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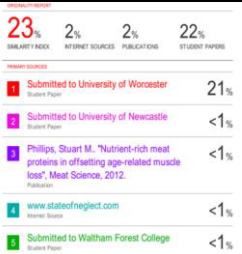

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R. Rubini

Department of Electrical and Electronics Engineering

Vels Institute of Science, Technology, and Advanced Studies

Chennai, India.

rubini77@gmail.com

C.Saranya

Department of Electronics and Communication Engineering

Kongunadu college of Engineering and Technology

Chennai, India.

Saranya.kncet91@gmail.com

S. Pradeep Kumar

Department of Electrical and Electronics Engineering

Vels Institute of Science, Technology and Advanced Studies

Chennai, India.

pradeep88.se@velsuniv.ac.in

S. Pradeep Kumar

Department of Electrical and Electronics Engineering

Vels Institute of Science, Technology and Advanced Studies

Chennai, India.

pradeep88.se@velsuniv.ac.in

Kalaiarasi G

Department of Advanced Computer Science and Engineering,

Vignan's Foundation for Science, Technology & Research (Deemed to be University),

Guntur, India.

kalaiibe@gmail.com

Kalaiarasi G

Department of Advanced Computer Science and Engineering,

Vignan's Foundation for Science, Technology & Research (Deemed to be University),

Guntur, India.

kalaiibe@gmail.com

Abstract

The process of installing electrical cables physically in a specific location inside a library block is widely considered as an electrically equipped place. It involves planning the particular route, securing the cables and ensuring technical support and proper protection. In a library block, the process of installing electrical wires can provide power and electrical connectivity to various devices and syster An insulation resistance tests were conducted a high voltage flow to the insulation and measures the resistance ratio to the actual current flow after cable installation. Testing of measurements given in table. Algorithms help to identify all kinds of weaknesses and faults in the insulation that could lead to any electrical leakages or short circuits. The insulation resistance test is primarily important to ensure the safety and reliability of electrical systems. It is particularly needed in an environment like a library. Libraries are filled with books made of papers that are easily flammable in nature. So, we should give top priority to electrical safety in libraries. Minimum constrained non-linear minimization solver is used to identify the iteration levels and verified with best function values and first order optimality values. This paper shows performance analysis of Insulation resistance test and Cable laying installation in a Library block.

Keywords : Cable laying, Megger test, Insulation and Optimization.

I. INTRODUCTION

Insulation problems may occur while electricity distribution in underground area with high voltage cables. Insulation aterials for production steps are chosen carefully. Need to limit the installation cost and service cost while obtaining higher performance, reliability and strengthen product life in energy sector. Degraded Cable systems fail to transmit uninterrupted energy to systems which can be considered as a cable system reliability. The resulting cable failure measures f m unscheduled interruption of energy production, entails over d and labour costs associated with down time. Proper handling and maintenan e of cables through down time can be minimized by continuous monitoring and analysis of their condition. Tatyana et al. Inspected fault analysis are carried out in power cables and locations for faultless operations of systems. Most common type of fault is cable damage. Insulation deterioration in cables is the main cable fau hat showed in the case study. They revamped necessary to increase surveillance of cable systems of the XLP cables to prevent faults and mitigate the threats, and use of cables with higher reliability and functionality[1]. Mladenovic et al. ney enacted many factors to grid ageing, including transients, short- and long-duration variations, load low and pattern, voltage imbalances, waveform distortions, voltage fluctuations, and

power frequency variations. Regarding Medium-Voltage (MV) grids composed of cable systems, this means that a significant portion of the grid infrastructure relies on underground or underwater cables rather than overhead lines. This can offer advantages in terms of reduced visual impact, but it also presents unique challenges in terms of maintenance and repair[2]. Olusegun Ogundapo et al. They exposed feature selective validation method to assess recapitulate of variation between cable measurements. Four unshielded category, Six twisted pair cables from different manufacturers. Feature selective validation method to the cable measurements in terms of experimen recapitulate[3]. Polanský et al. They substantiated the cable insulation during the fire tests an insulation resistance meter was connected directly to the measurement circuit to monito the actual state of cable. Two materials like as mica glass tape and ceramifiable silicon rubber with fire b iers are made of testing cables. During fire test the results shows that insulation resistance is sensitively affected by the melting of the organic components of insulation, by the decomposition of the retardant, by the ignition of the core insulation and by the formation of a silica layer. The readings are explored to review by therm ravimetry and differential scanning calorimetric mechanisms of the fire proof functionality in cables. The suggested procedure can assist in the comparison of the fire-proof functionalities of different cable designs, in the analysis of their failure mechanisms and in cable design optimisation[4]. Sin-Dong Kang et al. They evaluated insulation resistance characteristics by under external flame of cables, over current, accelerated degradation est. Author concluded that the results implicated that the over-current had a greater impact than heat applied externally on the degradation of the cable insulator[5]. Luyao Zhao et al. They tested the proces ovided with the electric current and Polyethylene insulated copper wire. The flame spread velocity and inclination le are analysed. This model is predictive as of the flame length and pyrolysis length it depends strongly on these two ways[6]. Jayashree Bijwe et al. developed and characterized the thermal and mechanical properties of PEK containing three composites containing short carbon/glass fibers as well as various solid lubricant. Under load and spee considerations the tribo-properties will vary a composites pin against a mild steel disc as a counter ce. To enhanced the pressure and velocity limits for indication of utility of a tribo-polymer in severe operating condi ns [7]. Xiaosheng Liu et al. test was conducted in the fire compartment of a cable trench in a standard substation to determine the sensitivity of the fire detector. the fire detector with different sensitivity analysed and simulated temperature, gas, and fire alarm sequence by fire dynamic simulator [8]. Lauren Gagnon et al. presented here structural, transportation, and space applications of electrical wires. Tested different ambient conditions with different materials using artificial neural networks. Their predictions from the data sets resulted in a decrease in the error rate analysis of 14% [9]. Yermoshin, N.I. et al. experimented nd found that the dependence characteristics of the settling time of resistance under measurement on the capacitance are identical to the analogous characteristics of the electronic component of the resistance-to-voltage converter. e fast response time of resistance to voltage converters results based on measurements of cable insulation resistance were investigated based on cable manufacturing plants to enable access to large coils of cables[10].

