

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Maximum Load/Demand till Date

| | |
|---------------|-------------------------|
| Date: | December 5, 2020 |
| Hours: | 19:00 Hours |

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

| Sl. No. | Hydropower Plant | Unit | MW | Name of Feeders | Load (MW) | Sign | Remarks |
|----------|------------------|--------------|--------------------------|--|---------------|------|--|
| 1 | 1020MW THP | Unit- I | 0.00 | 400kV THP - Siliguri Fdr- I | 0.00 | | Unit- I, II under shutdown. Unit-IV & V on stand by. 400kV THP-SIL Fdr I under shutdown. 400kV THP-SIL Fdr IV on Standby. |
| | | Unit- II | 0.00 | 400kV THP - Siliguri Fdr- II | 105.78 | + | |
| | | Unit- III | 140.14 | 400kV THP - Siliguri Fdr- IV | 0.00 | | |
| | | Unit- IV | 0.00 | 400kV THP - Malbase Fdr- III | 167.15 | + | |
| | | Unit- V | 0.00 | 400kV Malbase - Siliguri | 86.00 | + | |
| | | Unit- VI | 139.94 | - | - | - | |
| | | Total | 280.08 | Error at Station/Auxiliary Consumption/Losses | 2.553% | | |
| 2 | 720MW MHP | Unit-I | 0.00 | 400kV MHP - Jigmeling Fdr - I | 0.00 | | Unit-II under shutdown. Unit-III under breakdown. Unit-I on standby. 400kV MHP-JLG Fdr I & III under standby. |
| | | Unit-II | 0.00 | 400kV MHP - Jigmeling Fdr - II | 69.74 | + | |
| | | Unit-III | 0.00 | 400kV MHP - Jigmeling Fdr - III | 0.00 | + | |
| | | Unit-IV | 140.51 | 400kV MHP - Jigmeling Fdr - IV | 69.89 | | |
| | | - | - | 200MVA, 400/132kV ICT | | | |
| | | - | - | (Local Load) | | | |
| | | Total | 140.51 | Error at Station/Auxiliary Consumption/Losses | 0.626% | | |
| 3 | 336MW CHP | Unit- I | 0.00 | 220kV CHP - Birpara Fdr- I | 35.20 | + | Unit I & Unit II under Annual Maintenance. 220kV CHP-Malbase Fdr III under AMP. |
| | | Unit- II | 0.00 | 220kV CHP - Birpara Fdr- II | 35.24 | + | |
| | | Unit- III | 69.46 | 220kV CHP - Malbase Fdr- III | 0.00 | | |
| | | Unit- IV | 70.80 | 220kV CHP - Semtokha Fdr- IV | 47.01 | + | |
| | | - | - | 220kV Malbase - Birpara Fdr. | -38.50 | - | |
| | | - | - | 66kV CHP - Chumdo Fdr. | 14.60 | + | |
| | | - | - | 66kV CHP - Gedu Fdr. | 5.18 | + | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.23 | + | |
| | | Total | 140.26 | Error at Station/Auxiliary Consumption/Losses | 1.283% | | |
| 4 | 24MW BHP (U/S) | Unit- I | 0.00 | 220kV BHP - Semtokha Fdr. | 16.40 | + | U/S Unit-I & L/S Unit-I standby. |
| | | Unit- II | 10.50 | 66kV BHP - Lobeysa Fdr. | 16.39 | + | |
| | Total | 10.50 | 220kV BHP - Tsirang Fdr. | -2.80 | - | | |
| | 40MW BHP (L/S) | Unit- I | 0.00 | 5MVA, 66/11kV TFR | 0.90 | + | |
| Unit- II | | 21.20 | 30MVA ICT, 220/66kV | | | | |
| | | Total | 21.20 | Error at Station/Auxiliary Consumption/Losses | 2.555% | | |
| 5 | 126MW DHPC | Unit-I | 0.00 | 220kV DHPC - Tsirang Fdr. | 33.97 | + | Unit I on Standby |
| | | Unit-II | 34.22 | 220kV Jigmeling - Dagapela Fdr. | 2.20 | + | |
| | | - | - | 5MVA, 220/33kV TFR | | | |
| | | Total | 34.22 | Error at Station/Auxiliary Consumption/Losses | 0.731% | | |
| 6 | 60MW KHP | Unit- I | 0.00 | 132kV KHP - Nangkhon Fdr- I | 15.16 | + | Unit I under Annual Maintenance. Unit IV on Standby. |
| | | Unit-II | 15.08 | 132kV KHP - Kilikhar Fdr- II | 13.81 | + | |
| | | Unit- III | 15.08 | 5MVA, 132/11kV TFR | 0.43 | + | |
| | | Unit- IV | 0.00 | 132kV Gelephu - Salakati Fdr. | -11.90 | - | |
| | | - | - | 132kV Motanga - Rangia Fdr. | 3.63 | + | |
| | | - | - | 220kV Tsirang - Jigmeling | 28.38 | + | |
| | | Total | 30.16 | Error at Station/Auxiliary Consumption/Losses | 2.523% | | |

