Analysis of electrical power and energy systems

Practical session 8

24 November 2022

1 Primary frequency control

1. A power system has a total load of 1260MW at 60Hz. The load varies 1.5% for every 1% change in frequency (D = 1.5). The system has 240MW of spinning reserve evenly spread among 500MW of generation capacity with 5% regulation based on this capacity. All other generators are operating with their valves wide open and are capable of down regulation only, also with R = 5%. Find the steady-state frequency deviation when a 60MW load is suddenly tripped.[1]

2 Solutions

Link to the Python notebook shown during the session: Python Notebook TP8

1. $f_{ss} = 60.1132$ Hz

[1] This exercise has been adapted from the course *31750 Stability and control in electric power systems* given at Technical University of Denmark.