



**Internship Report 2020**  
**(Managing Forecast and Actual Demand of MG3DF)**



**PETRONAS**

**PETRONAS Lubricants International Sdn Bhd**

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Date: 22th July 2020



Declaration of Original Work Bachelor of Business Administration (Honours)  
International Business  
Faculty of Business And Management Universiti Teknologi MARA  
“Declaration of Original Work”

I, (Aisyah binti Shabri), (I/C Number: \_\_\_\_\_) hereby, declared that:

- This internship report has not previously been accepted in substance for any degree, locally or overseas, and is not being concurrently submitted for this degree or any other degrees.
- This internship report is the result of my independent work and investigation, except where otherwise is stated.
- All verbatim extracts have been distinguished by quotation marks and sources of my information have been specifically acknowledged.

Signature: *Aisyah*

Date: **22th July 2020**

## Table of Content

<b>No.</b>	<b>Items</b>	<b>Pages</b>
<b>1.0</b>	<b>Company Profile</b>	<b>1 – 3</b>
<b>2.0</b>	<b>Issues Identification</b>	<b>4 – 5</b>
<b>3.0</b>	<b>Research Objectives and Research Questions</b>	<b>6</b>
<b>4.0</b>	<b>Scope of the Study</b>	<b>7</b>
<b>5.0</b>	<b>Relevant Literature Review</b>	<b>8</b>
<b>6.0</b>	<b>Research Methodology</b>	<b>9</b>
<b>7.0</b>	<b>Findings and Analysis</b>	<b>10 – 15</b>
<b>8.0</b>	<b>Discussions</b>	<b>16 – 17</b>
<b>9.0</b>	<b>Recommendations</b>	<b>18</b>
<b>10.0</b>	<b>Conclusion</b>	<b>19</b>
<b>11.0</b>	<b>Significances</b>	<b>20</b>
<b>12.0</b>	<b>Self-Reflection</b>	<b>21</b>
<b>13.0</b>	<b>References</b>	<b>22</b>
<b>14.0</b>	<b>Appendices</b>	<b>23 – 29</b>

## 1.0 Company Profile

### 1.1 Company Background

Established in 2008, PETRONASs Lubricants International (PLI), is one of the players that bring PETRONAS Group into lubricants industry globally. PLI Operates in more than 28 countries worldwide and currently ranked among the top 10 of PETRONAS subsidiaries companies. Besides, PLI is driving an aggressive business growth agenda to secure its position as a leading global lubricants company at the forefront of the industry. This has made PLI as one of PETRONAS marketing arm in lubricants industry.

### 1.2 Vision

- To be a leading oil and gas multinational of choice. It is hoping to become a worldwide known organization and the first choice among all other oil companies present so far.

### 1.3 Mission

- To develop and add value to petroleum resources wherever it operates, converting these resources into higher-value products that would satisfy the needs of customers and bring benefits to the people.

### 1.4 Service and Products

- Motoring



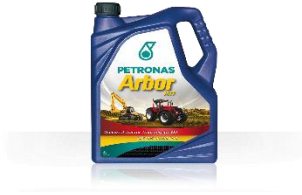
- Motorsport



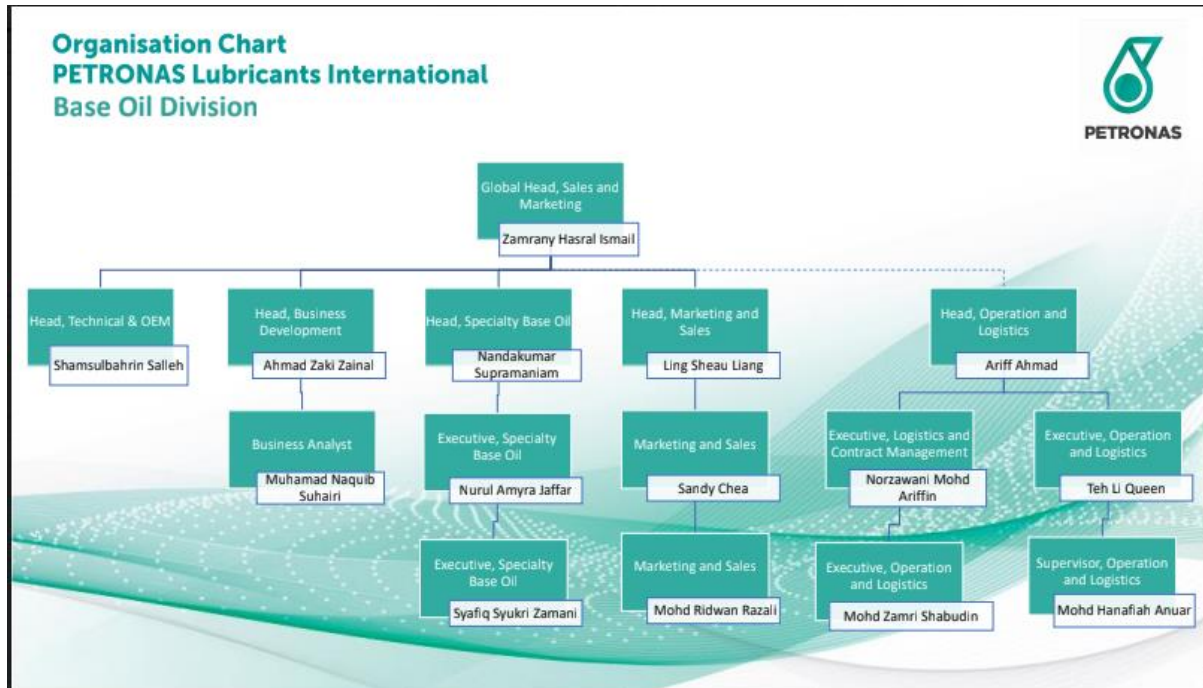
- Industrial Lubricant



- Agriculture



## 1.5 Organizational Structure



Petronas Base Oil Malaysia Sdn Bhd (PBOM) is initially founded in year 2008 with selling and trading business of base oils that produced in Melaka Refining Company Sdn Bhd (MRC SB). Later in 2018, the company has been substituted into PLI becoming a marketing unit for base oils activities. Spearheaded by Mr Zamrany Hasral Ismail as the Global Head, the base oil team is comprising of a group of committed employees that promotes and operates the whole these oils activities. They are divided into several sub-units which are Technical & OEM, Business Development, Specialty Base Oil, Marketing & Sales and Operation & Logistics. Each of the units is comprised with experienced staffs that cooperate with other units to deliver the most effective oils deal.

