



Birzeit University
Faculty of Engineering and Technology
Department of Electrical and Computer Engineering
Power Systems – ENEE 4403
PowerWorld Simulator Project

Dr. Jaser Sa'ed & Dr. Ali Abdo

Deadline for Submission (Hard Copy): At the beginning of lecture time on Monday 9-1-2016

To asses ABET SO “k”

Project Description:

Indoor substation (S/S) contains a tap changer transformer which is fed from 33KV line. The voltage is stepped down to 6.6 KV to feed a Basbar which is branched to two 6.6KV feeders as shown in the single line diagram below.

Notes:

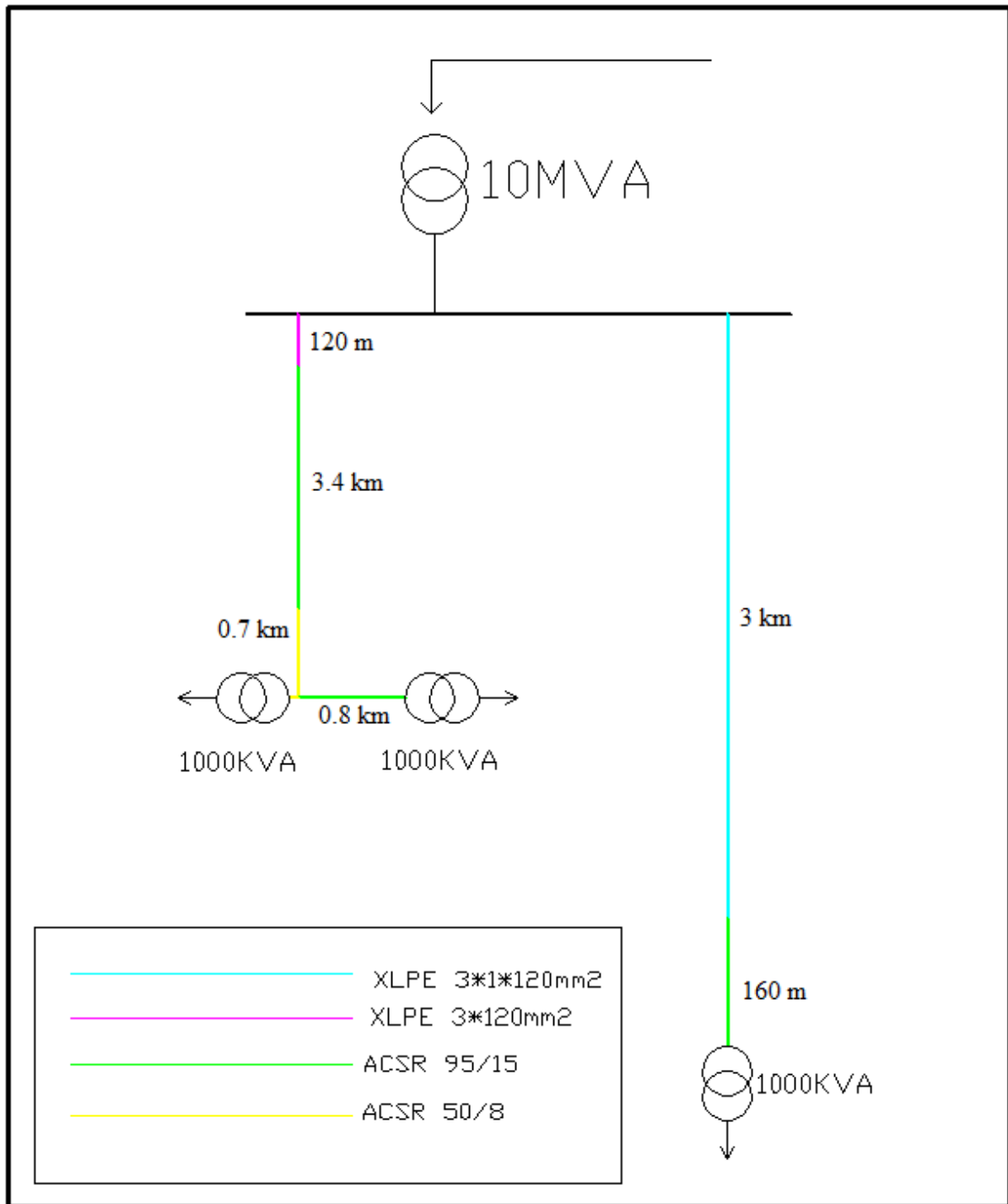
- The distribution transformers are 70% loaded.
- Power factor = 0.90.
- The per unit values for transformer per phase :

Capacity (MVA)	Zbase	R Per unit	X Per unit
1	0.4356	0.479431	0.147934
10	10.89	0.010311	0.007227

- The per unit values for transmission line per phase:

Type	Rated current (A)	Voltage (Kv)	Resistance Per unit/km	Reactance Per unit/km
XLPE(120mm ²)	335	6.6	0.646	0.265
ACSR(95/15)	359	6.6	0.75	0.621
ACSR(50/8)	359	6.6	1.415	0.662

- a) Calculate the values (MW, MVAR, and MVA) of the loads.
 - b) Calculate the MVA limit for each line.
 - c) What is Dy11 transformer?
 - d) Insert the single line diagram to the PowerWorld Simulator, then find:
 - 1) The capacity of the substation.
 - 2) The loads consumption.
 - 3) The total losses.
 - 4) The actual voltage on the busses.
 - 5) The current flows in each line.
 - 6) The power flow list.
 - e) Determine the effect of adding a suitable shunt capacitor bank at each load.
 - f) Use PowerWorld simulator to determine the fault current for three-phase faults at each of the buses.
- ✓ *You must show the values inserted in the PowerWorld simulator for the parameters of the transformers and transmission lines in your report.*



... With Best Wishes ...