



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

Universita di Roma / 2° Convegno Nazionale "Sicurezza ed esercizio ferroviario"
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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

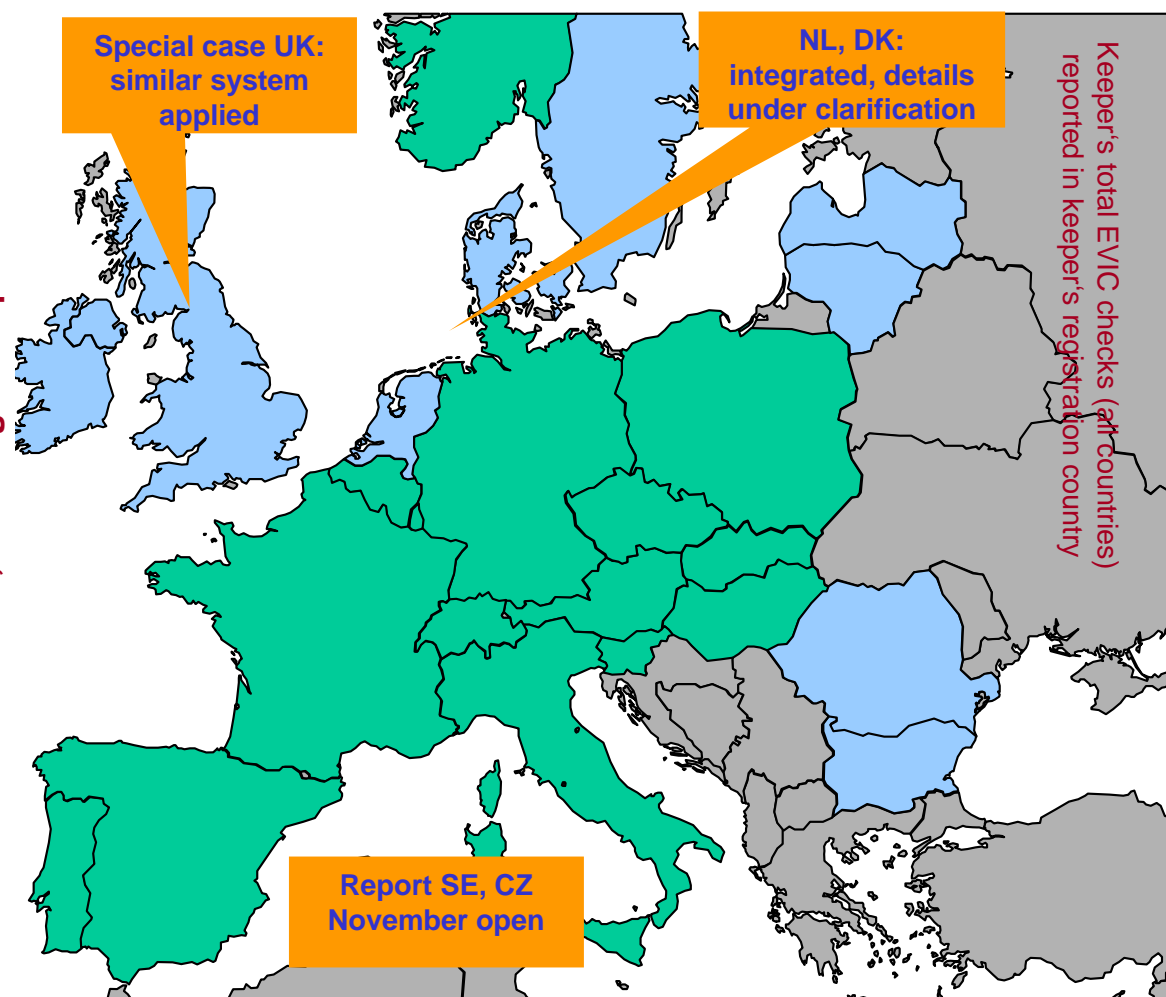
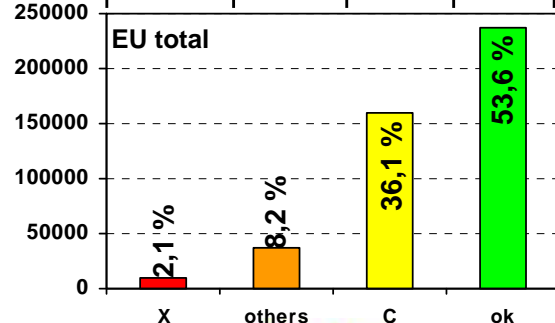
Pictorial representation:



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



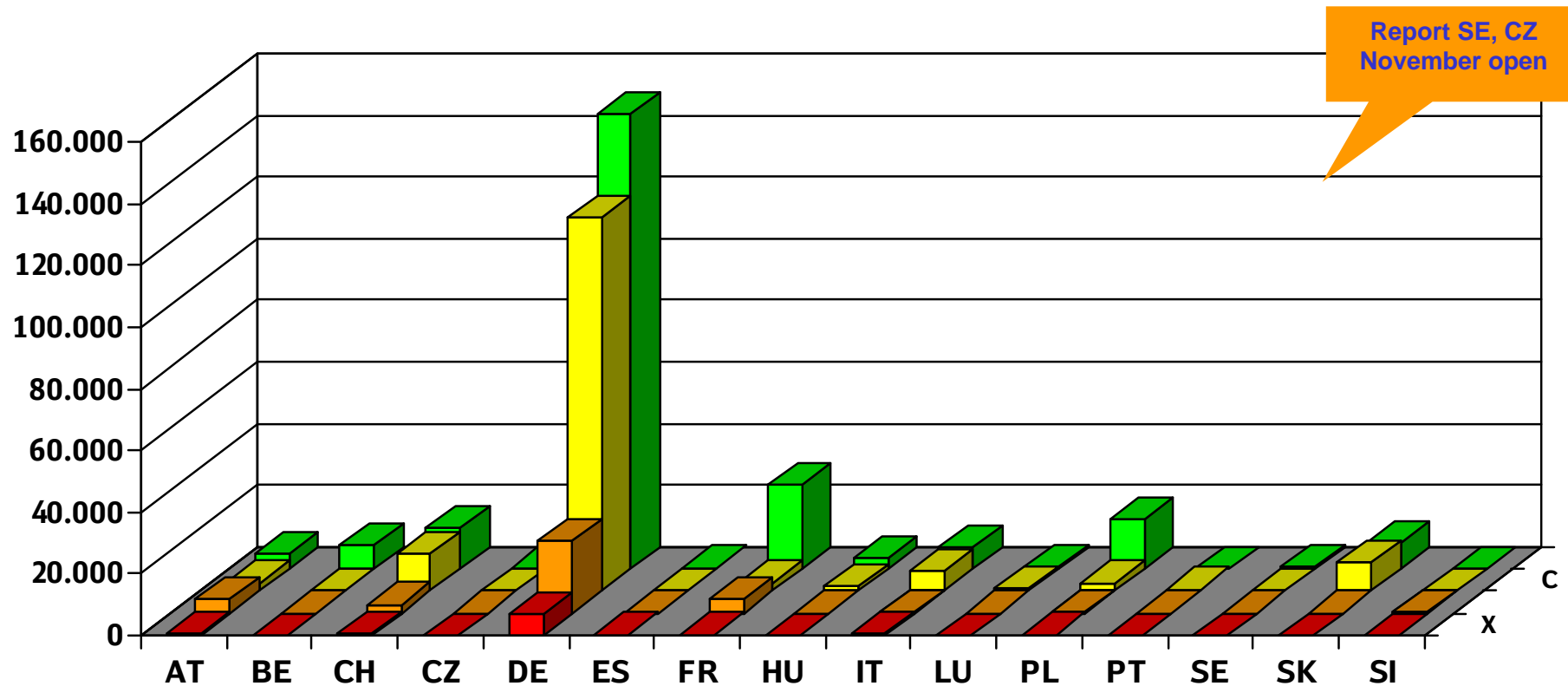
X: Remove from service without delay

