European Railway Agency

European Commission

# EU activities for reducing impacts of freight train derailments

## DG MOVE B2 / ERA

# 2007 - 2009

# EC Mandate - end 2007

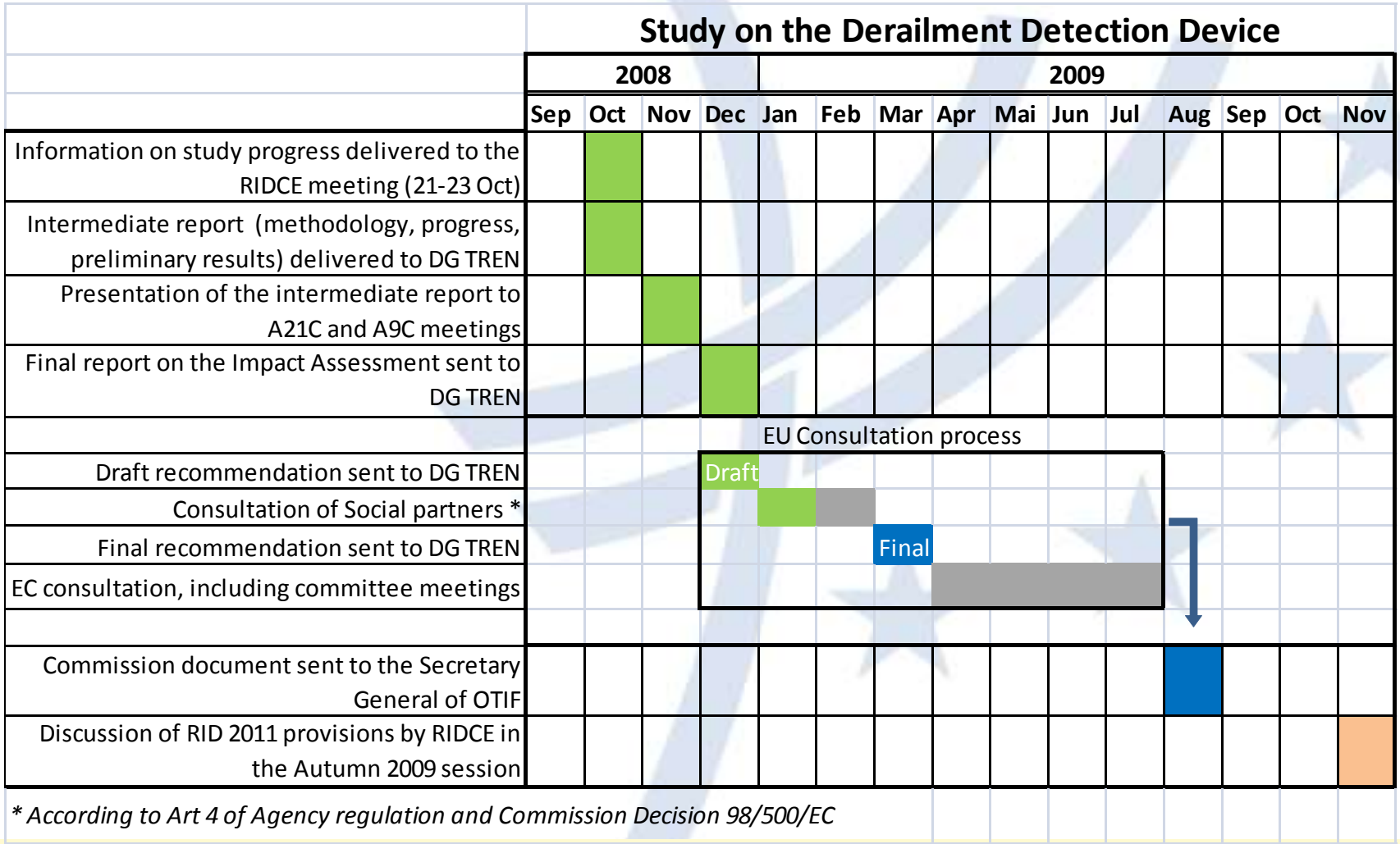
**Mandate to the Agency to issue a Recommendation to the Commission on the decision of RID to impose the use of mechanical derailment detectors (according to the article 6.2 and 6.4 of Agency Regulation)**

**The recommendation is supported by an Impact Assessment fulfilling the corresponding EC Guidelines (SEC(2005)791 and revised annex).**

**A consultation of Social Partners (CER, EIM, ETF) on the basis of the draft recommendation, according to the Article 4 of the Agency regulation.**

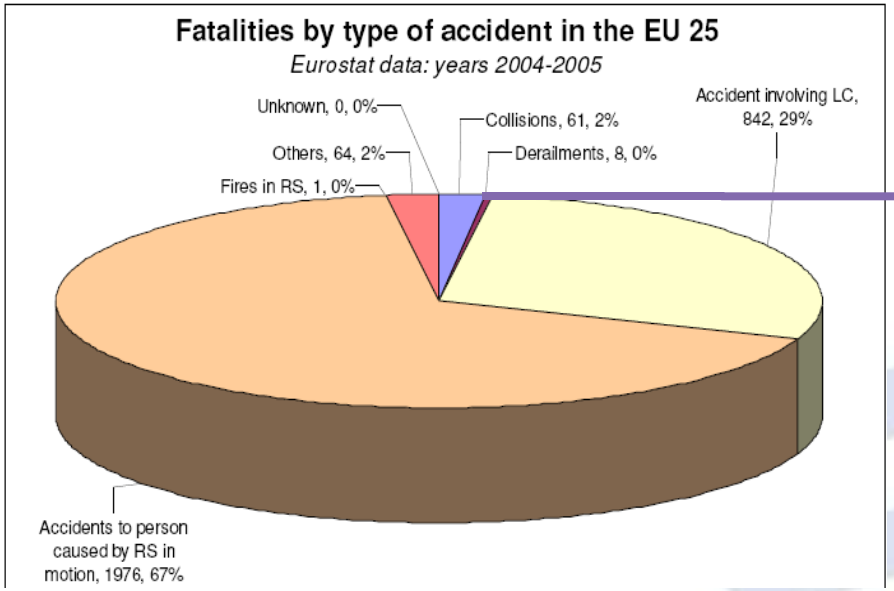
**Besides the mandatory consultation of the social partners, the NSAs have been invited to give their comments to the Agency about the draft recommendation and the impact assessment.**

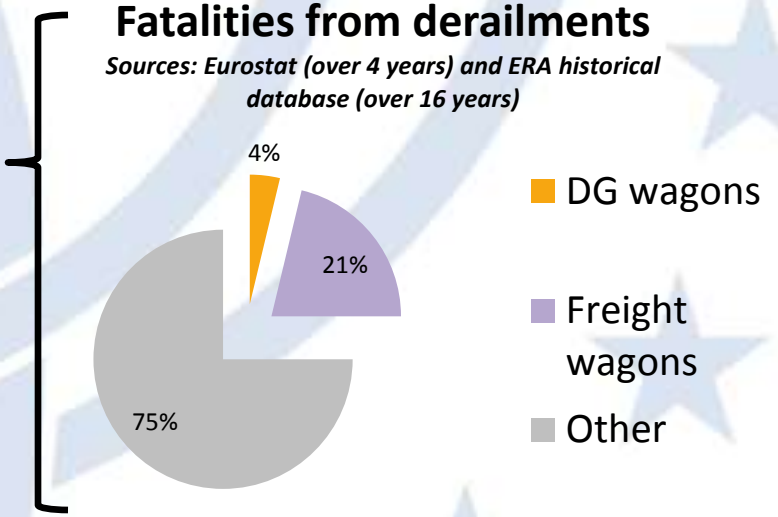
# Agency reports and EC consultation planning




** According to Art 4 of Agency regulation and Commission Decision 98/500/EC*

# Overall figures on EU derailment fatalities




**The derailments of DG wagons, with involvement of the dangerous goods, resulted in 3 fatalities over the last 16 years.**

# Main sources for risk assessment methods :

- ERA recommendation on Common Safety Methods,

- RID Guidelines on calculation of TDG risks by rail,

- Relevant reports on the risks of DG transport by rail in Switzerland,

- Risk assessment reports, methods from Netherland and France.

# Considered options

**Option 0:** The reference situation in EU-27 in 2008

**Option 1:** Voluntary use of DDD (Not quantified)

**Options 2:**

**2.A. :** The mandatory use of the DDD according to proposed RID 2011 provision

**2.B. :** Potential extension of application scope to all DG wagons

**Option 3:** The use of DDD on all freight wagons

→ Not assessed : **Option 4:** Prevention of derailments

# Main sources for EU wide derailment data :

- EUROSTAT data on freight traffic (including DG), accidents, population density,

- ERA 'Historical accident database', including railway accidents data since 1990,

- Collection of freight derailment data from National Safety Authorities and National Investigation Body networks.

# Derailment risks assessment
## *Freight derailments lessons*

## The Agency received from NSA and NIB networks

- ✓ **251 filled-in questionnaires from AT, DE, EE, ES, FI, HU, LT, LV, PL, SE, SK, UK and NO**

- ✓ **Including some comprehensive surveys**
  - **IT reported a comprehensive list of 45 derailments over 7 years,**
  - **DK reported its synthesis from 235 derailments,**
  - **FR reported a comprehensive list of 160 derailments over 10 years**

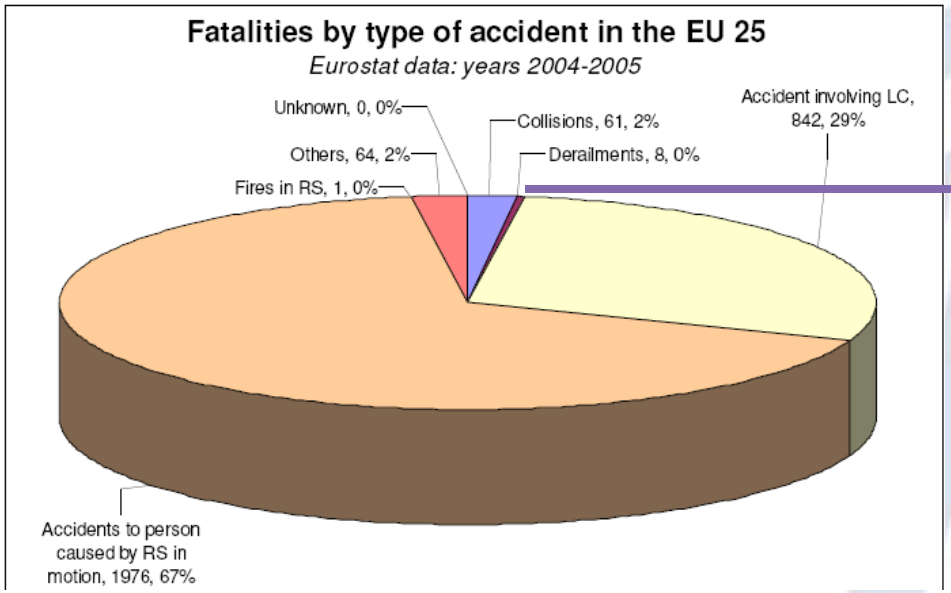
- ✓ **In total, information on 691 derailments, with various level of details, were collected spanning a period over more than 10 years.**

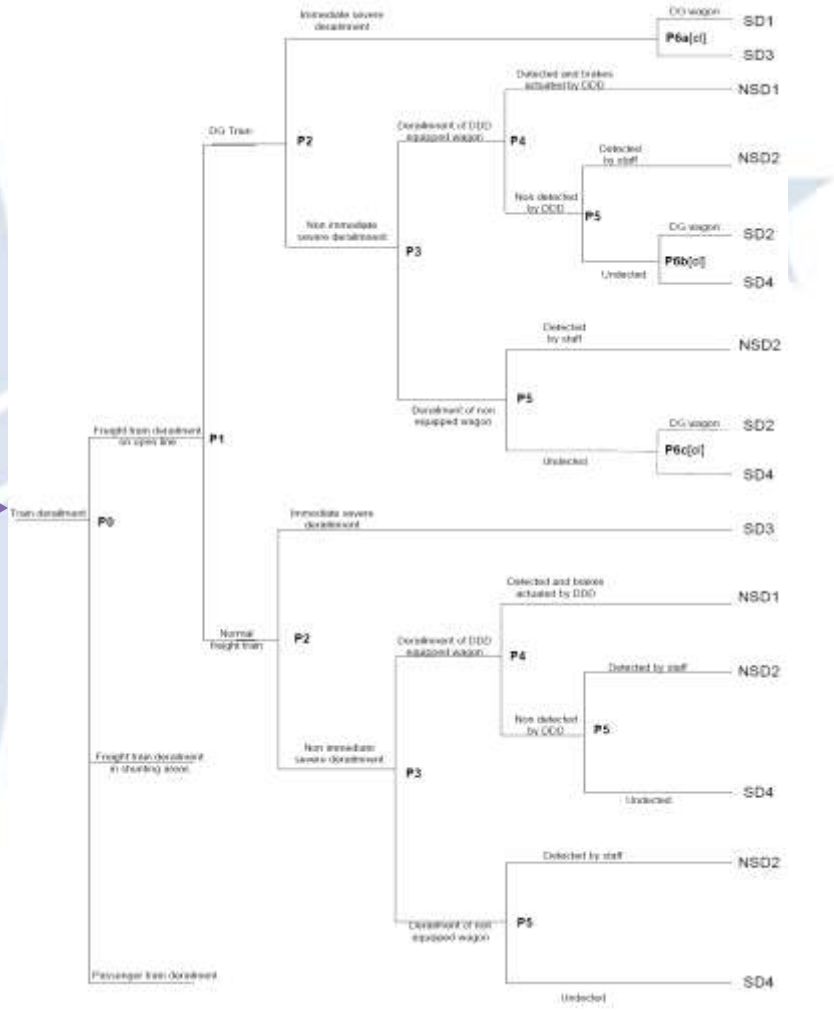
# Applied Methodology

## Step 1:

**Likelihoods of freight derailment accidents for pre-defined categories**

*(Railway freight EU-27 – 2008: 815 Mln.Train.km giving 450 Bln.ton.km with 63 Bln.ton.km of Dangerous Goods freight)*