Note: Generation-Load Summary for December 05, 2020 at 19:00hrs.

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import (MW) | Load Balance (MW) |
|--------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|-------------------|
| 1 | Western Grid | 486.26 | 234.16 | 226.35 | 223.72 | 7.81 |
| 2 | Eastern Grid | 170.67 | 67.69 | 66.05 | 131.36 | 1.64 |
| | Total | 656.93 | 301.85 | 292.40 | 355.08 | 9.45 |

Note: Generation-Load Summary for December 05, 2019 at 19:00hrs.

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import (MW) | Load Balance (MW) |
|--------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|-------------------|
| 1 | Western Grid | 507.24 | 283.93 | 276.79 | 207.87 | 7.14 |
| 2 | Eastern Grid | 151.93 | 61.02 | 60.35 | 106.35 | 0.67 |
| | Total | 659.17 | 344.95 | 337.14 | 314.22 | 7.81 |

NOTE-Data collected from MHPA,Motanga and KHP

- 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: | December 6, 2020 |
| Hours: | 09:00 Hours |

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

| Sl. No. | Hydropower Plant | Unit | MW | Name of Feeders | Load (MW) | Sign | Remarks |
|---------|------------------|--------------|---------------|--|----------------|------|---|
| 1 | 1020MW THP | Unit- I | 0.00 | 400kV THP - Siliguri Fdr- I | 0.00 | | Unit- I, II under shutdown. Unit-IV & V on stand by. 400kV THP-SIL Fdr I under shutdown. 400kV THP-SIL Fdr IV on Standby. |
| | | Unit- II | 0.00 | 400kV THP - Siliguri Fdr- II | 110.00 | + | |
| | | Unit- III | 139.70 | 400kV THP - Siliguri Fdr- IV | 0.00 | | |
| | | Unit- IV | 0.00 | 400kV THP - Malbase Fdr- III | 163.00 | + | |
| | | Unit- V | 0.00 | 400kV Malbase - Siliguri | 91.00 | + | |
| | | Unit- VI | 140.50 | - | - | - | |
| | | Total | 280.20 | Error at Station/Auxiliary Consumption/Losses | 2.570% | | |
| 2 | 720MW MHP | Unit-I | 0.00 | 400kV MHP - Jigmeling Fdr - I | 0.00 | | Unit-II under shutdown. Unit-III under breakdown. Unit-I on standby. 400kV MHP-JLG Fdr I on Standby & Fdr-III under standby. |
| | | Unit-II | 0.00 | 400kV MHP - Jigmeling Fdr - II | 79.77 | | |
| | | Unit-III | 0.00 | 400kV MHP - Jigmeling Fdr - III | 0.00 | + | |
| | | Unit-IV | 160.64 | 400kV MHP - Jigmeling Fdr - IV | 79.90 | + | |
| | | - | - | 200MVA, 400/132kV ICT | | | |
| | | - | - | (Local Load) | | | |
| | | Total | 160.64 | Error at Station/Auxiliary Consumption/Losses | 0.604% | | |
| 3 | 336MW CHP | Unit- I | 0.00 | 220kV CHP - Birpara Fdr- I | 35.20 | + | Unit I & II under Annual Maintenance. 220kV CHP-Malbase Fdr III under AMP. |
| | | Unit- II | 0.00 | 220kV CHP - Birpara Fdr- II | 35.24 | + | |
