046 from BPSO and feeder kept under idle charge.
30			29.09.2022	10:23			Idle charge	66kV Ping Malhasa fir	66kV Ping Malhasa fir				At 10:23hrs charged 66kV Ping Malhasa with charging code 1452 as per instruction from BPSO. At 22:30hrs CI opened for said feeder with opening code 046 from BPSO and feeder kept under idle charge.
31	29.09.2022	13:30	29.09.2022	13:37	0	-4.27	66kV Ping Gentsu fir	66kV Ping Gentsu fir	Tripped at both end	186A 90	Tripped at both end		The cause of tripping was due to transient fault.
32	30.09.2022	12:32	30.09.2022	12:38	0	-8.19	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at our end	DETN OPTD. 186A 90	Tripped at our end	Tripped on fault	Ping blackout since 66kV Ping Malhasa and Ping Gentsu feeder got interrupted due to 220kV supply failure from Malhasa end.
33	30.09.2022	13:25	30.09.2022	13:30	0	-2.28	66kV Chukha-Ping feeder	66kV Chukha-Ping feeder	Tripped at our end	DETN OPTD. 186A 90	Tripped at our end	Tripped on fault	Ping blackout since 66kV Ping Malhasa and Ping Gentsu feeder got interrupted due to 220kV supply failure from Malhasa end.
34			30.09.2022	13:39		-5.07	66kV Ping Malhasa fir	66kV Ping Malhasa fir					At 13:15hrs CI opened for 66kV Ping Malhasa feeder with opening code 046 from BPSO and feeder kept under idle charge.
(In 06/20/21 kV Gentsu Substation)													
1	15.09.2022	22:15	15.09.2022	22:22	0	1.86	66kV Chukha-F/Tag	66kV Chukha-F/Tag	Bad weather condition		Line segment		66kV supply charged from Chukha end.
2	15.09.2022	23:39	15.09.2022	23:46	0	1.88	66kV Chukha-F/Tag	66kV Chukha-F/Tag	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-F/Tag	66kV Chukha-F/Tag	Bad weather condition		Line segment		66kV supply charged from Chukha end.
4	16.09.2022	23:29	16.09.2022	23:47	0	1.41	66kV Chukha-F/Tag	66kV Chukha-F/Tag	Bad weather condition		Line segment		66kV supply charged from Chukha end.
5	22.09.2022	3:49	22.09.2022	3:55	0	1.1	66kV Chukha-F/Tag	66kV Chukha-F/Tag	Bad weather condition		Line segment		66kV supply charged from Chukha end.
6	22.09.2022	3:53	22.09.2022	5:13	1	1.1	66kV Chukha-F/Tag	66kV Chukha-F/Tag	Bad weather condition		Line segment		66kV supply charged from Chukha end.
7	23.09.2022	1:58	23.09.2022	3:05	0	1.36	66kV Chukha-F/Tag	66kV Chukha-F/Tag	Bad weather condition		Line segment		66kV supply charged from Chukha end.
8	28.09.2022	7:41	28.09.2022	7:47	0	2.03	66kV Chukha-F/Tag	66kV Chukha-F/Tag	Bad weather condition		Line segment		66kV supply charged from Chukha end.
9	28.09.2022	19:42	28.09.2022	18:52	0	1.87	66kV Chukha-F/Tag	66kV Chukha-F/Tag	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-F/Tag	66kV Chukha-F/Tag	Bad weather condition		Line segment		66kV supply charged from Chukha end.



