

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Maximum Load/Demand till Date

| | |
|---------------|---------------------|
| Date: | May 21, 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 | 187.39 | 400kV THP - Siliguri Fdr- I | 272.36 | | |
| | | Unit- II | 188.63 | 400kV THP - Siliguri Fdr- II | 270.95 | + | |
| | | Unit- III | 186.64 | 400kV THP - Siliguri Fdr- IV | 262.98 | + | |
| | | Unit- IV | 187.20 | 400kV THP - Malbase Fdr- III | 298.95 | + | |
| | | Unit- V | 187.32 | 400kV Malbase - Siliguri | 250.33 | + | |
| | | Unit- VI | 187.18 | - | - | - | |
| | | Total | 1,124.36 | Error at Station/Auxiliary Consumption/Losses | 19.12 | | |
| 2 | 720MW MHP | Unit-I | 179.83 | 400kV MHP - Jigmeling Fdr - I | 240.69 | + | 400kV MHP-JLG IV Standby. |
| | | Unit-II | 178.18 | 400kV MHP - Jigmeling Fdr - II | 241.77 | + | |
| | | Unit-III | 179.72 | 400kV MHP - Jigmeling Fdr - III | 234.55 | + | |
| | | Unit-IV | 180.84 | 400kV MHP - Jigmeling Fdr - IV | 0.00 | + | |
| | | - | - | 200MVA, 400/132kV ICT | 0.00 | | |
| | | - | - | (Local Load) | | | |
| | | Total | 718.57 | Error at Station/Auxiliary Consumption/Losses | 1.56 | | |
| 3 | 336MW CHP | Unit- I | 0.00 | 220kV CHP - Birpara Fdr- I | 87.55 | + | Unit-I under shutdown till 30th June. |
| | | Unit- II | 91.16 | 220kV CHP - Birpara Fdr- II | 87.55 | + | |
| | | Unit- III | 90.96 | 220kV CHP - Malbase Fdr- III | 143.16 | + | |
| | | Unit- IV | 90.87 | 220kV CHP - Semtokha Fdr- IV | -58.81 | - | |
| | | - | - | 220kV Malbase - Birpara Fdr. | 33.45 | + | |
| | | - | - | 66kV CHP - Chumdo Fdr. | 5.97 | + | |
| | | - | - | 66kV CHP - Gedu Fdr. | 5.65 | + | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.47 | + | |
| | | Total | 272.99 | Error at Station/Auxiliary Consumption/Losses | 0.45 | | |
| 4 | 24MW BHP (U/S) | Unit- I | 11.81 | 220kV BHP - Semtokha Fdr. | 93.34 | + | |
| | | Unit- II | 11.81 | 66kV BHP - Lobeysa Fdr. | 19.79 | + | |
| | | Total | 23.62 | 220kV BHP - Tsirang Fdr. | -47.79 | - | |
| | 40MW BHP (L/S) | Unit- I | 20.96 | 5MVA, 66/11kV TFR | 0.52 | + | |
| | | Unit- II | 20.14 | 30MVA ICT, 220/66kV | 0.00 | | |
| | | Total | 41.10 | Error at Station/Auxiliary Consumption/Losses | 1.14 | | |
| 5 | 126MW DHPC | Unit-I | 56.30 | 220kV DHPC - Tsirang Fdr. | 119.05 | + | |
| | | Unit-II | 63.26 | 220kV Jigmeling - Dagapela Fdr. | 0.00 | | |
| | | - | - | 5MVA, 220/33kV TFR | 0.00 | | |
| | | Total | 119.56 | Error at Station/Auxiliary Consumption/Losses | 0.51 | | |
| 6 | 60MW KHP | Unit- I | 16.45 | 132kV KHP - Nangkhon Fdr- I | 54.84 | + | |
| | | Unit-II | 15.78 | 132kV KHP - Kilikhar Fdr- II | 8.29 | + | |
| | | Unit- III | 16.48 | 5MVA, 132/11kV TFR | 0.27 | + | |
| | | Unit- IV | 16.00 | 132kV Gelephu - Salakati Fdr. | 39.06 | + | |
| | | - | - | 132kV Motanga - Rangia Fdr. | 41.44 | + | |
| | | - | - | 220kV Tsirang - Jigmeling | 69.00 | + | |
| | | Total | 64.71 | Error at Station/Auxiliary Consumption/Losses | 1.31 | | |

Note: Generation-Load Summary for May 21, 2020 at 19:00hrs.

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import | Load Balance |
|--------|--------------|-----------------------|---------------------------------------|------------------------------------|---------------------|--------------|
| 1 | Western Grid | 1,581.63 | 247.46 | 228.52 | 1,265.17 | 18.94 |
| 2 | Eastern Grid | 783.28 | 54.77 | 51.90 | 797.51 | 2.87 |
| | Total | 2,364.91 | 302.23 | 280.42 | 2,062.68 | 21.81 |

Note: Generation-Load Summary for May 21, 2019 at 19:00hrs.