# Derailment risks assessment
## *Derailment categories*

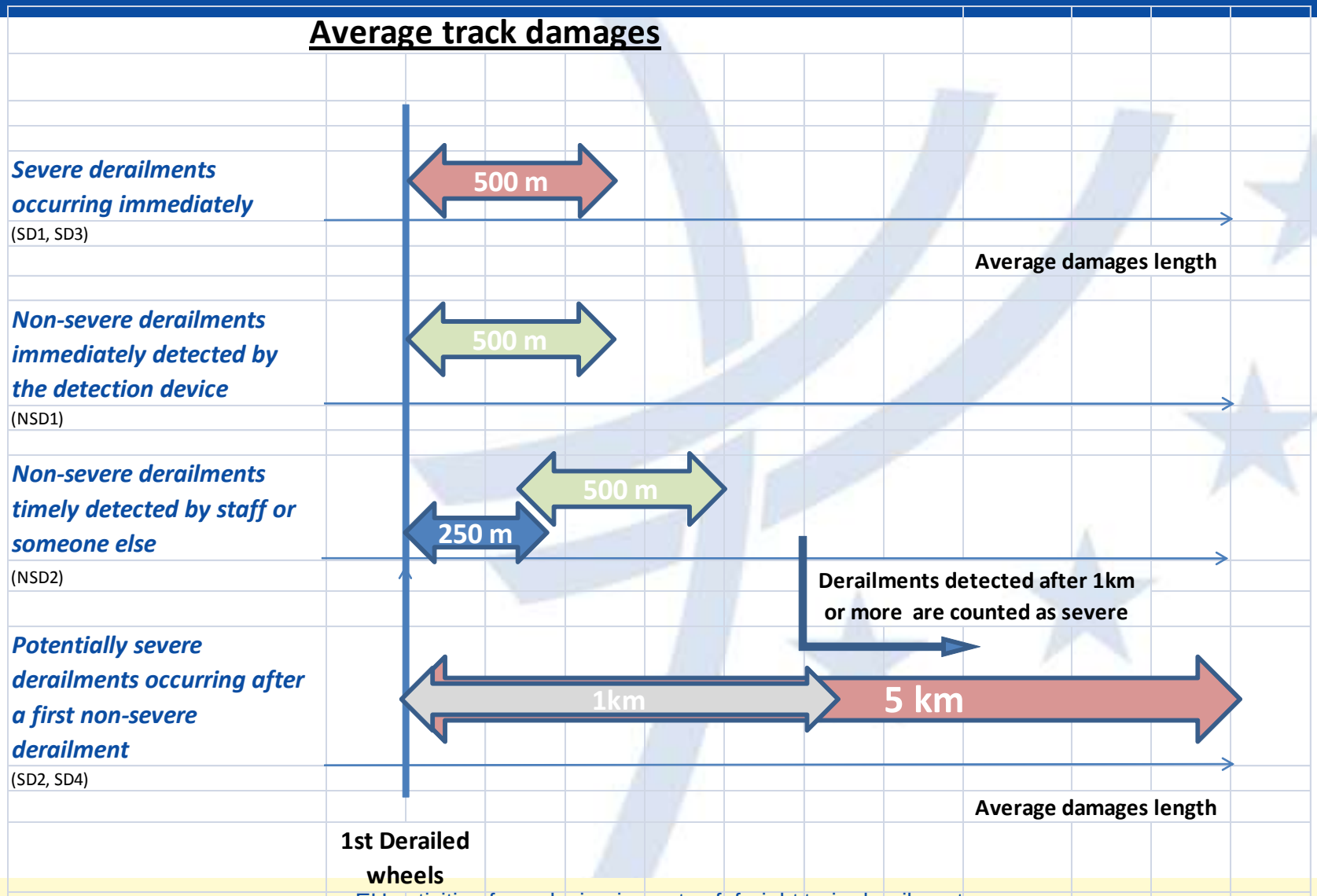
**The following categories of derailments are considered in the event tree:**

- **Severe derailments** (with potential for wagon overturn):
  - Occuring immediately
    - Involving DG wagon → **SD1**
    - Not involving DG wagon → **SD3**
  - Occuring some time after first undetected derailment:
    - Involving DG wagon → **SD2**
    - Not involving DG wagon → **SD4**

- **Non severe derailments** (with or without DG wagon):
  - Detected by the DDD → **NSD1**
  - Detected by the driver or other persons → **NSD2**

# Derailment risks assessment

## *Derailment severities*



# Present situation of EU 27 derailments

**Each year, around 600 freight train derailments have to be considered, following these categories*:**

- 198 (33%) Severe** : occurring immediately,
- 121 (20%) Potential to end up severe : not detected initially
- 281 (47%) Not severe: timely detected.

## Average derailments severity

- Track kilometre damages (500 m to 5 km)
- Number of wagons impacted (2,5 to 10 wagons)
- Hours of line closure (12 to 50 hours)
- Environment damages (145 to 2000 K euros)

**according to the consultation of NSAs and NIBs networks ; **with potential to lead to important human or financial impacts*

# Applied Methodology

**Step 2:**

**Severity assessment of freight derailments, including potential outcomes from the involvement of Dangerous Goods wagons**

**Step 3:**

**Cost Benefit Analysis of the various options related to the potential use of the derailment detection device**

| | Impacts on Safety (human and environment) | Impacts on Economics | Legal Impacts |
|---|---|---|---|
| Option 2a | | | |
| Option 2b | | | |
| Option 3 | | | |
| Option 1 | | | |

# Applied Methodology

| | Option 0 | Societal, Environmental and Economical Risks | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Occurrence Frequency | Population | Victims | | Railway system | | | Damaged environment |
| | Quantified scenarii involving the dangerous good substance | Population within lethal area | Fatalities | Injuries | Damaged tracks | Damaged wagons | Operation disruption | |
| | Nb / Y | Nb | Nb / Y | Nb / Y | km / Y | Nb / Y | h / Y | - |
| Pool fire | 0,872 | 0,046 | 4,03E-02 | 4,03E-01 | see below | see below | see below | see below |
| VCE gasoline | 0,063 | 0,631 | 5,01E-02 | 5,01E-02 | | | | |
| BLEVE | 0,006 | 6,472 | 3,62E-01 | 3,62E-01 | | | | |
| VCE LPG | 0,585 | 2,598 | 1,52E+01 | 1,52E+01 | | | | |
| Jet Fire LPG | 0,005 | 0,346 | 1,68E-03 | 1,68E-02 | | | | |
| Chlorine (50mm breach) | 0,005 | 38,975 | 1,94E-01 | 1,94E+00 | | | | |
| Ammonia (50mm breach) | 0,008 | 1,444 | 1,16E-02 | 1,16E-01 | | | | |
| Fires Class 4 | 1,735 | 0,173 | 4,74E-01 | 4,74E+00 | | | | |
| Pollution to Environment | 4,301 | NQ | NQ | NQ | | | | |
| | | | | | | | | |
| Less significant (with or without DG substance involvement)* | 16,628 | 0,046 | 7,68E-01 | 7,68E+00 | | | | |
| | | | | | | | | |
| Class1 (with or without DG substance involvement) | 2,077 | NQ | NQ | NQ | | | | |
| Class7 (with or without DG substance involvement) | 0,103 | NQ | NQ | NQ | | | | |

*The consequences of those accidents have probably been overestimated

NQ=Not Quantified

| | Nb / Y | *ME / Y* | | Nb / Y | *ME / Y* | Nb / Y | *ME / Y* | km / Y | *ME / Y* | Nb / Y | *ME / Y* | h / Y | *ME / Y* | *ME / Y* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Severe DG wagon derailments with substance involvement** | 19 | *48* | SD1 | 3,0 | *4,6* | 30 | *6,1* | 6 | *2* | 117 | *3* | 584 | *9* | *11* |
| | | | SD2' | | | | | 0 | *0* | 0 | *0* | 0 | *0* | |
| | | | SD2 | | | | | 36 | *5* | 72 | *2* | 358 | *5* | |
| Severe DG wagon derailment without substance involvement | 23 | *31* | SD1 | 1,0 | *1,5* | 2 | *0,4* | 7 | *3* | 14 | *3* | 703 | *11* | - |
| | | | SD2' | | | | | 0 | *0* | 0 | *0* | 0 | *0* | |
| | | | SD2 | | | | | 43 | *6* | 86 | *2* | 428 | *6* | - |
| Severe derailment of normal freight wagon | 277 | *356* | SD3 | | | | | 86 | *34* | 1723 | *21* | 8613 | *129* | - |
| | | | SD4 | | | | | 525 | *79* | 1049 | *13* | 5246 | *79* | - |
| **Severe Derailments** | **319** | ***435*** | | | | | | | | | | | | |
| Derailments mitigated by the Derailment detection device | **0** | *0,0* | NSD1 | 0 | *0* | 2 | *0,4* | 0 | *0* | 0 | *0* | 0 | *0* | - |
| Detected by station manager | 281 | *35,6* | NSD2 | | | | | 211 | *6* | 704 | *4* | 3377 | *25* | - |
| **Non severe derailments** | **281** | ***36*** | | | | | | | | | | | | |
| **All considered derailments** | **600** | ***471*** | | **4** | ***6,1*** | **34** | ***7*** | **913** | ***136*** | **3890** | ***46*** | **19307** | ***264*** | ***11*** |

Scenarios involving Dangerous Goods

Human impacts

Railway system impacts

Environment impacts

Summary of Derailments impacts

# Conclusions on studied options

| | Impact on Safety (human and environment) | Impact on Economics | Legal Impact |
|---|---|---|---|
| Option 2a | Reduction of fatalities < 0.1 per year | - 5 M Euros (but some costs are not counted) | Disproportionate action TSIs impacts Only one DDD product |
| Option 2b | Reduction of fatalities < 1 per year | - 34 M Euros | Disproportionate action TSIs impacts Only one DDD product |
| Option 3 | Reduction of fatalities < 1 per year | - 192 M Euros | Disproportionate in regards Safety aspects EN standards are required |
| Option 1 (voluntary use) | Reduction of fatalities << 1 per year ? | Sector should check its economical interest | Voluntary users have to respect the existing EU legal framework |

# Impact Assessment results

## Safety (1/2)

**The *DDD Provision* (Option 2a) does not significantly contribute to the reduction of the overall human risk level applicable to the EU railways**

**-> less than 0.1 fatalities over 1500 fatalities per year**

**The main costs and benefits (All options) related to the freight train derailments are incurred by IMs and RUs and due to infrastructure and rolling stock damages as well as operation disruptions.**

**Automatic train stopping, without override function, might be inconsistent with the existing emergency procedures within the EU Member States, especially in tunnel contexts, and might induce new risks not sufficiently assessed and managed**

# Impact Assessment results

## Safety (2/2)

**The potential catastrophic consequences of derailments involving dangerous substances are most likely to arise in specific vulnerable locations.**

**The EU member states have the possibility to use the Article 1.4.b) of the Directive 2008/68/EC and the Article 1.9 of its RID annex for managing local and time dependent risks with local solutions.**

**A definition of risk acceptance criteria, common for all inland transport modes, adapted to the particular risks of dangerous goods, might facilitate the implementation of local solutions, commonly accepted by the concerned parties, and without discrimination of a given transport mode**

# Impact Assessment results

## Interoperability

**The *DDD Provision* might require several amendments of the existing Technical Specifications of Interoperability of the trans-European conventional rail relating to the subsystem "Rolling stock – Freight wagons" and to the subsystem "Traffic Operation and Management"**

**The implementation (including application of existing TSIs) of the *DDD Provision* would induce costs to the sector which might not be compensated by the expected safety benefits**

# 2009 reports

European Railway Agency

**Final Report**

**Impact Assessment on the use of Derailment Detection Devices in the EU Railv**

| | | | |
|---|---|---|---|
| Reference: | ERA/REP/03-2009/SAF | Document type: | Public |
| Version : | 1.0 | | |
| Date : | 07 / 05 / 2009 | | |

| | Prepared by | Reviewed by | App |
|---|---|---|---|
| Name | Leading author: Emmanuel Ruffin<br>Contributing authors: Christophe Cassir Torben Holvad* | Jean-Charles Pichant<br>Airy Magnien* | And |
| Position | Safety Unit Project Officers<br>*Economic Unit Advisor | Head of Interoperability Unit<br>*Head of Economic Evaluation Unit | Hea |
| Date & Signature | Signed | Signed | |

File : Era-Rep-03-2009-Saf.doc

European Railway Agency

Safety Unit

Recommendation on the provision proposed by the RID Committee of Experts requiring the use of Derailment Detection Devices (ERA/REC/01-2009/SAF)

Reference: ERA/REC/01-2009/SAF
Version: 1.0
Date: 11/05/2009
Status: Final
Author: Safety Unit

ERA 1.0

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European Railway Agency

Safety Unit

Information to the Commission
bout the consultations undertaken by the Agency
draft Recommendation (ERA/REC/01-2009/SAF)
and its supporting draft impact assessment

ERA/INF/01-2009/SAF
1.0
05/05/2009
Final
Safety Unit

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# 2009 - 2012

# 2009 Workshop agreement

## RISC and Inland TDG Committee agreed on the following actions

"A study on derailment preventive measures (which would lead to better impact assessment results)."

