



European Railway Agency

Setting up of safety targets on Railway Systems of the Member States of the European Community

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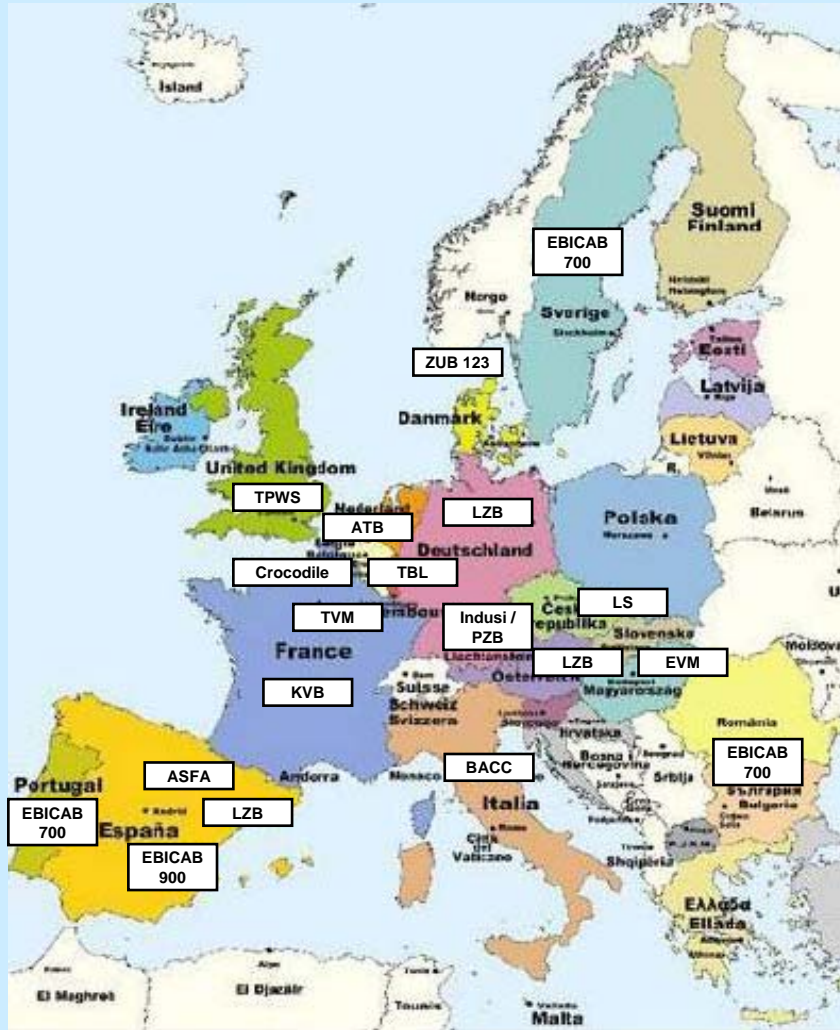
European Railways Agency
Cross Acceptance Unit

