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**Working Party on the Transport
of Dangerous Goods**
(Seventy-second session,
Geneva, 13-17 May 2002)

PROPOSALS FOR AMENDMENTS TO ANNEXES A AND B OF ADR

**Report of the informal working group on EX-type vehicles, Tønsberg,
Norway, 17–19 December 2001**

Transmitted by the Government of Norway

SUMMARY

Executive Summary:	An intersessional working group met in Tønsberg, Norway to discuss the provisions regarding the construction/approval of EX/II and EX/III vehicles.
Action to be taken:	Proposals for changes to the ADR provisions are set out in this document.
Related documents:	TRANS/WP.15/2001/11, TRANS/WP.15/2001/14 and TRANS/WP.15/2001/15, as well as INF.12 presented by Norway at the seventy-first session.

INTRODUCTION

1. The working group session was attended by experts from France, Germany, the Netherlands, Norway, Poland, Sweden and the United Kingdom. The following non-governmental organizations were also represented: Liaison Committee of Coachwork and Trailer Builders (CLCCR), European Association of Automotive Suppliers (CLEPA), Federation of European Explosives Manufacturers

(FEEM), International Federation of Forwarding Agents' Associations (FIATA) and International Organization of Motor Vehicle Manufacturers (OICA).

2. The Director of the Unit for Dangerous Substances of the Directorate for Fire and Explosion Prevention (DBE) Mr. R.E Bjørnstad opened the meeting and welcomed the participants to Tønsberg and Norway.
3. Mr. A. Johansen from Norway acted as Chairman of the working group.
4. The mandate given to the informal working group by the Working Party on the Transport of Dangerous Goods as set out in paragraphs 64 and 65 of the report on its seventieth session (TRANS/WP.15/165) was to revise all provisions relating to the construction of vehicles intended for the carriage of explosives in view of the progress of technology and the development of modern commercial explosives manufactured at the place of use. The background documents for the meeting were the three documents presented by Norway at the seventieth session: TRANS/WP.15/2001/11, TRANS/WP.15/2001/14 and TRANS/WP.15/2001/15, as well as INF.12 presented by Norway at the seventy-first session.
5. Eight documents were presented as working papers to the meeting: WP.1 from Germany containing their position on the various issues raised by Norway in INF.12; WP.2 from the United Kingdom with proposals for changes to the provisions for EX/II and EX/III vehicles, as well as their position on certain aspects of INF.12; WP.3 from the Netherlands supporting the basic ideas from INF.12; WP.4 from Portugal containing specific questions to the working group regarding transport of explosives with other dangerous goods; WP.5 from Austria questioning the exclusion of "M" vehicles from certification as EX/II vehicles; WP.6 from CLEPA containing information on automatic circuit breaker systems; WP.7 from the Chairman with information received of specific restrictions on vehicles transporting explosives in Spain and WP.8 from the Netherlands containing an overview of their areas of concern and a list of areas of attention.

DISCUSSIONS

6. After an introduction of the members of the working group a short discussion was held on whether the mandate for the working group also included matters of security. Germany was in favour of including security issues in the review but with regard to the majority of the participants, it was decided that this was not the case, and that the working group on this matter should restrict itself to evaluating the present regulations regarding access to the dangerous goods transported and the supervision of vehicles, as in the present regulations.
7. The question of dividing the vehicles for transport of explosives into different types was discussed. It was felt necessary to make some distinction on the requirements for vehicles carrying different amounts and types of explosives, and the concept of EX/II and EX/III vehicles was kept. Further discussions would come later on the various requirements necessary.

8. The various working papers were then introduced, and it was decided to use WP.8 from the Netherlands as a starting point, since this contained a list of possible points for discussion related to the dangers that may occur and the ways of dealing with them. The other working papers were dealt with in the course of the discussion.

BATTERIES

9. The representative from OICA stated that the covering of batteries to eliminate the possibility for short-circuiting was standard on all modern vehicles, and that a text to this effect in the regulations was no longer necessary. The working group nevertheless decided that since this was not a requirement in any other regulation, the text of 9.2.2.4 was to be kept as it is to establish a “basic requirement”. The working group invites the Working Party to request the secretariat to raise the question with the secretariat of the World Forum for Harmonisation of Vehicle Regulations (WP.29) in order to take such regulations in as a standard requirement for all vehicles.

IGNITION

10. The working group did not consider the possibility of the ignition system to short-circuit in an accident to be a priority item. This possibility could be dealt with by installing a circuit breaker on the complete electrical system.

CABLES/WIRING

11. The working group decided that this was a safety issue that was of importance. It was accepted that the wording of 9.2.2.6.1 was open to interpretation. This was underlined by the fact that the Netherlands has special requirements for the cables regarding their ability to operate under extreme temperatures (+100 °C to -40 °C). Germany will come back to this in a separate proposal with references to standards.