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import | Load Balance |
|--------|--------------|-----------------------|---------------------------------------|------------------------------------|---------------------|--------------|
| 1 | Western Grid | 553.58 | 266.32 | 261.24 | 256.13 | 5.08 |
| 2 | Eastern Grid | 50.12 | 64.17 | 63.75 | 17.08 | 0.42 |
| | Total | 603.70 | 330.49 | 324.99 | 273.21 | 5.50 |

NOTE: KHP & Motanga Loads 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: | May 22, 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 | 187.29 | 400kV THP - Siliguri Fdr- I | 277.37 | + | |
| | | Unit- II | 188.28 | 400kV THP - Siliguri Fdr- II | 275.99 | + | |
| | | Unit- III | 186.82 | 400kV THP - Siliguri Fdr- IV | 268.62 | + | |
| | | Unit- IV | 187.41 | 400kV THP - Malbase Fdr- III | 282.92 | + | |
| | | Unit- V | 188.12 | 400kV Malbase - Siliguri | 258.02 | + | |
| | | Unit- VI | 184.74 | - | - | - | |
| | | Total | 1,122.66 | Error at Station/Auxiliary Consumption/Losses | 17.76 | | |
| 2 | 720MW MHP | Unit-I | 179.77 | 400kV MHP - Jigmeling Fdr - I | 236.30 | + | 400kV MHP-JLG IV Standby. |
| | | Unit-II | 178.20 | 400kV MHP - Jigmeling Fdr - II | 237.80 | + | |
| | | Unit-III | 179.81 | 400kV MHP - Jigmeling Fdr - III | 230.50 | + | |
| | | Unit-IV | 181.00 | 400kV MHP - Jigmeling Fdr - IV | 0.00 | + | |
| | | - | - | 200MVA, 400/132kV ICT | 0.00 | | |
| | | - | - | (Local Load) | | | |
| | | Total | 718.78 | Error at Station/Auxiliary Consumption/Losses | 14.18 | | |
| 3 | 336MW CHP | Unit- I | 0.00 | 220kV CHP - Birpara Fdr- I | 92.18 | + | Unit-I under shutdown till 30th June |
| | | Unit- II | 91.79 | 220kV CHP - Birpara Fdr- II | 92.02 | + | |
| | | Unit- III | 91.93 | 220kV CHP - Malbase Fdr- III | 159.43 | + | |
| | | Unit- IV | 91.94 | 220kV CHP - Semtokha Fdr- IV | -78.00 | - | |
| | | - | - | 220kV Malbase - Birpara Fdr. | 28.99 | + | |
| | | - | - | 66kV CHP - Chumdo Fdr. | 2.36 | + | |
| | | - | - | 66kV CHP - Gedu Fdr. | 5.95 | + | |
| | | - | - | 3x3MVA, 66/11kV TFR | 0.88 | + | |
| | | Total | 275.66 | Error at Station/Auxiliary Consumption/Losses | 0.84 | | |
| 4 | 24MW BHP (U/S) | Unit- I | 11.87 | 220kV BHP - Semtokha Fdr. | 101.85 | + | |
| | | Unit- II | 11.87 | 66kV BHP - Lobeysa Fdr. | 17.78 | + | |
| | | Total | 23.74 | 220kV BHP - Tsirang Fdr. | -53.95 | - | |
| | 40MW BHP (L/S) | Unit- I | 20.96 | 5MVA, 66/11kV TFR | 0.30 | + | |
| | | Unit- II | 20.19 | 30MVA ICT, 220/66kV | | | |
| | | Total | 41.15 | Error at Station/Auxiliary Consumption/Losses | -1.09 | | |
| 5 | 126MW DHPC | Unit-I | 63.22 | 220kV DHPC - Tsirang Fdr. | 126.09 | + | |
| | | Unit-II | 63.32 | 220kV Jigmeling - Dagapela Fdr. | | | |
| | | - | - | 5MVA, 220/33kV TFR | | | |
| | | Total | 126.54 | Error at Station/Auxiliary Consumption/Losses | 0.45 | | |
| 6 | 60MW KHP | Unit- I | 15.60 | 132kV KHP - Nangkhor Fdr- I | 57.07 | + | |
| | | Unit-II | 15.75 | 132kV KHP - Kilihar Fdr- II | 5.42 | + | |
| | | Unit- III | 16.00 | 5MVA, 132/11kV TFR | 0.22 | + | |
| | | Unit- IV | 16.30 | 132kV Gelephu - Salakati Fdr. | 45.00 | + | |
| | | - | - | 132kV Motanga - Rangia Fdr. | 46.72 | + | |
| | | - | - | 220kV Tsirang - Jigmeling | 64.06 | + | |
| | | Total | 63.65 | Error at Station/Auxiliary Consumption/Losses | 0.94 | | |

Note: Generation-Load summary for May 22, 2020 at 09:00hrs.

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import | Load Balance |
|--------|--------------|-----------------------|---------------------------------------|------------------------------------|---------------------|--------------|
| 1 | Western Grid | 1,589.75 | 232.50 | 214.54 | 1,293.19 | 17.96 |
| 2 | Eastern Grid | 782.43 | 50.17 | 35.05 | 796.32 | 15.12 |
| | Total | 2,372.18 | 282.67 | 249.59 | 2,089.51 | 33.08 |

Note: Generation-Load Summary for May 22, 2019 at 09:00hrs

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import | Load Balance |
|--------|--------------|-----------------------|---------------------------------------|------------------------------------|---------------------|--------------|
| 1 | Western Grid | 470.37 | 256.64 | 251.93 | 204.23 | 4.71 |
| 2 | Eastern Grid | 65.78 | 49.46 | 49.12 | 25.82 | 0.34 |
| | Total | 536.15 | 306.10 | 301.05 | 230.05 | 5.05 |

NOTES: KHP & Motanga loads 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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