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1. A power system is supplied by three generating units that are rated at 150, 200 and 250 MW, respectively. What is the maximum load that can be securely connected to this system if the simultaneous outage of two generating units is not considered to be a credible event?
 2. A small power system consists of two buses connected by three transmission lines. Assuming that this power system must be operated according to the N-1 security criterion and that its operation is constrained only by thermal limits on the transmission lines, calculate the maximum power transfer between these two buses for each of the following conditions
 - (a) All three lines are in service and each line has a continuous thermal rating of 300 MW.
 - (b) Only two lines rated at 300 MW are in service.
 - (c) All three lines are in service. Two of them have a continuous thermal rating of 300 MW and the third is rated at 200 MW.
 - (d) All three lines are in service. All of them have a continuous thermal rating of 300 MW. However, during emergencies, they can sustain a 10% overload for 20 min. The generating units on the downstream bus can increase their output at the rate of 4 MW per minute.
 - (e) Same conditions as in (d), except that the output of the downstream generators can only increase at the rate of 2 MW per minute.
 - (f) Low temperatures and high winds improve the heat transfer between the conductors and the atmosphere. Assume that this dynamic thermal rating increases the continuous and emergency loadings of (d) by 15%.