"A market research on products that meet the DDD provision in its current version (EDT 101 type) and/or in the version modified."

"A study on the impact of false alarms and the level of reliability that should be imposed for DDD (EDT 101 type)."

"A study on the impact of automatic braking and false alarms in tunnels/bridges .

# 2009 Workshop agreement

## The Workshop of RISC and Inland TDG Committee agreed on the following actions in September 2009

"A study on the comparison of the decision making process in the context of the safety/interoperability directives on one side, and in the context of the RID committee on the other side. This study should also look at the scope of both instruments, as well as at the competences of the RISC/TDG Committees and of the RID Committee."

"A study on the feasibility of harmonizing risk acceptability…of dangerous goods accident… (national level, EU level, RID versus safety directive)."

"Voluntary experiments at national level."

# DNV / ERA / EC Work organisation

"A study on derailment preventive measures (which would lead to better impact assessment results)."

"A market research on products that meet the DDD provision in its current version (EDT 101 type) and/or in the version modified."

"A study on the impact of false alarms and the level of reliability that should be imposed for DDD (EDT 101 type)."

"A study on the impact of automatic braking and false alarms in tunnels/bridges .

"Voluntary experiments at national level."

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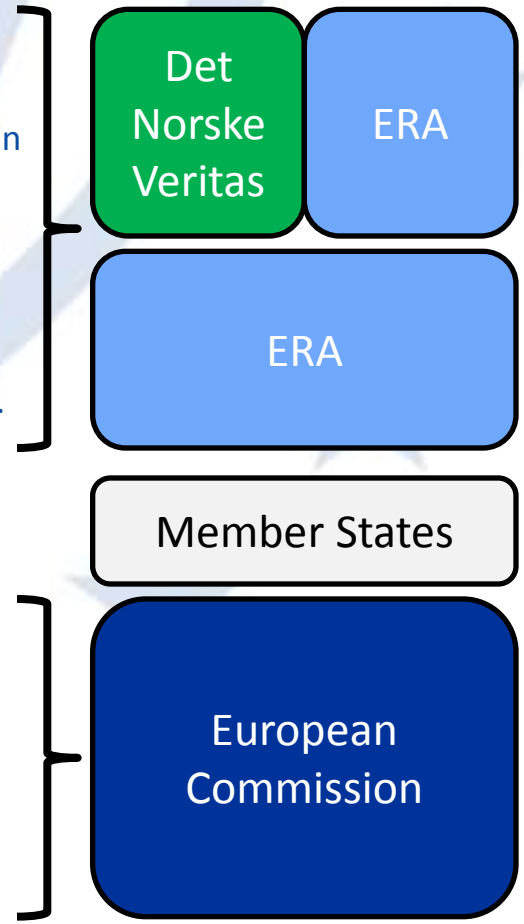
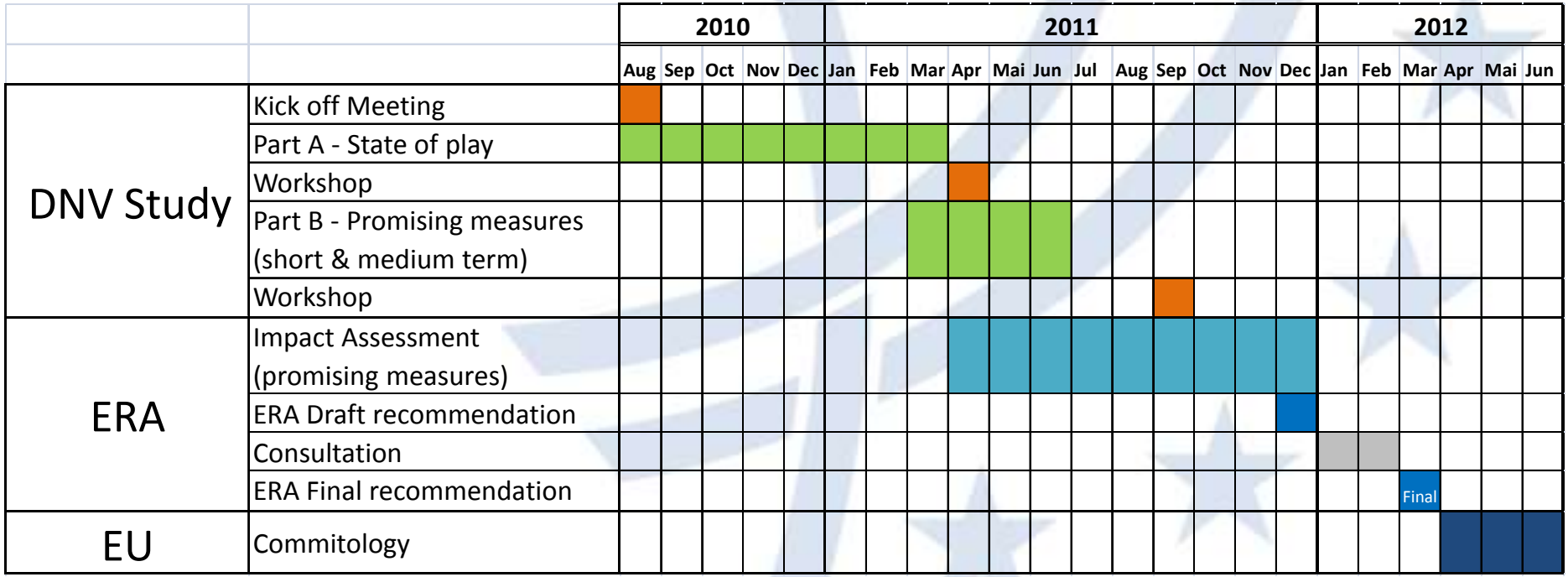


# Planning


2010
2011
2012
Aug Sep Oct Nov Dec Jan Feb Mar Apr Mai Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr Mai Jun
DNV Study
Kick off Meeting
Part A - State of play
Workshop
Part B - Promising measures (short & medium term)
Workshop
ERA
Impact Assessment (promising measures)
ERA Draft recommendation
Consultation
ERA Final recommendation
Final
EU
Commitology

# Scope of Det Norske Veritas study

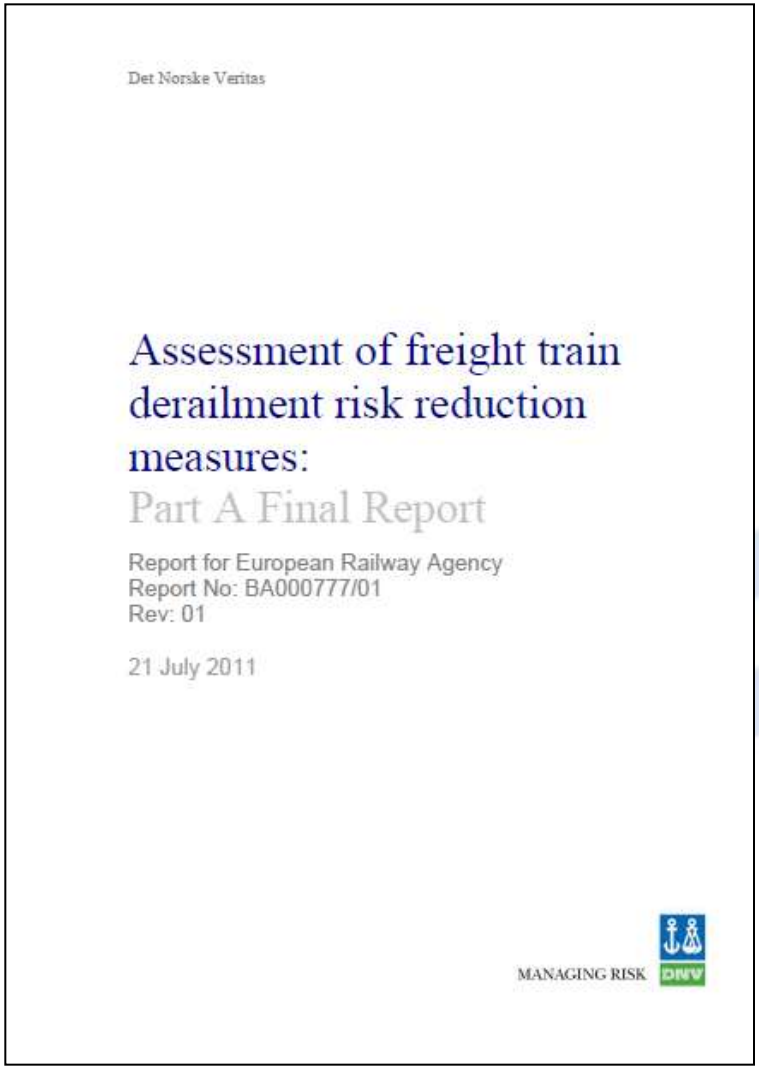
"A study on derailment preventive measures (which would lead to better impact assessment results)."

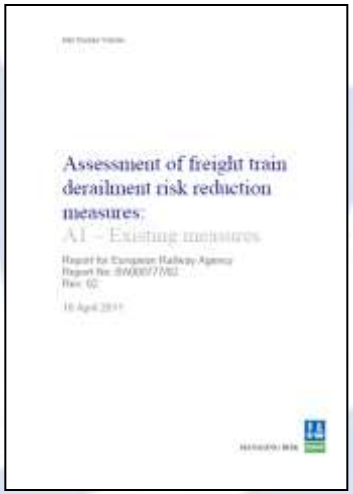
"A market research on products that meet the DDD provision in its current version (EDT 101 type) and/or in the version modified."