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

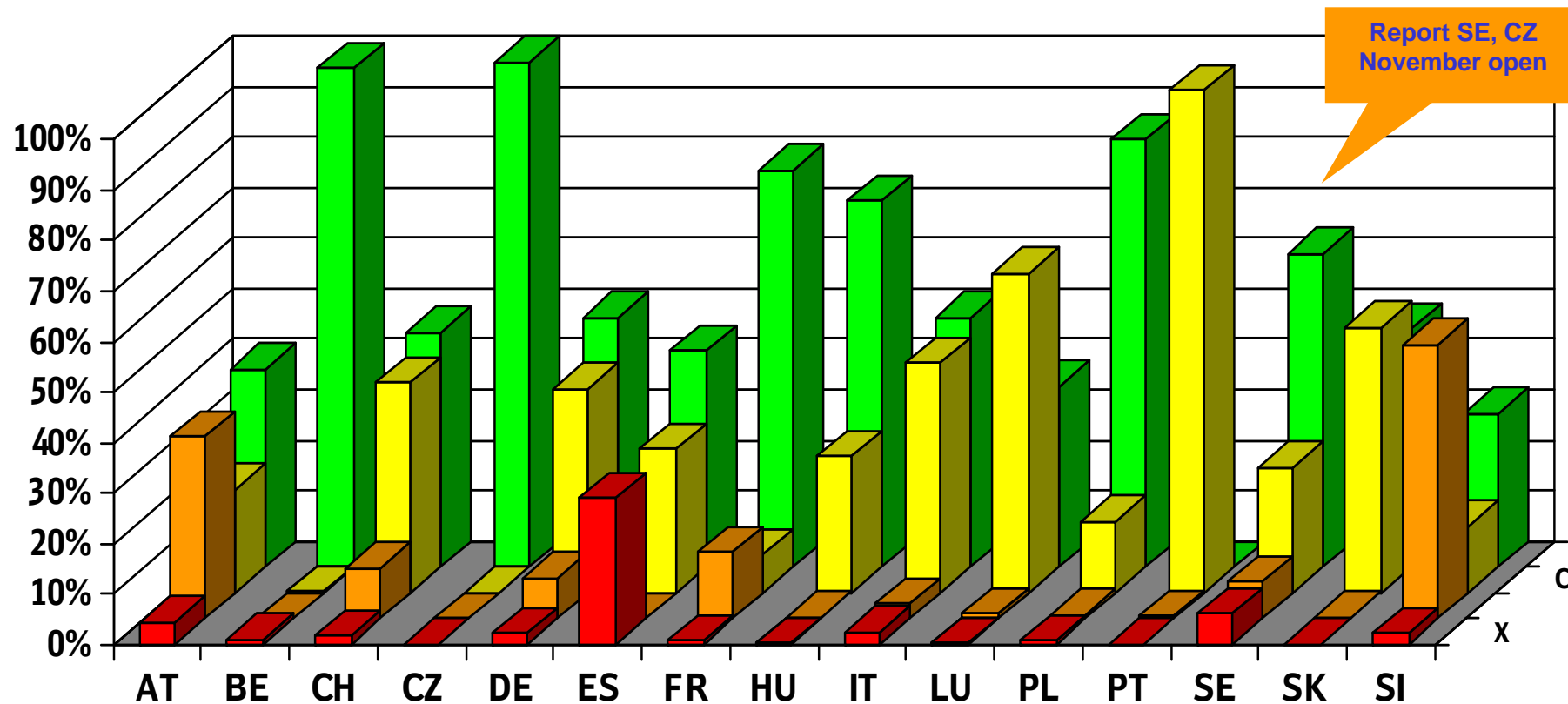
others: sorted out for other reasons, e.g. reprofiling

