

利用系統暫態資料建立工廠的負載模型

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摘 要

近年來國內裝置汽電共生設備的工廠越來越多，而且此類型工廠的發電機與感應電動機和其他負載之間的距離很短。爲了探討此類型工廠的負載特性對於電力系統的影響，本文將建立一個等效的負載模型，表示工廠內的所有感應電動機和其他負載，做爲相關研究之基礎。

當系統發生暫態時，利用數位資料收集系統記錄負載的響應。從這些資料，可以推導出合適的負載模型和其中的參數。負載模型的建立係以記錄的電壓做爲模型的輸入，並比較模型輸出的功率與實測的數據，然後推導出模型的參數。利用權重最小平方法求出實測數據和模擬輸出的最小誤差，可以獲得準確的模型參數。

本文利用A/D轉換器組成資料收集系統，來測量系統的暫態現象，然後利用數位技巧從資料中辨識出負載模型的參數。此種方法之準確度相當高，而且可同時分析工廠的負載特性。由於負載模型乃是相關研究之基礎，因此本文對於電力潮流分析和穩定度分析等相關研究有相當大之助益。

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A Load Model for Industrial Plants Derived from System Transient Data

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Abstract

In the recent years, there are many cogeneration to be installed for the lack of electricity. These generators are closely connected to plants which consist of induction motors and other loads. An equivalent load model for these kind of plants is derived to represent induction motors and other loads.

Load response of plants will be recorded during system transients by means of a data acquisition system. Using these data, the load model of a plant is developed and parameters of the model is obtained. Recorded voltage is considered as an input to the model. The simulated real and reactive output power are compared with the measured output of a real system. The weighted squared error between the measured output and the simulated output is minimized to obtain the optimum model parameters.

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