

EE/CprE/SE 492 WEEKLY REPORT 2 (2/1/2020 – 2/13/2020)

Group number: sdmay20-27

Project title: Gauss Sensor for Magnet Array Filter

Client: Dennis O'Neel

Advisor: Dr. Mani Mina

Team Members/Role:

Muhammad Lutfi Latip -Team Manager

Irfan Rafie – Test Engineer

Vishal Patel – Meeting Scribe

Muhammad Aiman Zulkefli – Research manager

Wei-nee Long – Report Manager

o Weekly Summary

The team collected multiple data which include baseline values and incremental values of contaminants. These sets of data will help us determine the type of sensor that could be used for our final prototype. In addition, these tests will also help us identify defects and improve our product.

o Past week accomplishments

1) Determining the suitable amount of iron particles to be used in testing

- The team has decided to start the testing with 3 grams of iron particle.
- We are not sure if the effect of 3 grams of iron particles can be detected by the sensors.

- Also, once the iron particle is in the oil system, it is impossible to remove or reduce the number of iron particles from the oil system. Hence, we are starting from a low amount of iron particle, which is 3 grams, then 6 grams and 9 grams.
- If 3-9 grams of the iron particle has too little effect on the sensor reading, we will continue to increase the amount of the iron particle we are putting into the system to obtain interpretable data.

2) Determining the appropriate methods to obtain the most accurate sensor reading

- After consulting the team advisor, we have decided to take the sensor reading three times at three separate days to ensure that the measurements we have gotten from our sensors are consistent.
- Hence, we are in the process of collecting data on the effect of different amounts of iron particles on 12 different days.
- The following table is our schedule on data collection.

	A	B	C	D	E
1	31/1	FRIDAY	lutfi, irfan, aiman	baseline	
2	1/2	SAT	lutfi, vishal	baseline	
3	2/2	SUN	lutfi	baseline	
4	3/2	MON	aiman	3g	ADD CONTAMINANTS 3g
5	4/2	TUE	irfan		
6	5/2	WED	weinee		
7	6/2	THU	vishal	6g	ADD CONTAMINANTS 3g
8	7/2	FRIDAY	weinee		
9	8/2	SAT	aiman		
10	9/2	SUN	vishal	9g	ADD CONTAMINANTS 3g
11	10/2	MON	weinee		
12	11/2	TUE	irfan		

3) Discovering that the stirrer and the plate used to mix the iron particle into the oil is magnetic

- While setting up the test bench, the team has decided to use a stirrer and a metal plate to help to mix the iron particle evenly into the oil.

- However, later during the testings, we have discovered that the stirrer and the metal plate is magnetic and has attracted most of the iron particles to stick on the stirrer.
- The team has then decided to not use the stirrer and the plate to mix the iron particle into the oil. Instead, the team has decided to do the testing with a longer period to ensure that the iron particle are in the system when the measurement is taken.

o Pending issues

- 1) PVC ring cannot hold the sensors firmly in one place:
 - Surface-mount-method is proposed
 - The team has decided to launch the testing with the sensor directly attached to the collar to first decide on the most suitable sensor to use.
 - However, the holding of sensors on the gasket would be an issue in the future once the type of sensors to be used is decided.
- 2) Determining the best model of sensors to be used:
 - Testings are being launched to collect more data

o Individual contributions

NAME	INDIVIDUAL CONTRIBUTIONS	HOURS THIS WEEK	HOURS CUMULATIVE
Muhammad Lutfi	<ul style="list-style-type: none"> - Setting up meetings with the client - Collection of data during assigned shifts. - Devising testing plan. 	36	108

Irfan Rafie	<ul style="list-style-type: none"> - Collection of data during assigned shifts - Devising testing plan. 	36	108
Vishal Patel	<ul style="list-style-type: none"> - Improvising the design of the board to make it smaller in order to fit into the collar - Collection of data during assigned shifts 	36	108
Muhammad Aiman	<ul style="list-style-type: none"> - Collection of data during assigned shifts - Devising testing plan. 	36	108
Wei-nee Long	<ul style="list-style-type: none"> - Setting up the test bench - Setting up meetings with advisor and instructor - Writing Biweekly Report 2 	36	108

o Plans for the upcoming week

- 1) Collection of more data from testing
 - a) The team should determine the max threshold value that the filter could handle.
- 2) Determine the best sensor model to be used for our product
- 3) Identify the best sensor orientation that could give accurate values.
 - a) The hall effect sensors depends on the amount of magnetic flux that passes through it.
- 4) Interpretation of the data collected

