
Economic Commission for Europe**Inland Transport Committee****Working Party on the Transport of Dangerous Goods****19 August 2014****Joint Meeting of the RID Committee of Experts and the
Working Party on the Transport of Dangerous Goods**

Geneva, 15-19 September 2014

Item 8 of the provisional agenda

Future work**Roadmap on risk management in the context of inland
transport of dangerous goods****Transmitted by the European Railway Agency (ERA)****Introduction**

Since 2009 the European Commission Committees on Inland Transport of Dangerous Goods (ITDG) and on Railway Interoperability and Safety (RISC) identified that some harmonization work concerning the use of risk-based decision-making may facilitate the management of TDG risks [1]. A decision was made to launch an independent study [2] procured by the European Commission services through an open call for tender. This study on “Harmonized risk acceptance criteria for transport of dangerous goods” was finalized and discussed in a workshop organized by the European Commission in February 2014. The general conclusions were that a better harmonization in the field of TDG risks management was not only desirable but also achievable in the future, however it was also noticed that some works still need to be performed in several technical fields to be able to establish a fully practicable and harmonized risk management framework.

From the beginning it was also clear that potential harmonized improvements in this technical field need to consider - all - the inland modes of transport, as risk assessment methods and practices should be similar for roads, railways and inland waterways.

Taking into account the relevant assumptions and available results the Agency started to facilitate the emergence of an improved harmonization in the field of risk assessments and risk-based decision making processes. In 2013 the Agency organized a first “workshop on risk evaluation and assessment in the context of inland transport of dangerous goods”. This workshop was also opened to third party organizations to the EU and coordinated with the relevant tasks of the UNECE & OTIF Joint Meeting.

From this workshop a certain number of technical issues were identified, assorted with potential solution(s) and key success factors to improve the use of risk-based approach toward a better harmonization and mutual acceptance of risk-based decisions. These conclusions were reported in [3] and a follow up to this facilitation work was discussed at the spring 2014 session of the Joint Meeting.

During this session it was confirmed that the European Railway Agency should continue to facilitate the development of a better harmonized framework for the inland modes of transport through the organization of well-structured and regular technical discussions.

The Agency promised the Joint Meeting participants to present a roadmap for these future discussions.

Roadmap

Objectives

Considering the activities presented in introduction the general objectives of the roadmap are the following:

- 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.

Technical scope

The scope of the activities will be limited to the facilitation and the coordination of activities necessary to achieve an improved use of risk-based decision-making for the management of risks in inland (road, rail, waterways) transport of dangerous goods. The interfaces with the management of the risks of SEVESO establishments will also be considered.

In particular the activities, mainly working meetings, will be organized following three thematic working groups of experts:

- harmonizing the approach to data used in risk evaluation and assessment,
- harmonizing the practices, models and tools used for risk evaluations,
- harmonizing the risk management processes, decision methods and criteria.

In annex to the present document, the main findings of the 1st workshop [1] and of the study [2] have been arranged in a table following the above thematic working group. This table provides an idea of the necessary technical discussions within each experts group in order to solve/mitigate the identified issues.

Steering and Collaboration

The facilitation of the work by the Agency is limited, for the three modes of transport, to the tasks of a secretariat for the organization of meetings and discussions within the defined technical scope. The Agency will also facilitate the production of documents, initiating discussions, and the drafting of shared conclusions reviewed by the participants to the discussions.

All the interested parties represented at the relevant meetings of the EU, UNECE and OTIF will be invited to participate to the discussions on an informal basis.

The facilitation tasks will be performed by the Agency without prejudice to its mission and activities, as defined in the Agency regulation, and within the limit of available resources.

Organization

For facilitating the organization of the meetings and the preparation of the discussions foreseen in the present roadmap the Agency will set up an **extranet workspace**. This work space will be accessible to the **experts registered in each thematic work group**.

