„ZF Test Systems now focusing on Wind Energy“

Josef Pagany, Head of ZF Test Systems and Ernst Plöchinger, Sales Manager ZF Test Systems on contemporary test rig technology

Modern environmentally-friendly, renewable energies are in great demand. The future wind energy market is permanently growing, there is a high demand particularly in China, the USA and Europe. ZF became aware of this trend and with its strategic business unit ZF Test Systems located in Passau, it is extending its activities in the field of wind power transmission test rigs. On the occasion of the Testing Expo in Stuttgart, the leading trade fair in Europe for testing and development procedures in the automotive industries, ZF Test Systems presented its test rig concept on the market for the first time.

We all know pictures of wind energy plants from the media. However, it is hard to find information on wind power transmission test rigs.
In general, what do you understand by wind power transmission test rigs?
Mr. Pagany: *Wind energy plants are usually equipped with wind power transmissions. These transmissions serve to adapt the low rotor speeds to the high generator speeds. Wind power transmission test rigs are required for the development and series production testing of these transmissions, and for servicing them.*

Does this mean that there are already wind power transmission test rigs available on the market?
Mr. Pagany: *The construction of wind energy plants necessitated the realization of suitable test rigs. In the past, these test rigs were usually made of single crafts by various suppliers. ZF Test Systems is offering the great advantage to its customers of supplying these test rigs as turnkey*

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whole facility with CE marking, thus obviating any safety risks and customer's need for expensive interfaces.

What kind of tests can be performed with wind power transmission test rigs?
Mr. Plöchinger: *Tests differ depending on the type of test rig. Development test rigs and series test rigs are applied in practice. Development test rigs are mainly used for implementing the following tests:*
Endurance strength, overload behavior, efficiency, service life and wear, temperature behavior, structure-borne noise and air-borne noise.
Whereas series /service test rigs are used for testing the function, run-in test under load application, noise as well as the cleaning of oil circuit.

Is there any special feature in the testing method and what does the test process look like?
Mr. Plöchinger: *The testing methods meet the high quality standards known from the automotive sector:*
Acoustic measurements with extensive evaluations, e.g. order analyses, consistent documentation and traceability of the test sequence and the measured results.

What are the benefits offered by such a test rig?
Mr. Plöchinger: *The test rig has been designed as an electric torque test rig with two test units in back-to-back arrangement being driven and loaded by electric motors. Exchange of energy between motor and generator is ensured by connecting the motors via the voltage intermediate circuit of the converter. Just a low supply power is therefore necessary for facility operation even at high loads. Only power for losses and dynamic procedures must be performed by the supply unit.*
This design ensures a maximum of flexibility for testing most various wind power transmissions.

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You are offering best solutions tailored to the customer's specific requirements. Could you benefit from the know-how gained in other test rig fields?
Mr. Pagany: *ZF Test Systems has been producing development and series test rigs for vehicle and industrial transmissions in the high power range for decades. The experience and know-how gained here are the basis for getting quickly and successfully established in the wind power market.*

How long approximately are development times? Can production expenses be compared with those of other test rigs?
Mr. Pagany: *Realization times are comparable to those of other test rigs. The key differences in production are the enormous component dimensions, weight and the required production tolerances.*
Since power capacities go up to a 2-digit MW-range, the complete drive system within this power range is designed in medium-voltage technology. Precondition for this, among others, is an especially qualified staff and complex insulation measures.

How much are the investment costs?
Mr. Pagany: *Investment costs depend on equipment and functionality of the test rig. As an approximate value, however, we can give € 1 Mio per MW test power.*

Recently the production of wind power transmissions has experienced a strong upswing. Who are potential customers?
Mr. Plöchinger: *Wind power transmission test rigs are definitely most needed by manufacturers of wind power plants and by transmission suppliers. These facilities, however, also attract interest from service providers like research and test institutes as well as service organizations.*

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Which countries record the highest demand?
Mr. Plöchinger: *Prospective customers mainly come from China, the USA, Europe.*

Could you give us examples of wind power transmission test rigs which you are currently working on?
Mr. Pagany: *We are presently assembling a 4 MW wind power transmission test rig for ZF Service in Dortmund. This facility serves for run-in tests under load application and for functional tests of transmissions after repair. Furthermore, we are developing a 6.4 MW test rig for another customer in Bad Homburg, which will be used for transmission development.*

What does the current order situation look like?
Mr. Pagany: *At present there are specific acquisition and order activities for further test rigs for international customers. We expect to receive further orders for wind power transmission test rigs in the near future, which will start operation in 2011.*

Picture Caption:
3.) Josef Pagany, Head of ZF Test Systems
4.) Ernst Plöchinger, Sales and Product Manager

Pictures: ZF

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ZF is a leading worldwide automotive supplier for Driveline and Chassis Technology with 123 production companies in 27 countries. In 2009, the ZF Group achieved with 60,000 employees a sales figure of approx. EUR 9.4 billion. In order to continue to be successful with innovative products, ZF annually invests at least five percent of its sales (2009: 663 million of EUR) in Research and Development. Approx. 5,300 employees work for Research and Development worldwide, 750 thereof in Corporate Research and Development of the ZF Group.

The ZF Division Off-Road Driveline Technology and Axle Systems specializes in the development and production of transmissions and axles for agricultural and construction machines as well as axle systems for buses and trucks. With about **7,000 employees**, the division generated a turnover of **1.1 billion Euros** in 2009.

Business unit ZF Test Systems of ZF Passau GmbH employs about 90 specialists, who develop state-of-the-art test systems for the most different applications, with a turnover of 36 million Euro generated in 2009. So for the growing wind energy markets, a 4 Megawatt wind power transmission test rig was developed for ZF Services, which will be installed in the Service Competence Center in Dortmund shortly. With its thoroughly designed plants, ZF Test Systems provides mobility and safety, and finds the optimum solution for all test requirements.

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