The project: smARt RAILroad maintenance eNGinEERing with stochastic model checking.

How can we model and analyse big railway systems and:
• Compare the effects of different maintenance strategies?
• Obtain smart maintenance strategies?
  – Best balance between maintenance cost and reliability
• Improve reliability and availability?
• Reduce costs of maintenance and failures?

Methods: fault trees, maintenance models, and stochastic model checking.

Results: Decision support for maintenance policies.
• We have developed fault maintenance trees (FMTs).
• We have developed tools to analyse FMTs to compute:
  – Reliability, availability, expected number of failures
  – Breakdown of most common failure causes
  – Costs of maintenance and failures
• We have performed case studies on EI-Joints and pneumatic compressors.

Impact:
• Tools to compare different maintenance policies.
  – Based on stochastic and statistical model checking
• Insight into dependability documentation inside ProRail.
  – Effects of interdependent failure modes
• Validation of ProRail’s maintenance strategy for EI-joints.

Next steps:
• Improve automation of analyses.
• Use Big Data to obtain model parameters.
• Reduce computation time for analysis.

Date finish project (expected): 31.10.2016