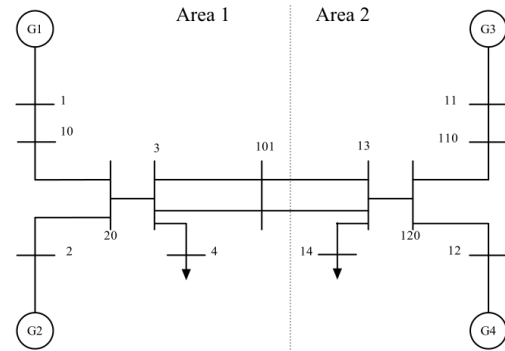


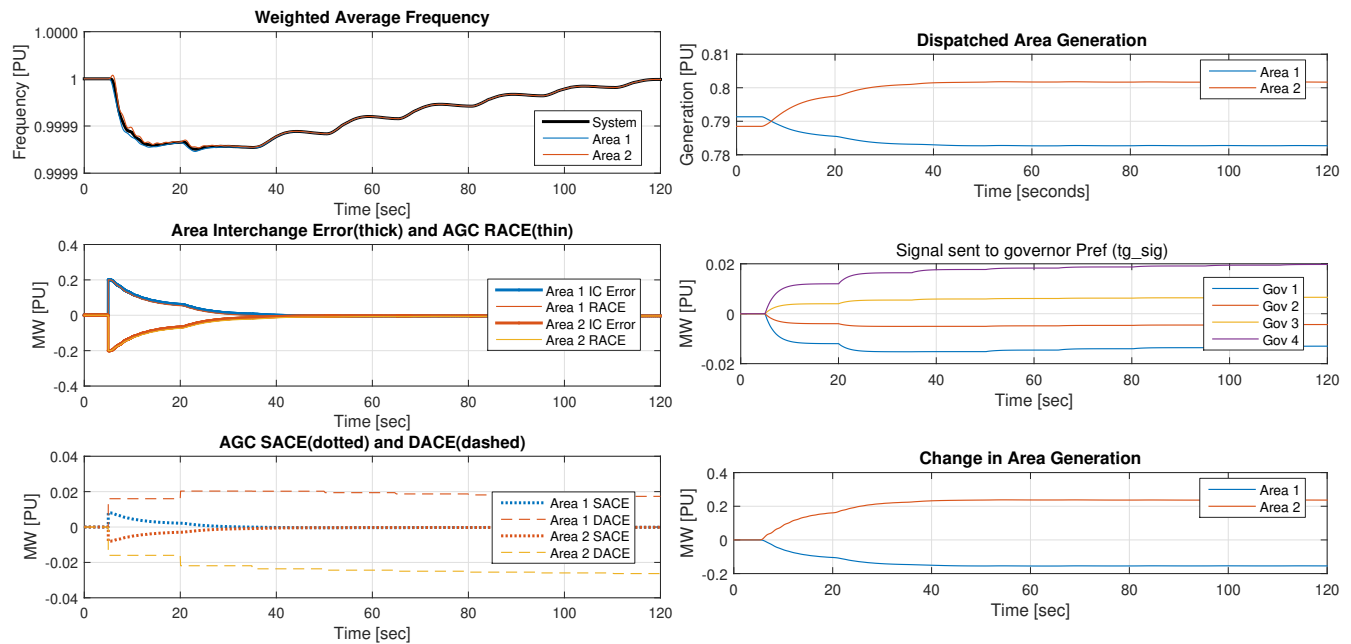
AGC Modulation Test (Interchange adjustment)

- Event: When $t = 5$ Area 2 increases its scheduled interchange by 0.2 PU.
Area 1 interchange is adjusted by -0.2 PU to keep system in balance.
Area 2 increases generation while Area 1 reduces generation.
- Each area has non-conditional AGC set to act every 15 seconds and is forced to act by `mAGC_sig` when the interchange adjustment first takes place.



Result Summary:

- Interchange adjustment seems to work correctly and is accounted for in AGC calculations.
- The use of `mAGC_sig` was tested as working using FTS or VTS.



Why this might matter:

An extended term simulation may required the adjustment of scheduled interchange to achieve system recovery. Specifically, if an area realizes that their available reserves become lower than was originally allocated for, a resolution may be to import more power from another area. This added functionality will allow custom logic to handle such a scenario.

MATLAB modulation code

The mAGC_sig file that adjusts the interchange and forces AGC action is shown below.

```
1  function mAGC_sig(k)
2  % Syntax: mAGC_sig(k)
3  % input k is current data index
4  % 09:46 08/21/20
5  % place to define modulation signal for AGC operation
6
7  global g
8
9  %{
10     Scenario:
11     Area 1 is exporting generation to Area 2 (Interchange value Positive)
12     Area 2 is importing power from Area 1 (Interchange value is Negative
13
14     Area 2 increases scheduled interchange, which reduces its scheduled import and causes area 2 to
15     ↪ increase generation.
16     Area 1 decreases scheduled interchange to balance area 2 action.
17     As area 1 is exporting, the negative valued icAdj will reduce the generation in the area.
18  %}
19  persistent ForceDisptach
20
21  if g.sys.t(k) >= 5
22     % adjust iterchange
23     g.area.area(2).icAdj(k) = 0.2;
24     g.area.area(1).icAdj(k) = -0.2;
25
26     % force AGC disptach when interchange adjustment first applied
27     if ForceDisptach
28         g.agc.agc(1).nextActionTime = g.sys.t(k);
29         g.agc.agc(2).nextActionTime = g.sys.t(k);
30         ForceDisptach = 0;
31     end
32
33  else
34     g.area.area(2).icAdj(k) = 0;
35     g.area.area(1).icAdj(k) = 0;
36     ForceDisptach = 1;
37  end
38  end
```