

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Coincidental Maximum Load

Date: March 28, 2022
Hours: 18:00 Hours

Date: 12-Jan-22 **Time:** 18:00hrs **Load(MW):** 492.25

| Sl. No. | Hydropower Plant | Unit | MW | Transmission Lines and Elements | Load (MW) | Remarks |
|--------------|------------------|---|---------------|---|---------------|---|
| 1 | 1020MW THP | Unit- I | 0.00 | 400kV THP - Siliguri Line - I | 0.00 | Unit I, II & III under maintenance. 400kV THP- Siliguri - I under Shutdown. 400kV THP- Siliguri - II under Breakdown. |
| | | Unit- II | 0.00 | 400kV THP - Siliguri Line - II | 0.00 | |
| | | Unit- III | 0.00 | 400kV THP - Siliguri Line- IV | 83.44 | |
| | | Unit- IV | 89.59 | 400kV THP - Malbase Line - III | 172.68 | |
| | | Unit- V | 68.86 | 400kV Malbase - Siliguri Line | 64.22 | |
| | | Unit- VI | 99.91 | - | - | |
| | | Total | 258.36 | Auxiliary Consumption & Transformation Losses at Generator end | 0.87% | |
| 2 | 720MW MHP | Unit-I | 0.00 | 400kV MHP - Jigmeling Line - I | 168.33 | Unit-I & II under Annual Maintenance. 400kV MHP-JLG Line II,III & IV on Standby. 132kV MHP_Yurmo line I & II not in Service. 400kV JLG-ALI I (Interim) on Standby. 400kV JLG_ALI Line II (Direct) on Standby |
| | | Unit-II | 0.00 | 400kV MHP - Jigmeling Line - II | 0.00 | |
| | | Unit-III | 68.55 | 400kV MHP - Jigmeling Line - III | 0.00 | |
| | | Unit-IV | 100.03 | 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) | 78.91 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 0.00 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 34.91 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 52.43 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 0.00 | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 20.75 | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 21.10 | |
| | | - | - | 220kV Tsirang - Jigmeling Line | -52.40 | |
| - | - | 132kV Gelephu - Salakati Line | -4.34 | | | |
| Total | 168.58 | Auxiliary Consumption & Transformation Losses at Generator end | 0.15% | | | |
| 3 | 336MW CHP | Unit- I | 0.00 | 220kV CHP - Birpara Line- I | 27.52 | Unit-I under Annual Maintenance. Unit IV on Standby. |
| | | Unit- II | 77.92 | 220kV CHP - Birpara Line- II | 27.57 | |
| | | Unit- III | 61.41 | 220kV CHP - Malbase Line- III | 0.00 | |
| | | Unit- IV | 0.00 | 220kV CHP - Semtokha Line- IV | 61.37 | |
| | | - | - | 220kV Malbase - Birpara Line | -49.32 | |
| | | - | - | 66kV CHP - Chumdo Line | 13.61 | |
| | | - | - | 66kV CHP - Gedu Line | 5.16 | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.24 | |
| Total | 139.33 | Auxiliary Consumption & Transformation Losses at Generator end | 2.05% | | | |
| 4 | 24MW BHP (U/S) | Unit- I | 6.90 | 220kV BHP - Semtokha Line | 48.80 | U/S Unit-II under AMP & L/S Unit-II on Standby. |
| | | Unit- II | 0.00 | 66kV BHP - Lobeyasa Line | 21.73 | |
| | | Total | 6.90 | 220kV BHP - Tsirang Line | -49.50 | |
| 5 | 40MW BHP (L/S) | Unit- I | 15.00 | 5MVA, 66/11kV TFR | 0.66 | |
| | | Unit- II | 0.00 | 30MVA ICT, 220/66kV (HV) | 15.62 | |
| | | Total | 15.00 | Auxiliary Consumption & Transformation Losses at Generator end | 0.96% | |
| 6 | 126MW DHP | Unit-I | 23.23 | 220kV DHP - Tsirang Line | 0.00 | Unit-II under Annual Maintenance. 220kV DHP_Tsirang Line on Standby. |
| | | Unit-II | 0.00 | 220kV DHP - Dagapela Line | 23.03 | |
| | | - | - | 220kV Jigmeling - Dagapela Line | -15.50 | |
| | | - | - | 5MVA, 220/33kV TFR | 0.15 | |
| Total | 23.23 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.22% | | | |
| 7 | 60MW KHP | Unit- I | 10.47 | 132kV KHP - Nangkhoh Line | 15.17 | Unit-IV on Standby. |
| | | Unit-II | 10.47 | 132kV KHP - Kilikhar Line | 15.20 | |
| | | Unit- III | 10.46 | 5MVA, 132/11kV TFR | 0.56 | |
| | | Unit- IV | 0.00 | 132kV Motanga - Rangia Line | 1.56 | |
| | | Total | 31.40 | Auxiliary Consumption & Transformation Losses at Generator end | 1.50% | |

