Schweizerische Eidgenossenschaft
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Confederazione Svizzera
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Federal Department of the Environment, Transport,
Energy and Communications DETEC
Federal Office of Transport FOT
Safety Division

European Rail Safety Days

Occurrence reporting and risk management by the Swiss National Safety Authority

4 November 2021

Overview

- Safety Risk Management by NSA CH
- National Events Database NEDB
- Safety Monitoring 2021 and relevant issues

Safety Policy of NSA CH (FOT)

8 Safety Principles

Nr. 2: We are committed to **maintain safety at least at its current level** and ensure that it remains **comparable with other leading countries.**

Nr. 5: We assess the safety-relevant aspects in the **authorization procedures** and during **safety supervision** in the operational phase on a **risk-oriented** basis.

Safety supervision – control cycle

Approval: issue of SC / SA, compliance of SMS with regulations

Supervision: control of implementation and results of SMS processes

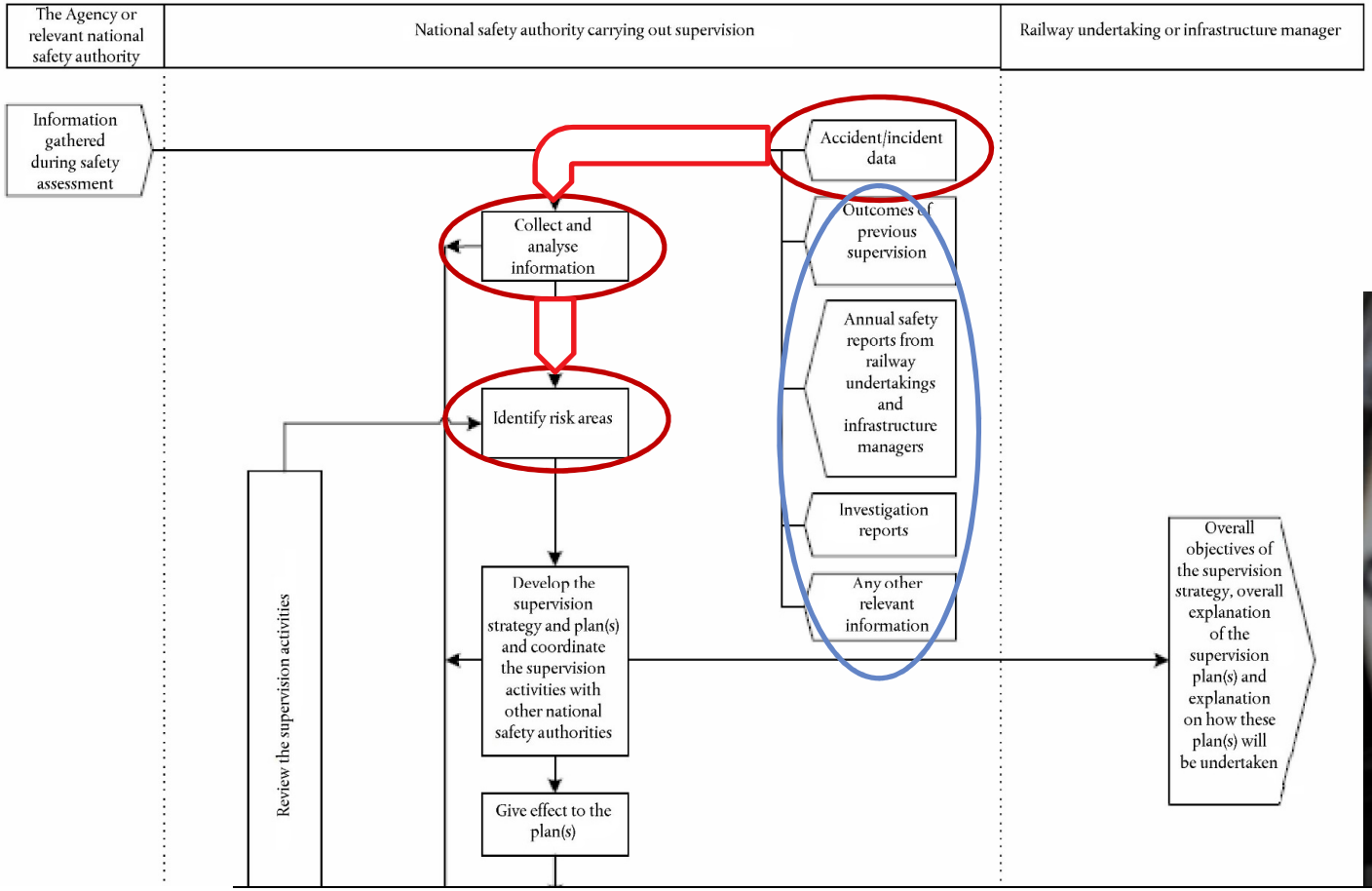
Regulation: revision of regulation based on implementation experiences

