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ANNEX B

PROVISIONS CONCERNING TRANSPORT EQUIPMENT AND TRANSPORT OPERATIONS

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PART 8

Requirements for vehicle crews, equipment, operation and documentation

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CHAPTER 8.1

GENERAL REQUIREMENTS CONCERNING TRANSPORT UNITS AND EQUIPMENT ON BOARD

8.1.1 Transport units

A transport unit loaded with dangerous goods may in no case include more than one trailer (or semi-trailer).

8.1.2 Documents to be carried on the transport unit

8.1.2.1 In addition to the documents required under other regulations, the following documents shall be carried on the transport unit:

(a) The transport documents prescribed in 5.4.1, covering all the dangerous goods carried and, when appropriate, the large container or vehicle packing certificate prescribed in 5.4.2;

(b) The instructions in writing prescribed in 5.4.3;

(c) *(Reserved)*;

(d) Means of identification, which include a photograph, for each member of the vehicle crew, in accordance with 1.10.1.4.

8.1.2.2 Where the provisions of ADR require the following documents to be drawn up, they shall likewise be carried on the transport unit:

(a) The certificate of approval referred to in 9.1.3 for each transport unit or element thereof;

(b) The driver's training certificate prescribed in 8.2.1;

(c) A copy of the competent authority approval, when required in 5.4.1.2.1 (c) or (d) or 5.4.1.2.3.3.

8.1.2.3 The instructions in writing prescribed in 5.4.3 shall be kept readily available.

8.1.2.4 *(Deleted)*

8.1.3 Placarding and marking

Transport units carrying dangerous goods shall be placarded and marked in conformity with Chapter 5.3.

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8.1.4 Fire-fighting equipment

8.1.4.1 The following provisions apply to transport units carrying dangerous goods other than those referred to in 8.1.4.2:

(a) Every transport unit shall be equipped with at least one portable fire extinguisher for the inflammability classes [1] A, B and C, with a minimum capacity of 2 kg dry powder (or an equivalent capacity for any other suitable extinguishant agent) suitable for fighting a fire in the engine or cab of the transport unit;

(b) Additional equipment is required as follows:

(i) for transport units with a maximum permissible mass of more than 7.5 tonnes, one or more portable fire extinguishers for the inflammability classes [1] A, B and C, with a minimum total capacity of 12 kg dry powder (or an equivalent capacity for any other suitable extinguishing agent), of which at least one shall have a minimum capacity of 6 kg;

(ii) for transport units with a maximum permissible mass of more than 3.5 tonnes up to and including 7.5 tonnes, one or more portable fire extinguishers for the inflammability classes [1] A, B and C, with a minimum total capacity of 8 kg dry powder (or an equivalent capacity for any other suitable extinguishing agent), of which at least one shall have a minimum capacity of 6 kg;

(iii) for transport units with a maximum permissible mass of up to and including 3.5 tonnes, one or more portable fire extinguishers for the inflammability classes [1] A, B and C with a minimum total capacity of 4 kg dry powder (or an equivalent capacity for any other suitable extinguishing agent);

(c) The capacity of the fire extinguisher(s) required under (a) may be deducted from the minimum total capacity of the extinguishers required under (b).

8.1.4.2 Transport units carrying dangerous goods in accordance with 1.1.3.6 shall be equipped with one portable fire extinguisher for the inflammability classes [1] A, B and C, with a minimum capacity of 2 kg dry powder (or an equivalent capacity for any other suitable extinguishing agent).

8.1.4.3 The portable fire extinguishers shall be suitable for use on a vehicle and shall comply with the relevant requirements of EN 3 Portable fire extinguishers, Part 7 (EN 3-7:2004 + A1:2007).

If the vehicle is equipped with a fixed fire extinguisher, automatic or easily brought into action for fighting a fire in the engine, the portable extinguisher need not be suitable for fighting a fire in the engine. The extinguishing agents shall be such that they are not liable to release toxic gases into the driver's cab or under the influence of the heat of the fire.

8.1.4.4 The portable fire extinguishers conforming to the provisions of 8.1.4.1 or 8.1.4.2 shall be fitted with a seal verifying that they have not been used.

In addition, they shall bear a mark of compliance with a standard recognized by a competent authority and an inscription at least indicating the date (month, year) of the next recurrent inspection or of the maximum permissible period of use, as applicable.

The fire extinguishers shall be subjected to periodic inspections in accordance with authorized national standards in order to guarantee their functional safety.

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[1] *For the definition of the inflammability classes, see Standard EN 2:1992 Classification of fires.*

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8.1.4.5 The fire extinguishers shall be installed on the transport units in a way that they are easily accessible to the vehicle crew. The installation shall be carried out in such a way that the fire extinguishers shall be protected against effects of the weather so that their operational safety is not affected.