ENGINE

12. It was decided that the heat generation from engines could be a problem, and to align the texts of 9.2.4.4 and 9.3.5.

EXHAUST

13. Exhaust systems were accepted as being an area that needs special attention. The working group was of the opinion that the text could be improved, in particular regarding other installations than the engine propelling the vehicle.

BEARINGS

14. It was decided that bearings could represent a safety problem, but not to such an extent that it needed special regulations. Detection of possible overheating could be tackled in connection with overheating of brakes.

BRAKES

15. The working group agreed that this was an area where special provisions should be established. It is known from accident reporting that binding brakes have been the cause of fires on vehicles carrying explosives. The working group was of the opinion that this was a general problem for all dangerous goods vehicles, and invites the Working Party to request the secretariat to raise the question with the secretariat of WP.29 for them to look into this and agree on a system for surveillance of temperatures on brake-drums/discs in order to detect binding brakes.

TYRES

16. Tyres are a well-known source of fires and other accidents on vehicles. According to OICA and CLCCR there are systems for monitoring the tyre pressure commercially available today, and they are already being installed on vehicles for reasons of tyre-economy. The working group invites the Working Party to request the secretariat to raise the question with the secretariat of WP.29 in order to establish a regulation to implement this as standard equipment, at least on dangerous goods vehicles.

17. The question of banning re-treaded tyres was discussed, but it was noted that provisions on such tyres now are to be found in ECE Regulation 109. Therefore the issue should no longer pose a particular problem in the transport of dangerous goods.

CONSTRUCTION MATERIALS FOR THE LOAD COMPARTMENT

EX/II vehicles

18. The working group agreed that a text regarding this issue was needed. It was agreed that the present text of 9.3.3 regarding EX/II vehicles could be used with some modifications.

19. The requirements for sheeting to be tautened and to have a minimum overlap was changed to accommodate for the use of modern vehicles, such as vehicles with sliding sheets, as EX/II vehicles. The requirement for a lockable device was also deleted for sheeted vehicles.

20. It was decided that some specification should be given regarding the strength and fire resistance of sheeting. The question of substantiating the requirements that the sheeting shall be resistant to tearing and be of impermeable material was discussed, and it was a general wish to refer to standards for this purpose. No CEN standard is available for the moment, but work is going on in this area. In the case of fire resistance, national standards already exist for this purpose and which may be referred to, but it was preferred to install a reference to ISO standard 3795:1989 in a footnote. This is the same standard that is referred to in 9.2.4.2 for the material in the vehicle cab.

21. The present provisions regarding the prohibition of windows in closed EX/II vehicles were discussed. Norway said that the background for introducing this was a wish to avoid having category "M" vehicles ("passenger vehicles") certified as EX/II vehicles. It was pointed out that since then, the

scope of Chapter 9, as set out in 9.1.1.1, now took care of this as it now refers only to categories “N” and “O”, not to category “M”. The provision for not allowing windows was then deleted.

22. It was also agreed that the driver’s compartment of EX/II vehicles should be separated from the load compartment by a continuous wall.

23. The question of whether or not to retain the reference to “lockable” in the text was discussed, and it was found necessary to retain this provision for the closed vehicles, due to the necessity of having the possibility of securing the vehicle in a parking space as required in Chapter 8.4.

EX/III vehicles

24. It was agreed to introduce the same basic requirements regarding the design, construction and equipment as for the EX/II vehicles. The group was of the opinion that this was an omission when the text was restructured, since the “old” provisions were set up in such a way that the provisions for the EX/III vehicles were in addition to the provisions for the EX/II vehicles. It was also decided to retain the text from the EX/II provisions regarding the separation of the driver’s compartment and the load compartment.

25. The generally accepted interpretation of the term “closed vehicles” has created problems, in particular in the Nordic countries where the use of big bags for Ammonium Nitrate/Fuel Oil (ANFO) explosives is very common. There exists a real need for the ability to handle these with a crane through the roof of the vehicle, in particular on blasting sites. Tests run by the Norwegian Fire Laboratory have demonstrated that the heat from a tyre fire is not a safety problem at the top of a vehicle.

26. After checking the definition of a “closed vehicle” against the definition for “closed container”, it was found that the more recent text of the “closed container” reflects the actual situation and openable roofs are permitted. The working group agreed that the term “rigid walls” also includes walls that are openable. The working group agreed to align the text of the definition of the closed vehicle in 1.2.1 with that of the closed container.

27. The problem addressed in document TRANS/WP.15/2001/14 regarding the requirement for a “continuous” floor was discussed, and it was decided to change the text to accommodate for the installation of load restraint points. It was also realized that it is not practical to build a large vehicle without having joints in the floor, and a provision for sealing such joints was installed.

28. The working group agreed that the first part of the text regarding the heat resisting properties of the body is technically insufficient and leads to different interpretations, and that it should be deleted. A text requiring verification by the competent authority of the heat resisting properties as tested according to the new provisions was inserted. The representatives from the United Kingdom opposed this text. They preferred a text in line with that regarding the endurance braking system of 9.1.2.1.1, since this in their opinion put the onus on the manufacturer rather than on the competent authority.

