

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Maximum Load/Demand till Date

Date: August 25, 2021
Hours: 19:00 Hours

| Date | Time | Load(MW) |
|-----------|----------|----------|
| 27-Dec-18 | 18:18hrs | 399.35MW |

| Sl. No. | Hydropower Plant | Unit | MW | Transmission Lines and Elements | Load (MW) | Sign | Remarks |
|--------------|------------------|--|-----------------|--|---------------|------|---|
| 1 | 1020MW THP | Unit- I | 185.30 | 400kV THP - Siliguri Line - I | 0.00 | | 400kV THP-Siliguri line I under breakdown. |
| | | Unit- II | 186.53 | 400kV THP - Siliguri Line - II | 351.65 | + | |
| | | Unit- III | 186.04 | 400kV THP - Siliguri Line- IV | 335.61 | + | |
| | | Unit- IV | 185.68 | 400kV THP - Malbase Line - III | 418.33 | + | |
| | | Unit- V | 185.10 | 400kV Malbase - Siliguri Line | 310.89 | + | |
| | | Unit- VI | 185.89 | - | - | - | |
| | | Total | 1,114.54 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.803% | | |
| 2 | 720MW MHP | Unit-I | 197.71 | 400kV MHP - Jigmeling Line - I | 390.30 | + | 400kV MHP-JLG Line II & IV on standby. 132kV MHP_Yurmo line I & II not in service. 400kV JLG_ALI Line I (Interim) on standby. |
| | | Unit-II | 194.71 | 400kV MHP - Jigmeling Line - II | 0.00 | | |
| | | Unit-III | 197.65 | 400kV MHP - Jigmeling Line - III | 392.30 | + | |
| | | Unit-IV | 197.09 | 400kV MHP - Jigmeling Line - IV | 0.00 | | |
| | | - | - | 132kV MHP - Yurmo Line - I | 0.00 | | |
| | | - | - | 132kV MHP - Yurmo Line - II | 0.00 | | |
| | | - | - | 500MVA, 400/220kV ICT at Jigmeling (HV) | -20.00 | - | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 0.00 | | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 198.80 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 298.10 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 298.10 | + | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 36.10 | + | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 36.20 | + | |
| | | - | - | 220kV Tsirang - Jigmeling Line | 95.69 | + | |
| - | - | 132kV Gelephu - Salakati Line | 31.58 | + | | | |
| Total | 787.16 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.579% | | | | |
| 3 | 336MW CHP | Unit- I | 91.84 | 220kV CHP - Birpara Line- I | 101.42 | + | |
| | | Unit- II | 90.88 | 220kV CHP - Birpara Line- II | 101.57 | + | |
| | | Unit- III | 91.32 | 220kV CHP - Malbase Line- III | 125.28 | + | |
| | | Unit- IV | 91.50 | 220kV CHP - Semtokha Line- IV | 19.12 | + | |
| | | - | - | 220kV Malbase - Birpara Line | 68.23 | + | |
| | | - | - | 66kV CHP - Chumdo Line | 10.39 | + | |
| | | - | - | 66kV CHP - Gedu Line | 5.60 | + | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.37 | + | |
| | | Total | 365.54 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.216% | | |
| 4 | 24MW BHP (U/S) | Unit- I | 12.30 | 220kV BHP - Semtokha Line | 58.50 | + | |
| | | Unit- II | 12.20 | 66kV BHP - Lobeysa Line | 32.32 | + | |
| | | Total | 24.50 | 220kV BHP - Tsirang Line | -25.87 | - | |
| 5 | 40MW BHP (L/S) | Unit- I | 20.60 | 5MVA, 66/11kV TFR | 0.91 | + | |
| | | Unit- II | 21.10 | 30MVA ICT, 220/66kV (HV) | 8.73 | + | |
| | | Total | 41.70 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.514% | | |
| 6 | 126MW DHP | Unit-I | 63.58 | 220kV DHP - Tsirang Line | 126.07 | + | 220kV DHP_Dagapela Line on standby. |
| | | Unit-II | 63.10 | 220kV DHP - Dagapela Line | 0.00 | | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 2.00 | + | |
| | | - | - | 5MVA, 220/33kV TFR | 0.60 | + | |
| | | Total | 126.68 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.008% | | |
| 7 | 60MW KHP | Unit- I | 16.62 | 132kV KHP - Nangkhon Line | 37.91 | + | |
| | | Unit-II | 16.54 | 132kV KHP - Kilikhar Line | 26.95 | + | |
| | | Unit- III | 16.24 | 5MVA, 132/11kV TFR | 0.35 | + | |
| | | Unit- IV | 16.46 | 132kV Motanga - Rangia Line | 39.72 | + | |
| | | Total | 65.86 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.987% | | |

