



The Joint Sector Group approach to increase safety in freight wagons: programme, results, outlook

*Universita di Roma / 2° Convegno Nazionale “Sicurezza ed esercizio ferroviario”
Roma, 18.02.2011*

Dr. Jens Engelmann

Chairman of the Joint Sector Group for the ERA Task Force

Where do we come from? The Joint Sector approach for a European problem

- The following 3 initiatives started on EU level since September 2009:

1. EU Rail Safety Conference



2. ERA Task Force « Freight Wagon Maintenance »



- The Sector is asked to provide expertise and to work out solutions/proposals

3. **Joint Sector Group: CER, ERFA, UIP, UIRR, UNIFE**



- The task: find a common European solution for a European problem

Who exactly is acting together in the Task Force?

- **ERA and several National Safety Authorities**

- ERA
- NSAs: **Italy**, Germany, UK, Netherlands, Belgium, France, Sweden, Latvia, Austria



- **The Joint Sector Group: all EU freight wagon stakeholders & wheelset manufacturers**

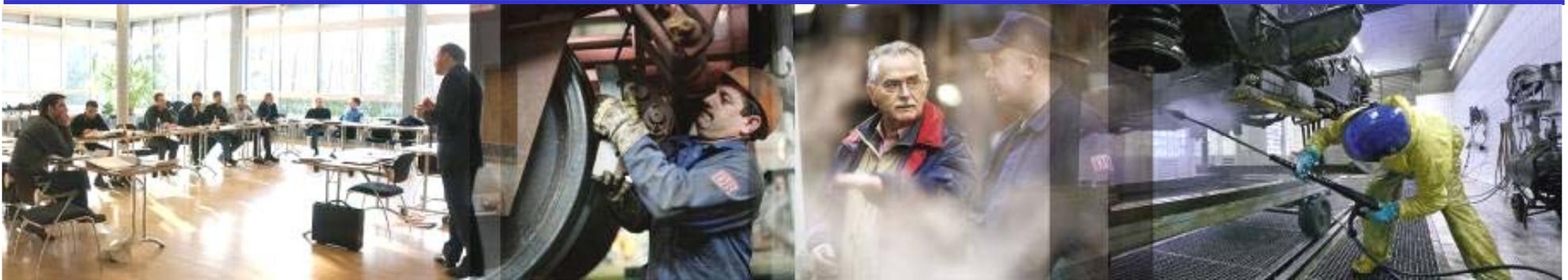
- CER: SNCF, SNCB, DB, **Trenitalia**, SBB, ÖBB/RCA, ZSSK, MAV/RCH, SLO, RENFE, PKP, DB UK, CFL,
- ERFA: AAE, IGTL (Poland), **ASSTRA** (Italy), VDV (Germany), ...
- UIP: VPI Germany (VTG, GATX, ...), **ASSOFERR**, VPI Austria, ERMEWA, WASCOSA, Transfesa, all other national associations,
- UNIFE **Lucchini**, Valdynes, Rafil (wheelset manufacturer)
- UIRR



- **Sector and NSAs worked jointly together in the Task Force to find European solutions**



The Joint Sector Programme worked out in the ERA Task Force was fully adopted in Viareggio in December 2009



- **European Action Programme:**

- A **Visual Inspection** of the European wheelset/axle population (according to EVIC)
- A more in-depth **investigation of samples** of wheelsets from defined operating areas
- A European-wide implementation of **systematic traceability of wheelset maintenance**

- **European Common Criteria for Maintenance (ECCM)**

The 1st element of the European Action Programme: EVIC inspections – harmonised European Criteria

EUROPEAN VISUAL INSPECTION CATALOGUE (EVIC) FOR FREIGHT WAGON AXLES

V 2.11

example

32 Mechanical damage – smooth edged circumferential grooves		Painted axles
Salient information:		
Characterised by smooth transitions in the edges (GCU Annex 9, 1.6.2). Pitting that arises during operation (caused e.g. by brake lever connectors dragging) involves damaged anti-corrosion coating		
Decision:		
Check on the wagon why this damage could have occurred and repair accordingly		
Remove from service		Case B
if there is damage to the base material > 1mm: (acc. GCU)		Case A
mark 1 at “X” column in EVIC logging		X

