

# **Abstract**

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## **Application of model based fault detection for an industrial boiler**

Boilers are considered as the stem of the most of real industries such as power plant generation and petrochemical industry. So, it is essential to improve performance and safety related issues for a safe and efficient operation. A sudden shut down of a boiler unit causes a huge loss of the operating revenue. Hence to enhance availability and reduce the shut down times, the application of fault detection and diagnosis methods will play a great role in early identification of faults and finding the most suitable fault tolerant scenario without losing the services. Utility boiler in Sidi Kerir Petrochemicals (SIDPEC) plants is used as the case study of this work. The boiler has multi-loops, the most important loop, which is called the master loop, is identified on line. The identified model is used to detect a real abnormal situation that has been carried during the operation using model based fault diagnosis methods. Different fault scenarios are simulated on the identified model in order to validate the observer based fault detection algorithm. Finally the fault detection algorithm is applied on real abnormal behavior to identify it.