SRM: Safety risk management

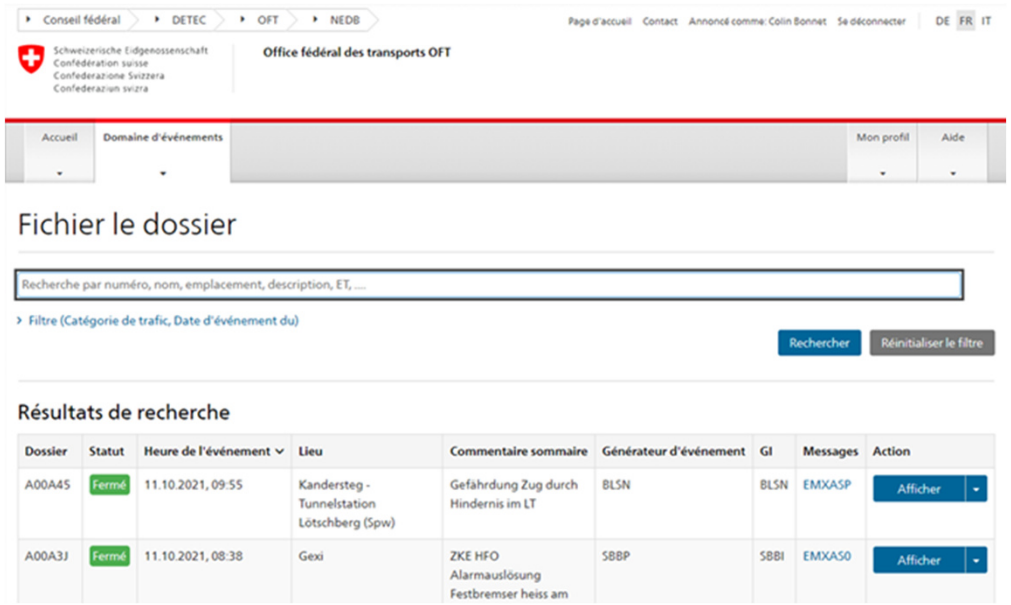
Safety Risk Management: collect and assess safety relevant information, determine the need for action

Regulation (EU) 2018/761 - CSM Supervision

Annex I - Appendix



Accident / Incident data collection
National Events Database NEDB



~780 events/year reported (standard-gauge railways)

Accident / Incident data collection
National Events Database NEDB

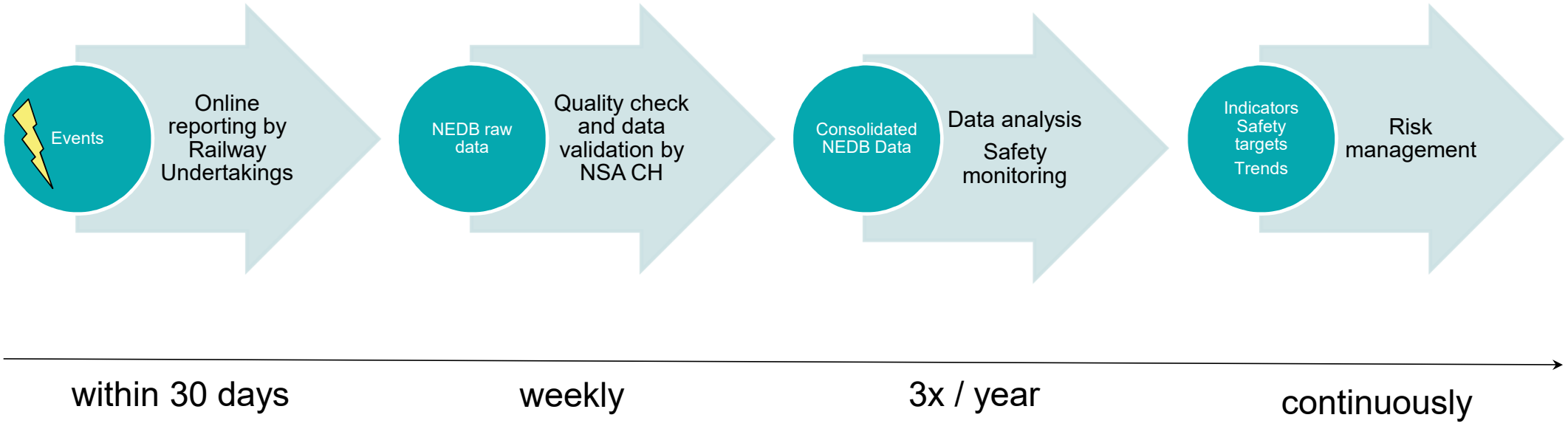
Mandatory reporting of events based on national regulation (OSITI, SR 742.161)

