

Siemens Launches SIEAERO – The Next Generation Of Overhead Line Inspection

Siemens has launched a new service approach for overhead line inspection called “SIEAERO” at European Utility Week 2018 in Vienna, Austria. For the first time artificial intelligence and a long-range unmanned aerial vehicle (UAV) are used to bring inspection of transmission lines to the next level. SIEAERO smart analytics software is utilizing artificial intelligence (AI) and machine learning to store, manage and analyze all data in one integrated software system. To reduce the needed amount of flights and inspection efforts drastically, SIEAERO is using a unique high-resolution multi-sensor-system that can record all needed data in one go. Compared to conventional overhead line inspection, SIEAERO service is fully automated, faster and more precise. Siemens has been working closely with German and Austrian transmission system operators (TSO) TenneT and APG on the development of SIEAERO overhead line inspection service since 2016. With both TSOs Siemens has worked on test cases and the validation of a comprehensive inspection approach.

“SIEAERO is a gamechanger in overhead line inspection because we are using digitalization to bring services for our customers to the next level”, says Mirko Düsel, CEO Transmission Solutions at Siemens’ Energy Management Division. “Everything, from planning and performing inspection flights, managing and analyzing the gathered data to report generation and long-term data archiving, is more cost-efficient with SIEAERO – and it provides better and faster results on top.”

Overhead line inspection is a billion Euro market. In North America and Europe alone there are more than 200,000 kilometers (km) of overhead lines transmitting power to households and industries. All of them are critical infrastructure that need regular inspection to avoid failures. Today, TSOs inspect their power lines with helicopters at least once a year. Siemens has developed the SIEAERO service concept cooperating closely with customers and introduces a series of innovations to improve transmission line inspection as it is today.

Using SIEAERO, the flights are performed with the CAMCOPTER® S-100, a high-performance long-range UAV for beyond visual line-of-sight operation with a high payload capacity. The S-100 carries the SIEAERO high-end multi-sensor system which was specifically developed to meet the complex requirements of overhead line inspections. Since all necessary sensors and cameras are combined in one multi-sensor system, all relevant inspection data are recorded in one go. Therefore, SIEAERO is much faster and more cost-efficient compared to conventional services.

The extensive amount of multi-sensor data generated during the flights is handled by the SIEAERO smart data analytics software. The software was also developed by Siemens and is based on AI and deep learning for automated detection and assessment of faults and issues along the overhead lines. The documentation of the complete lines as well as the relevant findings and results can be directly integrated into the customers’ existing asset management systems. These are relevant for trend monitoring and preventive maintenance.

SIEAERO allows not only reducing the time for flight execution and data analysis from weeks or even months to a few days, but also delivers more precise results while using sensors way above industry standard. For example, the 3D LIDAR Sensors used in SIEAERO have 120 dots per m², while industry standard is roundabout 30 dots per m². More sensor data results in more precise analytics and results. Moreover, SIEAERO uses five cameras with 100 megapixels each, while competitors are typically working with one or two cameras and a lower resolution. On top, the SIEAERO multi-sensor system also includes infrared and corona sensors.

Schiebel Group, a Vienna-based company, is supplying the CAMCOPTER® S-100 UAVs and is also involved in R&D activities to ensure that specific requirements are met. SIEAERO is utilizing the S-100 with a flight distance up to 200km and a sensor load capacity of 50 kg. Siemens has partnered with Lufthansa Aerial Services for the operation of UAVs. Lufthansa will perform the SIEAERO inspection flights globally. Currently most countries do not allow the operation of UAVs beyond visual line of sight. Once national regulations change, SIEAERO will utilize the CAMCOPTER® S-100. SIEAERO is available utilizing helicopters from March 2019 on.

For further information on Division Energy Management, please see www.siemens.com/energy-management