

Chaliew Ketkaew 2014: Outage Cost Assessment of Power Distribution System for Reliability Improvement. Doctor of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Dulpichet Rerkpreedapong, Ph.D. 80 pages.

This research presents assessment methods of outage cost on power distribution systems. Outage costs of electricity customers and utilities are an important factor used for decision making process on reliability improvement. Therefore, data of more than 400 industrial factories are surveyed by means of questionnaires to develop a customer damage function composed of duration outage cost and initial outage cost, which is used to evaluate the outage cost of each customer. However, to obtain the total outage cost of a distribution feeder, it is unlikely to survey all customers and get their customer damage functions. Consequently, outage cost modeling including fuzzy regression and conventional linear regression is proposed in this dissertation. First, all customer damage functions available are evaluated for their corresponding customers. Some of the resulting customer outage costs are then used as the output variable of the models being developed versus the corresponding input variables, which are the rate of production, cost of electricity bill and startup time. These three variables are selected as the inputs because they are helpful, and it is convenient to request them from the customers. Finally, model selection process is proposed for selecting the best model out of those resulted from fuzzy regression or conventional linear regression based on hypothesis testing. The practical methodology presented in this thesis can be used for high accuracy outage cost assessment of industrial customers.

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