Safety is vital in critical bolting

Words: Ken Maio, Business Development Manager, AIMCO

The wind industry presents specific challenges when dealing with tool operator injuries. Because of remote locations and hazardous working conditions, it can often take hours for help to arrive once an injury occurs. Safety needs to be considered in every aspect of the job.

Ken Maio

Hand Injuries: costly in many ways

Hand injuries, in particular, can be not only devastating to a worker, but also costly to a project budget. Worker compensation claims for hand injuries average around $7,500 per injury. The Bureau of Labor Statistics cites that approximately 110,000 hand injuries result in lost time.

Hand injuries send more than 1,000,000 workers to the emergency room each year. The construction industry requires the tightening of approximately 30,000 bolts per year, so if not done properly, the chance for hand and finger injuries is significant.

In the construction industry alone, the annual cost of hand cuts and punctures is around $400 million. When dealing with wind tower construction and maintenance specifically, these injuries most often include bruises, cuts, abrasions, punctures, fractures, and even amputations.

Many factors in wind tower construction and maintenance contribute to those injuries, including cramped spaces, limited visibility, improper tool operation, and using tools that were not appropriately designed to safely operate in your specific application.

Steps to safety

Here's how you can help to protect your tool operators from injuries to their fingers, hands, arms, and wrists.

The first step in ensuring a safe workspace is education. Providing clear work instructions and safety policies is essential.

The second step is identifying safety

‘Tool developers are listening to industry feedback, which has indicated the need for updated tool designs. Although high-torque tools have been used in the wind industry for years, demands for more accurate, larger, more powerful tools means new ergonomic and worker-protection issues have emerged.’

hazards, not just in general, but in the specific maintenance applications being performed. Scope out any pinch points, or places where the movement of a tool can cause a hazard. Be alert to the position of hands and feet and lift and carry tools properly.

The third step is just as critical as the first two: use the right tool for the right job.

Responding to wind industry safety demands

Tool developers are listening to industry feedback, which has indicated the need for updated tool designs. Although high-torque tools have been used in the wind industry for years, demands for more accurate, larger, more powerful tools means new ergonomic and worker-protection issues have emerged.

Dual-lever tools

Dual-lever two-hand no tie down high-torque DC nutrunner systems have helped mitigate some of the wind industry’s safety concerns. The dual-lever designs help prevent:

- **Injuries from accidental tool start:** two-hand operation with no tie-down feature, requires the operator to use both hands on the trigger simultaneously, eliminating accidental tool start and keeping both hands out of harm’s way. Further, should an operator release even one hand for one moment, tool operation immediately ceases.
- **Strain caused by awkward tool operation:** multiple handle styles ensure the safest, most ergonomic tool for your application. Angle of approach to the fastener is rarely consistent and working with tools that have varieties of configurations, ensures that the right tool for the job gets used on each tower from each manufacturer.
- **Reaction bar geometry and approach:** working with correct reaction bar geometry ensures that proper torque is transmitted from the tool to the workpiece. Additional benefits come in the form of best cosmetic preservation to the reactive surface. Operator safety is also maximized when using soft start or acceleration strategies. Programming the tool to advance the reaction bar to the reactive surface, in a moderated manner, then ramping up the tightening speed ensures that operators can witness any potential obstructions and stop operation before any damages to person or property occur.
- **Quick ability to reverse:** some older technologies have ratcheting piston type movements. This can result in having to advance a tool one half stroke forward prior to reversing off of a position. Best tool selection is a system that allows for immediate ability to reverse from a pinch situation should the unthinkable occur and an operator’s finger or hand must be extracted.

Safety plus the power of data

With the latest tool technologies, project managers no longer need to choose between safety and quality.

Transducerized tool/controller systems have emerged, providing optimal monitoring and process control. Powerful transducerized tools are combined with highly capable controllers, that not only achieve accurate torque values, but add an added benefit of traceable data and data storage. This data can be easily reported to a wide variety of Quality Management Systems.

Tools can also be employed that add an additional level of accuracy, measurement gauging built within the tool, directly at the tool’s output drive. This allows for dynamic torque in measurements to be made as close to the driving socket as possible without the need for any external devices. This means that measurements are unaffected by changes in gear efficiencies or motor performance and are truly what the head of the bolt is experiencing from the tool delivering torque to it.

This is a vast improvement over the previous tool technologies that rely on consumption of energy (current) or delivery of power (pressure) to the tool’s output. Calibrations are more stable and long lasting which provide more in-use time between service saving service providers cost and time.

Protecting your assets

Being aware of, then choosing, the best of these new technologies is best practice for decision makers today. People first, then projects and best use of resources is more important than ever. Great news is that tooling makers continue to recognize these needs and are responding with technologies that meet the needs of today and those of tomorrow.

www.aimco-global.com

Ken Maio

Ken is a Business Development Manager for AIMCO. He has over 25 years’ experience in threaded fastening and bolting applications across a wide range of industries.

Ken works with major end users and product suppliers worldwide, bringing the perfect solutions to assembly and bolting challenges.

Ken is also AIMCO’s Director of Training.