

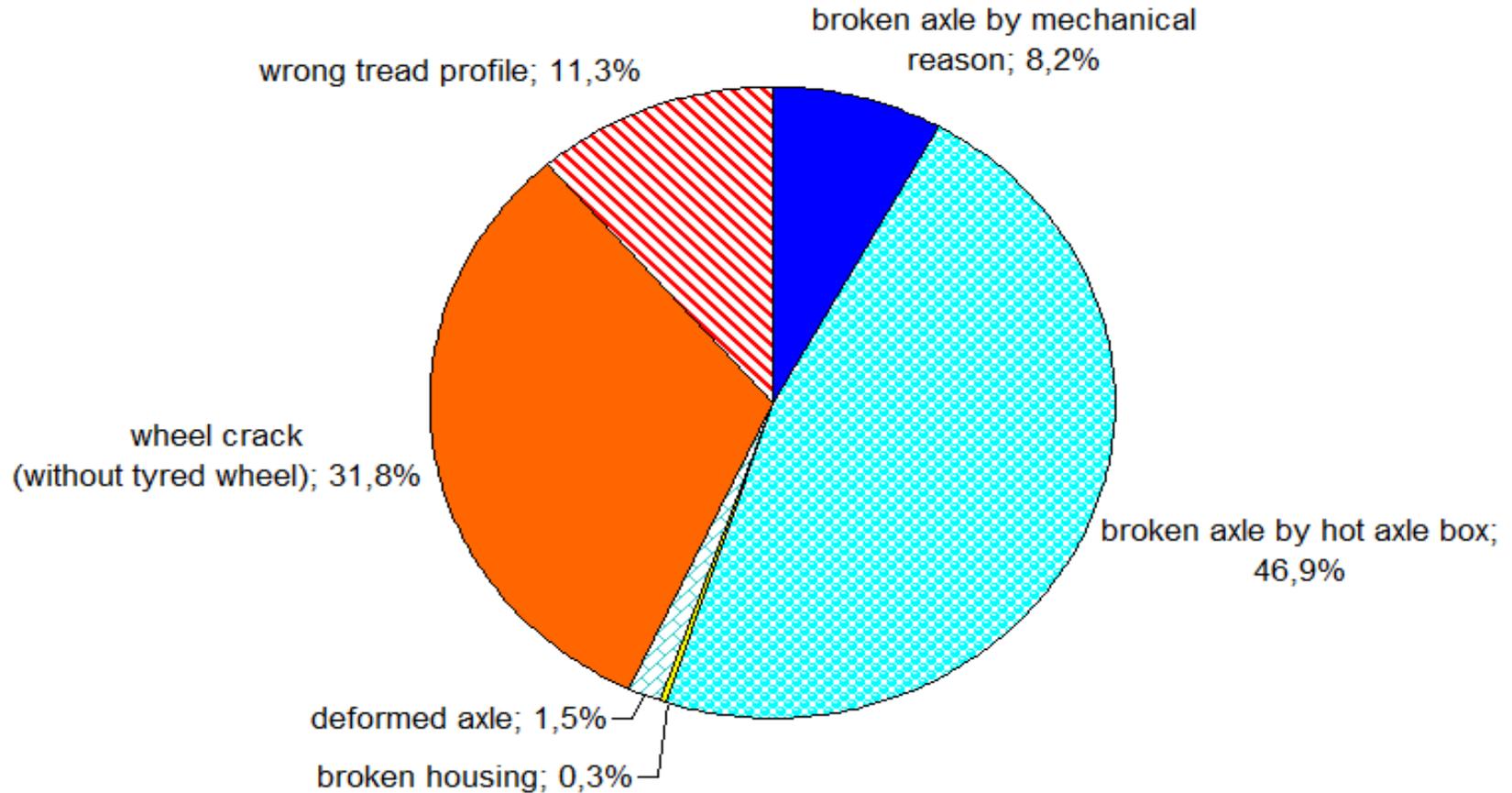


Joint Sector Group for ERA Task Force on wagon/axle maintenance FMEA & FTA – UIC Risk model Project

*ERA, Lille
13th December 2011*

European Wheelset FMEA & FTA

FTA: Results - excluding "tyred wheel"
(based on level 2 of the FTA)



Risk model – UIC-Project “SET_06 "EN 50126"”

- **Aim of the project**

Establishing a procedure for calculating the RAMS - KPI (key performance indicators) for wheelsets and their components for any type of rail vehicle according to the EN 50126

- R (Reliability)
- A (Availability)
- M (Maintainability)
- S (Safety)

- **Start and duration of the project: September 2011 till December 2013**

Situation today:

- **Up to now there is no systematic risk analysis known nor corresponding KPI for wheelsets or its components.**

Situation near future:

- **RAMS – Analysis are important to quantify the current safety level.**
- **KPI are important for monitoring and demonstrating the development of the safety level.**



Risk model – UIC-Project “SET_06 "EN 50126"”

