



INTERNATIONAL UNION
OF RAILWAYS

STATISTICS ON ACCIDENTS AT WORK

METHODOLOGY

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UIC methodology for statistics on accidents at work

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1. Foreword

This document was prepared by the ad-hoc Working Group "UIC benchmarking of statistics on accidents at work" following the input received by UIC Safety Platform and Occupational Health and Safety Group (OHSG).

The Railway Companies that were involved and contributed to the definition of the methodology were: CFR SA (Romania); CP (Portugal); HZ Infra (Hungary); Infrabel (Belgium); Network Rail (Great Britain); PKP Infra (Poland); PKP LHS (Poland); MAV – START (Hungary); RFI (Italy) SBB CFF FFS (Switzerland); RFF (France); Southeastern (Great Britain); SNCF (France); Trenitalia (Italy); ZSR (Slovak Republic); ZSSK (Slovak Republic).

Riccardo Trillini (Trenitalia) coordinated the works as chairman of the ad-hoc Working Group and Olivier Georger (UIC) provided technical advice.

2. Purposes

This document provides guidance on the development and compilation of the UIC database for Accidents at work for European UIC members (railway infrastructure managers and railway undertakings).

3. Introduction

Until 2001 UIC was able to compile statistics on accidents at work from approximately 40 European UIC members however data has not been published since that date. Subsequently new pilot tables were implemented however data collected was not always complete or homogeneous.

The European rail transport sector should have available all the tools that the management systems can provide to improve its performance.

Accident statistics are one of the best and most effective tools to inform the prevention of occupational health and safety risk. They help companies to:

- better evaluate the safety performance of railway activities
- take actions to improve their workplaces that are considered more critical
- identify and share best practices.
- improve their processes and make them more efficient, delivering economic benefits.

This document is intended to provide the necessary methodology for European UIC members and act as a useful reference for the implementation of the UIC statistics database on accidents at work.

The main references to European directives, Regulations and international standards useful to define the indicators and information for statistics on accident at work are described in Appendix 1.

In particular, note that the methodology in this document is the one stated in the document “European statistics on accidents at work (ESAW) - Methodology 2001 edition”, see also Appendix 1e.

4. Procedure for data collection by UIC Railway Companies

Each Company is asked to indicate the following information by completing the attached “excel spreadsheet for request of accident at work data relevant European UIC members”.

General information (first sheet of excel spreadsheet)

- 4.1 Railway company name.
- 4.2 Activity of the Railway Company. Choose between:
 - *Infrastructure Manager;*
 - *Integrated company (infrastructure manager + railway undertaking);*
 - *Railway undertaking: Passenger and freight transport;*
 - *Railway undertaking: Passenger transport;*
 - *Railway undertaking: Freight transport.*
- 4.3 First name and surname of the person in charge of accident data provision to UIC.
- 4.4 E-mail address of the person in charge of accident data provision to UIC.
- 4.5 Statement clarifying if data include or exclude the contribution of contractor/subcontractor staff.
Select yes or no.
- 4.6 Statement clarifying the accident reporting procedure based on.
Select one of the following option: insurance system or legal obligation (see ESAW 2001 page 23 and page 11 of this document).
- 4.7 Statement clarifying the criteria of calculation of the days lost.
Select one option between: static or dynamic criteria (see following point 4.12).

The following data refer to two different sections:

- Infrastructure manager,
- Railway undertakings,

explaining the data to the following railway staff categories, considered more hazardous and subject to accidents:

- track workers,
- shunters,
- train drivers,
- on board staff,
- rolling stock maintenance workers.

The definitions of the staff categories (activity and examples of job profile description) are available in Appendix 2.

Information related to accident at work data (sheets relevant to years of excel spreadsheet)

4.8 Average staff headcount

Definition

Number of workers actually working calculated as the average of measurements made on 12 months in full time equivalent. In order to take account of part time workers or workers with short time contract the number of staff headcount has to be calculated in **Full Time Equivalent (FTE)**.

