

# Maintenance of vehicles Organization and control in EU legal system

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Training in Budapest

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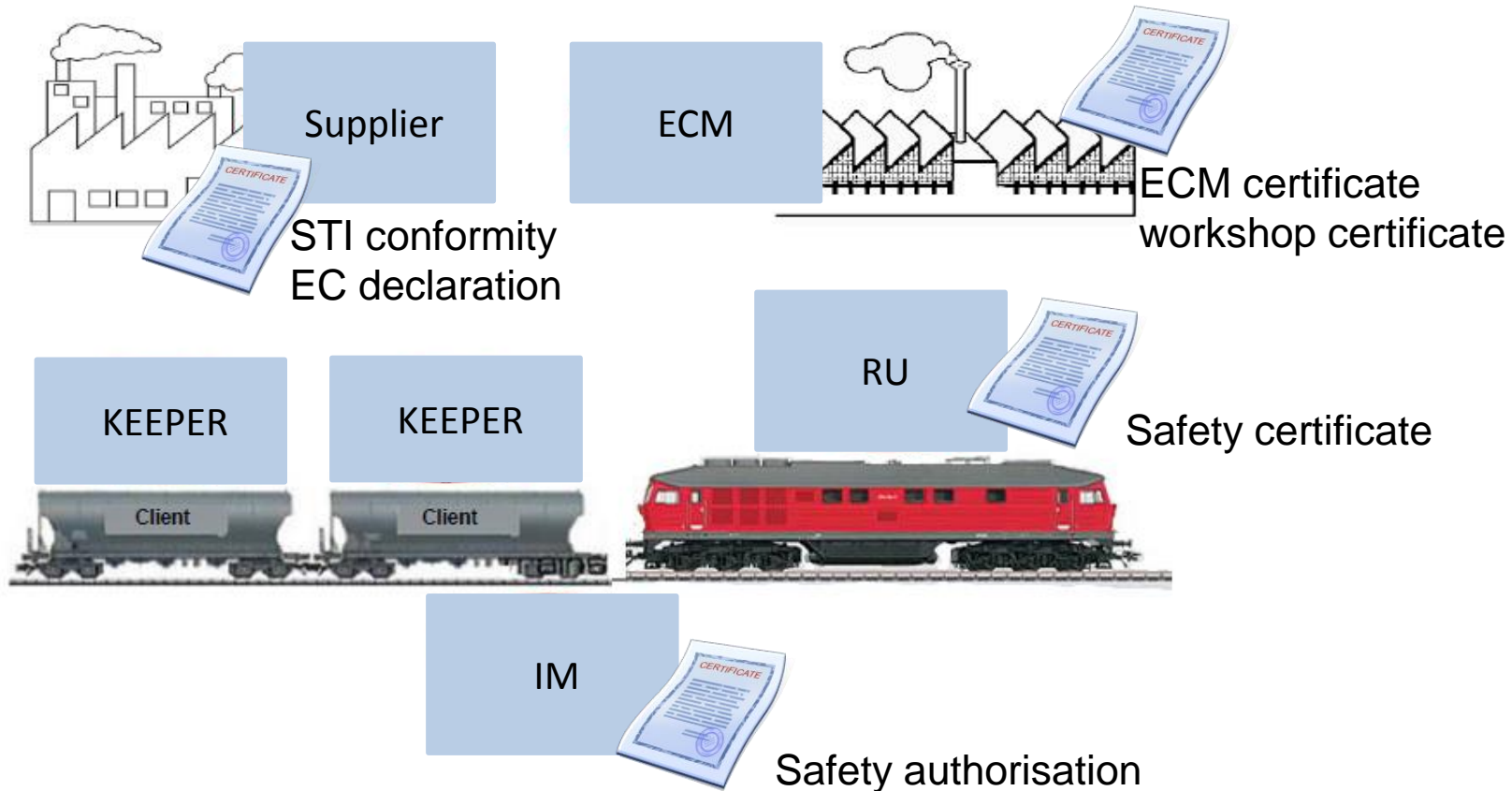
- Overall framework
- Maintenance management functions
- Allocation of responsibilities
- Interface between ECM Regulation and TSIs
- Change of ECM
- Substitution in the framework of maintenance
- Status of ECM implementation

\* Maintenance includes repairs (hereafter the term « maintenance » is used)

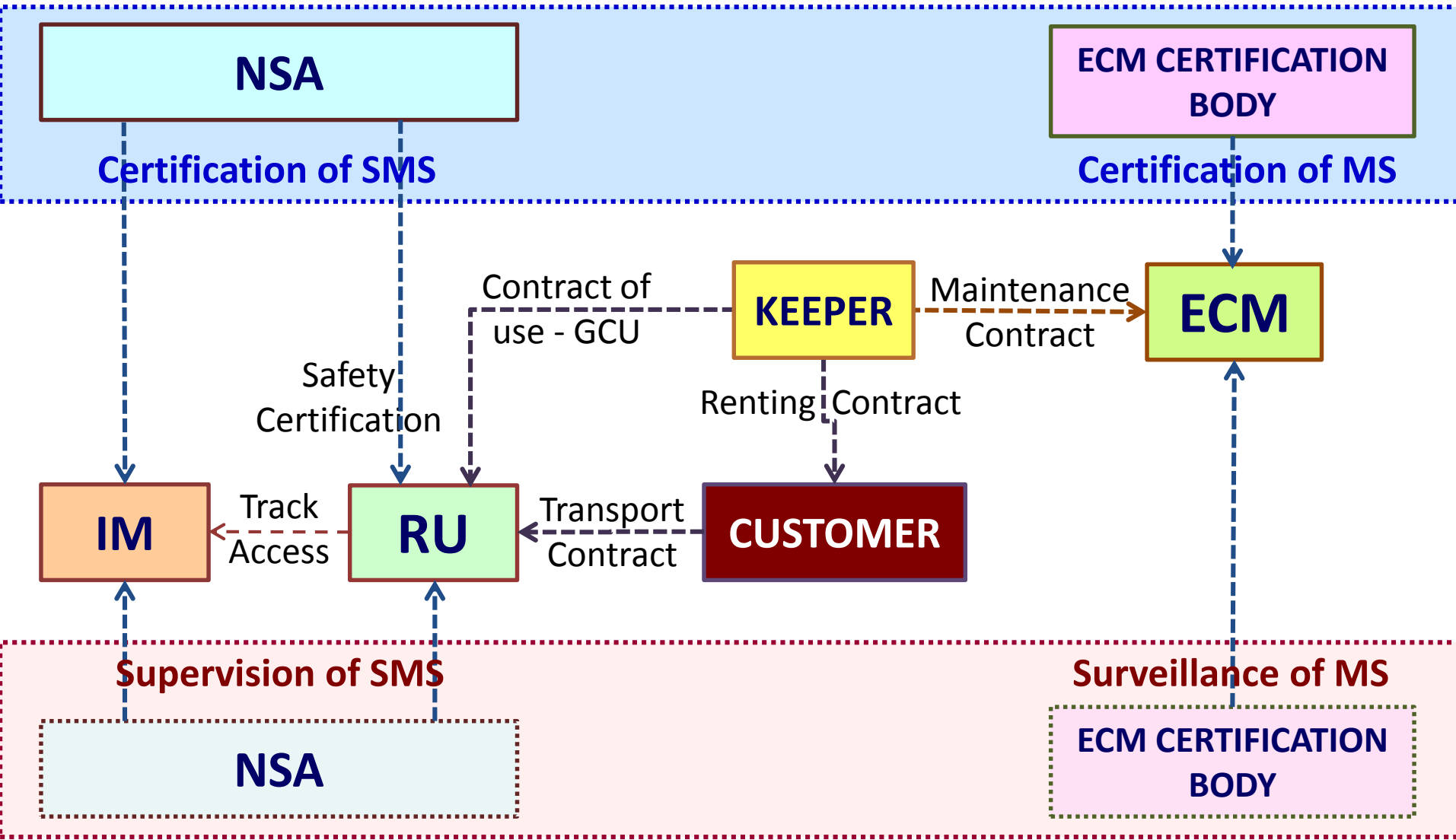
# OVERALL FRAMEWORK



# Wagon is a shared resource in the open access system



## Key railway actors



### Railway Safety Directive 2004/49 (Article 14a)

- All vehicles registered in the NVR must have an ECM
- Each ECM shall have Maintenance System
- ECM holds overall responsibility for maintenance
- Without prejudice to respective roles of other parties
  - For example RU/IM keeps the responsibility to define criteria to select the ECM

