

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Maximum Load/Demand till Date

| | |
|---------------|----------------------|
| Date: | July 17, 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 | 185.57 | 400kV THP - Siliguri Line - I | 0.00 | | 400kV THP-Siliguri Line I under breakdown. |
| | | Unit- II | 185.20 | 400kV THP - Siliguri Line - II | 357.33 | + | |
| | | Unit- III | 185.85 | 400kV THP - Siliguri Line- IV | 342.96 | + | |
| | | Unit- IV | 184.88 | 400kV THP - Malbase Line - III | 405.29 | + | |
| | | Unit- V | 184.80 | 400kV Malbase - Siliguri Line | 321.17 | + | |
| | | Unit- VI | 184.85 | - | - | - | |
| | | Total | 1,111.15 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.501% | | |
| 2 | 720MW MHP | Unit-I | 197.93 | 400kV MHP - Jigmeling Line - I | 294.34 | + | Unit-III under Restoration 400kV MHP-JLG Line II & IV on standby. 132kV MHP_Yurmoo line I & II not in service. 400kV JLG_ALI Line II(Interim) under shutdown. |
| | | Unit-II | 197.85 | 400kV MHP - Jigmeling Line - II | 0.00 | | |
| | | Unit-III | 0.00 | 400kV MHP - Jigmeling Line - III | 295.76 | + | |
| | | Unit-IV | 197.88 | 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) | 44.20 | - | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 156.70 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 0.00 | | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 234.20 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 234.20 | + | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 33.20 | + | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 33.30 | + | |
| | | - | - | 220kV Tsirang - Jigmeling Line | 112.77 | + | |
| - | - | 132kV Gelephu - Salakati Line | 25.57 | + | | | |
| Total | 593.66 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.600% | | | | |
| 3 | 336MW CHP | Unit- I | 91.48 | 220kV CHP - Birpara Line- I | 101.79 | + | |
| | | Unit- II | 90.83 | 220kV CHP - Birpara Line- II | 101.96 | + | |
| | | Unit- III | 91.61 | 220kV CHP - Malbase Line- III | 128.75 | + | |
| | | Unit- IV | 91.35 | 220kV CHP - Semtokha Line- IV | 15.71 | + | |
| | | - | - | 220kV Malbase - Birpara Line | 66.61 | + | |
| | | - | - | 66kV CHP - Chumdo Line | 8.69 | + | |
| | | - | - | 66kV CHP - Gedu Line | 5.38 | + | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.20 | + | |
| | | Total | 365.27 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.490% | | |
| 4 | 24MW BHP (U/S) | Unit- I | 12.20 | 220kV BHP - Semtokha Line | 41.11 | + | |
| | | Unit- II | 12.10 | 66kV BHP - Lobeysa Line | 25.50 | + | |
| | | Total | 24.30 | 220kV BHP - Tsirang Line | -1.66 | - | |
| 5 | 40MW BHP (L/S) | Unit- I | 20.60 | 5MVA, 66/11kV TFR | 0.90 | + | |
| | | Unit- II | 21.00 | 30MVA ICT, 220/66kV (HV) | 2.15 | + | |
| | | Total | 41.60 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.076% | | |
| 6 | 126MW DHP | Unit-I | 58.40 | 220kV DHP - Tsirang Line | 117.88 | + | 220kV DHP_Dagapela Line on standby. |
| | | Unit-II | 59.93 | 220kV DHP - Dagapela Line | 0.00 | | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 1.60 | + | |
| | | - | - | 5MVA, 220/33kV TFR | 0.28 | + | |
| | | Total | 118.33 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.144% | | |
| 7 | 60MW KHP | Unit- I | 16.50 | 132kV KHP - Nangkhon Line | 36.03 | + | |
| | | Unit-II | 16.50 | 132kV KHP - Kilikhar Line | 28.31 | + | |
| | | Unit- III | 16.18 | 5MVA, 132/11kV TFR | 0.33 | + | |
| | | Unit- IV | 16.50 | 132kV Motanga - Rangia Line | 43.66 | + | |
| | | Total | 65.68 | Auxiliary Consumption & Transformation Losses at Gen. end | 1.538% | | |

Note: Generation-Load Summary (MW) for July 17, 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 | 1,660.65 | 256.06 | 250.08 | 1,291.82 | 5.98 |
| 2 | Eastern Grid | 659.34 | 77.78 | 73.21 | 694.33 | 4.57 |
| | Total | 2,319.99 | 333.84 | 323.29 | 1,986.15 | 10.55 |

Note: Generation-Load Summary for July 17, 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 | 1,678.62 | 222.26 | 207.40 | 1,360.98 | 14.86 |
| 2 | Eastern Grid | 857.18 | 66.55 | 62.88 | 886.01 | 3.67 |
| | Total | 2,535.80 | 288.81 | 270.28 | 2,246.99 | 18.53 |

NOTE-BHP and MHP data collected from site

- 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:
 - 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

