Branch Data from resultsGC\_branch.txt



* **lineflow**: This column indicates the power flow through the branch (line).
  + Example: Branch 1 has a lineflow of **13.89 MW**.
* **rateA**: The maximum allowed flow (capacity) of the branch.
  + Example: Branch 1 has a capacity of **15 MW**.
* **slackVar**: Indicates any slack or violation in the system. A value of **0** means there is no violation.
  + All slack values are **0**, indicating no violations in any of the branches.

In this case, none of the branches are overloaded, and they are operating within their allowed limits

Bus Data from resultsGC\_bus.txt



**busNumber**: The identifier of the bus (node) in the power system.

* + Example: Bus 1 is identified by number **1**.
* **busAngle**: The voltage angle at the bus, measured in radians.
  + Example: Bus 1 has a bus angle of **0.022323** radians.

These bus angles help determine the power flow across the network and whether there is any instability. In your case, the bus angles are relatively small, indicating that the system is stable.

Generator Contingency Data from resultsGC\_contingencyPgc.txt



 **indexCtgcy**: The contingency index. In this case, all rows are associated with contingency 2.

 **gen\_IsInSvc**: Indicates whether the generator is in service (1 = in service, 0 = not in service).

* Example: Generator 1 is in service, while Generator 2 is not.

 **pgc**: The power generation in MW for the contingency.

* Example: Generator 1 is producing **138.23 MW**, while Generator 5 is producing **-6.90 MW** (indicating reverse power flow or possibly absorption).

Branch Contingency Data from resultsGC\_contingencyPkc.txt



 **indexCtgcy**: The contingency index. In this case, all rows are related to contingency 2.

 **brc\_IsInSvcOrig**: Indicates whether the branch was in service during the contingency.

 **pkc**: The power flow in the branch under the contingency scenario.

* Example: Branch 1 has a power flow of **12.48 MW** under the contingency.

 **rateC**: The capacity of the branch under contingency conditions. Most branches have a high limit (**99999 MW**) except for a few.

Generator Data from resultsGC\_gen.txt

 **PgInSvc**: Indicates if the generator is in service (1 = in service, 0 = not in service).

* Example: Generator 1 is in service, while Generator 2 is not.

 **Pgmax** and **Pgmin**: Maximum and minimum generation limits for the generator.

* Example: Generator 1 has a max generation of **105 MW** and a min generation of **38 MW**.

 **Pg**: Actual power generated by the generator.

* Example: Generator 1 is generating **83.23 MW**.

 **energyRampUp\_Slack**: Indicates the violation in ramp-up capacity. Generator 1 has a violation of **21.23 MW**.

Generator Cost Data from resultsGC\_genCost.txt



 **genIdx**: The index of the generator.

 **segmentIdx**: The cost segment for each generator.

 **segmentBreadth**: The range of power output covered by the segment.

* Example: Generator 1 has a segment breadth of **0.5 MW** in its first segment.

 **segmentPrice**: The price per unit of power in the segment.

* Example: The price for Generator 1 in segment 1 is **9.39**.

 **Pgi**: The actual power generated in the segment.

* Example: Generator 1 produces **0.5 MW** in its first segment.

Updated Interface Data from resultsGC\_interface.txt



 **interfaceEnabled**: Shows whether the interface is enabled or disabled.

* Example: Interface 1 is disabled (0), while Interface 2 is enabled (1).

 **totalFlow**: The actual power flow through the interface.

* Example: Interface 1 has a flow of **26.95 MW**, which exceeds its limit.

 **interfacelimit**: The maximum allowed power flow for each interface.

* Example: Interface 1 has a limit of **20 MW**, indicating it's overloaded.

 **slackVar**: Indicates if there is a slack or violation. A value of **0** means there is no violation or slack in the system.

Load Data from resultsGC\_load.txt



 **loadBusNumber**: The bus number where the load is connected.

* Example: Bus 1 has a load connected.

 **Pload**: The requested load at the bus in MW.

* Example: Bus 1 has a requested load of **16.58 MW**.

 **Pd\_served**: The actual load served at the bus in MW.

* Example: Bus 1 was fully served with **16.58 MW**.

 **Pd\_shedded**: The amount of load shed (if any).

* In this case, **no load was shed** at any bus.

Summary Data from resultsGC\_summary.txt

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type | Description | |  |  |
| Objective Value | 106051 |  |  |  |
| Branch Overload | No branches overloaded | | |  |
| Interface Overload | No interfaces overloaded | | |  |
| Generator Violation | Generator 1 Pg Max limit exceeded by 33.23 MW | | | |
| Generator Violation | Generator 1 ramp-up limit exceeded by 21.23 MW | | | |
| Generator Violation | Generator 3 Pg Max limit exceeded by 10 MW | | | |
| Generator Violation | Generator 5 Pg Min limit violated by 56.90 MW | | | |
| Spinning Reserve Shortage | 0 MW spinning reserve shortage | | |  |
| Load Shed | No load shedding | |  |  |
| Contingency Load Shed | No load shedding in Contingency 2 | | | |
| Contingency Interface Overload | No interfaces overloaded in Contingency 2 | | | |

 **Objective Value**: The total objective value of the SCED optimization, which is **106051.01**.

 **Branch Overload**: No branches are overloaded.

 **Interface Overload**: No interfaces are overloaded.

 **Generator Violations**: Several violations occurred:

* Generator 1 exceeded its maximum limit by **33.23 MW**.
* Generator 1 also violated its ramp-up limit by **21.23 MW**.
* Generator 3 exceeded its maximum limit by **10 MW**.
* Generator 5 violated its minimum limit by **56.90 MW**.

 **Spinning Reserve**: No spinning reserve shortages.

 **Load**: No load shedding occurred.

 **Contingency**: No load shedding or interface overloads in contingency scenario 2.