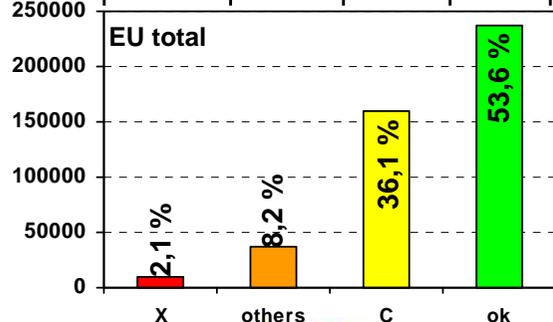
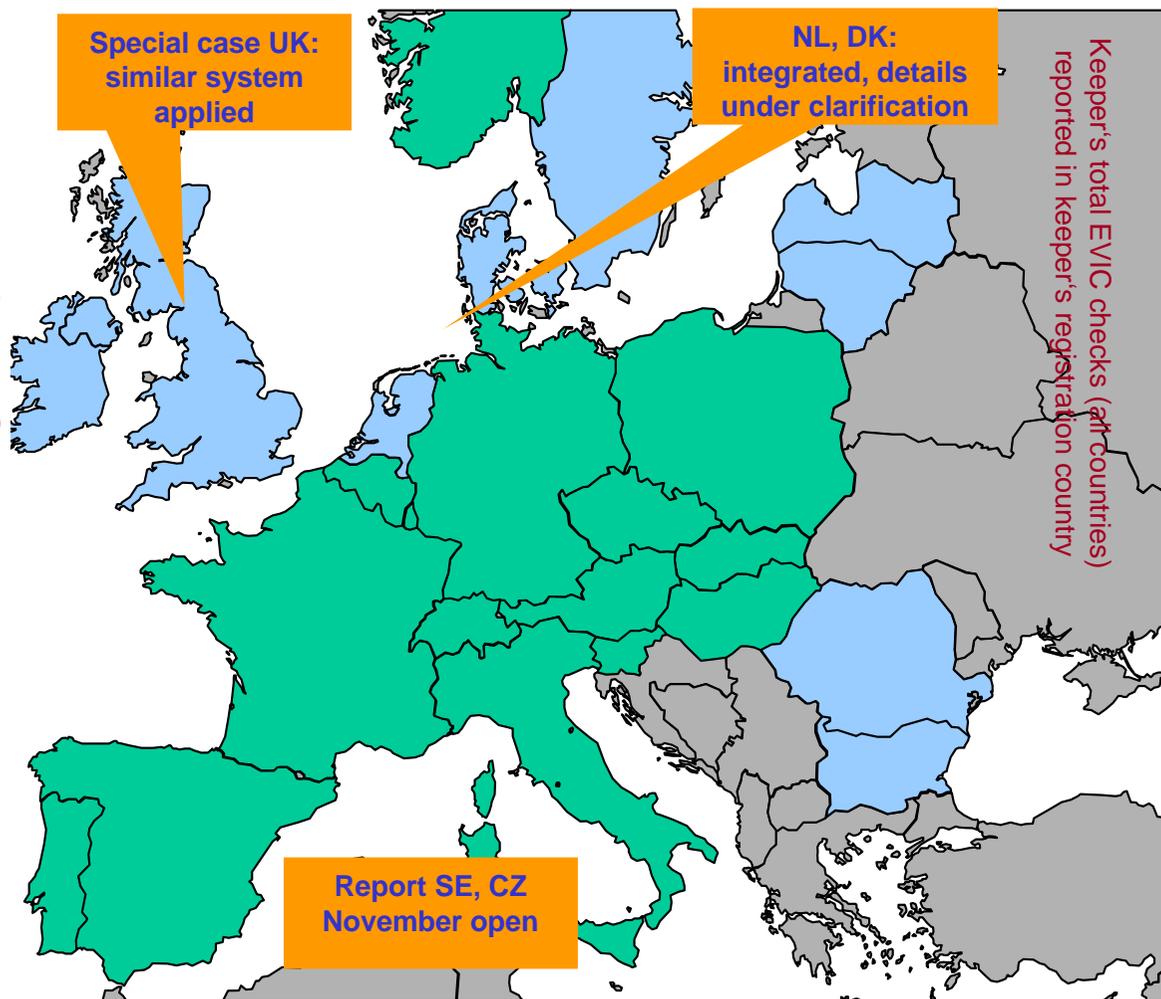
Pictorial representation:



Status of the EVIC Visual Inspections total as per November 2010

	Wagons checked	Axles Total	Others	„ok“	„X“	„C“
EU total *	113.431	443.156	36.356	237.637	9.148	160.015
AT	3.239	12.665	4.567	4.948	551	2.599
BE	2.032	7.895	0	7.807	68	20
CH	8.118	28.532	2.868	13.256	524	11.884
CZ	61	244	0	244	0	0
DE	75.146	299.193	23.457	147.527	6.979	121.230
ES	223	689	0	294	199	196
FR	9.299	34.961	4.618	27.436	251	2.656
HU	1.319	5.071	14	3.679	9	1.369
LU	315	1.216	12	433	3	768
IT	3.767	14.450	391	7.130	349	6.580
PL	4.777	18.673	110	15.810	148	2.605
PT	183	451	2	0	0	449
SE	211	843	61	522	52	208
SK	4.627	17.845	23	8.421	6	9.395
SI	114	428	233	130	9	56