Definition of Full time Equivalent done by Eurostat:

A full-time equivalent, sometimes abbreviated as FTE, is a unit to measure employed persons in a way that makes them comparable although they may work a different number of hours per week.

The unit is obtained by comparing an employee's average number of hours worked to the average number of hours of a full-time worker. A full-time person is therefore counted as one FTE, while a part-time worker gets a score in proportion to the hours he or she works. For example, a part-time worker employed for 20 hours a week where full-time work consists of 40 hours, is counted as 0.5 FTE.

If the data "Full time equivalent" (FTE) is not available because records only show hours worked, it is possible to calculate the FTE data in the following way:

Sum the hours paid, divided per the legal or actual number of hours (worked during a week, or a month, or a year) = FTE relevant to on the period (week or month or year).

Average staff headcount calculated as the average of 12 months in Full Time Equivalent:

Full Time Equivalent = (Full Time Equivalent January+ Full Time Equivalent February+ ... + Full Time Equivalent December) / 12

4.9 Number of worked hours

Definition

Number of total hours worked during the reference period (actual or estimated).

If the number of hours is not determined directly on the basis of staff assignments, it may be calculated as follow:

N° personnel x (N° of contractual worked hours – N° of hours of leave, rest and absences and the number of hours for staff absenteeism due to illness and injuries).

4.10 Number of work accidents

Definition

Number of a discrete occurrence in the course of work which leads to physical or mental harm.

The statistics include only the cases of accidents at work leading to an absence of more than three calendar days.

The number of accidents to report should be consistent with the criteria indicated by the ESAW methodology, see from page 12 to 14 (i.e. commuting accidents and road accidents during the journey between home and the workplace are not included).

4.11 Number of fatal accidents

Definition

Accidents at work leading to the death of the victim within a year (after the day) of the accident.

See also ESAW definition (page 14).

4.12 Number of days lost

Definition

The variable days lost means the number of calendar days where the victim is unfit for work due to an accident at work.

See also ESAW definition (page 18).

We can consider two criteria of calculation. The descriptions of the criteria are as follow:

Static calculation: number of days lost during the observed year independently of the date when the accidents occurred.

Dynamic calculation: number of days lost due to the accidents occurred during the observed year, independently of the dates of days lost.

Hereinafter an example.

Year n						Year n+1					
J - F	M - A	M - J	J - A	S - O	N - D	J - F	M - A	M - J	J - A	S - O	N - D
				■	■■■■■■				■	■■■■■■	
<i>60 DAYS + 60 DAYS</i>						<i>60 DAYS</i>					

Static criteria:

Static counting of days lost = days lost during the year

- Year "n": 60 days
- Year "n + 1": 120 days

Dynamic criteria

Dynamic counting of days lost = days lost due to accidents occurred during the year

- Year "n": 120 days
- Year "n + 1": 60 days

Each company should declare which methodology it has followed.

The static methodology is preferable because the days lost calculation is consolidated more quickly, after a few months of the period of analysis. The days lost calculated with dynamic criteria is subject to changes due to eventual extension or re-opening of accidents which occurred much earlier.

4.13 Explaining or additional notes

Companies must be able to qualify with specific notes (relevant to each provided information) detailing any misalignment, if any, with the general criteria established by this methodology or to characterize specific details of their national or company procedures.

4.14 Incidence rate

Definition: Number of accident at work every 1000 workers.

Calculation (done by the application): N° of work accidents x 1000 / Average staff headcount

4.15 Severity rate

Definition: Number of days lost every 1000 workers.

Calculation (done by the application): N° of days lost x 1000 / Average staff headcount

5. Instructions for data provision to UIC

Before the end of February each year, UIC will issue the questionnaire, see attachment “Excel spreadsheet for request of accident at work data relevant European UIC members”, to the persons in charge of accident data communication within European railway companies. The deadline for fulfilling it and sending it back to UIC is fixed at 31 May each year.

