



**Organization for Security and Co-operation in Europe
Secretariat**

EEF.IO/18/08

19 May 2008

ENGLISH only

Conference Services

The 16th Meeting of the OSCE Economic and Environmental Forum

**“Maritime and inland waterways co-operation in the OSCE area:
Increasing security and protecting the environment”**

Part 2 / Prague, 19 – 21 May 2008

**Plenary Session I
Review of the implementation of OSCE commitments**

Please find attached the presentation by the speaker, Mr. Olivier Kervella, Chief, Dangerous Goods and Special Cargos Section, Transport Division, UNECE.

Review of the implementation of OSCE commitments in the economic and environmental dimension

Transport of Dangerous Goods

16th OSCE Economic and Environmental Forum
Prague, 19 - 21 May 2008

Olivier Kervella
Chief, Dangerous Goods and Special Cargoes Section
United Nations Economic Commission for Europe (UNECE)

© United Nations Economic Commission for Europe

1

Contents

1. Introduction
2. Dangerous goods: examples
3. Dangerous goods: accidents
4. UN regulatory framework
5. Requirements
6. Enforcement
7. Recommendations by UNECE secretariat
8. Project proposals

© United Nations Economic Commission for Europe

2

Introduction Transport of dangerous goods

Dangerous goods:

- are produced and transported in very large quantities;
- cover a very large range of products;
- present risks for the population in general, property and the environment (at all stages of their lifecycle)

© United Nations Economic Commission for Europe

3

Dangerous Goods (examples) Class 1: Explosives



Military ammunitions, bombs, etc (all types); Industrial explosives (dynamite...), Fireworks...

© United Nations Economic Commission for Europe

4

Dangerous Goods (examples) Class 2: Divisions 2.1, 2.2 and 2.3



Gases compressed, liquefied or refrigerated

Div. 2.1: Flammable gases
(propane, LPG, cigarette lighters)

Div. 2.2: Non-flammable, non-toxic
gases
(air, oxygen, nitrogen, helium)



Div.2.3: Toxic gases
(ammonia, chlorine)

© United Nations Economic Commission for Europe

5

Dangerous Goods (examples) Class 3: Flammable liquids



Petroleum products, Paints, Alcoholic beverages

© United Nations Economic Commission for Europe

6

Dangerous Goods (examples) Class 4: Div. 4.1, 4.2 and 4.3



- Div. 4.1: Flammable solids (Sulphur, matches)
- Div. 4.2: Substances liable to spontaneous combustion (phosphorus; fish meal, seed cake)
- Div. 4.3: In contact with water emit flammable gases (metal powders; sodium)

Dangerous Goods (examples) Class 5: Div. 5.1 and 5.2



Div. 5.1: Oxidizing substances
(Ammonium nitrate fertilizers, hydrogen peroxide, bleaching agents)

Div. 5.2: Organic peroxides
(Dibenzoyl peroxide, catalysts for polyester resin)

Dangerous Goods (examples) Class 6: Div. 6.1 and 6.2



- Div. 6.1: Toxic substances (Sodium cyanide, pesticides)
- Div. 6.2: Infectious substances (Cultures for bacteria, viruses, etc; medical diagnostic specimens, medical wastes)

Dangerous Goods (examples) Class 7: Radioactive material



Nuclear fuel,
Uranium hexafluoride,
Medical radioisotopes



Dangerous Goods (examples) Class 8: Corrosive substances



Sulphuric acid, Caustic soda, Car batteries

Dangerous Goods (examples) Class 9: Miscellaneous



Environmentally hazardous substances;
Mobile phone/computer batteries...

Dangerous goods in limited quantities



Cosmetics, perfumes, cleaning products...