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(B) 66/33/11 kV Gootu Substation													
1	07.09.2022	17:23	07.09.2022	17:28	0	2.23	66KV Phuentsholing feeder	Gootu substation	Tripped from Chukka	NI	Line segment	grid fail	Tripped from chukka end and supply resumed at 17:28hrs
2	07.09.2022	17:33	07.09.2022	17:32	0	-6.956	66KV Dhandhum feeder	Gootu substation	B phase & Y Phase fault	NI	Line segment	Transient fault	Charged as per the instruction from BPSO and charge withdrawn
3	11.09.2022	20:35	11.09.2022	20:39	0	3.51	66KV Phuentsholing feeder	Gootu substation	Grid failed	NI	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 Dhandhum feeder	Gootu substation	Three Phase fault	General Trip, Zone 4 Trip, B 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 withdrawn
5	15.09.2022	22:09	15.09.2022	22:08	0	1.54	66KV Phuentsholing feeder	NI	Over current	31 Cr and 31 Br	Gootu substation	Transient fault	Charged the line as per the instruction received from BPSO and charge withdrawn charging ends 29G
6	15.09.2022	22:41	15.09.2022	22:40	0	-6.54	66KV Dhandhum feeder	Gootu substation	Grid failed	NI	Malhase substation	grid fail	Grid failed and supply resumed at 22:40hrs.
7	16.09.2022	23:26	16.09.2022	23:17	0	0.23	66KV Phuentsholing feeder	NI	Over current	31 Cr and 31 Br	Line segment	Transient fault	Two charged the line as per the instruction of BPSO and kept breaker opened at piling end at charged on 17.09.2022 at 13:04 hrs from piling end
8	16.09.2022				0								
9	20.09.2022	8:31	20.09.2022	8:41	0	2.11	66KV Phuentsholing feeder	Gootu substation	Grid failed	NI	Line segment	Transient fault	Tripped from source
10	20.09.2022	8:31	20.09.2022	8:41	0	-4.225	66KV Dhandhum feeder	Gootu substation	Grid failed	NI	Line segment	Transient fault	Tripped from source
11	22.09.2022	4:05	22.09.2022	4:13	0	-7.44	66KV Dhandhum feeder	Gootu substation	Grid failed	NI	Malhase substation	Transient fault	Tripped from Malhase end and supply resumed at 04:13hrs.
12	22.09.2022	13:30	22.09.2022	13:33	0	2.40	66KV Phuentsholing feeder	Gootu substation	Grid failed	NI	Line segment	Transient fault	Tripped from piling end and supply resumed at 13:33hrs
13	22.09.2022	13:30	22.09.2022	13:30	0	-11.098	66KV Dhandhum feeder	Gootu 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 withdrawn
14	23.09.2022	3:27	23.09.2022	3:03	5	0.01	66/33KV MVVA Transformer	NI	Over current	DDCTL 30R & 30R	Line segment	Feeder fault	Tripped along with 15KV Samtse feeder and charged the transformer after keeping 15KV feeder in trip position
15	23.09.2022	17:23	23.09.2022	17:43	0	-10.977	66KV Dhandhum feeder	Gootu substation	Grid failed	NI	Line segment	Grid Failed	Grid failed from Malhase substation.
16	23.09.2022	17:41	23.09.2022	17:45	0	4.90	66 KV Phuentsholing feeder	Gootu substation	Hand tripped as per BPSO	NI	Gootu substation	Hand tripped.	Breaker opened as per BPSO instruction (at P) / jing 05 could not charge line.
17	23.09.2022	20:33	23.09.2022	20:43	0	3.29	66 KV Phuentsholing feeder	Gootu substation	Grid failed	Grid failed	Line segment	Grid Failed	Grid failed from Malhase substation.
18	23.09.2022	20:35	23.09.2022	20:45	0	-0.849	66KV Dhandhum feeder	Gootu substation	Grid failed	Grid failed	Line segment	Grid Failed	Grid failed from Malhase substation.
19	26.09.2022	10:04	26.09.2022	11:20	1	1.55	66KV Phuentsholing feeder	NI	Shutdown as per BPSO	NI	Piling se	Shutdown	Avoided shutdown for arresting sparking from Y phase CT terminal pad at Phuentsholing T/S Against opening code No 044 and shutdown withdrawn at 11:20 after changing code No 3423 given from BPSO
20	30.09.2022	12:32	30.09.2022	12:30	0	-16.056	66KV Dhandhum feeder	Gootu substation	Grid failed	NI	Malhase substation	Transient fault	Tripped from Malhase end and supply resumed at 12:38hrs.
21	30.09.2022	13:05	30.09.2022	13:17	0	-10.384	66KV Dhandhum feeder	Gootu substation	Grid failed	NI	Malhase substation	Transient fault	Tripped from Malhase end and supply resumed at 13:17hrs
(B) 220KV/33 kV Dhandhum Substation													
1	13.09.2022	22:41	15.09.2022	22:46	0	-8.8	Malhase	Samtse					Grid supply fail
2	16.09.2022	19:29	16.09.2022	19:50	0	-10.28	220KV Malhase Hr.	Samtse	Lightning/thunder and heavy rainfall	REL 470	Dhandhum Substation		General trip, Zone 1, Y phase fault supply failed from Malhase end.
3	16.09.2022	19:29	16.09.2022	20:03	0	-3.09	220KV Jings Hr.	Samtse	Lightning/thunder and heavy rainfall	REL 670	Dhandhum Substation		General trip, Zone 1 trip, B phase fault supply failed from Malhase end.
4	16.09.2022	22:31	16.09.2022	22:35	0	-0.07	Samtse	Samtse	Lightning/thunder and heavy rainfall	REL 470	Dhandhum Substation		General trip, Zone 1, Over current on RB
5	23.09.2022	17:27	23.09.2022	17:42	0	-11.27	malhase	Samtse			Dhandhum Substation		line tripped from malhase end. No equipment was operated from dhandhum s/s.
6	23.09.2022	20:34	23.09.2022	20:44	0	-6.82	220KV Malhase Hr.	Samtse	Cloudy				line tripped from malhase end. No equipment was operated from dhandhum s/s.
7	23.09.2022	21:34	23.09.2022	21:44	0	-4.04	220KV Jings Hr.	Samtse	Cloudy		Dhandhum Substation		line tripped from malhase end. No equipment was operated from dhandhum s/s.
8	30.09.2022	10:31	30.09.2022	12:37	0	-14.49	220KV malhase feeder	Samtse	sunny		Dhandhum Substation		line tripped from malhase end. No equipment was operated from dhandhum s/s.
9	30.09.2022	13:05	30.09.2022	13:17	0	-10.06	220KV malhase feeder	Samtse	sunny		Dhandhum Substation		line tripped from Malhase end. No equipment was operated from dhandhum s/s.



