WP 1 in Energy-SmartOps.

**WP 1 Objectives**

- Fault diagnosis
- Equipment monitoring
- Advanced control
- Parameter identification
- Real-time optimization
- Maintenance
- Scheduling
- Optimization
- Process industries

**Electromachinery - Work Package 1**

**Work Package 1 Objectives**

- Modelling of electromechanical system with effects of interactions for diagnostic purpose
- Undertake data capture, conditioning and analysis with advance signal processing methods for diagnosis of electrical/mechanical interactions
- Create diagnostic algorithms based on intelligent calculation (neural network, fuzzy logic, pattern recognition) for machines assessment in industry electric drives.
- Develop a systematic framework for increasing diagnostic reliability through combination of global diagnostic signals or diagnostic indicators

**Early Stage Researchers in Work Package 1**

- Alejandro Fernandez
  - Continuous and discrete time dynamic models of induction motor and fault diagnosis.
  - Cracow University
- Jose Gregorio Ferreira
  - Condition monitoring of electric drives system using advance signal processing methods.
  - Cracow University
- Victor Jaramillo
  - Data Fusion of different condition monitoring indicators on electric drives systems.
  - ABB - Cracow
- Cristobal Ruiz
  - Multivariate statistical process predictive monitoring using operational data.
  - Cranfield University
- Giampaolo Torrisi
  - Loss modelling and control of electrical drives
  - ETH Zurich

**Condition Monitoring and its Link to Energy Savings.**

Addressing technology gaps at the interfaces between the process, mechanical and electrical domains, and realizing energy savings from integrated operation are the cases that motivate and are pursued on this work package.

Integrated systems demands continuous information of the assessment of their components; the control and operation of processes, rotating machinery and electrical equipment is becoming more integrated giving new opportunities for energy saving through equipment management, automation, and optimization.

"The goal of this research is to achieve continuous and discrete time dynamic models of induction motor under fault condition suitable for drives applications and fault diagnosis. Moreover, as secondary objectives, develop algorithms for machine parameter identification and Motor Current Signature Analysis (MCSA)." - Alejandro Fernandez

"Developing a smart multivariate method capable of early fault detection is the aim of this research. It is intended to identify which mechanical or electrical signals are best suited to monitoring and prediction of faults in electrical machines. Integrating the condition of the system assessment it might lead to improvements in efficiency." - Jose Gregorio Ferreira

"The purpose of the tasks in the work package is to identify potential global indicators that could point to specific faults in systems comprised of several components, in this sense novel technique for the Data Fusion of different condition monitoring indicators has been developed." - Victor Jaramillo

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Energy-SmartOps consortium investigates equipment and process monitoring, integrated automation and optimization for energy savings. http://www.energy-smartops.eu/