6. Policy of confidentiality of the accidents at work data

The criteria to be followed shall be:

- full data will be published yearly and visible only to Railway Companies providing data on accidents at work.
- anonymised data may be made available more widely.

Appendices

1. Reference documentation.
2. Definition of railway activities.

Attachment

Excel spreadsheet for request of accident at work data relevant European UIC members.

Appendix 1 - Reference documentation

a. Council Directive of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work (89/391/EEC)

In particular see article 9 “Various obligations on employers”:

1. *The employers shall:*

(...)

(c) keep a list of occupational accidents resulting in a worker being unfit for work for more than three working days;

b. Regulation (EC) n° 1338/2008 of 16/12/2008 on community statistics on public health and health and safety at Work

In particular see Annex IV “Domain: Accidents at work”.

In this Annex IV there is a clear reference to adopt the European Statistics on Accident at Work (ESAW) in order to provide the accident-at-work data by the Member States.

The point (d) states as follow:

“The accidents-at-work data set shall be established in the framework of the specifications laid down by the European Statistics on Accidents at Work (ESAW) methodology, taking into consideration the circumstances and practices in Member States”.

c. Commission Regulation (EU) No 349/2011 of 11 April 2011 implementing Regulation (EC) No 1338/2008 of the European Parliament and of the Council on Community statistics on public health and health and safety at work, as regards statistics on accidents at work

In particular see article 1 “Definitions”:

For the purpose of this Regulation, the following definitions shall apply:

(a) ‘accident at work’ means a discrete occurrence in the course of work which leads to physical or mental harm. The phrase ‘in the course of work’ means whilst engaged in an occupational activity or during the time spent at work. This includes road traffic accidents that occur in the course of work but excludes commuting accidents, i.e. road accidents that occur during the journey between home and the workplace;

(b) ‘a fatal accident’ means an accident which leads to the death of a victim within 1 year of the accident; (...)

(i) ‘days lost’ means the number of calendar days during which the victim is unfit for work as a result of an accident at work;

The previous Regulations indicates European statistics on accidents at work, ESAW methodology, as a reference. The recipients of the Regulations are the Member States to communicate the accident data to European commission (Eurostat), but the reference can be considered valid also for the purpose of communicating of accidents at work to UIC by Companies.

d. Occupational Health and Safety Assessment Series (OHSAS) 18001:2007 Occupational Health and Safety Management System – Requirement

OHSAS is one of the standards on the management of safety at work most followed and implemented by companies and organizations.

In this standard there are various requirements that highlight the need to identify, measure and investigate the accidents at work. In particular the following points are highlighted.

4.3.3 Objectives and programme(s)

The organization shall establish, implement and maintain documented OH&S objectives, at relevant functions and levels within the organization.

The objectives shall be measurable, where practicable, and consistent with the OH&S policy, including the commitments to the prevention of injury and ill health, to compliance with applicable legal requirements and with other requirements to which the organization subscribes, and to continual improvement.

4.5.1 Performance measurement and monitoring

The organization shall establish, implement and maintain a procedure(s) to monitor and measure OH&S performance on a regular basis. This procedure(s) shall provide for: (...)

e) reactive measures of performance that monitor ill health, incidents (including accidents, near-misses, etc.), and other historical evidence of deficient OH&S performance;

4.5.3.1 Incident investigation

The organization shall establish, implement and maintain a procedure(s) to record, investigate and analyse incidents in order to:

a) determine underlying OH&S deficiencies and other factors that might be causing or contributing to the occurrence of incidents;

b) identify the need for corrective action;

c) identify opportunities for preventive action;

d) identify opportunities for continual improvement;

e) communicate the results of such investigations.

The investigations shall be performed in a timely manner.

