UIC Safety Database (SDB)

Presentation

The UIC Safety Database (UIC-SDB) is an internet application organised within the Infrastructure Forum activities. It is continuously maintained and developed in agreement with the Safety Platform, according to the necessities introduced by safety managers and EU Bodies.

The safety database aims to improve access to the information on accidents and incidents in the rail sector by providing a repository of data and statistics for best practice. One of the main focuses is on accident data, as well as in helping to give a better understanding of each railway’s performance in relation to other transport modes.

The Safety Database is particularly focused on:

- Providing Members with detailed railway accidents or performances data, allowing for a detailed analysis of safety indicators with other transport modes.
- Indicating the most critical areas where specific attention could result in a decrease in the overall incidence of accidents in Europe.
- Interpreting and validating cumulative frequency curves (Q-curves), based on the accident data to provide relevant safety indicators to be adopted in the context of the pending Safety Directive Annex I Further development.
- Providing a basis for setting appropriate safety targets for the future.
- Assisting European projects with benchmarking and analysis on accidents.

Next UIC Safety Database Correspondents Group meeting dedicated to discussion on second and third level of causes is scheduled for 13th March 2006.

Last update: 18 October 2007

Address: http://safetydb.uic.asso.fr/
UIC Safety Database is:

- An Internet application based on a server at UIC in Paris
  [http://safetydb.uic.asso.fr](http://safetydb.uic.asso.fr)

- 24 European Infrastructure Managers including Norway, Switzerland and Eurotunnel:
  - 200,000 kilometres of lines
  - 124,000 level crossings
  - 4,000 Million km of train movements per year

- 8,500 significant accidents registered since 2003
UIC SDB is available for the following:

- **Learning from accidents** - Identification of railways that have low accident rates so that good practice can be investigated.
- Providing a homogeneous statistical data set that can be used for accident analysis and risk assessments.
- Using a “comparison database” for lobbying purposes,
- Producing trend analyses.
- Proving a basis for bi- and multi-lateral discussions between individual IM(s).

**UIC SDB offers 3 levels of analysis**
Data registered in the SDB for each accident:

- Type of Accident
- Associated Events
- Location
- Train(s) involved
- Causes
- Type of Line
- Signalling System
- Traffic Control
- Consequences
  - Human
  - Financial
  - Environmental
- Protective Measures
19 types of accidental events divided in:

- 9 types of Accidents
- 5 types of Critical event

An accident may associate from $1 \div 18$ accidental events
9 Types of accidents in 6 families

- Train Collision
- Derailment
- Fire in Rolling Stock
- To Person caused by Rolling Stock in Motion
- Electrocution by Traction Power
- Involving Dangerous Goods

- with an obstacle with another train
- individual hit by train
- individual falling from train
- without dangerous goods release in which dangerous goods are released
.. And 5 types of critical events:

- TRACK SUBSIDENCE / TRACK DEFORMATION
- BROKEN RAIL
- (WRONG-SIDE) SIGNALLING FAILURE
- BROKEN WHEEL OR BROKEN AXLE
- SIGNAL PASSED AT DANGER (SPAD)
Accidents taken in account:

- **Serious Injuries**: Involving at least 24 h hospitalisation
- **Significant Accidents**: Cost of damage to stock, track, other installations > 150 K€ or disruptions to traffic > 6h

+ Accident involving dangerous goods when in accordance with RID/ADR section 1.8.5,
Safety Data Base definitions are given on:


Where in compliance with European Regulation N° 1192/2003 amending Regulation N° 91/2003 EUROSTAT:

- **Fatality** means any person killed immediately or dying within 30 days as a result of an injury accident, excluding suicides.

- **Serious Injury** refers to a person who was hospitalized for more than 24 hours as a result of an accident, excluding attempted suicides.
Location

Open Line

Station

Other

Location Details

• Level Crossing
• Bridge / Viaduct
• Tunnel
• Switches and Crossings
• Other
# Trains Involved

## Freight Trains
- Combined Transport
- Block Train
- HS Train
- Other

## Passenger Trains
- Regional
- Long Distance
- HS Train
- Other

## Shunting Operation

## Other or not Identified
- Locomotive Running Light
- Infrastructure Works Train
- Other Train (infra)
- Train not Identified
3 Levels of Causes

It recognises internal or external causes of accidents and the associated subsystems.
Data on consequences of accidents

- Number of Fatalities
- Number of Injuries
- Cost of Damage
- Environmental Impact
  - Passengers
  - Railway Staff
  - Other
SDB Level 1 of analysis gives:

- Number of accidents by type
- Causes of accidents
- Location of accidents
- Daily and monthly distribution of accidents
- Types of trains involved
- Passengers, workforce and public:
  - fatalities
  - serious injuries
- Key findings (in the Annual Report)
- Specific reports.
Level 1: Breakdown and Rate of types of accidents

