Patented fastener technology revives steam turbine

HYTORC

In Brownsville, Texas, at the Brownsville Public Utility's Silas Ray Power Station a bolting challenge arose and HYTORC was called in to develop a solution. A 52-year-old Westinghouse steam turbine and steam chest had a history of leaking at start-up and all of the bolting solutions attempted had been to no avail. Furthermore, previous bolting methods were difficult to use and time-consuming for break-out of the existing acorn nuts.

The plant-engineering manager at Silas Ray became aware of a new fastening technology called the HYTORC Nut™. The HYTORC Nut is a specialty fastener that replaces standard heavy hex nuts and acorn nuts, and allows for extremely accurate tensioning without relaxation or heat. HYTORC provides this fastening technology with the Leakage-Zero Guarantee; if the application fitted with HYTORC Nuts is not absolutely leak-free upon start-up, the problem will be addressed and the tool system rental and HYTORC Nuts are free of charge.

Upon the first visit, HYTORC completed a thorough survey of the application, which includes photos and measurements of all critical areas and all fasteners currently in use. This information was taken back to HYTORC's engineering team where the best possible combination of tooling was determined and the size, material and lubrication type for the HYTORC Nuts were calculated. This is important to ensure the structural integrity of the Nuts throughout the lifetime of the installation, as well as easy removal without bolt damage prior to equipment maintenance.

The maintenance crew was trained by an experienced HYTORC technician on the safe handling and operation of the tooling systems and the correct preparation and installation of the HYTORC Nuts. A HYTORC supervisor was on site during the installation to oversee the crews and ensure the installation was flawless from start to finish. The steam chest installation was completed with a four-tool system comprised of HYTORC Avanti™ hydraulic torque wrenches to assure parallel joint closure on the gasket. This, combined with the even and accurate load assured by the HYTORC Nut, is what allows HYTORC to guarantee zero leakage on start-up.

For the horizontal casing, it was decided the HYTORC Nuts would be installed on the underside of the turbine for easier stud removal for future breakout. An inverted lock-on option is available for inverted applications. The four-tool system was locked onto the nuts so one operator could remotely tighten four at a time completely hands-free. As guaranteed, the start-up of both applications was completely leak-free.

The next step for the Silas Ray Power Station? A survey and installation on another 52-year-old Westinghouse steam turbine that is about to be recommissioned. HYTORC looks forward to the challenge.

For more information, contact HYTORC, Division UNEX Corp., at 333 Route 17, Mahwah, N.J. 07430, call (201) 512-9500 or e-mail info@hytorc.com. ●

Pictured is an old steam turbine retrofitted with HYTORC Nuts for leak-free operation.