Human Error Probabilites (HEPs) for generic tasks and Performance Shaping Factors (PSFs) selected for railway operations

This report describes an HRA (Human Reliability Assessment) of six generic tasks and four Performance Shaping Factors (PSFs) targeted at railway operations commissioned by Banedanmark. The selection and characterization of generic tasks and PSFs are elaborated by DTU Management in close collaboration with Banedanmark. The estimates provided are based on HRA literature and primarily the HEART method, being recently been adapted for railway tasks by the British Rail Safety and Standards Board (RSSB). The method presented in this report differs from the RSSB tool by supporting an analysis at task level, which can be performed with fewer resources than a more detailed analysis of specific errors for each task. The generic tasks are presented with estimated Human Error Probabilities (HEPs) based on and extrapolated from the HRA literature, and estimates are compared with samples of measures from comparable tasks from the COREDATA database. PSFs are presented with multipliers to be used in combination with generic tasks types to support a quantitative HRA of railway tasks. Estimates contained in this report should be used with caution and judgment, since they are largely based on estimates derived from industries other than rail and the general warning that a task-based analysis is less precise than an error-based one. The authors recommend that estimates be adjusted to actual measures of task failures when feasible.