- Collisions: 58%
- Level Crossings: 28%
- Derailments: 6%
- Persons & RS in motion: 1%
- Fire: 2%
- Others: 5%

- Accidents to persons caused by RS in motion:
- Fire:
- Others:
Level 1- Passengers, workforce and public safety:
Rate of the victims of all accidents

**Killed**
- Passengers: 93%
- Staff: 4%
- 3rd Parties: 3%

**Seriously injured**
- Passengers: 73%
- Staff: 19%
- 3rd Parties: 8%

**Total Victimes**
- Passengers: 84%
- Staff: 11%
- 3rd Parties: 5%
Level 1- Accident rates in 2006 per million km of train movements from Safety Database 2007 Annual Report

<table>
<thead>
<tr>
<th>Years:</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2006</th>
<th>Approximation of accident rates in 2006 in Europe</th>
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<tbody>
<tr>
<td>Number of serious injury accidents</td>
<td>878</td>
<td>986</td>
<td>823</td>
<td>732</td>
<td>757</td>
<td>808</td>
<td>2147</td>
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<tr>
<td>Rate of serious injury accidents per million km of train movements</td>
<td>0.32</td>
<td>0.35</td>
<td>0.30</td>
<td>0.26</td>
<td>0.25</td>
<td>0.27</td>
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<tr>
<td>Number of fatalities</td>
<td>468</td>
<td>470</td>
<td>486</td>
<td>459</td>
<td>466</td>
<td>500</td>
<td>1285</td>
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<tr>
<td>Rate of fatalities per million km of train movements</td>
<td>0.17</td>
<td>0.17</td>
<td>0.18</td>
<td>0.17</td>
<td>0.16</td>
<td>0.17</td>
<td>0.32</td>
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<td>Number of significant accidents</td>
<td>1026</td>
<td>1124</td>
<td>948</td>
<td>815</td>
<td>853</td>
<td>1008</td>
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<td>0.29</td>
<td>0.34</td>
<td>0.59</td>
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<tr>
<td>Number of victims</td>
<td>1022</td>
<td>921</td>
<td>950</td>
<td>1035</td>
<td>1119</td>
<td>919</td>
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<td>Rate of victims per million km of train movements</td>
<td>0.37</td>
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<td>0.38</td>
<td>0.31</td>
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<td>Number km of million train movements:</td>
<td>2761.08</td>
<td>2793.126</td>
<td>2723.486</td>
<td>2780.54</td>
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</table>
SDB Level 2 calculates Common Safety Indicators and draws S curves:
- Numbers of accidents per million Km of trains movements
- Numbers of fatalities and serious injuries (per passengers staff and other)
  per million Km of trains movements with their breakdown per types:
  ➢ Train derailments
  ➢ Train collisions:
    • collision with an obstacle
    • collisions between trains
  ➢ Level crossing accidents
  ➢ Accidents to persons caused by rolling stock in motion
    • persons hit by a train
    • persons boarding/alighting a train
  ➢ Fires in rolling stocks
  ➢ Other types of accidents
Second level analysis from UIC SDB – Indicator on significant accidents period 2004 - 2006

Collisions of trains, including collisions with obstacle within the clearance gauge relating to combined total number of million km of train movements.

Collisions between trains

Trains collisions with obstacles within the clearance gauge
Second level analysis from UIC SDB – Indicator on significant accidents period 2004 - 2006

Number of level crossing accidents, including acc. involving pedestrians at level crossing relating to combined total number of million km of train movements.

0.24165
Level 2 analysis from UIC SDB – Indicator period 2004 - 2006
Number of all significant accidents relating to combined total number of million km of train movements.

1) Enter your indicator
2) Evaluate your performance
SDB Level analysis 3 is for:

- Assessing the performance of each company in the context of the distribution of community performance
- Finding out specific local areas of accident’s risk to improve the overall safety of the system.
- Validating a future threshold for each indicator as a value for the community.
Level 3: Assess performances in the context of the distribution of community performance.

- **Class C:** Poorer performance than representative range
- **Class B:** Representative range
- **Class A:** Better performance than representative range

Normal distribution of the indicators on significant accidents in the period 2004 - 2006 for the network of European UIC members participating in SDB.
Third level analysis from UIC Safety Data Base

<table>
<thead>
<tr>
<th>Infrastructure Manager</th>
<th>Collisions of trains, including collisions with obstacle within the clearance gauge</th>
<th>Collisions of trains</th>
<th>Derailments of train</th>
<th>Level crossing accidents, including accidents involving pedestrians at level crossing</th>
<th>Accidents to persons caused by rolling stock in motion, with exception of suicides</th>
<th>Other accidents including Fires at the rolling stock</th>
<th>All significant accidents</th>
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<td><img src="image" alt="Class C: Poorer performance than representative range" /></td>
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<td><img src="image" alt="Class B: Representative range" /></td>
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Performances of 20 UIC European railway companies in 2006 in relation to the results of the community in the period 2004 – 2006.
Any questions?
Thank you for your attention.