An Application of Univariate and Multivariate Control Charts in Monitoring Water Quality

ABSTRACT

Control chart is a tool for detecting an out-of-control signal in statistical process control (SPC). It is widely used in process monitoring in order to detect changes in process mean or process dispersion. This study aims to illustrate the application of multivariate control charts in monitoring water quality at one of the water treatments plants in Kota Kinabalu, Sabah. The tested water quality variables in this study are turbidity, pH value, dissolved oxygen (DO) and concentration of ferum. Two multivariate control charts, Hotelling'sT2 and MCUSUM control charts are constructed under the violation of the multivariate normality assumption. The purpose is to study the effect of non-normal data upon the monitoring process using the selected multivariate control charts. By comparing the monitoring process between the two types of control charts, the consistency of the results is studied. All the univariate and multivariate control charts produced out-of-control signals from different points, hence inconclusive results obtained