

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Coincidental Maximum Load

Date: September 30, 2022
Hours: 19:00 Hours

Date	Time	Load(MW)
30-Aug-22	19:23 hrs	536.69

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Remarks
1	1020MW THP	Unit- I	146.09	400kV THP - Siliguri Line - I	180.45	
		Unit- II	153.79	400kV THP - Siliguri Line - II	178.62	
		Unit- III	79.78	400kV THP - Siliguri Line- IV	174.12	
		Unit- IV	80.22	400kV THP - Malbase Line - III	237.93	
		Unit- V	156.27	400kV Malbase - Siliguri Line	157.92	
		Unit- VI	159.69	-	-	
		Total	775.84	Auxiliary Consumption & Transformation Losses at Generator end	0.61%	
2	720MW MHP	Unit-I	135.19	400kV MHP - Jigmeling Line - I	226.17	400kV MHP-JLG Line II & IV on Standby. 132kV MHP_Yurmoo line I not in service. 400kV JLG_ALI Line II (Interim) on Standby.
		Unit-II	135.09	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	135.48	400kV MHP - Jigmeling Line - III	227.71	
		Unit-IV	135.56	400kV MHP - Jigmeling Line - IV	0.00	
		-	-	132kV MHP - Yurmo Line - I	0.00	
		-	-	132kV MHP - Yurmo Line - II	82.90	
		-	-	500MVA, 400/220kV ICT at Jigmeling (HV)	43.59	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	101.13	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	152.15	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	151.32	
		-	-	80MVA, 220/132kV ICT - I (HV)	18.88	
		-	-	80MVA, 220/132kV ICT - II (HV)	19.27	
		-	-	220kV Tsirang - Jigmeling Line	-9.33	
-	-	132kV Gelephu - Salakati Line	21.78			
Total	541.32	Auxiliary Consumption & Transformation Losses at Generator end	0.84%			
3	336MW CHP	Unit- I	91.72	220kV CHP - Birpara Line- I	75.24	
		Unit- II	91.34	220kV CHP - Birpara Line- II	75.14	
		Unit- III	91.06	220kV CHP - Malbase Line- III	109.73	
		Unit- IV	75.72	220kV CHP - Semtokha Line- IV	63.76	
		-	-	220kV Malbase - Birpara Line	38.30	
		-	-	66kV CHP - Chumdo Line	17.22	
		-	-	66kV CHP - Gedu Line	5.84	
		-	-	3x3MVA, 66/11kV TFR	1.51	
Total	349.84	Auxiliary Consumption & Transformation Losses at Generator end	0.40%			
4	24MW BHP (U/S)	Unit- I	12.00	220kV BHP - Semtokha Line	44.00	
		Unit- II	11.70	66kV BHP - Lobeyasa Line	26.76	
		Total	23.70	220kV BHP - Tsirang Line	-6.91	
5	40MW BHP (L/S)	Unit- I	20.40	5MVA, 66/11kV TFR	0.64	
		Unit- II	21.10	30MVA ICT, 220/66kV (HV)	4.45	
		Total	41.50	Auxiliary Consumption & Transformation Losses at Generator end	1.09%	
6	126MW DHP	Unit-I	33.32	220kV DHP - Tsirang Line	0.00	220kV DHP_Tsirang Line on Standby.
		Unit-II	33.03	220kV DHP - Dagapela Line	65.89	
		-	-	220kV Jigmeling - Dagapela Line	-3.87	
		-	-	5MVA, 220/33kV TFR	0.45	
Total	66.35	Auxiliary Consumption & Transformation Losses at Gen. end	0.02%			
7	60MW KHP	Unit- I	16.53	132kV KHP - Nangkhoh Line	35.95	
		Unit-II	16.51	132kV KHP - Kilikhar Line	28.72	
		Unit- III	16.57	5MVA, 132/11kV TFR	0.90	
		Unit- IV	16.52	132kV Motanga - Rangia Line	62.40	
		Total	66.13	Auxiliary Consumption & Transformation Losses at Generator end	0.85%	

Note: Generation-Load Summary (MW) for September 30, 2022 at 19:00hrs.

Sl. No	Region	Total Generation (MW)	Total Load [Generation - Export (MW)]	Total Load [Feeder Summation (MW)]	Total Export/Import (MW)	Auxiliary Consumption & Transformation Losses (MW)
1	Western Grid	1,257.23	382.90	376.06	879.79	6.84
2	Eastern Grid	607.45	113.21	108.11	488.78	5.10
Total		1,864.68	496.11	484.17	1,368.57	11.94

Note: Generation-Load Summary for September 30, 2021 at 19:00hrs.

Sl. No	Region	Total Generation (MW)	Total Load [Generation - Export (MW)]	Total Load [Feeder Summation (MW)]	Total Export/Import (MW)	Auxiliary Consumption & Transformation Losses (MW)
1	Western Grid	1,328.56	303.86	298.60	1,020.86	5.26
2	Eastern Grid	542.64	50.93	47.53	495.55	3.40
Total		1,871.20	354.79	346.13	1,516.41	8.66

NOTE- MAT data collected from site.

1. The Instantaneous load balance,calculated as (Total generation - (Total export-Import) - Total domestic load), do not tend towards zero. This could be due to the following reasons:

- i) Not all the meters are digital and nor are all the meter at all locations can be read at same time (say 9:00hrs) due to many meter to be read manually.
- ii) The clocks of all the locations are not synchronized.