## **2.0 Issues Identification**

### **2.1 Introduction: Managing Forecast and Actual Demand of MG3DF**

Base oil is the initial grade oils that are produced from refined crude oil through chemical synthesis. In lubricant industry, base oil is useful in manufacturing products that include greases, motor oil and metal processing fluids. Melaka Group III Drilling Fluid (MG3DF), is one of PETRONAS base oil products. It delivers competitive advantages in challenging drilling environment and safe to be used with minimal health, safety, and environmental impact. With production capacity rate of 450, 000 barrels per year, Drilling Fluid (DF) is advanced lubricants to deliver superior performance in wells drilling. Since PETRONAS base oil group aim to maximize profits, the firm must maximize benefits and minimize costs along demand of MG3DF. Despite the importance of MG3DF in delivering competitive advantages to the end consumer, it contains challenges in managing forecast and actual demand of MG3DF.

### **2.2 Issues Identification**

Due to industry developments and advanced technologies, base oils are highly required by PETRONAS Lubricants International's (PLI) stakeholders. Oil and gas companies are forced to maintain higher safety stocks and search for alternative sources of supplies due to highly unpredictable sustainable oil supply (Ikram, 2004). Due to the single source of supply of MG3DF, PLI need to find another alternative source of supply to meet customer demand. Forecast and actual demand of MG3DF are also affected with logistical challenges. The logistics network in the petroleum industry is highly inflexible, which arises from the production capabilities of crude oil suppliers, long transportation lead times, and the limitations of modes of transportation. Every point in the network, represents a major challenge (Gareth P. Jenkins, 1998). Moreover, according to Svetlana Lisitsa (2019), this also includes warehousing and any types of intangible and material operations that take place before the moment when the goods or a resource will be delivered to the desired point. In 2019, MG3DF were having two logistical challenges which are refinery turnaround issue and inventory issue that hurts the forecast and actual demand of MG3DF. According to one of the Executive of Specialty Base Oil, Mr. Syafiq, both refinery turnaround and inventory issue affected the forecast lifting volume of MG3DF (Zamani, 2019). Referring to 2019 Consumption Forecast Vs Actual Data, MG3DF were having inventory issue in June, July and October where HESS (one of MG3DF's customer) failed to follow the forecast as per planned. In December 2019,

REPSOL (one of MG3DF's customer) taking ESCAID (MG3DF's alternative source of supply) stock about 1901bbls due to refinery turnaround issue. Refinery turnaround issue resulting to delayed in shipping and suppliers failed to stock up the product as the demand is high. To add on, once product is available at refinery, the vessel failed to arrive at supply base right on time. The frequency of actual lifting similar with forecast lifting is 2 compared to the frequency of actual lifting dissimilar with forecast lifting is 34.



### **3.0 Research Objectives and Research Questions**

#### **3.1 Research Objectives**

The research objective of this study is to identify the discrepancy between forecast and actual demand of MG3DF. The second research objective of this study is to identify the capability of MG3DF to deliver demand as per requested.

#### **3.2 Research Questions**

The research question of the study is to answer is there any discrepancy between forecast and actual demand of MG3DF? The second research question of the study is to answer is MG3DF capable to deliver demand as per requested?

#### **4.0 Scope of the Study**

The purpose of this study is to manage forecast and actual demand of MG3DF. Time series is used in this study where it is a sequence of information that attaches a time period to each value. The data in the study describes monthly forecast and actual lifted volume of MG3DF in 2019 for each Petroleum Agreement Contractors (PACs). The period of the Data used in this study was 12 months and it consist of 3 companies which are HESS, PCSB and REPSOL. Topics that will be discussed in this report is Managing Forecast and Actual Demand of MG3DF, which is one of PLI Base Oil's product. Study was carried out at PETRONAS Lubricants International. This is limited to the geographical area of the city of Kuala Lumpur. This study was conducted by using secondary data. The researcher has used journals, company's annual report, research papers and internet as secondary data in this study.

## 5.0 Relevant Literature Review

Melaka Group III Drilling Fluid (MG3DF), is one of PETRONAS base oil products. It delivers competitive advantages in challenging drilling environment and safe to be used with minimal health, safety, and environmental impact. With production capacity rate of 450, 000 barrels per year, MG3DF is advanced lubricants to deliver superior performance in wells drilling. Researchers agreed that steadily increasing global demand for oil has enabled companies providing these products to reach more customers and increase their market share and profitability (Svetlana Lisitsa, 2019).

Studies have found that oil and gas companies are forced to maintain higher safety stocks and search for alternative sources of supplies due to highly unpredictable sustainable oil supply (Ikram, 2004). Due to single source of supply of MG3DF, PLI need to find another alternative source of supply to meet customer demand. As for MG3DF, its alternative supply consists of ESCAID, which the product is supplied from Singapore. Technically, the product specifications are different from MG3DF, but the quality is almost identical. PLI will use ESCAID once MG3DF run out of stock.

A study conducted by Gareth P. Jenkins (1998) found that the logistics network in the petroleum industry is highly inflexible, which arises from the production capabilities of crude oil suppliers, long transportation lead times, and the limitations of modes of transportation. Every point in the network, therefore, represents a major challenge. According to Svetlana Lisitsa (2019), this also includes warehousing and any types of intangible and material operations that take place before the moment when the goods or a resource will be delivered to the desired point. In 2019, MG3DF were having two logistical challenges. First is refinery turnaround issue. Refinery turnaround issue resulting to delayed in shipping and firm failed to stock up the product as the demand is high. To add on, once product is available at refinery, the vessel failed to arrive at supply base right on time. Next is inventory issue. Every month, PLI customer will share their forecast lifting plan for MG3DF. But sometimes, customer not following the forecast plan as shared resulting to inventory issue. PLI will need to find tank to store the product.