8.1.5 Miscellaneous equipment and equipment for personal protection

8.1.5.1 Each transport unit carrying dangerous goods shall be provided with items of equipment for general and personal protection in accordance with 8.1.5.2. The items of equipment shall be selected in accordance with the danger label number of the goods loaded. The label numbers can be identified through the transport document.

8.1.5.2 The following equipment shall be carried on board the transport unit:

- For each vehicle, a wheel chock of a size suited to the maximum mass of the vehicle and to the diameter of the wheel;
- Two self-standing warning signs;
- Eye rinsing liquid[2]; and

for each member of the vehicle crew

- A warning vest (e.g. as described in the EN 471 standard);
- Portable lighting apparatus conforming to the provisions of 8.3.4;
- A pair of protective gloves; and
- Eye protection (e.g. protective goggles).

8.1.5.3 Additional equipment required for certain classes:

- An emergency escape mask[3] for each member of the vehicle crew shall be carried on board the vehicle for danger label numbers 2.3 or 6.1;
- A shovel[4];
- A drain seal[4];
- A collecting container[4].

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[2] *Not required for danger label numbers 1, 1.4, 1.5, 1.6, 2.1, 2.2 and 2.3.*

[3] *For example an emergency escape mask with a combined gas/dust filter of the A1B1E1K1-P1 or A2B2E2K2-P2 type which is similar to that described in the EN 141 standard.*

[4] *Only required for solids and liquids with danger label numbers 3, 4.1, 4.3, 8 or 9.*

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CHAPTER 8.2

REQUIREMENTS CONCERNING THE TRAINING OF THE VEHICLE CREW

8.2.1 Scope and general requirements concerning the training of drivers

8.2.1.1 Drivers of vehicles carrying dangerous goods shall hold a certificate issued by the competent authority stating that they have participated in a training course and passed an examination on the particular requirements that have to be met during carriage of dangerous goods.

8.2.1.2 Drivers of vehicles carrying dangerous goods shall attend a basic training course. Training shall be given in the form of a course approved by the competent authority. Its main objectives are to make drivers aware of hazards arising in the carriage of dangerous goods and to give them basic information indispensable for minimizing the likelihood of an incident taking place and, if it does, to enable them to take measures which may prove necessary for their own safety and that of the public and the environment, for limiting the effects of an incident. This training, which shall include individual practical exercises, shall act as the basis of training for all categories of drivers covering at least the subjects defined in 8.2.2.3.2. The competent authority may approve basic training courses limited to specific dangerous goods or to a specific class or classes. These restricted basic training courses shall not be provided for drivers of vehicles referred to in 8.2.1.4.

8.2.1.3 Drivers of vehicles or MEMUs carrying dangerous goods in fixed tanks or demountable tanks with a capacity exceeding 1 m^3, drivers of battery-vehicles with a total capacity exceeding 1 m^3 and drivers of vehicles or MEMUs carrying dangerous goods in tank-containers, portable tanks or MEGCs with an individual capacity exceeding 3 m^3 on a transport unit, shall attend a specialization training course for carriage in tanks covering at least the subjects defined in 8.2.2.3.3. The competent authority may approve tank specialization training courses limited to specific dangerous goods or to a specific class or classes. These restricted tank specialization training courses shall not be provided for drivers of vehicles referred to in 8.2.1.4.

8.2.1.4 Drivers of vehicles carrying substances or articles of Class 1, other than substances and articles of Division 1.4, compatibility group S (see additional requirement S1 in Chapter 8.5), drivers of MEMU carrying mixed loads of substances or articles of Class 1 and substances of Class 5.1 (see 7.5.5.2.3) and drivers of vehicles carrying certain radioactive material (see special provisions S11 and S12 in Chapter 8.5) shall attend specialization training courses covering at least the subjects defined in 8.2.2.3.4 or 8.2.2.3.5.

8.2.1.5 All training courses, practical exercises, examinations and the role of competent authorities shall comply with the provisions of 8.2.2.

8.2.1.6 All training certificates conforming to the requirements of this section and issued in accordance with 8.2.2.8 by the competent authority of a Contracting Party shall be accepted during their period of validity by the competent authorities of other Contracting Parties.

8.2.2 Special requirements concerning the training of drivers

8.2.2.1 The necessary knowledge and skills shall be imparted by training covering theoretical courses and practical exercises. The knowledge shall be tested in an examination.

8.2.2.2 The training body shall ensure that the training instructors have a good knowledge of, and take into consideration, recent developments in regulations and training requirements relating to the carriage of dangerous goods. The training shall be practice-related. The

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training programme shall conform with the approval referred to in 8.2.2.6, on the subjects set out in 8.2.2.3.2 to 8.2.2.3.5. The training shall also include individual practical exercises (see 8.2.2.3.8).

