

Fault detection and Isolation in Elsam Superheater

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Cooperation between Aalborg University Esbjerg and Elsam Engineering A/S

1. INTRODUCTION

Elsam owns and operates many gas- or coal-powered power plants in Denmark, and research in the area of efficiency and reliability is of high priority to Elsam. Power plants are huge structures, which require an enormous amount of capital investment to build and run. Faults inside the power plant have different effects. Some may lead to substantial damage, outages, loss of efficiency or increased cost of operation. Early fault detection and diagnosis can aid the safe and efficient operation of the power plant in cases when faults have occurred. Only rare faults lead to critical situations.

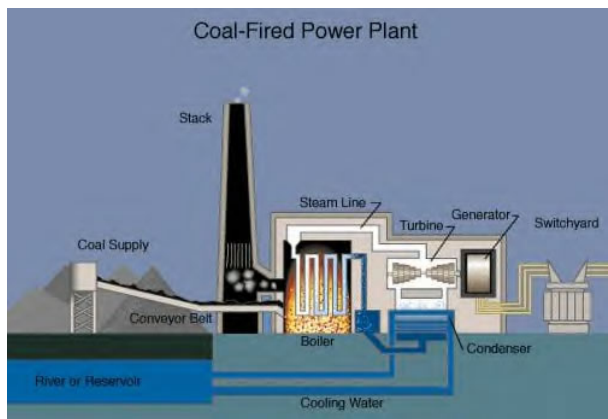


Fig.1 The diagram of a coal fueled power plant

2. OBJECTIVES

Inside the super heater, the steam from the boiler is super heated into dry steam, before the steam pass through the turbines. The pressure and temperature of the steam must be controlled, in order to guarantee high efficiency. The objective of the project is to detect and isolate faults inside the super

heater part of the power plant. The techniques must provide information on which part of the super heater is faulty.

3. STRATEGY

The system can be checked for faults using estimation and monitoring techniques and if needed, maintenance workers can be sent to repair the faulty parts.

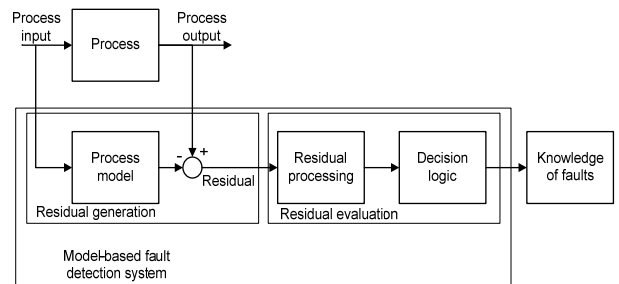


Fig.2 Model-based fault detection diagram

4. RESULTS

The investigation has found that the fault detection and isolation techniques can provide information on which sensor is faulty in time to perform the necessary tasks to repair the system, and in critical cases before the power plant is damaged.