## *Railway Safety Directive*

EU Member States can derogate from EU system to identify ECM in respect of:

- Vehicles registered in a third country and maintained according to the law of that country
- Freight and passenger coaches in shared use with third countries
- Any other vehicles for which international agreements with third countries fulfill equivalent objectives (compliance with relevant maintenance requirements, maintenance file and traceability)

## Specific requirements for ECM

### Mandatory certification for ECM for freight wagons

- Regulation 445/2011 and its sectorial accreditation scheme
- COTIF ATMF annex A = identical rules for OTIF
- ECM maintenance system is certified by certification body

### Voluntary certification for workshops

- Regulation 445/2011 applies as good practice
- National rules shall be avoided in this field

### Non-certified ECM for other vehicles (attestation of conformity)

- Maintenance system of RU and IM is assessed during the assessment of the SMS



Cooperation of  
certification bodies



# MAINTENANCE MANAGEMENT FUNCTIONS



The **resources** required to control risks related to the maintenance process can be **excessive for newcomers or small railway operators**.

**Generic Elements**

**Specific Elements**

**Risk assessment**

**SMS : safety and monitoring**

### SMS requirements for Maintenance:

Policy, roles & responsibilities, design of the process, competence management, technical procedures & instructions, maintenance file of each vehicle, monitoring procedures, contracts' definition ...

To support the opening of the market, after consultation with the sector, it has been decided to define a **new entity** responsible to ensure, by means of a **system of maintenance**.

