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ACTIVE LOAD AND LOSS ALLOCATION IN TRANSMISSION LINE VIA IMPROVED CUCKOO SEARCH OPTIMIZATION TECHNIQUE

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of the requirements for the degree of
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Faculty of Electrical Engineering

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non – academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

The introduction of deregulation in transmission system has given the opportunity for the end user to choose the supplier. This has brought the importance of active load and loss allocation in transmission line. Due to the nonlinear character of power flow, it is crucial to allocate the losses and active load. Thus, this research has proposed a novel technique to allocate both active load and losses in transmission line using a newly developed Improved Cuckoo Search (ICS) Optimization Technique. In addition, a new objective function has also been proposed in this research to improve the accuracy of the power allocation. The active load and transmission loss allocation have been treated as an optimization problem. In this research, IEEE 5-Bus, Ward-Hale 6-Bus, IEEE 30-Bus and also IEEE 57- Bus systems are used as test systems and a comparative study is conducted with Cuckoo Search (CS) technique and also Genetic Algorithm (GA) technique. In addition, the proposed method with the new objective function is also tested in line outage and load increase conditions. The results are compared in terms of accuracy of the allocation, computational time and also the consistency. From the results and comparative study, the proposed new technique offers an accurate allocation of power among the market participants. Hence, they will be charged fairly for their transmission cost as required in a deregulated power system.

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