MODELING OF ENERGY TRENDING BASED ON PRESSURE, TEMPERATURE AND VARIOUS GAS COMPONENTS OF NATURAL GAS TO PREDICT POTENTIAL BILLING ERROR BY MEANS OF ARTIFICIAL INTELLIGENT TECHNIQUES AND REGRESSION METHODS

BY:

NURHANI KASUAN

SAIFUL ZAIMY YAHAYA

NOFRI YENITA DAHLAN

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ABSTRACT

In the recent global issues, oil and gas prices have proven to be a valuable commodity. This so called 'black-gold' is finite and there will be time when these valuable resources will deplete and vanish from other earth reservoir. Due to this scenario, every molecule matters. Natural gas processing and transmission network plays an important role in ensuring our country energy requirements are meet. One of the important facilities in the network is the metering system. It acts as a custody transfer point between both seller and buyer and governs by specific regulatory requirements. The reliability, integrity and accuracy of such facilities are critical since the energy calculation obtained will be use for customer billing purposes. A slight error of energy reckoning will lead to a significant loss in profit. Till now, there is no specific methodology to double check the reliability of data produced although one knows that each individual equipment for such facilities have a clear traceability line to international measurement standard. This thesis proposed a new alternative approach to predict the energy by modeling energy trending using Artificial Neural Network (ANN). A Hybrid Multilayered Perceptron (HMLP) network is chosen to perform the energy trending. The execution result of ANN has successfully modeled energy pattern with accuracy is up to 100%. Other conventional modeling methods also employed i.e. Regression Technique and System Identification to compare the performance of ANN.