## Maintenance system

MANAGEMENT PROCESS



*Establish the  
maintenance  
file*

MANAGEMENT PROCESS



*Remove from  
operation and  
return to  
operation*

MANAGEMENT PROCESS

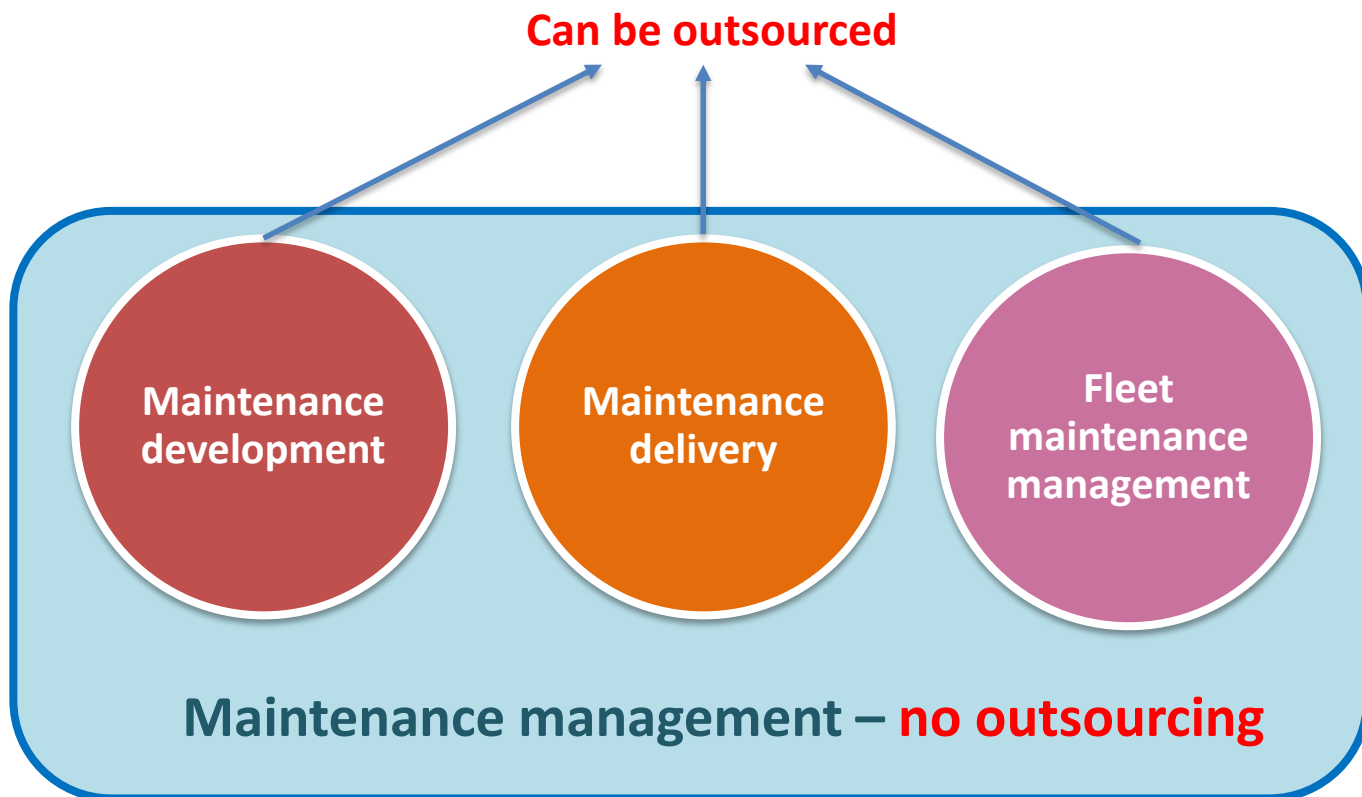


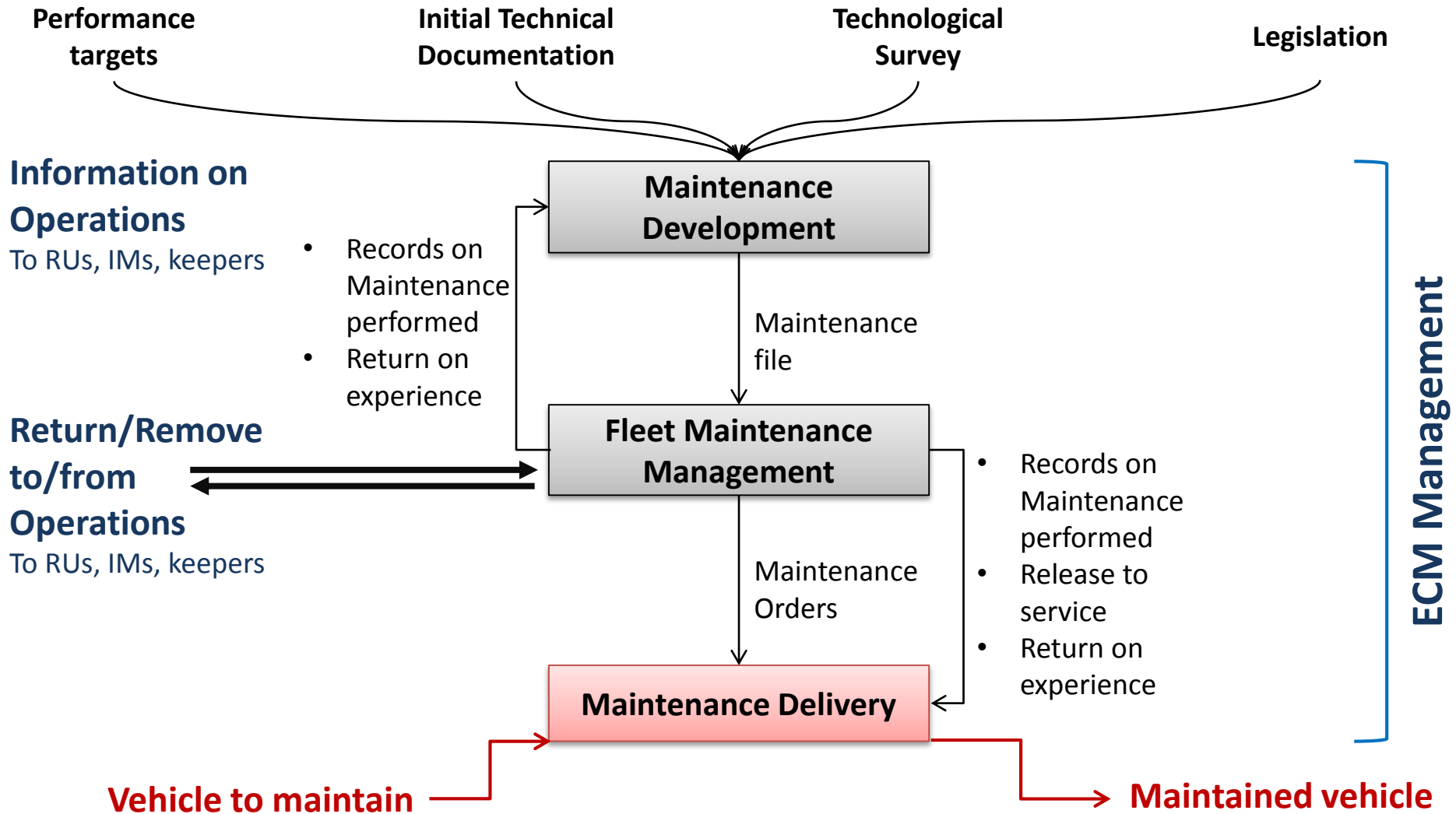
*Deliver the  
technical  
maintenance  
tasks*

MANAGEMENT PROCESS-ECM

Today Regulation 445/2011

Amended Railway Safety Directive 2016/798 article 14





# Certification of ECMs and Maintenance Workshops

The process for certification and surveillance is similar to ISO 9001, 14001

Requirements are specific in Regulation 445/2011 ( Annex 3)

Three ways to appoint the ECM Certification Body:

- Accreditation (**privileged by EU law to achieve trust**)
- Recognition
- Designation by the Member State ( NSA acts as certification body)

## Example : Derailment in Bressanone

The 1<sup>st</sup> wagon derailed  
(type: Eaos, *EVN n° 31815341854-2*)



**Keeper:**

Company A

**ECM:**

Company B in the same country





Both wheels (*monoblock*) of the 1<sup>st</sup> axle and one wheel (*monoblock*) of the 4<sup>th</sup> axle displaced.

Accidental displacement of the wheels





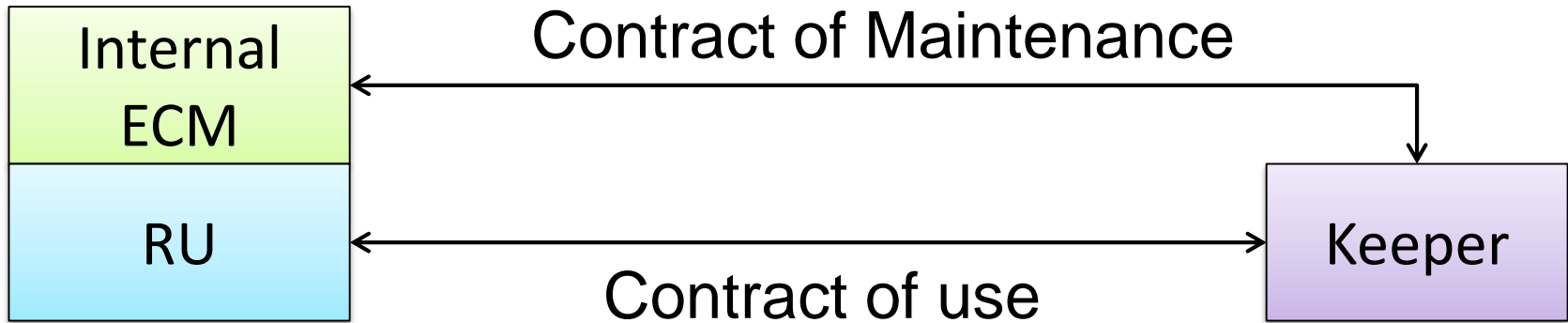
## For the wheels of the first wheelset, **the value of interference was also smaller than the prescription of the ECM (limit value in rules)**

- Information exchange and transmission of documents between “maintenance development function” and “maintenance delivery function” was not good
- The activity of internal control of ECM, in particular concerning the “maintenance delivery function” (priority in the case this function is external), should be improved
- Regulation 445/2011 requires ECM to react in right way and exchange information after an incident where the lack in the maintenance process is evident (important surveillance by the ECM Certification Body)

