



# ME Seminar



## White Etch Cracks in Wind Bearings

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### ABSTRACT

White Etch Crack (WEC) failures can reduce bearing life by  $>90\%$ . WEC is an industry wide issue which includes wind turbine bearings. For this issue, there is no consensus about the root causes in the industry. This work critically reviews literature work (mainly coupon level tests) to identify factors affecting WEC. The four main factors affecting bearing life are material & manufacture, bearing design and type, operating conditions, and lubricant (base oil and additive). Results from four test configurations i) 4-ball test, ii) Thrust test, iii) MPR tests and iv) FE8 rig have been reviewed here. Even though the above factors contribute to reduction of Weibull life, a clear correlation between low Weibull life and WEC formation cannot be established. Lube additive has most significant influence in life reduction and slip has lowest influence. Other factors which contributes to life reduction between lube additive and slip are current, material quality, surface hardening, Lube and base oil in that order. Based on this critical literature review lubricant additive, current and material quality emerge as major factors influencing the reduction of wind turbine bearing life.

### ABOUT THE SPEAKER



Sridhar has a Ph.D. in area of Thermal Contact Resistance, University of Waterloo and has more than 28 years of experience including 24 years in GE. He has worked in areas of scuffing and wear of rotating/reciprocating components (including vacuum bearings), mechanics of rough surfaces, high temperature fretting wear, X-ray tube thermal management & Cathode design and more recently in rolling contact fatigue of bearings. He has 15 patents/patent applications, 3 trade secrets, 50 GE internal publications, 14+ conference & journal publications to his credit. In 2014 he won the Dushman Award (GE Research's highest award for technical achievement).

**October 13, 2023 (Friday)  
4:00 PM, A.R. Auditorium**