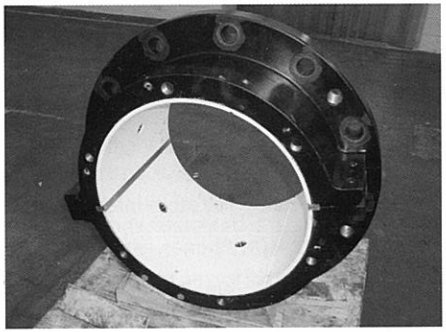

Many of the world's vertical and horizontal hydro turbines run on water lubricated main guide bearings. Wear life for these bearings is heavily influenced by the type and quantity of abrasives present in the water. Bearing replacement on a 3 to 5-year cycle is common in many applications using conventional water-lubricated main guide bearing materials such as phenolic laminates or rubber. However, recent observations from one leading hydro power plant operator points to significantly longer wear life and reduced operating costs from an elastomeric polymer bearing - Thordon SXL.

'We have used rubber main guide bearings for many years,' says Conrad St. Pierre, Director of Mechanical Maintenance & Repair for Enel North America, Inc, 'but we are always evaluating new materials to extend the wear life and reduce downtime of our units.'

Enel North America first used elastomeric Thordon bearings in the fall of 2003 at the Star Lake hydro power station (18MW) in Newfoundland, Canada. Thordon SXL replaced a water-lubricated metal hydrostatic turbine guide bearing in a vertical Francis turbine unit that required a high pressure filtered water supply. 'The Thordon SXL bearing has been a complete success,' says St. Pierre. 'This unit has operated with minimal wear or issues once the initial design was modified to prevent delaminating caused be allowing lubrication water under pressure between the bearing and housing.'

The second Thordon SXL installation was for a turbine guide bearing at Sheldon Springs Hydro (25MW) in Vermont, US in 2005. 'This turbine was a 140kW unit rotating at 1200 rpm,' says St. Pierre. 'We were looking to extend the life span of the bearing and replaced the standard Rubber turbine guide bearing with Thordon SXL. We also had the shaft hard coated with NiCrB. To date, we have had good service on this unit and are satisfied but will continue tweaking to extend the bearing life.'

Thordon was chosen again for the Crescent hydroelectric project (1.5MW) operated by Littleville Power Company (a subsidiary of Enel North America) located in Massachusetts, US. 'Again we were looking to extend service life due to loading and abrasive water conditions,' says St. Pierre. 'We replaced the rubber main turbine bearing with SXL in 2006. However, water flow issues caused the SXL material to overheat in early 2007, so Thordon recommended a slight design modification for a new SXL bearing. During assembly of the new bearing, we determined that the shaft had excessive runout and at this point, we are operating the unit until we can correct the problem while minimising costs and duration of outage and resultant loss of revenues. So far the experience and technical support we have had from Thordon Bearings has been very good.'

Thordon Bearings designs and manufactures a complete range of environmentally friendly main turbine, wicket gate, shaft seals and other hydro-bearing products for the global marine market.

www.thordonbearings.com