# ALLOCATION OF RESPONSIBILITIES



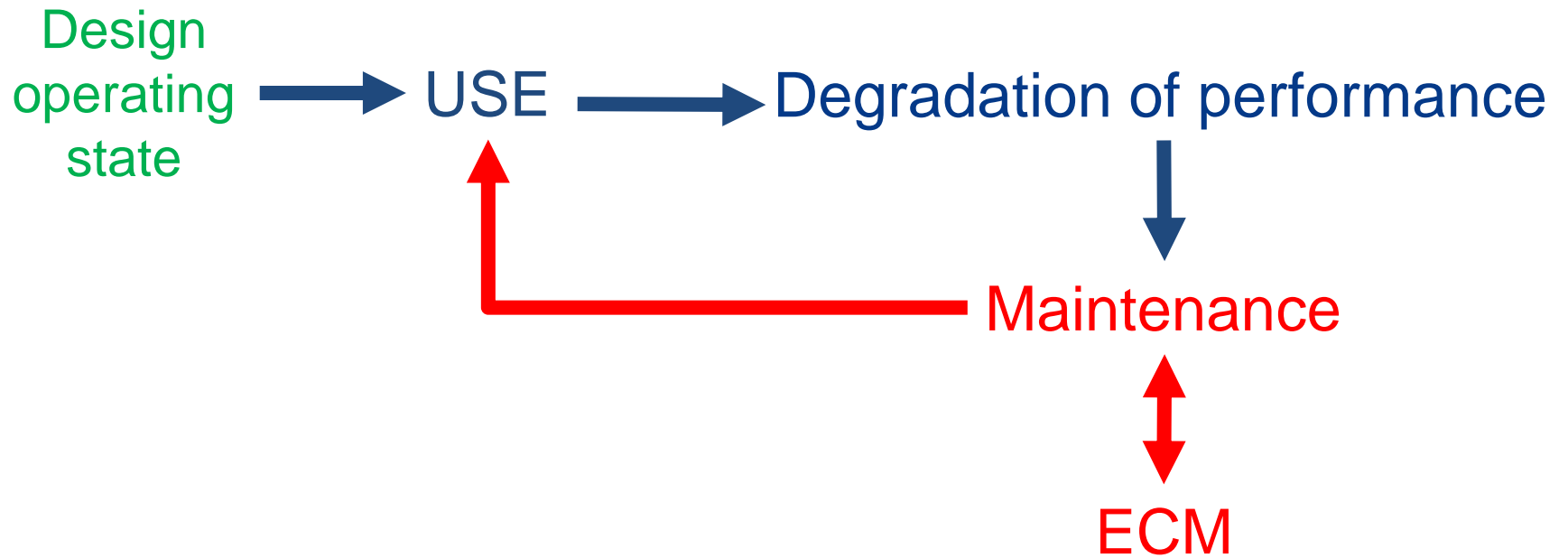




## Some business models



Maintenance is under the responsibility of ECM



## ***Railway Safety Directive 2004/49***

*“To this end, the ECM shall ensure that vehicles are maintained in accordance with:*

- a) the maintenance file of each vehicle;*
- b) the requirements in force including maintenance rules and TSI provisions.*

*The ECM shall carry out the maintenance itself or make use of contracted maintenance workshops.”*

- ECM must **set up and keep updated the maintenance file** (maintenance development);
- ECM must ensure that the **maintenance file is effectively applied** (fleet management and delivery);
- ECM must **coordinate all those activities and supervise its subcontractors**.

## Regulation 445/2011

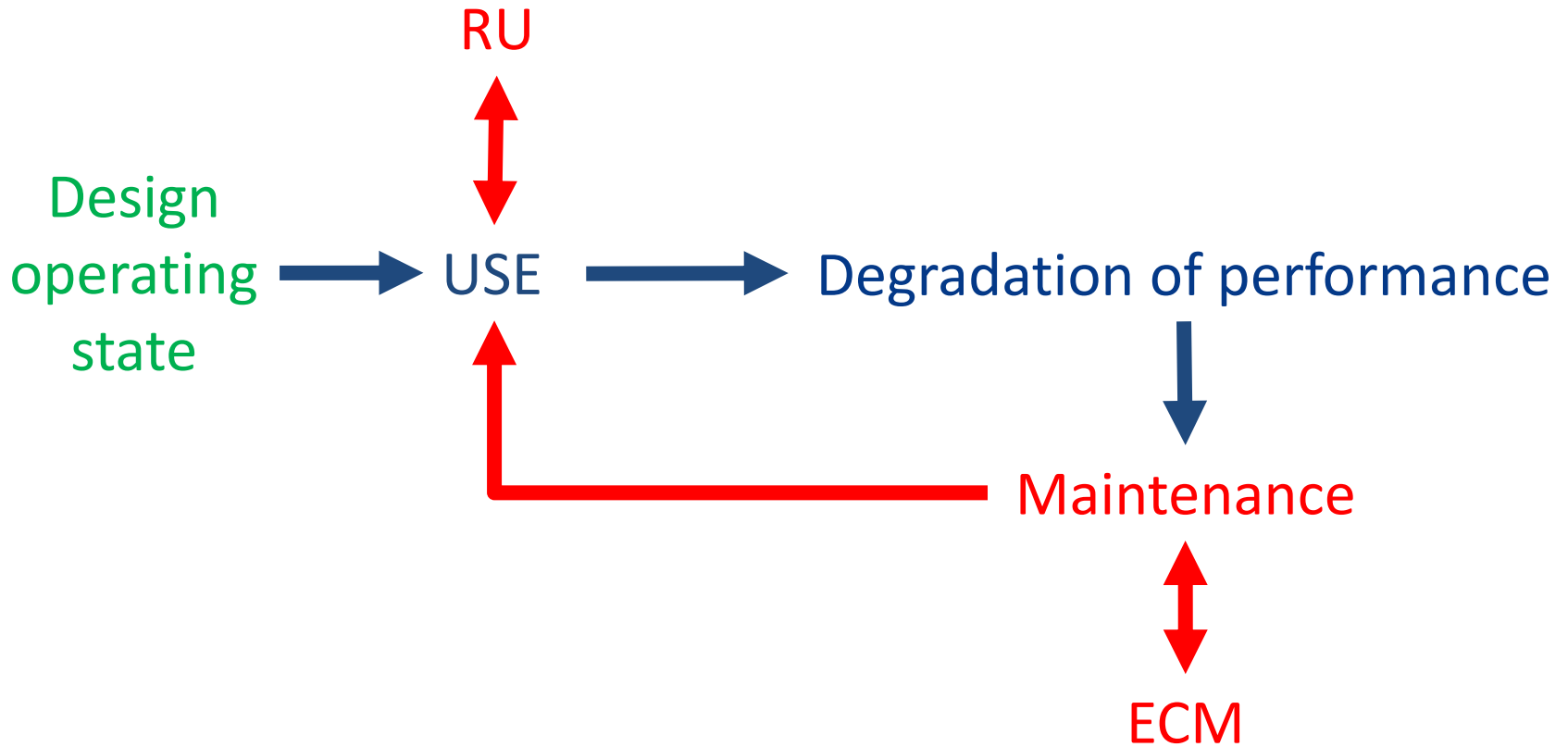
### Exchange of information:

The ECM has to address return to operation issues to RUs and keepers.

### Certification for FREIGHT WAGONS:

- The ECM must be certified against the Regulation 445/2011;
- The ECM must inform its partners, RUs, IMs and Keepers, about all changes related to its certification, e.g. amendment, renewal, suspension, revocation.





## *Railway Safety Directive*

*“RU shall be made responsible for safe operation and associated control of risks.”*

*“Through its SMS, the RU shall control all risks associated with its activities including supply of maintenance and use of contractors.”*

- ECM certification provides assurance to RU that ECM is competent to address the risks associated to supply of maintenance
- **Regulation 445/2011** imposes to RU to ensure that the ECM is registered in the NVR and appropriately certified

Define what you need to control your risks and include it clearly in the contract  
(Supported by Risk Assessment)