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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 Index outage (MW)	Feeder Name	Name of the Substation/line affected by the fault	Reason of fault	Relay operation	Exact location of fault (Line segment / Substation)	Type of outages	Remarks
(A) 66kV Chanda switching station													
1	16.09.2022	23:28hrs	16.09.2022	23:47hrs	19	117.85MW	66KV Chanda Feeder	Pare/Pagphra, Jompa	Grid Fall	one operation at Chanda	Concrete road	Grid fall	Grid fall
2	22.09.2022	02:46hrs	22.09.2022	03:25hrs	39	117.85MW	66KV Chanda Feeder	Pare/Pagphra, Jompa	Grid Fall	one operation at Chanda	Concrete road	Grid fall	Grid fall
3	22.09.2022	03:25hrs	22.09.2022	04:02hrs	37	117.85MW	66KV Chanda Feeder	Pare/Pagphra, Jompa	Grid Fall	one operation at Chanda	Concrete road	Grid fall	Grid fall
4	24.09.2022	01:15hrs	25.09.2022	13:05hrs	36	9.95MW	66KV Pare Feeder	Par Zom/Pagphra Substation	5 buses	CD open, Line & bus isolation open, Switch closed	Par: 22kV LLO opening	5 buses	Outage by DPO. Check the checklist against the DPO.
5	24.09.2022	14:22hrs	24.09.2022	14:37hrs	15	11.05MW	66KV Pare Feeder	Pagphra substation	Transmission fault	CD open 20%	Concrete	Tripped	Tripped due to error
6	24.09.2022	18:40hrs	24.09.2022	18:47hrs	7	11.05MW			66KV Pare Feeder	Par Zom/Pagphra Substation	5 buses	CD open, Line & bus isolation open, Switch closed	Par: 22kV LLO opening
7	28.09.2022	07:20hrs	28.09.2022	17:00hrs	36	8.17MW	66KV Pare Feeder	Par Zom/Pagphra Substation	5 buses	CD open, Line & bus isolation open, Switch closed	Par: 22kV LLO opening	5 buses	Outage by DPO. Check the checklist against the DPO.
(B) 66-22kV Wama Substation													
1	16/9/2022	21:29hrs	16/9/2022	21:47hrs	18	320MW	66KV IC	Fk I and II	66KV IC failed from chikka end	66KV IC failed from chikka end	66KV IC failed from chikka end	Tripped	
2	22/9/2022	2:06hrs	22/9/2022	2:55hrs	49	260MW	66KV IC	Fk I and II	66KV IC failed from chikka end	66KV IC failed from chikka end	66KV IC failed from chikka end	Tripped	
3	22/9/2022	3:55hrs	22/9/2022	4:55hrs	60	260MW	66KV IC	Fk I and II	66KV IC failed from chikka end	66KV IC failed from chikka end	66KV IC failed from chikka end	Tripped	
4	26/9/2022	15:03hrs	28/9/2022	15:10hrs	17	1.57	66KV SF 6 Breaker	Fk I and II	Over current on ABC phase	Over current relay operated	Fk II. Check the Storage cables	Tripped	Line tripped due to over current on 22kV chikka line at Wama while TMD (Transformer) is charging 660-220W



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Sl. No.	Line No.	Line Name	Line Length (km)	Line Voltage (kV)	Line Type	Line Status	Line Description	Line Category	Line Type	Line Status	Line Description	Line Category	Line Status	Line Description
1	01-001-0010	01-001	10.000	115	HT	Operational	01-001-0010	HT	Operational	01-001-0010	HT	Operational	01-001-0010	HT
2	01-001-0011	01-001	10.000	115	HT	Operational	01-001-0011	HT	Operational	01-001-0011	HT	Operational	01-001-0011	HT
3	01-001-0012	01-001	10.000	115	HT	Operational	01-001-0012	HT	Operational	01-001-0012	HT	Operational	01-001-0012	HT
4	01-001-0013	01-001	10.000	115	HT	Operational	01-001-0013	HT	Operational	01-001-0013	HT	Operational	01-001-0013	HT
5	01-001-0014	01-001	10.000	115	HT	Operational	01-001-0014	HT	Operational	01-001-0014	HT	Operational	01-001-0014	HT
6	01-001-0015	01-001	10.000	115	HT	Operational	01-001-0015	HT	Operational	01-001-0015	HT	Operational	01-001-0015	HT
7	01-001-0016	01-001	10.000	115	HT	Operational	01-001-0016	HT	Operational	01-001-0016	HT	Operational	01-001-0016	HT
8	01-001-0017	01-001	10.000	115	HT	Operational	01-001-0017	HT	Operational	01-001-0017	HT	Operational	01-001-0017	HT
9	01-001-0018	01-001	10.000	115	HT	Operational	01-001-0018	HT	Operational	01-001-0018	HT	Operational	01-001-0018	HT
10	01-001-0019	01-001	10.000	115	HT	Operational	01-001-0019	HT	Operational	01-001-0019	HT	Operational	01-001-0019	HT
11	01-001-0020	01-001	10.000	115	HT	Operational	01-001-0020	HT	Operational	01-001-0020	HT	Operational	01-001-0020	HT
12	01-001-0021	01-001	10.000	115	HT	Operational	01-001-0021	HT	Operational	01-001-0021	HT	Operational	01-001-0021	HT
13	01-001-0022	01-001	10.000	115	HT	Operational	01-001-0022	HT	Operational	01-001-0022	HT	Operational	01-001-0022	HT
14	01-001-0023	01-001	10.000	115	HT	Operational	01-001-0023	HT	Operational	01-001-0023	HT	Operational	01-001-0023	HT
15	01-001-0024	01-001	10.000	115	HT	Operational	01-001-0024	HT	Operational	01-001-0024	HT	Operational	01-001-0024	HT
16	01-001-0025	01-001	10.000	115	HT	Operational	01-001-0025	HT	Operational	01-001-0025	HT	Operational	01-001-0025	HT
17	01-001-0026	01-001	10.000	115	HT	Operational	01-001-0026	HT	Operational	01-001-0026	HT	Operational	01-001-0026	HT
18	01-001-0027	01-001	10.000	115	HT	Operational	01-001-0027	HT	Operational	01-001-0027	HT	Operational	01-001-0027	HT
19	01-001-0028	01-001	10.000	115	HT	Operational	01-001-0028	HT	Operational	01-001-0028	HT	Operational	01-001-0028	HT
20	01-001-0029	01-001	10.000	115	HT	Operational	01-001-0029	HT	Operational	01-001-0029	HT	Operational	01-001-0029	HT
21	01-001-0030	01-001	10.000	115	HT	Operational	01-001-0030	HT	Operational	01-001-0030	HT	Operational	01-001-0030	HT