Within this workspace the registered experts will have the possibility to:

- read documents available for each meetings,
- request uploading relevant documents to the ERA's extranet administrator,
- send comments for the documents under review.

Typically the following documents will be accessible:

- publicly on dedicated Agency's webpages:
 - invitations,
 - meeting agendas,
 - documents proposed for discussion in meetings,
 - conclusions of the meetings,
 - final deliverables
- to the registered experts:
 - all public documents and,
 - working documents,
 - reference technical documents.

The organization of the workshops will remain as it was established for the 1st Workshop. In particular an invitation will be sent to all interested parties far in advance the workshops with a provisional agenda of the foreseen discussion. All participants will have the possibility to provide documents/presentations for discussion.

Final deliverables

The expected deliverables will take the following forms:

- final versions of working documents,
- guidelines,
- reports to the relevant Committees,
- proposals, submitted to the relevant Committees.

Planning

2014

28-30 October 2014 - 2nd Workshop on risk evaluation and assessment in the context of inland transport of dangerous goods, including:

- 1st technical discussion on databases,
- 1st technical discussion on risk evaluation

2015

17-19 February 2015 – 3rd Workshop on risk evaluation and assessment in the context of inland transport of dangerous goods, including:

- 2nd technical discussion on databases,
- 2nd technical discussion on risk evaluation and assessment practices

9-11 June 2015 – 4th Workshop on risk evaluation and assessment in the context of inland transport of dangerous goods, including:

- 1st technical discussion on risk management,
- 1st technical discussion on decision-making methods

13-15 October 2015 – 5th Workshop on risk evaluation and assessment in the context of inland transport of dangerous goods, including:

- 1st interim conclusions on databases and risk evaluation practices

2016

16-18 February 2016 – 6th Workshop on risk evaluation and assessment in the context of inland transport of dangerous goods, including:

- 2nd technical discussion on risk management,
- 2nd technical discussion on decision-making methods

14-16 June 2016 – 7th Workshop on risk evaluation and assessment in the context of inland transport of dangerous goods, including:

- 3rd technical discussion on databases,
- 3rd technical discussion on risk evaluation and assessment practices

11-13 October 2016 – 8th Workshop on risk evaluation and assessment in the context of inland transport of dangerous goods, including:

- 1st interim conclusions on risk management and decision-making methods

2017

14-16 February 2017 – 9th Workshop on risk evaluation and assessment in the context of inland transport of dangerous goods, including:

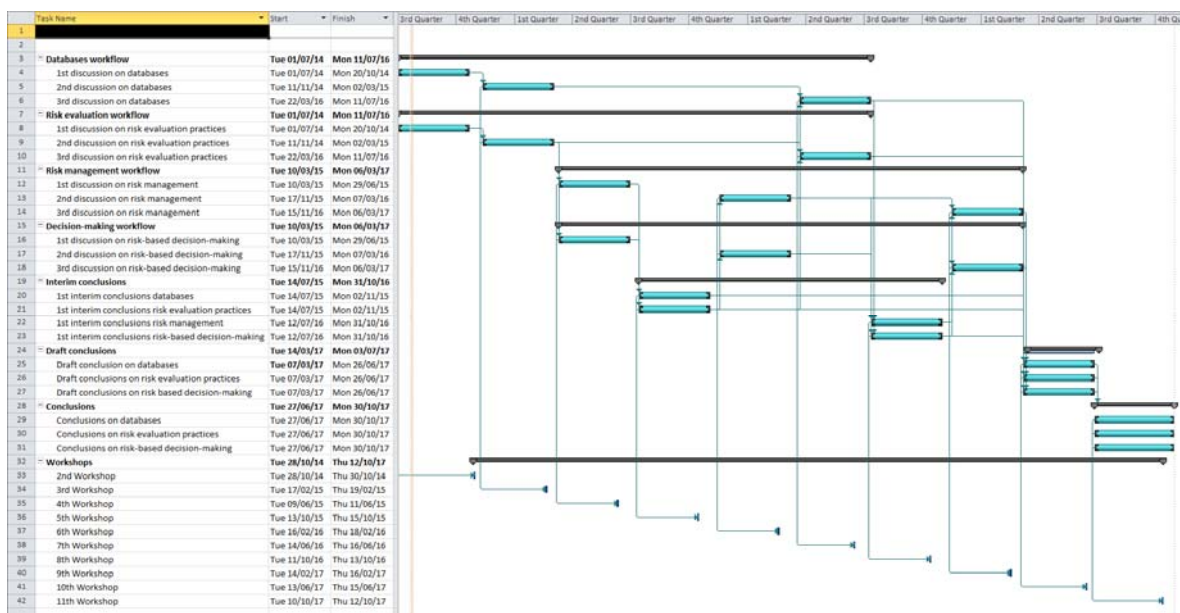
- 3rd technical discussion on risk management,
- 3rd technical discussion on decision-making methods