RU/IM

Check that the contractor is **organised** to deliver what you want

Check contractor is **competent** to deliver what you want

ECM certificate assures  
these two requirements  
are met

**Monitor** that the contractor is delivering what you want  
(Supported by Risk Assessment)

RU/IM

RU / IM

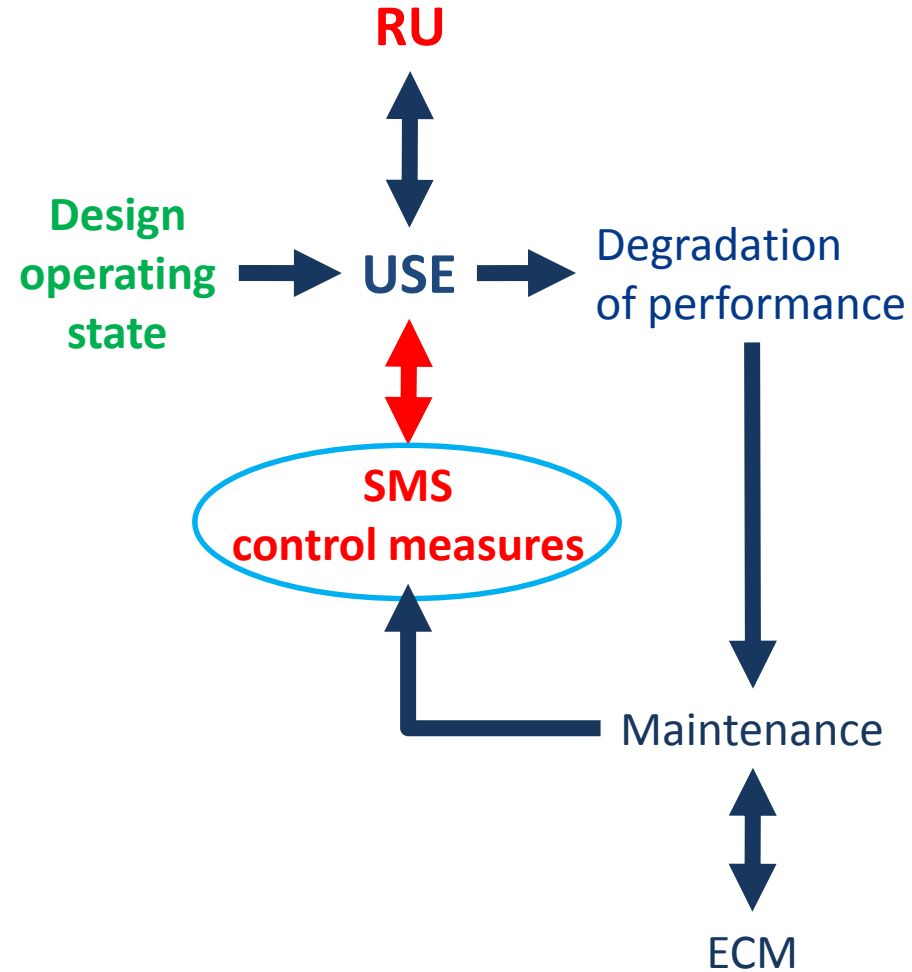
1. Certification is not a full guarantee of **absence of errors**;
2. Between maintenance interventions, risks of **degradation of performance**.

**Example of Risks to be controlled through the Safety Management System**



e.g. pre-departure checks, restrictions in operations, etc.

## Railway Undertaking



## Example : Derailment at Artenay (1)



The **9<sup>th</sup> march 2011**, the 17<sup>th</sup> and 19<sup>th</sup> wagon of the freight train n°62858 derail in open track on the 4 track electrified line between Paris and Orleans, before the station of Artenay.

- The 17<sup>th</sup> wagon has its first 3 axles derailed. The first wheelset axle is broken in two parts.

The **surface damages** should have been detected and measures should have been taken at least on the following occasions :

- Feb 2002, wheels reprofiling at workshop X;
- Oct 2002, wheelset overhaul at workshop X;
- July 2004, wheels reprofiling at workshop X;
- Feb 2008, on pit examination during wagon overhaul at workshop Y.



Example : Derailment at Artenay (2)

## SMS of RU

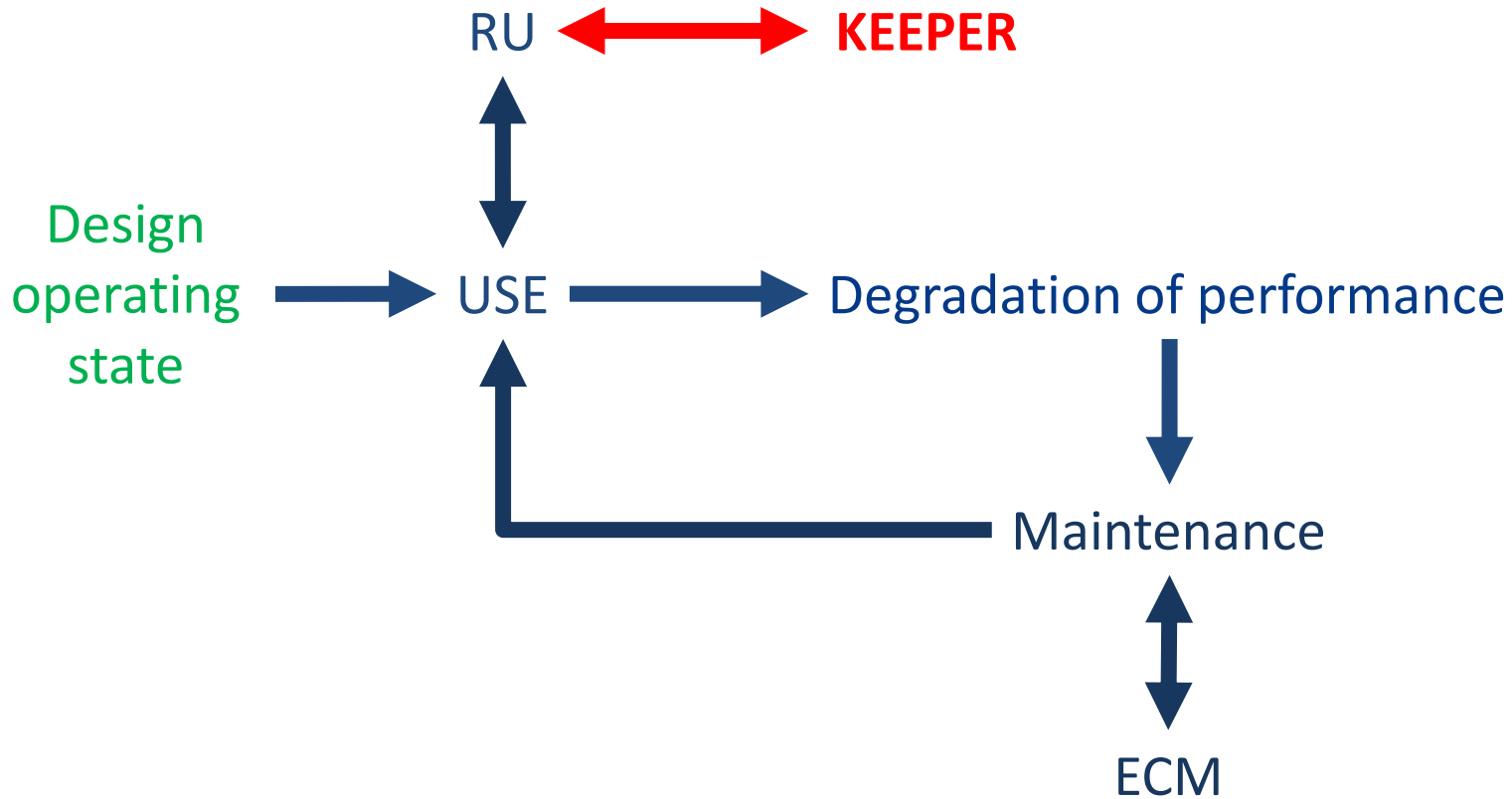
Risk Control Measures such as pre-departure and en route inspections, restriction in operations.

Relevant?

*“The **Safety Management System** shall also take into account, **where appropriate and reasonable**, the risks arising as a result of activities by other parties”*

*Safety Directive 2004/49*

Appropriate? Reasonable?



*‘Keeper’ means “the person or entity that, being the owner of a vehicle or having the right to use it, exploits the vehicle as a means of transport and is **registered as such in the National Vehicle Register (NVR)** provided for in Article 33 of Interoperability Directive 2008/57/EC.”*

**Safety Directive 2004/49**

According to NVR legal rules, the keeper is the registration holder in the sense of article 33 of Interoperability Directive 2008/57 (if not otherwise mentioned).



