

The importance of monitoring in critical fastening and bolting tools



Bobbi McConnell

PES had a very informative interview with Bobbi McConnell, Marketing Communications Manager at AIMCO Global. The effects of the electricity production tax credit on the US wind industry, critical fastening and bolting tools were just a few of the things we talked about.

BM: Based on industry reports, the forecast in the US marketplace expect growth upwards of 40% throughout the wind industry.

Offshore is expected to be a tremendous growth market in the US despite the challenges the US is experiencing in developing offshore wind farms. Among those, the coastal waters of the United States don't share the same meteorological or oceanographic conditions as those in Europe's North Sea. Although US coastal waters provide strong winds, the occurrence of hurricanes is a force to be reckoned along the East Coast and the Gulf of Mexico in the United States.

Currently, according to the U.S. Department of Energy, more than 25 offshore wind projects with a generating capacity of 24 gigawatts are now being planned, mainly off the U.S. Northeast and mid-Atlantic coasts.

PES: We know that data collection is important to AIMCO, please tell us why?

BM: To understand the importance of data collection, you must first understand the accuracy difference between Transducerized and Current Controlled tooling. You may remember I wrote about this in PES last year.

Current Controlled (Open Loop) tools are a dedicated system consisting of a tool, cable and controller. They are pre-calibrated in a lab using an external transducer on a

rundown fixture. The tool is operated on the external transducer at set torque points. The amount of current supplied by the system is matched up to the torque reading of the external transducer. The lab will input these torque readings which the system translates into the amount of current it needs to supply to achieve the amount of torque required.

Unfortunately, current controlled tooling is an open loop design. Once the tool is removed from the external transducer there isn't any true torque feed back into the system. The system simply supplies the per-set current and the operator has to accept the torque was properly applied.

However, a number of things effect the torque output but not the torque readings of the system. Things like temperature, gear wear, voltage and motor performance all effect the torque output, but the system is unable to adapt and compensate for these changes. It's simply all guess work. It's also a dedicated system, which means that something as simple as changing out the cable, voids the calibration.

Transducer Controlled (closed Loop) tools like the AcraDyne HT system from AIMCO have the transducer built into the tool itself at the output shaft. The transducer is constantly measuring the torque in real time and feeding that back into the system. Variations of temperature, gear ware, voltage and motor performance do not affect the accuracy of the transducerized

PES: Welcome back to PES Wind magazine. Thanks for talking with us. For the benefit of our new readers would you like to begin by explaining a little about the background of AIMCO and the importance of the wind industry to you?

Bobbi McConnell: Our headquarters are in Portland, Oregon and we have over 40 years' experience in various industries and wind energy one of the most important and have a wide range of product portfolios.

Our service, repair and calibration labs provide fast turnaround on repairs and also, all electronic torque equipment meets NIST standards.

PES: Currently are you experiencing more growth in the market?

system because they all happen before the transducer. The system will simply keep applying power until the transducer reads the requested torque before shutting off.

The AcraDyne HT system also records date, time and rundown information of up to 32 different preset torque jobs stored in the controller. All the recorded torque data is easily exported to Excel with the touch of a finger. Modular design- unlike current controlled systems that are a dedicated system. The calibration of a transducerized tool is in the tool itself not the system. Tools, cables and controllers are all interchangeable. When the annual calibration is due you only need to send in the tool not the whole system.



If your customer is relying on you for accurately applied torque. Take the guess work out and use a closed loop transducerized system for unparalleled accuracy.

PES: How do you see future wind turbine monitoring developing or has it gone as far as it can?

BM: As the towers are getting larger, the output of the turbines continues to grow and, once again, offshore will be a tremendous boost.

PES: Would you like to tell us about any current or future projects?

BM: As the towers get taller and bigger, the bolts required to hold them together are also getting larger, requiring more torque. Manufacturers have come to AIMCO and asked us to develop larger electric tools, up to 12,000 Nm, to meet the needs of the future.

