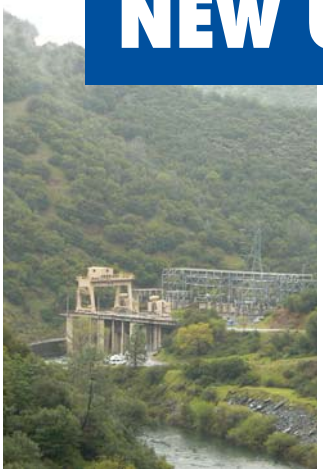
S.M.U.D. HYDRO WORKERS FIND NEW USES WITH THORDON BEARINGS



It was late 2007, and the White Rock Powerhouse was overdue for an overhaul. Two of the largest hydroelectric generating units operated by the Sacramento Municipal Utility District (SMUD), California, U.S.A. were to be shut down for extensive repairs.

Among the necessary repairs, the wicket gate liner plates had to be replaced. High-pressure water had eroded them over the years and was costing thousands of dollars a day in water leakage. Having the machine open would also present a rare opportunity to inspect, repair and upgrade other components that are not normally accessible, such as the wicket gate bushings.

The 40 wicket gates – each weighing 1,500 pounds – have sleeve-like bushings that support the shafts. The original bronze bushings require constant lubrication from grease lines. Grease is also supplied to numerous bushings that make up the gate operating mechanism. Although the SMUD facility was using organic, vegetable-based jelly grease, not considered a harsh pollutant like petroleum, the use of grease as a lubricant had created quite a housekeeping issue in the units turbine pits.

Significant grease had accumulated in each turbine pit, coating various parts and surfaces. Before proceeding with the disassembly, crews spent five days removing 40 years' worth of grease ultimately filling two 55-gallon (208 L) drums two-thirds full.

"It was quite a mess, and an unsafe place to work," says Bill Collins, Principal Mechanical Engineer in SMUD's Power Generation department. "These guys were in their coveralls, covered in grease and pumping it into containers. The prospect of eliminating the grease lubrication system was clearly attractive, not just because it was difficult to work in there but because it looked terrible."

Once the first machine was disassembled, the crew set out to replace the greased bushings with Thordon's bronze-backed HPSXL TRAXL bearings, which require no maintenance and run grease-free. They started with the 20 wicket gates, each of which has a lower, an intermediate and an upper bushing, thereby eliminating 60 grease points. Next, at the upper stem of the wicket gate is a thrust cap that secures the wicket gate lever as it rotates between the open and close positions. Engineers machined the thrust caps to provide a smooth surface for a Thordon SXL washer to ride against, and installed the washer over the gate lever flanges thereby eliminating 20 more grease points. Collins and his foreman came up with that idea – a custom job that eliminated a grease point beyond what was outlined in Thordon's product catalogue. "The crews got really excited about the process of eliminating 60, then 80 grease lines, and we thought there were certainly other things we could do," says Collins. "Then we got really carried away."

They decided to use ThorPlas, a thermoplastic grease-free bushing from Thordon, to replace the small sleeve bushings installed within the link levers for the gate operating mechanism, eliminating yet another 40 grease points. In addition, the servo connecting rod bushings and the PRV connecting rod bushings were replaced with ThorPlas greaseless bushings.

The crew has now completed work on both units. Not only are the units free of grease, but the turbine pits look new, with freshly painted gate levers, gate arms, floors, and walls.

The new bearings are expected to outlast the previous, greased ones. Collins, who set out to reduce leakage from the Powerhouse, says the Thordon bearings provided the added bonus of minimizing the greased systems used for lubrication at the powerhouse.

"It's kind of nice to be able to complete your work in such a nice looking area and take pride in it," he says, "without any grease on the horizon."

White Rock refits with grease free ThorPlas bearings

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