The keeper has contracts with ECM and RU



**The keeper is responsible for all its allocated contractual tasks**

Contractual tasks **may be** related to exchange of information between RU and ECM (**keeper = intermediate**)

The keeper is also responsible to the RU to provide **vehicles in conformity** with the legislation:

- *Vehicles with a valid authorisation for placing in service*
- *Freight wagons with ECM duly certified*

## The exchange of information

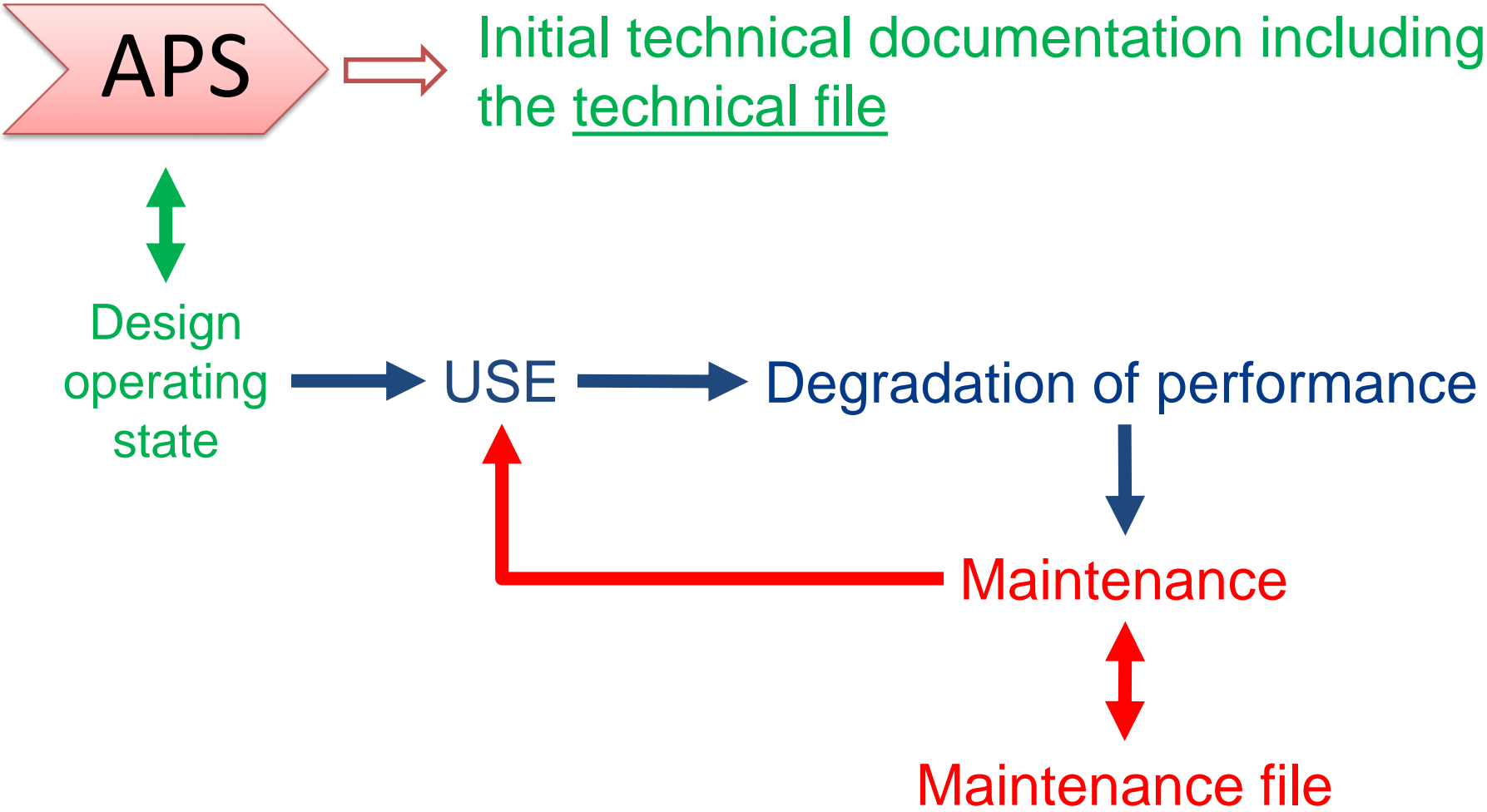
It is an important requirement taken in account in the ECM Regulation for the 3 parts: **RUs, keepers and ECMs.**

## Some references and means

- **TSI Telematic Application for Freight (TAF TSI)**, in order to harmonise all the information systems related to the transport of freight wagons;
- **Private initiative:** e.g. UIP, is developing a Rolling Stock reference Database (RSRD<sup>2</sup>) in order to respond to the TAF TSI requirements;
- Database ERADIS;
- NVR.

# INTERFACE BETWEEN ECM REGULATION AND TSIs



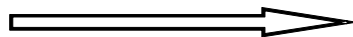


\*APS = Autorisation for placing into service

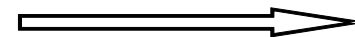
## Process of establishment of the first maintenance file

### INPUT

- Technical file
- Information on operation planned to be performed
- Performance targets



**Maintenance  
development**



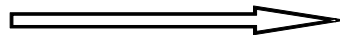
### OUTPUT

- (First) Maintenance file

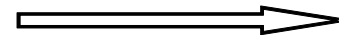
## Process of continuous update/improvement of the maintenance file

### INPUT

- Maintenance file
- Technical file
- Information on operation
- Records on maintenance performed and return on experience
- Technological survey
- Legislation (changes)
- Performance targets



