

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Coincidental Maximum Load

Date: August 27, 2022
Hours: 19:00 Hours

Date **Time** **Load(MW)**
 15-Aug-22 19:30 hrs 521.02

| Sl. No. | Hydropower Plant | Unit | MW | Transmission Lines and Elements | Load (MW) | Remarks |
|--------------|------------------|---|---------------|---|--------------|---|
| 1 | 1020MW THP | Unit- I | 137.73 | 400kV THP - Siliguri Line - I | 189.37 | |
| | | Unit- II | 148.68 | 400kV THP - Siliguri Line - II | 188.70 | |
| | | Unit- III | 97.95 | 400kV THP - Siliguri Line - IV | 185.60 | |
| | | Unit- IV | 138.17 | 400kV THP - Malbase Line - III | 251.79 | |
| | | Unit- V | 136.38 | 400kV Malbase - Siliguri Line | 169.45 | |
| | | Unit- VI | 160.94 | - | - | |
| | | Total | 819.85 | Auxiliary Consumption & Transformation Losses at Generator end | 0.54% | |
| 2 | 720MW MHP | Unit-I | 144.88 | 400kV MHP - Jigmeling Line - I | 282.75 | 400kV MHP-JLG Line II & III on Standby. 132kV MHP_Yurmo line I & II not in service. 400kV JLG_ALI Line II (Interim) on Standby. |
| | | Unit-II | 144.93 | 400kV MHP - Jigmeling Line - II | 0.00 | |
| | | Unit-III | 135.53 | 400kV MHP - Jigmeling Line - III | 0.00 | |
| | | Unit-IV | 145.16 | 400kV MHP - Jigmeling Line - IV | 284.24 | |
| | | - | - | 132kV MHP - Yurmo Line - I | 0.00 | |
| | | - | - | 132kV MHP - Yurmo Line - II | 0.00 | |
| | | - | - | 500MVA, 400/220kV ICT at Jigmeling (HV) | 84.73 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 118.91 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 0.00 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 178.83 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 177.57 | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 37.74 | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 38.47 | |
| | | - | - | 220kV Tsirang - Jigmeling Line | -12.78 | |
| - | - | 132kV Gelephu - Salakati Line | 6.99 | | | |
| Total | 570.50 | Auxiliary Consumption & Transformation Losses at Generator end | 0.62% | | | |
| 3 | 336MW CHP | Unit- I | 91.51 | 220kV CHP - Birpara Line- I | 71.69 | |
| | | Unit- II | 90.88 | 220kV CHP - Birpara Line- II | 71.97 | |
| | | Unit- III | 91.49 | 220kV CHP - Malbase Line- III | 114.28 | |
| | | Unit- IV | 75.31 | 220kV CHP - Semtokha Line- IV | 68.70 | |
| | | - | - | 220kV Malbase - Birpara Line | 28.96 | |
| | | - | - | 66kV CHP - Chumdo Line | 15.68 | |
| | | - | - | 66kV CHP - Gedu Line | 5.55 | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.43 | |
| Total | 349.19 | Auxiliary Consumption & Transformation Losses at Generator end | -0.03% | | | |
| 4 | 24MW BHP (U/S) | Unit- I | 9.60 | 220kV BHP - Semtokha Line | 36.49 | |
| | | Unit- II | 9.20 | 66kV BHP - Lobeysa Line | 24.44 | |
| | | Total | 18.80 | 220kV BHP - Tsirang Line | -10.84 | |
| 5 | 40MW BHP (L/S) | Unit- I | 16.20 | 5MVA, 66/11kV TFR | 0.68 | |
| | | Unit- II | 16.40 | 30MVA ICT, 220/66kV (HV) | 7.44 | |
| | | Total | 32.60 | Auxiliary Consumption & Transformation Losses at Generator end | 1.23% | |
| 6 | 126MW DHP | Unit-I | 61.48 | 220kV DHP - Tsirang Line | 0.00 | 220kV DHP_Tsirang Line on Standby. DHP Unit-II under Shutdown. |
| | | Unit-II | 0.00 | 220kV DHP - Dagapela Line | 61.06 | |
| | | - | - | 220kV Jigmeling - Dagapela Line | -5.44 | |
| | | - | - | 5MVA, 220/33kV TFR | 0.20 | |
| Total | 61.48 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.36% | | | |
| 7 | 60MW KHP | Unit- I | 16.52 | 132kV KHP - Nangkhoh Line | 38.14 | |
| | | Unit-II | 16.56 | 132kV KHP - Kilikhar Line | 26.57 | |
| | | Unit- III | 16.53 | 5MVA, 132/11kV TFR | 0.52 | |
| | | Unit- IV | 16.55 | 132kV Motanga - Rangia Line | 33.22 | |
| | | Total | 66.16 | Auxiliary Consumption & Transformation Losses at Generator end | 1.41% | |

Note: Generation-Load Summary (MW) for August 27, 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 | 1,281.92 | 383.52 | 378.39 | 905.74 | 5.13 |
| 2 | Eastern Grid | 636.66 | 113.80 | 109.36 | 515.52 | 4.44 |
| Total | | 1,918.58 | 497.32 | 487.75 | 1,421.26 | 9.57 |

Note: Generation-Load Summary for August 27, 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 | 1,487.48 | 308.36 | 302.29 | 1,084.06 | 6.07 |
| 2 | Eastern Grid | 854.12 | 85.28 | 79.33 | 863.90 | 5.95 |
| Total | | 2,341.60 | 393.64 | 381.62 | 1,947.96 | 12.02 |

NOTE- MAT, MHPA & BHP data collected from site.

