ME 451

Fall 2008

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ME 451Formal Reports

Things to watch for in the formal reports

The things to watch for

- The instructions that are spelled out
- The instructions that are verbalized
- The formats that you are given

The Lab Manual

- Read
- Read
- Read
- Read
- Ask questions
- Ask Questions
- Clarify

The Instructions Given

- The pages to cover - Say what needs to be said and STOP!!!
- Read the report before you hand it in.
- Follow ALL the written instructions in the manual.
- Find other readers.

The instructions that are verbalized

- Listen to what your TA asks for - It may be modifications to the written instructions.
- Listen because the verbal instructions may be the information you missed in the lab manual.
- Ask lots of QUESTIONS!!!!

The Formats

The Title Page	The Abstract	The Nomenclature
The Introduction	The Lab Observations	The Results
The Discussion	The Conclusions	The References

The Abstract

- The Abstract (approximately 200-250 words)
- The experiments were conducted to (don't mention anything about people – only the lab)
  _____
  _____
  _____
- The laboratories were conducted by using the following tools, materials, laws, theories
- _____
  _____
  _____
- The conclusions drawn from the laboratories were
- _____
  _____
- _____
  _____

Nomenclature

- All symbols contained in the equations (no abbreviations) in alphabetical order
- **English**
  - f = frequency
  - H(t) = heat in the mixing tank
  - h = heater core temperature
  - T = Time (seconds)
  - T(t) = mixing tank temperature
- **Greek**
  - τ = V/Q = time constant (sec)
  - ρ = density (gm/cc)

Introduction

- Prepare the reader for what is to come
- Provide needed information and incentives to read
- Give an overview of the lab
- What is your connection to the report information

In industry, processes often require control of the temperature of a fluid in a holding tank. Therefore, two experiments were performed which investigated the issues related to this control process. The first was a simulation, utilizing Matlab scripts to simulate a physical system; the second was an actual temperature control experiment involving a holding tank of water with hot and cold water inputs. The primary objective of performing this experiment was to gain an understanding of the response of a first-order system. This response was characterized by a time constant and a time delay, which were functions of the system parameters.
Some important background material that may be of importance to the reader is

The system's behavior was predicted (see Analysis) using mathematical models and then tested (see Experimental Procedure) to see how favorably the system's actual response followed the predicted response (see Results and Discussion). Conclusions based on data acquired are presented along with practical applications for utilizing the lessons learned in the laboratory.

Analysis

- Explain the equations used
- Give the reader an idea of how they are used and for what
- A list of equations means nothing, so you need to guide the reader through your explanation

Equipment and Procedure

- In simple terms walk the reader through the experiment.
- Tell the reader how you did what you did
- Tell the reader what you used to do it

Equipment and Procedures (don't COPY lab manual - approximately 2 pages – Tell about, don't tell to do

A pump is used to inject water of temperature T_{inp} into a mixing tank. The input water's temperature is controlled by selecting fluid from tank 1 at T1 or tank 2 at T2. The changing temperature in the mixing tank is sensed by a thermocouple. If the temperature in the tank is too high, the high temperature valve is closed (valve 2) and the low temperature valve is opened (valve 1). If the temperature in the tank is too low, the low temperature valve is closed and the high temperature valve is opened.
And any other equipment or computer programs used

It is perfectly okay to bullet the equipment used and then explain why it was used
•A mixing bowl
•Two ice cubes
•Three tongs
The above list of equipment was used to ……The ice cubes were of particular importance because…..

Results

- Present the readers with the information they need to see in order to understand your study.
- Explain exactly what should be seen
- Do not explain what the results mean, just what they are
- Figures and tables mean nothing if the reader does not know what is to be seen

Results (approximately 1 page)
It is important to note the following information that can be learned/shown from the data collected in the three experiments

(do not explain just tell what data were collected)
Table 1. Title

Figure 1. Title
Spend time making sure that yours readers understand what you want them to see. What are the specific things that everyone must be clear on before you present your interpretations of those happenings.
The section should show a unified set of results that do not come from each experiment but reflect a total picture of what you have discovered and what you will tell the reader.

Discussion

- You have told the reader what to look for in the figures and tables and what to be aware of in the results that you obtained.
- Now tell them what those results mean to your study and to them

Discussion/Interpretations of Results (approximately 1/2 – 1 page

The time constant of the system was in agreement with its theoretical calculated value for all the experiments performed. The same is true for all the time delays, except the t_{dly} for the long process delay loop. The actual delay time was 25 sec.; the predicted delay time was 60 sec. (Notice how the results are explained) **This is probably due to the fact that the water in the delay tube was hot water from the previous experiment, not cold water as the equation assumed. Since the water temperature in the tube was higher than predicted, its effect on the mixing tank water was quicker and more profound (Figure 12).**

Conclusions (use 1.2.3.form to indicate your conclusions from the experiment)

The following conclusions are supported by the results of these experiments:

1. The time constant of a physical system is independent of the time delay for said system and vice-versa.
2. Temperatures above 104 C will cause material degeneration.

The Final Steps

- Read for content - is it all there?
- Read for clarity - could I have said it more clearly?
- Read for grammatical correctness
- Read for brevity - is it as short as I can make it?
- Read for style - can it be improved?

Plagiarism

- You've heard it!
- You've seen it!
- You WILL avoid it!

Plagiarism defined

- The act of using anything that belongs to someone else without his/her permission and or giving him/her credit for the item.

(The really simple definition!)

Beware

- Copying is only one of the problems
- Making people think you created something when you didn't is Plagiarism.
- Always give credit to others' work.

Questions????