Note: Generation-Load Summary (MW) for March 28, 2022 at 18:00hrs.

| 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 | 442.82 | 341.79 | 336.43 | 153.43 | 5.36 |
| 2 | Eastern Grid | 199.98 | 63.02 | 62.30 | 84.56 | 0.72 |
| Total | | 642.80 | 404.81 | 398.73 | 237.99 | 6.08 |

Note: Generation-Load Summary for March 28, 2021 at 18:00hrs.

| 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 | 237.42 | 252.52 | 248.62 | -38.90 | 3.90 |
| 2 | Eastern Grid | 141.29 | 74.98 | 74.15 | 90.11 | 0.83 |
| Total | | 378.71 | 327.50 | 322.77 | 51.21 | 4.73 |

NOTE- 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: | March 29, 2022 |
| Hours: | 09:00 Hours |

| | | |
|-------------|-------------|-----------------|
| Date | Time | Load(MW) |
| 12-Jan-22 | 18:00hrs | 492.25 |

| Sl. No. | Hydropower Plant | Unit | MW | Transmission Lines and Elements | Load (MW) | Remarks |
|--------------|------------------|---|---------------|---|---------------|--|
| 1 | 1020MW THP | Unit- I | 0.00 | 400kV THP - Siliguri Line - I | 0.00 | Unit I, II & III under maintenance. 400kV THP- Siliguri - I under Shutdown. 400kV THP- Siliguri - II under Breakdown. |
| | | Unit- II | 0.00 | 400kV THP - Siliguri Line - II | 0.00 | |
| | | Unit- III | 0.00 | 400kV THP - Siliguri Line- IV | 71.00 | |
| | | Unit- IV | 60.00 | 400kV THP - Malbase Line - III | 154.00 | |
| | | Unit- V | 70.00 | 400kV Malbase - Siliguri Line | 55.67 | |
| | | Unit- VI | 100.00 | - | - | |
| | | Total | 230.00 | Auxiliary Consumption & Transformation Losses at Generator end | 2.17% | |
| 2 | 720MW MHP | Unit-I | 0.00 | 400kV MHP - Jigmeling Line - I | 158.98 | Unit-I & II under Annual Maintenance. 400kV MHP-JLG Line II,III & IV on Standby. 132kV MHP_Yurmoo line I & II not in service. 400kV JLG-ALI I (Interim) on Standby. 400kV JLG_ALI Line II (Direct) on Standby |
| | | Unit-II | 0.00 | 400kV MHP - Jigmeling Line - II | 0.00 | |
| | | Unit-III | 80.67 | 400kV MHP - Jigmeling Line - III | 0.00 | |
| | | Unit-IV | 78.47 | 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) | 67.33 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 0.00 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 29.82 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 48.92 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 0.00 | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 20.14 | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 20.45 | |
| | | - | - | 220kV Tsirang - Jigmeling Line | -39.99 | |
| - | - | 132kV Gelephu - Salakati Line | 2.40 | | | |
| Total | 159.14 | Auxiliary Consumption & Transformation Losses at Generator end | 0.10% | | | |
