Experiment 4 - Rankine Cycle

Questions

1. Plot the following parameters as a function of time:
   a Boiler pressure
   b Boiler temperature
   c Turbine inlet and output temperature (on the same graph)
   d Turbine inlet and output pressure (on the same graph)
   e Generator current (load)
   f Generator voltage
   g Turbine RPM
   h Fuel flow rate
2. On the plots above, identify the beginning and the end of the steady state (SS) process (this should correspond to the scan count you noted during the experiment). Determine the total time for the steady state process.
3. From the plot of steady state run data, identify the steady state system parameters for the analysis. Record these into the data sheet provided.
4. Calculate the heat transferred from the boiler during the SS process based on the boiler temp & pressure. Do the same using the fuel rate; compare the two and comment on the agreement and/or discrepancy.
5. Find out the efficiency of 'Rankine Cycler' steam turbine. Discuss and compare this value with that of an actual steam power plant.
6. Find out the efficiency of condenser.
7. Find the overall efficiency of the Rankine Cycler steam turbine system. How does the performance of the turbine and the entire system change with applied load and boiler pressure? Discuss various methods to improve the overall efficiency of the system.