- Accidents, serious incidents, exceptional events
- Suspected or proven sabotage
- Fires in vehicles

} Also reported to the National Investigation Body NIB

- Events resulting in minor injuries, events with property damage >100 000 Swiss francs, serious disruption
- Dangerous goods events
- Larger explosions and fires in safety-related installations
- Suicides, and attempted suicides that result at least in a minor injury
- Derailments during train or shunting movements, collisions with other vehicles or obstacles during train or shunting movements
- Runaway rail vehicles
- Non-observation of signals

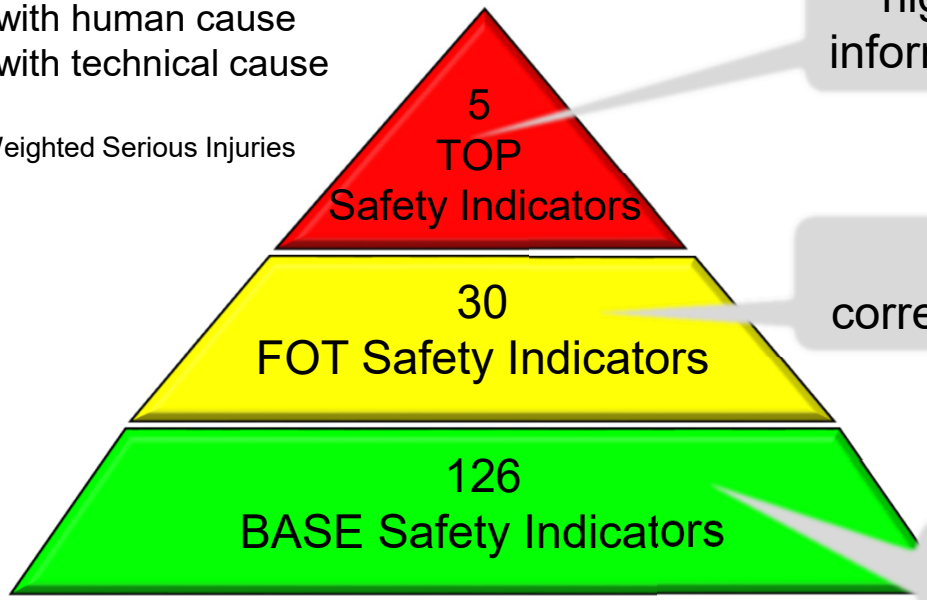
Accident / Incident data collection
National Events Database NEDB



Safety Level Monitoring - Safety indicators

TOP1: Total FWSI*
TOP2: FWSI in operators' responsability
TOP3: All incidents
TOP4: Incidents with human cause
TOP5: Incidents with technical cause

