

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Maximum Load/Demand till Date

| | |
|---------------|-------------------------|
| Date: | October 14, 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 | 118.15 | 400kV THP - Siliguri Line - I | 0.00 | | Unit-II on Standby. 400kV THP-Siliguri line I under breakdown. |
| | | Unit- II | 0.00 | 400kV THP - Siliguri Line - II | 156.79 | + | |
| | | Unit- III | 99.48 | 400kV THP - Siliguri Line- IV | 148.47 | + | |
| | | Unit- IV | 99.72 | 400kV THP - Malbase Line - III | 233.83 | + | |
| | | Unit- V | 107.38 | 400kV Malbase - Siliguri Line | 128.15 | + | |
| | | Unit- VI | 119.87 | - | - | - | |
| | | Total | 544.60 | Auxiliary Consumption & Transformation Losses at Gen. end | 1.012% | | |
| 2 | 720MW MHP | Unit-I | 0.00 | 400kV MHP - Jigmeling Line - I | 160.92 | + | Unit-I on standby. 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. |
| | | Unit-II | 114.71 | 400kV MHP - Jigmeling Line - II | 0.00 | | |
| | | Unit-III | 110.20 | 400kV MHP - Jigmeling Line - III | 162.06 | + | |
| | | Unit-IV | 100.14 | 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) | 17.62 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 0.00 | | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 74.17 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 113.38 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 112.21 | + | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 24.66 | + | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 25.00 | + | |
| | | - | - | 220kV Tsirang - Jigmeling Line | 34.43 | + | |
| - | - | 132kV Gelephu - Salakati Line | 8.90 | + | | | |
| Total | 325.05 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.637% | | | | |
| 3 | 336MW CHP | Unit- I | 69.05 | 220kV CHP - Birpara Line- I | 57.01 | + | 66kV CHP_Gedu line opened at 10:01hrs(08/10/2021) to regulate 66kV voltage. |
| | | Unit- II | 66.84 | 220kV CHP - Birpara Line- II | 56.96 | + | |
| | | Unit- III | 71.29 | 220kV CHP - Malbase Line- III | 85.64 | + | |
| | | Unit- IV | 71.72 | 220kV CHP - Semtokha Line- IV | 53.85 | + | |
| | | - | - | 220kV Malbase - Birpara Line | 27.71 | + | |
| | | - | - | 66kV CHP - Chumdo Line | 23.34 | + | |
| | | - | - | 66kV CHP - Gedu Line | 0.00 | | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.20 | + | |
| | | Total | 278.90 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.323% | | |
| 4 | 24MW BHP (U/S) | Unit- I | 8.70 | 220kV BHP - Semtokha Line | 33.70 | + | Lobeysa Line |
| | | Unit- II | 8.50 | 66kV BHP - Lobeysa Line | 28.50 | + | |
| | | Total | 17.20 | 220kV BHP - Tsirang Line | -12.70 | - | |
| 5 | 40MW BHP (L/S) | Unit- I | 16.40 | 5MVA, 66/11kV TFR | 0.00 | | |
| | | Unit- II | 16.30 | 30MVA ICT, 220/66kV (HV) | 12.50 | + | |
| | | Total | 32.70 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.802% | | |
| 6 | 126MW DHP | Unit-I | 51.38 | 220kV DHP - Tsirang Line | 51.11 | + | DHP Unit II on standby. 220kV DHP_Dagapela Line on standby. |
| | | Unit-II | 0.00 | 220kV DHP - Dagapela Line | 0.00 | | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 2.67 | + | |
| | | - | - | 5MVA, 220/33kV TFR | 0.10 | + | |
| | | Total | 51.38 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.331% | | |
| 7 | 60MW KHP | Unit- I | 15.00 | 132kV KHP - Nangkhoh Line | 33.72 | + | |
| | | Unit-II | 15.00 | 132kV KHP - Kilikhar Line | 24.48 | + | |
| | | Unit- III | 14.50 | 5MVA, 132/11kV TFR | 0.31 | + | |
| | | Unit- IV | 14.50 | 132kV Motanga - Rangia Line | 40.38 | + | |
| | | Total | 59.00 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.831% | | |

Note: Generation-Load Summary (MW) for October 14, 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 | 924.78 | 315.26 | 310.95 | 575.09 | 4.31 |
| 2 | Eastern Grid | 384.05 | 69.44 | 66.88 | 349.04 | 2.56 |
| | Total | 1,308.83 | 384.70 | 377.83 | 924.13 | 6.87 |

Note: Generation-Load Summary for October 14, 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 | 1,101.68 | 192.56 | 182.85 | 827.12 | 9.71 |
| 2 | Eastern Grid | 466.89 | 62.98 | 58.60 | 485.91 | 4.38 |
| | Total | 1,568.57 | 255.54 | 241.45 | 1,313.03 | 14.09 |