PSAM 9 conference Hongkong, 20th May 2008



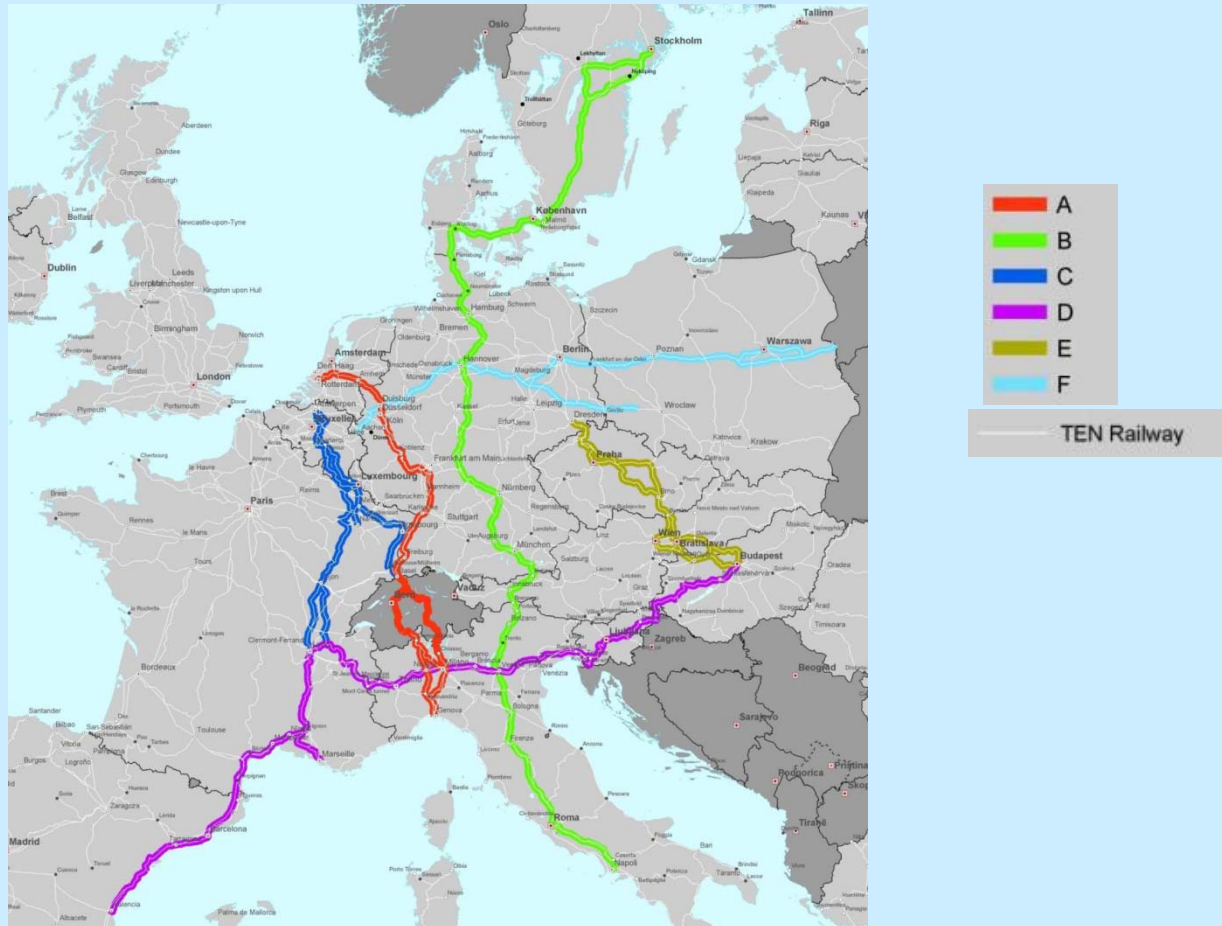
Member States (year 2008) of the European Community:

- | | |
|-----------------------|----------------------|
| AT - Austria | IE - Ireland |
| BE - Belgium | IT - Italy |
| BG - Bulgaria | LT - Lithuania |
| CY - Cyprus | LU - Luxembourg |
| CZ - Tcheque Republic | LV - Latvia |
| DE - Germany | MT - Malta |
| DK - Denmark | NL - Netherland |
| EE - Estonia | PL - Polen |
| ES - Spain | PT - Portugal |
| FI - Finland | RO - Romania |
| FR - France | SE - Sweden |
| GB - Great Britain | SI - Slovenia |
| GR - Greece | SK - Slovak Republic |
| HU - Hungary | |



Selection of railway Signalling systems in Member States of the European Community (in accordance to Annex B of TSI CC)

ASFA	– Spain
ATB	– Netherland
BACC	– Italy
Crocodile	– France, Belgium, Luxembourg
Ebicab 700	– Sweden, Norway, Portugal, Bulgaria
Ebicab 900	– Spain
Indusi / PZB	– Germany, Austria
KVB	– France
LZB	– Germany, Austria, Spain
RSDD	– Italy
SELCAB	– Spain
TBL	– Belgium
TPWS	– UK
TVM	– France, Belgium
ZUB 123	– Denmark
EVM	– Hungary
LS	– Czech Republic, Slovak Republic



