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Sommario/riassunto	Wind turbine drivetrains consist of components that directly convert kinetic energy from the wind to electrical energy. Guaranteeing robust and reliable drivetrain designs is therefore important to minimize turbine downtime. Current drivetrain models often lack the ability to model both the impacts of electrical transients as well as wind turbulence and shear in one package. In this work, the capability of the FAST wind turbine computer-aided engineering tool, developed by the National Renewable Energy Laboratory, is enhanced through integration of a dynamic model of the drivetrain. The dynamic drivetrain model is built using Simscape in the MATLAB/Simulink environment and incorporates detailed electrical generator models. This model can be used in the future to test advanced control schemes to extend life of the gearbox.