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

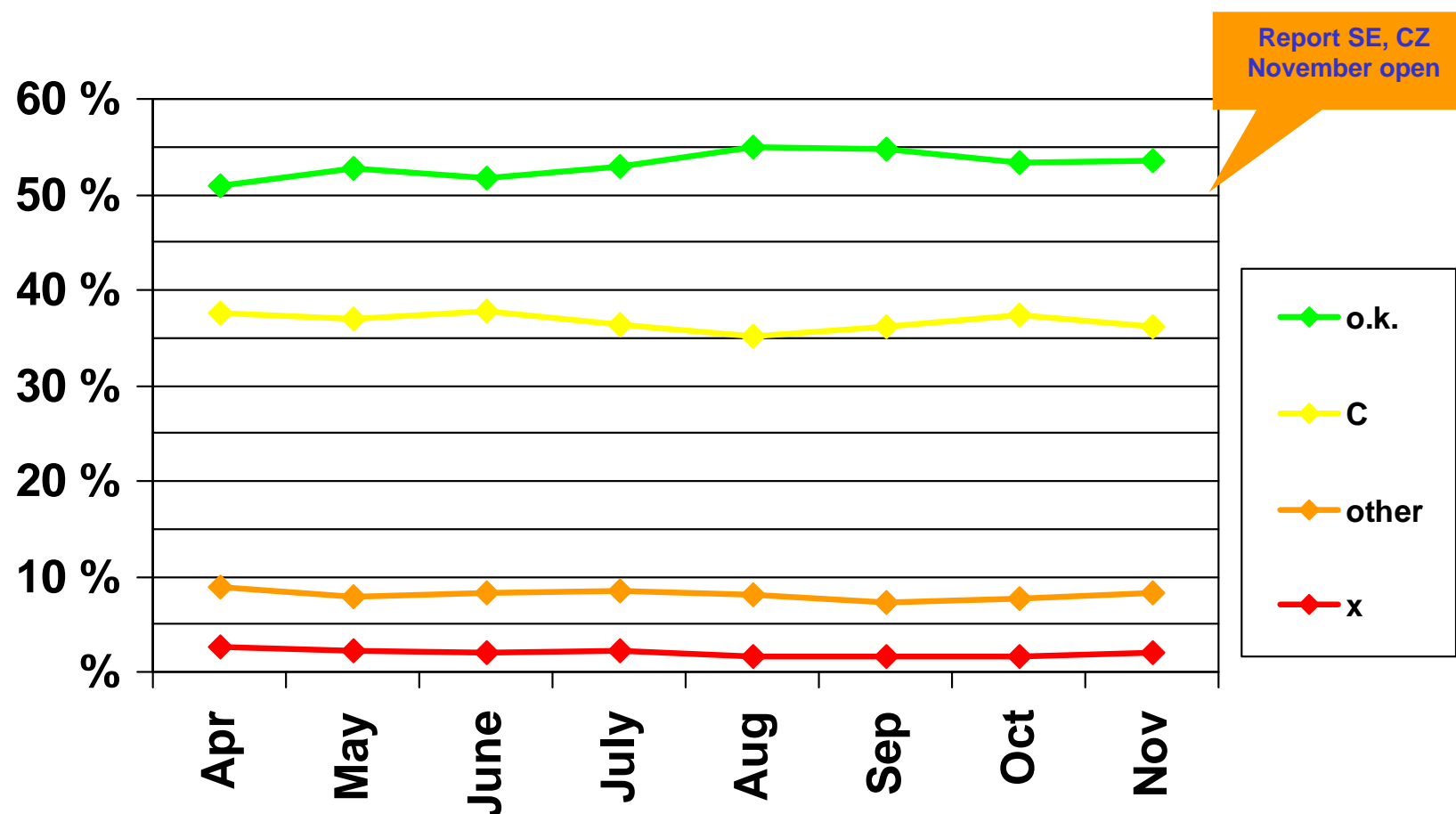
others: sorted out for other reasons, e.g. reprofiling

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)