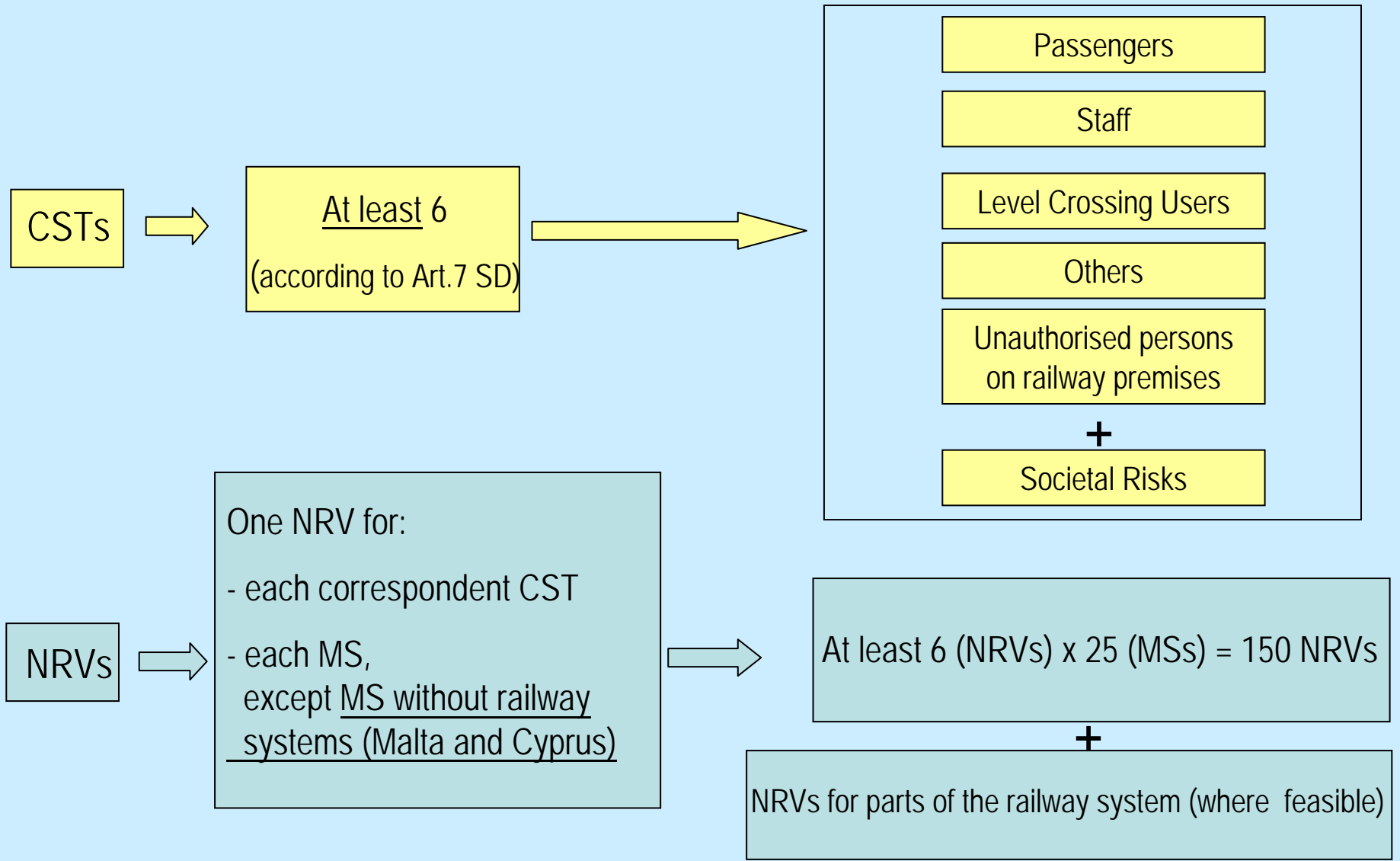
- **Treaty establishing the European Community, in particular Article 71§1.c:**
“1. For the purpose of implementing Article 70 (common transport policy at EC level), and taking into account the distinctive features of transport, the Council shall (...) lay down:
...
(c) measures to improve transport safety;
...“
- Directive 2004/49/EC, which, on the other hand, acknowledges that safety levels in the Community rail system are generally high, in particular compared to road transport, and requires:
 - that current safety performance of rail is not reduced in any Member State
 - that CSTs are developed, expressed in risk acceptance criteria
(1st set of CSTs to be adopted by the European Commission by end of April 2009 - Article 7)
- Mandate of the European Commission to the European Railway Agency – issued 16/12/2005
(1st set of CSTs to be submitted to the European Commission by end of September 2008)

- Promotion / Creation of an integrated European rail system where train can run freely, safely and interoperable
- Limit differentiation of national policies in the field of safety targeting, as this may hinder the competitive potential of railway transport with respect to other transport modes by fragmenting the EU market
- Harmonise the way safety is monitored and reduce existing differentiation in the safety performance of railway systems in Member States
- Avoid that “safety arguments” are unduly used by Member States for creating barriers to the entry into the respective national markets by newcomers

