

# Optimal Doubling Burn-in Policy Based on Tweedie Processes with Applications to Degradation Data

Chien-Yu Peng<sup>1</sup> and Kun-Hung Lin

**Abstract:** In the current competitive marketplace, manufacturers need to screen weak products in a short period of time. It is a challenge for manufacturers to implement a burn-in test that can screen out the weak products quickly and efficiently. When selecting an approach to determine the duration of the burn-in, one could build a criterion aiming to minimize the burn-in cost. In practice, when the optimal burn-in time is unreasonable (e.g., time 0) due to minimizing the cost, this means that the burn-in procedure is unnecessary to perform for manufacturers. In this study, we propose an optimal doubling burn-in policy to improve the predicament without additional experiments. The advantage of the proposed policy is to simultaneously determine the optimal burn-in time and the optimal cutoff point for classifying weak and strong components from the production. In addition, a new degradation model based on a Tweedie mixture process is used for a burn-in test. The proposed burn-in procedure is applied to a real data.

---

<sup>1</sup>Institute of Statistical Science, Academia Sinica, Taipei, 11529, Taiwan, E-mail: [chienyu@stat.sinica.edu.tw](mailto:chienyu@stat.sinica.edu.tw)