- 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:
 - 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.
 - The clocks of all the locations are not synchronized.
- 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: August 28, 2022
Hours: 09:00 Hours

| Date | Time | Load(MW) |
|-----------|-----------|----------|
| 15-Aug-22 | 19:30 hrs | 521.02 |

| Sl. No. | Hydropower Plant | Unit | MW | Transmission Lines and Elements | Load (MW) | Remarks |
|--------------|------------------|---|-----------------|---|---------------|---|
| 1 | 1020MW THP | Unit- I | 182.80 | 400kV THP - Siliguri Line - I | 253.41 | |
| | | Unit- II | 184.69 | 400kV THP - Siliguri Line - II | 250.24 | |
| | | Unit- III | 118.57 | 400kV THP - Siliguri Line- IV | 244.86 | |
| | | Unit- IV | 185.90 | 400kV THP - Malbase Line - III | 282.63 | |
| | | Unit- V | 181.74 | 400kV Malbase - Siliguri Line | 234.13 | |
| | | Unit- VI | 184.02 | - | - | |
| | | Total | 1,037.72 | Auxiliary Consumption & Transformation Losses at Generator end | 0.63% | |
| 2 | 720MW MHP | Unit-I | 175.24 | 400kV MHP - Jigmeling Line - I | 327.21 | 400kV MHP-JLG Line II & III under standby 132kV MHP_Yurmoo line I & II not in service. 400kV JLG_ALI Line II (Interim) on Standby. |
| | | Unit-II | 175.30 | 400kV MHP - Jigmeling Line - II | 0.00 | |
| | | Unit-III | 135.53 | 400kV MHP - Jigmeling Line - III | 0.00 | |
| | | Unit-IV | 174.11 | 400kV MHP - Jigmeling Line - IV | 328.59 | |
| | | - | - | 132kV MHP - Yurmo Line - I | 0.00 | |
| | | - | - | 132kV MHP - Yurmo Line - II | 0.00 | |
| | | - | - | 500MVA, 400/220kV ICT at Jigmeling (HV) | 34.01 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 153.54 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 0.00 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 229.22 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 230.18 | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 29.26 | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 29.81 | |
| | | - | - | 220kV Tsirang - Jigmeling Line | -5.33 | |
| - | - | 132kV Gelephu - Salakati Line | 9.42 | | | |
| Total | 660.18 | Auxiliary Consumption & Transformation Losses at Generator end | 0.66% | | | |
| 3 | 336MW CHP | Unit- I | 91.51 | 220kV CHP - Birpara Line- I | 75.62 | |
| | | Unit- II | 90.88 | 220kV CHP - Birpara Line- II | 75.52 | |
| | | Unit- III | 91.49 | 220kV CHP - Malbase Line- III | 127.20 | |
| | | Unit- IV | 75.31 | 220kV CHP - Semtokha Line- IV | 51.35 | |
| | | - | - | 220kV Malbase - Birpara Line | 25.48 | |
| | | - | - | 66kV CHP - Chumdo Line | 12.65 | |
| | | - | - | 66kV CHP - Gedu Line | 4.54 | |
| | | - | - | 3x3MVA, 66/11kV TFR | 0.91 | |
| Total | 349.19 | Auxiliary Consumption & Transformation Losses at Generator end | 0.40% | | | |
| 4 | 24MW BHP (U/S) | Unit- I | 11.65 | 220kV BHP - Semtokha Line | 42.76 | |
| | | Unit- II | 11.65 | 66kV BHP - Lobeyasa Line | 24.48 | |
| | | Total | 23.30 | 220kV BHP - Tsirang Line | -2.79 | |
| 5 | 40MW BHP (L/S) | Unit- I | 20.40 | 5MVA, 66/11kV TFR | 0.44 | |
| | | Unit- II | 21.00 | 30MVA ICT, 220/66kV (HV) | 1.60 | |
| | | Total | 41.40 | Auxiliary Consumption & Transformation Losses at Generator end | -0.29% | |
| 6 | 126MW DHP | Unit-I | 50.44 | 220kV DHP - Tsirang Line | 0.00 | 220kV DHP_TSI Line on Standby. |
| | | Unit-II | 34.00 | 220kV DHP - Dagapela Line | 83.92 | |
| | | - | - | 220kV Jigmeling - Dagapela Line | -29.57 | |
| | | - | - | 5MVA, 220/33kV TFR | 0.40 | |
| Total | 84.44 | Auxiliary Consumption & Transformation Losses at Generator end | 0.14% | | | |
| 7 | 60MW KHP | Unit- I | 16.58 | 132kV KHP - Nangkhor Line | 42.88 | |
| | | Unit-II | 16.53 | 132kV KHP - Kilikhar Line | 22.20 | |
| | | Unit- III | 16.58 | 5MVA, 132/11kV TFR | 0.30 | |
| | | Unit- IV | 16.47 | 132kV Motanga - Rangia Line | 24.62 | |
| | | Total | 66.16 | Auxiliary Consumption & Transformation Losses at Generator end | 1.18% | |

Note: Generation-Load Summary (MW) for August 28, 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 | 1,536.05 | 352.55 | 344.64 | 1,159.26 | 7.91 |
| 2 | Eastern Grid | 726.34 | 103.60 | 98.44 | 646.98 | 5.16 |
| Total | | 2,262.39 | 456.15 | 443.08 | 1,806.24 | 13.07 |

Note: Generation-Load Summary for August 28, 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 | 1,674.61 | 308.18 | 333.27 | 1,256.17 | -25.09 |
| 2 | Eastern Grid | 647.46 | 67.71 | 68.51 | 690.01 | -0.80 |
| Total | | 2,322.07 | 375.89 | 401.78 | 1,946.18 | -25.89 |

Notes: MAT data collected from site.

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