Det Norske Veritas (1)

# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx

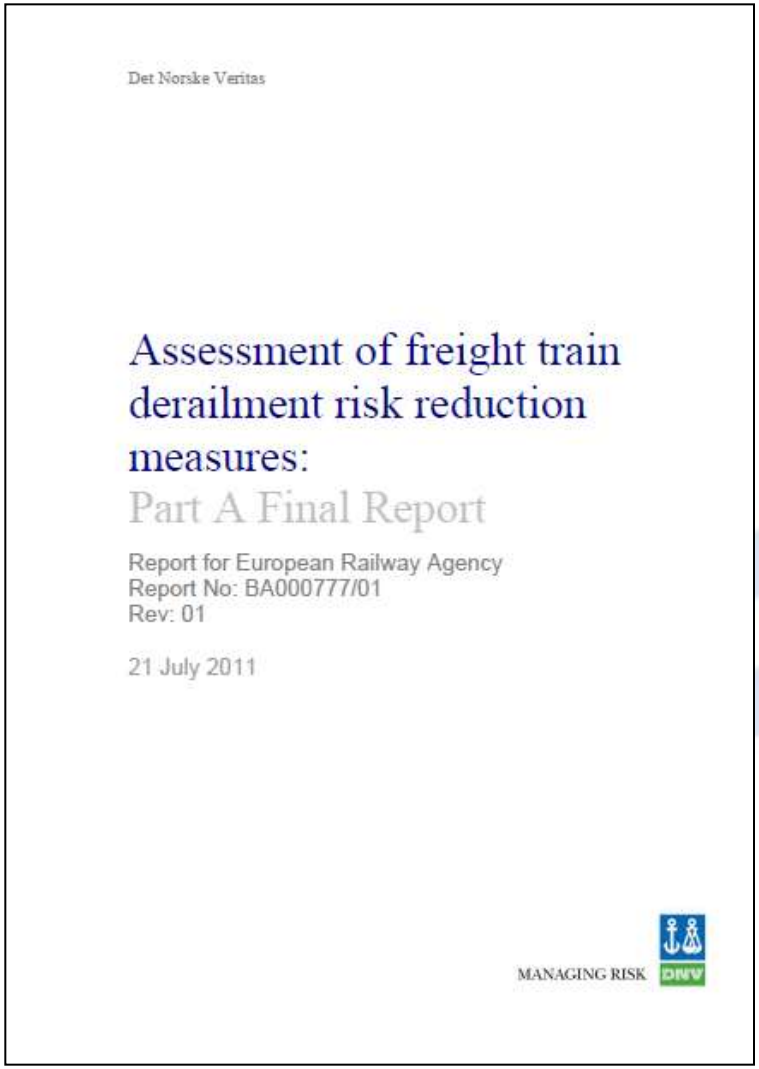





# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx

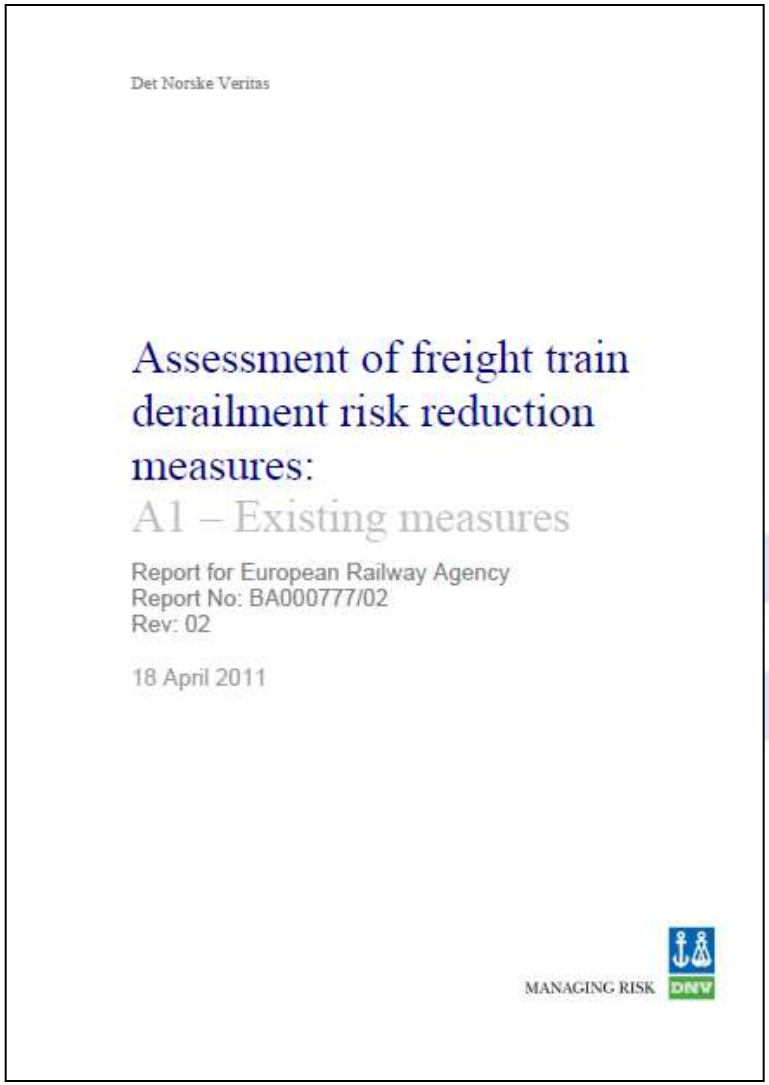



Contains main findings on:

- Existing Measures (P & M)
- Market for Technical Measures
- Functional and performance assessment
- New technologies and approaches

# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx



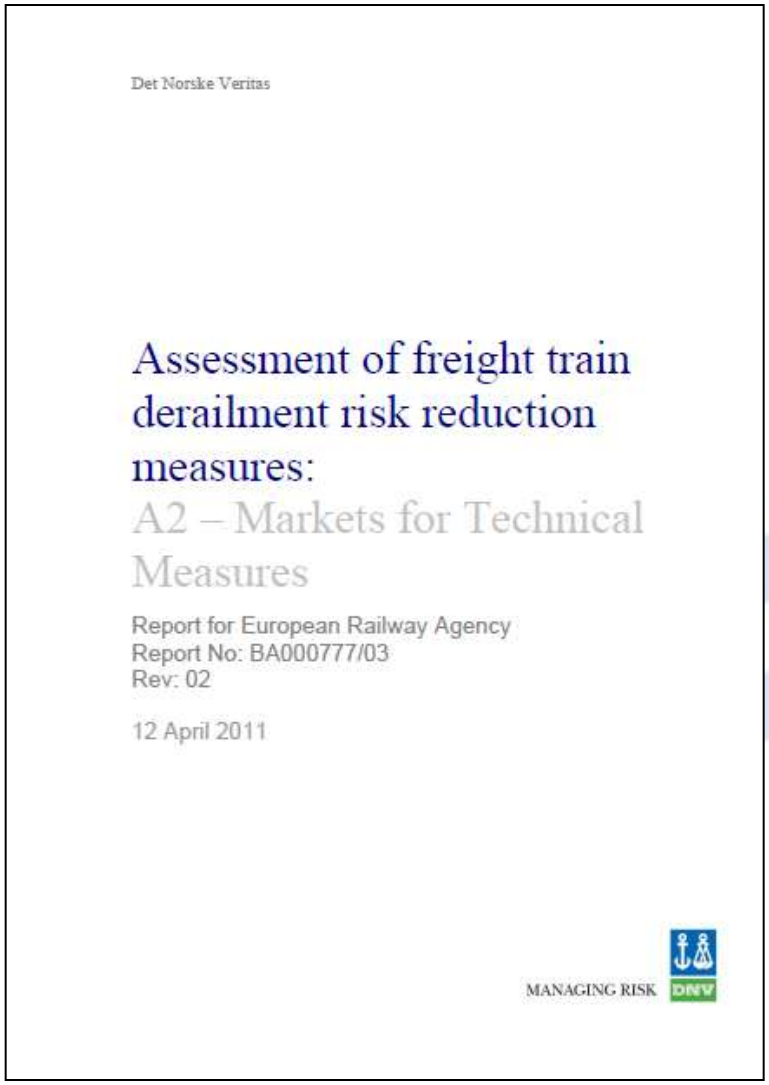

-> Survey of Infrastructure managers, Railway undertakings, accident reports, network statements, literature and internet search

-> 47 preventive measures

-> 13 mitigating measures

# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx


Det Norske Veritas

Assessment of freight train derailment risk reduction measures:
A2 – Markets for Technical Measures

Report for European Railway Agency
Report No: BA000777/03
Rev: 02

12 April 2011

MANAGING RISK DNV

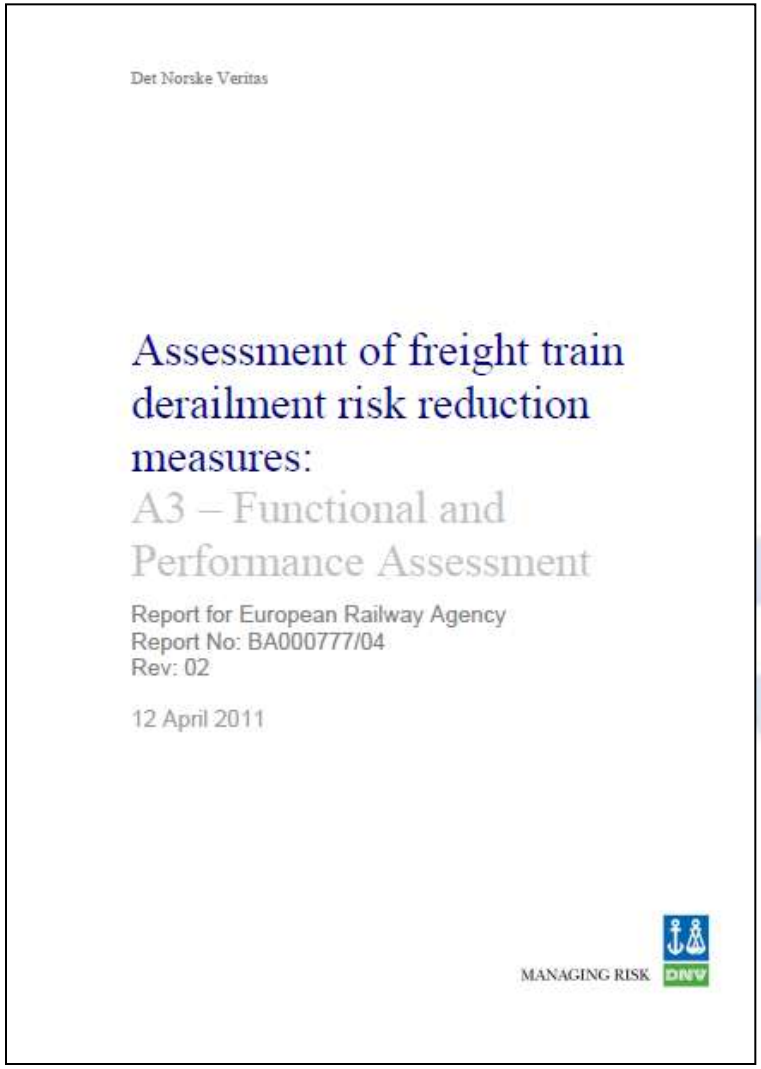
-> Products' catalogues,
-> Internet,
-> Interview with suppliers

-> Market size
-> Market share
-> Market maturity
-> Price evolutions

-> Mechanical DDD considered as a growing market
-> 2000 wagons equipped in 2011 world-wide

# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx


Det Norske Veritas

Assessment of freight train derailment risk reduction measures:
A3 – Functional and Performance Assessment

Report for European Railway Agency
Report No: BA000777/04
Rev: 02

12 April 2011

MANAGING RISK DNV

-> Use of relevant data from A1 and A2,

-> Interview with IMs and RUs

-> What measure they use and why?

-> Effectiveness? Reliability? Experience? LCC?

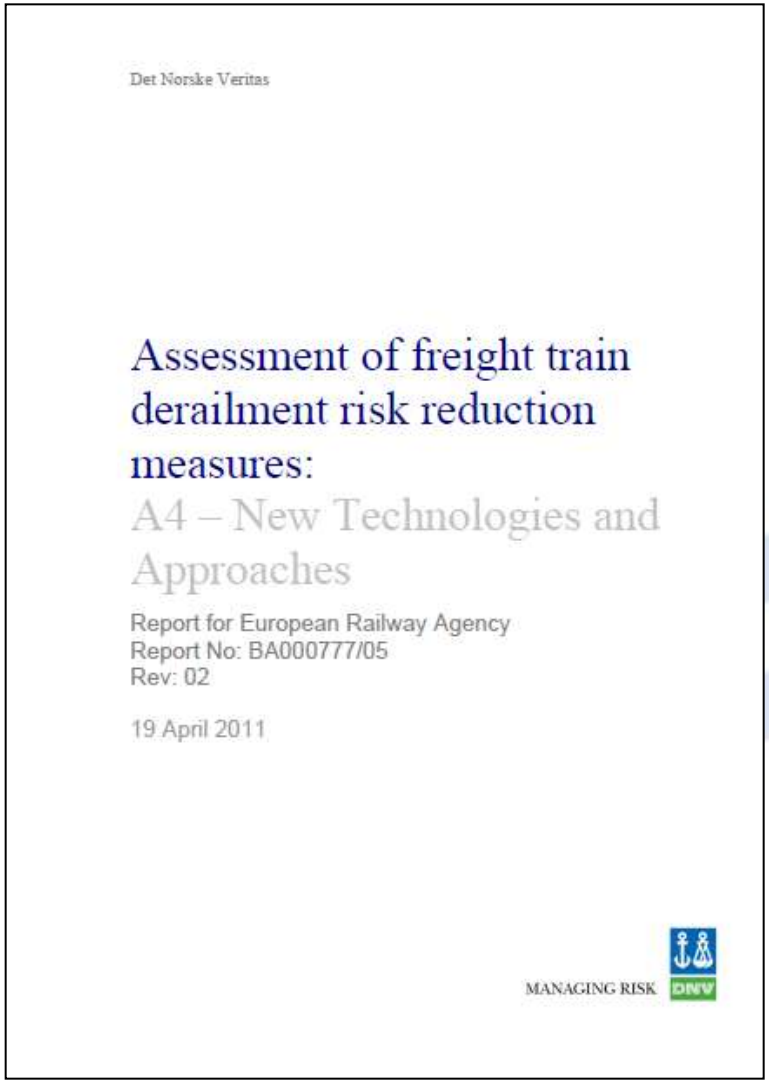
-> Plans to introduce additional measures?