## **6.0 Research Methodology**

### **6.1 Types of Data**

This study was conducted by using secondary data. The researcher has used journals, company's annual report, research papers and internet as secondary data in this study. Time series is used in this study where it is a sequence of information that attaches a time period to each value. The data in the study describes monthly forecast and actual lifted volume of MG3DF in 2019 for each Petroleum Agreement Contractors (PACs). The period of the Data used in this study was 12 months where it consists of 3 surge demand customers which is PCSB, HESS and REPSOL. The unit of volume used in the Data is in Barrels (bbls).

### **6.2 Descriptive Analysis**

Descriptive Analytics is used in this study where it is to understand past and current business performance and make informed decisions. The method used to analyse the Data are Pivot Table, Pivot Chart and Measures of Central Tendency.

Pivot Table is a summary of the data, that includes sums, averages and other statistics in a more simplify way. While, Pivot Chart is the visual representation of a pivot table in excel. Measures of central tendency describes the summary statistics for center point or typical value of the data which consist of Mean, Median and Mode. Mean represents the average of the data. Median represents the value that is in the middle of the data. It is the value that splits the dataset in half. Mode represents the value that occurs the most in the data.

## 7.0 Findings and Analysis

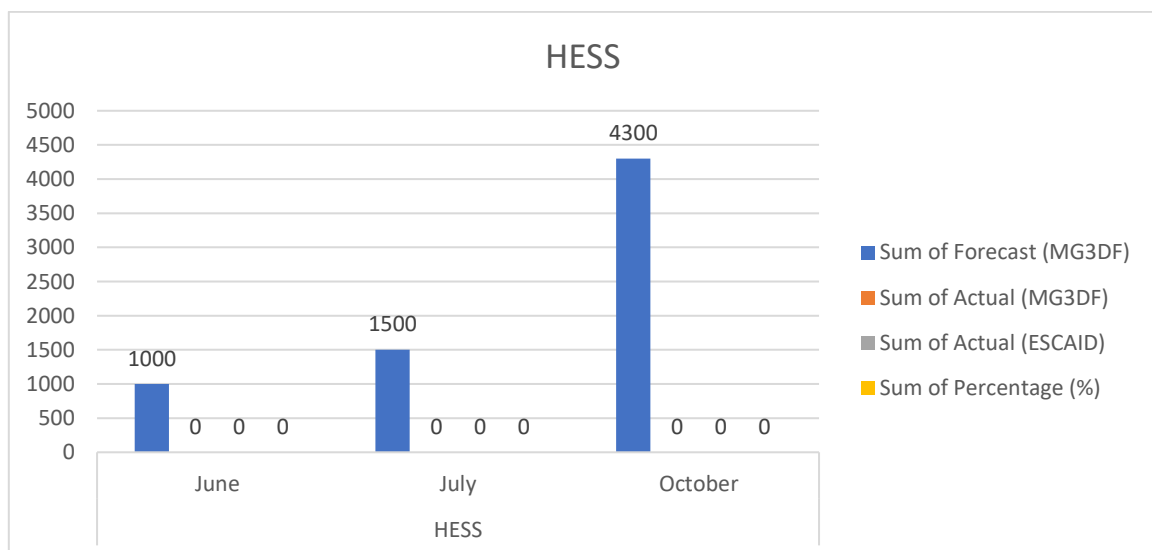
### 7.1 Report Pivot Table (Actual Value)

Overall consumption for HESS shows the sum of MG3DF forecast is 25650bbbls and the actual forecast for MG3DF is 16513bbbls.

Row Labels	Sum of Forecast (MG3DF)	Sum of Actual (MG3DF)	Sum of Actual (ESCAID)	Sum of Percentage (%)
<b>HESS</b>	<b>25650</b>	<b>16513</b>	<b>0</b>	<b>825.8</b>
January	850	850	0	100
February	2700	1100	0	40.74
March	2000	1470	0	73.5
April	1000	1250	0	125
May	1000	700	0	70
June	1000	0	0	0
July	1500	0	0	0
August	1500	800	0	53.33
September	1500	2503	0	166.87
October	4300	0	0	0
November	3100	3500	0	112.9
December	5200	4340	0	83.46

MG3DF were having inventory issue in June, July and October 2019 where HESS failed to follow the forecast as per planned.

Row Labels	Sum of Forecast (MG3DF)	Sum of Actual (MG3DF)	Sum of Actual (ESCAID)	Sum of Percentage (%)
<b>HESS</b>	<b>6800</b>	<b>0</b>	<b>0</b>	<b>0</b>
June	1000	0	0	0
July	1500	0	0	0
October	4300	0	0	0



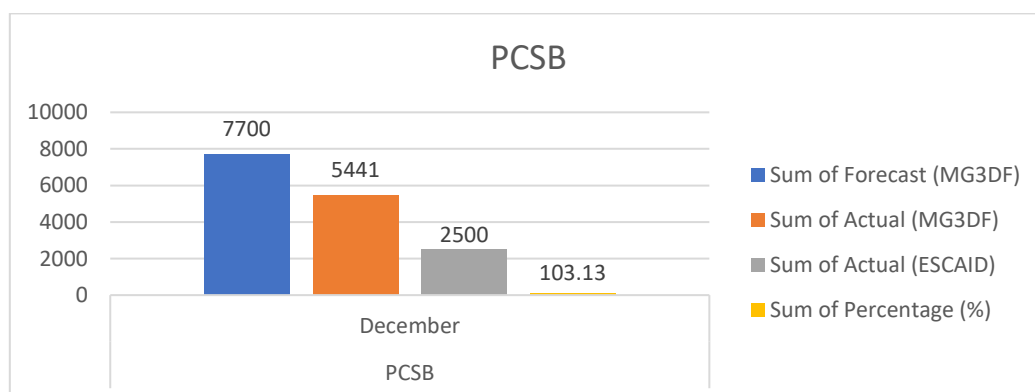
The simplify Pivot Table and Graph for HESS above shows how there are discrepancy in June, July and October due to inventory issue. For example, in June and July, HESS were supposed to lift 1000bbls and 1500bbls but instead the actual lifting is 0. In October, HESS were supposed to lift 4300bbls, but the actual lifting is 0.

