Degradation Model for UK Railway Drainage System

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Abstract : Management of UK railway drainage assets is challenging due to the large amounts of historical assets with long asset life cycles. A major concern for asset managers is to maintain the required performance economically and efficiently while complying with the relevant regulation and legislation. As the majority of the drainage assets are buried underground and are often difficult or costly to examine, it is important for asset managers to understand and model the degradation process in order to foresee the upcoming reduction in asset performance and conduct proactive maintenance accordingly. In this research, a Markov chain approach is used to model the deterioration process of rail drainage assets. The study is based on historical condition scores and characteristics of drainage assets across the whole railway network in England, Scotland, and Wales. The model is used to examine the effect of various characteristics on the probabilities of degradation, for example, the regional difference in probabilities of degradation, and how material and shape can influence the deterioration process for chambers, channels, and pipes.

Keywords : deterioration, degradation, markov models, probability, railway drainage
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