-> some cases supported by in-service data

-> in general users are not very well informed on actual performance

# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx


Det Norske Veritas

Assessment of freight train derailment risk reduction measures:
A4 – New Technologies and Approaches

Report for European Railway Agency
Report No: BA000777/05
Rev: 02

19 April 2011

MANAGING RISK

-> Interview with IMs and RUs

-> Review of published research/papers on new topics & technology

-> Consolidation of information on potential risk reduction

-> Consideration of future market /logistic trends

-> Electronically controlled pneumatic Brakes

-> Improved vehicle design

-> Use of on-board condition monitoring

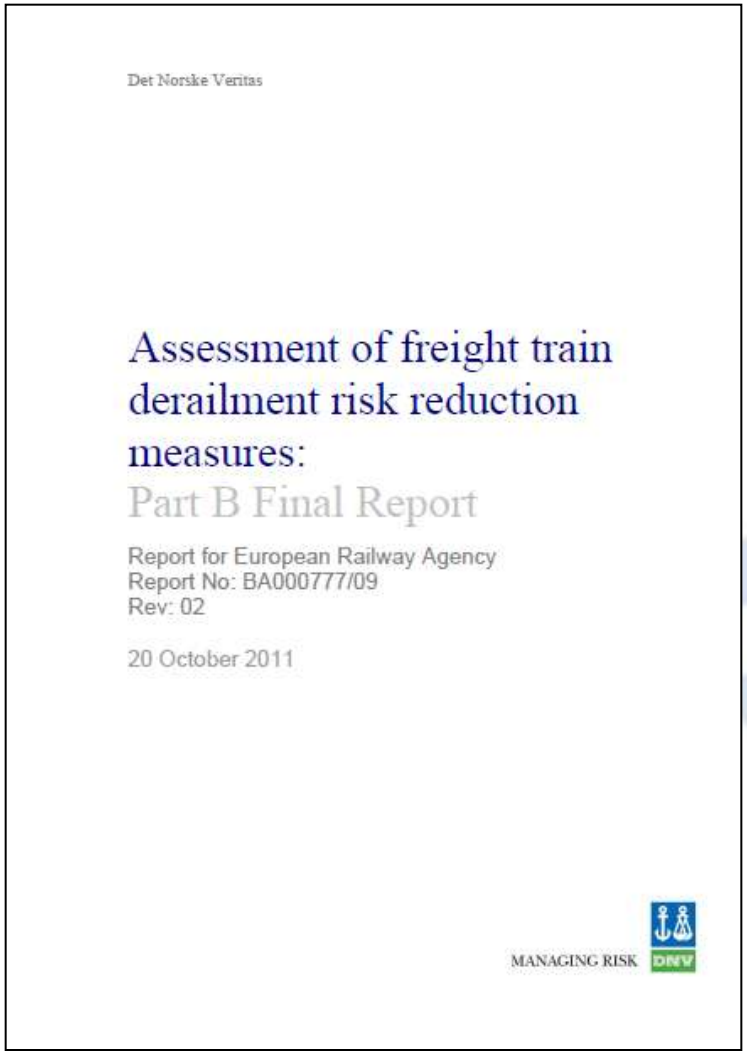
-> New brake blocks

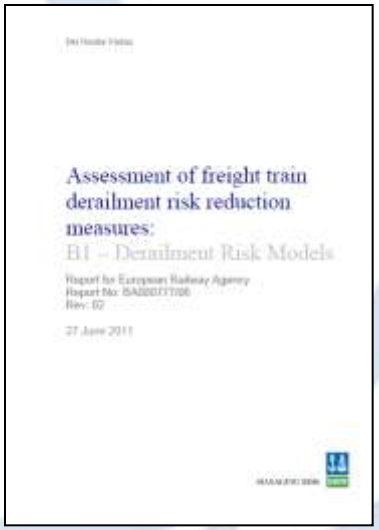
-> Use of acoustic and imaging technology

-> Active operation monitoring and 'in operation' safety data communication

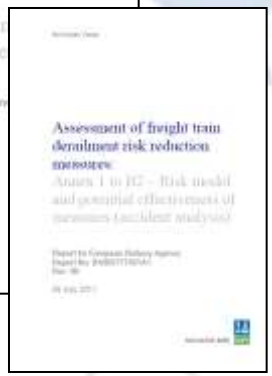
# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx








# DNV Study

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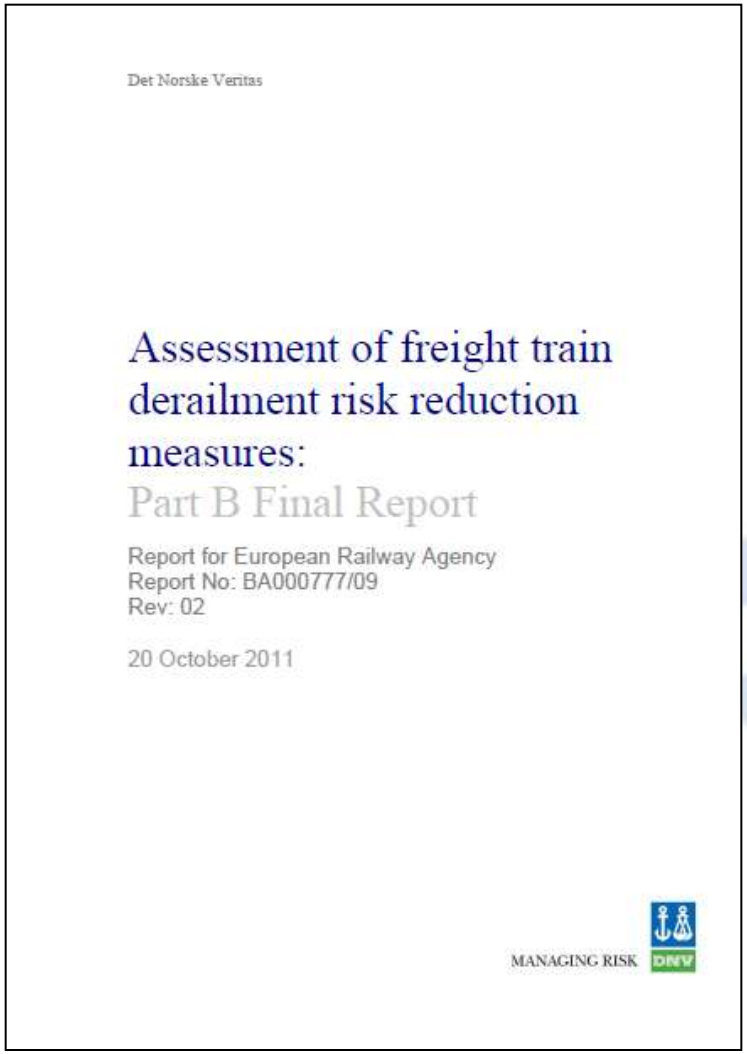

Det Norske Veritas

Assessment of freight train derailment risk reduction measures:

Part B Final Report

Report for European Railway Agency
Report No: BA000777/09
Rev: 02

20 October 2011

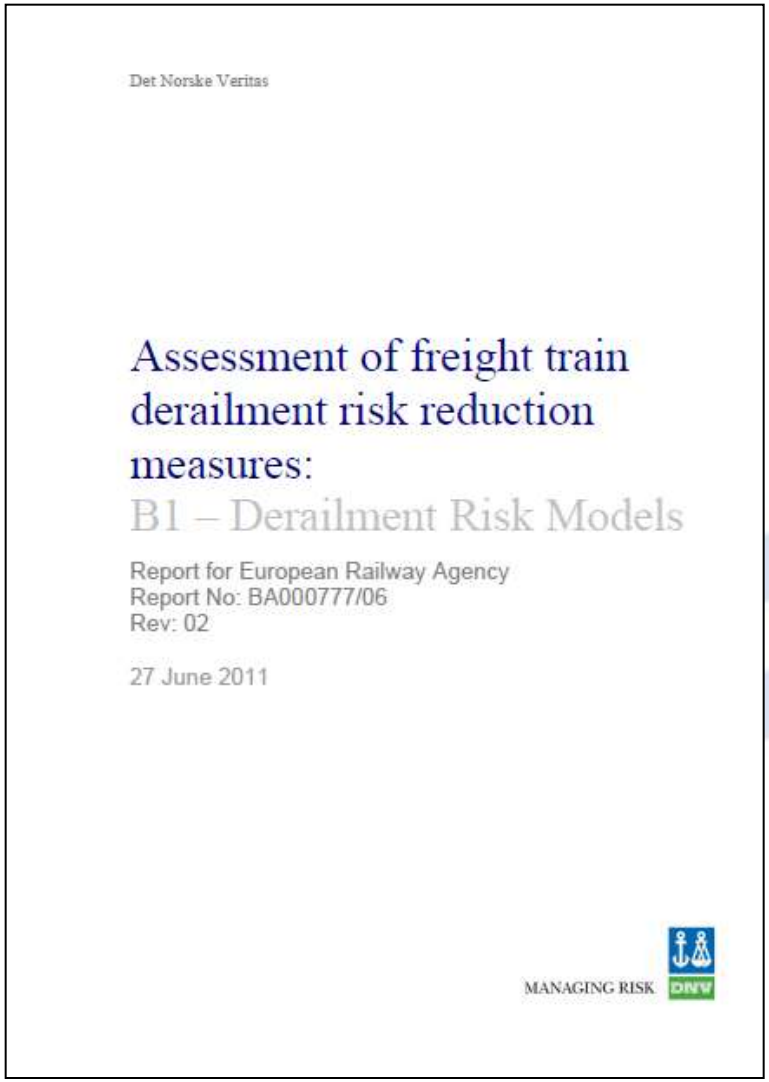
MANAGING RISK DNV

Contains an overview of:

- Derailment risk models
- Risk model and potential effectiveness of measures
- Accidents analyses
- Top ten ranking of safety measures

# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx




-> Review of derailment accidents

-> Cause-consequence of derailments

-> Influence of existing measures

-> Barrier models

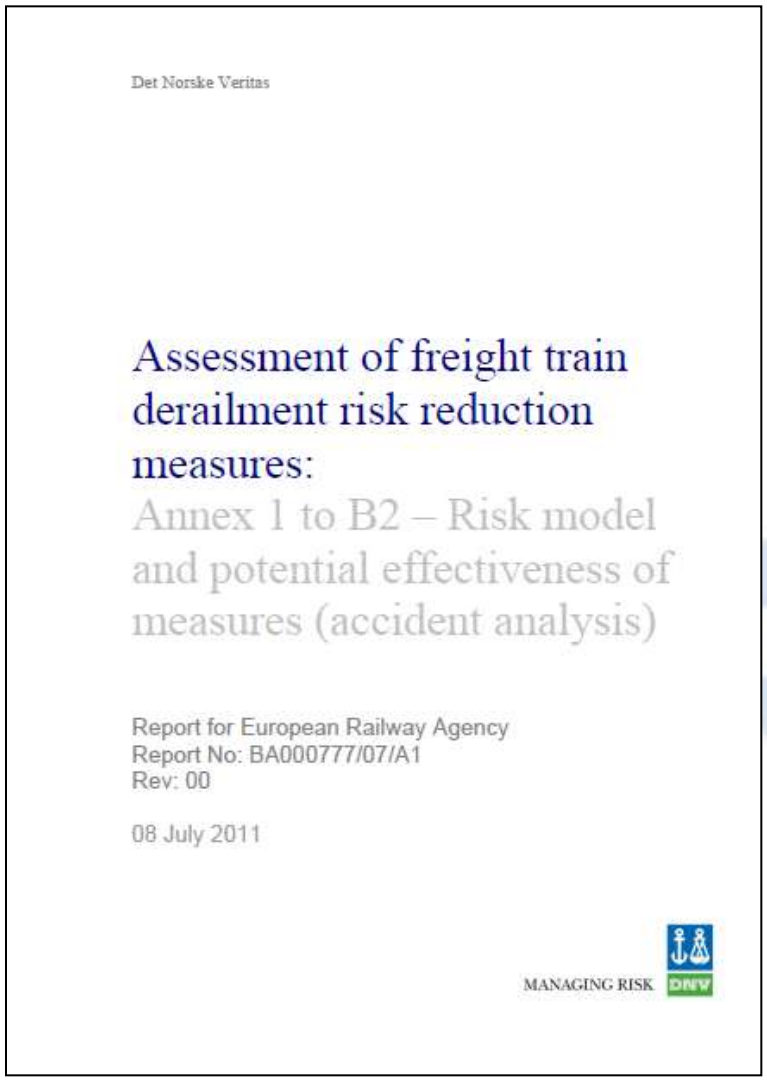
-> Fault-tree model + combination of causes

-> Event-tree model

-> Confirmation of validity of ERA 2009 model

# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx


Det Norske Veritas

Assessment of freight train derailment risk reduction measures:
Annex 1 to B2 – Risk model and potential effectiveness of measures (accident analysis)

