



## Wind Turbine Manufacturer

6/25/2009 by Tony Tipton, Former Chief Metallurgist

*Case history from Metallurgical Department of NHML.*

Customer problem: Turbine shaft fractured transversely during low temperature.

What NHML did to solve problem: Recommended nickel bearing steel be used in lieu of 4340 low alloy steel to improve toughness at low temperature. Also recommended that strut to shaft weldments be stress relieved after welding and subsequently shot peened to improve fatigue resistance.

Benefit to customer: Improved reliability to turbine shaft.