Any identified need for corrective action or opportunities for preventive action shall be dealt with in accordance with the relevant parts of 4.5.3.2.

e. European statistics on accidents at work (ESAW) – Methodology 2001 edition

The Aims of the ESAW project is "to collect Union-wide comparable data on accidents at work and establish a database."

Comparable data on work accidents are a prerequisite for monitoring trends in health and safety at work in the Union and for promoting accidents prevention both at Community level and in the individual Member States. The natural criteria to implement a database of accidents at work for railway Companies is to use the ESAW methodology. Below are some extracts from ESAW with the basic information and definition about accidents at work.

Page 12 defines:

All cases of accidents at work leading to an absence of more than three calendar days are included in the ESAW data. In practice it means that an accident at work is included in ESAW if the person is unfit for work for more than 3 days even if these days include Saturdays, Sundays or other days where the person is not usually working.

*An **accident at work** is defined as "a discrete occurrence in the course of work which leads to physical or mental harm". This includes cases of acute poisoning and wilful acts of other persons, as well as accidents occurring during work but off the company's premises, even those caused by third parties.*

It excludes deliberate self-inflicted injuries, accidents on the way to and from work (commuting accidents, see Appendix F) and accidents having only a medical origin and occupational diseases. The phrase "in the

course of work" means whilst engaged in an occupational activity or during the time spent at work. This includes cases of road traffic accidents in the course of work.

A fatal accident is defined as an accident which leads to the death of a victim within one year of the accident.

The type of accident included / excluded in the ESAW methodology is indicated in the following table.

Table 1- Types of accidents included / excluded in the ESAW methodology

Type of accidents	Included YES / NO
Definition: "A discrete occurrence in the course of work which leads to a physical or mental harm".	
The phrase "in the course of work" means "whilst engaged in an occupational activity or during the time spent at work".	
Acute poisoning	YES
willful acts of other persons	YES
Accidents in public places or means of transport during a journey in the course of work:	YES
Road traffic accidents in the course of work (public highways, car parks, internal ways inside the premises of the enterprise)	YES
Other accidents (slips, falls, aggressions, etc.) in a public place (pavement, staircases, etc.) or in the arrival and starting points (station, port, airport, etc.) of any mean of transport, during a journey in the course of work	YES
Accidents on board of any mean of transport used in the course of work (underground railway, tram, train, boat, plane, etc.)	YES
Accidents occurred within the premises of another company than that which employs the victim, or in a private individual, in the course of work	YES
Deliberate self-inflicted injuries	NO
Accidents on the way to and from work (commuting accidents see Appendix F)	NO
Accidents having only a medical origin in the course of work and occupational diseases	NO
Members of public, outside any occupational activity	NO

Accidents from strictly natural causes

Accidental injuries from strictly natural causes are also excluded from the ESAW methodology. This applies to, for example, cardiac or cerebral incidents, or any other sudden medical disorders, which have occurred during work, but having a priori no link with the occupational activity of the victim and the injury being only related to the medical disorder.

Nevertheless, such cases should only be excluded if there is no other work-related causal element identified. For example, if a bricklayer felt faint (medical cause) and fell down from scaffolding (work-related causal element), the accidental injury should be included in the ESAW methodology. This is the case, even if the fall would not have occurred without the discomfort of the worker, because the gravity of its consequences was sharply increased by the presence of the person on scaffolding, which is a purely work related causal element.

Accident at work with more than 3 days' absence from work

The Framework Directive retained the concept of "absence from work of more than 3 working days".

However, as a large number of Member States can not make a distinction between working days or not, because the work stops are prescribed in calendar days, the concept of "3 calendar days", i.e. more simply "3 days", was retained for ESAW.

The concept of "more" than 3 days of absence from work has been implemented in the following way in the ESAW methodology (summary in Table 2):

Only full working days of absence from work of the victim have to be considered excluding the day of the accident.