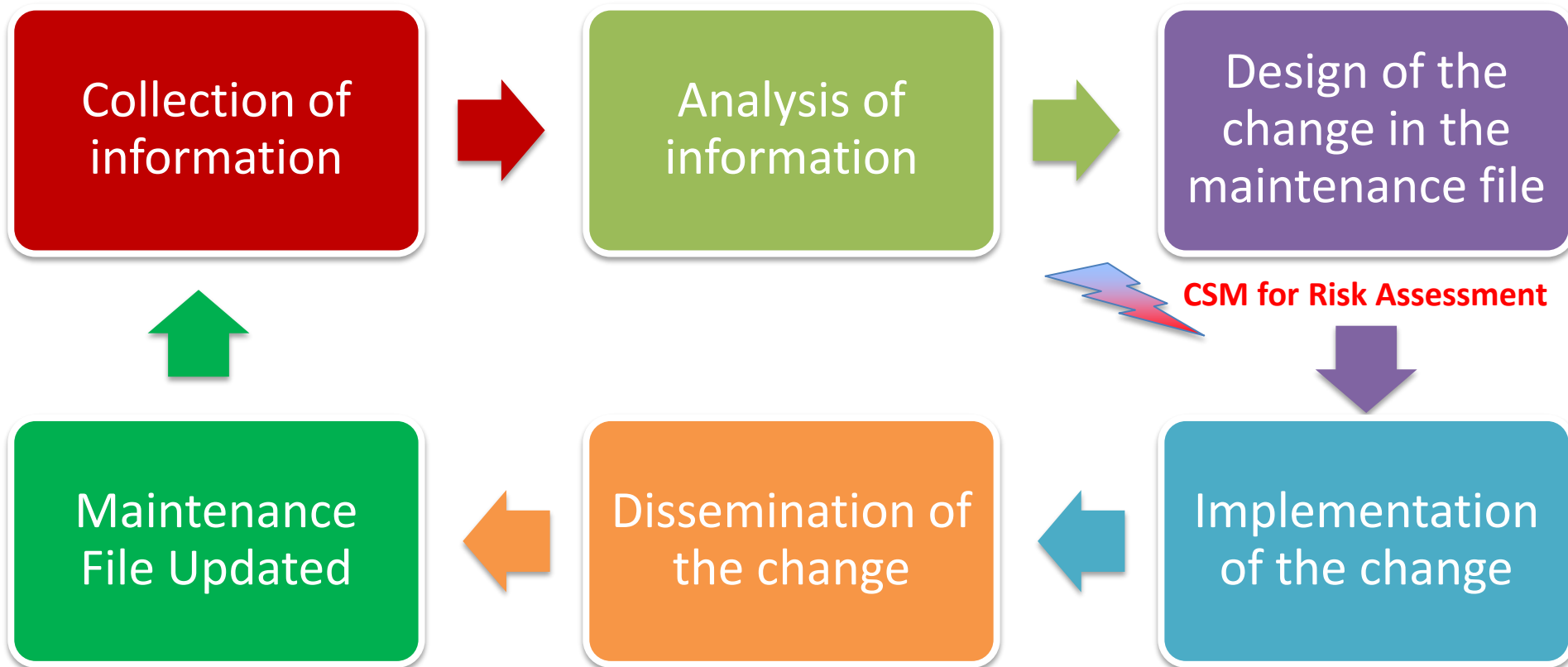
**Maintenance  
development**



### OUTPUT

- Maintenance file updated

### Continuous update/improvement of the maintenance file by applying CSM on Monitoring



# CHANGE MANAGEMENT

## Change of ECM



## Regulation 445/2011

*“When there is a change of ECM, the registration holder ... shall inform in due time the registration entity... so that the latter may update the National Vehicle Register.*

*The former ECM shall deliver the maintenance documentation to either the registration holder or the new ECM.*

*The former ECM is relieved of its responsibilities when it is removed from the National Vehicle Register. If on the date of de-registration of the former ECM any new entity has not acknowledged its acceptance of ECM status, the registration of the vehicle is suspended.”*

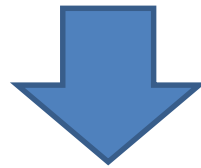


- The change may be motivated:
  - For business purposes
  - Bankruptcy
  - By revocation/suspension of ECM certificate
- Minimum information to be transferred to the new ECM:
  - (sufficient) information on the **maintenance file** including **records** on maintenance performed
  - The **technical documentation** (technical file is not the property of ECM)
  - The **configuration files** of each vehicle
  - All **additional information required by the contract** between keeper and 'former' ECM

## The are risks arising from the interface with ECMs

### EXAMPLE:

Maintenance file is strongly associated to the “know-how” of the ECM.



Stakeholders (incl. the keepers) should control this risk in its contracts with the ECM.



# CHANGE MANAGEMENT

## Substitution in the framework of maintenance

**ECM is responsible:** *“to manage the substitutions in the framework of maintenance.”* *Regulation 445/2011*

Note: Vehicles in service **may be TSI compliant or not.**

**Substitution** in the framework of maintenance means:

*“any replacement of components by parts of identical function and performance in the framework of preventive or corrective maintenance”* *Interoperability Directive 2008/57*

**Two types of parts:**

- Parts with **references** in the technical file
- Parts with (appropriate and sufficient) **specifications** in the technical file

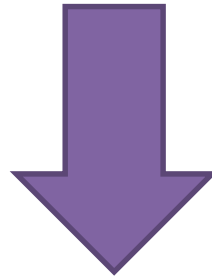
**ECM responsible for:** *“verifying in all circumstances the consistency of the maintenance file with the authorisation of placing-in-service”.*

*Regulation 445/2011*

Note: Vehicles in service **may be TSI compliant or not.**

Then the role of ECM is to verify that the vehicle **is maintained in accordance with the design operating state, with the parts mentioned in the technical file,** also when proceeding with substitutions!

Substitutions in the field of maintenance **do not affect the technical file of the vehicle** and therefore remain within the scope of the authorisation of the vehicle.



Not considered as a renewal or upgrading requiring new authorisation for placing into service.

The majority of vehicles in service **are not TSI compliant or have never been verified against TSIs:**

- *NO authorisation and technical file in conformity with Interoperability Directive 2008/57 and TSIs.*

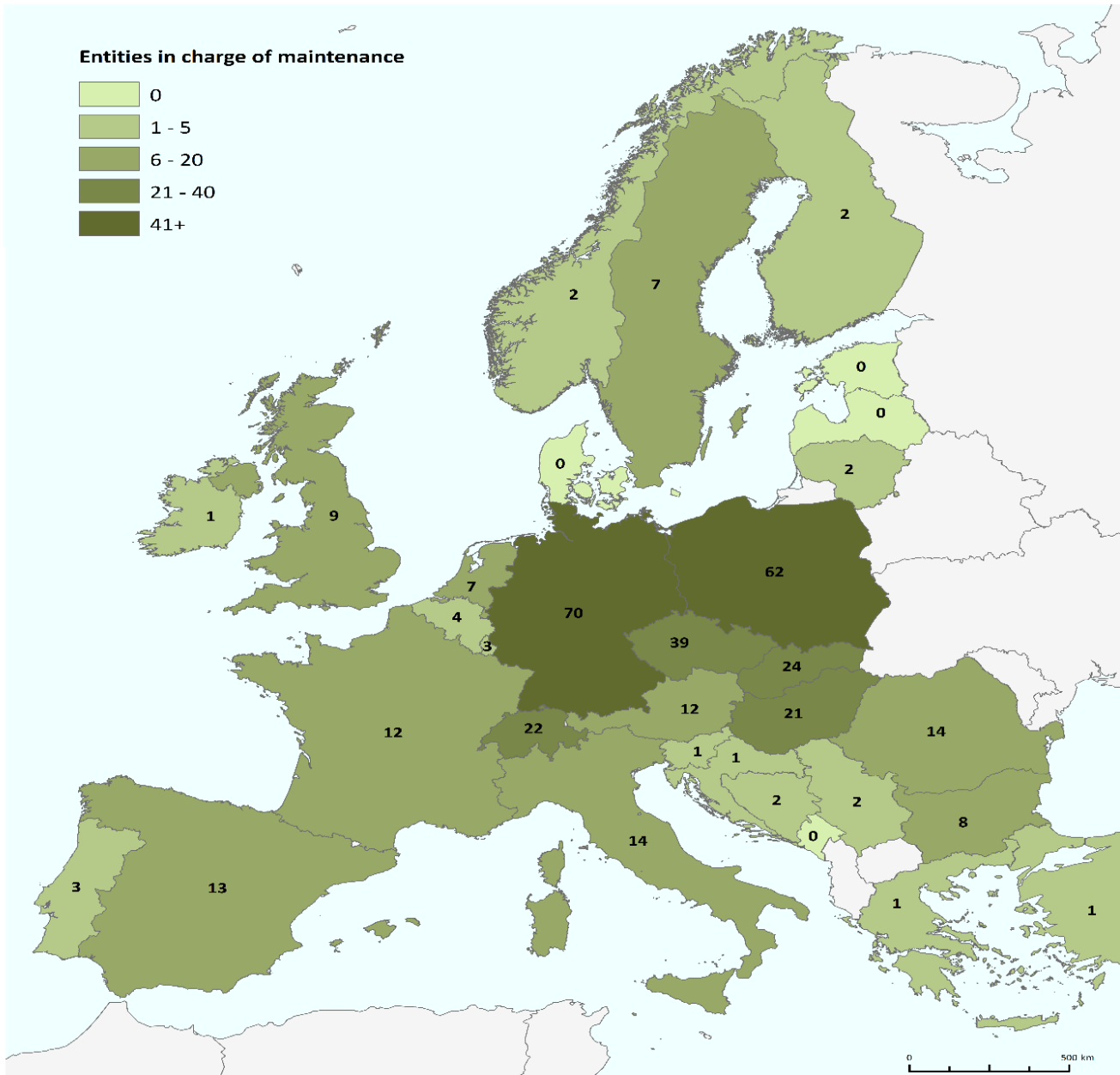
**BUT**

**for each of those vehicles, there is an approved design against previous national rules with a documentation similar to the (TSI).**

