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APS TBC life prediction - Impact of manufacturing variations

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APS TBC LIFE PREDICTION - IMPACT OF MANUFACTURING VARIATIONS

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Thermal barrier coating systems (TBC) are essential to meet the increased performance and reliability requirements for heavy duty gas turbines providing a cost effective and environmentally sound power generation solution. The push to higher firing temperatures and reduced cooling air flow emphasizes TBC degradation and increases risk of failure. Therefore, appropriate life prediction and test methodologies are required to evaluate the reliability of current and new TBC systems under realistic operation conditions and to predict performance limits. Additionally, the impact of manufacturing variations on coating properties and life is becoming more critical under demanding operation conditions and needs to be included.

In the talk the overall framework of our TBC life and performance prediction is presented and discussed in some detail. The impact of manufacturing variations on coatings properties and, consequently, on TBC life is discussed in this framework and compared with test results.