

ECEN 643 Project Spring 2019

Post on Feb 27, 2019
Due on March 26, 2019

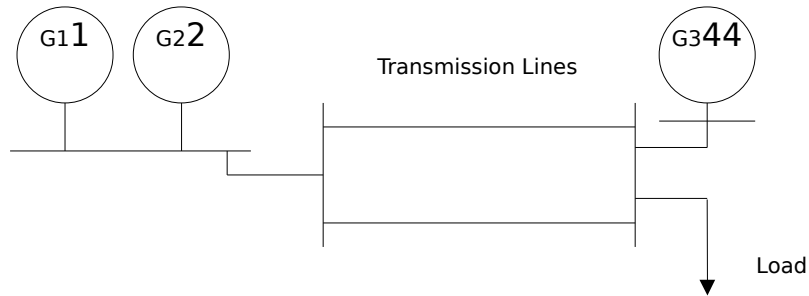


Fig. 1

Generators:

There are three generators supplying a load as shown in Fig. 1. For generators G1, G2 and G3, each has full capacity of 75 MW or 0 MW when failed. The failure rate of each generator is 0.1/day and mean-repair-time is 8 hours.

Transmission Lines:

The transmission lines are exposed to two states of weather. The failure rate of each transmission line is assumed to be 10 /year during the normal weather and 100 /year during the adverse weather. The mean down time is 8 hours irrespective of weather. Capacity of each line is 100MW. Each transmission line is protected by a breaker at each end and the breakers are assumed perfectly reliable, that is, they open to isolate the line with probability 1.

Weather:

The weather fluctuates between normal and adverse state, mean duration of normal state is 200 hours and mean duration of adverse state is 20 hours

Load:

Load fluctuates between different states, the daily load cycle is:

Hours	Load (MW)
0-4	60
4-8	105
8-12	205
12-16	105

- (1) For the described system, using an analytical method, please find the exact values of loss of load probability and frequency of load loss. **(50 points)**.
- (2) For the described system, using Monte Carlo Simulation, please find the estimate of loss of load probability and frequency of load loss. (Convergence criterion: $COV \leq 5\%$) **(50 points)**

Notes:

1. Please explain the process followed in arriving at your results in a detailed report.
2. Please attach the documentation of your program of Monte Carlo Simulation.