13-15 June 2017 – 10th Workshop on risk evaluation and assessment in the context of inland transport of dangerous goods, including:

- draft conclusions on the harmonization of databases used for risk evaluations,
- draft conclusions on the harmonization of risk evaluation practices,
- draft conclusions on the risk management and decisions-making practices

10-12 October 2017 – 11th Workshop on risk evaluation and assessment in the context of inland transport of dangerous goods, including:

- Conclusions on the harmonization of databases used for risk evaluations,
- Conclusions on the harmonization of risk evaluation practices,
- Conclusions on risk management and decisions-making practices



Conclusions

The Agency will be happy to receive suggestions from the Joint Meeting concerning the proposed organization.

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.

As a first action, the Agency will send to all interested parties an invitation to register experts for the thematic working groups and the access to the Agency extranet workspace.

References

- [1] European Commission – Draft conclusions of the Workshop on derailment detectors held in Brussels on 1-2 September 2009.
- [2] DNV GL - Harmonized risk acceptance criteria for transport of dangerous goods – Final report for the European Commission – DG MOVE, Report No: PP070679/4, rev.2 – March 2014.
- [3] European Railway Agency, Report on the 1st workshop on risk evaluation and assessment in the context of rail, road and inland waterways Transport of Dangerous Goods, 8 and 9 October 2013
<http://www.unece.org/fileadmin/DAM/trans/doc/2014/dgwp15ac1/ECE-TRANS-WP15-AC1-14-BE-inf14e.pdf>.

Annex

Expert groups I, II and III

Issues and potential solutions to be considered by all groups

Key success factors: [3]

- ***A clear roadmap and a strong/scientific coordination of the efforts. The involvement of all interested parties.***
- ***Common understanding of risk-based decision's workflows, objectives, and criteria, as well as transparency of decisions, based on facts and risk-based approach.***
- ***Increase the level and the maturity of the communication towards the public on potential catastrophic events.***

Issues:	Potential solutions:	Source
Both qualitative and quantitative methods should be allowed	Different approach to assess the risks should be allowed including both qualitative or quantitative approaches, for example: <ul style="list-style-type: none"> - use of codes of practice, - comparison with a reference system, - explicit risk estimation Similar framework should be developed for all modes of transport	[3]
Uncertainties can be high in the calculation of both the estimation of consequences and probabilities	Uncertainties are certainly to be minimized as far as practicable with the help of harmonized practices and better input data. However it is also possible to take decision in uncertain environment as soon as the uncertainties and their potential impact on the decision are well identified and does not change the relevant decision (2 nd order influence in the decision taken).	[3]
Nimby behavior/ individual interest/ societal interests	A clear, transparent and enforceable risk-based decision making framework applicable to the transport of dangerous goods and coordinated with the framework applicable to establishments (Seveso) would facilitate balancing individual and societal interest.	[3]
"It is so complex that it will be impossible to develop an harmonized [risk management] framework"	A step by step approach must be taken; sending human on the moon was not achieved the next day. A clear roadmap must be established and a strong coordination of the work is necessary. On that basis every concerned actors can bring in its experience and prepare for the future change towards a harmonized framework. It is also noted that some 'global companies' have been able to define and use risk management models on a worldwide scope for all transport modes. Even if challenging, the development of a harmonized framework is seen by the participants as the desirable future for solving many of the problems discussed during the two-days.	[3]