For PCSB, overall forecast consumption for MG3DF is 63106bbls and the actual MG3DF consumption is 64005bbls. Due to high demand from them, the actual plan exceeds the forecast plan for about 899bbls. The overall data also shows the discrepancy between forecast and actual consumption for PCSB.

PCSB	63106	64005	2500	1657.35
January	7206	6947	0	96.41
February	1300	2650	0	203.85
March	4000	3572	0	89.3
April	3500	3900	0	111.43
May	4000	2600	0	65
June	2300	10402	0	452.26
July	3200	7284	0	227.63
August	3300	3400	0	103.03
September	4500	3041	0	67.58
October	10400	10770	0	103.56
November	11700	3998	0	34.17
December	7700	5441	2500	103.13

At the end of the year, MG3DF usually will be running out of stock to cover up the stock for early and middle of the year. Since MG3DF is a single source of supply, they need to back up with their alternative supply to meet customer demand. There is additional lifting for ESCAID in December 2019 which is 2500bbls due to run out of MG3DF stock.

Row Labels	Sum of Forecast (MG3DF)	Sum of Actual (MG3DF)	Sum of Actual (ESCAID)	Sum of Percentage (%)
PCSB	7700	5441	2500	103.13
December	7700	5441	2500	103.13

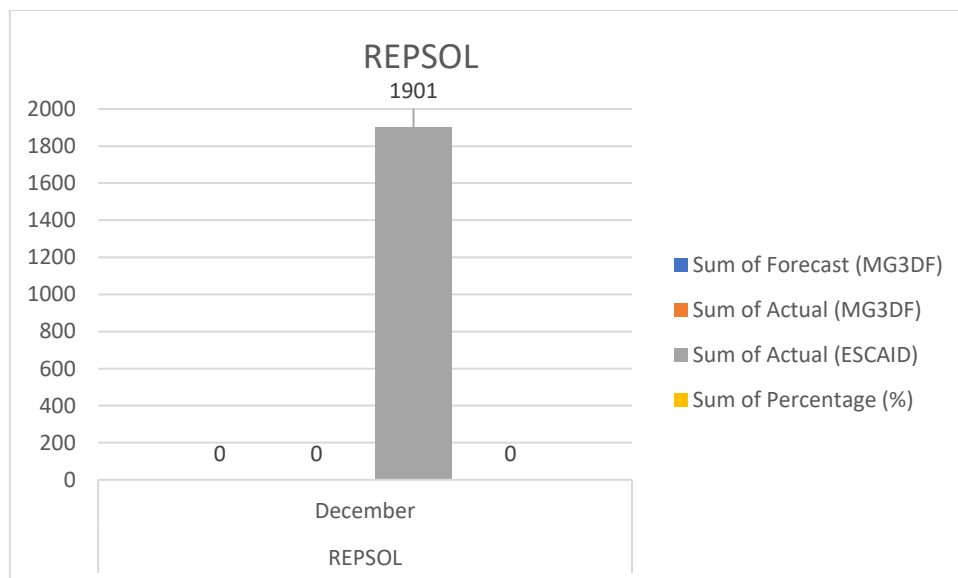


For REPSOL, overall forecast consumption for MG3DF is 11400bbls and the actual MG3DF consumption is 9351bbls. The overall data also shows the discrepancy between forecast and actual consumption for REPSOL.

REPSOL	11400	9351	1901	656.05
January	400	400	0	100
February	2000	0	0	0
March	2000	1000	0	50
April	1000	0	0	0
May			0	0
June	1000	1300	0	130
July	1000	1150	0	115
August	1000	1400	0	140
September	1000	400	0	40
October	2000	1621	0	81.05
November	0	2080	0	0
December	0	0	1901	0

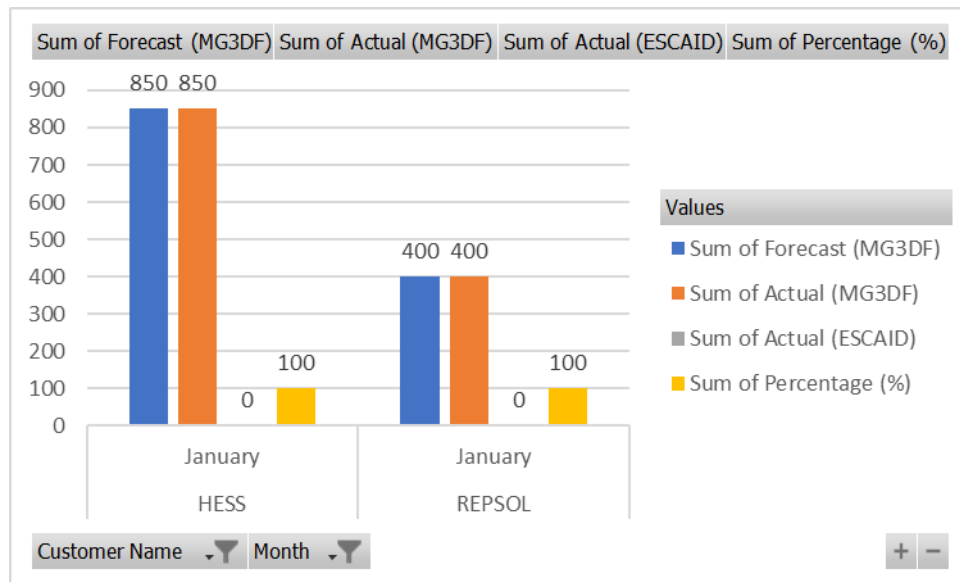
REPSOL taking ESCAID stock about 1901bbls in December 2019 due to refinery turnaround issue. Refinery turnaround issue resulting the supplier failed to stock up the product as the demand is high. Hence, MG3DF used their alternative resource which is ESCAID to replace MG3DF. To add on, once product is available at refinery, the vessel failed to arrive at supply base right on time.

Row Labels	Sum of Forecast (MG3DF)	Sum of Actual (MG3DF)	Sum of Actual (ESCAID)	Sum of Percentage (%)
REPSOL	0	0	1901	0
December	0	0	1901	0



However, MG3DF is still capable to deliver demand as per requested by customer.