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1	11.09.2022	27.27	14.09.2022	22.87	0	2.74 MVA (2.0MW) (Changrabha to Chhamsi) (Chhamsi to Changrabha)	40 kV Line (Chhamsi to Changrabha)	Black out	Supply failed due to supply failure at the Changrabha substation.	08	Completed in 10 min.		Supply failed due to supply failure at the Changrabha substation.
2	22.08.2022	16.66	22.08.2022	16.77	0	2.44 MVA (2.0MW) (Chhamsi to Chhamsi) (Chhamsi to Chhamsi)	40 kV Line (Chhamsi to Chhamsi)	Black out	Supply failed due to supply failure at the Chhamsi substation.	08	Completed in 10 min.		Supply failed due to supply failure at the Chhamsi substation.
3	22.09.2022	10.74	22.09.2022	6.83	0	1.20	40 kV Line (Chhamsi)	Black out	Grid had been reported for supply failure at the Chhamsi substation.	0110	Grid had		Supply failed due to supply failure at the Chhamsi substation.
4	22.09.2022	10.65	22.09.2022	6.83	0	1.40	40 kV Line (Chhamsi)	Black out due to supply failure	Grid had been reported for supply failure at the Chhamsi substation.	0110	Grid had		Supply failed due to supply failure at the Chhamsi substation.
(B) 66 kV Lines - Chhamsi to Chhamsi													
5	14.09.2022	21.26	14.09.2022	21.06	0	1.00	66 kV Line (Chhamsi to Chhamsi)	Whole system blackout	Supply failed due to supply failure at the Chhamsi substation.				
6	22.09.2022	10.66	22.09.2022	6.83	0	1.00	66 kV Line (Chhamsi to Chhamsi)	Whole system blackout	Supply failed due to supply failure at the Chhamsi substation.				
7	22.09.2022	10.66	22.09.2022	6.83	0	1.00	66 kV Line (Chhamsi to Chhamsi)	Whole system blackout	Supply failed due to supply failure at the Chhamsi substation.				
8	22.09.2022	10.66	22.09.2022	6.83	0	1.00	66 kV Line (Chhamsi to Chhamsi)	Whole system blackout	Supply failed due to supply failure at the Chhamsi substation.				
(B) 66 kV Lines - Para-Katathang													
9	14.09.2022	22.26	14.09.2022	22.87	0	0.97	66 kV Line	AB	Supply failed due to supply failure at the Para-Katathang substation.	0110	0.97	Completed in 10 min.	Supply failed due to supply failure at the Para-Katathang substation.
10	14.09.2022	11.41	14.09.2022	11.96	0	1.44	66 kV Line	AB	Supply failed due to supply failure at the Para-Katathang substation.	0110	1.44	Completed in 10 min.	Supply failed due to supply failure at the Para-Katathang substation.
11	17.09.2022	10.74	17.09.2022	10.27	0	1.40	66 kV Line	AB	Supply failed due to supply failure at the Para-Katathang substation.	0110	1.40	Completed in 10 min.	Supply failed due to supply failure at the Para-Katathang substation.
12	22.09.2022	10.65	22.09.2022	6.83	0	0.96	66 kV Line	AB	Supply failed due to supply failure at the Para-Katathang substation.	0110	0.96	Completed in 10 min.	Supply failed due to supply failure at the Para-Katathang substation.
13	24.09.2022	10.66	24.09.2022	6.83	0	1.44	66 kV Line	AB	Supply failed due to supply failure at the Para-Katathang substation.	0110	1.44	Completed in 10 min.	Supply failed due to supply failure at the Para-Katathang substation.
14	24.09.2022	11.00	24.09.2022	11.96	0	1.44	66 kV Line	AB	Supply failed due to supply failure at the Para-Katathang substation.	0110	1.44	Completed in 10 min.	Supply failed due to supply failure at the Para-Katathang substation.
15	28.09.2022	10.30	28.09.2022	10.30	1.0	-0.20	66 kV Line	AB	Supply failed due to supply failure at the Para-Katathang substation.	0110	1.00	Completed in 10 min.	Supply failed due to supply failure at the Para-Katathang substation.



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2022-2023 (Till 31st Dec)											
S/N	Line No.	Line Name	Capacity (MW)	Actual (MW)	Loss (%)	Remarks	Line Status	Start Date	End Date	Start Time	End Time
1	101	101	101	101	0.00	100% Availability	Operational	01/01/2022	31/12/2022	00:00	23:59
2	102	102	102	102	0.00	100% Availability	Operational	01/01/2022	31/12/2022	00:00	23:59
3	103	103	103	103	0.00	100% Availability	Operational	01/01/2022	31/12/2022	00:00	23:59
4	104	104	104	104	0.00	100% Availability	Operational	01/01/2022	31/12/2022	00:00	23:59
5	105	105	105	105	0.00	100% Availability	Operational	01/01/2022	31/12/2022	00:00	23:59
6	106	106	106	106	0.00	100% Availability	Operational	01/01/2022	31/12/2022	00:00	23:59
7	107	107	107	107	0.00	100% Availability	Operational	01/01/2022	31/12/2022	00:00	23:59
8	108	108	108	108	0.00	100% Availability	Operational	01/01/2022	31/12/2022	00:00	23:59
9	109	109	109	109	0.00	100% Availability	Operational	01/01/2022	31/12/2022	00:00	23:59
10	110	110	110	110	0.00	100% Availability	Operational	01/01/2022	31/12/2022	00:00	23:59



