Innovative hydraulic nuts deliver huge time, manpower and safety margins for high temperature bolting

An Australian innovation is making light work of some of the largest and most difficult bolt tensioning applications encountered in high temperature areas of electricity generation, mining, petrochemical and other processes.

In a recent application, Technofast Industries' new EziTite® TR High Temperature Hydraulic Nuts demonstrated their performance when they were used to assemble boiler feed pumps at an electricity generating plant in South Korea.

This application involved the use of 12 large EziTite® TR High Temperature Hydraulic Nuts fitted to M110 X 4.0 studs.

The temperature resistant fasteners were used to replace the former method employing large torque wrenches weighing more than 125kg.

The Technofast method resulted in an installation time of around thirty minutes using two personnel, compared with eight hours and four personnel using the previous method.

Technofast's Founder and Managing Director John Bucknell explained that time savings of this order, and better, are possible using the EziTite® fasteners instead of conventional methods involving sledgehammers, stud heaters and multi-jackbolt tensioners.

"Large nuts of this diameter can require terrific torque forces to achieve the desired tensioning, or require 'jacknuts' which have multiple forcing screws to bring the job within the power range of hand tools."

"Given the damage which can occur to the fastener components and joint faces, some operators have opted to use these jacknut fasteners. However, large nuts such as those used on the Boiler Feed Pump can easily have 24 of these forcing screws per nut, and they have to be progressively and sequentially tightened to a specific torque at each step, or the individual

screws will be overstressed and fail. This can add days of downtime to a typical maintenance operation."

"Also, when jacknut fasteners need to removed, the forcing screws have to be backed off in a strict sequence to avoid failure. If not, then excessive load will transfer to remaining screws and cause failures. The jacknut assembly will then need to be cut off," Mr Bucknell said.

EziTite® Hydraulic Nuts, by contrast, tension the bolt in one simple operation. They are rapidly applied by being screwed by hand onto bolt studs, hydraulically actuated to stretch the bolt to the precise tension required, then secured in place mechanically with an integral mechanical lock ring.

The charging pressure is relieved, and the EziTite® Hydraulic Nuts remain in situ at the precise target bolt load.

The reverse procedure permits equally rapid disassembly when it is eventually required. All studs can be tensioned or de-tensioned simultaneously by manifolding them to a single hydraulic source.

In addition to their simple and swift operation, the EziTite® Hydraulic Nuts used in the Korean application overcame multiple issues experienced with the former method involving heavy torque wrenches, including:

- Horizontal stud position, which made handling difficult
- Torque damage to studs, hex nuts and sump surfaces
- Irregular torque readings that were difficult to relate to tensions applied (a result which can be caused by common issues such as corrosion, thread damage and other factors where multiple tensioning is involved).

EziTite® Hydraulic Nuts removed all these difficulties, as well as achieving precise bolt loads over multiple studs through simultaneous tensioning achieved by hydraulically loading entire groups of fasteners at once (as above).

Simultaneous tensioning gives an extremely accurate and even load onto the flange/joint, enhancing its long-term security, safety and reliability.

Mr Bucknell said the customer was very impressed with the time and labour savings as well as the safety improvements, and are now replacing all standard hex nuts on a further seven boiler feed pumps with Technofast EziTite® TR Hydraulic Nut technology.

Technofast technologies such as EziTite® Hydraulic Nuts and Bolts and the complementary CamNut range are employed worldwide in applications including Australasia, Europe, Asia and North America.

They are particularly valued in applications where avoidance of downtime and reduced maintenance time is critical, including nuclear, hydro, gas and coal electricity generation plants as well as mining and industrial applications.

Recent relocation to the company's purpose built factory in the industrial precinct of Crestmead allows streamlining of manufacture and a significant increase in production to address increasing demand for these innovative fastener systems.

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