Consequently, "more than 3 days" means "at least 4 days", which implies that only accidents with a resumption of work not before the fifth day after the day of the accident or later should be included.

Following on from this, the " number of days lost " has to be counted beginning with 4 days lost if the resumption of work takes place the fifth day following the day of the accident, 5 days lost if the resumption of work takes place the sixth day, etc.

Table 2 - Concepts of "accidents with more than 3 days' absence from work" and of numbers of counted "days lost" in the ESAW methodology

Resumption of work the:	Day of the accident	1st to 4th days after the accident	5th day after the accident	6th day after the accident / or beyond
Accident included in ESAW	NO	NO	YES	YES
Number of days lost	not included	not included	4	5 / or more

Fatal accident at work

The definition adopted by the ESAW project is that of "accidents at work leading to the death of the victim within a year (after the day) of the accident". In practice the majority of the Member States send the cases of fatal accidents at work counted in their national statistics.

In fact, the majority of the accidental deaths occur either immediately at the time of the accident, or within a few days or a few weeks after the accident.

Days lost

In particular see page 18: *The variable days lost means the number of calendar days where the victim is unfit for work due to an accident at work.*

Incidence rates

The ESAW methodology considers 2 main types of indicators on accidents at work: the numbers of accidents and the incidence rates. Obviously, the numbers of accidents have to be related to the reference population of persons in employment (persons exposed to the risk of accident at work) in order to establish the incidence rates (frequency).

The incidence rate is defined as the number of accidents at work per 100 000 persons in employment.

The standard formula proposed in ESAW is the following:

$$\text{Incidence rate} = \frac{\text{Number of accidents (fatal or non-fatal)} \times 10^5}{\text{N}^\circ \text{ of employed persons in the studied population}}$$

Reporting procedures in the Member States (Insurance and non-insurance based systems)

Eurostat receives the ESAW data from the Member States' national registers or other national bodies responsible for the collection of data on accidents at work. The ESAW data are occurrence-related and based on administrative sources in the Member States. Compared to surveys the harmonization prospects of ESAW data therefore depend on the operative reporting procedures, the possibility of modifying these or adapting their data to ESAW concepts and specifications.

Mainly there are the following two types of reporting procedures can be identified in the various Member States of the European Union.

1) The **insurance based systems**

This system is followed in 10 Member States.

Reporting procedures are mainly based on the notification of the accidents to the insurer, public or private according to the case.

In this case the supply or the refunding of care benefits and the payment of benefits in cash (daily subsistence allowances, rents where applicable, etc.) resulting from accidents at work, are conditioned in its report to the public or private insurer. Additionally, in a number of these countries, the benefits thus paid under the accidents at work insurance legislation are higher than in the case of non-occupational accidents. Thus, there is an economic incentive for the employer and the employee to notify an accident at work in the insurance-based systems. Due to these various factors, the reporting levels for accidents at work are in general very high in the insurance based systems and considered to be about 100 percent.

2) The **system of legal obligation of the employer** to notify the accidents to the relevant national Authorities (which is often the National Labour Inspection Service).

This system is followed in five Member States: Denmark, Ireland, the Netherlands, Sweden and the United Kingdom.

The five other Member States and Norway have in general a system of universal social security “ coverage ”. In such systems the benefits provided to the victim of an accident at work are not depending on a preliminary reporting of the accident, except for the specific benefits paid for the most serious accidents (rents for permanent disability, etc.). Consequently, the economic incentive for notifying accidents at work is not very strong in the non-insurance based systems. Nevertheless, there is a legal obligation for the employer to notify an accident at work. In practice only a part of work accidents are actually reported and the systems based on the employers liability to notify work accidents to the authorities have only a medium reporting level usually ranging from 30 to 50 percent on average for all branches of economic activity taken together (see Table 9).

