Nashua Hydro Retrofit

Split Stainless Steel Shaft Sleeve

Thordon SXL Split Main Guide Bearing

Application

- GOBAUD turbine
- 1000 KW
- 5 blade Kaplan runner at 10,000# (+/-)
- Shaft:
  - 10.630” diameter
  - 36 degree angle
  - 185 RPM
Overview

- **The Problem**
  - The sealing system would fail on the Babbitt and oil lubricated bearing.
  - The oil would be contaminated with water.
  - Replacing the seals and oil required dewatering the unit.
  - The seals have a long lead time.
  - The turbine would be shut down at inopportune times for repair.
  - Time didn’t allow for the damaged shaft to be removed for machining
  - Environmental contamination concern from oil leakage

- **The Solution**
  - Design and supply a water lubricated Thordon SXL split main guide bearing.
  - Design and supply a stainless steel split sleeve to fit over the damaged shaft.

![Original bearing assembly](image-url)
Power washing old bearing

Babbitt bearing lubrication supply lines

Babbitt bearing housing

Cover plate
Babbitt bearing with cover plate removed

Top half of split Babbitt bearing

Babbitt bearing with top half removed
(looking at the lower half of the Babbitt bearing)
Babbitt bearing to be removed

Ring to be removed

Turbine shaft stripped of bearing and ring

Fretting of the shaft
Turbine shaft and annular ring

Shaft dimensions for manufacturing the split sleeve
Split sleeve design
Bluing on shaft
Chalk white on split sleeve

Checking the split sleeve's contact areas to the shaft
Close up of the split sleeve fit to the fretted shaft

Lowering the top half of the split sleeve

N.C.B. hard coat
Split sleeve temporary installation

Split sleeve temporary installation
I.D. of split sleeve machined to fit fretted shaft

I.D. of split sleeve showing the initial contact areas with the shaft

Split sleeve final installation

Loctite
Thordon SXL split main guide bearing being unpacked
Looking down on the shaft / sleeve
The bottom half of the Thordon bearing is in place

Looking up at the bottom half of the Thordon bearing
Looking up at the bottom half of the Thordon bearing

Looking from the left side at the bottom half of the Thordon bearing
Top half of the Thordon bearing being lowered

The split sleeve and the Thordon bearing installed
Bolting the bearing housing to the annular ring

Drilling for dowel pins
Dowel pin installed.

Split sleeve

Shaft

Thordon SXL bearing

Bearing housing with coal tar epoxy applied
Water supply lines installed (if needed)

Final installation

Before