* 15 countries, 117 wagon keepers



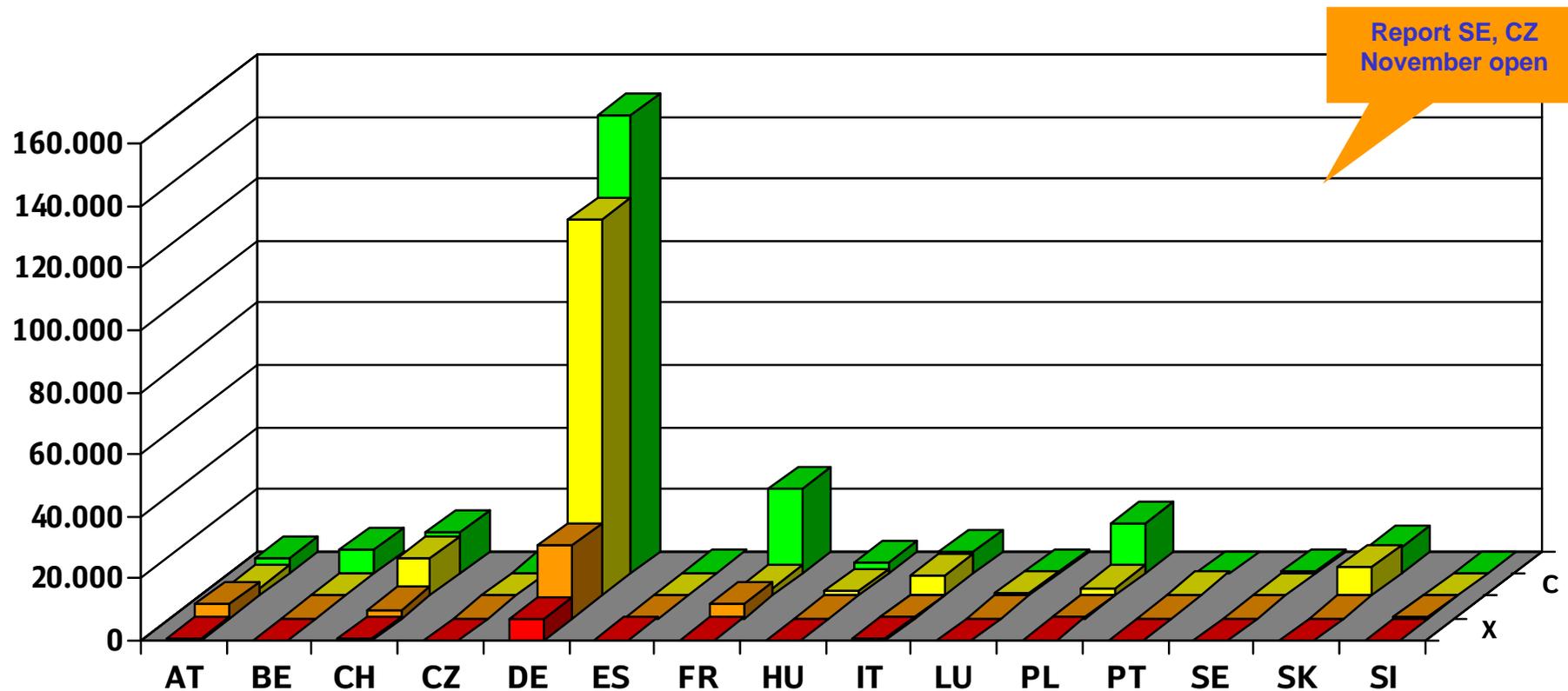
X: Remove from service without delay

others: sorted out for other reasons, e.g. reprofiling

C: Leave in service until the next EVIC check

ok: no defects, leave in service

Status of the EVIC Visual Inspections per Member State as per November 2010 (absolute)



