

Bolt tensioning device slashes power station downtime; improving safety and usability

Two major power stations in South Korea have installed Technofast's innovative hydraulic CamNut EziJac bolting system with outstanding results in both reducing production downtime and improving safety levels for their maintenance engineers.

Park Jong Geun, General Manager of the Technical Solutions Team at Korea's East-West Power (EWP) Company based in Seoul, said Technofast's CamNut EziJac system had been successfully utilised on the steam turbine casings at both the company's Dangjin and Donghae power stations with outstanding results.

In a letter to Technofast, Mr Park explained that by installing the CamNut EziJac system, his maintenance team had been able to dramatically shorten the maintenance and upgrade times, reduce downtime, as well as increasing production at both locations.

He went on to say that by changing from the previous out-dated heating method of loosening and tightening the bolting on the turbine casings they have also improved the safety of their maintenance engineers.

With the old heating method the company couldn't carry out simultaneous operations and needed many hours to heat up and cool down the bolts as well as measurement of the elongation.

Mr Park explained that this method can also cause serious damage to the components due to their exposure to excessive heat.

But by adopting the CamNut EziJac system, the maintenance engineers were able to loosen and tighten the nuts simultaneously and avoid thermal stress and heat deterioration of the bolts.

He said that by installing the Technofast system, the power company has drastically reduced the number of downtime days lost, plus increased the reliability, production, safety and usability of the power plants.

At the number one unit at the Dangjin steam turbine power station, Mr Park said the company was able to reduce downtime by two days, equating to 840 million Won (A\$1m) per year.

On top of that, the company was able to save 100 million Won (A\$120,000) due to the lifetime extension of other material, due to no thermal stress.

Mr Park said the company was also able to reduce downtime by two days at the Donghae thermal power station, saving 440 million Won (\$A482,000) per year.

Again, the company was able to save another 100 million Won (\$A120,000) due no thermal stress on other material.

Based upon these results Mr Park said management will continue to install CamNut systems on the company's other turbines, valves and other applications, and recommends Technofast's hydraulic bolting system to other steam plant operators.

The Dangjin coal fired power complex (4,000MW) is a core operating site and one of the most eco-friendly plants built in Korea.

Eight units are currently being operated in the complex to provide sustainable energy to the metropolitan area, while the Donghae coal fired power plant (400MW) is the world's largest anthracite/CFBC (Circulating Fluidized Bed Combustion) power plant.

Technofast's Founder and CEO, John Bucknell, said he has had similar glowing endorsements from other industrial users of the company's hydraulic CamNut EziJac bolting system.

He describes the system as a compact, affordable and efficient bolting system, which is simple, safe and easy to use, and 8 to 10 times faster than conventional bolt heating.

Mr Bucknell explained that normally a bolt tensioning tool pulls on the bolt threads protruding above the regular hex nut and then screwed down to retain the loads induced by hydraulic operation of the tool.

“However, with no available thread, the CamNut system performs as the connection to the bolt for the operation.

“Its integral collar expands to take up the bolt’s elongation under force and retains the load when the hydraulic charging pressure is released.”

He said the company used 32 3.1/2 CamNuts with four Ezijac tensioners on the LP turbines at the larger Dangjin power station, while at Donghae Technofast installed 68 CamNuts on the horizontal flange bolts, ranging from 6” to 4”.

Mr Bucknell went on to explain that overhaul and maintenance schedules at power stations accommodate many different operations being performed concurrently or sequentially, with bolting a major operation requiring clear access, which often excludes other activities taking place.

“It is one of the first and one of the last procedures in maintenance scheduling and so it is important to reduce the time taken to unbolt and bolt the turbines as much as possible.”

He said the operators of the turbine, EWP (Korea), were delighted with the installation, with the turbines bolted up in only a few hours.

“Normally this would take over two days to complete, as they would have to allow for heating, cooling, remeasuring and some repeating of this process for adjustment of bolts which were not to the specified elongation.

“They were especially pleased with the accuracy of the hydraulic bolt tensioning, and how quickly adjustments could be made.”

Mr Bucknell said bolting applications such as gas and steam turbine main joints, valve bonnets and steam supply flanges rarely have bolts which have sufficient stud length or available room around the nut area to allow engagement of any type of hydraulic bolt tensioner.

“Instead Technofast’s system replaces standard hex or round nuts with a CamNut which provides connection to the bolt, attachment for a hydraulic bolt tensioner and a rigid platform to accept the reaction from the tool.”

Mr Bucknell said the user friendly CamNuts are fast to install and remove, and require little physical effort.

“They are ideal for situations with short bolt grip length and where space for tooling is restricted.”

He said by installing the CamNut system, there is no longer any need to replace expensive studs to provide sufficient grip length to be able to use hydraulic tensioning methods

“Designed for extreme situations and adverse conditions, the CamNut system can achieve reliable and precise tensioning the first time, all at a minimum cost.

“They are designed to operate in temperatures from –40 degC up to over 650 degC, and where simultaneous tightening of bolts and even joint/gasket compression is required.

“And by removing the risk of strike and pinch point injuries caused by other tightening methods, the CamNut system is ideal for regular maintenance requiring repeated adjustment or removal of nuts, especially where speed of operation is essential and where bolts are of a large diameter.

“We see ourselves as the providers of the ultimate solution for many of these age-old bolting problems, where we can install systems which safely deliver efficient and accurate outcomes.

“This is especially relevant for power generation equipment, where reduced outage time means that the plant can be producing and earning much sooner.”

Mr Bucknell said Technofast has a long history with power generation, and has pioneered other ground-breaking technologies such as the metal-sealed High Temperature Hydraulic Nut.

Recent relocation to the company’s purpose built factory in the industrial precinct of Crestmead, in the southern suburbs of Brisbane, has allowed the streamlining of the manufacturing process, and a significant increase in production to address increasing demand for these innovative fastener systems.

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