Report for European Railway Agency
Report No: BA000777/07/A1
Rev: 00

08 July 2011

MANAGING RISK DNV

-> Analysis of 201 accidents

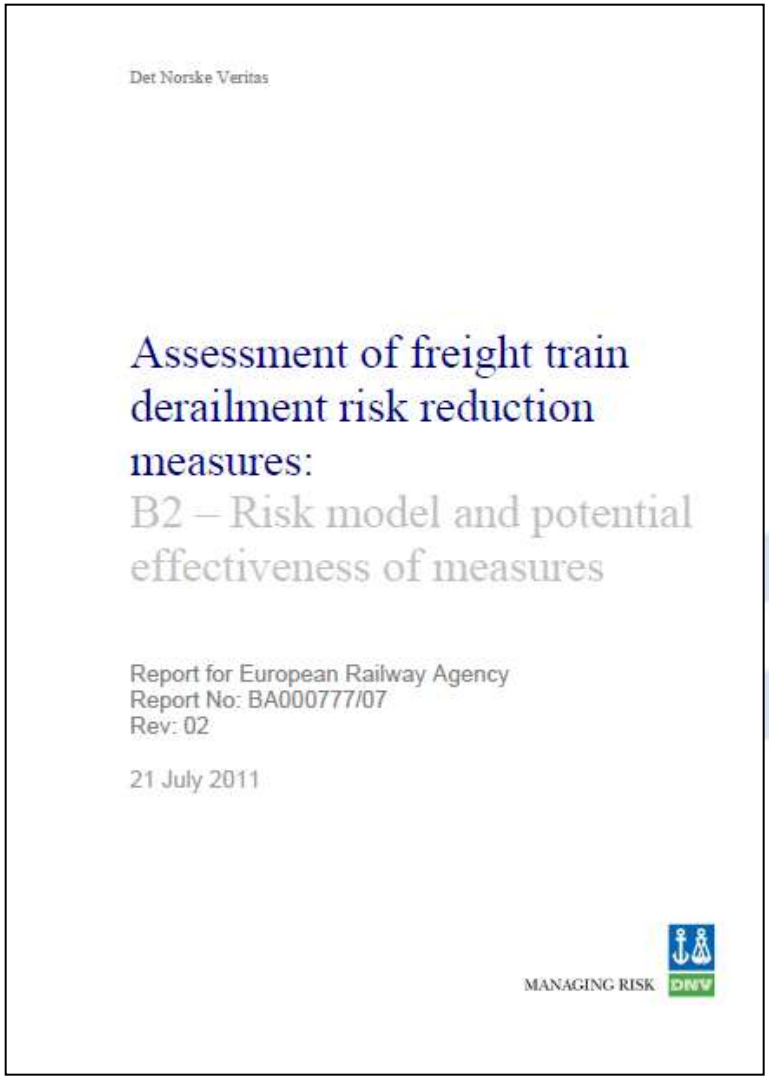
(in addition to accident analysed in 2009)

-> Derailment causes

-> Combined causes

# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx


Det Norske Veritas

Assessment of freight train derailment risk reduction measures:
B2 – Risk model and potential effectiveness of measures

Report for European Railway Agency
Report No: BA000777/07
Rev: 02

21 July 2011

MANAGING RISK DNV

-> Populating risk model with data

-> Development of Impact model (Human-Railway system-Environment)

-> Use of the model

-> Benchmarking/Checking validity of the model approach

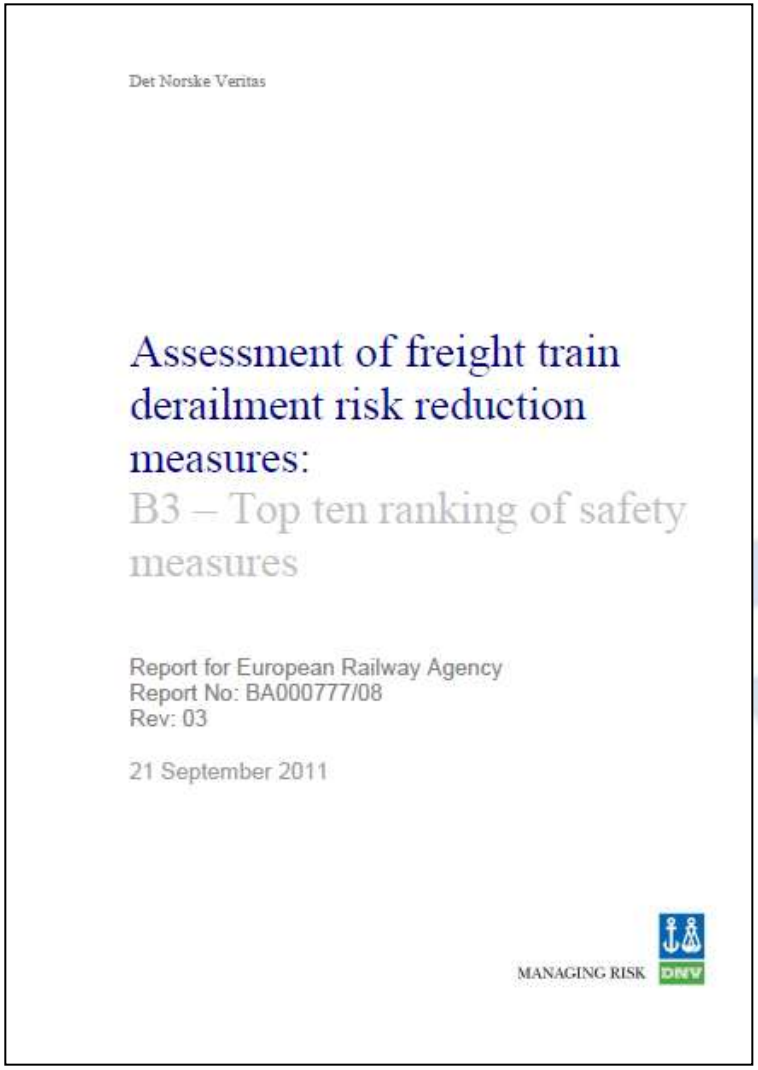
-> Maximum risk reduction potential, with:

- New measures
- Extended/Adapted use of existing measures

-> Confirmation of validity of ERA 2009 results

# DNV Study

http://www.era.europa.eu/Document-Register/Pages/Freight-train-derailments-relevant-documents.aspx




-> Measure identification

-> Type of measure (technical, procedural, organisational)

-> Optimal application scope

-> Risk reduction quantification

-> Cost-Benefit assessment

-> Identification of non-quantified advantages and drawbacks

-> Top ten ranking

Prevention

- WLID/WIM, PRC, BHD, BAM, WPD, SWD

Mitigation

- DDD (10th) and not cost effective
- DDD has a drawback confirmed

Organisation

- Awareness programme on rolling stock maintenance (focussed on main causes – increased supervision)
- Track geometry (increased supervision)

# Parties involved in DNV's study

*(summarized in section 3.1 of ERA 2012 report)*

. Information was received from the following States and organisations:

- Railway undertakings from 13 EU MS, and from Norway, Switzerland and USA,
- Infrastructure Managers from 15 EU MS, and from Norway, Switzerland and USA,
- 12 suppliers on 31 technological products used for preventing or mitigating derailments,
- CER, UIP and UNIFE,
- Research organisations and internet, as well as DNV's team knowledge.

# DNV Study – Key conclusions

- Confirmed ERA 2009 report's conclusions
  - -> Mechanical DDD not cost-effective
  - -> Automatic braking can trigger a derailment

- Showed that
  - more than one mechanical DDD exists on the market
  - But, many other technical measures than DDDs are more effective and are efficient

- (mainly) Studied technical measures
- Organisation measures should also be considered

# ERA 2012 report scope

"A study on derailment preventive measures (which would lead to better impact assessment results)."

-> including also non technical measures (SMS – EVIC) not covered by DNV + long term measures

"A market research on products that meet the DDD provision in its current version (EDT 101 type) and/or in the version modified."

"A study on the impact of false alarms and the level of reliability that should be imposed for DDD (EDT 101 type)."

"A study on the impact of automatic braking and false alarms in tunnels/bridges .