8.2.2.3 ***Structure of training***

8.2.2.3.1 Training shall be given in the form of a basic training course and, when applicable, specialization training courses. Basic training courses and specialization training courses may be given in the form of comprehensive training courses, conducted integrally, on the same occasion and by the same training body.

8.2.2.3.2 Subjects to be covered by the basic training course shall be, at least:

(a) General requirements governing the carriage of dangerous goods;

(b) Main types of hazard;

(c) Information on environmental protection in the control of the transfer of wastes;

(d) Preventive and safety measures appropriate to the various types of hazard;

(e) What to do after an accident (first aid, road safety, basic knowledge about the use of protective equipment, instructions in writing, etc.);

(f) Marking, labelling, placarding and orange-coloured plate marking;

(g) What a driver should and should not do during the carriage of dangerous goods;

(h) Purpose and the method of operation of technical equipment on vehicles;

(i) Prohibitions on mixed loading in the same vehicle or container;

(j) Precautions to be taken during loading and unloading of dangerous goods;

(k) General information concerning civil liability;

(l) Information on multimodal transport operations;

(m) Handling and stowage of packages;

(n) Traffic restrictions in tunnels and instructions on behaviour in tunnels (prevention of incidents, safety, action in the event of fire or other emergencies, etc.);

(o) Security awareness.

8.2.2.3.3 Subjects to be covered by the specialization training course for carriage in tanks shall be, at least:

(a) Behaviour of vehicles on the road, including movements of the load;

(b) Specific requirements of the vehicles;

(c) General theoretical knowledge of the various and different filling and discharge systems;

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(d) Specific additional provisions applicable to the use of those vehicles (certificates of approval, approval marking, placarding and orange-coloured plate marking, etc.).

8.2.2.3.4 Subjects to be covered by the specialization training course for the carriage of substances and articles of Class 1 shall be, at least:

(a) Specific hazards related to explosive and pyrotechnical substances and articles;

(b) Specific requirements concerning mixed loading of substances and articles of Class 1.

8.2.2.3.5 Subjects to be covered by the specialization training course for the carriage of radioactive material of Class 7 shall be, at least:

(a) Specific hazards related to ionizing radiation;

(b) Specific requirements concerning packing, handling, mixed loading and stowage of radioactive material;

(c) Special measures to be taken in the event of an accident involving radioactive material.

8.2.2.3.6 Teaching units are intended to last 45 minutes.

8.2.2.3.7 Normally, not more than eight teaching units are permitted on each training day.

8.2.2.3.8 The individual practical exercises shall take place in connection with the theoretical training, and shall at least cover first aid, fire-fighting and what to do in case of an incident or accident.

8.2.2.4 ***Initial training programme***

8.2.2.4.1 The minimum duration of the theoretical element of each initial training course or part of the comprehensive training course shall be as follows:

Basic training course	18 teaching units
Specialization training course for carriage in tanks	12 teaching units
Specialization training course for carriage of substances and articles of Class 1	8 teaching units
Specialization training course for carriage of radioactive material of Class 7	8 teaching units

For the basic training course and the specialization training course for carriage in tanks, additional teaching units are required for practical exercises referred to in 8.2.2.3.8 which will vary depending on the number of drivers under instruction.

8.2.2.4.2 The total duration of the comprehensive training course may be determined by the competent authority, who shall maintain the duration of the basic training course and the specialization training course for tanks, but may supplement it with shortened specialization training courses for Classes 1 and 7.

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8.2.2.5 ***Refresher training programme***

8.2.2.5.1 Refresher training undertaken at regular intervals serves the purpose of bringing the drivers' knowledge up to date; it shall cover new technical, legal and substance-related developments.

8.2.2.5.2 The duration of the refresher training including individual practical exercises shall be of at least two days for comprehensive training courses, or at least one half the duration allocated to the corresponding initial basic or initial specialization training courses as specified in 8.2.2.4.1 for individual training courses.

8.2.2.5.3 A driver may replace a refresher training course and examination with the corresponding initial training course and examination.

8.2.2.6 ***Approval of training***

8.2.2.6.1 The training courses shall be subject to approval by the competent authority.

8.2.2.6.2 Approval shall only be given with regard to applications submitted in writing.

8.2.2.6.3 The following documents shall be attached to the application for approval:

(a) A detailed training programme specifying the subjects taught and indicating the time schedule and planned teaching methods;

(b) Qualifications and fields of activities of the teaching personnel;

(c) Information on the premises where the courses take place and on the teaching materials as well as on the facilities for the practical exercises;

(d) Conditions of participation in the courses, such as number of participants.