X: Remove from service without delay

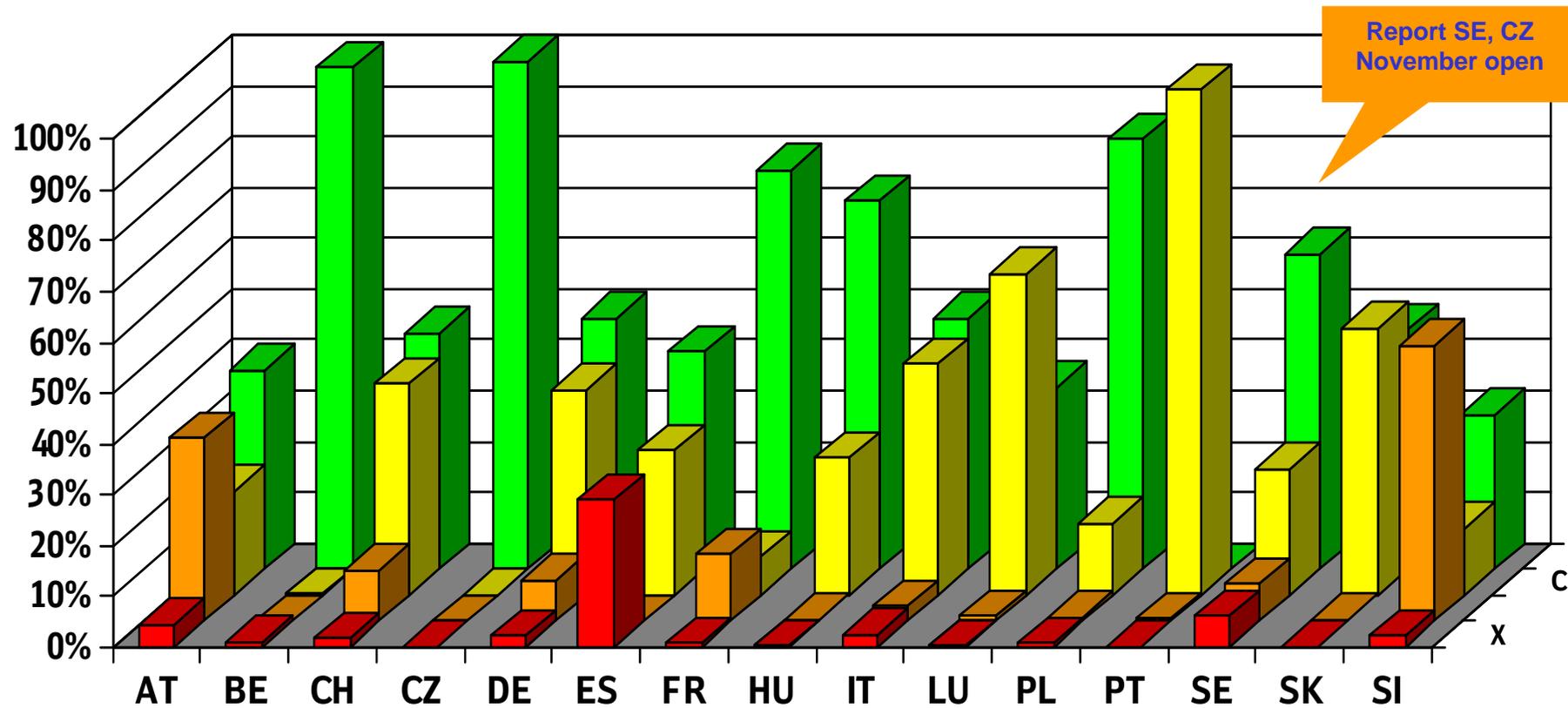
others: sorted out for other reasons, e.g. reprofiling

Keeper's total EVIC checks (all countries) reported in keeper's registration country

C: Leave in service until the next EVIC check

ok: no defects, leave in service

Status of the EVIC Visual Inspections per Member State as per November 2010 (percentage)