Maximum Load/Demand till Date

| | |
|---------------|----------------------|
| Date: | July 18, 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 | 185.64 | 400kV THP - Siliguri Line - I | 0.00 | | 400kV THP-Siliguri Line I under breakdown. |
| | | Unit- II | 183.77 | 400kV THP - Siliguri Line - II | 361.58 | + | |
| | | Unit- III | 185.14 | 400kV THP - Siliguri Line- IV | 345.84 | + | |
| | | Unit- IV | 184.55 | 400kV THP - Malbase Line - III | 398.77 | + | |
| | | Unit- V | 185.83 | 400kV Malbase - Siliguri Line | 327.64 | + | |
| | | Unit- VI | 185.71 | - | - | - | |
| | | Total | 1,110.64 | Auxiliary Consumption & Transformation Losses at Generator end | 0.401% | | |
| 2 | 720MW MHP | Unit-I | 197.86 | 400kV MHP - Jigmeling Line - I | 294.38 | + | Unit-III on Restoration. 400kV MHP-JLG Line II & IV on standby. 132kV MHP_Yurmo line I & II not in service. 400kV JLG_ALI Line II (Interim) under standby. |
| | | Unit-II | 197.64 | 400kV MHP - Jigmeling Line - II | 0.00 | | |
| | | Unit-III | 0.00 | 400kV MHP - Jigmeling Line - III | 295.91 | + | |
| | | Unit-IV | 197.92 | 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) | -57.80 | - | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 160.00 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 0.00 | | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 239.80 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 239.80 | + | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 25.70 | + | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 25.70 | + | |
| | | - | - | 220kV Tsirang - Jigmeling Line | 110.70 | + | |
| | | - | - | 132kV Gelephu - Salakati Line | 21.70 | + | |
| Total | 593.42 | Auxiliary Consumption & Transformation Losses at Generator end | 0.527% | | | | |
| 3 | 336MW CHP | Unit- I | 92.18 | 220kV CHP - Birpara Line- I | 98.31 | + | |
| | | Unit- II | 91.05 | 220kV CHP - Birpara Line- II | 97.98 | + | |
| | | Unit- III | 91.59 | 220kV CHP - Malbase Line- III | 143.02 | + | |
| | | Unit- IV | 91.79 | 220kV CHP - Semtokha Line- IV | 12.95 | + | |
| | | - | - | 220kV Malbase - Birpara Line | 49.95 | + | |
| | | - | - | 66kV CHP - Chumdo Line | 6.50 | + | |
| | | - | - | 66kV CHP - Gedu Line | 5.46 | + | |
| | | - | - | 3x3MVA, 66/11kV TFR | 0.70 | + | |
| | | Total | 366.61 | Auxiliary Consumption & Transformation Losses at Generator end | 0.461% | | |
| 4 | 24MW BHP (U/S) | Unit- I | 12.20 | 220kV BHP - Semtokha Line | 38.94 | + | |
| | | Unit- II | 12.10 | 66kV BHP - Lobeysa Line | 24.00 | + | |
| | | Total | 24.30 | 220kV BHP - Tsirang Line | 1.80 | - | |
| 5 | 40MW BHP (L/S) | Unit- I | 20.50 | 5MVA, 66/11kV TFR | 0.88 | + | |
| | | Unit- II | 21.00 | 30MVA ICT, 220/66kV (HV) | 0.66 | + | |
| | | Total | 41.50 | Auxiliary Consumption & Transformation Losses at Generator end | 0.274% | | |
| 6 | 126MW DHP | Unit-I | 56.41 | 220kV DHP - Tsirang Line | 111.91 | + | 220kV DHP_Dagapela Line on standby. |
| | | Unit-II | 56.01 | 220kV DHP - Dagapela Line | 0.00 | | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 1.20 | + | |
| | | - | - | 5MVA, 220/33kV TFR | | + | |
| | | Total | 112.42 | Auxiliary Consumption & Transformation Losses at Generator end | 0.454% | | |
| 7 | 60MW KHP | Unit- I | 16.52 | 132kV KHP - Nangkhon Line | 40.91 | + | |
| | | Unit-II | 16.53 | 132kV KHP - Kilikhar Line | 24.50 | + | |
| | | Unit- III | 16.58 | 5MVA, 132/11kV TFR | 0.40 | + | |
| | | Unit- IV | 16.52 | 132kV Motanga - Rangia Line | 44.64 | + | |
| | | Total | 66.15 | Auxiliary Consumption & Transformation Losses at Generator end | 0.514% | | |

Note: Generation-Load Summary (MW) for July 18, 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 | 1,655.47 | 263.47 | 257.84 | 1,281.30 | 5.63 |
| 2 | Eastern Grid | 659.57 | 64.33 | 60.86 | 705.94 | 3.47 |
| | Total | 2,315.04 | 327.80 | 318.70 | 1,987.24 | 9.10 |

Note: Generation-Load Summary for July 18, 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 | 1,681.78 | 218.69 | 197.04 | 1,368.07 | 21.65 |
| 2 | Eastern Grid | 856.73 | 56.60 | 55.47 | 895.15 | 1.13 |
| | Total | 2,538.51 | 275.29 | 252.51 | 2,263.22 | 22.78 |

NOTE- BHP & MHP data collected from site

- 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:
 - 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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