



Development of ARX model based off-line FDD technique for energy efficient buildings

Haruniri Yoshida*, Sanjay Kumar

Department of Global Environment Engineering, Kyoto University Sakyo-ku, Kyoto 606-01, Japan

Abstract

Tools available for energy conservation in buildings still lack practical and cost-effective fault detection and diagnosis technique. This paper puts forth model based fault detection technique for off-line analysis based upon Autoregressive Exogenous method. Real time operation data of a Variable Air Volume Air Handling Unit in normal operating condition with artificially induced faults and without faults are obtained to validate the model. It is concluded that off-line analysis of data by this model is likely to detect most of the faults such as problems in damper control. The method seems to be robust until on-line fault detection and diagnosis techniques are developed. © 2000 Elsevier Science Ltd. All rights reserved.

1. Introduction

Possibilities for the development of the society greatly depend upon the energy sources available and how efficiently they are used without reducing their availability for the coming generation. Nevertheless, the pattern of the world's energy supply and the consumption pattern have undergone dramatic changes over the last few decades which are unsustainable beyond doubt. The time gap between the estimated most optimistic life-time of the conventional energy source reserves and time lag perceived in the development of reliable as well as cost-

* Corresponding author.