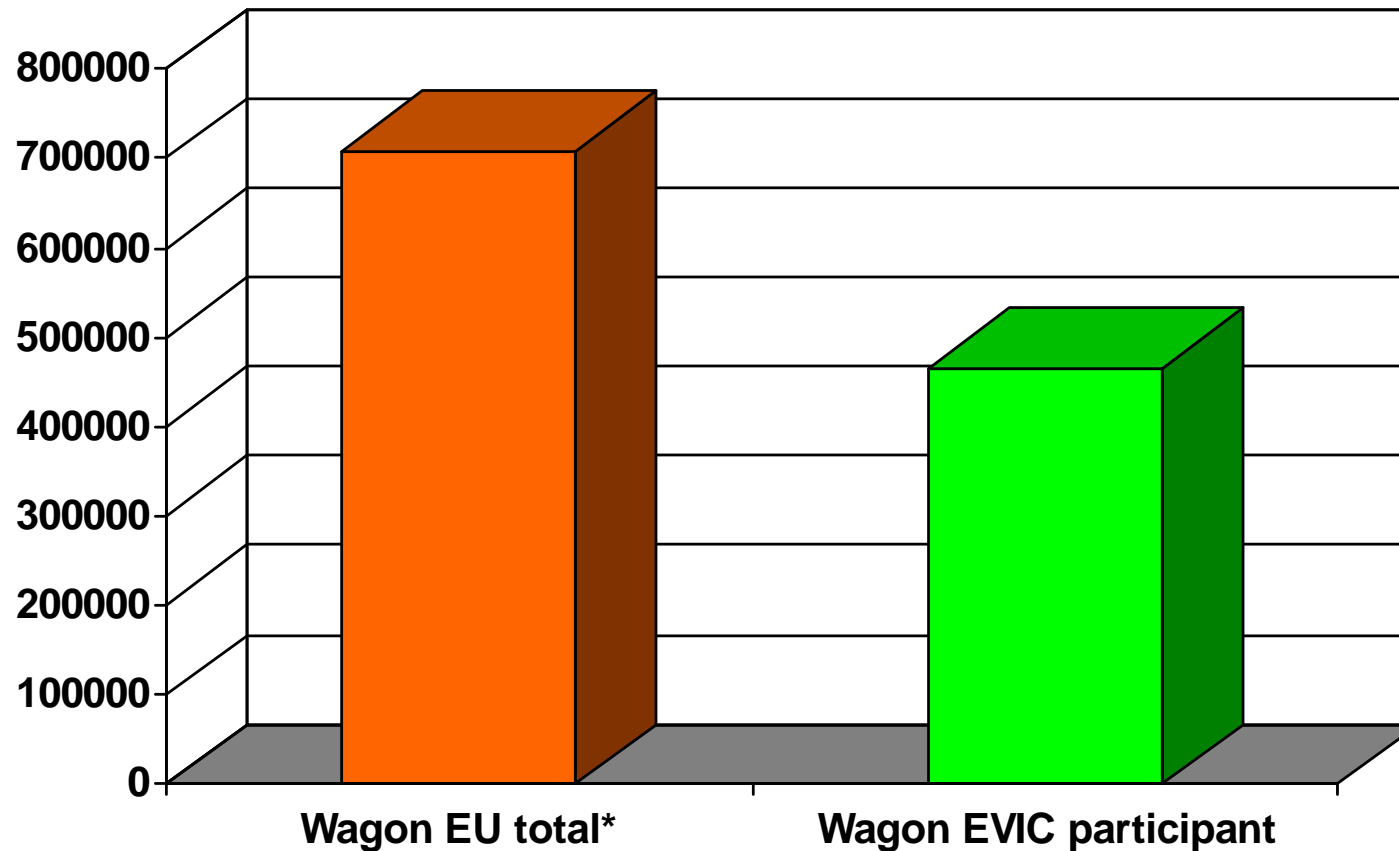
X: Remove from service without delay

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



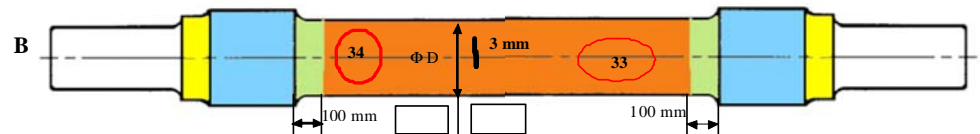
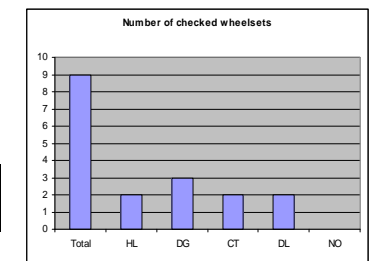
- 117 wagon keepers
- as per November 2010
- share from GCU signatories

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	Rkk 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									

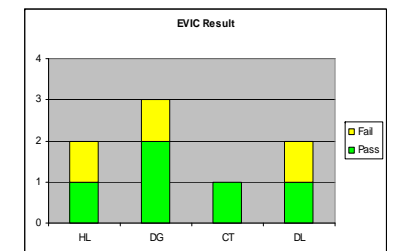
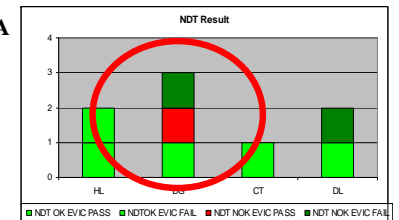


<u>NDT before treatment</u>									
Zone	Before treatment				After treatment				
	B journal	B abutment	B wheel seat	B transition radius (100 mm length)	Shaft	A transition radius (100 mm length)	A wheel seat	A abutment	A journal
NDT System									
MT	No	No	No	No	Yes	No	No	No	No
Man UT									
Auto 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 ☒ UT auto ☐ Axle scrapped Yes / ☒ No



