

POWER FLOW ANALYSIS ON ADDITIONAL LOAD OF REFINERY AND UTILITY UNITS IN OIL AND GAS HUMAN RESOURCES DEVELOPMENT CENTER (PPSDM MIGAS) CEPU

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ABSTRACT

In an electric power system, a reliable electrical system is needed and is able to operate optimally under any conditions. Voltage that does not meet normal limits can be categorized into undervoltage or overvoltage. One way to help fulfill the basic requirements of service to consumers in this case is the Cepu Oil and Gas PPSDM electrical system, namely by improving the electrical system so that it is more optimal in operation, and knowing the maximum load limit that can be installed on each unit and all units are not undervoltage in both marginal and critical conditions. The methods used to mitigate undervoltage are tap changers and capacitor banks. The results obtained from this study after changing the value of the tap on the transformer and adding the capacitor bank, there are 5 additional load models that are operated, namely: Model 1 adding 100KVA lump load installed in 4 units, with a total load of 400KVA. Generator 1 and generator 8, the safe limit for adding a load is 40% operating a lump load of a total load of 400KVA or 160KVA, generator 2, the safe limit for adding a load is 200KVA. Model 2 adds a 400KVA lump load installed in the refinery unit. Generator 1 and generator 8, the safe limit for adding a load is 40% of operating a lump load of a total load of 400KVA or 160KVA, generator 2, the safe limit for adding a load is 200KVA. Model 3 adds a lump load of 400KVA which is installed in the Boiler unit. Generator 1, generator 2 and generator 8 have a safe limit for adding a load of 20% operating a lump load from a total load of 400KVA or 80KVA. Model 4 adds a 400KVA lump load installed in the WTP unit. Generator 1 and generator 8, the safe limit for adding a load is 40% of operating a lump load of a total load of 400KVA or 160KVA, generator 2, the safe limit for adding a load is 200KVA. Model 5 adds a lump load of 400KVA which is installed in the power plant unit. Generator 1, generator 2 and generator 8 have a safe limit of additional load, which is 30% of operating a lump load of a total load of 400KVA or 120KVA.

Keywords: *Electrical System, Load Addition, Undervoltage Mitigation*