

Condition Monitoring of Casting Process using Multivariate Statistical Method

Hocine BENDJAMA, Kaddour Gherfi, Daoud Idiou, Jürgen Bast

Abstract: Growing demand for higher performance, safety and reliability of industrial systems has increased the need for condition monitoring and fault diagnosis. A wide variety of techniques were used for process monitoring. This study will mainly investigate a technique based on principal component analysis in order to improve the accuracy for fault diagnosis of casting process. The process faults are identified using the following statistical parameters: Q-statistic, also called squared prediction error, and Q-residual contribution. The proposed method is evaluated using real sensor measurements from a pilot scale. The monitoring results indicate that the principal component analysis method can diagnose the abnormal change in the measured data.

Keywords : Fault Diagnosis, process monitoring, principal component analysis, Q-statistic, Q-residual contribution