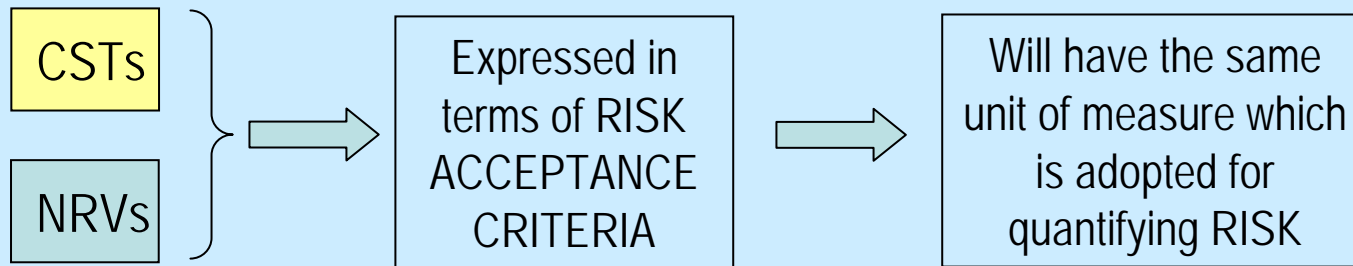
Two step approach:

- First develop a quantitative baseline to define the level of safety performance of railway transport in the different Member States, expressed in terms of risk to individuals + societal risk (**National Reference Values - NRVs**)
- Then derive CSTs from NRVs considering also results of an impact analysis and the medium average of NRVs

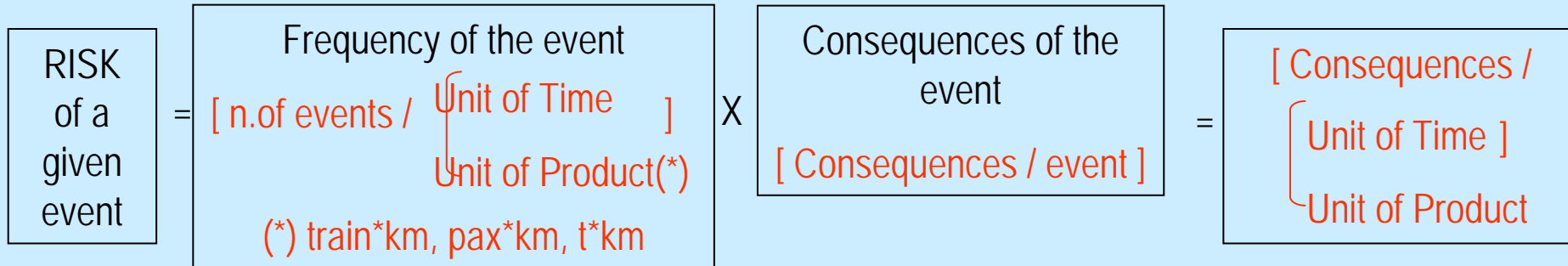
CSTs for different group of risks



Measurement:



Dimensional Definition:



<i>Risk category</i>	<i>Measurement units</i>		<i>Scaling bases</i>
1. Passengers	NRV 1.1	Number of passenger FWSIs per year arising from significant accidents / Number of passenger train-km per year	Passenger train-km per year
	NRV 1.2	Number of passenger FWSIs per year arising from significant accidents / Number of passenger-km per year	Passenger-km per year
2. Employees	NRV 2	Number of employee FWSIs per year arising from significant accidents / Number of train-km per year	Train-km per year
3. Level crossing users	NRV 3.1	Number of level-crossing user FWSIs per year arising from significant accidents / Number of train-km per year	Train-km per year
	NRV 3.2	Number of level-crossing user FWSIs per year arising from significant accidents / [(Number of Train-km per year * Number of LCs) / Track-km]	(Train-km per year * Number of LCs) / Track-km
4. Others	NRV 4	Yearly number of FWSIs to persons belonging to the category "others" arising from significant accidents / Number of train-km per year	Train-km per year
5. Unauthorised persons on railway premises	NRV 5	Number of FWSIs to unauthorised persons on railway premises per year arising from significant accidents / Number of train-km per year	Train-km per year
6. Whole society	NRV 6	Total number of FWSIs per year arising from significant accidents / Number of train-km per year	Train-km per year

- NRV and CST for passengers risk \rightarrow NRV₁;CST₁
- NRV and CST for staff risk \rightarrow NRV₂;CST₂
- NRV and CST for level crossing users risk \rightarrow NRV₃;CST₃
- NRV and CST for unauthorised persons risk \rightarrow NRV₄;CST₄
- NRV and CST for risk to others \rightarrow NRV₅;CST₅
- NRV and CST for societal risk \rightarrow NRV₆;CST₆

