Gefördert durch:
Bundesministerium für Wirtschaft und Energie
aufgrund eines Beschlusses des Deutschen Bundestages

Development of a Climbing Platform (SMART) for Wind Turbines

In August 2014, the SMART (**S**canning, **M**onitoring, **A**nalyzing **R**epair and **T**ransportation) project was launched and is being funded by the German Federal Ministry of Economic Affairs and Energy.

The aim of the SMART research project is the development of a climbing service platform for wind turbines. Using a work booth, the rotor blade is encased at a desired section, so that fault detection and maintenance can be carried out independent of weather conditions. In the work booth workers can move around freely and work at great height, without the risk of vertigo. In particular, it is possible to utilise both measurement and repair technologies, autonomously or teleoperatively, within the robust work booth, which helps avoid accidents with people beforehand. In combination with a trend monitoring system, the analysis of the measured data can be automated while the availability of wind turbines can be increased in a sustainable manner.

With due regard to the requirements of the industry, great importance is attached to logistics and a quick operational readiness of the SMART platform. This has a huge effect on economic efficiency.
The project was funded by the BMWi with a funding sum of approximately € 5.3 million for the project duration of four years in two project phases. During the first phase, a downsized demonstrator was successfully developed, built and put into operation at FH Aachen in 2015. In the second phase of the project, a prototype for the maintenance of 2.5 MW turbines will be developed, tested and certified by 2019.

Advantages of the SMART Project:

i. The SMART platform can be attached to wind turbines 24/7, all year round, independent of weather conditions
ii. Semi-autonomous or teleoperated repair of rotor blades can be carried out by e.g. laser scarfing
iii. Trend monitoring and data analysis increases the availability of wind turbines in the long run
iv. Non-destructive materials testing of rotor blades by using thermography, microwave and ultrasonic instruments
v. Transport of wind turbine components (e.g. spare parts within the framework of maintenance of the generator) along the tower
vi. Cleaning, inspection (e.g. ultrasonic or cleaning of tower welding) and maintenance of tower surfaces
vii. The possibility of a rotor blade exchange for small to medium sized wind power plants

With the FH Aachen University of Applied Sciences acting as the central coordinator, the project is being realised in cooperation with two industry partners, Fa. Gebr. Käufer GmbH and ematec AG.

Applied patents by FH Aachen: DE-A 102012001725 / WO 2013/113494 / US-B 9,327,784 / EP-A 2896823 und DE-A 102015010804 / WO 2017/032438 A1.