

EE 374
ELECTRICAL EQUIPMENT AND APPLICATIONS

Spring 2016 Term Project

Due: 22.5.2016 – 23.55

Objective:

In this project it is asked to implement a tool that can design reactive power compensation units for 3-phase systems based on the given specifications in MATLAB environment. The tool should not be case specific (you should be able to run your tool on different systems).

Project Description:

For this project the following information will be provided in two different input files.

- 1) Network connectivity and parameters
- 2) Daily load curves of each customer

By using this information the developed tool should be able to evaluate the following cases and find the required capacitor and/or inductor capacity with minimum cost required to satisfy the defined limits.

CASE 1: on-site compensation (each load is compensated assuming there is no other load connected to the system).

CASE 2: compensation at substation (compensate all the reactive power demand assuming a single compensation unit is located at the substation)

Limits: power factor should be higher than 0.98 for inductive loads and higher than 0.95 for capacitive loads.

The following should be compared between the cases.

- the voltage drop at loads
- the power factor as seen at the transformer substation
- the line loadings

Graphical User Interface (GUI):

It is required to create a “Graphical User Interface” in MATLAB. Each student should design his/her own GUI considering the input files and outputs to be displayed.

Results:

- You should submit your report via ODTUClass in pdf format.
 - Report should explain how you designed the tool (state assumptions, solution procedure etc.)
 - Report should include results corresponding to the provided sample case.
 - Report should contain your comments about the results

- Report should include your m-file solution in the appendix.
 - Report should propose a protection scheme in the appendix.
- You should submit your m-file via ODTUClass
- You should prepare a 5 minute-long demo-presentation. Randomly selected student will present their project during the lecture hours in the last week. (presentation grade will replace the quiz with lowest grade)
- Your m-files will be evaluated with a set of input files, which are different than the ones provided to you (different number of loads, different loads curves, etc.)

* Group projects are allowed, with a 10% penalty per extra person (e.g. a group of 2 will be evaluated over a total of 90 points and a group of 3 will be evaluated over a total of 80 points, etc.)