8.2.2.6.4 The competent authority shall organize the supervision of training and examinations.

8.2.2.6.5 Approval shall be granted in writing by the competent authority subject to the following conditions:

(a) The training shall be given in conformity with the application documents;

(b) The competent authority shall be granted the right to send authorized persons to be present at the training courses and examinations;

(c) The competent authority shall be advised in time of the dates and the places of the individual training courses;

(d) The approval may be withdrawn if the conditions of approval are not complied with.

8.2.2.6.6 The approval document shall indicate whether the courses concerned are basic or specialization training courses, initial or refresher training courses, and whether they are limited to specific dangerous goods or a specific class or classes.

8.2.2.6.7 If the training body, after a training course has been given approval, intends to make any alterations with respect to such details as were relevant to the approval, it shall seek permission in advance from the competent authority. This applies in particular to changes concerning the training programme.

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8.2.2.7 ***Examinations***

8.2.2.7.1 *Examinations for the basic training course*

8.2.2.7.1.1 After completion of the basic training, including the practical exercises, an examination shall be held on the corresponding basic training course.

8.2.2.7.1.2 In the examination, the candidate has to prove that he has the knowledge, insight and skill for the practice of professional driver of vehicles carrying dangerous goods as provided in the basic training course.

8.2.2.7.1.3 For this purpose the competent authority shall prepare a catalogue of questions which refer to the items summarized in 8.2.2.3.2. Questions in the examination shall be drawn from this catalogue. The candidates shall not have any knowledge of the questions selected from the catalogue prior to the examination.

8.2.2.7.1.4 A single examination for comprehensive training courses may be held.

8.2.2.7.1.5 Each competent authority shall supervise the modalities of the examination.

8.2.2.7.1.6 The examination shall take the form of a written examination or a combination of a written and oral examination. Each candidate shall be asked at least 25 written questions for the basic training course. If the examination follows a refresher training course, at least 15 written questions shall be asked. The duration of these examinations shall be at least 45 and 30 minutes respectively. The questions may be of a varying degree of difficulty and be allocated a different weighting.

8.2.2.7.2 *Examinations for specialization training courses for carriage in tanks or carriage of substances and articles of Class 1 or radioactive material of Class 7*

8.2.2.7.2.1 After having sat the examination on the basic training course and after having attended the specialization training course for carriage in tanks or carriage of substances and articles of Class 1 or radioactive material of Class 7, the candidate shall be allowed to take part in the examination corresponding to the training.

8.2.2.7.2.2 This examination shall be held and supervised on the same basis as in 8.2.2.7.1. The catalogue of questions shall refer to the items summarized in 8.2.2.3.3, 8.2.2.3.4 or 8.2.2.3.5, as appropriate.

8.2.2.7.2.3 With respect to each specialization training examination, at least 15 written questions shall be asked. If the examination follows a refresher training course, at least 10 written questions shall be asked. The duration of these examinations shall be at least 30 and 20 minutes respectively.

8.2.2.7.2.4 If an examination is based on a restricted basic training course, this limits the examination of the specialization training course to the same scope.

8.2.2.8 ***Certificate of driver's training***

8.2.2.8.1 The certificate referred to in 8.2.1.1 shall be issued:

(a) After completion of a basic training course, provided the candidate has successfully passed the examination in accordance with 8.2.2.7.1;

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(b) If applicable, after completion of a specialization training course for carriage in tanks or carriage of substances and articles of Class 1 or radioactive material of Class 7, or after having acquired the knowledge referred to in special provisions S1 and S11 in Chapter 8.5, provided the candidate has successfully passed an examination in accordance with 8.2.2.7.2;

(c) If applicable, after completion of a restricted basic or restricted tank specialization training course, provided the candidate has successfully passed the examination in accordance with 8.2.2.7.1 or 8.2.2.7.2. The certificate issued shall clearly indicate its limited scope of validity to the relevant dangerous goods or class(es).

8.2.2.8.2 The date of validity of a driver training certificate shall be five years from the date the driver passes an initial basic or initial comprehensive training examination.

The certificate shall be renewed if the driver furnishes proof of participation in refresher training in accordance with 8.2.2.5 and has passed an examination in accordance with 8.2.2.7 in the following cases:

(a) In the twelve months before the date of expiry of the certificate. The competent authority shall issue a new certificate, valid for five years, the period of validity of which shall begin with the date of expiry of the previous certificate;

(b) Prior to the twelve months before the date of expiry of the certificate. The competent authority shall issue a new certificate, valid for five years, the period of validity of which shall begin from the date on which the refresher examination was passed.

