

SCHOOL OF ENGINEERING

ERROR ANALYSIS OF EXPERIMENTAL DATA
AND ITS APPLICATION ON AN ACTUAL
SOLAR WATER HEATER PERFORMANCE
MEASUREMENTS

PROJECT FINAL REPORT

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Abstract

As we know, when we are doing the experiments, we always can't get the value or result exactly same to the result that we get from the theoretical calculations. Because it has some errors occur in the instruments or from the person who is doing the experiment. As an engineer or scientist, we know the precision and accuracy in the experiment is very important, so we need to analyze the experimental data from the instruments to check the instruments reliability. This method is called 'Error Analysis'.

If the error analysis is not performed on the experimental data then, we can't know the precision and accuracy of the experiment. If the errors occur in the experiment are bigger than the standard error range, it means the experiment's result is not reliable. Since the calibration of the components are always has an error and its value is not completely same as the true value. When the error is in the standard error range, we will consider it as a reliable reading. A good example is the tolerance in the resistors, if the resistor value of is bigger or smaller to its tolerance resistor value, this resistor is not reliable. So, if you want to make sure that the experimental data is reliable, then an experimental error analysis should be conducted.

In this project, it is aimed to make an analysis for the errors occurred during experimental measurements. The error analysis will apply on the experimental data obtained from an actual solar water heater used in Malaysia.