

SGS SUCCESSFULLY ENDS END OF WARRANTY INSPECTION OF WIND TURBINES IN TURKEY

APRIL 2012

In January of 2012, SGS accepted a contract from Borusan EnBW Energy to provide end of warranty inspection services for twenty Vestas V90-3MW wind turbines. SGS examined the wind turbines at the Turkish Borusan Wind Energy Power Plant to identify deficiencies in order to establish warranty claims within the stipulated warranty period and avoid unnecessary expense for the company. The contract consisted of three two-week subprojects to be completed between March and May of 2012.

SGS AWARDED END OF WARRANTY INSPECTION CONTRACT BY BORUSAN ENBW ENERGY

The Borusan EnBW Bandırma Wind Energy Power Plant, located in Balıkesir, has 60 MW of installed capacity consisting of twenty 3 MW turbines. A 46,5 km energy transmission line connects the plant to the national grid via the Akçalar Substation.

Generating electricity using the renewable energy source of wind power, the Bandırma plant produces clean electric energy and has already reduced carbon

dioxide emissions by 100,000 tons. The Borusan energy production portfolio is intentionally based on naturally renewable resources to create a sustainable future for generations to come.

Borusan EnBW Energy, a leader in the global energy market, invests in projects sensitive to both society and the environment with the objective of raising living standards and ensuring the efficient use of energy resources.

Due to SGS technical expertise and extensive experience in end of warranty inspection, Borusan EnBW selected SGS to conduct independent examination and provide complete and accurate reporting of defects and abnormalities in support of warranty claims issued to manufacturers.

SGS ARRAY OF END OF WARRANTY INSPECTION SERVICES

In the Borusan project, wind turbine reliability was of utmost importance as even minor failures could cause costly interruption or total suspension of services or production resulting in substantial financial losses. Therefore,

it was paramount that SGS end of warranty inspection ensured that turbines performed effectively for as long as possible. In order to guarantee the highest quality and reliability of turbine components and performance, Borusan chose to rely on SGS independent inspection, verification, testing and certification skills.

SGS supported the Borusan project leaders with in-service inspections and provided the documentation necessary to issue warranty claims.

The long list of SGS wind energy tower and machinery inspection services implemented in the Borusan project included rotor blade inspection via rope access to include the measurement of the lightning protection system, vibration measurement of the drive train, endoscopic inspection of the main gearbox and analysis of the gearbox oil and focused on the structural integrity and safe operation of each turbine. Specific content of SGS inspection services followed the guidelines established by the expert committee of BWE, the German Wind Energy Association.

SGS rotor blade inspection identified problems and pinpointed locations in need of remediation by measuring the pitch angle of wind turbine blades. Throughout the entire project, responsible SGS experts conducted rotor blade inspection via rope access in order to ensure inspector safety at heights posing difficult access.

During the measurement of drive train vibration, professional SGS inspectors examined vibrations with the installation of sensors on the main bearing, the



gearbox and the generator to assist in detecting potential bearings and gears failures and any misalignment of the drive train connecting the generator and gearbox. With this technique, specific defects in and damage to individual components requiring SGS inspector attention were also identified.

SGS services for measuring vibration affecting the wind turbines included accurate measurement of vibrations in the drive train, expert analysis of the measurement data and detailed reporting of the vibration measurement findings.

The introduction of endoscopic inspection of the gearbox, allowing for the examination of gearbox components using video-endoscopy, enabled highly-skilled SGS inspectors to proof and monitor the condition of those components. SGS diagnostic engineers conducted an extensive range of tests including the sampling of lubricating oils, greases and hydraulic fluids to cover all applications. With this strategy, SGS analysts were able to provide expert diagnosis of wind turbine components and lubricant conditions.

SGS skilled professionals supported Borusan officials by performing a full scope of in-service inspections, examining wind turbine components, identifying deficiencies and failures of



critical components and preparing the detailed evidentiary reports required to take advantage of valid warranties.

The operation and maintenance of wind farms requires huge financial commitment. SGS end of warranty inspection services offers some relief by detecting problems with critical components within mandated warranty time restraints, allowing clients to file claims and save money. The Bandırma Wind Energy Power Plant in Turkey profited from SGS expertise in end of warranty inspections by strategically

avoiding costly repair or replacement of parts due to warranty expiration, largely reducing the risk of revenue lost by interruption or suspension of services or production and substantially increasing the value of the mechanical assets.

SGS was particularly proud to play an important role in this distinguished project implementing renewable energy technology and strategy to positively impact the world.

CONTACT

POWER@SGS.COM, WWW.SGS.COM/POWER

SGS IS THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY

WHEN YOU NEED TO BE SURE

SGS