

SPECIAL SESSION ON “E-Maintenance Engineering, Services and Technologies for PHM development in Industry”

The idea of this special session has been originally developed in the frame of the IFAC WG A-MEST (working group on Advanced Maintenance Engineering, Services and Technology) affiliated to IFAC Technical Committee 5.1. (Manufacturing Plant Control)

Proposers

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Keywords: E-maintenance services and technologies, E-maintenance Engineering, Health monitoring, Prognosis, Diagnosis, ICT for maintenance, Manufacturing plants, Networked Infrastructures

Scope

Even if maintenance is a necessity, it is often associated with a negative image in industry. Undeniably, it is usually recognised as a cost, a necessary evil, not as a contributor by many companies. But, as a matter of fact, a number of surveys and business cases in the past years has shown that a proactive maintenance – anticipating decisions based on health monitoring of equipment – can be considered a strategic lever positively correlated with the long-term improvement of the equipment availability, product / service quality and production costs. In the more recent years, maintenance management has been acquiring importance in industry also due to the needs for more sustainable industrial activities, which has been driving even more attention towards an overall equipment efficiency (considering also energy efficiency), and an eco-efficient and safe production. Prognostics and System Health Management (PHM) is a promising approach in order to enhance the capability of maintenance management to cope with these objectives. But other empirical researches are showing that companies are partially (or not at all) deploying prognostics and diagnostics systems, or, even if they operate some health monitoring, this is not adequately integrated with other processes within the company.

This session starts from these negative evidences but also from the general understanding that PHM provides a promising blend of techniques for making health monitoring, fault detection, diagnosis and prognosis, which finally allows to foresee effective management practices fulfilling the requirements of proactive maintenance. The session also considers the importance of an integration of the dispersed information and fragmented knowledge as another relevant lever to effectively deploy such practices in industry: E-maintenance is a promising paradigm to this end. In particular, E-maintenance is a new form of maintenance fully consistent with what it is expected in the decision making process to support the PHM approach. E-maintenance is in fact integrating the principles implemented in the past years by Tele-maintenance, adding today the late advancements in technologies (web-services in a Service Oriented Architecture, cloud computing, MEMS, wireless communication, ...) in favour of proactivity. E-maintenance can then be conceived as an integrating platform where the technological components enable a better use of the maintenance information and knowledge and, subsequently, an effective deployment of the PHM approach. Correspondingly, a research question is particularly considered to drive the discussion in this special session: “*how can E-maintenance facilitate the development of PHM in industry?*”. In order to gain “extended” insights thanks to cross-fertilization, researches and technological developments in different industrial domains are target of interest (hence, applications in manufacturing plants and networked infrastructures supplying services, e.g. water supply systems, gas / energy transportation networks, telecommunication networks, ...). Contributions on the following topics are then welcome in order to feed the discussion from different perspectives:

- new business models created by E-maintenance;
- E-maintenance engineering for PHM deployment;
- E-maintenance services and processes applying PHM;
- ICT for E-maintenance (PDA, MEMS, RFID, SOA, cloud computing ...) and their use for PHM;
- PHM within E-maintenance frameworks and models;
- PHM in E-maintenance applications within industry