X: Remove from service without delay

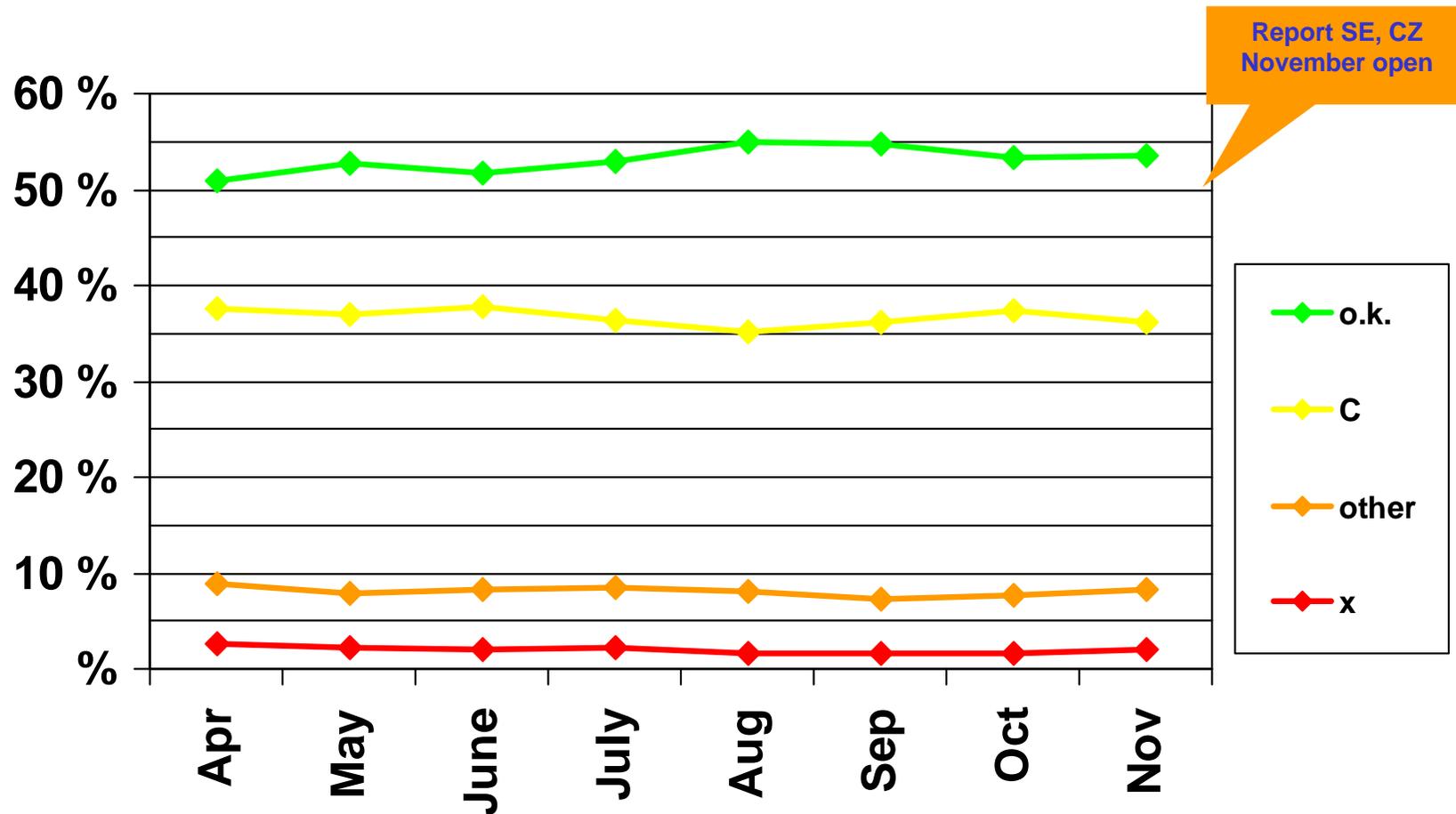
others: sorted out for other reasons, e.g. reprofiling

Keeper's total EVIC checks (all countries) reported in keeper's registration country

C: Leave in service until the next EVIC check

ok: no defects, leave in service

Evolution of the EVIC categories findings over time (EU total)