October 2022

#1 No.	Date of Tripping	Time of outages	Date of Successful on	Time of fault was cleared	Duration of Outages (hrs)	MW before outage (MW)	Feeder Name	Name of the Substation/Line affected by the fault	Reasons of fault	Relay operations	Exact location of fault [Line segment/ Substation]	Type of outages	Remarks
66KV/33KV/11KV Malheva Substation													
1	07-10-2022	23:07	07-10-2022	01:53	0	3	220KV Malheva Feeder	Malheva Substation	Transient	3/2 Trip, Reclosed			H=42528-129.512-220KV-448231-12.7623-422472246-223.3
2	08-10-2022	00:46	08-10-2022	01:32	0	4	220KV Malheva Feeder	Malheva Substation	Tripping	911-90200001 is pulled out	42 KV 22.96M		H=1978-342.110-42234-42234-102.319-439.34-344.434-39278-162.4
220KV/11KV Singhaeang Substation													
1	08-10-22	07:29	08-10-22	00:18	0	0	220KV Singhaeang Feeder	Singhaeang Fe	Tripped	-	Line		0/C General trip=1-27.00V-20.00Hz-D=79.75A-101.70mg-D=90.77A-114.30mg-D=20.00V-20.00Hz
2	08-10-22	10:27	08-10-22	11:03	0	2.09	220KV Singhaeang Feeder	Singhaeang Fe	Tripped	-	Line		
3	11-10-22	23:44	11-10-22	11:09	0	0.50	220KV Singhaeang Feeder	Singhaeang Fe	Tripped	-	Line		
66KV/33KV/11KV Phuntsoling Substation													
1	06-10-2022	00:29	06-10-2022	00:53	0	2.51	66KV Chukha-Phing Feeder	Black out at Phing Fe				Tripped at Chukha end	At 00:30hrs 66KV Chukha-Phing feeder got tripped from Chukha end and 66KV Phing Control Feeder got tripped at our end causing black out at Phing. At 00:53hrs normalised the 66KV Chukha-Phing from Chukha end. At 00:54hrs normalised the 66KV Chukha Feeder with charging code 1493 from RPSD.
2	06-10-2022	00:29	06-10-2022	00:47	0	0.20	66KV Phing Control Fe	Black out at Phing Fe		RSTN OPTD, 10000V		Tripped at our end	
3			06-10-2022	00:54		00A	66KV Phing Malheva Fe	66KV Phing Malheva Fe					At 00:54hrs charged 66KV Phing Malheva feeder which was under the charge condition with charging code 1491 from RPSD. At 00:56hrs opened CB of above Fe with opening code 472 from RPSD and seal locker kept under the charged condition after successful 66KV Chukha and Phing feeder.
4	11-10-2022	00:00	11-10-2022	00:50	0	0.04	66KV Chukha-Phing Feeder	66KV Chukha-Phing Feeder	Tripped at both end	10000V		Tripped at both end	The cause of tripping was due to transient fault. Feeder charged after getting clearance from RPSD with charging code 1500 and closed normal.
5	23-10-2022	05:34	23-10-2022	05:44	0	0.01	66KV Phing Control Fe	Black out at Phing Fe		RSTN OPTD, 10000V		Tripped at our end	At 05:44hrs charged 66KV Phing Control Feeder got tripped at our end. At 05:46hrs normalised the feeder after getting clearance from RPSD.
6			20-10-2022			00A	66KV Phing Malheva Fe	66KV Phing Malheva Fe					At 10:20hrs as per instructions from RPSD charged 66KV Phing Malheva feeder which was under the charge condition with charging code 1001 (opened CB of 66KV Phing Malheva feeder at 10:20hrs with opening code 1120 as per instructions from RPSD and feeder was put back to the charged condition.
66KV/33KV/11KV Gedu Substation													
1	08-10-2022	0:23	08-10-2022	0:30	0	1.02	66KV Chukha-Phing Fe	Gedu Black Out					Due to failure & tripping tripped both ends
2	11-10-2022	9:54	11-10-2022	0:00	0	1.26	66KV Chukha-Phing Fe	Gedu Black Out					Due to failure & tripping tripped both ends
110KV/33KV/11KV Guntse Substation													
1	07-10-2022	15:15	07-10-2022	14:04	0:40	0.04	66/33 KV 3 MVA Transformer	Nil	Transformer	Nil	Control 33	Hand Tripped	66/33KV 3 MVA Transformer manually hand trip due to 33KV 3 Phase Bus PT was purchased. Charged the transformer after changing the 33KV bus PT.
2	08-10-2022	0:20	08-10-2022	0:22	0	1.104	66KV Guntse/Phing Feeder	Guntse Fe	Tripped	General tripped	Line segment	Transient Fault	General tripped. Charged as per RPSD instruction.
3	08-10-2022	0:24	08-10-2022	0:28	0	1.114	66KV Guntse/Phing Feeder	Guntse Fe	Tripped	General tripped	Line segment	Transient Fault	General tripped. Charged as per RPSD instruction.
4	12-10-2022	11:00	12-10-2022	14:11	3	0	110/33KV 3MVA Transformer	33KV Guntse Fe	Shutdown	Nil	Control 33	Shutdown	33KV shutdown started work period No. 120 by maintenance team for capacitor 33KV Guntse Feeder breaker and transformer testing as Transformer is producing abnormal sound.
5	23-10-2022	0:20	23-10-2022	0:58	0	0.00	66KV Guntse/Phing Feeder	Guntse Fe	Hand Tripped	Nil	Line segment	Transient Fault	Hand Tripped. Feeder back to the normal.
220KV/33KV/11KV Thimphu Substation													
1	07-10-2022	22:24	08-10-22	00:10	1	0.01	220KV Singhaeang Fe		Heavy rainfall, lightning & thunder	REL670		Transient fault	Tripped feeder due to Over current on TB Bus-1
2	08-10-2022	00:00	08-10-2022	01:03	1	0.41	220KV Malheva Fe	Guntse Thimphu	Heavy rainfall, lightning & thunder	REL670		Transient fault	Supply tripped from Malheva end
3	08-10-2022	16:24	09-10-2022	20:00	0	1.28	220KV Singhaeang Fe		Heavy Raining	REL670		Transient fault	Feeder tripped due to Over Current on TB (Line 1) 1) Fault: 300.400V 4.00% 2) Fault: Ref Bus: 4.43%.
4	11-10-2022	22:04	11-10-2022	22:09	0	0.15	220KV Singhaeang Fe		Heavy Raining	REL670		Transient fault	Feeder tripped due to Over Current on TB (Line 1) - General trip value 21-Fv= 210V, 2.243V=74.00Hz, H=2-Fv 37.44A, 23V=11.40mg, H=3-0.046-0.046 PM=75.00mg
5	13-10-2022	11:00	13-10-2022	11:30	2	0.14	220KV Singhaeang Fe		Shutdown	-		Shutdown	Shut down taken by Maintenance team from 220KV Singhaeang Feeder. RPSD 72hrs opening code used issued 004. Closing code No.1521.