Where a driver extends the scope of his certificate during its period of validity, by meeting the requirements of 8.2.2.8.1 (b) and (c), the period of validity of a new certificate shall remain that of the previous certificate. When a driver has passed a specialization training examination, the specialization shall be valid until the date of expiry of the certificate.

8.2.2.8.3 The certificate shall have the layout of the model shown in 8.2.2.8.5. Its dimensions shall be in accordance with ISO 7810:2003 ID-1 and it shall be made of plastic. The colour shall be white with black lettering. It shall include an additional security feature such as a hologram, UV printing or guilloche patterns.

8.2.2.8.4 The certificate shall be prepared in the language(s) or one of the languages of the country of the competent authority which issued the certificate. If none of these languages is English, French or German, the title of the certificate, the title of item 8 and the titles on the back shall also be drawn up in English, French or German.

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8.2.2.8.5 *Model for the training certificate for drivers of vehicles carrying dangerous goods*

Front

ADR DRIVER TRAINING CERTIFICATE

**

(Insert driver photograph) *

1. (CERTIFICATE No.)*
2. (SURNAME)*
3. (OTHER NAME(S))*
4. (DATE OF BIRTH dd/mm/yyyy)*
5. (NATIONALITY)*
6. (DRIVER SIGNATURE)*
7. (ISSUING BODY)*
8. VALID TO: (dd/mm/yyyy)*

Back

VALID FOR CLASS(ES) OR UN Nos.:

TANKS	**OTHER THAN TANKS**
9. (Enter Class or UN Number(s))*	10. (Enter Class or UN Number(s))*

* Replace the text with appropriate data.

** Distinguishing sign used on vehicles in international traffic (for Parties to the 1968 Convention on Road Traffic or the 1949 Convention on Road Traffic, as notified to the Secretary General of the United Nations in accordance with respectively article 45(4) or annex 4 of these conventions).

8.2.3 Training of persons other than the drivers holding a certificate in accordance with 8.2.1, involved in the carriage of dangerous goods by road

Persons whose duties concern the carriage of dangerous goods by road shall have received training in the requirements governing the carriage of such goods appropriate to their responsibilities and duties according to Chapter 1.3. This requirement shall apply to individuals such as personnel who are employed by the road vehicle operator or the consignor, personnel who load or unload dangerous goods, personnel in freight forwarding or shipping agencies and drivers of vehicles other than drivers holding a certificate in accordance with 8.2.1, involved in the carriage of dangerous goods by road.

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CHAPTER 8.3

MISCELLANEOUS REQUIREMENTS TO BE COMPLIED WITH BY THE VEHICLE CREW

8.3.1 Passengers

Apart from members of the vehicle crew, no passengers may be carried in transport units carrying dangerous goods.

8.3.2 Use of fire-fighting appliances

Members of the vehicle crew shall know how to use the fire-fighting appliances.

8.3.3 Prohibition on opening packages

A driver or a driver's assistant may not open a package containing dangerous goods.

8.3.4 Portable lighting apparatus

The portable lighting apparatus used shall not exhibit any metal surface liable to produce sparks.

8.3.5 Prohibition on smoking

Smoking shall be prohibited during handling operations in the vicinity of vehicles and inside the vehicles.

8.3.6 Running the engine during loading or unloading

Except where the engine has to be used to drive the pumps or other appliances for loading or unloading the vehicle and the laws of the country in which the vehicle is operating permit such use, the engine shall be shut off during loading and unloading operations.

8.3.7 Use of the parking brakes and wheel chocks

No vehicles carrying dangerous goods may be parked without the parking brakes being applied. Trailers without braking devices shall be restrained from moving by applying at least one wheel chock as described in 8.1.5.2.

8.3.8 Use of cables

In the case of a transport unit equipped with an anti-lock braking system, consisting of a motor vehicle and an O_3 or O_4 trailer, the connections referred to in paragraph 9.2.2.6.3 shall be connecting the towing vehicle and the trailer at all times during carriage.

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CHAPTER 8.4

REQUIREMENTS CONCERNING THE SUPERVISION OF VEHICLES

8.4.1 Vehicles carrying dangerous goods in the quantities shown in special provisions S1 (6) and S14 to S24 of Chapter 8.5 for a given substance according to Column (19) of Table A of Chapter 3.2 shall be supervised or alternatively may be parked, unsupervised, in a secure depot or secure factory premises. If such facilities are not available, the vehicle, after having been properly secured, may be parked in an isolated position meeting the requirements of (a), (b) or (c) below:

(a) A vehicle park supervised by an attendant who has been notified of the nature of the load and the whereabouts of the driver;

(b) A public or private vehicle park where the vehicle is not likely to suffer damage from other vehicles; or

(c) A suitable open space separated from the public highway and from dwellings, where the public does not normally pass or assemble.