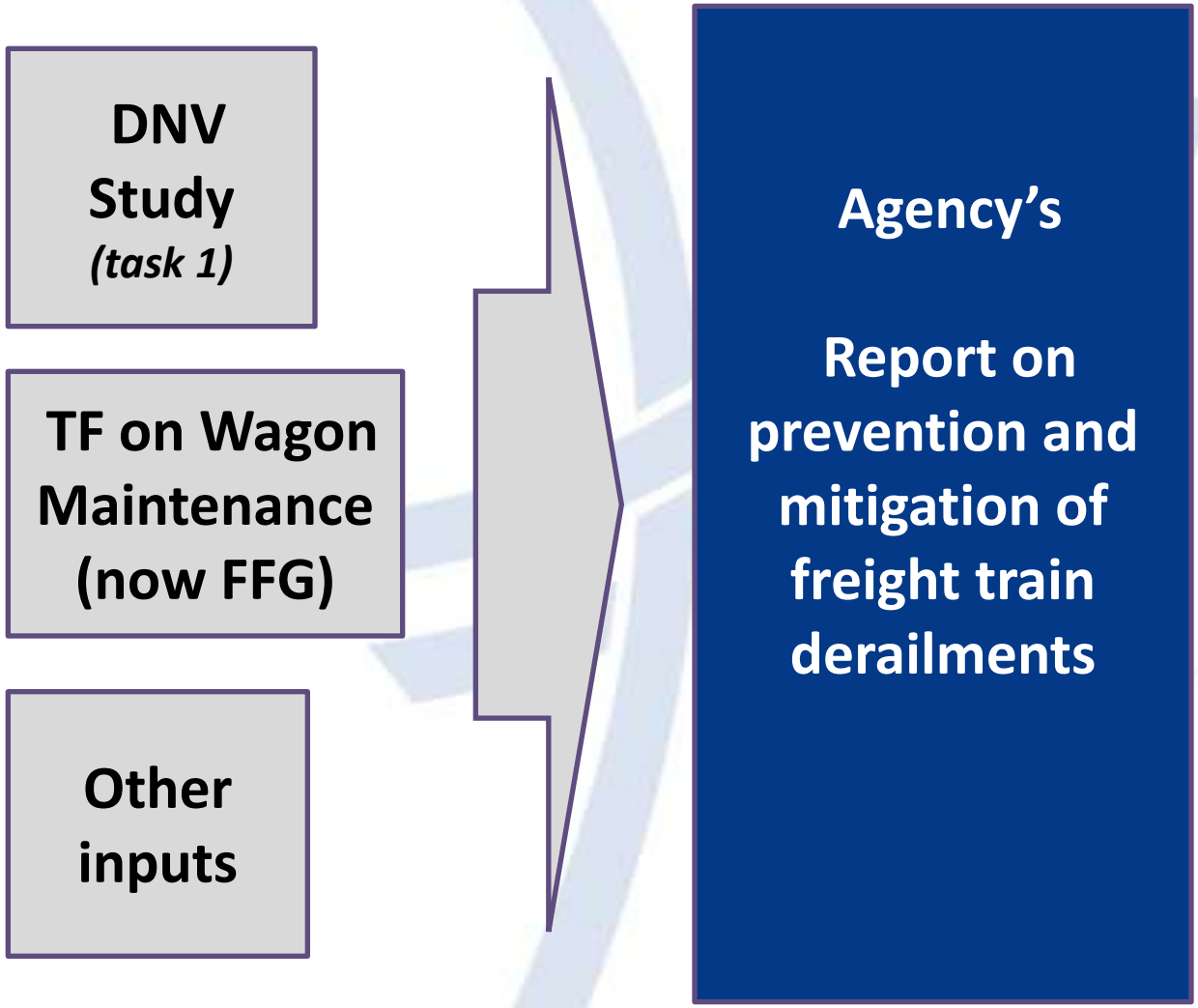
ERA 2012 report

Sections 4.1, 4.4 & 7

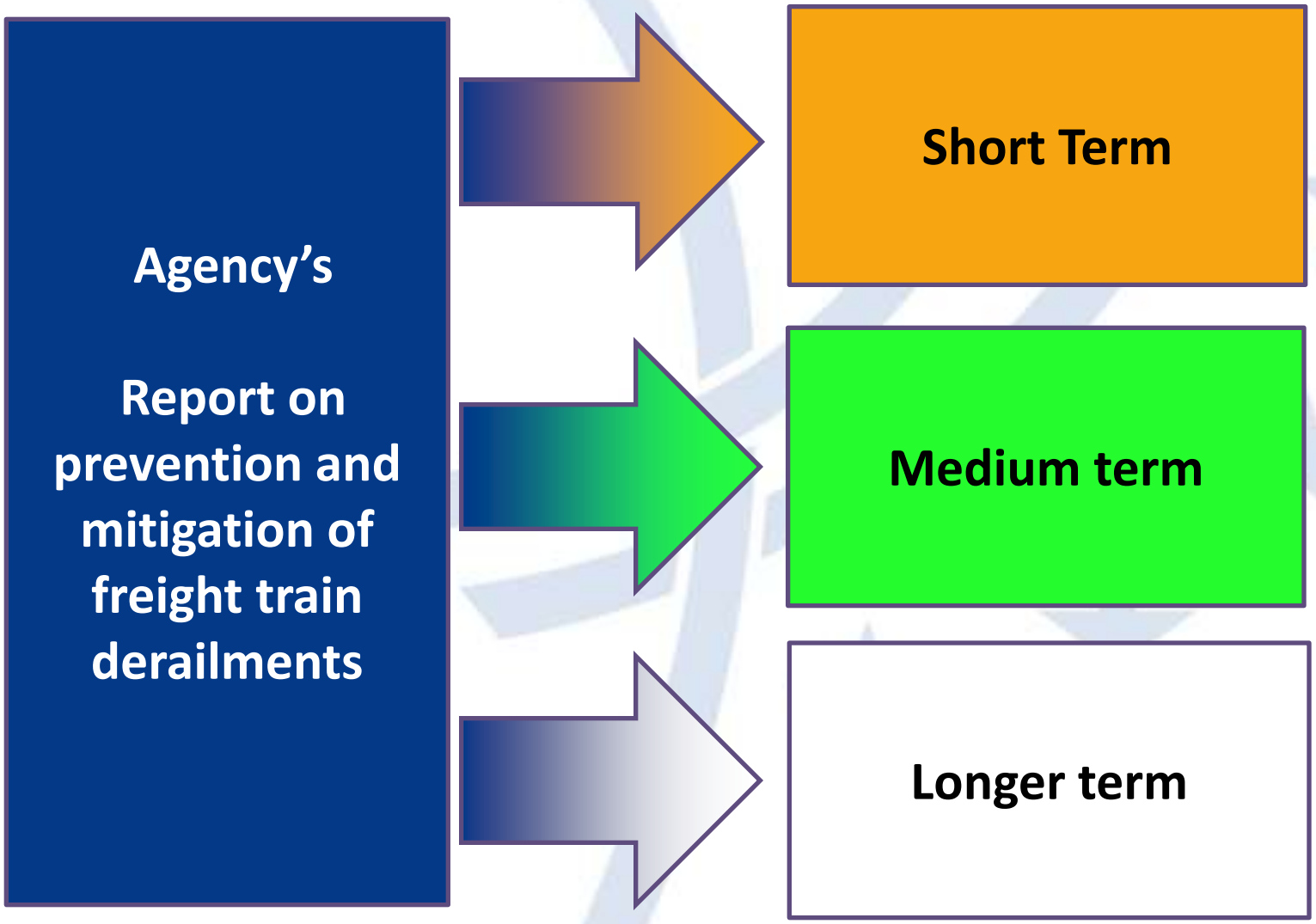
Section 6.1

Section 6.1

# ERA 2012 report process (inputs)



# ERA 2012 report process (outputs)



# DNV's inputs

***The Agency***

- *Checked DNV's methodology,*
- *Checked inputs and re-assessed DNV's findings,*
- *Shared and discussed DNV's reports in two workshops (May 2011 and September 2011):*

  *- Representatives from RISC, TDG/EC, NSA, NIB, RID experts, CEFIC, CER, EIM, ERFA, UIC, UIP, UIRR, UNIFE were invited.*

- *Received detailed comments from:*

  *- DK NSA, FI NSA, IT NSA, FR NIB, BE ECM, CER, CH FOT, RID WG TVT, UIC, Rail Cargo Austria, Knorr-Bremse*

*-> General agreement on the high quality of the DNV's Study*

# Agency's Report

***The Agency***

- *Used relevant results from the DNV's study, including answers to detailed comment received from interested parties,*
- *Complemented with other relevant inputs*
- *Answered to the questions raised in 2009 by the RISC and TDG EC Committee (1st Slide) – in the light of the new findings*
- *Put in perspective short/medium/long term measures*
- *Recommended on the most efficient risk reduction actions*
- *Sent its draft report for consultation to representative associations*

# Consultation on ERA's report

***Consultation from 20/01/2012 to 06/02/2012 of representative associations:***

***- CER, EIM, ERFA, UIC, UIP, UIRR and UNIFE***

***- Two answers: UIRR, CER***

***->*** ***General agreement on Agency's conclusions***

***including, detailed comments which support / do not affect the general conclusions***

# ERA 2012 conclusions on derailment detection

## Mechanical detectors (M1-a)

1) Other measures are more effective,

2) M1-a type do not report a clear signal to the driver

3) M1-a type can trigger a derailment in case of false alarms

4) M1-a type can be used if APIS requirements fulfilled

-> It means under the responsibility of the applicant if authorisation granted by the competent authority.

-> Note in RID 7.1.1 section

# ERA 2012 conclusions on derailment detection

**The Agency confirmed its 2009 recommendation to the European Commission**

**RID 2013 adopted a note in section 7.1.1 explaining the (voluntary) conditions for using derailment detections**

# ERA 2012 conclusions on derailment detection

## Electronic detectors (M1-b)

1) M1-b type does not exist on the market (2012)

2) M1-b type would give a clear signal to the driver

3) M1-b type could be compatible with TSIs

4) M1-b type potential efficiency to be considered in the framework of telematics developments

**ERA agreed to re-assess this option in the light of technical and scientific progress.**

# ERA 2012 report - Short term

## Priority to SMS and maintenance systems

1. *Priority is to make safety management system and maintenance system working better*

2. *More effective and efficient measures than the derailment detection are immediately practicable*

3. *Derailment detection should be used on voluntary basis if requirements for vehicle autorisation are fulfilled*

# Medium term

## Voluntary approach for (additional) technical measures

1. *The Agency recommends a voluntary approach concerning four (4) technical measures assessed as being efficient at EU level (WLID/WIM, PRC, BHD, BAM).*

2. *RUs & IMs must target efficient measures, as a result of*
   *a) the implementation of their SMS,*
   *b) taking into account company and country specific situations*

3. *Priority is to make safety management system and maintenance system working better*

# Longer term

## Longer term measures

1. ***Improving knowledge on derailments combined causes***

   For example: - Wheel/Rail interactions
   - Intervention limits concerning track quality

2. ***Prepare future developments in IT systems for safety data monitoring and data networking***

   For example: - Harmonised real-time monitoring (quality of wagon/track/train composition)
   - Harmonised safety-data exchanges (RUs, IMs & ECMs)

3. ***Study potential changes in freight fleet design (combined add-values for logistics and safety improvements)***

   For example: - Increased use of central-couplings
   - Wagons fitted with power supply and data transmission …

# Status of the mandate after 2011 DNV reports and 2012 ERA's report

- ✓ "A study on derailment preventive measures (which would lead to better impact assessment results)."
- ✓ "A market research on products that meet the DDD provision in its current version (EDT 101 type) and/or in the version modified."
- ✓ "A study on the impact of false alarms and the level of reliability that should be imposed for DDD (EDT 101 type)."
- ✓ "A study on the impact of automatic braking and false alarms in tunnels/bridges .

# Status of the mandate after 2012 ERA's report

"A study on the comparison of the decision making process in the context of the safety/interoperability directives on one side, and in the context of the RID committee on the other side. This study should also look at the scope of both instruments, as well as at the competences of the RISC/TDG Committees and of the RID Committee."

"A study on the feasibility of harmonizing risk acceptability…of dangerous goods accident… (national level, EU level, RID versus safety directive)."

"Voluntary experiments at national level."

# 2011 – 2014
# EC Studies

# Study on interactions between EU legislation and RID

"A study on the comparison of the decision making process in the context of the safety/interoperability directives on one side, and in the context of the RID committee on the other side. This study should also look at the scope of both instruments, as well as at the competences of the RISC/TDG Committees and of the RID Committee."

# Study on interactions between EU legislation and RID

Selected consultant: SMITHERS / PIRA

Report delivered on: March 2013

Report accessible at :
http://ec.europa.eu/transport/modes/rail/studies/doc/2013-03-10-rail-dangerous-goods.pdf

# Study on interactions between EU legislation and RID

Main conclusions from Smithers and Pira:

-> Cooperation between ERA and RID Committee is crucial on certain topics

Main concerned topics :

-> Emergency planning

-> Railway operation (e.g. ECMs roles and responsibility)

-> Wagon construction

-> Reporting of accidents and statistics

-> Terminology

-> Telematics

-> Impact assessment

-> Multi-modal harmonisation

# Use of the study results by DG MOVE / OTIF / ERA

**Administrative Arrangement : point 12 establishes the principles for management of TDG interfaces:**

a) **Allocation of responsibilities to the railway stakeholders**
b) **Railway operations**
c) **Wagon construction**
d) **Reporting of accidents and statistics**
e) **Emergency planning**
f) **Telematics applications**
g) **Terminology**
h) **Risk evaluation and assessment methods**
i) **Any other relevant issues.**

# Study on harmonised risk acceptability

"A study on the feasibility of harmonizing risk acceptability…of dangerous goods accident… (national level, EU level, RID versus safety directive)."

# Study on harmonised risk acceptability

Selected consultant: DNV

Report delivered on: March 2014

*(draft presented in an EC Workshop in February 2014)*

Report accessible at :

http://ec.europa.eu/transport/modes/rail/studies/doc/2014-03-25-dangerous-goods.pdf

# Policy Options for Network Risk Assessment

A. A new directive on DG safety, and a regulation requiring MS to calculate and report their risk levels in all DG transport modes, equivalent to that currently in place for railways.

B. Inclusion of DG risks in the existing policy on road safety and legislation on rail safety. Inland waterways could be included by adopting a new policy for all modes of DG transport.

C. Implementation of the network risk assessment as a research study led by the Commission, using voluntary assistance from MS.

Preferred option is A

# Policy Options for Local Risk Assessment

A. A new directive on DG safety, and a regulation requiring MS to calculate and report their risk levels in all DG transport modes, equivalent to that currently in place for railways.

B. Inclusion of DG risks in the existing CSM legislation for railways and development of equivalent CSM for road and inland waterways.

C. Inclusion of a requirement for a local risk assessment of DG restrictions in the existing Directive on the inland transport of dangerous goods.

D. Amendment of the guidelines for calculation of risks under Chapter 1.9 of ADR/RID/ADN to follow the harmonised approach.

E. Promotion of the local risk assessment approach through an independent guideline document, produced by the Commission, in consultation with MS.

Preferred option is A

# Recommended Changes in EU Policy and Legislation

- A new directive on DG safety in all transport modes. This would include road, rail and inland waterways. It would state the harmonised RACand explain how they are intended to improve safety. Where MS intend to apply restrictions on TDG, it would require them to make a risk assessment coving the complete scope of changes in TDG that may result, and supply the results to the Commission for use in the EU level network risk assessment.
- Adjustment of the Commission's existing policy on road safety to include DG risks explicitly.
- Adjustment of the CSTs for rail safety to include DG risks explicitly.

## Recommended Organisational Steps

- Analyse the data on DG transport activity and incidents that has been collected under existing legislation, in order to produce accident frequencies suitable for the network and local risk assessments.
- Develop a suitable methodology for the network and local risk assessments.
- Conduct an initial network risk assessment as a research study, using voluntary assistance from MS.
- Develop a process for setting the specific values of the harmonised RAC.
- Communicate with MS the priorities for risk reduction that are selected in the network risk assessment, and receive the results of local risk assessments of DG transport restrictions.
- Review periodically the harmonised RAC, in the light of practical changes to DG transport restrictions that they support, and adjust the RAC if necessary.

# Status of the mandate after EC's Studies

"A study on the comparison of the decision making process in the context of the safety/interoperability directives on one side, and in the context of the RID committee on the other side. This study should also look at the scope of both instruments, as well as at the competences of the RISC/TDG Committees and of the RID Committee."

"A study on the feasibility of harmonizing risk acceptability…of dangerous goods accident… (national level, EU level, RID versus safety directive)."

"Voluntary experiments at national level."