*FWSI: Fatalities and Weighted Serious Injuries

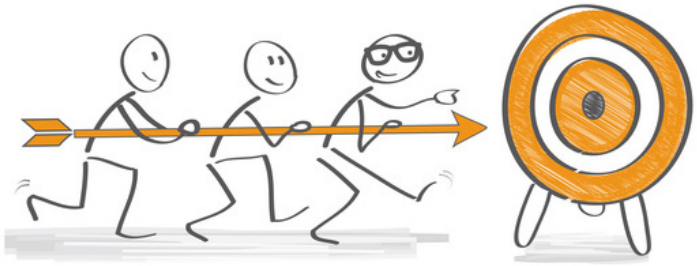


highest abstraction level for information to FOT management

Medium abstraction level corresponding to the main risk topics

indicators in relation to type, place, cause and severity of the occurrences

Safety targets definition



Average safety performance compared to the reference time period of the years 2009-2012 or 2011-2016 (if lower)

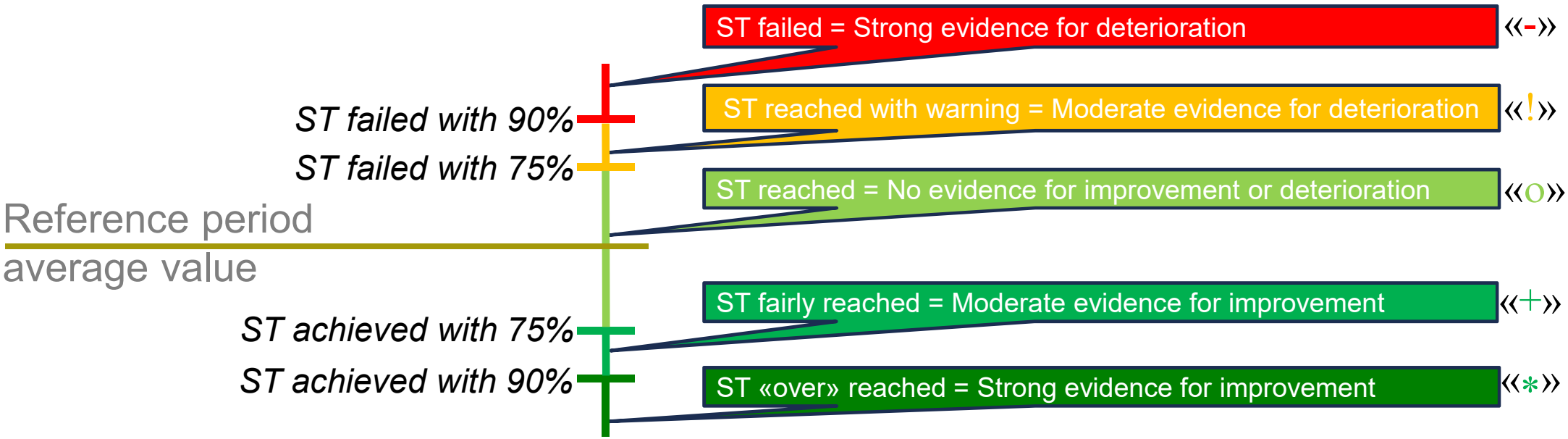
No absolute number, the statistical significance of the reference data is part of the safety target

Applicable on all abstraction levels (whole public transport CH, transport mode, group of operators, single operator)