| 3 | 336MW CHP | Unit- I | 0.00 | 220kV CHP - Birpara Line- I | 30.79 | Unit-I under Annual Maintenance. Unit IV on Standby. 220kV CHP -Malbase Line- III under Maintenance. |
| | | Unit- II | 71.37 | 220kV CHP - Birpara Line- II | 31.29 | |
| | | Unit- III | 75.43 | 220kV CHP - Malbase Line- III | 0.00 | |
| | | Unit- IV | 0.00 | 220kV CHP - Semtokha Line- IV | 65.97 | |
| | | - | - | 220kV Malbase - Birpara Line | -29.76 | |
| | | - | - | 66kV CHP - Chumdo Line | 12.00 | |
| | | - | - | 66kV CHP - Gedu Line | 4.30 | |
| | | - | - | 3x3MVA, 66/11kV TFR | 0.94 | |
| Total | 146.80 | Auxiliary Consumption & Transformation Losses at Generator end | 1.03% | | | |
| 4 | 24MW BHP (U/S) | Unit- I | 7.30 | 220kV BHP - Semtokha Line | 38.90 | U/S Unit-II under AMP & L/S Unit-II on Standby |
| | | Unit- II | 0.00 | 66kV BHP - Lobeysa Line | 20.60 | |
| | | Total | 7.30 | 220kV BHP - Tsirang Line | -37.55 | |
| 5 | 40MW BHP (L/S) | Unit- I | 15.00 | 5MVA, 66/11kV TFR | 0.37 | |
| | | Unit- II | 0.00 | 30MVA ICT, 220/66kV (HV) | 13.89 | |
| | | Total | 15.00 | Auxiliary Consumption & Transformation Losses at Generator end | -0.09% | |
| 6 | 126MW DHP | Unit-I | 22.93 | 220kV DHP - Tsirang Line | 0.00 | Unit-II under Annual maintenance. 220kV DHP_Tsirang Line on Standby. |
| | | Unit-II | 0.00 | 220kV DHP - Dagapela Line | 22.70 | |
| | | - | - | 220kV Jigmeling - Dagapela Line | -15.42 | |
| | | - | - | 5MVA, 220/33kV TFR | 0.20 | |
| Total | 22.93 | Auxiliary Consumption & Transformation Losses at Generator end | 0.13% | | | |
| 7 | 60MW KHP | Unit- I | 11.68 | 132kV KHP - Nangkhoh Line | 19.25 | Unit-IV on Standby. |
| | | Unit-II | 11.70 | 132kV KHP - Kilikhar Line | 14.82 | |
| | | Unit- III | 11.70 | 5MVA, 132/11kV TFR | 0.51 | |
| | | Unit- IV | 0.00 | 132kV Motanga - Rangia Line | 7.88 | |
| | | Total | 35.08 | Auxiliary Consumption & Transformation Losses at Generator end | 1.43% | |

Note: Generation-Load Summary (MW) for March 29, 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 | 422.03 | 303.03 | 296.51 | 158.99 | 6.52 |
| 2 | Eastern Grid | 194.22 | 65.21 | 64.55 | 89.02 | 0.66 |
| Total | | 616.25 | 368.24 | 361.06 | 248.01 | 7.18 |

Note: Generation-Load Summary for March 29, 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 | 239.95 | 234.31 | 230.09 | -6.20 | 4.22 |
| 2 | Eastern Grid | 162.84 | 52.12 | 51.78 | 122.56 | 0.34 |
| Total | | 402.79 | 286.43 | 281.87 | 116.36 | 4.56 |

NOTE-All 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.

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