

Handout for Railway Traffic Safety

1. Introduction

Why I would like to introduce railway traffic safety?

- types of traffic safety
- reasons to choose railway

2. Example: ICE Accident – Eschede Derailment

- accident information
- the most serious railway accident to date

3. Cause Analysis

3.1 Causes

- derailment and hit the bridge
- conversion of railway switch due to the derailed wheels
- lift of the guard rail on account of the wheel tire sticking in the train body
- fracture of metal tire due to metal fatigue
- incomplete execution of maintenance process

3.2 Measures after Eschede Derailment

4. CTCS: European Train Control System

ETCS – 0 / ETCS – STM /

ETCS – 1 / ETCS – 2 / ETCS – 3

5. Summary and inspiration

- accident causation model

6. References

- [1] Christian Brauner, Willi Stadler (Hrsg.): Bewältigung größerer Schadensereignisse – Das ICE-Unglück Eschede. Villingen-Schwenningen 2002, ISBN 3-931778-28-2
- [2] Ewald Hüls: Die ICE-Katastrophe von Eschede; Fakten – Erfahrungen – Konsequenzen, Zivilschutz-Forschung – 45., 46. und 48. Jahrestagung der Schutzkommission beim Bundesminister des Innern, S. 275–289
- [3] UIC (Hrsg.): Compendium on ERTMS. European Rail Traffic Management System. Eurailpress, Hamburg 2009, ISBN 978-3-7771-0396-9

7. Vocabulary

derailment: the action of a train or tram leaving its tracks accidentally

collapse: (structure) suddenly fall down or give way; fold or be foldable into a small space

wreckage: the remains of something that has been badly damaged or destroyed

guard rail: a strong fence at the side of a road or railway, intended to reduce the risk of serious accidents

frog: a grooved metal plate for guiding the wheels of a railway vehicle at an intersection

wheelset: a pair of wheels attached to an axle

fracture: the cracking or breaking of a hard object or material

metal fatigue: weakness in metal caused by repeated variations of stress

tire/tyre: a strengthening band of metal fitted around the rim of a wheel

beacon: a fire or light set up in a high or prominent position as a warning, signal, or celebration

balise: an electronic beacon or transponder placed between the rails of a railway as part of an automatic train protection (ATP) system

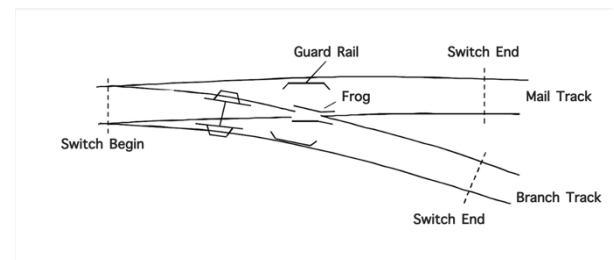


Figure 1. Railway Switch

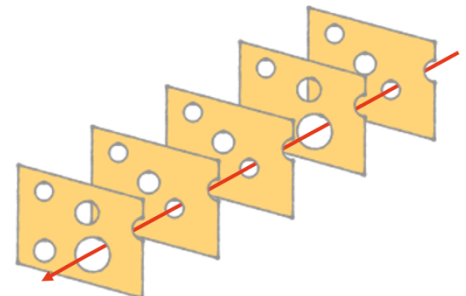


Figure 2. Swiss Cheese Model