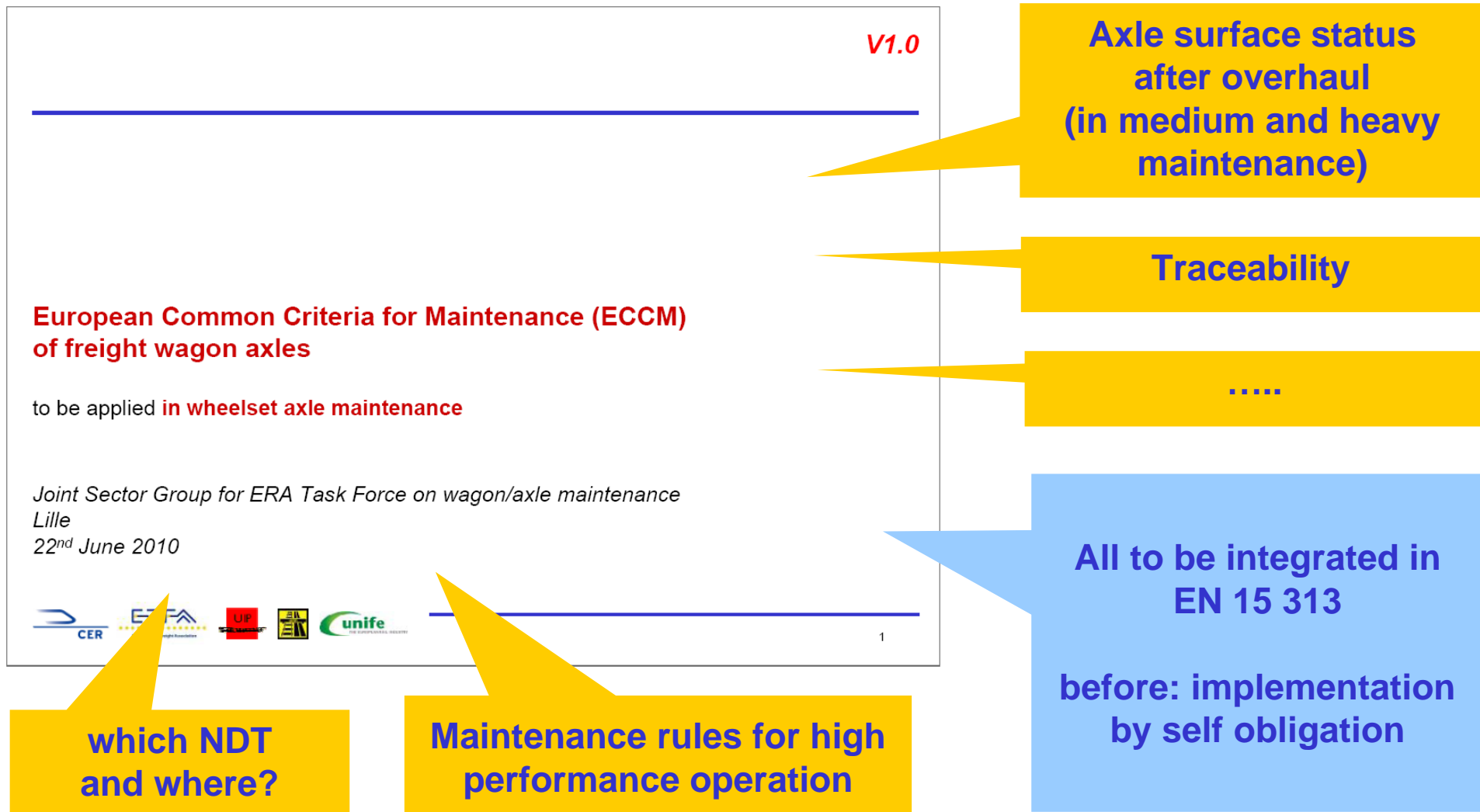
The 3rd element of the European Action Programme: European-wide systematic traceability of wheelset maintenance data

