Chawajun Sanguankom 2009: Power Outage Cost Assessment of Industrial Customers Using Regression Analysis and Artificial Neural Networks. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Dulpichet Rerkpreedapong, Ph.D. 115 pages.

This thesis develops a procedure to assess power outage costs of industrial customers using regression analysis and artificial neural networks. Outage data to be used in this study are collected from groups of industrial customers classified by the TSIC code. In this thesis, two TSIC groups of industrial customers including TSIC 35609 (plastic injection processing) and TSIC 31149 (frozen seafood processing) in the central area of Thailand are considered as case studies.

This research begins with surveying basic information related to production process of individual industrial customers, and then computing their actual outage costs. Next, the relationship between the customer outage costs and contributing factors, which are average power demand, outage duration, per-day incomes and number of working hours, are determined. Two mathematical models are obtained as the results by using regression analysis and artificial neural networks. Lastly, the estimation errors of both models are compared to point out the most suitable model for outage cost assessment. It is found that the neural networks based model gives a lower percentage error.

The procedure of outage cost assessment proposed in this thesis can be used by the Provincial Electricity Authority of Thailand (PEA) and other industrial customers. Minor adjustment may be required for use with customers in other locations and TSIC codes. The assessment results can be utilized in maintenance planning and distribution system improvement in order to achieve better reliability in the future.

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