

STEAM GENERATOR

$$X = \frac{6}{15} = \frac{4}{10}, Y = \frac{6}{20} = \frac{3}{10} \quad \text{Z we assumed to have a typo, our } Z = 1 - \frac{6}{15} - \frac{6}{20} = \frac{3}{10}$$

$$X = (\text{group number})/15, Y = (\text{group number})/20, Z = 1 - X + Y$$

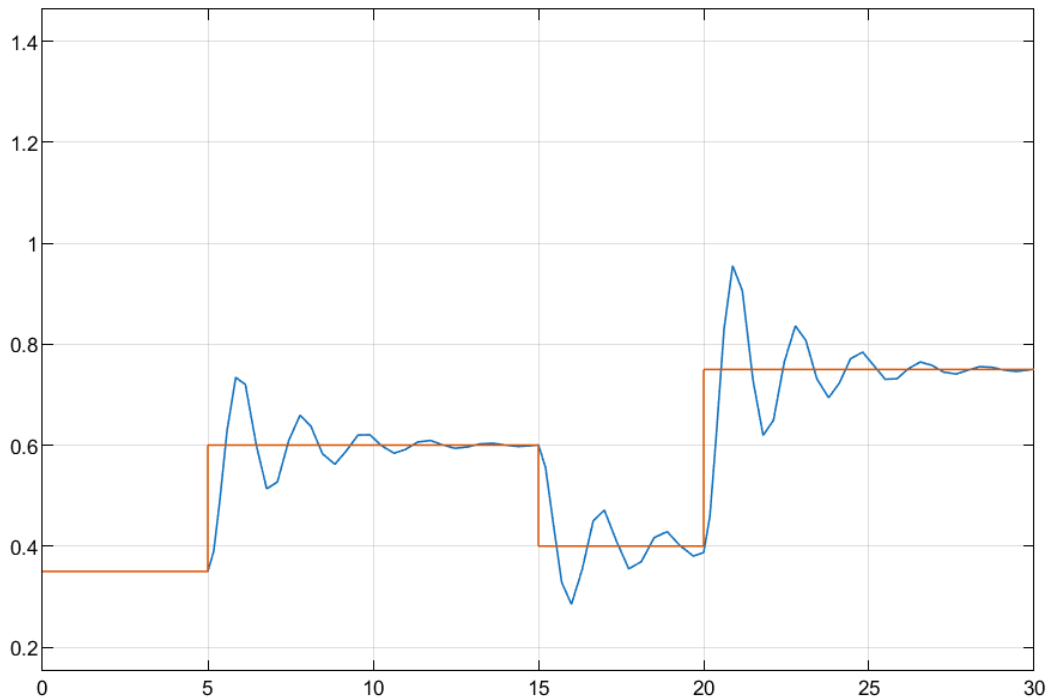
A 3-stage steam generator comprises a high pressure turbine part of X fraction and $\min\{X, Y, Z\}$ time constant, a medium pressure turbine part of Y fraction and $\max\{X, Y, Z\}$ time constant and a low pressure turbine part of Z fraction and $(\max\{X, Y, Z\} + \min\{X, Y, Z\})/2$ time constant. At some point in the day it operates at a 35% mechanical power output. The inertia constant of the turbine-generator couple is $4Zs$. Assume a droop of 5%.

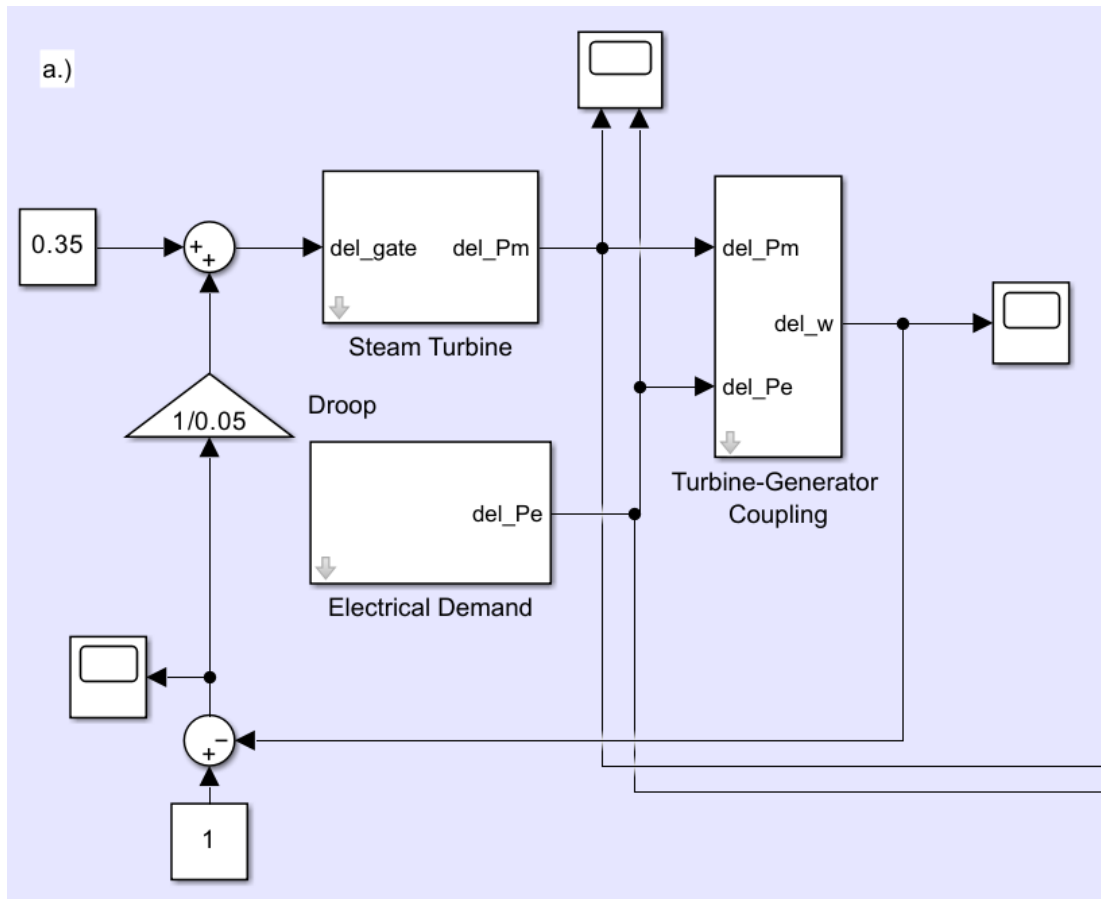
a. Simulate the model for a time of 30s, subject to at least 3 changes in the electric power demand P_e that are at least 5s apart, both in increasing and decreasing directions.

b. Change the model as follows for further tests

- Even-numbered groups repeat (a) with the high-pressure and the medium-pressure fractions and time constants exchanged.

a.





b.)

