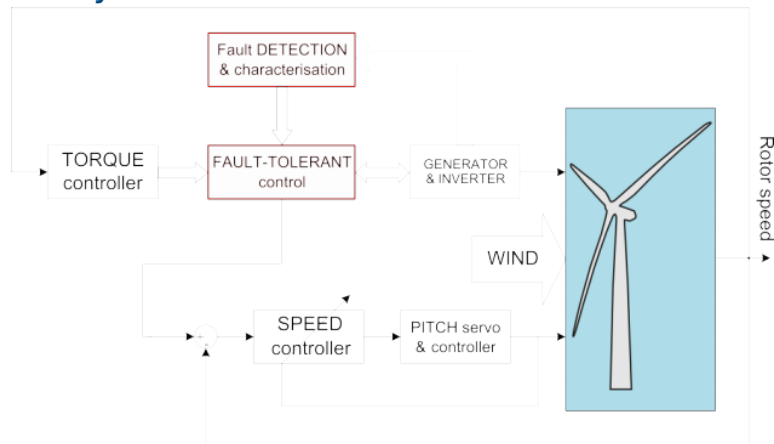




Control system for optimal operation of wind turbine generator under faulty conditions



Market sectors

- Alternative Energy
- Electricity
- Software & Computer Services

Solution

Developments of wind turbine components that aim to increase efficiency, improve reliability and reduce costs of wind energy generation are currently on-going. Usual current procedure under identified faulty condition of wind turbine components is a safety shut-down which prevents the fault from spreading, at the cost of setting the wind turbine power production to zero.

The innovation developed by researchers at University of Zagreb consists of the algorithm for fault-tolerant control of blade-pitch wind turbines with inverter-fed generators in case of identified wind turbine generator faults (foremost stator winding inter-turn short circuit, and also broken rotor bar). The control procedure needs to be linked with the „Online detection of insulation degradation in inverter fed drive systems“ invention from TU Vienna, offered jointly with this invention.

Benefits

The significant added value of the innovation is that it can be easily incorporated in currently used wind turbine control software and hardware because it is an algorithmic extension of the classical control system for blade-pitch wind turbines.

This algorithm prevents the generator fault from further spreading and exploits the wind power at or near the optimum point under emergency circumstances, without unnecessary shut-down of the turbine. This reduces potential wind turbine maintenance costs, prolongs wind turbine components life and lets the wind turbine produce energy also under generator faults. This is especially so since the linked fault detection algorithm is highly sensitive and can diagnose a developing fault.

Applications

Implementation of software based innovation in existing wind turbines.

Improvement of wind turbine availability.

Adjustment to other generator-powered machines.

Opportunity

University of Zagreb is seeking industrial partners in order to further develop and commercialise the technology through licensing of its IPR (patent application and know-how). The research group is available to offer support in successful transfer and further improve the process for commercialisation, for both asynchronous and synchronous machines used as wind turbine generators.

IP status

US and EPO patent applications have been filed. The prototype has been developed and tested in the laboratory on a small scale, for induction generators.

Additional information

Innovation has been developed through the SEE-ERA.NET Plus p MONGS Monitoring of Wind Turbine Generator Systems All publications are presented on the web page of the project:

<http://www.ieam.tuwien.ac.at/research/mongs/EN/>