The parking facilities permitted in (b) shall be used only if those described in (a) are not available, and those described in (c) may be used only if facilities described in (a) and (b) are not available.

8.4.2 Loaded MEMUs shall be supervised or alternatively may be parked, unsupervised, in a secure depot or secure factory premises. Empty uncleaned MEMUs are exempted from this requirement.

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CHAPTER 8.5

ADDITIONAL REQUIREMENTS RELATING TO PARTICULAR CLASSES OR SUBSTANCES

In addition to the requirements of Chapters 8.1 to 8.4, when reference is made to them in Column (19) of Table A of Chapter 3.2, the following requirements shall apply to the carriage of the substances or articles concerned. In the event of conflict with the requirements of Chapters 8.1 to 8.4, the requirements of this Chapter shall take precedence.

S1: Additional requirements concerning the carriage of explosive substances and articles (Class 1)

(1) ***Special training of drivers***

(a) The requirements of 8.2.1 shall apply to drivers of vehicles carrying substances or articles of Class 1, other than substances and articles of Division 1.4, compatibility group S;

(b) Drivers of vehicles carrying substances or articles of Class 1, other than substances and articles of Division 1.4, compatibility group S, shall attend a specialization training course covering at least the subjects defined in 8.2.2.3.4;

(c) If, according to other regulations applicable in the country of a Contracting Party, a driver has followed equivalent training under a different regime or for a different purpose, covering the subjects referred to in (b), the specialization course may be totally or partially dispensed with.

(2) ***Approved official***

If the national regulations so provide, the competent authority of a country contracting party to ADR may require an approved official to be carried in the vehicle at the carrier's expense.

(3) ***Prohibition of smoking, fire and naked flame***

Smoking, the use of fire or of naked flames shall be prohibited on vehicles carrying substances and articles of Class 1, in their vicinity and during the loading and unloading of these substances and articles.

(4) ***Places of loading and unloading***

(a) Loading or unloading of substances and articles of Class 1 shall not take place in a public place in a built-up area without special permission from the competent authorities;

(b) Loading or unloading of substances and articles of Class 1 in a public space elsewhere than in a built-up area without prior notice thereof having been given to the competent authorities shall be prohibited, unless operations are urgently necessary for reasons of safety;

(c) If, for any reason, handling operations have to be carried out in a public place, then substances and articles of different kinds shall be separated according to the labels;

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(d) When vehicles carrying substances and articles of Class 1 are obliged to stop for loading or unloading operations in a public place, a distance of at least 50 m shall be maintained between the stationary vehicles.

(5) ***Convoys***

(a) When vehicles carrying substances and articles of Class 1 travel in convoy, a distance of not less than 50 m shall be maintained between each transport unit and the next;

(b) The competent authority may lay down rules for the order or composition of convoys.

(6) ***Supervision of vehicles***

The requirements of Chapter 8.4 shall be applicable only when substances and articles of Class 1 having a total net mass of explosive substance above the limits set below are carried in a vehicle:

Division 1.1:	0 kg
Division 1.2:	0 kg
Division 1.3, compatibility group C:	0 kg
Division 1.3, other than compatibility group C:	50 kg
Division 1.4, other than those listed below:	50 kg
Division 1.5:	0 kg
Division 1.6:	50 kg
Substances and articles of Division 1.4 belonging to UN numbers 0104, 0237,0255, 0267, 0289, 0361, 0365, 0366, 0440, 0441, 0455, 0456 and 0500:	0 kg

For mixed loads the lowest limit applicable to any of the substances or articles carried shall be used for the load as a whole.

In addition, these substances and articles shall be supervised at all times in order to prevent any malicious act and to alert the driver and the competent authorities in the event of loss or fire.

Empty uncleaned packagings are exempted.

(7) ***Locking of vehicles***

Doors and rigid covers in the load compartments of EX/II vehicles and all openings in the load compartments of EX/III vehicles carrying substances and articles of Class 1 shall be locked during transport, except for the periods of loading and unloading.

S2: Additional requirements concerning the carriage of flammable liquids or gases

(1) ***Portable lighting apparatus***

The load compartment of closed vehicles carrying liquids having a flash-point of not more than 60 °C or flammable substances or articles of Class 2, shall not be entered by persons carrying portable lighting apparatus other than those so designed and constructed that they cannot ignite any flammable vapours or gases which may have penetrated into the interior of the vehicle.

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(2) ***Operation of combustion heaters during loading or unloading***

The operation of combustion heaters of vehicles of type FL (see Part 9) is forbidden during loading and unloading and at loading sites.