- 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**

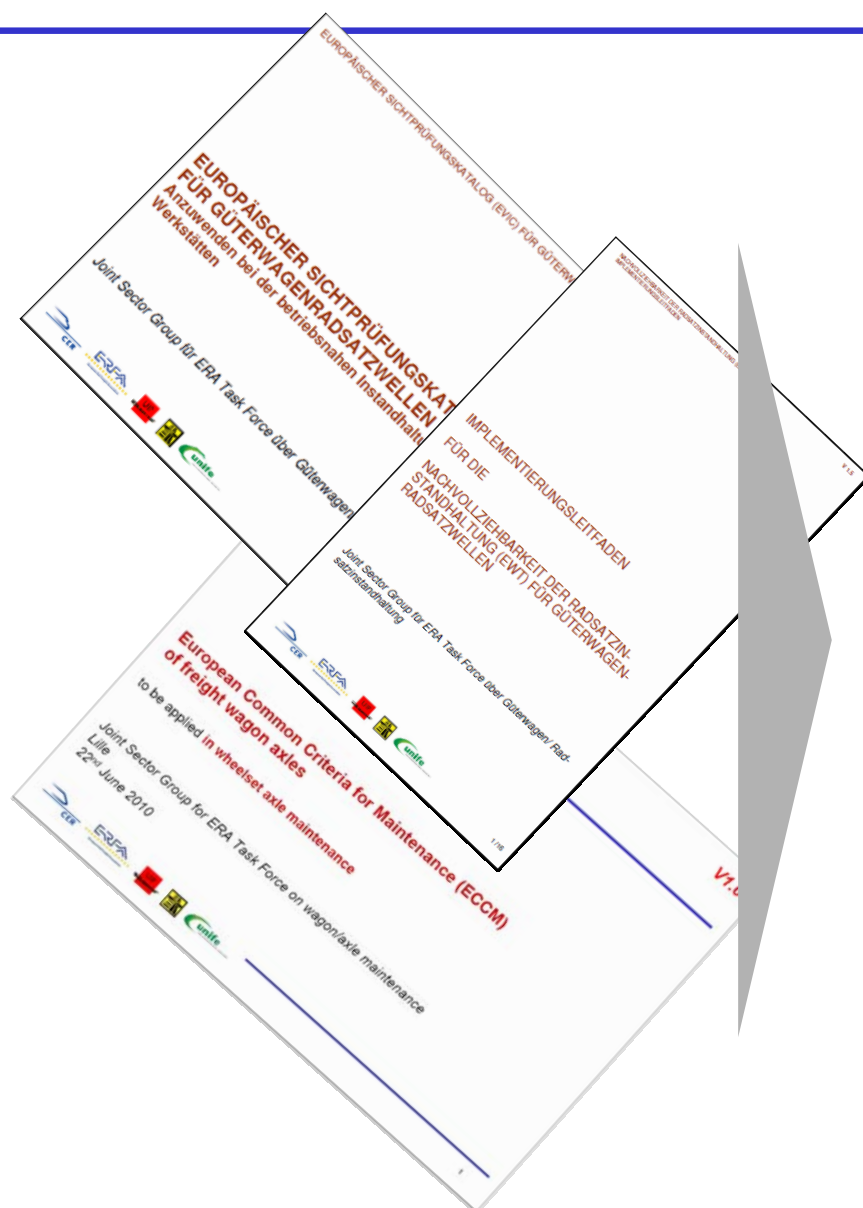
No	timeframe	Designation	Remark
Wheelset in general			
1	a	Wheelset number	if applicable (if the keeper has changed) Data has to be stored from the last wheel change on Remark: Current keeper of the wheelset is the keeper of the wagon (see number 38)
2	a	Wheelset design type or alternative designation	
3	a	Previous keeper(s) (ECM)	
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)	for wheelsets from service: if available
6	a	assembler of wheels (manufacturer if first assembly)	
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	if available
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)	for wheelsets from service: 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)	for wheelsets from service: if available The manufacturing standard is directly related to the manufacturing date; (UIC; EN)
17	b	Manufacturing standard of the axle	
Wheels			
18	a	Design type or alternative designation	Yes/ No
19	a	Tyred wheels	
20	a	Certificate number and notified body from EC-declaration of conformity (TSI compliant wheels)	if available
		Homologation number and authorising or certifying body (other wheels)	
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



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:

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.

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.

In order to manage the quality of the wheelset freight wagon maintenance, a traceability system for in-service wheelsets has been agreed.

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.

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.

Note: This standard will not be used for conformity assessment against TSI. Therefore, ERA will not formally check and validate its content.

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

Draft / Excerpt				Failure mode
1 Frame				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	3121 Solid wheel	broken wheel
			3122 Tyred 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	fracture
			3252 inner ring	fracture
			3253 roller	spalling
			3254 cage	broken 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!