2. This report is generated to give an idea of the generation & load flow for the system at a particular instant.

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Coincidental Maximum Load

Date:	October 1, 2022
Hours:	09:00 Hours

Date	Time	Load(MW)
30-Aug-22	19:23 hrs	536.69

Sl. No.	Hydropower Plant	Unit	MW	Transmission Lines and Elements	Load (MW)	Remarks
1	1020MW THP	Unit- I	146.26	400kV THP - Siliguri Line - I	192.44	
		Unit- II	154.86	400kV THP - Siliguri Line - II	189.70	
		Unit- III	109.61	400kV THP - Siliguri Line- IV	184.86	
		Unit- IV	80.77	400kV THP - Malbase Line - III	232.90	
		Unit- V	156.98	400kV Malbase - Siliguri Line	173.42	
		Unit- VI	159.01	-	-	
		Total	807.49	Auxiliary Consumption & Transformation Losses at Generator end	0.94%	
2	720MW MHP	Unit-I	130.21	400kV MHP - Jigmeling Line - I	216.16	400kV MHP-JLG Line II & IV on Standby. 132kV MHP_Yurmoo line I not in service. 400kV JLG_ALI Line II (Interim) on Standby.
		Unit-II	130.29	400kV MHP - Jigmeling Line - II	0.00	
		Unit-III	110.70	400kV MHP - Jigmeling Line - III	217.63	
		Unit-IV	130.59	400kV MHP - Jigmeling Line - IV	0.00	
		-	-	132kV MHP - Yurmo Line - I	0.00	
		-	-	132kV MHP - Yurmo Line - II	64.72	
		-	-	500MVA, 400/220kV ICT at Jigmeling (HV)	21.51	
		-	-	400kV Jigmeling - Alipurduar Line - I (Interim)	101.96	
		-	-	400kV Jigmeling - Alipurduar Line - II (Interim)	0.00	
		-	-	400kV Jigmeling - Alipurduar Line - I (Direct)	152.95	
		-	-	400kV Jigmeling - Alipurduar Line - II (Direct)	153.01	
		-	-	80MVA, 220/132kV ICT - I (HV)	12.27	
		-	-	80MVA, 220/132kV ICT - II (HV)	12.46	
		-	-	220kV Tsirang - Jigmeling Line	-0.63	
-	-	132kV Gelephu - Salakati Line	18.94			
Total	501.79	Auxiliary Consumption & Transformation Losses at Generator end	0.65%			
3	336MW CHP	Unit- I	91.05	220kV CHP - Birpara Line- I	69.86	
		Unit- II	91.36	220kV CHP - Birpara Line- II	69.71	
		Unit- III	91.72	220kV CHP - Malbase Line- III	125.38	
		Unit- IV	75.54	220kV CHP - Semtokha Line- IV	63.52	
		-	-	220kV Malbase - Birpara Line	17.82	
		-	-	66kV CHP - Chumdo Line	13.75	
		-	-	66kV CHP - Gedu Line	5.94	
		-	-	3x3MVA, 66/11kV TFR	0.79	
Total	349.67	Auxiliary Consumption & Transformation Losses at Generator end	0.21%			
4	24MW BHP (U/S)	Unit- I	10.36	220kV BHP - Semtokha Line	33.49	
		Unit- II	10.36	66kV BHP - Lobeyasa Line	23.64	
		Total	20.72	220kV BHP - Tsirang Line	1.30	
5	40MW BHP (L/S)	Unit- I	19.13	5MVA, 66/11kV TFR	0.39	
		Unit- II	18.93	30MVA ICT, 220/66kV (HV)	3.10	
		Total	38.06	Auxiliary Consumption & Transformation Losses at Generator end	-0.07%	
6	126MW DHP	Unit-I	33.83	220kV DHP - Tsirang Line	0.00	220kV DHP_TSI Line on Standby.
		Unit-II	32.03	220kV DHP - Dagapela Line	65.43	
		-	-	220kV Jigmeling - Dagapela Line	-4.30	
		-	-	5MVA, 220/33kV TFR	0.35	
Total	65.86	Auxiliary Consumption & Transformation Losses at Generator end	0.12%			
7	60MW KHP	Unit- I	16.60	132kV KHP - Nangkhoh Line	41.40	
		Unit-II	16.60	132kV KHP - Kilikhar Line	23.75	
		Unit- III	16.63	5MVA, 132/11kV TFR	0.58	
		Unit- IV	16.51	132kV Motanga - Rangia Line	43.67	
		Total	66.34	Auxiliary Consumption & Transformation Losses at Generator end	0.92%	

Note: Generation-Load Summary (MW) for October 01, 2022 at 09:00hrs.

Sl. No	Region	Total Generation (MW)	Total Load [Generation - Export (MW)]	Total Load [Feeder Summation (MW)]	Total Export/Import (MW)	Auxiliary Consumption & Transformation Losses (MW)
1	Western Grid	1,281.80	380.32	371.97	897.81	8.35
2	Eastern Grid	568.13	101.27	97.38	470.53	3.89
Total		1,849.93	481.59	469.35	1,368.34	12.24

Note: Generation-Load Summary for October 01, 2021 at 09:00hrs.

Sl. No	Region	Total Generation (MW)	Total Load [Generation - Export (MW)]	Total Load [Feeder Summation (MW)]	Total Export/Import (MW)	Auxiliary Consumption & Transformation Losses (MW)
1	Western Grid	1,303.85	295.84	290.41	989.43	5.43
2	Eastern Grid	537.36	54.02	51.78	501.92	2.24
Total		1,841.21	349.86	342.19	1,491.35	7.67

Notes: MAT data collected from site.

1. The Instantaneous load balance,calculated as (Total generation - (Total export-Import) - Total domestic load), do not tend towards zero. This could be due to the following reasons:

- i) Not all the meters are digital and nor are all the meter at all locations can be read at same time (say 9:00hrs) due to many meter to be read manually.
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