Common Safety Indicators

for 1st set, data from NSA report 2006

EUROSTAT data

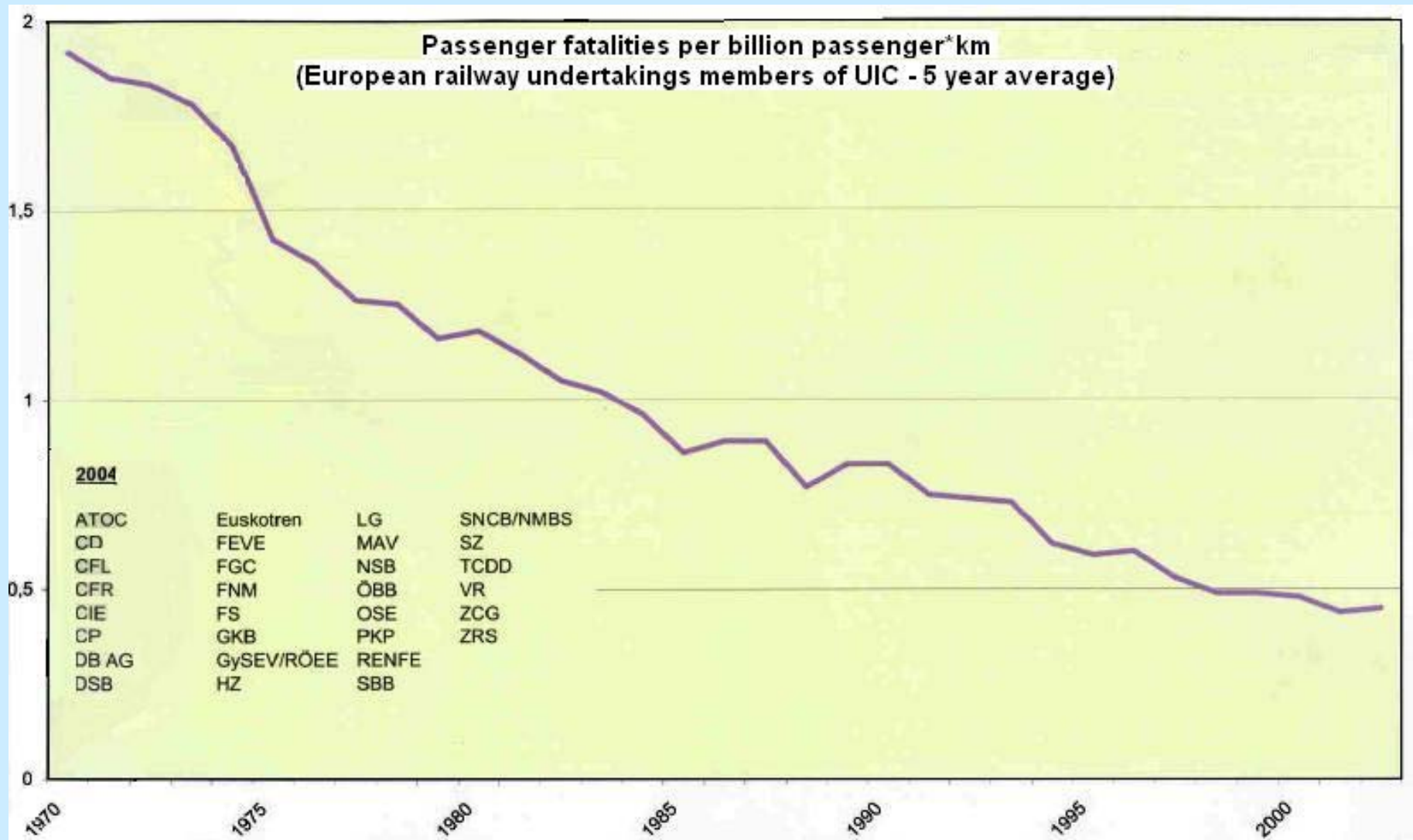
for 1st set, full data from 2004, 2005, 2006 + partial data (w/o production data) from 2007