| | | Unit- III | 69.46 | 220kV CHP - Malbase Fdr- III | 0.00 | | |
| | | Unit- IV | 70.80 | 220kV CHP - Semtokha Fdr- IV | 47.01 | + | |
| | | - | - | 220kV Malbase - Birpara Fdr. | -47.00 | - | |
| | | - | - | 66kV CHP - Chumdo Fdr. | 14.60 | + | |
| | | - | - | 66kV CHP - Gedu Fdr. | 5.18 | + | |
| | | Total | 140.26 | Error at Station/Auxiliary Consumption/Losses | 1.283% | | |
| 4 | 24MW BHP (U/S) | Unit- I | 0.00 | 220kV BHP - Semtokha Fdr. | 18.30 | + | U/S Unit-I under annual maintenance & L/S Unit-I standby. |
| | | Unit- II | 10.00 | 66kV BHP - Lobeysa Fdr. | 13.10 | + | |
| | | Total | 10.00 | 220kV BHP - Tsirang Fdr. | -2.05 | - | |
| | 40MW BHP (L/S) | Unit- I | 0.00 | 5MVA, 66/11kV TFR | 0.90 | + | |
| | | Unit- II | 20.10 | 30MVA ICT, 220/66kV | | | |
| | | Total | 20.10 | Error at Station/Auxiliary Consumption/Losses | -0.498% | | |
| 5 | 126MW DHPC | Unit-I | 0.00 | 220kV DHPC - Tsirang Fdr. | 33.21 | + | Unit-I Standby |
| | | Unit-II | 33.43 | 220kV Jigmeling - Dagapela Fdr. | 1.69 | + | |
| | | - | - | 5MVA, 220/33kV TFR | | | |
| | | Total | 33.43 | Error at Station/Auxiliary Consumption/Losses | 0.658% | | |
| 6 | 60MW KHP | Unit- I | 0.00 | 132kV KHP - Nangkhon Fdr- I | 14.72 | + | Unit I under Annual Maintenance. Unit IV on Standby. |
| | | Unit-II | 14.08 | 132kV KHP - Kilihar Fdr- II | 12.21 | + | |
| | | Unit- III | 14.07 | 5MVA, 132/11kV TFR | 0.36 | + | |
| | | Unit- IV | 0.00 | 132kV Gelephu - Salakati Fdr. | -4.20 | - | |
| | | - | - | 132kV Motanga - Rangia Fdr. | 7.59 | + | |
| | | - | - | 220kV Tsirang - Jigmeling | 27.10 | + | |
| | | Total | 28.15 | Error at Station/Auxiliary Consumption/Losses | 3.055% | | |

Note: Generation-Load summary for December 06, 2020 at 09:00hrs.

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import (MW) | Load Balance (MW) |
|--------------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|-------------------|
| 1 | Western Grid | 483.99 | 232.45 | 225.07 | 224.44 | 7.38 |
| 2 | Eastern Grid | 188.79 | 52.83 | 51.00 | 163.06 | 1.83 |
| Total | | 672.78 | 285.28 | 276.07 | 387.50 | 9.21 |

Note: Generation-Load Summary for December 06, 2019 at 09:00hrs

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import (MW) | Load Balance (MW) |
|--------------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|-------------------|
| 1 | Western Grid | 368.12 | 265.40 | 260.35 | 90.96 | 5.05 |
| 2 | Eastern Grid | 171.29 | 67.39 | 64.71 | 115.66 | 2.68 |
| Total | | 539.41 | 332.79 | 325.06 | 206.62 | 7.73 |

NOTES: All 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.