Row Labels	Sum of Forecast (MG3DF)	Sum of Actual (MG3DF)	Sum of Actual (ESCAID)	Sum of Percentage (%)
HESS	850	850	0	100
January	850	850	0	100
REPSOL	400	400	0	100
January	400	400	0	100

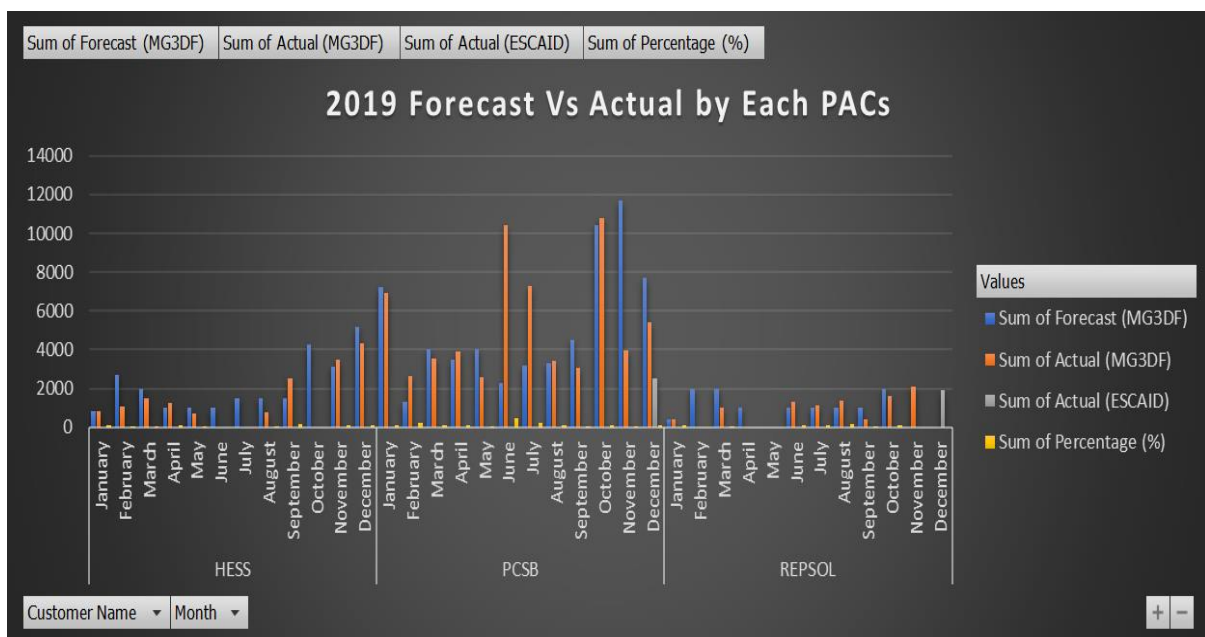


The simplify Pivot Table and Graph above shows how MG3DF manage to deliver demand as per requested by HESS and REPSOL in January. The lifting forecast consumption are 850bbbls and 400bbbls respectively. This clearly shows how MG3DF capable to fulfil the demand to requested by customer.



## 7.2 Report Pivot Chart (Actual Percentage)

The bar graph shows 3 PLI customers that purchased DF monthly from January until December 2019. The blue graph indicates the sum of forecast for MG3DF, the orange graph indicates the sum of actual for MG3DF, the grey graph indicates the sum of actual for ESCAID and the yellow graph indicates sum of percentage. The overall percentage for HESS is 825.8%. For PCSB, the overall percentage of the product is 1657.35%. For REPSOL, the overall percentage of the product is 656.05%. Hence, making the grand total of percentage by all PACs is 3139.2%.



### 7.3 Report the Measures of Central Tendency

The researchers used Measures of Central Tendency to summaries and describe the center point or typical value of the data. In 2019 Consumption Forecast Vs Actual Data, the value of the Mean is 1834.21. This is to describe what is the actual average of the value in overall 2019 Consumption Forecast Vs Actual Data. Next, in 2019 Consumption Forecast Vs Actual Data, the value of the Median is 1000 where this value indicates the center point in the data. This is a very helpful measure to determine the value that is in the middle of the Data. Lastly, in 2019 Consumption Forecast Vs Actual Data, the value of the Mode is 0 where it indicates the value of ESCAID. The Mode is useful when there are a lot of repeated values in a dataset.

	Values
Mean	<b>1834.207547</b>
Median	<b>1000</b>
Mode	<b>0</b>

## 8.0 Discussions

For the study as described above, it shows clear image the issue and challenges in managing forecast and actual demand of MG3DF. Referring to the first research objectives, which is to identify the discrepancy between forecast and actual demand of MG3DF. For example, there are discrepancy in June, July and October 2019 for HESS where HESS not followed the forecast consumption as per agreed with supplier. In June and July, HESS were supposed to take 1000bbls but instead there is no lifting as per planned. Same in October, HESS were supposed to take 4300bbls but instead there is no lifting as per planned.

Next, referring to the second research objectives, which is to identify the capability of MG3DF to deliver demand as per requested. Despite with all the challenges, MG3DF is capable to meet customer demand. For example, in January, MG3DF manage to deliver the product to HESS and REPSOL as per forecast consumption where both volumes are 850bbls and 400bbls respectively.

Besides, referring to the first research question, which is to answer is there any discrepancy between forecast and actual demand of MG3DF? Referring to 2019 Consumption Forecast Vs Actual Data, there are discrepancy as shown in the Data. The reasons of the discrepancy of the data are due to the single source of supplies and logistical challenges issues. Since MG3DF is a single source of supply, they need to back up with their alternative supply to meet customer demand which is ESCAID. In December 2019, PCSB taking ESCAID for about 2500bbls due to run out of MG3DF stock. The value of the forecast consumption of MG3DF, actual consumption of MG3DF and actual consumption of ESCAID are not tally with each other. This shows how there are discrepancy in the Data.

