

OTIF



ORGANISATION INTERGOUVERNEMENTALE POUR  
LES TRANSPORTS INTERNATIONAUX FERROVIAIRES

ZWISCHENSTAATLICHE ORGANISATION FÜR DEN  
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INTERGOVERNMENTAL ORGANISATION FOR INTER-  
NATIONAL CARRIAGE BY RAIL

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### RID/ADR/ADN

Joint Meeting of the RID Committee of Experts and the  
Working Party on the Transport of Dangerous Goods  
(Bern, 21. bis 25. März 2011)

### Item 8 of provisional agenda: Any other business

### International survey on transposition of Chapter 1.9 of RID/ADR/ADN among users of risk evaluation procedures in the field of dangerous goods transport

### Transmitted by Germany

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#### Introduction

1. The international dangerous goods regulations RID, ADR and ADN stipulate in chapter 1.9 transport restrictions by the competent authorities according to which Contracting Parties/Contracting States may apply additional provisions in certain cases.
2. In accordance with section 1.9.2 of RID / 1.9.3 of ADR/ADN, these include the following:
  - a) Additional safety requirements or restrictions on carriage using certain structures such as bridges or tunnels, or combined transport installations such as transshipment installations, where the transport operation begins or ends in ports, railway stations, or other transport terminals;
  - b) Provisions according to which the carriage of certain dangerous goods *on sections with special and local risks* is prohibited, such as sections in residential areas, environmentally sensitive areas, economic centres or industrial zones containing hazardous installations, or to which special conditions, e.g. operational measures (reduced speed, specified jour-

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ney times, prohibition on trains meeting each other, etc.) apply. Where possible, the Competent Authorities shall establish alternative routes which may be used for each prohibited route or each route subject to special provisions;

- c) Exceptional provisions specifying the excluded or prescribed routeing or provisions to be observed for temporary storage resulting from extreme weather conditions, earthquake, accident, demonstrations, civil disorder or military hostilities.
3. In the cases in accordance with section 1.9.2 (a) and (b) of RID, the competent authority shall provide evidence of the need for the measures. Chapter 1.9, however, does not contain specifications on how to prove the need for the above measures. In order to guarantee an international minimum standard for carrying out risk assessments and to make the individual risk assessments comparable, in 2006 the RID Committee of Experts presented a *"Generic Guideline for the Calculation of Risk inherent in the Carriage of Dangerous Goods by Rail"*<sup>1</sup>. This guideline focuses on general aspects that should be considered in a risk analysis, on minimum contents and on quality requirements with respect to chapter 1.9 of RID. A relevant Guideline is also available for the transport of dangerous goods by road<sup>2</sup>, the application of which, however, is not mandatory for the Contracting States.
  4. The above guidelines provide a good basis for a harmonized risk analysis of the Contracting Parties/Contracting States. However, risk analysis results become comparable only when detailed specifications which cover more than the basics have been harmonized. Experience so far shows different approaches to transposing chapter 1.9 of RID/ADR/ADN, inter alia, by already established methods adapted to national conditions. There might, nevertheless, be still a need for harmonization as regards some partial aspects such as the selection of methods, the hypotheses and data required as well as the standardization of thresholds and limiting curves with the aim of achieving better comparability of decisions on the basis of risk assessments at international level.
  5. In order to advance the further development on regulations on standardized risk analysis and to make the relevant criteria more transparent for the other Contracting Parties/Contracting States, Germany intends to compile by means of a questionnaire the current practice as regards the transposition of chapter 1.9 of RID/ADR/ADN and the experiences gained in order to identify possible further international harmonization needs and possibilities as regards risk concepts in the dangerous goods sector. With the present questionnaire, it is to be established
    - whether, and if so what, methods are used for carrying out risk analyses in the dangerous goods transport sector of the Contracting Parties/Contracting States,
    - what hypotheses and specifications in particular are taken as a basis for carrying out the risk applications,
    - what national special characteristics are considered in the risk evaluation,
    - which calculation and dispersion models are used,
    - what problems have been identified in practice and what needs to be improved.
  6. If the evaluation of the received answers show that there are common approaches which may also be helpful to Contracting Parties/Contracting States which have not yet carried out dangerous goods risk analyses and evaluations, an update of the above basic guidelines is con-

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<sup>1</sup> OTIF document: A81-03/501.2006/Add.2.

