Bayesian modelling of failure prediction using maintenance information

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Abstract

In this paper we illustrated that even for large, complex systems with evident heterogeneity and sparse failure data, incomplete maintenance information, simplistic models with nominal but intuitive assumptions can bring out interesting and useful features of the system. Moreover, inference for both population and individual level inferences can be carried out. A hierarchical Bayesian model based on a latent variable structure is proposed to take into account such heterogeneity in reliability/survival data. This is illustrated by an analysis of failure data from several motor operated closing valves at two nuclear power plants.