The reasons of logistical challenges are due to inventory issues and refinery turnaround issues. For example, MG3DF were having inventory issue in June, July and October 2019 where HESS failed to follow the forecast as per planned. HESS were supposed to lift 1000bbls and 1500bbls but instead the actual lifting is 0. In October, HESS were supposed to lift 4300bbls, but the actual lifting is 0. This shows how there are discrepancy in forecast and actual demand of MG3DF. Next, the refinery turnaround issues also lead to discrepancy in the Data. REPSOL taking ESCAID stock about 1901bbls in December 2019 due to refinery turnaround issue. Refinery turnaround issue resulting the supplier failed to stock up the product as the demand is

high. Hence, MG3DF used their alternative resource which is ESCAID to replace MG3DF. To add on, once product is available at refinery, the vessel failed to arrive at supply base right on time. The overall data also shows the discrepancy between forecast and actual consumption for REPSOL.

Lastly, referring to the second research question of the study, which is to answer is MG3DF capable to deliver demand as per requested? MG3DF manage to deliver demand as per requested by HESS and REPSOL in January. The lifting forecast consumption are 850bbbls and 400bbbls respectively. This clearly shows how MG3DF capable to fulfil the demand to requested by customer.

## 9.0 Recommendations

### 1) Effectively manage single source of supply

- It is important to properly reviews stock with operational suppliers. This is to ensure that firm have enough stock to offer to customers. PLI can share their best price and potential volume that they prefer to offer monthly to ensure the effectiveness of MG3DF lifting volume.

### 2) Enhance the quality of alternative supply

- ESCAID will be used whenever MG3DF is run out of stock. Technically, the product specifications are different from MG3DF, but the quality is almost identical. Building a good relationship with suppliers is a good way to enhance the quality of ESCAID. This way, both suppliers and distributors can discuss to improve the quality service and meet customer's specific needs.

### 3) Technology strategy to improve efficiency

- Implementing new technology can help logistic to run more efficiently and smoothly. For example, inventory planning system can reduce difficulty in finding storage tank and analyse real time information about sales, accurate information on stock as well as react quickly to changes in demand.

## 10.0 Conclusion

Based on the study above, we can conclude that single source of supply and logistical challenges has greatly affected in managing forecast and actual demand of MG3DF. MG3DF is a single source of supply where it delivers competitive advantages in challenging drilling environment and safe to be used with minimal health, safety, and environmental impact. Due to the high demand from customer, MG3DF alone is not enough to supply to all customers resulting PLI finding another alternative supply which is ESCAID. The logistical challenges such as inventory and refinery turnaround issue have affected the forecast and actual lifting volume of MG3DF in 2019. Inventory issues happened when customers did not follow the forecast as per agreed with MG3DF. MG3DF will need to find another tank to store the product. Refinery turnaround issues causing suppliers to take ESCAID as suppliers failed to stock up the product and the vessel failed to arrive at supply base right on time. Single source of supplies and logistical challenges issues leads to the discrepancy and the capability of forecast and actual demand of MG3DF. However, the researcher has points out 3 recommendations to manage forecast and actual demand of MG3DF beneficially. Firstly, is to effectively manage single source of supply, next is enhance the quality of alternative supply and lastly using technology strategy to improve efficiency.

## 11.0 Significances

### 1) To the organization

- The significance of the study to the organization is that PLI can point out and see the clear image the root of the problems that leads in hurting forecast and actual demand of MG3DF. With this study, the organization can consider the recommendations suggested by researcher to effectively manage MG3DF to meet customer demands.

### 2) To the employees

- The significance of the study to the employees is that employees can plan properly and discuss deeply with customers on monthly MG3DF lifting volume. Employees can also be completely aware with the issues and make a proper plan and target to at least minimize the issues from coming.

### 3) To the researcher

- The significance of the study to the researcher is that the researcher can learn new knowledges regarding Base Oil, Crude Oil and PLI business as a whole. The researcher also manages to take the opportunity with 6 month period of Internship with new experience before entering the real phase of working life.

## **12.0 Self-Reflection**

As this study has been completed, I realized how Forecast and Actual Demand of MG3DF are greatly related with the issues that have been highlighted in the study. The issues that have been highlighted in the study shows a clear image how single source of supply and logistical challenges has contributes to the discrepancy and the capability of forecast and actual demand of MG3DF lifting volume in 2019. However, MG3DF proof that it still capable to deliver demand as per requested by customers. I also learned new experience and knowledge for 6 months period of Internship at PLI. This experience thought me to be a more responsible person. I learned basic responsibilities such as being on time, maintaining a perfect attendance record, and realizing that if I did not finish my work there would be real consequences. I also went through obstacles during this Internship where all employees are directed to Work from Home until further notice due to COVID-19 pandemic. Communication with my colleagues is a real challenge since we cannot meet and communicate face to face. However, I manage to get through it by keeping a comfortable and ergonomic workplace at home. This difficult time taught me to be a grateful and a better person.



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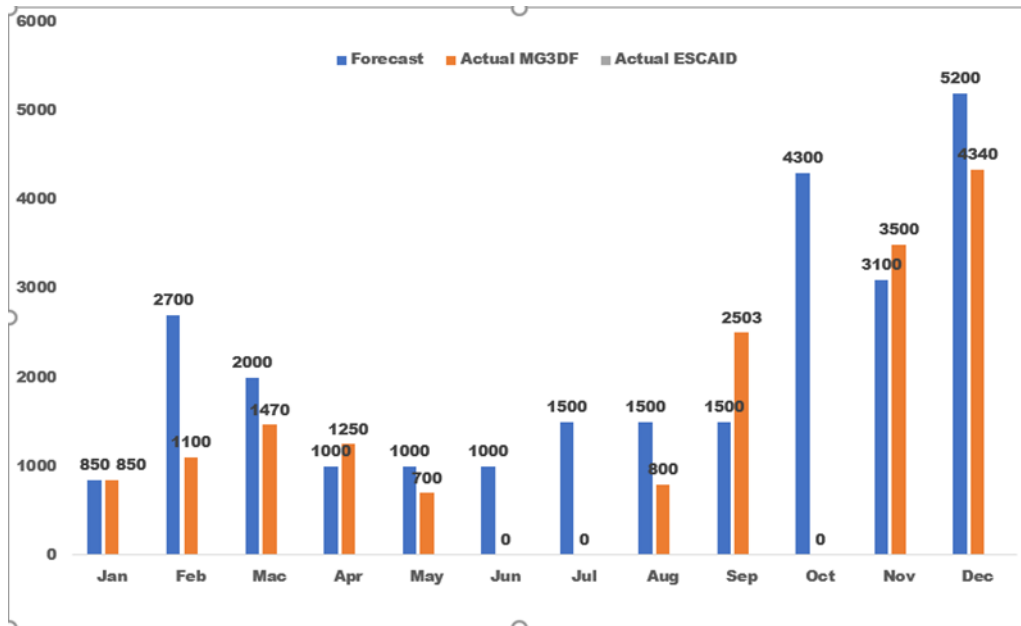
## 14.0 Appendices