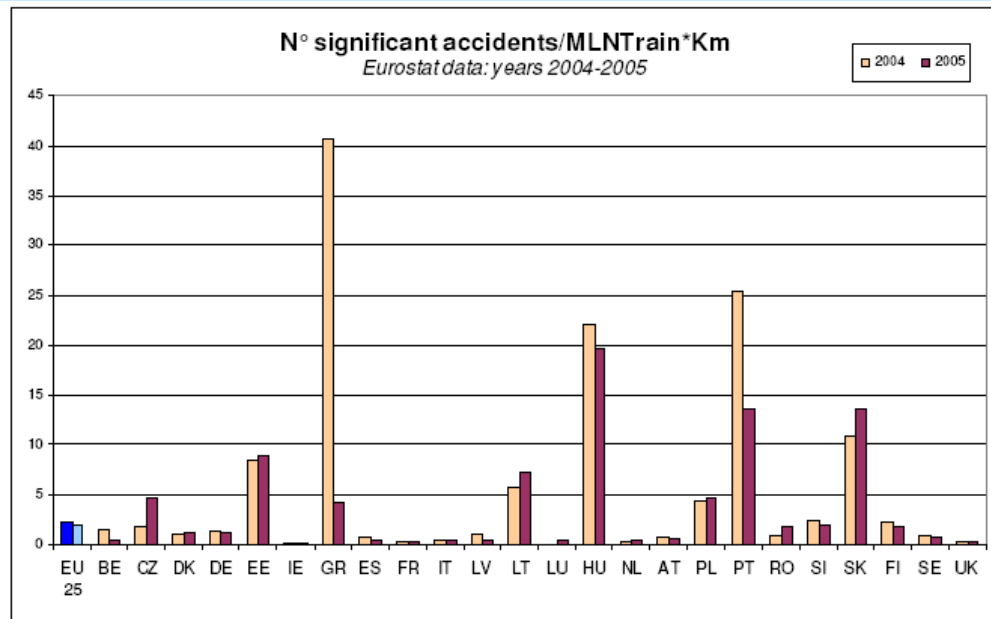
Others

Voluntary time series from MS
Extra normalisation (production) data

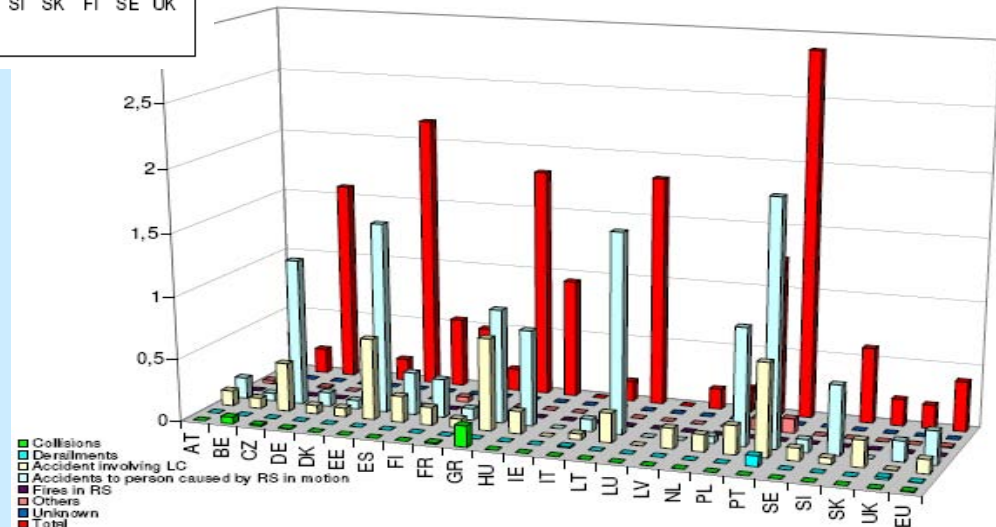


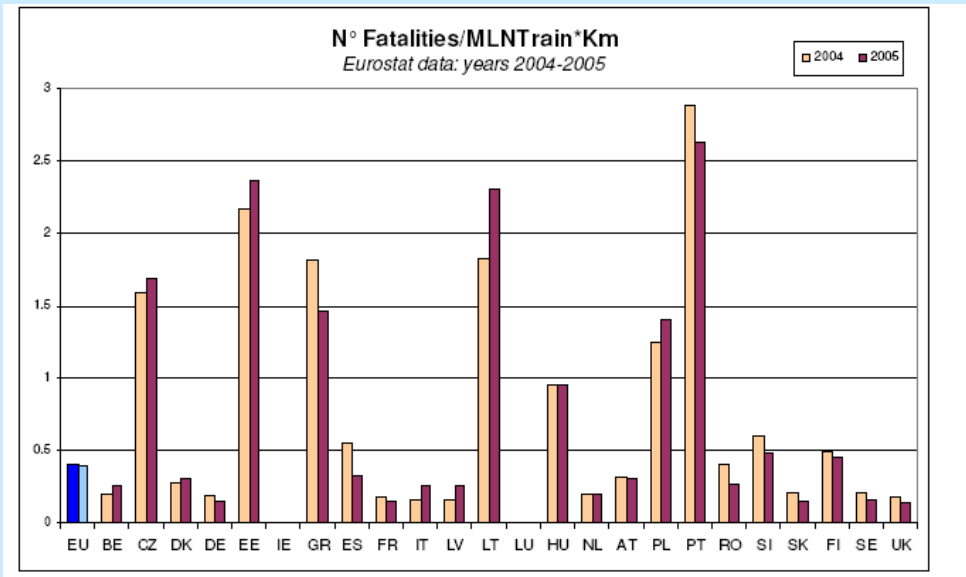