(3) ***Precautions against electrostatic charges***

In the case of vehicles of type FL (see Part 9), a good electrical connection from the vehicle chassis to earth shall be established before tanks are filled or emptied. In addition, the rate of filling shall be limited.

S3: Special provisions concerning the carriage of infectious substances

For transport units carrying dangerous substances of Class 6.2, the requirements of 8.1.4.1 (b) and 8.3.4 shall not apply.

S4: Additional requirements concerning carriage under controlled temperatures

Maintenance of the prescribed temperature is essential for safe carriage. In general, there shall be:

- thorough inspection of the transport unit prior to loading;
- instructions to the carrier about the operation of the refrigeration system, including a list of the suppliers of coolant available en route;
- procedures to be followed in the event of loss of control;
- regular monitoring of operating temperatures; and
- availability of a back-up refrigeration system or spare parts.

The temperature of the air space within the transport unit shall be measured by two independent sensors and the output shall be so recorded that temperature changes are readily detectable.

The temperature shall be checked every four to six hours and logged.

If the control temperature is exceeded during carriage, an alert procedure shall be initiated involving any necessary repairs to the refrigeration equipment or an increase in the cooling capacity (e.g. by adding liquid or solid coolant). There shall also be frequent checking of the temperature and preparations for implementation of the emergency procedures. If the emergency temperature (see also 2.2.41.1.17 and 2.2.52.1.15 to 2.2.52.1.18) is reached, the emergency procedures shall be set in operation.

NOTE: *This provision S4 does not apply to substances referred to in 3.1.2.6 when substances are stabilized by the addition of chemical inhibitors such that the SADT is greater than 50 °C. In this latter case, temperature control may be required under conditions of carriage where the temperature may exceed 55 °C.*

S5: Special provisions common to the carriage of radioactive material of Class 7 in excepted packages (UN Nos. 2908, 2909, 2910 and 2911) only

The requirements of the instructions in writing of 8.1.2.1 (b) and of 8.2.1, 8.3.1 and 8.3.4 shall not apply.

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S6: **Special provisions common to the carriage of radioactive material of Class 7 other than in excepted packages**

The provisions of 8.3.1 shall not apply to vehicles carrying only packages, overpacks or containers bearing category I-WHITE labels.

The provisions of 8.3.4 shall not apply provided there is no subsidiary risk.

Other additional requirements or special provisions

S7: *(Deleted)*

S8: When a transport unit is loaded with more than 2 000 kg of these substances, stops for service requirements shall as far as possible not be made near inhabited places or frequented places. A longer stop near such places is permissible only with the consent of the competent authorities.

S9: During the carriage of these substances, stops for service requirements shall as far as possible not be made near inhabited places or frequented places. A longer stop near such places is permissible only with the consent of the competent authorities.

S10: During the period April to October, when a vehicle is stationary, the packages shall, if the legislation of the country in which the vehicle is halted so requires, be effectively protected against the action of the sun, e.g. by means of sheets placed not less than 20 cm above the load.

S11: (1) The requirements of 8.2.1 shall apply.

(2) Drivers shall attend a specialization training course covering at least the subjects defined in 8.2.2.3.5.

(3) If, according to other regulations applicable in the country of a Contracting Party, a driver has followed equivalent training under a different regime or for a different purpose covering the subjects referred to in (2), the specialization course may be totally or partially dispensed with.

S12: If the total number of packages containing radioactive material carried does not exceed 10, and the sum of the transport indices does not exceed 3, special provision S11 need not be applied. However, drivers shall then receive appropriate training, commensurate with and appropriate to their duties, which provides them with an awareness of the radiation hazards involved in the carriage of radioactive material. Such awareness training shall be confirmed by a certificate provided by their employer.

S13: When a consignment cannot be delivered, it shall be placed in a safe place; the competent authority should be informed as soon as possible and requested for instructions on how to proceed.

S14: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply for vehicles carrying any amount of these substances.

S15: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply for vehicles carrying any amount of these substances. However, the provisions of Chapter 8.4 need not be applied when the loaded compartment is locked or the packages carried are otherwise protected against any illicit unloading.

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S16: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply when the total mass of these substances in the vehicle exceeds 500 kg.

In addition, vehicles carrying more than 500 kg of these substances shall be subject at all times to supervision to prevent any malicious act and to alert the driver and competent authorities in the event of loss or fire.

S17: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply when the total mass of these substances in the vehicle exceeds 1 000 kg.

S18: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply when the total mass of such substances in the vehicle exceeds 2 000 kg.

S19: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply when the total mass of such substances in the vehicle exceeds 5 000 kg.

S20: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply when the total mass or volume of these substances in the vehicle exceeds 10 000 kg as packaged goods or 3 000 litres in tanks.

