

Special Issue

Machine Fault Detection and Fault-Tolerant Control

Message from the Guest Editors

Electric drives currently play an important role in transport thanks to the promotion of clean energies and electric vehicles. The requirements for these emerging applications are also becoming more restrictive. For instance, fault tolerance and continuous operation of drives are now required to increase their reliability. Post-fault operation is especially critical in applications where security is a main concern (e.g., electric vehicle propulsion systems), but it is also appreciated when the shut-down of the electric machine involves a significant economic impact (e.g., wind energy conversion systems). Based on these new requirements, different research groups have focused on the development of fault-tolerant electric drives. This feature should ideally be obtained without extra hardware, and from this point of view, multiphase machines have an important advantage over conventional three-phase systems due to their inherent redundancy. Despite their better fault tolerance, three software stages are necessary for suitable fault situation management: fault localization and isolation, post-fault control reconfiguration, and derating to safeguard the integrity of the system.

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