<sup>2</sup> Document of the UNECE Inland Transport Committee: ECE/TRANS/WP.15/2008/6; Publication on the UNECE dangerous goods homepage planned for 1 January 2011.

ceivable. Moreover, with this update, possible solutions to identified common problem areas could be developed and provided as international recommendations.

7. You will find the questionnaire on the following pages. It is divided into the following sections:
  1. Transposition into National Law
  2. Risk Analysis Basics
  3. Clustering of Hazardous Substances/Definition of Accident Scenarios
  4. Accident Effect Models
  5. Statistical Data
  6. Risk Analysis Procedure
  7. Computer-aided Calculation Models
  8. Risk Evaluation
  9. Risk Management
  10. Special case: Categorisation of Tunnels
  11. Other
8. The Contracting Parties/Contracting States are asked to assist in compiling information on experiences gained and practice in the field of risk analysis and evaluation for the transport of dangerous goods and to fill out the questionnaire to the extent that they have information on the individual questions. The results of the questionnaire will be notified to the Contracting Parties/Contracting States and, if appropriate, the professional bodies concerned.

## Questionnaire

referring to a) carriage by rail, b) carriage by road, c) carriage by inland waterways:

### 1. Transposition into National Law

How and on what legal basis is chapter 1.9 of RID/ADR/ADN transposed into national law?


Are there sub-legal regulations on this matter (technical rules or similar)? If yes, please specify.


### 2. Risk Analysis Basics

Are risk analyses carried out?                      yes                       no

If yes, for what purpose:

To identify the risk and decide on passage restrictions/approvals for certain dangerous goods for	
Tunnels	
Bridges	
Residential Areas	
Other	
To identify the risk of accident effects and decide on further technical and/or organizational measures (if appropriate)	
BLEVE	
Other	
Other purpose:	

Are all modes of transport (road, rail, inland navigation) taken into account? Are different approaches used for the individual modes of transport?


General description of the method(s):


**3. Clustering of Hazardous Substances / Definition of Accident Scenarios**

What hazardous substance clusters or main substances are laid down?


What percentage of the carried dangerous goods is covered by the clusters/main substances?


Is there a coupled classification of accident scenarios and substances? (see also question 4)


Comments (Experiences, problems, need for improvement, ...):


**4. Accident Effect Models**

Which damage indicators are taken as a basis?

Fatalities:	
Seriously injured persons: (with permanent impairments?)	
Slightly injured persons:	
Damage to the environment:	
Material damage:	
Other:	

What accident scenarios are considered? Are event trees used for process modelling?


Which effects are considered and which (limit) values are defined as "critical effects"?

Explosion /pressure	
Fire	
Heat	
Toxicity	
Release of toxic substances	
Other	

Which dispersion scenarios are taken as a basis?


How severe were the considered accidents?


Which hazardous substances/main substances involved in the accidents were considered and what amounts of these substances were released?


What probabilities regarding the manner of release of the dangerous good and an ignition are taken as a basis for the consideration? (Specify e.g. as a percentage)

Release:	spontaneous	
	continuous	
Ignition:	instantaneous	
	delayed	
	none	

On what basis have these probabilities been determined (analysis of data, estimates, ...)?


Are data on vehicles and transport specifications as well as infrastructure information considered?  
If so, what data are considered?

Vehicle type:	
Tank type:	
Specific safety measures:	
Transport time:	
Specific infrastructure characteristics:	
Other:	

Is the level of harm/the spatial or frequency distribution determined?


What calculation models are used (see also question 7)?


Comments (Experiences, problems, need for improvement, ...):


**5. Statistical Data**

What data on dangerous goods transport are required for the risk analyses?

