

Development of Integrated Assessment System for Underground Power Cable Performance: A Case Study

Faiz Mohd Turan¹, Kartina Johan¹, Nur Soliha Sahimi¹ and Nik Hisyamudin Muhd Nor²

¹Faculty of Manufacturing Engineering, Universiti Malaysia Pahang, 26600 Pekan, Pahang, Malaysia

²Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, Malaysia

Corresponding author: faizmt@ump.edu.my

Abstract. The basic operation of any electrical machines that is catered to serve needs of civilization involves electrical power which is the main source to trigger the internal mechanism in the machines then transfer the power to other form of energy such as mechanical, light, sound and etc. The supplies of electrical does not happen just by providing the source itself, it has load carrying agent which in many cases, user would refer to it as cable. Specifically, it is the power cable which its ampacity depends significantly on the operation temperature and load stress on it. Apart from having to focus on providing improvement on improving efficiency on the source itself, power cable plays an important role because without it, current ranging from low to high could not be transmitted and hence a failure of the power system generally. Studies have conducted to discuss whether which factor contributes relatively more to the causes of power cable failure or breakdown. Such factors can be narrowed down to the three major causes which are over temperature, over voltage and stress caused by over current. Over current is one of the factor which depends on the usage of the power system itself. The higher the usage of the power system, higher the chances of over current to take place. This will then produce load stress on the cable which eventually destroy the insulator of the cable and slowly reach the core of the cable. It is believed that an assessment method should be implemented in order to predict the performance and failure rate of the power cable and use this prediction as reference rather than just letting power failure to happen anytime unpredictable which cause huge inconvenience to users and industries. Not only do a method should be implemented, it should be as easy to be used and understood by large range of users and integrated by a graphical user interface to be used. Therefore, this research will further narrow down on the approaches to do so and the location of studies involve Company M which is an agriculture industries which has higher usage on their own underground power cable. Moreover, in the past history the company experienced electrical power failure and this studies and findings will definitely come in hand to provide them necessary help and benefits.