NOTE-BHP, KHP, JLG and MHPA 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: | October 15, 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 | 118.82 | 400kV THP - Siliguri Line - I | 0.00 | | Unit-II on standby. 400kV THP-Siliguri line I under breakdown. |
| | | Unit- II | 0.00 | 400kV THP - Siliguri Line - II | 165.94 | + | |
| | | Unit- III | 98.96 | 400kV THP - Siliguri Line- IV | 157.93 | + | |
| | | Unit- IV | 99.57 | 400kV THP - Malbase Line - III | 214.82 | + | |
| | | Unit- V | 107.72 | 400kV Malbase - Siliguri Line | 144.27 | + | |
| | | Unit- VI | 119.62 | - | - | - | |
| | | Total | 544.69 | Auxiliary Consumption & Transformation Losses at Generator end | 1.102% | | |
| 2 | 720MW MHP | Unit-I | 164.97 | 400kV MHP - Jigmeling Line - I | 163.71 | + | MHP Unit I on standby. 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. |
| | | Unit-II | 0.00 | 400kV MHP - Jigmeling Line - II | 0.00 | | |
| | | Unit-III | 0.00 | 400kV MHP - Jigmeling Line - III | 164.66 | + | |
| | | Unit-IV | 165.26 | 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) | -9.00 | - | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 0.00 | | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 84.45 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 126.30 | + | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 126.30 | + | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 16.02 | + | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 16.32 | + | |
| | | - | - | 220kV Tsirang - Jigmeling Line | 43.80 | + | |
| - | - | 132kV Gelephu - Salakati Line | 7.98 | + | | | |
| Total | 330.23 | Auxiliary Consumption & Transformation Losses at Generator end | 0.563% | | | | |
| 3 | 336MW CHP | Unit- I | 64.34 | 220kV CHP - Birpara Line- I | 50.41 | + | 66kV CHP_Gedu line opened at 10:01hrs (08/10/2021) to regulate 66kV voltage. |
| | | Unit- II | 62.00 | 220kV CHP - Birpara Line- II | 50.26 | + | |
| | | Unit- III | 71.35 | 220kV CHP - Malbase Line- III | 94.35 | + | |
| | | Unit- IV | 73.71 | 220kV CHP - Semtokha Line- IV | 56.41 | + | |
| | | - | - | 220kV Malbase - Birpara Line | 8.17 | + | |
| | | - | - | 66kV CHP - Chumdo Line | 18.69 | + | |
| | | - | - | 66kV CHP - Gedu Line | 0.00 | | |
| | | - | - | 3x3MVA, 66/11kV TFR | 0.95 | + | |
| Total | 271.40 | Auxiliary Consumption & Transformation Losses at Generator end | 0.122% | | | | |
| 4 | 24MW BHP (U/S) | Unit- I | | 220kV BHP - Semtokha Line | 26.59 | + | |
| | | Unit- II | | 66kV BHP - Lobeysa Line | 28.63 | + | |
| | | Total | 0.00 | 220kV BHP - Tsirang Line | -40.26 | - | |
| 5 | 40MW BHP (L/S) | Unit- I | | 5MVA, 66/11kV TFR | 0.29 | + | |
| | | Unit- II | | 30MVA ICT, 220/66kV (HV) | | + | |
| | | Total | 0.00 | Auxiliary Consumption & Transformation Losses at Generator end | 0.000% | | |
| 6 | 126MW DHP | Unit-I | 51.85 | 220kV DHP - Tsirang Line | 51.62 | + | DHP-Unit II on standby. 220kV DHP_Dagapela Line on standby. |
| | | Unit-II | 0.00 | 220kV DHP - Dagapela Line | 0.00 | | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 2.01 | + | |
| | | - | - | 5MVA, 220/33kV TFR | 0.30 | + | |
| | | Total | 51.85 | Auxiliary Consumption & Transformation Losses at Generator end | -0.135% | | |
| 7 | 60MW KHP | Unit- I | 14.05 | 132kV KHP - Nangkhoh Line | 36.38 | + | |
| | | Unit-II | 14.12 | 132kV KHP - Kilikhar Line | 19.98 | + | |
| | | Unit- III | 14.47 | 5MVA, 132/11kV TFR | 0.30 | + | |
| | | Unit- IV | 14.59 | 132kV Motanga - Rangia Line | 26.49 | + | |
| | | Total | 57.23 | Auxiliary Consumption & Transformation Losses at Generator end | 0.996% | | |

Note: Generation-Load Summary (MW) for October 15, 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 | 867.94 | 247.16 | 258.16 | 576.98 | -11.00 |
| 2 | Eastern Grid | 387.46 | 59.74 | 57.31 | 371.52 | 2.43 |
| | Total | 1,255.40 | 306.90 | 315.47 | 948.50 | -8.57 |

Note: Generation-Load Summary for October 15, 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 | 1,083.03 | 175.52 | 163.80 | 831.14 | 11.72 |
| 2 | Eastern Grid | 477.04 | 85.13 | 56.81 | 495.28 | 28.32 |
| | Total | 1,560.07 | 260.65 | 220.61 | 1,326.42 | 40.04 |

NOTE-BHP,MHPA & Rangia 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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