Dangerous goods in figures (1) United States (1997)

- More than 800,000 shipments per day (estimated)
- 94% truck; 5% air; 1% rail, pipeline and water modes
- 30% of all freight shipped each year (including fuels and gases by pipeline)
- 3.1 billion tons of freight shipped annually (43% truck; 4.4 % rail; 37.9 % pipeline; 14.7 % water; 0.05 % air)

Dangerous goods in figures (2) EU15 (90-02) (inland, excluding pipelines)

Transport of dangerous goods increased from 98.3 to 111.1 billion tonne-km:

- road: + 27.4%
- inland waterways: + 11.1%
- rail: - 9.4%

Substances transported (2002):

- Petroleum products: 54% of all dangerous goods carried
- Gases: 12%
- Flammable liquids (excluding petroleum products): 10%
- Corrosive substances: 8%

Hazardous versus non-hazardous: 8%

Dangerous goods in figures (3) Conclusions

From the statistics in the USA and in Europe, it appears that:

- Transport of dangerous goods increases regularly
- The highest volumes transported are:
 - energy products (petroleum products, flammable gases)
 - flammable liquids and gases (other than energy products)
 - corrosive substances
- Road transport is by far the most used inland transport mode (in terms of quantities and of number of shipments)

Accidents (1)



1917 Halifax (Canada):

- Substance involved: 2600 tons of explosives
- Mode of transport: by sea
- 1250 people killed; 15 ships destroyed or damaged



1947 Texas City (USA):

- Substance involved: ammonium nitrate
- Mode of transport: by sea
- 468 people killed; 2 ships and 2 planes destroyed

Accidents (2)



1978 Los Alfaques (Spain):

- Substance involved: 43 m³ liquefied propylene
- Mode of transport: by road
- 217 people killed; 400 yards devastated in all directions



1979 Mississauga (Canada):

- Substance involved: toluene, propane, chlorine...
- Mode of transport: by rail
- 250000 people evacuated

Accidents (3)

1990 Bangkok (Thailand):

- Substance involved: LPG
- Mode of transport: by road
- 63 people killed; 90 injured

1998 Yaounde (Cameroun):

- Substance involved: petroleum products
- Mode of transport: by rail
- 220 people killed; 130 injured

Accidents (4)

1998 Kirghizstan:

- Substance involved: 1800 kg of sodium cyanide
- Mode of transport: by road
- Hundreds of people injured due to contamination of water

1999 Tauerntunnel (Austria):

- Substance involved: lacquer
- Mode of transport: by road
- 12 people killed; 50 injured; close of the tunnel for 3 months, economic cost: 17 millions DM

Accidents (5)



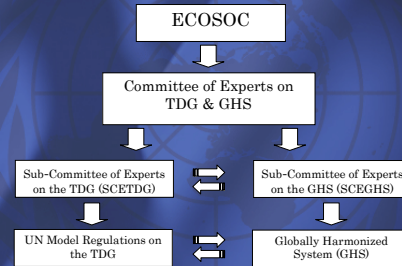
Accidents have also negative effects on the environment.

Well-known examples are oil spillages:

- Torrey-Canyon;
- Amoco Cadiz;
- Exxon Valdez;
- Erika...

although small spillages of highly toxic substances may also have disastrous effects.

UN Regulatory framework (1)



UN Regulatory framework (2) Mandate of the CETDG

To elaborate recommendations:

- addressed to all governments and international organizations concerned with the safety of transport of dangerous goods;
- allowing the uniform development of national and international regulations governing the various modes of transport.



“UN Recommendations on the Transport of Dangerous Goods, Model Regulations” (“Orange Book”).

UN Regulatory framework (3) Orange and Purple books

“Orange Book”:
UN Recommendations on the Transport of Dangerous Goods, Model Regulations



“Purple Book”:
Globally Harmonized System of classification and labelling of chemicals (GHS)



UN Regulatory framework (4) UN Model Regulations

Contain all necessary provisions concerning:

- classification and identification of dangerous goods;
- packing conditions (including standards for packaging and tank construction);
- labelling, marking and placarding of packages and transport equipment; and
- transport documentation

Apply to all modes of transport but remain flexible enough to accommodate any special additional requirements that would have to be met by specific modes of transport, or at national or regional level.

UN Regulatory framework (5)

It is recommended that:

- all governments (when developing national regulations) and
- international organizations (when developing regional or internationally legally binding instruments),

follow the same structure and implement the provisions contained in UN Model Regulations.

Its provisions may also be supplemented by specific provisions or requirements specific to one mode of transport when those are not addressed in the Model Regulations.