Expert group I

Harmonizing the approach to data used in risk evaluation and assessment

Key success factors: [3]

Better reporting scheme and facilitated access to data is necessary. Data collected must be usable by risk models. Data concerning road transport shall contain the same level of details than railway data bases and should be accessible at the same level of details.

Issues:	Potential solutions:	Source
Lack of harmonized input data suitable for risk calculation	<p>In the future, access to general data on traffic could theoretically be obtained from statistical analysis of transport data conveyed in telematics applications. Before the telematics applications contribute to the data collection process some data are publicly available in already existing databases (e.g. Eurostat) with different levels of details following the considered mode of transport.</p> <p>A big effort must be given to the development of data collection and quality of data used in risk assessments.</p>	[3]
Limited access to existing data / recognized analysis of data	<p>It is recommended to “Analyse the data on TDG activity and incidents that has been collected under existing legislation, in order to produce accident frequencies suitable for the network and local risk assessments.”</p> <p>Access to common interest statistics could be further developed but it should be based on clear and non-discriminating legal requirements.</p> <p>As soon as possible, a harmonized accident reporting system should be commonly used as recognized input to risk evaluation models</p> <p>The detailed analysis of the collected information will be a key step of any risk assessment. Therefore access to data and transparency of the analysis are important factors for recognizing the validity of the results provided by risk estimation tools.</p>	[2]
To implement risk assessment based on probabilities, reliable figures are primarily necessary. The collection of reliable figures is a challenging task	<p>A harmonized accident collection system is a major step in the process of defining probabilities. To be reliable the probabilities must be established on a sufficiently large number of events. Incidents and near misses contribute also the definition of robust probabilities, not only the catastrophic accidents. Therefore it is also necessary to consider non dangerous goods accidents in order to build reliable statistics and probabilities.</p> <p><i>Note: on this aspect the ERA and UNECE secretariat agreed that a coordination of effort is necessary for further development of reporting databases on event involving transport of dangerous goods and general railway safety data-bases.</i></p>	[3]

Expert group II

Harmonizing the practices, models and tools used for risk evaluations

Key success factors:

[3]

As none of the currently existing models for calculating risks is directly applicable by other parties, every participant to a harmonization process should accept to change its current practice/rules in order to converge on mutually recognized data/methods/calculation tools.

Lack of harmonized accident scenarios

There is a need to develop a common set of consequence scenarios on which harmonized assessments can be performed on the potential impact of loss of containment. The selection of scenarios to be evaluated should be justified by the risk analysis taking into account the local/global context and the potential hazardous impacts.

[3]

Contingency planning and rescue performance differs largely among countries; it has an impact on the estimation of the consequences.

In the justification of the selected scenarios there is need to take into account contingency planning. The correct estimation of the potential consequences (and of the risks) must take into account credible mitigating actions and the credible size of the loss of containment. The maximum physically possible scenario can also be a reference calculation which can however be far from the credible scenarios and their related impacts.

[3]

Consistency of models calibration with the risk acceptance criteria.

Theoretically accurate models provide results which could directly be compared to values affected to risk acceptance criteria. However, as in practice there are quite large uncertainties in risk estimations models and data, it might be necessary to calibrate the models in order to be sure that their results can be assessed against established risk acceptance criteria.

[3]

Lack of harmonized model(s)

There is a need to develop/complement mutually recognized detailed way(s) of calculating risks (consequences/probabilities), as well as a common set of methods/models.