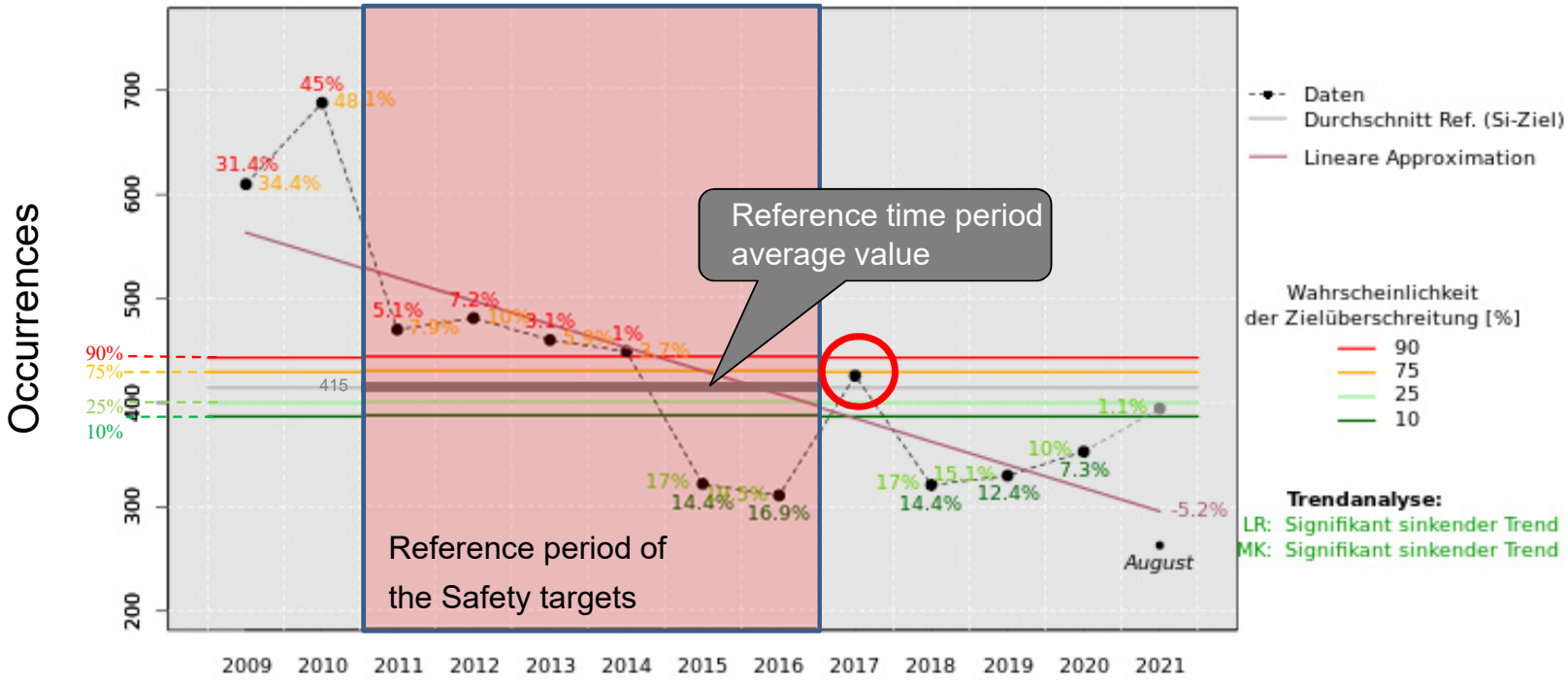
Evaluation of the safety targets (ST)

- Assessment of the hypotheses (with 75% and 90% significance level):
  - Safety Target failed
  - Safety Target reached

- Evaluation results: 5 degrees of compliance with the Safety Target:

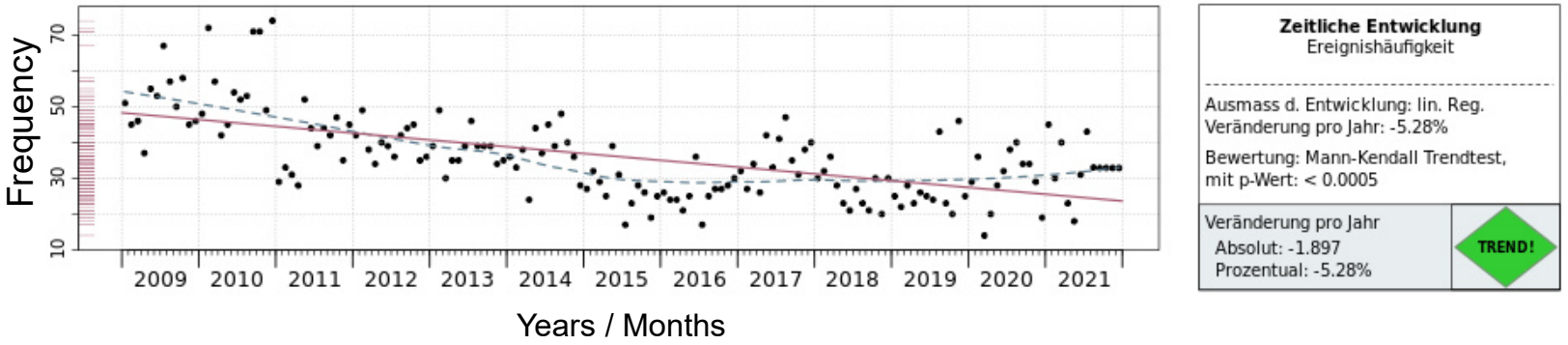


Assessment of the safety level
Visualisation



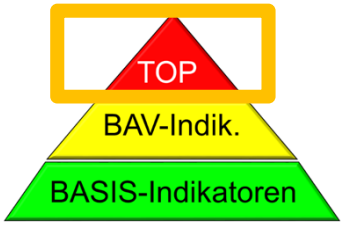
Assessment of the safety level
Evaluation of the trends

