

# Fuzzy Approach Applied in Fault Detection and Isolation to the Compression System Control

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**Abstract:** During the last decade, significant change of direction in the development of control theory and its application has attracted great attention from the academic and industrial communities. The concept of “Intelligent supervision” has been suggested as an alternative approach to conventional supervision techniques for complex control systems. The objective is to introduce new mechanisms permitting a more flexible supervision system, but especially more robust one, able to deal with model uncertainties and parameter variations. In this work, we present an application of the fuzzy approach in fault detection and isolation of surge in this compression system. This paper illustrates an alternative implementation to the compression systems supervision task using the basic principles of model-based fault detection and isolation associated with fuzzy modelling approach. Application results of a fault detection and isolation for a compression system are provided, which illustrate the relevance of the proposed fuzzy fault detection and isolation method.

**Keywords:** Fault detection and isolation; Nonlinear systems; Fuzzy logic; Fuzzy fault detection and isolation; Compression system; Centrifugal compressor; Surge phenomena.