[3]

Once consequence scenarios have been defined, the detailed way to estimate the impact of the scenarios should be harmonized, the expected type of evaluation results should also be clarified, for example should the model calculate the size of the area exposed to a certain level of impact or the number of people exposed or the number of potential fatalities/injuries?

A harmonized risk assessment method should clarify all these aspects and, in particular, which parameter should be used for which type of decision to be taken in relation with the applicable risk acceptance criteria.

It is recommended to “Develop a suitable methodology for the network and local risk assessments”

[2]

*Expert group II**Harmonizing the practices, models and tools used for risk evaluations*

Calibrating models	Using different models, the EU funded “Assurance” project demonstrated that risk estimations can vary significantly. It means that, for the results to be comparable, the use of different models in a harmonized risk-based decision framework would either require a calibration of the different models or using the same and unique model in the same way. It was reported that Netherlands has made mandatory the use of one model in risk assessment for elaborating decisions in the field of TDG. Maybe it is a way to follow at EU and international level to make risk-based decision mutually recognized.	[3]
	It is recommended to “Conduct an initial network risk assessment as a research study, using voluntary assistance from MS”	[2]

*Expert group III**Harmonizing the risk management processes, decision methods and criteria*

Key success factors: [3]

- ***Better communication towards the public on continuous safety improvements in the field of transport of dangerous goods is necessary. Perception and emotional reaction cannot be the basis of a stable and robust policy on Transport of Dangerous Goods risk management.***

- ***Making consistent the decisions made at local and global level is achievable under the condition that both local and global decision makers accept to establish a framework which will balance in a transparent and agreed manner the individual risks and societal risk levels.***

Issues:**Potential solutions:**

Consistency of models calibration with the risk acceptance criteria.	Theoretically accurate models provide results which could directly be compared to values affected to risk acceptance criteria. However, as in practice there are quite large uncertainties in risk estimations models and data, it might be necessary to calibrate the models in order to be sure that their results can be assessed against established risk acceptance criteria.	[3]
Expertise is not always available to calculate risks correctly / Groups of experts often have several methodological approaches / it is difficult to have a common methodology accepted by all involved experts	A system of accreditation/certification could be developed (it has been developed in railways). This system would allow competent authorities to better rely on the results of the risk assessments performed by independent risk assessors even in the case competent authorities would not have all the necessary in-house competence to judge the quality of the provided results. The situation concerning the availability of the necessary expertise may differ from one category of stakeholder to another.	[3]

*Expert group III**Harmonizing the risk management processes, decision methods and criteria*

	Risk assessment experts need to be carefully selected and trained. They shall also have no conflict of interest with the studied cases.	
Use of F/N curves, qualitative criteria	F/N curves could be used to assess the risks of the scenarios considered. However, these curves are not harmonized today. It should also be offered the possibility to use qualitative criteria.	[3]
Emotional perception of the risks is not always representative of the actual safety statistics	Better communication on the actual level of risks of all modes of transport should be promoted. An attempt to estimate EU risks levels in the carriage of dangerous goods is provided in the background document. Common risk acceptance criteria should be established on the basis of the actually achieved safety levels and improvement targets. The criteria and targets should be balanced for all modes of transport and should support the use of the less risky modes of transport. Transparency on actual safety level would facilitate the communication with the public.	[3]
Risk acceptance criteria are not used at all or not used in a harmonized way in risk-based decisions	A study on the feasibility to develop risk acceptance criteria has been launched by the European Commission. The results of this study should be considered as an input to future discussions/developments.	[3]
Different objectives may require the use of different models and/or different types of risk acceptance criteria.	A harmonized framework should be able to take into account different decision type, with different objectives, for example: <ul style="list-style-type: none"> - maintaining the level of safety within established levels, - improving the safety levels toward agreed targets, - stating if a safety level is sufficient enough in order not to require further improvements. 	[3]
Decisions on risk control measure are often obscure and complex to understand	A good decision framework should clearly show, with examples, how to use risk models in combination with risk acceptance criteria for different types of decision to be taken. The framework should be understandable by non-experts; the resulting decisions should be transparent and accessible to the concerned parties and the public.	[3]
Modes of transport have a different legal framework as regards risk acceptance criteria.	A harmonized decision making framework applicable to all modes of transport, assorted with the use of common risk acceptance criteria, seems necessary, to avoid uncontrolled risk shifting from one mode to another. The requirements in terms of risk assessment and evaluation should be the same	[3]