Trend of Safety for European Railways



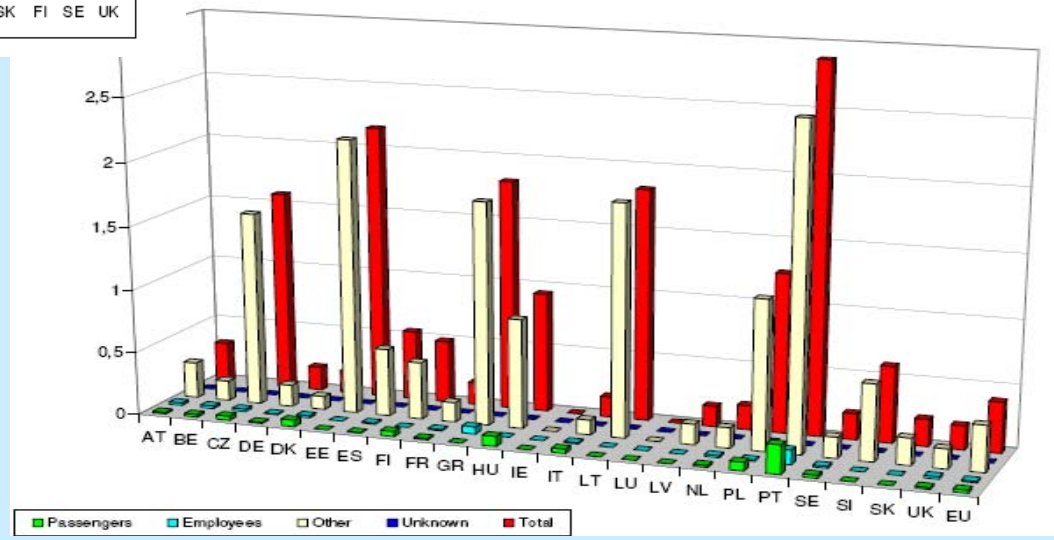


Fatalities by type of accident/T*Km (MLN)



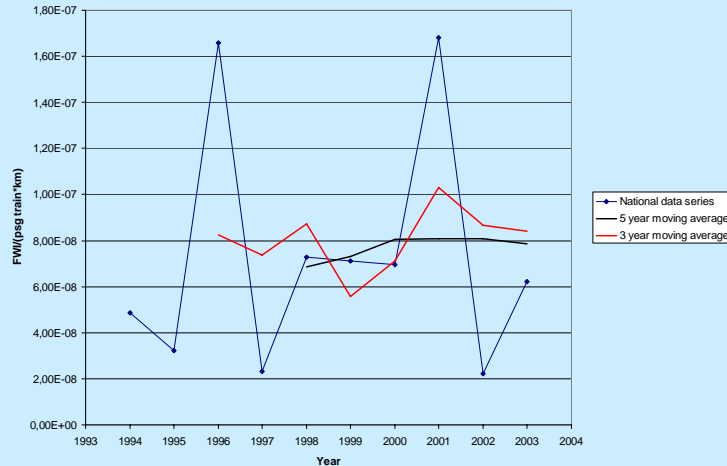


Fatalities by category of person/T*Km (MLN)