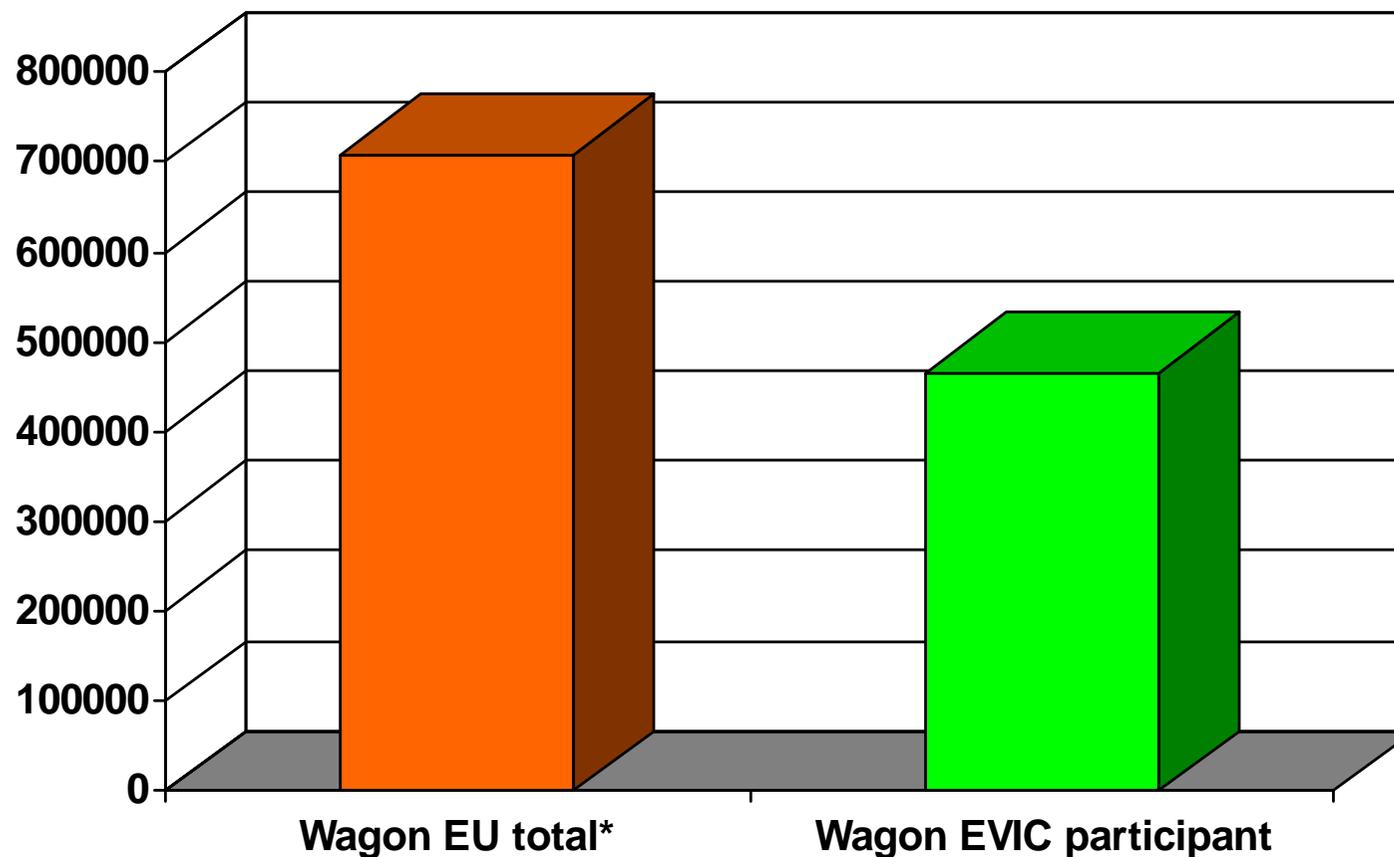
X: Remove from service without delay

others: sorted out for other reasons, e.g. reprofiling

C: Leave in service until the next EVIC check

ok: no defects, leave in service

Coverage of EU freight wagon keeper`s fleet by EVIC checks



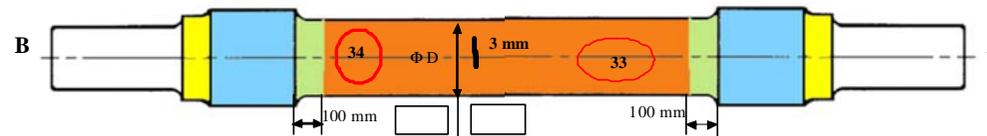
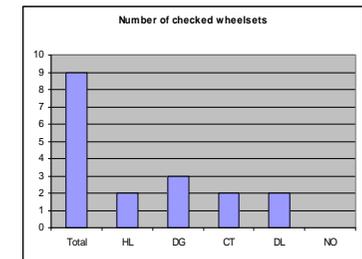
- 117 wagon keepers
- as per November 2010
- share from GCU signatories

The 2nd element of the European Action Programme: Sampling and analysis programme of wheelsets from defined operating areas

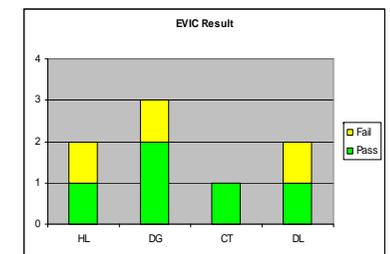
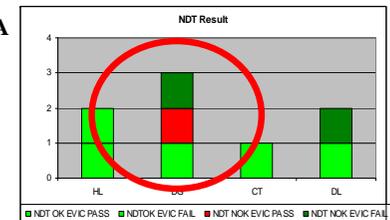


- Programme started Mai/June 2010
- 24.000 axles
- 4 risk domains
- Duration: 12 months
- **Critical for success!**

Workshop	Risk Domain	Wheelset type	Wheelset number	Date	Wheel dismantled	Bearing ring dismantled			
TERGNIER	DG	9052	12345	24 / 02 / 2010	Yes / No	Yes / No			
Previous axle maintenance with NDT									
Date	Level	NDT System	Workshop						
15 / 01 / 2001	COP	MT	Rennes						
EVIC APPLICATION									
Zone	B journal	B abutment	B wheel seat	B transition radius (100 mm)	Shaft	A transition radius (100 mm)	A wheel seat	A abutment	A journal
EVIC defect category					33,34				
Roughness or UIC surface categories									



NDT before treatment									
Zone	B journal	B abutment	B wheel seat	B transition radius (100 mm length)	Shaft	A transition radius (100 mm length)	A wheel seat	A abutment	A journal
NDT System									
MT	No	No	No	No	Yes	No	No	No	No
Man UT									
Auto UT									
Eddy Current									
Defect in EVIC zone		Yes / No		Yes / No	Yes / No	Yes / No		Yes / No	
Treatment									
Grinding the shaft central part 0,5 mm depth.									
NDT after treatment									
MT man	<input checked="" type="checkbox"/>								
UT auto	<input type="checkbox"/>								
Axis scrapped					Yes / No				



The 3rd element of the European Action Programme: European-wide systematic traceability of wheelset maintenance data

