



اَوْنِوَرَسِيْتِي تِي كُونُو لُو كِي مَارَا  
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MARA

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

by

NUR HIDAYAH BINTI MOHD RAZALI

(2009693684)

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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 40<sup>0</sup>C is 62.1%, Total Base Number (TBN) is 15.4%, flash point 12.8%, viscosity at 100<sup>0</sup>C is 6.7% and others are 3.0%. Overall, the most defect item in analyzing of oil is measurements during viscosity at 40<sup>0</sup>C follow up by TBN, flash point, water content and wear metals. However, commonly, others variables will be affected as well when the viscosity at 40<sup>0</sup>C 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.

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