



اَوْنُوْرَسِيْتِي تِيْكْنُوْلُوْجِي مَارَا
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MARA

**STATISTICAL ANALYSIS FOR CONDITION BASE MONITORING ON
AUXILIARY ENGINE**

by

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ABSTRACT

Auxiliary engines are well known for their operational robustness and efficient performance. Lube oil used by auxiliary engine need to be improved in order to increase the performance of overall availability. The oil analysis interpretation should include a discussion of the equipment wear state, level of oil contamination, oil condition and a recommendation outlining any corrective maintenance actions that are necessary. The baseline of this study involved 45 data of oil starting from month of July 2008 until December 2011. There are many methods that had been used in analyzing the data which are Pareto chart, cause and effect diagram, histogram, shewhart individual control chart, process capability analysis and multiple regression model. For the skewness normality test, all variable are remaining normal since all variable are between -3 and 3. Moreover, the histogram also shown bell shaped model which indicates that the data are normally distributed. Based from the result, for fresh oil, the percentage of viscosity at 40⁰C is 62.1%, Total Base Number (TBN) is 15.4%, flash point 12.8%, viscosity at 100⁰C is 6.7% and others are 3.0%. Overall, the most defect item in analyzing of oil is measurements during viscosity at 40⁰C follow up by TBN, flash point, water content and wear metals. However, commonly, others variables will be affected as well when the viscosity at 40⁰C is out of control because this is the main affected variable. On the other hand, using individual control charts, the oil needs to be changed to new fresh oil when time taken of oil is between 2200 and 2500 hours. During this hours, majority all the variables are out of control. There are specific limits had been documented for each variable. Next, according to the bar chart, we can conclude that iron gives the most abnormal condition to oil, followed by aluminum, copper, chromium and lead.

CONTENT

Contents	iv
List of Figures	viii
List of Tables	ix
1 Industrial training attachment	1
1.1 Background of company	1
1.1.1 PETRONAS	1
1.1.2 PETRONAS's Logo	1
1.1.3 PETRONAS Lubricants International Sdn. Bhd. (PLISB) ...	2
1.1.4 PLISB's Logo	3
1.1.5 Malacca Lube Blending Plant (MLBP)	3
1.1.6 Vision	4
1.1.7 Mission	4
1.2 Layout of PLI	5
1.3 Organizational Structure	6
1.3.1 Staff Organizational Structure (Asia Division)	6

1.3.2	Sales and Technical Department	7
1.4	Facilities	8
1.4.1	Headquarters of PLISB	8
1.4.2	Malacca Lube Blending Plant (MLBP)	8
1.5	Staff Amenities	9
1.5.1	Working Hours	9
1.5.2	Medical Treatments	9
1.5.3	Telecommunication, Intranet Connector & Software	10
1.5.3.1	Novell	10
1.5.3.2	SAP ERB	11
1.5.4	Security Services	11
1.5.5	Pantry	12
1.5.6	Musolla	12
1.5.7	Reading Material	12
1.5.8	Library	13
1.6	Description of Work Engaged	14
2	Introduction	15
2.1	Study Background	15