UN Regulatory framework (6) (Global application)

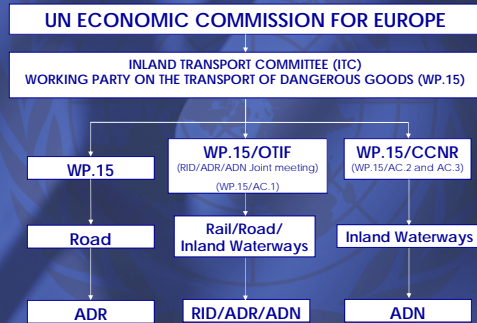
Maritime transport:
IMDG Code
(mandatory 155 countries)



**Air transport: ICAO
Technical Instructions**
(mandatory 188 countries)



UN Regulatory framework (7) (Regional application)



UN Regulatory framework (8) (Regional application)

Road: ADR
(43)



Rail: RID
(42)



Waterways: ADN
(8)



UN Regulatory framework (9) (Regional application)

SMGS countries (rail): Annex 2 of SMGS

ASEAN countries:

Protocol No.9 to the ASEAN Framework Agreement on the Facilitation of Goods in Transit (Signed on September 2002)

MERCOSUR countries:

Agreement for the facilitation of inland transport of dangerous goods (annexes based on the 7th edition of the UN Model Regulations)

ANDEAN countries:

Considering using the 13th revised edition of the UN Model Regulations and/or ADR/RID

UN Regulatory framework (10) (National application)

European Union:

Directives 94/55/EC and 96/49/EC will be soon repealed and replaced by one single directive applicable to inland transport of dangerous goods (road, rail, inland waterways) making the requirements of ADR, RID and ADN applicable to domestic and intracommunautary traffic by reference.

North America:

Canadian and USA regulations based on the 14th revised edition of the UN Model Regulations

Other countries:

Australia, Brazil, China, Japan, etc.

Requirements (1) Limited quantities



Packagings containing dangerous goods in limited quantities only need to conform to some general requirements

Requirements (2) “Classic packagings”



Up to 400 kg/450 l, such as drums, jerricans, boxes, bags, etc.



Requirements (3) IBCs and large packagings



Requirements (4) Tanks



Requirements (5) “UN mark”



UN 4G/Y31/S/03/GB/1919

Requirements (6) Examples of performance tests



Drop test (2.10 m)

Hydraulic pressure test

© United Nations Economic Commission for Europe

37

Requirements (7) ADR/RID tank



© United Nations Economic Commission for Europe

38

Requirements (8) Hazard labels

Affixing appropriate hazard label(s) on the packages:

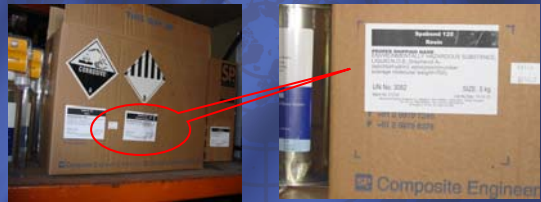


© United Nations Economic Commission for Europe

39

Requirements (9) Marks (UN No. and PSN)

Marking the UN (identification) number of the goods on the package, and the "Proper Shipping Name"



UN No.: 3082

Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

© United Nations Economic Commission for Europe

40

Requirements (10) Placards

Affixing placards on the cargo transport units (vehicles, wagons, containers, tanks) and displaying, either on these placards or on separate orange plates, the UN identification number;



© United Nations Economic Commission for Europe

41

Requirements (11) Transport document

Providing details of the dangerous goods offered for shipment in the transport document (i.e. UN No., name, hazard class, etc).

© United Nations Economic Commission for Europe

42

Requirements (12) Training (UN Model Regulations)

Human errors are the main cause of accidents.

The UN Model Regulations (and related legal instruments):

- (a) require training of all persons engaged in the transport of dangerous goods:
 - in the contents of dangerous goods requirements;
 - commensurate with their responsibilities; and
- (b) lay down specific provisions regarding:
 - general awareness/familiarization training,
 - function specific training,
 - safety training, records of training, etc.