### 14.1 Data from PLI

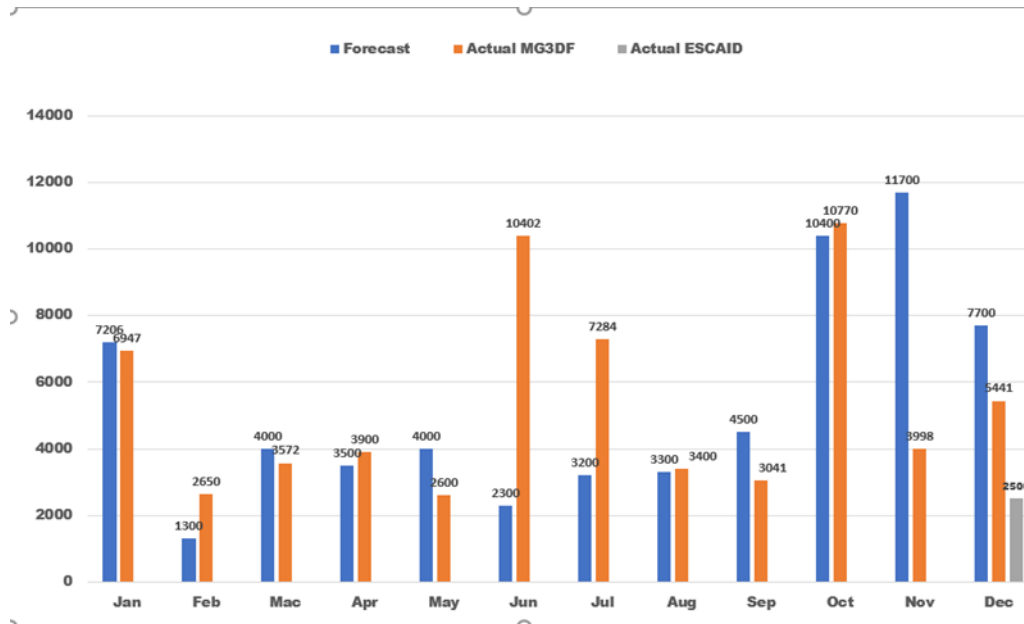
Customer Name	City	Address	Month	Forecast (MG3DF)	Actual (MG3DF)	Actual (ESCAID)	Percentage (%)
PCSB	Kuala Lumpur	Tower 1 KLCC	January	7206	6947	0	96.41
PCSB	Kuala Lumpur	Tower 1 KLCC	February	1300	2650	0	203.85
PCSB	Kuala Lumpur	Tower 1 KLCC	March	4000	3572	0	89.30
PCSB	Kuala Lumpur	Tower 1 KLCC	April	3500	3900	0	111.43
PCSB	Kuala Lumpur	Tower 1 KLCC	May	4000	2600	0	65.00
PCSB	Kuala Lumpur	Tower 1 KLCC	June	2300	10402	0	452.26
PCSB	Kuala Lumpur	Tower 1 KLCC	July	3200	7284	0	227.63
PCSB	Kuala Lumpur	Tower 1 KLCC	August	3300	3400	0	103.03
PCSB	Kuala Lumpur	Tower 1 KLCC	September	4500	3041	0	67.58
PCSB	Kuala Lumpur	Tower 1 KLCC	October	10400	10770	0	103.56
PCSB	Kuala Lumpur	Tower 1 KLCC	November	11700	3998	0	34.17
PCSB	Kuala Lumpur	Tower 1 KLCC	December	7700	5441	2500	103.13
HESS	Kuala Lumpur	Tower 2 KLCC	January	850	850	0	100.00
HESS	Kuala Lumpur	Tower 2 KLCC	February	2700	1100	0	40.74
HESS	Kuala Lumpur	Tower 2 KLCC	March	2000	1470	0	73.50
HESS	Kuala Lumpur	Tower 2 KLCC	April	1000	1250	0	125.00
HESS	Kuala Lumpur	Tower 2 KLCC	May	1000	700	0	70.00
HESS	Kuala Lumpur	Tower 2 KLCC	June	1000	0	0	0.00
HESS	Kuala Lumpur	Tower 2 KLCC	July	1500	0	0	0.00
HESS	Kuala Lumpur	Tower 2 KLCC	August	1500	800	0	53.33
HESS	Kuala Lumpur	Tower 2 KLCC	September	1500	2503	0	166.87
HESS	Kuala Lumpur	Tower 2 KLCC	October	4300	0	0	0.00
HESS	Kuala Lumpur	Tower 2 KLCC	November	3100	3500	0	112.90
HESS	Kuala Lumpur	Tower 2 KLCC	December	5200	4340	0	83.46
REPSOL	Kuala Lumpur	Ampang	January	400	400	0	100.00
REPSOL	Kuala Lumpur	Ampang	February	2000	0	0	0.00
REPSOL	Kuala Lumpur	Ampang	March	2000	1000	0	50.00
REPSOL	Kuala Lumpur	Ampang	April	1000	0	0	0.00
REPSOL	Kuala Lumpur	Ampang	May			0	0.00
REPSOL	Kuala Lumpur	Ampang	June	1000	1300	0	130.00
REPSOL	Kuala Lumpur	Ampang	July	1000	1150	0	115.00
REPSOL	Kuala Lumpur	Ampang	August	1000	1400	0	140.00
REPSOL	Kuala Lumpur	Ampang	September	1000	400	0	40.00
REPSOL	Kuala Lumpur	Ampang	October	2000	1621	0	81.05
REPSOL	Kuala Lumpur	Ampang	November	0	2080	0	0.00
REPSOL	Kuala Lumpur	Ampang	December	0	0	1901	0.00