- Implementation of the European Wheelset Traceability (EWT) in the Sector from 08/2010 onwards
- Self obligation (as for EVIC)
- Later integration in EN 15 313
- **ANSF has lifted national measures (not for UIC type A axle RID wagons) if EWT application is granted**

No	timeframe	Designation	Remark
Wheelset in general			
1	a	Wheelset number	
2	a	Wheelset design type or alternative designation	
3	a	Previous keeper(s) (ECM)	if applicable (if the keeper has changed) Data has to be stored from the last wheel change on <i>Remark:</i> Current keeper of the wheelset is the keeper of the wagon (see number 38)
4	a	Certificate number and notified body from EC-declaration of conformity (TSI compliant wheelsets) Homologation number and authorising or certifying body (other wheelsets)	if available
5	a	Maximum authorised axle load (of the entire wheelset)	
6	a	Manufacturer of wheels (manufacturer if first assembly)	for wheelsets from service: if available
7	a	Date of first assembly of wheels (month/year)	for wheelsets from service: if available
8	a	Date when wheelset is taken out of keepers' fleet (scrapped, selling, etc.)	
Wheelset axle			
9	a	Wheelset axle serial number	
10	a	Wheelset axle design type or alternative designation	
11	a	Certificate number and notified body from EC-declaration of conformity (TSI compliant axles) Homologation number and authorising or certifying body (other axles)	if available
12	b	Manufacturer	for wheelsets from service: if available
13	b	Manufacturing date (month/ year)	for wheelsets from service: if available
14	b	Number of cast iron	for wheelsets from service: if available
15	b	grade of steel (state of heat treatment)	for wheelsets from service: if available
16	a	Maximum permissible axle load (regarding the axle)	
17	b	Manufacturing standard of the axle	for wheelsets from service: if available The manufacturing standard is directly related to the manufacturing date; (UIC; EN)
Wheels			
18	a	Design type or alternative designation	
19	a	Tyred wheels	Yes/ No
20	a	Certificate number and notified body from EC-declaration of conformity (TSI compliant wheels) Homologation number and authorising or certifying body (other wheels)	if available
21	b	Manufacturer	for wheelsets from service: if available
22	b	Manufacturing date (month/ year)	for wheelsets from service: if available
23	b	grade of steel (state of heat treatment)	for wheelsets from service: if available
24	b	Number of cast iron	for wheelsets from service: if available
25	a	Maximum authorised axle load (regarding the wheel)	

excerpt

The integrating element: European Common Criteria for Maintenance

V1.0

**European Common Criteria for Maintenance (ECCM)
of freight wagon axles**

to be applied **in wheelset axle maintenance**

*Joint Sector Group for ERA Task Force on wagon/axle maintenance
Lille
22nd June 2010*



1

**Axle surface status
after overhaul
(in medium and heavy
maintenance)**

Traceability

.....

