

Fault detection needs to be accurate and precise to make right decisions about the systems operation status, unfortunately, monitoring processes via multivariate statistical control (MSPC) such as principal component analysis (PCA) arises the problem of false alarms. One solution to this problem is to increase the confidence intervals of the monitoring indices thresholds; however, doing that will decrease the sensitivity of PCA, thus, the detection ability of this technique is risked to be lost. In this paper, a Constant False Alarms Rate (CFAR) is proposed to decrease the number false alarms by investigating on the number of false alarms. Therefore, the fault detection accuracy will be increased. The advantage of using CFAR is that it does not need to change the confidence intervals. The proposed method has been tested on real data of cement rotary kiln to evaluate its capability detection of abrupt, intermittent and ramp changes. The obtained results demonstrate that the developed technique is able to detect different types of faults with no false alarms; furthermore, a real fault has been successfully detected