Steam Turbines and Low Plasticity Burnishing

TURBINES PROVIDE 80% of the world's electricity. Repeated exposure to high vibratory stresses and extreme steam environments leads to stress corrosion cracking and fatigue failure in steam turbine blades. The use of welding and replacement parts in these turbines results in 50% of reoccurring failures, costing millions for each occurrence.

Low Plasticity Burnishing (LPB®) extends component life and reduces costs by imparting a deep, stable layer of designed compression into the high-stress areas of steam turbine blades. How do we know this?

- We applied LPB to martensitic stainless steels Alloy 450 and 17-4 PH with and without surface damage to measure damage tolerance and corrosion fatigue performance.

- In undamaged alloys, LPB increased fatigue strength of 17-4 PH by 30% in neutral salt solution and of Alloy 450 in acidic salt by 50%.

- LPB mitigated damage to a 1 mm depth of compression in both alloys.

- The cyclic stress component of corrosion fatigue was eliminated, effectively restoring the endurance limit lost by active corrosion fatigue.

Read the complete technical paper titled, "Fatigue Life Extension of Steam Turbine Alloys Using Low Plasticity Burnishing" at www.lambdatechs.com/technical-papers.

For more information on this and other LPB applications, visit www.lambdatechs.com or contact Julie Prevey at 800-883-0851. ●