# Further steps: Roadmap on risk management

(see INF 16 – UNECE-OTIF Joint Meeting – September 2014)

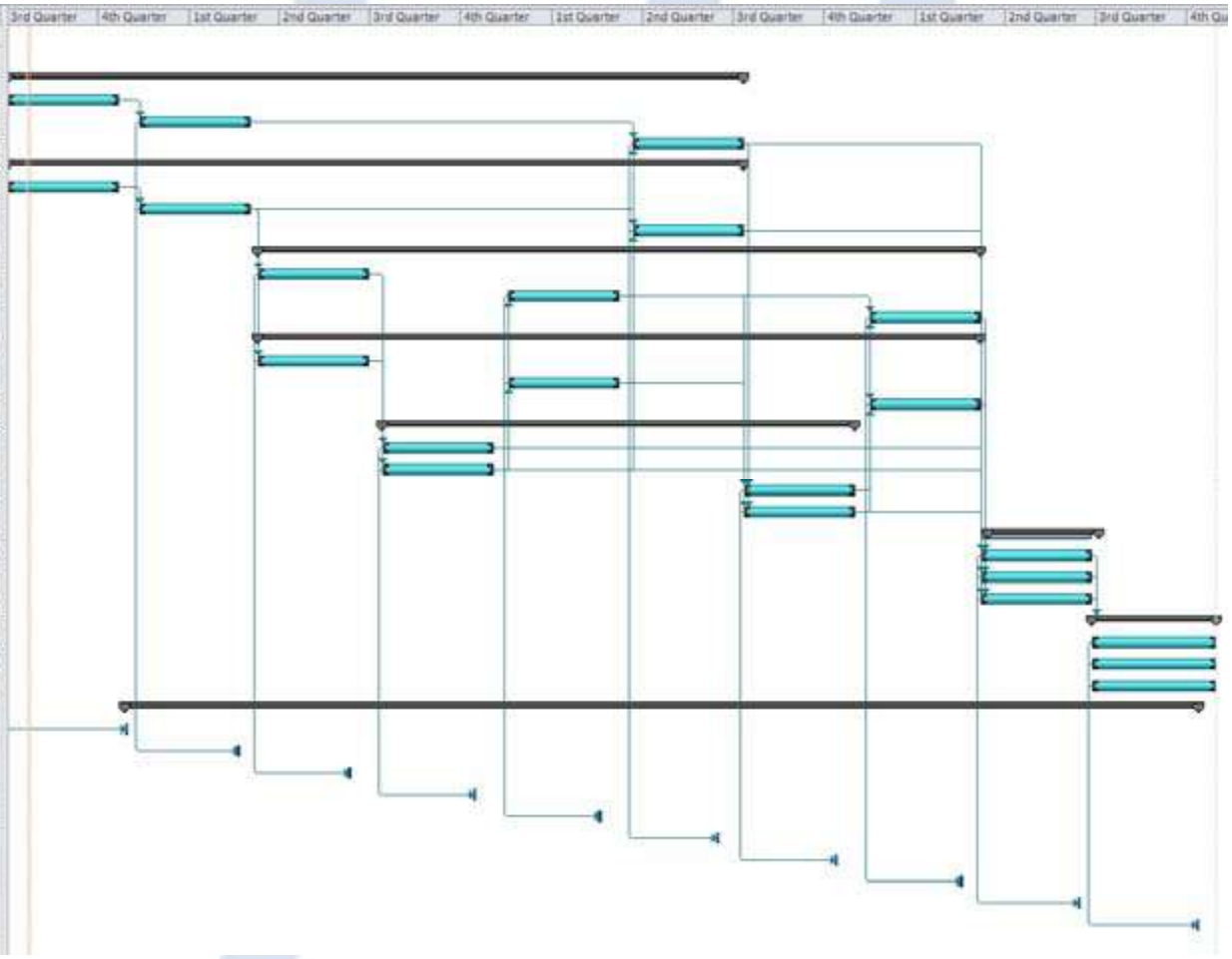
Objectives:

• To facilitate the exchange of technical information in a structured and well scheduled manner,
• To facilitate the coordination of technical developments by EU, UNECE and OTIF,
where relevant,
• To facilitate the development of common practices and guidance documents.”

# Further steps: Roadmap on risk management

## 11 Workshops over 3 years

| | Task Name | Start | Finish |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | **Databases workflow** | **Tue 01/07/14** | **Mon 11/07/16** |
| 4 | 1st discussion on databases | Tue 01/07/14 | Mon 20/10/14 |
| 5 | 2nd discussion on databases | Tue 11/11/14 | Mon 02/03/15 |
| 6 | 3rd discussion on databases | Tue 22/03/16 | Mon 11/07/16 |
| 7 | **Risk evaluation workflow** | **Tue 01/07/14** | **Mon 11/07/16** |
| 8 | 1st discussion on risk evaluation practices | Tue 01/07/14 | Mon 20/10/14 |
| 9 | 2nd discussion on risk evaluation practices | Tue 11/11/14 | Mon 02/03/15 |
| 10 | 3rd discussion on risk evaluation practices | Tue 22/03/16 | Mon 11/07/16 |
| 11 | **Risk management workflow** | **Tue 10/03/15** | **Mon 06/03/17** |
| 12 | 1st discussion on risk management | Tue 10/03/15 | Mon 29/06/15 |
| 13 | 2nd discussion on risk management | Tue 17/11/15 | Mon 07/03/16 |
| 14 | 3rd discussion on risk management | Tue 15/11/16 | Mon 06/03/17 |
| 15 | **Decision-making workflow** | **Tue 10/03/15** | **Mon 06/03/17** |
| 16 | 1st discussion on risk-based decision-making | Tue 10/03/15 | Mon 29/06/15 |
| 17 | 2nd discussion on risk-based decision-making | Tue 17/11/15 | Mon 07/03/16 |
| 18 | 3rd discussion on risk-based decision-making | Tue 15/11/16 | Mon 06/03/17 |
| 19 | **Interim conclusions** | **Tue 14/07/15** | **Mon 31/10/16** |
| 20 | 1st interim conclusions databases | Tue 14/07/15 | Mon 02/11/15 |
| 21 | 1st interim conclusions risk evaluation practices | Tue 14/07/15 | Mon 02/11/15 |
| 22 | 1st interim conclusions risk management | Tue 12/07/16 | Mon 31/10/16 |
| 23 | 1st interim conclusions risk-based decision-making | Tue 12/07/16 | Mon 31/10/16 |
| 24 | **Draft conclusions** | **Tue 14/03/17** | **Mon 03/07/17** |
| 25 | Draft conclusion on databases | **Tue 07/03/17** | Mon 26/06/17 |
| 26 | Draft conclusions on risk evaluation practices | Tue 07/03/17 | Mon 26/06/17 |
| 27 | Draft conclusions on risk based decision-making | Tue 07/03/17 | Mon 26/06/17 |
| 28 | **Conclusions** | **Tue 27/06/17** | **Mon 30/10/17** |
| 29 | Conclusions on databases | Tue 27/06/17 | Mon 30/10/17 |
| 30 | Conclusions on risk evaluation practices | Tue 27/06/17 | Mon 30/10/17 |
| 31 | Conclusions on risk-based decision-making | Tue 27/06/17 | Mon 30/10/17 |
| 32 | **Workshops** | **Tue 28/10/14** | **Thu 12/10/17** |
| 33 | 2nd Workshop | Tue 28/10/14 | Thu 30/10/14 |
| 34 | 3rd Workshop | Tue 17/02/15 | Thu 19/02/15 |
| 35 | 4th Workshop | Tue 09/06/15 | Thu 11/06/15 |
| 36 | 5th Workshop | Tue 13/10/15 | Thu 15/10/15 |
| 37 | 6th Workshop | Tue 16/02/16 | Thu 18/02/16 |
| 38 | 7th Workshop | Tue 14/06/16 | Thu 16/06/16 |
| 39 | 8th Workshop | Tue 11/10/16 | Thu 13/10/16 |
| 40 | 9th Workshop | Tue 14/02/17 | Thu 16/02/17 |
| 41 | 10th Workshop | Tue 13/06/17 | Thu 15/06/17 |
| 42 | 11th Workshop | Tue 10/10/17 | Thu 12/10/17 |



# Further steps: Roadmap on risk management

ERA further steps -> Roadmap on Risk Management

(see INF 16 – UNECE-OTIF Joint Meeting – September 2014)

"The Agency believes that by the end of 2017 the proposed organization may eventually lead to further recommendations (further technical work or proposals for legislative developments) to the relevant Regulatory Committees in regards the use of risk-based approach for a better harmonization of the management of risks in the inland transport of dangerous goods."

# 2011 – 2020
# Other ERA, EC or Sector activities

# Other activities having an impact on the control of derailment risks

-> Safety Management Systems (SMS) dissemination

-> Entities in Charge of Maintenance (ECM)

-> European Visual Inspection Catalogue (EVIC)

-> European Wheelset Traceability (EWT)

-> D-Rail research project (October 2011 – September 2014)

-> Shift 2 Rail

# Safety Management Systems (SMS)

## The Agency developed tools to support the RUs and the IMs

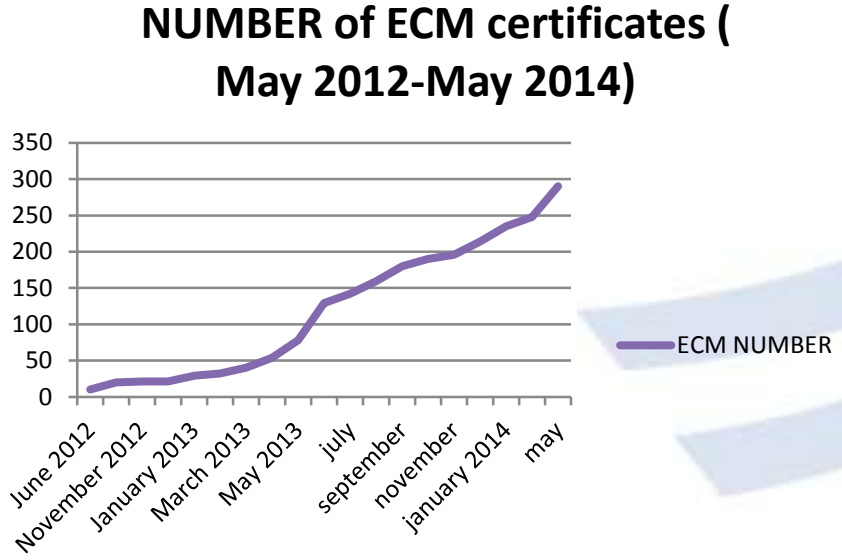
### The SMS Wheel

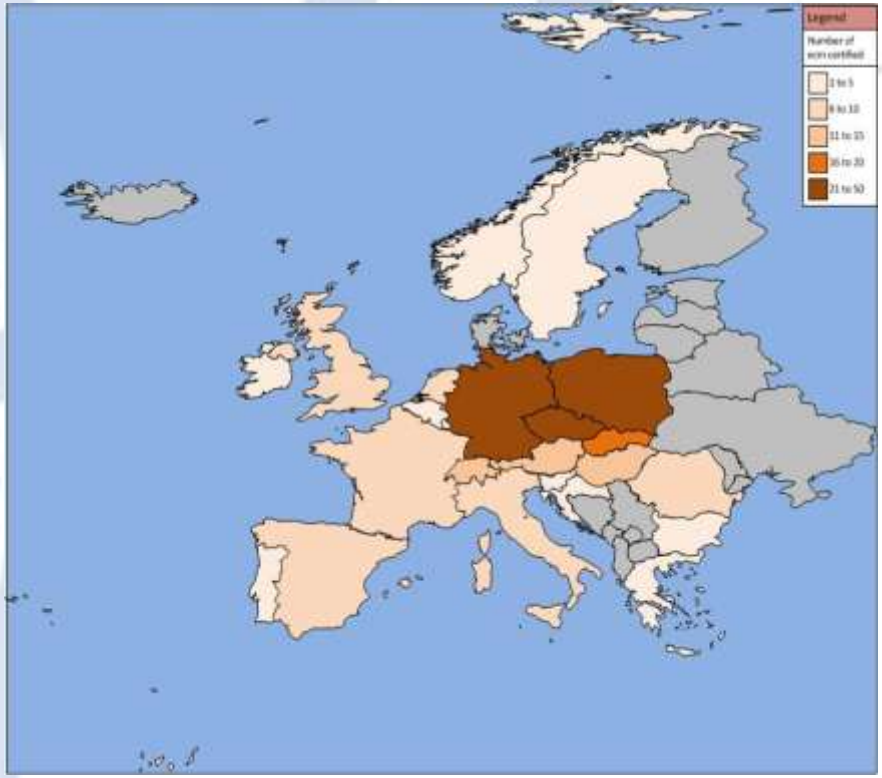
### The SMS website


### Guidance


- The Agency organised workshops and trainings inside and outside the EU providing expertise on SMS
  - Safety Regulatory Framework
  - Design, implementation and monitoring of SMS
  - Safety Culture
  - Risk management & Change management

# Maintenance – ECM – EVIC



Number of ECM certificates
in EU Member States

# UIC – Newcastle University D-Rail project

Objectives:

Long term and sustainable reduction of derailment impacts

Start: October 2011

End: September 2014

Final conference: Stockholm – 12th November 2014

Organised by:

**UIC – Trafikverket – Newcastle University**

Shift to rail Master plan (adopted by the Governing board 24.09.14) :

"identifying and developing innovative solutions to make the carriage of dangerous goods by rail the obvious number one choice is also essential."

Link:

http://ec.europa.eu/transport/modes/rail/doc/2014-09-24-draft-shift2rail-master-plan.pdf


# Thank you for your attention