*Expert group III**Harmonizing the risk management processes, decision methods and criteria*

	<p>for all transport modes, avoiding higher burdens on some of the modes.</p> <p>It would also facilitate the assessment of multimodal transport chain, which is nearly impossible today.</p> <p>It is recommended to establish a new directive on DG safety in all transport modes. This would include road, rail and inland waterways. It would state the harmonised RAC and 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 covering 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. It would also specify a common methodology for the risk assessment, and principles for collecting the necessary data</p>	[2]
Decisions based on accidents probabilities and cost-benefit analysis are difficult to be communicated to the public	There is a common understanding that zero risk does not exist, therefore it would be useful for authorities to establish a harmonized risk level threshold in international laws below which it is commonly agreed that no additional risk reduction measure going beyond the agreed reference level can be requested.	[3]
Absence/lack of mutual recognition	A harmonized risk-based decision framework including common risk-acceptance criteria is the basis for the mutual recognition that a decision taken by a country/authority/company is acceptable for another country/authority/company.	[3]
The regulations governing the transport of dangerous goods are not perceived as sufficient to control the risks locally	The workshop was of the view that Seveso approach to the control of major hazards is not applicable to the transport modes and would not allow achieving a better control of risks related to the transport of dangerous goods. The main problem is that Seveso framework does not consider the transport activity as an entire system and thus cannot prevent unexpected impact of local decisions on the system. Risk shifting instead of risk reduction is one of the commonly agreed problems in using Seveso-based approach for transport activities. Clear examples were provided showing that some decisions (new rules) taken after accidents have had the impact to shift traffic and to increase the risks elsewhere instead of reducing the risk for citizens.	[3]
Applicable national rules are not always transparent and/or justified	It is noted that, while the Seveso directive does not apply to the transport modes, in many countries additional rules have been established following the approach of the Seveso directive. These additional rules needs to be transparent and should not contradict the international regulation on the transport of dangerous goods. It is also noted that, in principle, the international regulation already ensure	[3]

*Expert group III**Harmonizing the risk management processes, decision methods and criteria*

	the level of safety which is implicitly considered as sufficient by the States.	
Different requirement levels in legislative frameworks	In the case of railways it is commonly agreed that the combination of RID and EU Railway Safety directive globally ensures a sufficient level of safety and that the Seveso directive is not adequate for managing the risks of transport of dangerous goods. Safety of road transport of dangerous goods is based on ADR regulation. General road safety improvement targets are part of the EU policy; however no targets are defined for the transport of dangerous goods by road. Road transport is also less affected by local safety decisions because the network is denser than for other inland transport modes.	[3]
	A way to solve the differences between modes in safety level requirements would be to establish a common risk management framework to all inland modes of transport with clear interface with local risk management requirements.	
	It is recommended to adjust	[2]
	“the Commission’s existing policy on road safety to include TDG risks explicitly”	
	and to adjust	
	“the common safety targets (CSTs) for rail safety to include TDG risks explicitly”	
The existing modes of transport differ substantially, their current legal framework also differ from the major hazards management framework	The establishment of a harmonized risk management framework shall provide for high level principles and requirements concerning the way decisions makers establish the risk control measures. There must be a mutual recognition of the transports and Seveso-based decision framework with clear responsibility delimitations. It must be recognized and applied by all concerned actors.	[3]