## 14.2 Chart from PLI for each PACs

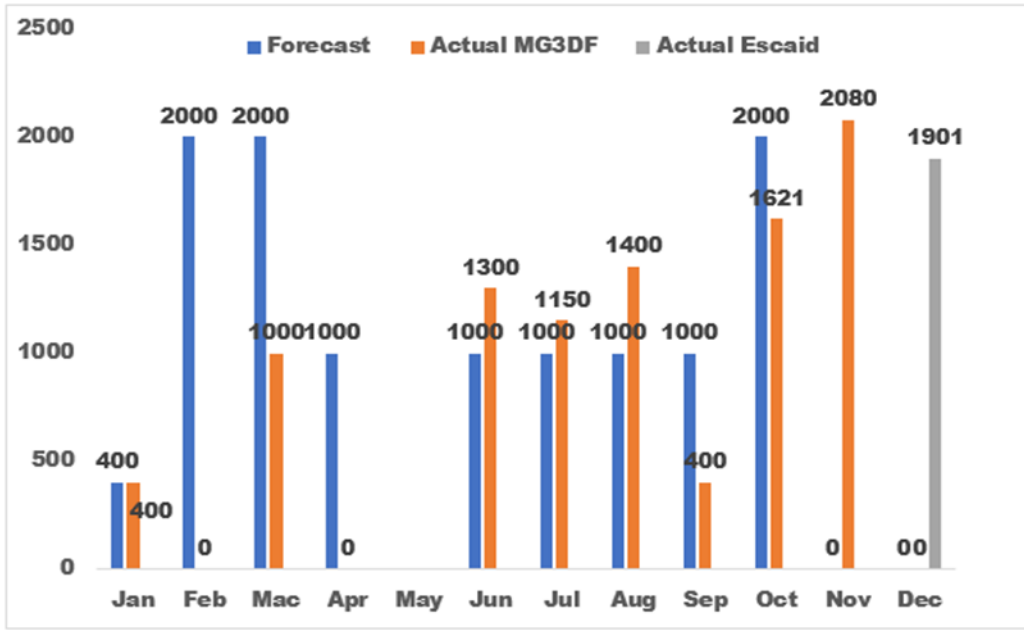
- HESS



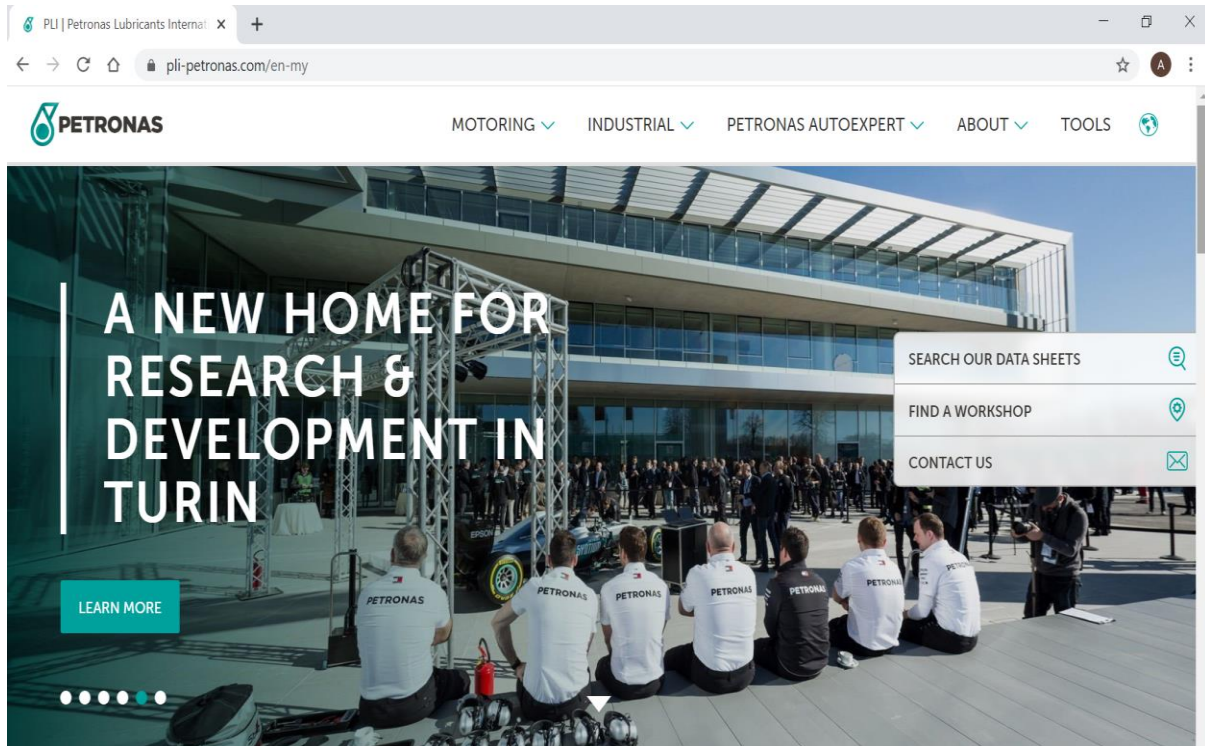
- **PCSB**



- REPSOL



## 14.3 PETRONAS Lubricants International Website



## 14.4 Journal

The image shows a PDF viewer window with the following content:

E3S Web of Conferences 110, 02061 (2019) <https://doi.org/10.1051/e3sconf/201911002061>  
*SPbWOSCE-2018*

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### Supply-chain management in the oil industry

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**Abstract.** The logistics network in the oil industry is highly inflexible, which arises from the production capabilities of crude oil suppliers, long transportation lead times, and the limitations of modes of transportation and energy planning and management. The paper considers the key factors for reducing costs and increasing the company's profits in managing supply chains: demand management, efficient distribution of petroleum products among customers, better transportation scheduling, warehouse management, and quality and timeliness of information through the automation of the supply chain. And this principle is carried out within the framework of the logistics concept of supply chain coordination - Supply Chain Management. The paper also considers advantages from implementation of supply-chain management. Implementation of supply-chain management in the oil industry can help to reduce costs, increase the company's profits in managing supply, and manage the planning of deliveries.

## 14.5 PLI 2019 Report