Use of a statistical test for identification of significant trends in the safety level



Positively significant trend, annual slope -5.28%/y or -1.897 occurrences/y

Safety Monitoring CH 2020
TOP-Indicators

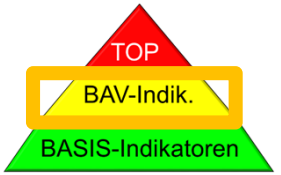


	Total	Railway	Urban transport	Cable-ways	Naviga-tion
TOP1 Total FWSI	🟢	🟢	🟢	🟢	🟢
TOP2 FWSI in operators' responsibility	🟢	🟢	🟢	🟡	🟢
TOP3 All incidents	🟢	🟢	🟢 ↗	🟡	🟢
TOP4 Incidents with human cause	🟡	🟢	🔴 ↗	🔴	🟢
TOP5 Incidents with technical cause	🟢	🟢	🟢	🟢	🟢

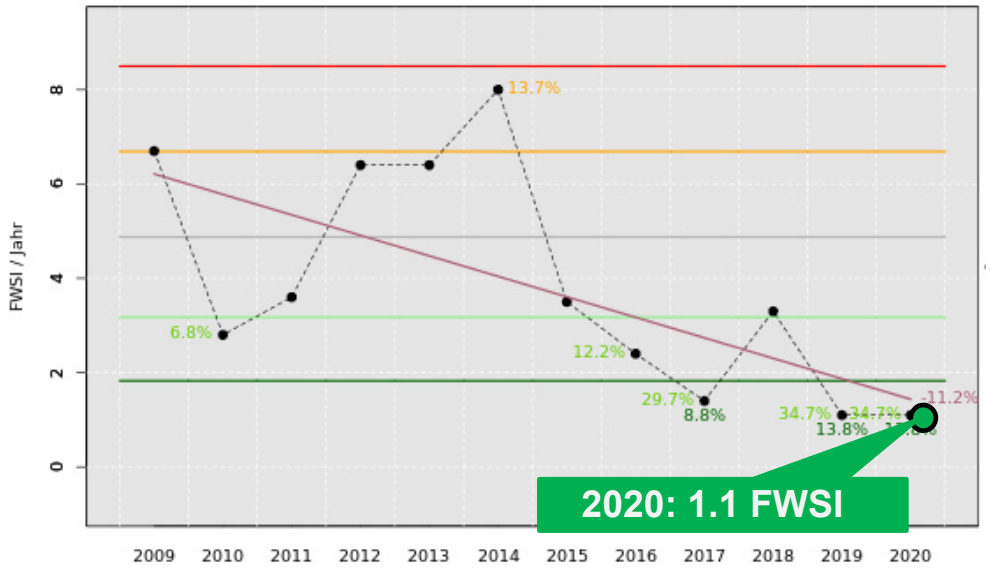
🟢 Safety target reached 🟡 Safety target reached with warning 🔴 Safety target failed