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(C) 66/33kV Olakha Substation												
1	07-10-2022	2:04	07-10-2022	2:25	0	3.11	66/33kV 20MVA, Transformer I	All the 33kV was effected as the 33kV incomer I & II was tripped.	Over current and earth fault	Earth Fault Over Current Operated	Distribution line	Transient fault
2	07-10-2022	2:04	07-10-2022	2:25	0	3.1	66/33kV 20MVA, Transformer II	All the 33kV was effected as the 33kV incomer I & II was tripped.	Over current and earth fault	Earth Fault Over Current Operated	Distribution line	Transient fault
(F) 66/33/11kV Jemina Substation												
1	21.10.2022	18:41	21.10.2022	18:48	0	26.07 (Imp) Changedaphu & 22.53 (Exp) Chumdo	66 kV Line Changedaphu & Chumdo	Black out	Supply failed from Sentoikha end due to failure of the Bus coupler on OC.	Nil	Sentoikha Substation	-
2	24.10.2022	18:22	24.10.2022	18:25	0	27.45 (Imp) Changedaphu & 24.063 (Exp) Chumdo	66 kV Line Changedaphu & Chumdo	Black out	Supply failed from Sentoikha end due to failure of the Bus coupler on OC.	Nil	Sentoikha Substation	-
3	24.10.2022	18:46	24.10.2022	18:50	0	27.45 (Imp) Changedaphu & 24.063 (Exp) Chumdo	66 kV Line Changedaphu & Chumdo	Black out	Supply failed from Sentoikha end due to failure of the Bus coupler on OC.	Nil	Sentoikha Substation	-
4	26.10.2022	15:59	26.10.2022	16:20	0	-17.86	66 kV Line Changedaphu	Black out	Supply failed from Changedaphu end to operate the CTR of the line.	Nil	Changedaphu	-
5	26.10.2022	16:20	26.10.2022	16:34	0	-17.86	66 kV Line Changedaphu	Black out	SOTF operated	Nil	Changedaphu	-
6	26.10.2022	16:20	26.10.2022	16:37	0	15.48	66 kV Line Chumdo	Black out	SOTF operated	Nil	Chumdo	-
(H) 66/11kV Haa Substation												
1	18.10.2022	18:12	18.10.2022	18:20	0	-2.81	66kV incomer	All	grid fail	O/C	Chumdo switching station	-
2	18.10.2022	18:29	18.10.2022	18:57	0	-2.81	66kV incomer	All	grid fail	O/C	Chumdo switching station	-
3	21.10.2022	18:41	21.10.2022	18:48	0	-3.04	66kV incomer	All	grid fail	O/C	Chumdo switching station	-
4	22.10.2022	14:35	22.10.2022	14:40	0	-1.83	66kV incomer	All	Emergency shutdown	Nil	Chumdo switching station	-
5	24.10.2022	18:22	24.10.2022	18:25	0	-2.83	66kV incomer	All	Buscoupler tripped	O/C	Changedaphu ss	-
6	24.10.2022	18:45	24.10.2022	18:48	0	-2.83	66kV incomer	All	Buscoupler tripped	O/C	Chukha power house	-
7	26.10.2022	15:58	26.10.2022	16:36	0	-1.7	66kV incomer	All	To upgrade CT ratio	Nil	Changedaphu ss	-
8	28.10.2022	13:09	28.10.2022	14:33	1	-1.94	66kV incomer	All	To upgrade CT ratio	Nil	Pangbasa	-
(I) 220kV Substation Sentoikha												
1	07.10.2022	02:05hrs	07.10.2022	02:10hrs			66kV Sentoikha-Dochula Line	Dochula s/s	Directional EF trip	Backup OC/EF relay optd. V&Bph I- Trip. IA=615.8A, JB=520.1A, C=297.2A		Transient
2	01-10-2022	13:23 hrs	01-10-2022	14:01 hrs	0 hrs	-4.42	66/11kV 20MVA-1 Transformer	Sentoikha s/s	Grid Failed	Chukha black-out R-PH A-380.6A, Y-PHA-70.39A, B-PH-676.7A.		Transient