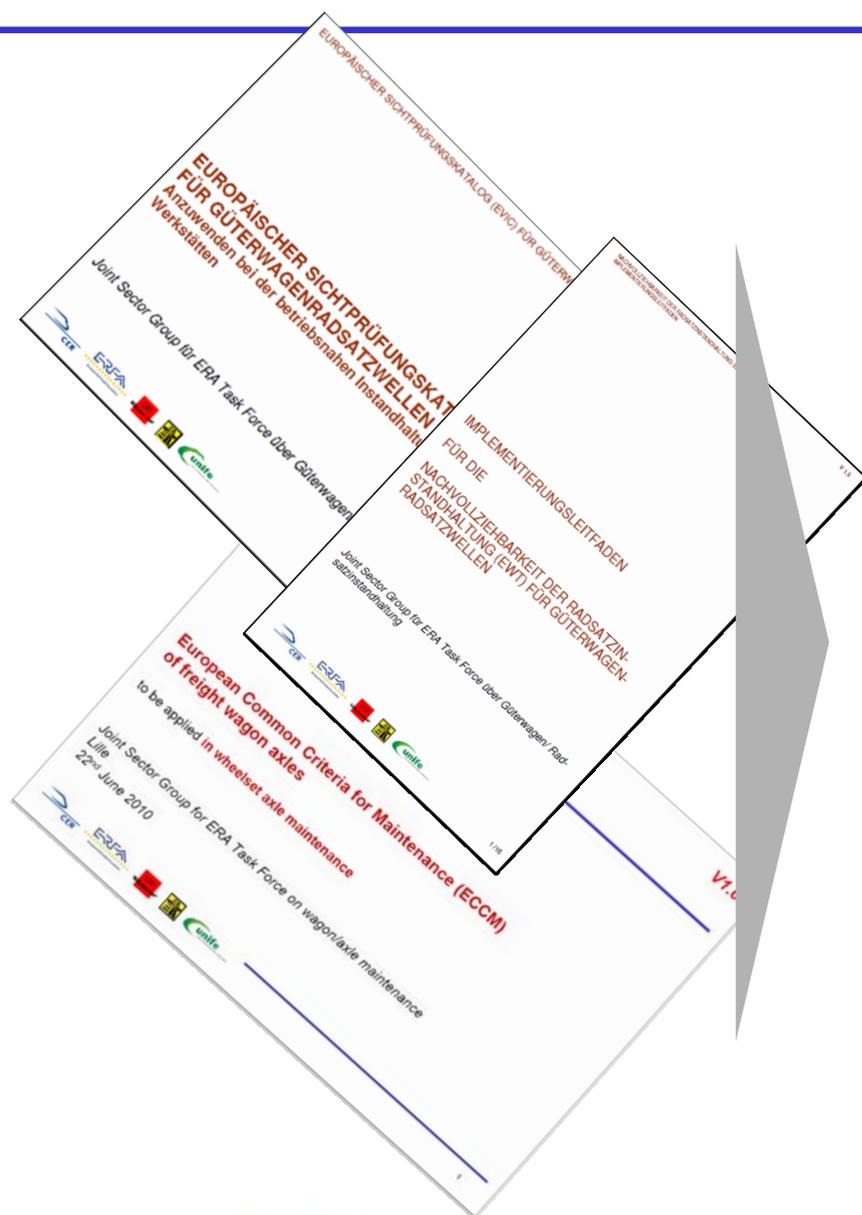
**All to be integrated in
EN 15 313**

**before: implementation
by self obligation**

**which NDT
and where?**

**Maintenance rules for high
performance operation**

Amendment of EN 15313 and EN 13103: RFS issued by ERA



Requirement for a Standard	
Requesting Body: ERA on behalf of the Railway Sector	Document Identification Number: N°: IU-RFS-035 Rev: 0 Date: 14/10/2010
Sub-system: Rolling stock	Title of TSI: CR RST: Freight wagons.
Other reference (interoperability constituent,...): Wheelset, axle	
Standards Body: CEN	Mandate Number:
WI Number:	WG Number:
Proposed Title: In-service wheelset operation requirements - In-service and off-vehicle wheelset maintenance	
Scope of Standard:	
<p>The purpose of this revision of EN 15313:2010 and EN13103:2009 A1:2010 is to introduce the appropriate results of the task force "Freight wagon maintenance" created after the Viareggio accident of June 2009.</p> <p>In order to increase the safety of the operation of Freight wagons and to have common examination criteria, a document for European Common Criteria for Maintenance (ECCM) has been agreed within representatives of the Railway sector, whose implementation has already started for several Keeper and Railway Undertakings in Europe.</p> <p>In order to manage the quality of the wheelset freight wagon maintenance, a traceability system for in-service wheelsets has been agreed.</p> <p>The parts of these results relevant for an EN have to be introduced into EN 15313:2010 and EN 13103:2009A1:2010 if necessary in specific clauses related to Freight wagons.</p> <p>The revised standard will support Applicants, RUs and ECMs in specifying maintenance rules. This standard will be of voluntary use, with the purpose of justifying maintenance rules.</p> <p>Note: This standard will not be used for conformity assessment against TSI. Therefore, ERA will not formally check and validate its content.</p>	
TSI Details (for information only: no conformity assessment required):	

JSG outlook: anticipated risk analysis / risk management



CSM
on risk
assessment

EN 50126
RAMS

FMEA
for the
"whole wheelset"
system

Relevance analysis
priorities

			Failure mode
1 Frame		Draft / Excerpt	Broken frame
2 primary suspension			
	21 spring		broken spring
	22 damper		no damping
3 Complete wheelset			
	31 wheelset		wrong geometry
		311 axle	broken axle
		312 wheel	broken wheel
			broken wheel center
		313 brake disc	broken disc
	32 axlebox		
		321 rear cover	no
		322 housing	broken housing
		323 front cover	no
		324 bolted joint	unscrew
		325 bearing	bearing damage
			3251 outer ring
			3252 inner ring
			3253 roller
			3254 cage
		326 internal spacer	wear
		327 external spacer	wear
		328 end cap	no
		329 bolted joint	unscrew
		32A abutment ring	wear
		32B grease	wrong quantity
4Track			
	41 rail		rail joint
	42 sleeper		low stiffness

“The ideas of today are the possibilities of tomorrow”: An enhanced rail system needs the exchange between Science and Sector



- **Systems Engineering and Research**
 - Risk analysis, risk management tools as FMEA (especially for SMS and ECMs)
 - Understanding complex operations and integrated vehicle/infrastructure systems
- **Technical Engineering and Research**
 - Technical solutions for issues derived from risk analysis (e. g. in maintenance)
 - Technical and innovative solutions for improved competitiveness
- **Shaping European harmonised solutions for a European Business**

Thank you for your attention!

