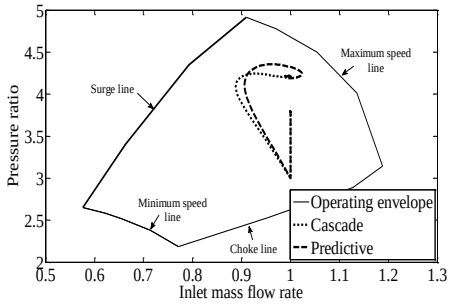
Examples of results presented at UKACC 2014

Improved process control for compression applications
S. Budinis et al.

- A control scheme based on the non-linear characteristic compressor map which takes into account the process disturbances is proposed.
- This approach allows tighter pressure control during fast changing dynamics and reduces the risk of compressor surge during transient operations



The team

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FP7 Marie Curie Initial Training Networks. ITN Energy-SmartOps Consortium
PITN-GA-2010-264940 (2011-2015)

www.energy-smartops.eu

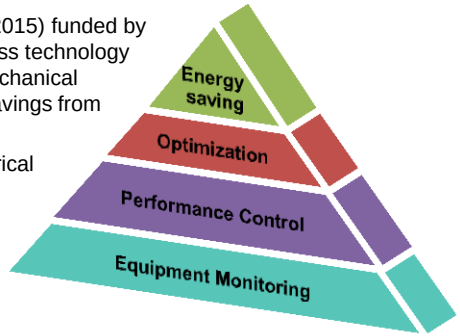
ENERGY-SMARTOPS PROJECT

UKACC 2014 Special Session: Integrated Operation in Large Scale Industrial Sites, Results from the ENERGY-SMARTOPS Consortium

Session 6D, Thursday 10th July, 10:00-12:00

Introduction

Energy -Smartops is a four year project (2011-2015) funded by the European Commission which aims to address technology gaps at the interfaces between the process, mechanical and electrical domains, and to realize energy savings from integrated operation.



The expertise in Energy-Smartops covers electrical machinery and power electronics, compressors and pumps, modelling and optimization, instrumentation, signal analysis, equipment condition monitoring, and automation of oil & gas, steel and chemical processes.

Project partners:

- Imperial College of Science Technology and Medicine
- ABB AG
- ABB AS
- ABB Sp. z o.o.
- BASF SE
- Cranfield University
- ETH Zurich HG
- ThyssenKrupp Acciai Speciali Terni
- Politechnika Krakowska
- Carnegie Mellon University
- ESD Training Simulation Ltd
- Statoil

Objectives

- Generate creative ideas for energy savings in large scale industrial sites, and test them in case studies
- Develop scalable and complete equipment monitoring systems integrating multiple measurements from the process, mechanical and electrical subsystems
- Do performance monitoring and control by capturing information from all three subsystems
- Develop new algorithms that explicitly manage the interfaces and interactions between them
- Study various ways that energy savings can be achieved through optimization and better integration of operations
- Transfer knowledge between academia and industry

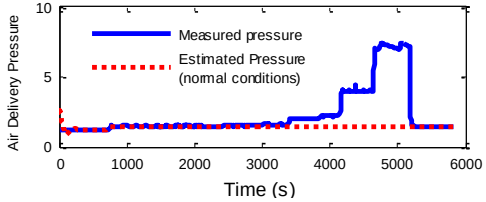
Challenges

- Integration of both models and measurements from the process, mechanical and electrical subsystems
- Solving large-scale optimization problems
- Implementation and testing in a real production environment

Examples of results presented at UKACC 2014

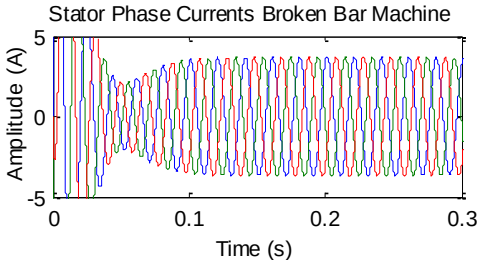
Multivariate statistical process monitoring
C. Ruiz-Carcel et al.

- Detection and diagnosis of process faults in an experimental multiphase flow facility using canonical variate analysis (CVA).
- Estimation of performance degradation and energy wastage caused by process faults under varying operational conditions.



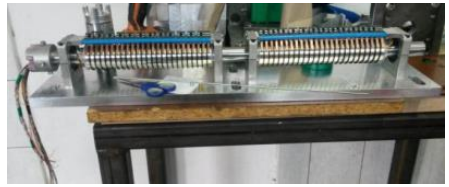
Fault detection in electric motors
V.H. Jaramillo et al.

- Disturbance estimation by means of Kalman Filtering for fault detection in Electrical Motors.
- The method showed a good performance for fault detection, regardless of the load induced to the Electric Motor



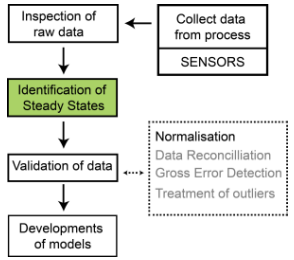
Multicriteria diagnosis of synchronous machines
J.G. Ferreira et al.

- Construction of a rotor-mounted sensing system test rig for multicriteria diagnosis of synchronous machines.
- Data acquisition from rotor-mounted sensors under different states for condition monitoring.



Modelling Compressor behaviour for energy optimization
D.P. Xenos et al.

- A developed steady-state algorithm analysed the influence of the steady-state assumptions of process data.
- A steady state index is introduced to evaluate the accuracy of the models regarding to different assumptions of steady states of the operation.



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