Transmission System Performance Report 2022

66/33kV Changdaphu Substation											
18:22 hrs	24-10-2022	18:26 hrs	0 hrs	4 mins		66kV Cangidaphu substation	Over Current	OC/EF Relay optd., Over current trip			Transient
18:46 hrs	24-10-2022	18:50 hrs	0 hrs	4 mins		66kV Cangidaphu substation	Over Current	OC/EF Relay optd., Over current trip			Transient
18:14 hrs	25-10-2022	18:15 hrs	0 hrs	1min		66kV Cangidaphu substation	Over Current	OC/EF Relay optd., Over current trip			Transient
18:38hrs	25-10-2022	18:39 hrs	0 hrs	1 mins		66kV Cangidaphu substation	Over Current	OC/EF Relay optd., Over current trip			Transient
18:45hrs	21-10-2022	18:48hrs	0	3mins		66kV Cangidaphu substation	Over Current	OC/EF Relay optd., Over current trip			Transient
18:22 hrs	24-10-2022	18:26	0 hrs	4 mins		66kV Cangidaphu substation	Over Current	OC/EF Relay optd., Over current trip			Transient
18:46 hrs	24-10-2022	18:51 hrs	0 hrs	5 mins		66kV Cangidaphu substation	Over Current	OC/EF Relay optd., Over current trip			Transient
18:14 hrs	25-10-2024	18:16hrs	0hrs	2mins		66kV Cangidaphu substation	Over Current	OC/EF Relay optd., Over current trip			Transient
18:38hrs	25-10-2024	18:40hrs	0hrs	2mins		66kV Cangidaphu substation	Over Current	OC/EF Relay optd., Over current trip			Transient
02:05 hrs	07-10-2022	02:25hrs	0	15mins		66kV Cangidaphu substation		Distance relay optd., Y&Bph Zone 2 trip			Transient
66/33kV Damji Substation											
11kV Dochula Substation											
07-10-2022	02:06	07-10-2022	02:13		-32.22	66kV Sentsokha	Sentsokha - Dochula	transit fault	Under voltage and BI relay	Sentsokha	Temporary
07-10-2022	02:06	07-10-2022	02:13		-30.25	66kV Libeyse	Libeyse - Dochula	transit fault	Under voltage and BI relay	Libeyse	Temporary



Transmission System Performance Report 2022

November 2022

Sl. No.	Date of Tripping	Time of outages	Date of Normalization	Time of fault was cleared	Duration of Outages (Hrs)	MW before outage (MW)	Feeder Name	Name of the Substation/Line affected by the fault	Reasons of fault	Relay operations	Exact location of fault (Line segment/ Substation)	Type of outages	Remarks
(F) 220kV/33kV Dhangshu Substation													
1	18-11-2022	15:13	18-11-2022	15:17	0	1.46	220kV TRF-I	Dhangshu	O/C	REB415-62TRIP		Tripping fault	Tripping along with Dhangshu feeder
(C) 66/33kV Chalkha Substation													
1	25-11-2022	10:02	25-11-2022	10:06	0	11.98	66kV Chalkha-Changphugha	Only 66kV Chalkha-Changphugha was affected	Under Voltage	Distance protection operated	Transmission line	Transmission fault	Tripped due to distance protection, under voltage and trip relay is indicated
(H) 66/11kV Haas Substation													
1	29-11-2022	11:53	29-11-2022	13:55	2	1.18	5MVA Transformer - I	5MVA Transformer - I	Tan Delta testing	NI	Haas substation	Shutdown caused by Mr. Ugyen Phuntsok, SMD, Semtsikha to carryout Tan Delta testing of 5mva transformer - I while work permit no. 2283, dated 29-11-2022. The same was normalised after completing the work.	Supply tripped from the source
2	29-11-2022	14:01	29-11-2022	15:46	1	2.23	5MVA Transformer - II	5MVA Transformer - II	Tan Delta testing	NI	Haas substation	Shutdown caused by Mr. Ugyen Phuntsok, SMD, Semtsikha to carryout Tan Delta testing of 5mva transformer - II while work permit no. 2283, dated 29-11-2022. The same was normalised after completing the work.	Supply tripped from the source
3	29-11-2022	15:52	29-11-2022	16:47	0	2.44	5MVA Transformer - I	5MVA Transformer - I	Tan Delta testing	NI	Haas substation	Shutdown caused by Mr. Ugyen Phuntsok, SMD, Semtsikha to carryout Tan Delta testing of 5mva transformer - I while work permit no. 2284, dated 29-11-2022. The same was normalised after completing the work.	Supply tripped from the source
(S) 220kV Substation Semtsikha													
1	24-11-2022	10:02hrs	24-11-2022	10:07hrs	0	88.54mw	66kV Semtsikha-Dochula Line	Dochula vs	Over Current	Backup OC/EF relay opnd, Y&Bph E-Trip, A=295.5A, B=5.728KA, IC=5.522KA, IN=17.78A		Transient	
2	24-11-2022	10:12hrs	24-11-2022	10:26hrs	0	57.01	220kV Semtsikha-BHP Line	220kV Semtsikha-BHP Line		Distance relay Miss-2 Opnd, RYBph trip			
3	30-11-2022	10:36hrs	30-11-2022	11:11hrs	0 hrs	73.04	220kV Semtsikha-CTP Line	Shutdown activities CHP, DOPC to attend work on Bph CT of CHP end		Backup OC/EF relay opnd, Y&Bph D-Trip, IA=263.24A, B=5.789KA, IC=5.605KA, IN=17.26A		Transient	
(M) 66/11kV Dochula Substation													
1	25-11-2022	10:02	25-11-2022	10:19		-32.22	66kV Semtsikha	Semtsikha - Dochula	Transient fault	Under voltage and 56 relay	Semtsikha	Temporary	DRH
2	25-11-2022	10:02	25-11-2022	10:21		-30.25	66kV Lohayon	Lohayon - Dochula	Transient fault	Under voltage and 56 relay	Lohayon	Temporary	DRH