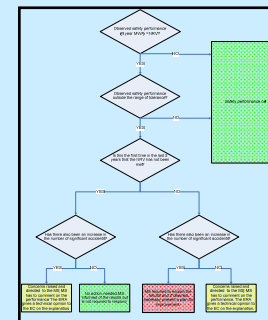
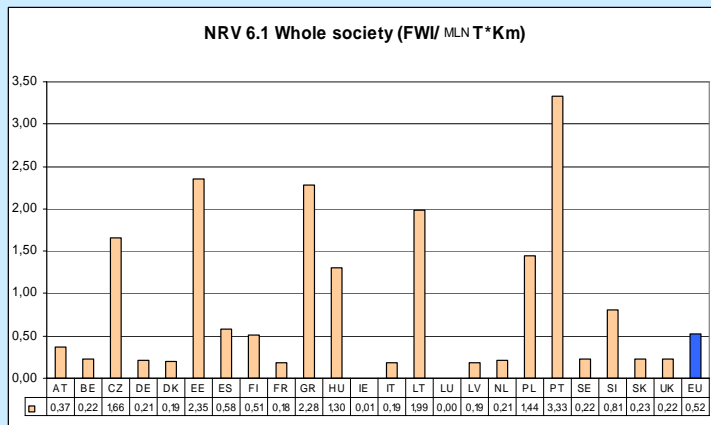


The important task to be handled within the recommendation on CSM for setting up and assessing the achievement of CSTs will be to define a methodology

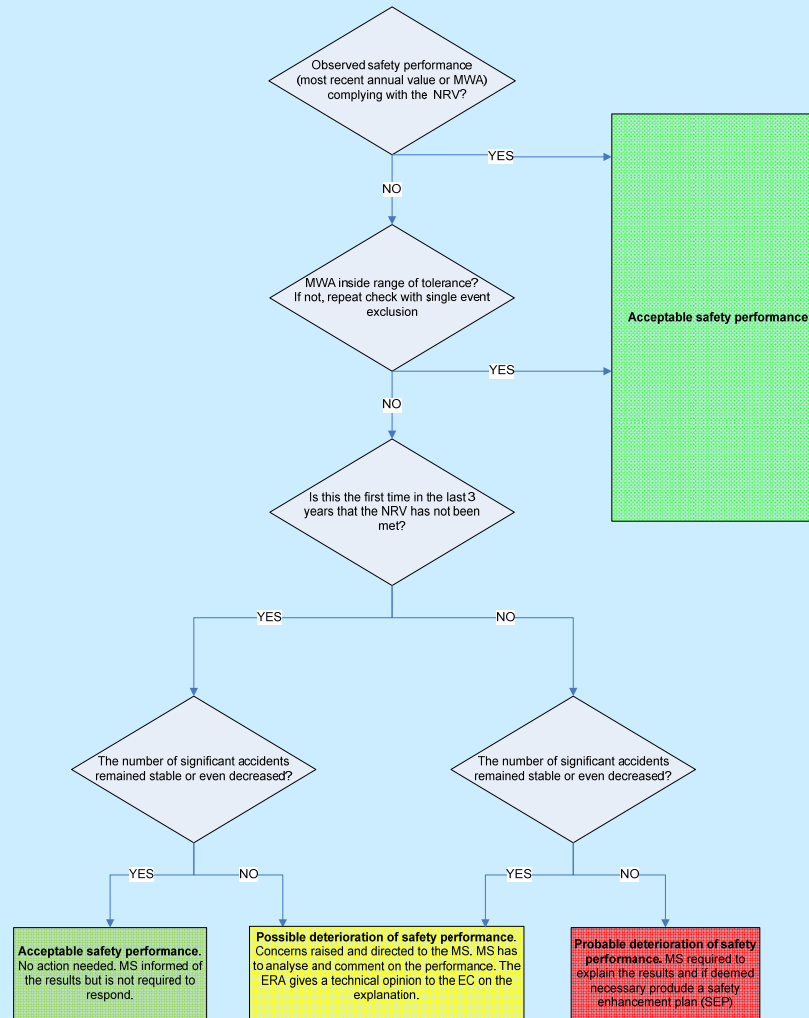
Example - passenger FWI per passenger train kilometre 1994-2003



- to set up National Reference Values at level of each Member State
- NRVs that are sufficiently robust to well represent the safety performances of the MSs over time
- to assess the annual variability effects to account for this in the enforcement of the CSTs



- It is evident from Eurostat data for 2004 and 2005 that there are significant differences in safety performance between MSs (two orders of magnitude variation of total FWI/train*km amongst Member States, as already shown)
- There is a need to analyse why these large differences occur and also to study additional data to see how annual fluctuations might influence these results
- A longer time series of national data would serve to average out some of the effects of the high-consequence low-frequency events and also to give more significance to the data for small Member States with few events





European Railway Agency



Thank you for
your attention!