↗ Significant negative trend in the last 4 years

Railways: Level crossings

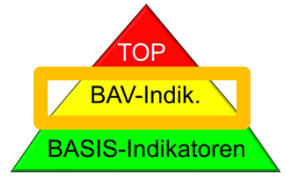


Fatalities and Weighted Serious Injuries FWSI*

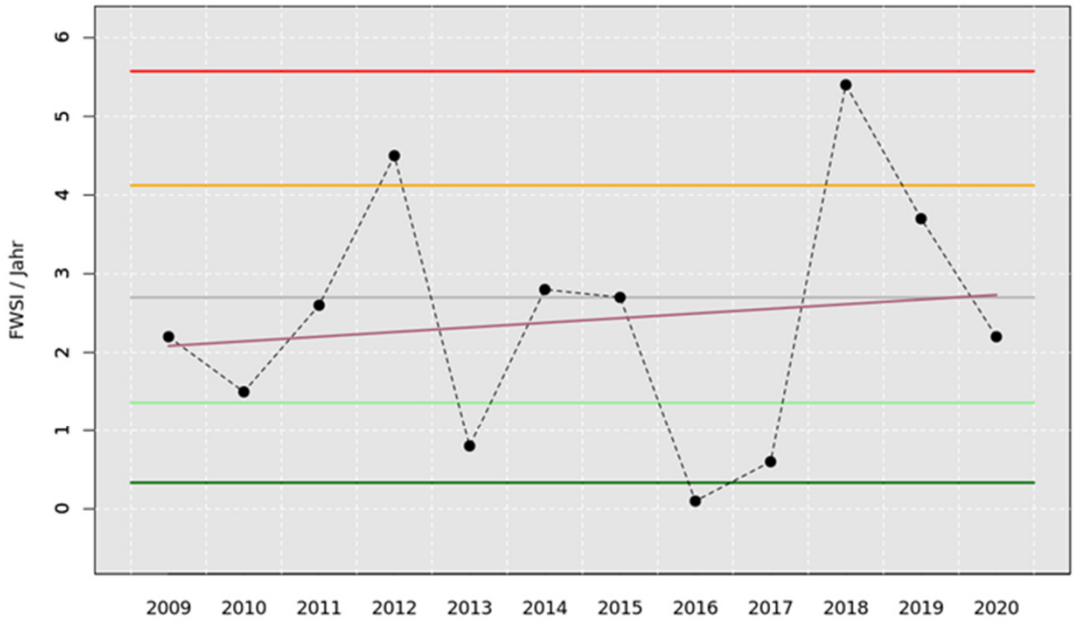


*FWSI: Fatalities + 0.1 x Serious Injuries

Working accidents



Fatalities and Weighted Serious Injuries FWSI*



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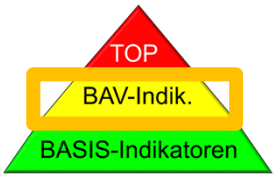
Working accidents



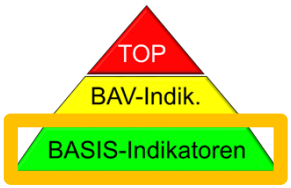
Workplaces have been a focus of safety monitoring since 2018

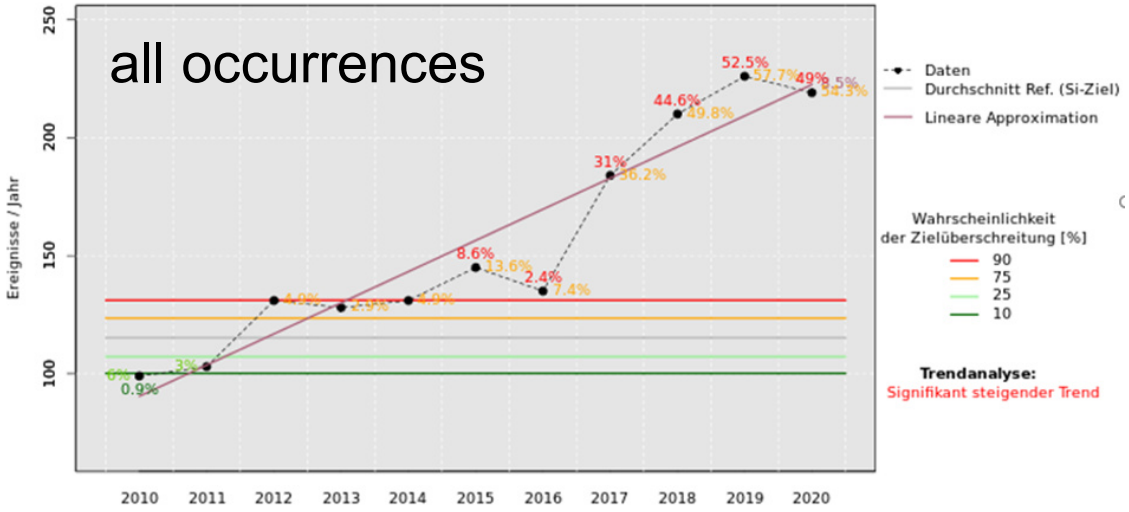
For 2021, additional operational inspections at workplaces are planned at the larger Infrastructure Managers.