Transmission System Performance Report 2022

December 2022

Sl. No.	Date of Tripping	Time of outages	Date of Normalized (hr)	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
94KV & Above													
(A) 400/220, 20/11 KV Malpas Substations													
01	07.12.2022	10:14	09.12.2022	23:12	2	0.08	10KV Transformer 1	Malpas Fe	Tripped		normal		Transformer was kept under tripped condition since it indicates different signal and inspection was carried out physically and relay setting checked & fixed issue.
(B) 220/11KV Sirphogon Substation													
1													
2													
(C) 110/11KV Phuentsholing Substation													
1	06.12.2022	2:00				12.54	66KV Phog Malpas Fe	66KV Phog Malpas Fe					At 12:00hrs opened CE of 66KV Phog Malpas feeder with opening order 030a from BPC and said feeder was kept under idle charged condition.
2			06.12.2022	17:42	15h		66KV Phog Malpas Fe	66KV Phog Malpas Fe					At 17:42hrs charged 66KV Phog Malpas feeder with charging order 149a which was under idle charged since at 17:47hrs CE of 66KV Chukha Phog Fe was kept opened at Chukha and feeder to avoid overloading at Chukha and (a-balance of increased HIL load at Sate and)
00	06.12.2022	21:10	06.12.2022	23:04	0	0.64	66KV Phog Gorno Fe	66KV Phog Gorno Fe	Tripped	Dist free light, IIR & BG	Line	Tripped on fault	At 23:05hrs not charged after getting clearance from BPC but got tripped on same fault. Normalized the feeder after opening CE from Gorno end.
(D) 66/11KV Gorno Substation													
1	07.12.2022	9:50	07.12.2022	9:57	0	16	DMVA 66/11KV TR-0	33KV DIB feeder 01	OTI trip	OTI trip	Substation		Transformer opened on OTI, changed after checking the OTI and WTI setting for transformer.
2	09.12.2022	11:06	09.12.2022	17:41	6	15.1	DMVA 66/11KV TR-0	33KV DIB feeder 01	OTI trip	OTI trip	Substation		Work permit no. 44 issued to Mr. Pem Nam, B. maintenance team for installation of outdoor cooling fan.
3	10.12.2022	12:00	10.12.2022	14:55	2	0.38	DMVA 66/11KV TR-4	33KV DIB feeder 01	OTI trip	OTI trip	Substation		Work permit no. 44 issued to Mr. Pem Nam, B. maintenance team for installation of outdoor cooling fan.
4													
(E) 66/11KV Gorno Substation													
1	11.12.2022	15:01	11.12.2022	18:30	0	2.76	66/11KV MVVA transformer	Gorno on	ILCC problem	Nil			Maintenance of ILCC.
2	14.12.2022	23:18	26.12.2022	23:00	0	15.200	40KV Damodar feeder	Gorno on	A phase fault	General Tripped, Zone-4 Trip, Rph Trip, Yph Trip, Rph Trip	Gorno Fe	Transient fault	66 KV Damodar Tripped on distance Phase Zone-4 Rph fault Yph Fault Rph Fault.
3	16.12.2022	23:51	16.12.2022	23:06	0	10.09	66KV Phuentsholing feeder	NE	Bus tripped	NE	Gorno Fe		Feeder opened as per BPC instruction, at 23:06 hrs, fault not change line.
(F) 220KV/11KV Phuentsholing Substation													
1	16.12.2022	23:34	16.12.2022	23:01	0	13.14	66KV Gorno feeder	Gorno x/y	O/C	General trip zone 3 trip		O/C	Tripped on O/C, General trip, Zone 3 trip, O/C phase loss (L1). Fault seq. 3.18A, Fault Ang. 141.95 (L2). Fault seq. 0.33A, Fault Ang. 172.23 (L3). Fault seq. 0.11A, Fault Ang. 21.50A.
Tripping Register for the month of DECEMBER 2022													
Sl. No.	Date of Tripping	Time of outages	Date of Normalization	Time of fault was cleared	Duration of Outages (hrs)	MW before outage (MW)	Feeder Name	Name of the Substation (Lines affected by the fault)	Reasons of fault	Relay operations	Exact location of fault [Line segment/ Substation]	Type of outages	Remarks
(G) 220KV Substation Phuentsholing													
1	19.12.2022	09:11hrs	19.12.2022	10:12hrs	0	17	220KV Damodar 110KV Line	220KV Gorno/110KV Line	Dist Trip Received	No relay operation		Transient	

