PES: With more and more companies focusing on data collection how are you finding this and what do you think makes AIMCO stand out from the competition?

BM: AIMCO's data collection is done at the square drive, or the output. This is critical, and unlike our competition, because torque measurement is not affected by changes in gear efficiency or normal tool wear between calibrations or temperature, voltage, motor performance or any other external variation.

This makes it one of the most accurate bolting systems in the world today. We have the only tool available in the market place today that offers data collection at the square drive. Others are either utilizing pump pressure to a Hydraulic wrench or current control to make an estimation of the torque. With AIMCO, you have superior accuracy with no guesswork or estimating.



Additionally, AIMCO offers a critical bolting system that offers a torque range from 1 to 12,000 Nm. Our critical bolting tools are up to 100 times faster than that of the competition's traditional hydraulic tools.

PES: Where do you operate and where are your key markets and are there are any areas, geographically speaking, that you would like to break in to?

BM: Since 1970, AIMCO has provided superior Critical Fastening and Bolting Tool solutions for the Motor Vehicle, AG/Off Road, Electronics, Aerospace, Energy Services, and General Assembly Industries.

In 1999, they began manufacturing their complete line of AcraDyne D/C Controlled Critical Bolting Systems ranging from 1 – 12,000 Nm. AIMCO has projects worldwide and currently exports to over 33 countries including Mexico, Brazil, Germany, France, Korea, China, the UK, India, Denmark and Russia among others.

PES: What is the single biggest challenge facing the market today?

BM: The stability of the Production Tax Credit (PTC). The federal renewable electricity production tax credit is an inflation-adjusted per-kilowatt-hour (kWh) tax credit for electricity generated by qualified energy resources, such as wind, and sold by the taxpayer to an unrelated person during the tax year.

The PTC was enacted as part of the Energy Policy Act of 1992, helping launch the wind industry as we know it. The first lapse of the credit occurred seven years later in 1999, causing a near halt in production. Since then, Congress cycled through the tax credit in one or two-year stints and allowed it to expire

multiple times. This cyclical pattern resulted in boom-bust cycles of development. The current PTC is expected to expire in 2020 unless Congress approves another extension.

These tax credits have benefited American consumers by growing our economy, creating jobs, improving energy security, saving money for families and businesses, and supporting a new U.S. manufacturing sector. They have driven tens of billions of dollars into rural America and brought new jobs to the American workforce. They are now being phased out on an 80-60-40 schedule, ending after 2019.

Thanks to this policy certainty, approximately 21 gigawatts (GW) of wind power capacity are now under construction or in advanced development. With the PTC phasedown, wind energy can grow to supply 10 percent of U.S. electricity by 2020 and support tens of thousands of additional jobs.

Like other domestic energy sources, American wind power has benefited over the years from a stable, pro-growth tax policy. The PTC was intended to keep wind energy attractive for the investors who financed new wind farms as the demand for clean energy sources continues to increase.

With the help of the PTC, U.S. wind farms now provide enough power for 25 million average American homes and attract billions in private investment to the U.S. economy each year, boosting economies in all 50 states. The remaining value of the PTC can be seen in better wind turbine technology, lower electricity rates, and rural economic development.

PES: Looking the rest of 2018 and beyond, what trends and/or changes are you anticipating in the market and why?

BM: We continue to look for cutting-edge solutions to the challenges faced by the wind turbine manufacturers, as well wind turbine maintenance issues such as joint failure due to bolt fatigue which can occur when bolts and tools are not protected from the outside elements during installation.

Safety has become paramount in the process of maintaining wind turbines. This is the reason that AIMCO has developed the data collection at the square drive of their tools, to increase accuracy of torque measurement when performing maintenance on the wind towers. Additionally, the need for increased torque has also become a critical requirement from manufacturers, although AIMCO offers bolting systems up to 12,000 Nm, we are continuing to develop higher torque tools that will boast a higher speed than standard hydraulic tools while maintaining the accuracy our customers have come to expect.

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