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Approach for Demonstrating Reliability Targets for Rail Transport during Low Mileage Accumulation in the Field: Methodology and Case Study

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Abstract : In railway industry, train sets are designed based on contractual requirements (mission profile), where reliability targets are measured in terms of mean distance between failures (MDBF). However, during the beginning of revenue services, trains do not achieve the designed mission profile distance (mileage) within the timeframe due to infrastructure constraints, scarcity of commuters or other operational challenges thereby not respecting the original design inputs. Since trains do not run sufficiently and do not achieve the designed mileage within the specified time, car builder has a risk of not achieving the contractual MDBF target. This paper proposes a constant failure rate based model to deal with the situations where mileage accumulation is not a part of the design mission profile. The model provides appropriate MDBF target to be demonstrated based on actual accumulated mileage. A case study of rolling stock running in the field is undertaken to analyze the failure data and MDBF target demonstration during low mileage accumulation. The results of case study prove that with the proposed method, reliability targets are achieved under low mileage accumulation.

Keywords : mean distance between failures, mileage-based reliability, reliability target appropriations, rolling stock reliability
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