Note: Generation-Load Summary (MW) for August 25, 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) at Generator end. |
|--------------|--------------|-----------------------|---------------------------------------|------------------------------------|-----------------------------|--|
| 1 | Western Grid | 1,672.96 | 307.90 | 299.81 | 1,269.37 | 8.09 |
| 2 | Eastern Grid | 853.02 | 82.41 | 77.20 | 866.30 | 5.21 |
| Total | | 2,525.98 | 390.31 | 377.01 | 2,135.67 | 13.30 |

Note: Generation-Load Summary for August 25, 2020 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 |
|--------------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|---|
| 1 | Western Grid | 1,673.15 | 202.68 | 183.63 | 1,374.88 | 19.05 |
| 2 | Eastern Grid | 844.42 | 58.33 | 57.06 | 881.68 | 1.27 |
| Total | | 2,517.57 | 261.01 | 240.69 | 2,256.56 | 20.32 |

NOTE-BHP and MHPA data collected from site

1. The Instantaneous load balance is 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

Maximum Load/Demand till Date

| | |
|---------------|------------------------|
| Date: | August 26, 2021 |
| Hours: | 09:00 Hours |

| | | |
|-------------|-------------|-----------------|
| Date | Time | Load(MW) |
| 27-Dec-18 | 18:18hrs | 399.35MW |