WP 1: Basis for the implementation of EN 50126 for running gear components

- Analysis of EN 50126, CST and CSM; Definition of working steps, methods and tools
- Analysis of available RAMS investigations / activities in the field of wheelsets
- Definition of costing model
- ➔ Establishing a procedure for RAMS analyses

WP 2: Implementation of the RAMS analysis for a wheelset and its components

- Definition of two wheelsets of freight wagons
- Definition of a risk acceptance method
- Analysis of the current status of reliability and availability of these wheelsets
- ➔ RAMS analysis of two freight wagon wheelsets and their components

WP 3: Implementation of the RAMS analysis for other running gear components

- ➔ RAMS analysis of other running gear components

WP 4: Summary of results and recommendations

- ➔ Final report / handbook for RAMS analysis

Number of derailments (freight & passenger): Differences of statistical sources

Sources for statistical data concerning derailments:

- **ERA: RU → NSA → ERA: wheel is getting off the rail**
 - each derailment is collected
 - Def. of derailment: wheel is getting off the rail

- **EuroStat: RU → nat. Statistic offices → EuroStat**
 - De. Of derailment: No definition
 - Only severe derailments are collected:
 - Before 2008: ≤ death or ≤ 50,000 Euro damage costs
 - Since 2008: ≤ death or ≤ 150,000 Euro damage costs
 - Since 2009: elimination of derailments on shunting yards / train composing sites
 - DNV - analysis are based on EuroStat – data → but differences up to 11%

- **Normally: ERA - data > EuroStat - data**
- **Germany: ERA - data < EuroStat - data**

- **2013: Harmonisation of statistical data of ERA and EuroStat concerning railway accidents including the process of data sourcing**

Number of derailments (freight & passenger): Differences of statistical sources

EU 27	GEO/TIME	EuroStat			
		2006	2007	2008	2009
1	Belgien	0	3	3	1
2	Bulgarien	2	1	0	0
3	Dänemark	0	2	0	0
4	Deutschland	144	13	15	10
5	Estland	18	13	14	0
	Europäische Union (15 Länder)	251	157	103	69
	Europäische Union (25 Länder)	492	431	232	140
	Europäische Union (27 Länder)	494	432	233	141
5	Finnland	1	0	1	2
6	Frankreich	11	68	15	14
7	Griechenland	4	8	2	2
8	Irland	0	0	1	0
9	Italien	11	10	10	6
	Kroatien	5	4	3	7
10	Lettland	1	0	0	0
11	Liechtenstein	0	0	0	0
12	Litauen	8	27	1	1
13	Luxemburg	0	0	0	0
14	Malta				
15	Niederlande	2	0	1	2
	Norwegen	3	0	3	3
16	Österreich	8	3	7	0
17	Polen	190	211	105	63
18	Portugal	9	3	3	1
19	Rumänien	0	0	1	1
20	Schweden	30	11	14	7
	Schweiz			3	1
21	Slowakei	8	11	6	3
22	Slowenien	3	5	0	0
23	Spanien	9	16	17	12
24	Tschechische Republik	10	3	2	3
	Türkei	96	89	104	63
25	Ungarn	3	4	1	1
26	Vereinigtes Königreich	22	20	14	12
27	Zypern				

Safety-Performance-Report 2011, ERA				
Years	2006	2007	2008	2009
BE	7	17	21	41
BG	139	1	0	0
DK	0	0	0	0
DE	52	7	12	7
EE		1	2	0

	474	346	316	174
FI	0	0	1	2
FR	42	68	97	14
EL	4	8	2	2
IE	0	0	1	0
IT	11	10	10	6

LV	1	0	0	0
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LT	7	27	1	1
LU				0

NL	2	0	1	2
NO	3	0	3	3
AT	1	3	7	1
PL	126	132	105	63
PT	9	3	3	1
RO	0	0	1	1
SE	5	11	14	7

SK	8	11	6	3
SI	3	5	0	0
ES	9	12	15	7
CZ	10	3	2	3

HU	16	7	1	1
UK	22	20	14	12
CT		0	0	0

Delta EuroStat - ERA			
2006	2007	2008	2009
600%	467%	600%	4000%
6850%	0%	-100%	-100%
-100%	-100%	-100%	-100%
-64%	-46%	-20%	-30%
-100%	-92%	-86%	-100%

-100%	-100%	0%	0%
282%	0%	547%	0%
0%	0%	0%	0%
-100%	-100%	0%	-100%
0%	0%	0%	0%

0%	-100%	-100%	-100%
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-13%	0%	0%	0%
-100%	-100%	-100%	-100%

0%	-100%	0%	0%
0%	-100%	0%	0%
-88%	0%	0%	0%
-34%	-37%	0%	0%
0%	0%	0%	0%
-100%	-100%	0%	0%
-83%	0%	0%	0%

0%	0%	0%	0%
0%	0%	-100%	-100%
0%	-25%	-12%	-42%
0%	0%	0%	0%

433%	75%	0%	0%
0%	0%	0%	0%
-100%	-100%	-100%	-100%