Proceedings of the Korean Nuclear Society Autumn Meeting
Seoul, Korea, October 1998

Feedwater Flowrate Monitoring Using the Advanced Signal Processing based on De-noising and Principal Component Analysis in Nuclear Power Plants

Gyunyoung Heo, Seong Soo Choi, and Soon Heung Chang
Korea Advanced Institute of Science and Technology

Abstract

In nuclear power plants, it is well known that the monitoring of secondary feedwater flowrate is not accurate due to the fouling phenomena of obstruction flowmeters. To overcome this shortcoming, the monitoring strategy using the signal processing based on the principal component analysis (PCA) has been proposed in this study. In the advanced signal preprocessing, the short-term distortions such as thermal noise are removed using the wavelet transform. The gradually varying noises caused by the fouling phenomena are corrected by the neural network which is carried out in a principal component space. The PCA is applied for the synthesizing of trend signals and for the construction of an autoassociative neural network. The proposed methodology was demonstrated using the signals acquired from a micro simulator and noise modeling.