TABLE 9 - ESAW 1998 data: National reporting levels for accidents at work with more than 3 days' absence from work

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	NO
100% reporting level for all sectors	Y	N	Y	N	Y	Y	N	P ⁽¹⁾	Y	N ⁽²⁾	Y ⁽³⁾	Y	Y	N	N	N ⁽⁴⁾
Average reporting levels for those countries which have not 100 percent reporting ⁽⁵⁾ :			46	39			38			(²)				52	43	(⁴)

⁽¹⁾ I: The reporting level is less than 100 % only for the craft professions.

⁽²⁾ NL: Data on non-fatal accidents available only for 1994 reference year.

⁽³⁾ A: Except agriculture for which the reporting level is less than 30%.

⁽⁴⁾ NO: between 25 to 100%.

⁽⁵⁾ The reporting level for each sector is provided to Eurostat on the basis of national evaluations. The level presented in the current table is the average on the 9 main branches.

Legend: Y = Yes; N = No; P = Partly.

Appendix 2 - Classification of staff categories

TRACK WORKERS

ACTIVITY

Activities related to the railway infrastructure maintenance.

The way and works department designs and maintains the fixed installations (track, buildings, structures, level crossings, catenaries, etc.) and the safety installations (signalling, telecommunications, etc.)

EXAMPLE OF JOB PROFILE

Depending on his speciality, a qualified way and works maintenance worker may be responsible for the following tasks:

- 1) Replacement of material, levelling and realigning the track, cleaning of the trackside area and the area around level crossings, resurfacing and welding of rails.
- 2) Protection of track gangs and workteams and surveillance of work of outside companies.
- 3) Driving railway maintenance stock (track cars, light rail motor tractors, etc.).
- 4) Maintenance and surveillance of electric traction installations (at traction sub-station exits).
- 5) Maintenance of mechanical signalling installations.

Electrical installations staff are responsible for all operations in the maintenance of:

- 1) telecommunications installations
- 2) electrical signalling installations
- 3) electric power supply and lighting installations (transformer and cut-off points, lighting for marshalling yards and stations, etc.).

SHUNTING

ACTIVITY

Shunting is the movement of trains or vehicles other than the normal passage of trains on running lines. The principal activities consist of coupling and uncoupling the couplers, brake piping and the electrical connections between two vehicles or locomotive.

EXAMPLE OF JOB PROFILE

The shunters must be formally qualified to carry out their activities.

Shunting may take place on running lines or in yards and sidings and may be controlled by fixed signals, hand signals, radio communication, audible signals or by the establishment of shunt authority limits. Shunting movements may be controlled from other than the leading end and may involve approaching other vehicles and obstructions, entering/leaving buildings, working in depots, or requiring to stop at or before reaching a specific location.

Excluded are loading, unloading and transshipment of goods of any kind on railway wagons

TRAIN DRIVER

ACTIVITY

Train driver staff has responsibilities in the conduct of the train for passenger and/or freight service.

It could be included the staff responsible for the assignment of the services and shift, training courses and monitoring of the application of traffic safety regulations.

EXAMPLE OF JOB PROFILE

The train drivers must be formally qualified to carry out their activities.

ON BOARD STAFF

ACTIVITY

The train crew staff performs activities related to management, supervision and responsibility of the train during the operational service of the trains.

EXAMPLE OF JOB PROFILE

The train staff must be formally qualified to carry out their activities.

Train crew staff have the task of accompanying customers in the trains, checking tickets, welcoming and assisting passengers, as well as fulfilling a safety function.

ROLLING STOCK MAINTENANCE WORKERS**ACTIVITY**

Rolling stock establishments are responsible for the maintenance of the tractive stock (locomotives and motive power units) or the trailing stock (passenger coaches, freight wagons) or the electric traction installations.

EXAMPLE OF JOB PROFILE

Professional maintenance staff have a very varied set of tasks in technical areas such as: mechanics, electrics, electronics, painting, upholstery, metalworking, welding, precision control, etc.).