| Sl. No. | Hydropower Plant | Unit | MW | Transmission Lines and Elements | Load (MW) | Sign | Remarks |
|--------------|------------------|---|-----------------|---|---------------|------|---|
| 1 | 1020MW THP | Unit- I | 185.71 | 400kV THP - Siliguri Line - I | 0.00 | | 400kV THP-Siliguri line I under breakdown. |
| | | Unit- II | 184.86 | 400kV THP - Siliguri Line - II | 362.33 | + | |
| | | Unit- III | 185.15 | 400kV THP - Siliguri Line- IV | 345.71 | + | |
| | | Unit- IV | 185.67 | 400kV THP - Malbase Line - III | 397.43 | + | |
| | | Unit- V | 185.14 | 400kV Malbase - Siliguri Line | 328.32 | + | |
| | | Unit- VI | 186.35 | - | - | - | |
| | | Total | 1,112.88 | Auxiliary Consumption & Transformation Losses at Generator end | 0.666% | | |
| 2 | 720MW MHP | Unit-I | 197.92 | 400kV MHP - Jigmeling Line - I | 391.23 | + | 400kV MHP-JLG Line II & IV on standby. 132kV MHP_Yurmoo line I & II not in service. 400kV JLG_ALI Line I(Interim) on standby. 500MVA ICT at JLG tripped. |
| | | Unit-II | 196.26 | 400kV MHP - Jigmeling Line - II | 0.00 | | |
| | | Unit-III | 197.58 | 400kV MHP - Jigmeling Line - III | 393.49 | + | |
| | | Unit-IV | 197.03 | 400kV MHP - Jigmeling Line - IV | 0.00 | | |
| | | - | - | 132kV MHP - Yurmo Line - I | 0.00 | | |
| | | - | - | 132kV MHP - Yurmo Line - II | 0.00 | | |
| | | - | - | 500MVA, 400/220kV ICT at Jigmeling (HV) | -50.50 | - | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 0.00 | | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 205.80 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 307.42 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 307.42 | + | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 23.90 | + | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 23.90 | + | |
| | | - | - | 220kV Tsirang - Jigmeling Line | 100.80 | + | |
| - | - | 132kV Gelephu - Salakati Line | 24.79 | + | | | |
| Total | 788.79 | Auxiliary Consumption & Transformation Losses at Generator end | 0.516% | | | | |
| 3 | 336MW CHP | Unit- I | 91.54 | 220kV CHP - Birpara Line- I | 98.17 | + | |
| | | Unit- II | 90.92 | 220kV CHP - Birpara Line- II | 98.00 | + | |
| | | Unit- III | 91.42 | 220kV CHP - Malbase Line- III | 144.18 | + | |
| | | Unit- IV | 91.47 | 220kV CHP - Semtokha Line- IV | 11.19 | - | |
| | | - | - | 220kV Malbase - Birpara Line | 48.32 | + | |
| | | - | - | 66kV CHP - Chumdo Line | 6.40 | + | |
| | | - | - | 66kV CHP - Gedu Line | 6.16 | + | |
| | | - | - | 3x3MVA, 66/11kV TFR | 0.86 | + | |
| | | Total | 365.35 | Auxiliary Consumption & Transformation Losses at Generator end | 0.107% | | |
| 4 | 24MW BHP (U/S) | Unit- I | 12.40 | 220kV BHP - Semtokha Line | 56.90 | + | |
| | | Unit- II | 12.30 | 66kV BHP - Lobeysa Line | 29.90 | + | |
| | | Total | 24.70 | 220kV BHP - Tsirang Line | -21.29 | - | |
| 5 | 40MW BHP (L/S) | Unit- I | 20.70 | 5MVA, 66/11kV TFR | 0.90 | + | |
| | | Unit- II | 21.10 | 30MVA ICT, 220/66kV (HV) | 6.18 | + | |
| | | Total | 41.80 | Auxiliary Consumption & Transformation Losses at Generator end | 0.135% | | |
| 6 | 126MW DHP | Unit-I | 63.65 | 220kV DHP - Tsirang Line | 126.30 | + | 220kV DHP_Dagapela Line on standby. |
| | | Unit-II | 63.14 | 220kV DHP - Dagapela Line | 0.00 | | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 1.40 | + | |
| | | - | - | 5MVA, 220/33kV TFR | | + | |
| | | Total | 126.79 | Auxiliary Consumption & Transformation Losses at Generator end | 0.386% | | |
| 7 | 60MW KHP | Unit- I | 16.50 | 132kV KHP - Nangkhon Line | 41.15 | + | |
| | | Unit-II | 16.49 | 132kV KHP - Kilikhar Line | 23.50 | + | |
| | | Unit- III | 16.05 | 5MVA, 132/11kV TFR | 0.26 | + | |
| | | Unit- IV | 16.50 | 132kV Motanga - Rangia Line | 34.87 | + | |
| | | Total | 65.54 | Auxiliary Consumption & Transformation Losses at Generator end | 0.966% | | |

Note: Generation-Load Summary (MW) for August 26, 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) at Generator end. |
|--------------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|--|
| 1 | Western Grid | 1,671.52 | 289.87 | 282.89 | 1,280.85 | 6.98 |
| 2 | Eastern Grid | 854.33 | 74.83 | 70.13 | 880.30 | 4.70 |
| Total | | 2,525.85 | 364.70 | 353.02 | 2,161.15 | 11.68 |

Note: Generation-Load Summary for August 26, 2020 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 |
|--------------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|---|
| 1 | Western Grid | 1,283.23 | 104.90 | 90.02 | 1,048.41 | 14.88 |
| 2 | Eastern Grid | 775.33 | 99.84 | 97.38 | 805.41 | 2.46 |
| Total | | 2,058.56 | 204.74 | 187.40 | 1,853.82 | 17.34 |

NOTE-BHP, KHP data collected from site

1. The Instantaneous load balance is 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.