Training can be provided by the employer

Requirements (13) Training RID/ADR/ADN

ADR requires:

- Training for drivers of road vehicles (ADR driver training certificate) (initial training and refreshers courses); and
- Specific additional training for drivers of tank vehicles, vehicles carrying explosives and vehicles carrying radioactive material.

ADN requires:

- experts trained every 5 years be on board chemical and gas tankers

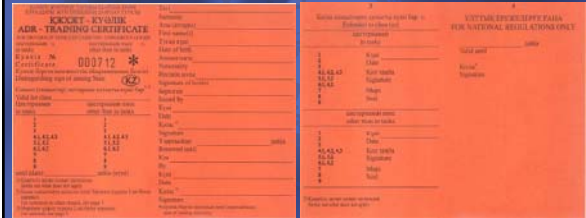
RID/ADR/ADN also require the appointment of a dangerous goods safety adviser (DGSA) holding a vocational training certificate.

Requirements (14) ADR training certificate for drivers



Belarusian certificate (sample)

Requirements (15) ADR training certificate for drivers



Kazakhstan certificate (sample)

Requirements (16) Security

After September 11th new security provisions

2 types:

- (a) General provisions applicable to all dangerous goods:
 - security of areas for temporary storage of dangerous goods
 - identification of carriers and their staff
 - registration of valid training certificates
- (b) Provisions applicable to "high consequence dangerous goods": compliance with a security plan

Requirements (17) Operational

General: all modes of transport (UN Model Regulations)

- use of packagings, bulk packagings and tanks.

Mode specific:

- loading, unloading and handling;
- stowage and segregation;
- restrictions;
- provisions in the event of incidents and for fire precautions;
- requirements for vehicle crew and equipment;
- supervision;

Requirements (18) Means of transport



SOLAS, MARPOL
certificates
ADN certificate



ADR certificate

Enforcement (1) Controls



- Responsibility of the national authorities
- Necessary to incite to compliance;
- Effective tool:
 - to reveal problems related to:
 - safety of transport or
 - practicability of regulations
 - to improve the practicability of the regulations

Provisions for the control of compliance with the applicable requirements are to be found in the relevant conventions or national legislation (e.g.: Chapter 1.8 of ADR/RID/ADN).

Enforcement (2) Problems of compliance

Requirements for international transport for one mode of transport \neq Requirements for domestic transport for the same mode of transport

Problems of compliance

Harmonization of national and international rules is an important factor:

- for better compliance with safety requirements and
- for transport facilitation

Recommendations by UNECE secretariat

To improve safety and to ensure full harmonization of rules and regulations applicable to all modes of transport in UNECE countries linked by road, rail or inland waterways, the UNECE recommends:

- (1) Accession to ADR and ADN
- (2) Harmonization of transport of dangerous goods regulations contained in SMGS with those contained in RID, whenever appropriate;
- (3) Application of the requirements of ADR, RID and ADN to domestic traffic in all countries contracting parties to those agreements.

Project proposal 1: Implementation of ADR

Objective:

Monitoring effective implementation of ADR in volunteer countries that have recently acceded to ADR but which do not participate regularly in related UNECE activities

Excepted accomplishments:

- Identification of implementation problems;
- Implementation of best administrative practices for the proper enforcement of ADR;
- Elimination of international transport facilitation problems linked to the lack of administrative structures or improper interpretation of ADR.

Project proposal 2: Harmonization: National regulations/ADR

Objective:

Harmonization of national regulations with ADR in volunteer countries.

Excepted accomplishments:

- Identification of divergences national/international;
- Development of national regulations, harmonized with the international framework and related administrative structures;
- Improved enforcement through harmonization of national and international rules.

Project proposal 3: Accession to ADR

Objective:

Assisting volunteer UNECE countries to accede to ADR

Excepted accomplishments:

- Evaluation of the situation in the country;
- Development of adequate administrative structures for approval of packagings and transport equipment;
- Accession to ADR.

Thank you for your attention!

Further information on the UNECE activities related to transport of dangerous goods is available at:

<http://www.unece.org/trans/danger/danger.htm>