The focus is on the tasks of safety management

- Work preparation
- Safety arrangements
- Communication

Signals passed at Danger during shunting

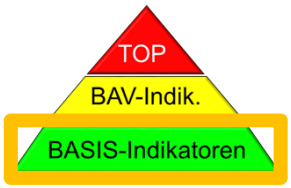




Approx. 5% of all occurrences result in putting a train in danger due to shunting movement

No significant increase in severity so far

Signals passed at Danger at shunting



Shunting: technically not fully safe but residual risks generally acceptable

Subject to safety supervision and discussions in national committees

Study by the University of Applied Sciences Northwestern Switzerland (FHNW) completed

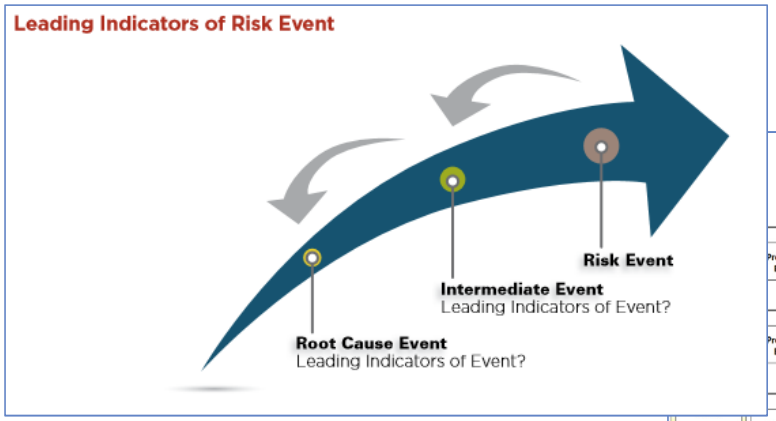
Workshops with FHNW on "Safety-oriented management" underway

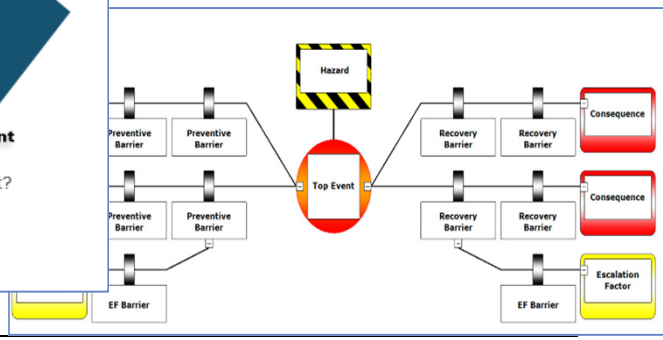
Challenges

1. **Sparse data** (railway system is safe!)
   - ➢ Optimization of statistical methods
   - ➢ Use of broader, international data base → CSM ASLP

2. **Reporting discipline and data quality**
   - ➢ Auditing Event management processes by operators including data reporting
   - ➢ Training, technical support and motivation of railway staff

3. **Reactive system**
   - ➢ Risk modelling
   - ➢ Leading indicators





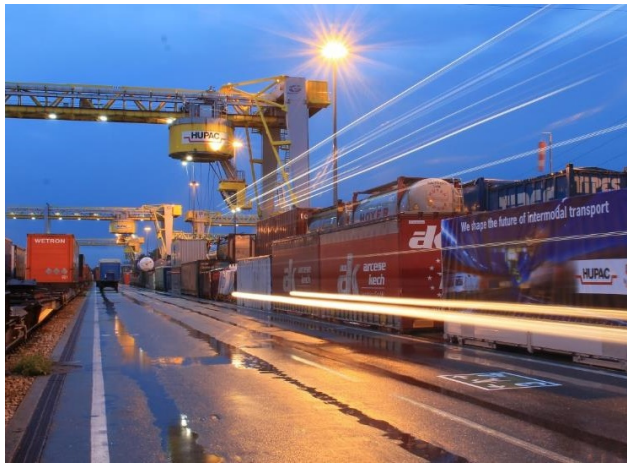
Conclusions

Occurrence reporting and **safety monitoring** are crucial for risk management

CSM ASLP is a big step towards efficient safety management

Humans are (increasingly) the **weakest link…** and the **solution**

➢ **Investing in safety culture is essential!**



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