S21: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply to all material, in whatever mass. In addition, these goods shall be subject at all times to supervision to prevent any malicious act and to alert the driver and the competent authorities in the event of loss or fire. However, the provisions of Chapter 8.4 need not be applied where:

(a) The loaded compartment is locked or the packages carried are otherwise protected against illicit unloading; and

(b) The dose rate does not exceed 5μSv/h at any accessible point on the outer surface of the vehicle.

S22: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply when the total mass or volume of these substances in the vehicle exceeds 5 000 kg as packaged goods or 3 000 litres in tanks.

S23: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply when this substance is carried in bulk or in tanks and when the total mass or volume in the vehicle exceeds 3 000 kg or 3 000 litres, as applicable.

S24: The provisions of Chapter 8.4 concerning the supervision of vehicles shall apply when the total mass of these substances in the vehicle exceeds 100 kg.

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CHAPTER 8.6

ROAD TUNNEL RESTRICTIONS FOR THE PASSAGE OF VEHICLES CARRYING DANGEROUS GOODS

8.6.1 General provisions

The provisions of this Chapter apply when the passage of vehicles through road tunnels is restricted in accordance with 1.9.5.

8.6.2 Road signs or signals governing the passage of vehicles carrying dangerous goods

The tunnel category, assigned in accordance with 1.9.5.1 by the competent authority to a given road tunnel for the purpose of restricting the passage of transport units carrying dangerous goods, shall be indicated as follows by means of road signs and signals:

Sign and signal	Tunnel category
No sign	Tunnel category A
Sign with an additional panel bearing a letter B	Tunnel category B
Sign with an additional panel bearing a letter C	Tunnel category C
Sign with an additional panel bearing a letter D	Tunnel category D
Sign with an additional panel bearing a letter E	Tunnel category E

8.6.3 Tunnel restriction codes

8.6.3.1 The restrictions for the transport of specific dangerous goods through tunnels are based on the tunnel restriction code of these goods, indicated in Column (15) of Table A of Chapter 3.2. The tunnel restriction codes are put between brackets at the bottom of the cell. When '(—)' is indicated instead of one of the tunnel restriction codes, the dangerous goods are not subject to any tunnel restriction; for the dangerous goods assigned to UN Nos. 2919 and 3331, restrictions to the passage through tunnels may, however, be part of the special arrangement approved by the competent authority(ies) on the basis of 1.7.4.2.

8.6.3.2 When a transport unit contains dangerous goods to which different tunnel restriction codes have been assigned, the most restrictive of these tunnel restriction codes shall be assigned to the whole load.

8.6.3.3 Dangerous goods carried in accordance with 1.1.3 are not subject to the tunnel restrictions and shall not be taken into account when determining the tunnel restriction code to be assigned to the whole load of a transport unit.

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8.6.4 Restrictions for the passage of transport units carrying dangerous goods through tunnels

Once the tunnel restriction code to be assigned to the whole load of the transport unit has been determined, the restrictions for the passage of this transport unit through tunnels are the following:

Tunnel restriction code of the whole load	Restriction
B	Passage forbidden through tunnels of category B, C, D and E
B1000C	Carriage where the total net explosive mass per transport unit - exceeds 1000 kg: Passage forbidden through tunnels of category B, C, D and E; - does not exceed 1000 kg: Passage forbidden through tunnels of category C, D and E
B/D	Tank carriage: Passage forbidden through tunnels of category B, C, D and E; Other carriage: Passage forbidden through tunnels of category D and E
B/E	Tank carriage: Passage forbidden through tunnels of category B, C, D and E; Other carriage: Passage forbidden through tunnels of category E
C	Passage forbidden through tunnels of category C, D and E
C5000D	Carriage where the total net explosive mass per transport unit - exceeds 5000 kg: Passage forbidden through tunnels of category C, D and E; - does not exceed 5000 kg: Passage forbidden through tunnels of category D and E
C/D	Tank carriage: Passage forbidden through tunnels of category C, D and E; Other carriage: Passage forbidden through tunnels of category D and E
C/E	Tank carriage: Passage forbidden through tunnels of category C, D and E; Other carriage: Passage forbidden through tunnels of category E
D	Passage forbidden through tunnels of category D and E
D/E	Bulk or tank carriage: Passage forbidden through tunnels of category D and E; Other carriage: Passage forbidden through tunnels of category E
E	Passage forbidden through tunnels of category E
-	Passage allowed through all tunnels (For UN Nos. 2919 and 3331, see also 8.6.3.1).

NOTE: *For example, the passage of a transport unit carrying UN 0161, powder, smokeless, classification code 1.3C, tunnel restriction code C5000D, in a quantity representing a total net explosive mass of 3000 kg is forbidden in tunnels of categories D and E.*