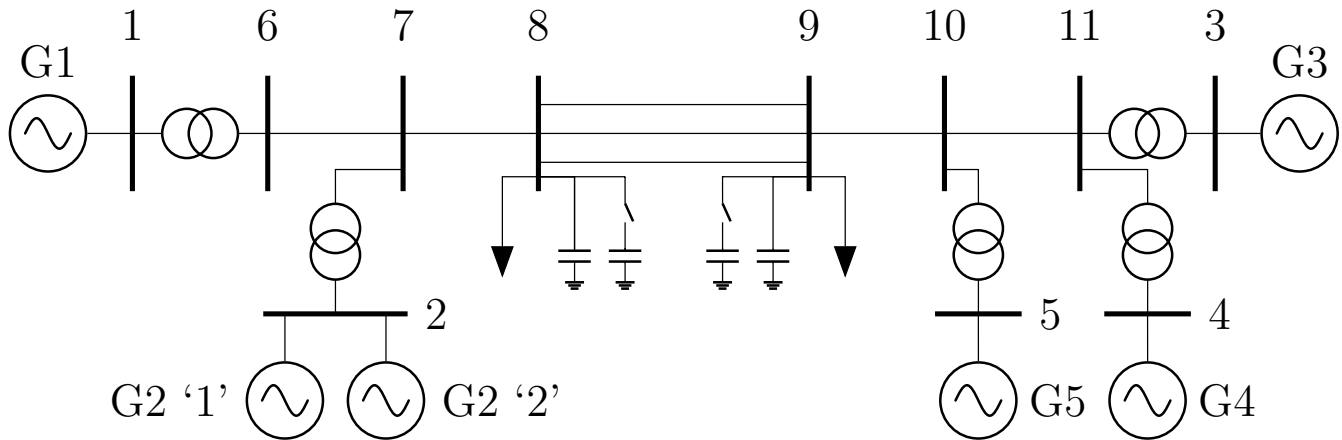


**System:**

**Event and BA Description:** The simplest explanation is the code used to define the event, power plants, and BA.

# Perturbances

```
mirror.sysPerturbances = [
    'load 9 : step P 5 75 rel', # Step Load P +75 MW relative at t=5
]
```

# Power Plants

```
# defined as a dictionary of lists {'name' : ['gen id : participation factor', ...], ...}
mirror.sysPowerPlants ={'pp1': ["gen 2 1: 0.75 : rampA", "gen 2 2 : 0.25: rampA"],
                        'pp2': ["gen 3 : 0.75: rampA", "gen 4 : 0.25: rampA"],
                        }
```

# Testing of Balancing Authority input

```
mirror.sysBA = {
    'BA1':{
        'Area':1,
        'B':" 1.0 : p", # MW/0.1 Hz
        'ActionTime': 5.00, # sends update signals as required every x seconds
        'Type':'TLB', # Tie-Line Bias
        'Filtering': 'PI : 0.1 0.0001', # where 0.1 = Kp, and 0.0001 = a = Ki/Kp
        'CtrlGens': ['plant pp1 : .60 ',
                     'gen 1 : .40 : rampA']
    },
    'BA2':{
        'Area':2,
        'B':" 1.0 : p", # MW/0.1 Hz
        'ActionTime': 5.00,
        'Type':'TLB', # Tie-Line Bias
        'Filtering': 'PI : 0.1 0.0001',
        'CtrlGens': ['plant pp2 : 1.0 ']
    },
}
```

**Results:** The filtered ACE (which is distributed to controlled generators Pref according to participation factor) is much smaller than the calculated ACE. This allows for governor action to take place with minimal interference. The 20 minute simulation took 76 seconds ( $\approx 60\%$  of total time spent solving Power Flows).