Accident frequency	
Share of relevant releases	
Accident effects	
Dangerous goods volume: Total	
on certain sections	
Overall transport mileage	
Share of dangerous goods transport in overall transport	
Heavy goods mileage	
Share of dangerous goods transport in heavy goods transport	
Composition of dangerous goods	
Other	

Dangerous goods volume per mode of transport:

	<i>Road</i>	<i>Rail</i>	<i>Waterway</i>
Accident frequency			
Share of relevant releases			
Accident effects			
Dangerous goods volume: Total			
on certain sections			
Overall transport mileage			
Share of dangerous goods transport in over-all transport			
Heavy goods mileage			
Share of dangerous goods transport in heavy goods transport			
Composition of dangerous goods			
Other			

Are these data available?


How current are these data?


Are national as well as international sources used?


Comments (Experiences, problems, need for improvement, ...):


**6. Risk Analysis Procedure**

How is the division into sections effected?




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What data are considered in the risk analysis?

Data on dangerous goods transport <sup>3</sup> (see question 5)	
Accident data (see question 5)	
Data on overall volume of transport <sup>4</sup> (see question 5)	
Data on technical specifications	
Equipment of the dangerous goods vehicle	
Equipment of the structure	
Data on the surroundings	
Routing data	
Other	

Are correction factors used e.g. to consider other substances with characteristics comparable to the main substances?


Which risk parameter is determined?

Individual risk:	
Societal risk:	
Environmental risk:	
Other:	

How are the risks depicted in the method? (is-risk contours, harm/frequency graph, ...)


How are uncertainties in the method (data, hypotheses, clustering, ...) addressed?


Comments (Experiences, problems, need for improvement, ...):


<sup>3</sup> e.g. type of the hazardous substances carried, transport volume for each mode of transport.

<sup>4</sup> Overall volume of transport also includes data on heavy goods transport or freight transport, passenger transport etc.

**7. Computer-aided Calculation Models**

What models/programmes are used for risk analyses in the field of dangerous goods transport? (e.g. OECD/PIARC on tunnel categorisation, ...)


What other programmes such as flow/dispersion models/programmes are used?


Are these freely accessible, up-to-date, thoroughly tested in practice, specifically developed?


What individual adaptations are necessary for the application of the programmes? (e.g. as regards scenarios, hazardous substance clusters, national need/circumstances, ...)


Information technology: Are the programme versions adapted on a regular basis?


Question on the OECD/PIARC model: What improvements to the OECD/PIARC model should be made, to what extent should they be made and what priority should be assigned to them? (e.g. modern model platform, more realistic sub-models, flexibility, modularity, ...)


Comments (Experiences, problems, need for improvement, ...):


**8. Risk Evaluation**

What risk evaluation criteria have been established? (limiting curves, thresholds, ...)


How have these criteria been laid down or who decided on them?


Comments (Experiences, problems, need for improvement, ...):


**9. Risk Management**

How is the effectiveness of risk minimisation measures determined and/or how are the measures established?


Comments (Experiences, problems, need for improvement, ...):


**10. Special case: Categorisation of Tunnels**

As the approach is based on harm levels and pre-sorting, the current definition of tunnel categories is not geared to commonly used risk analyses and evaluations of individual scenarios in accordance with sub-section 1.9.5.1.

How is the issue as regards the tunnel categorisation under ADR by means of risk analysis addressed and what experiences have been gained concerning this matter?


Is there a need to discuss a possible optimization of the tunnel categories or the tunnel restriction codes at international level?


Comments (Experiences, problems, need for improvement, ...):


**11. Other**

From your perspective, in which areas of risk analysis for the transport of dangerous goods is there a need for discussion at international level?


Where do you see further need for harmonization or possibilities for harmonization?


**Thank you very much for your support.**

**Please send the completed questionnaire by 31 October 2011 to  
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Bonn, Germany (ref-ui33@bmvbs.bund.de) and  
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