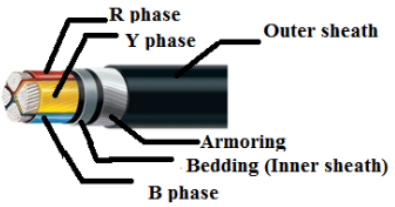

Fig.1 Armoured Cable

Summary of the literature survey portrayed that electrical wire connections installations, withstand life time of cables, based ambient conditions, materials, inclination angle, current flow etc.

II. CABLE TESTING

Protection against Mechanical Stress : Armoured cables, with their steel or aluminium wire reinforcement, provide robust protection against mechanical stresses. This makes them suitable for direct burial, as well as for outdoor or underground installations where the cable may be exposed to physical damage. Generation of Magnetic Field : When current flows through a cable, it generates a magnetic field in the surrounding space. This is a fundamental property of electric current. Eddy Currents in Steel Armour : In the case of steel-armoured cables, the presence of a magnetic field induces electric currents, known as eddy currents, in the steel armour. This phenomenon occurs due to the interaction between the magnetic field and the conductive material (in this case, the steel). Overheating in AC Systems : Eddy currents in the steel armour can lead to overheating, particularly in AC (alternating current) systems. This is because the continuous change in current direction in AC systems result in a constantly changing magnetic field, which in tum induces varying eddy currents in the steel. Non-Magnetic Aluminium Reinforcement : To

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ENSEMBLE BASED HYPOVIGILANCE DETECTION USING EOG

Suganiya Murugan*, Pradeep Kumar Sivakumar, Arun Sahayadhas

*Department of Computer Science and Engineering, Sathyabama Institute of Science and Technology, Chennai – 600 119, India

Artificial Intelligence Research Lab, Vels Institute of Science, Technology and Advanced Studies, Chennai – 600 117, India

*Email: suganiya11@gmail.com

ABSTRACT

Safe driving is critical to avoid death, injuries or financial losses sustained as a result of accidents. It is, therefore, necessary to monitor a driver's physical state to prevent accidents, and physiological measures, rather than vehicle-based or behavioural ones, provide the most accurate information in this regard. Researchers have used physiological signals like electrocardiography (ECG), electroencephalography (EEG), electrooculography (EOG) and surface electromyography (sEMG) to monitor the driver's physical state during the course of a drive. This study intends to detect driver hypovigilance (drowsiness, fatigue, and visual as well as cognitive inattention) using EOG signals collected from 10 subjects while driving. The driver's EOG signals are pre-processed for noise removal and 17 features extracted. Based on the ANOVA test, statistically significant features are selected and loaded into a machine learning algorithm. The features are reduced using the principal component analysis (PCA) and trained with three classifiers, that is, a support vector machine (SVM), K-nearest neighbour (KNN) and an ensemble. This study examines the performance of electrooculography (EOG), in terms of normal-visual and normal-cognitive detection maximum accuracy obtained is 91.1% whereas recognizing hypovigilance states as five-class, a maximum accuracy of 57.1% is obtained. This results in detection of more driver states with reduced accuracy but still the number of detection classes are more. Ensemble classifier performs better accuracy compared to the others. Better algorithms developed in the future will help to improve the accuracy of multiple class detection.

Keywords: Electrooculography, Drowsiness, Fatigue, Visual inattention, Cognitive Inattention, Hypovigilance

Funding: This work was supported by the Science & Engineering Research Board (SERB), Department of Science and Technology (DST), Government of India [SERB/F/3759/2016-17, 2016].

INTRODUCTION

Drivers at the wheel for long hours without adequate sleep, poor health, inattentive driving because of chatting on the mobile phone, and fatigue are factors that contribute to road accidents. Fatigue is brought on by illness or physical activity and drowsiness is a prelude to sleep [1]. Inattention is a state of getting distracted from a current physical activity and occurs in two ways: visual (distracted by sight) and cognitive (distracted by thinking). Road accidents end lives or result in crippling injuries. According to the Road Traffic Injury and

CONCLUSION

The work on driver hypovigilance detection of different states (normal, fatigue, visual inattention, cognitive inattention and drowsy) acquired from EOG signals helps to predict the accidents. The performance on two-class detection is 91.1% which drastically decrease when the increasing the number of driver states. The maximum accuracy obtained to detect driver hypovigilance is 57.1% with reduced false detection. Electrooculography (EOG) devices can be made less intrusive by turning them into comfortable smart wear items for future driver use. Further research can be combined electrooculography (EOG) with electroencephalography (EEG) to detect different driver states with reducing the channels to achieve the better performance.

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