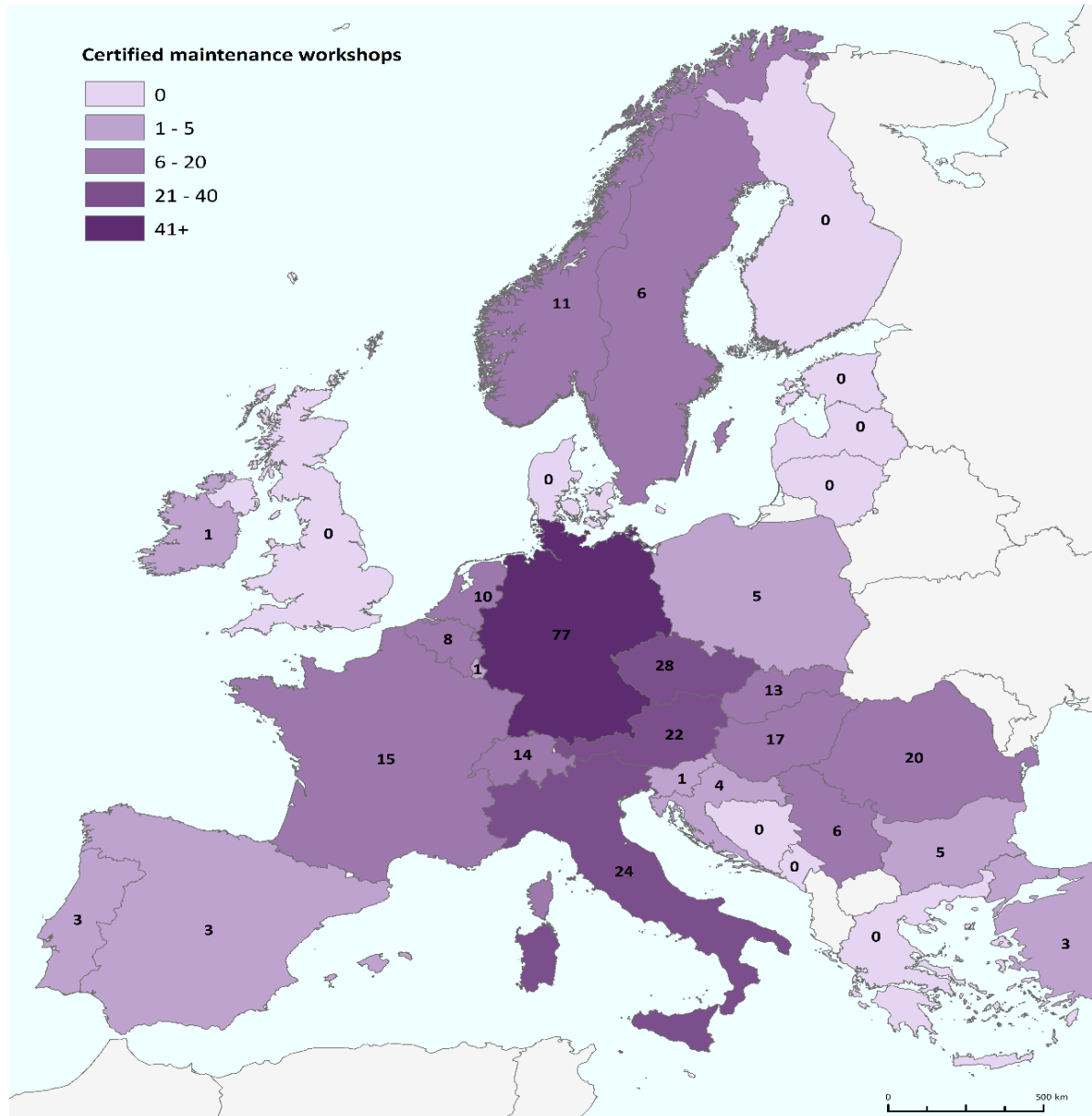
# STATUS OF ECM IMPLEMENTATION







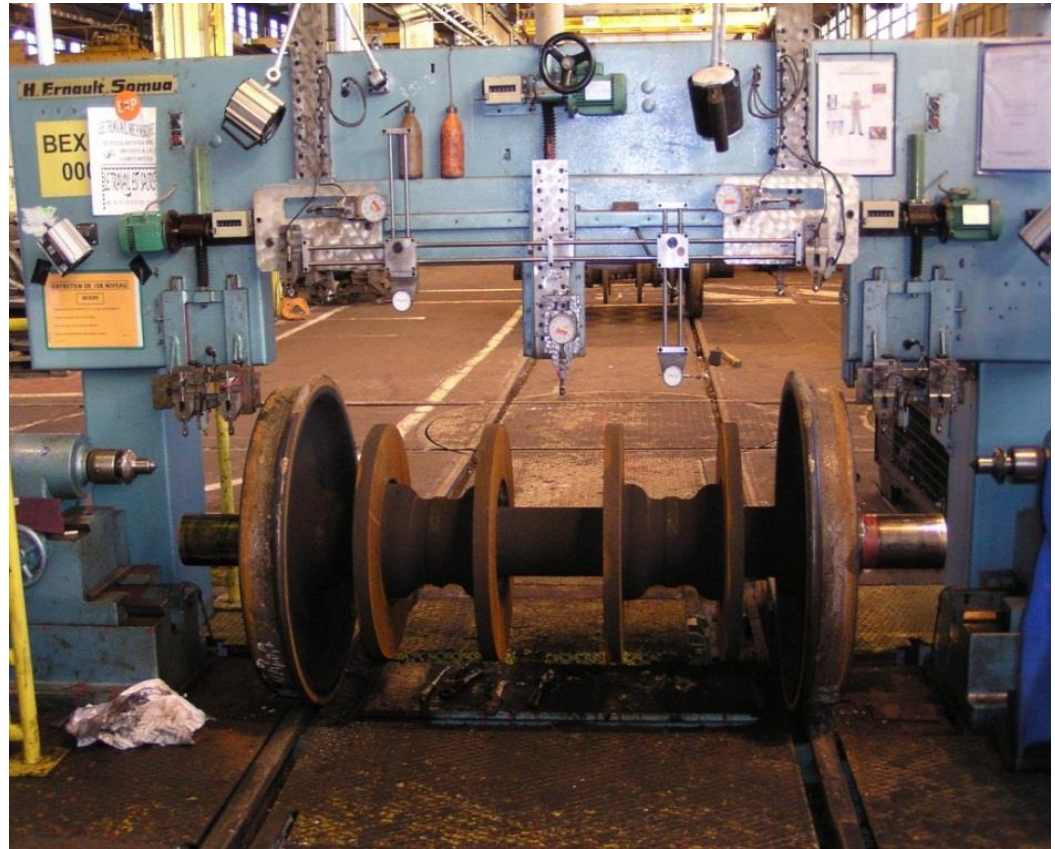
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Many thanks for your  
attention!

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