29. When the provisions for EX/III vehicles were changed the last time, the representative from Spain introduced some special weight restrictions for EX/III trailers with inertia braking systems. The working group discussed these provisions, and found that such restrictions did not exist in ADR, and that they were only applicable for national transport within Spain. The text was deleted.

CONSTRUCTION MATERIAL FOR THE CAB

30. The text of 9.2.4.2.1 regarding the fire resistance of the material of the driver's cab was discussed extensively. The working group agreed that the text was the basis for a lot of regulatory difficulties, and the validity of the contents for EX/II and EX/III vehicles was challenged. It was finally decided to delete the reference to 9.2.4.2.1 for both the EX/II and the EX/III vehicles in the table in 9.2.1.

INSULATION MATERIALS FOR THE ELECTRICAL CONDUITS

31. It was agreed that most of this point was discussed under "electrical installations", but the issue of the battery master switch was discussed in the light of the comments from the United Kingdom in WP.2. Some of the explosives experts wanted to reintroduce the concept of having a battery master switch that could be operated from outside the driver's cab, but since this had been rejected by the Working Party at its seventy-first session it was decided to leave things as they were. The Chairman, based on the information received from CLEPA in WP.6 on the availability of automatic "Safety Circuit Breakers", asked the group whether the time was ripe for introducing this concept into the ADR. The group felt that it was difficult to accept this only based on the information in a brochure, and encouraged CLEPA to propose this in a substantiated proposal directly to the Working Party.

32. The working group also discussed, on the basis of WP.2 from the United Kingdom, the text of 9.3.7 in connection with provisions for lighting inside the load compartments of EX/II vehicles. It was decided to change the text of 9.3.7.1 and to add a new 9.3.7.3 to separate the provisions for electrical installations in load compartments of EX/II and EX/III vehicles.

FUEL TANKS AND LINES

33. It was decided that the present text was sufficient, even though some doubts were raised on the issue of protection of the tanks.

AUXILIARY EQUIPMENT

34. The main issue under this point was the use of combustion heaters for heating the load compartments on EX/II and EX/III vehicles in Chapter 9.3. The explosives experts were of the opinion that heating of the load compartment by a combustion heater should not be allowed for reasons of explosives safety. It was decided to change the text of 9.3.2 to only allow for the use of combustion heaters for heating the driver's cab and the engine on such vehicles.

35. The representative from Sweden mentioned the possibility of having other types of equipment on the vehicles, such as refrigerating units, and whether provisions for this type of equipment also should be included. The working group was of the opinion that such equipment could be used as

long as it did not conflict with the provisions for continuous walls and the heat resistance properties, as set out in 9.3.4.

36. During the discussions it was mentioned that the directive 2001/56/EC on heating equipment had now been finalized, and that a proper text now could be inserted in 9.2.4.7.1. Sweden and Norway agreed to take appropriate action so that this could be done.

PROCEDURES AND EQUIPMENT

37. The working group decided that this issue was outside its mandate, and no discussion was held on this topic.

LIMITATIONS ON LOADING.

38. Under this point the issue of transport of fireworks of UN 0336 (1.4G) was raised. According to the text in force for limitations of the quantities carried in the 1997 version of the ADR, it was allowed to transport up to 4000 kg of such explosives in a former Type I vehicle with a trailer (marginal 11 401). After the deletion of the former Type I vehicle and the introduction of the requirements for B.3 certificates for EX/II vehicles in 1999, Germany had experienced problems in transporting these goods. The transport capacity of the fleet of EX/II and EX/III vehicles in Germany is not sufficient to cope with the seasonal demand. The German delegation wanted therefore to reinstall this provision in V2(1) of 7.2.4.

39. The United Kingdom and Poland supported Germany, but some of the countries represented in the group did not favour this, even though the deletion was unintentional. Germany was asked to bring this issue to the Working Party as a separate proposal.

REQUESTS FOR ACTION BY OTHER ECE BODIES

40. The working party agreed during the course of their discussions that the following tasks should be deferred to the appropriate ECE body:

- (a) To request WP.29 to adopt provisions for battery covers to eliminate the possibility of short-circuiting as a general requirement on all dangerous goods vehicles;
- (b) To request WP.29 to develop and implement requirements for surveillance of temperatures on brake-drums/disks to detect binding brakes on EX/II and EX/III vehicles. (all dangerous goods vehicles?);
- (c) Request WP.29 to establish a regulation to implement systems for monitoring the tyre pressure on EX/II and EX/III vehicles (all dangerous goods vehicles?).

AMENDMENT PROPOSALS

1.2.1 Amend the definition for closed vehicle to read as follows:

“Closed vehicle” means a vehicle with a totally enclosed load area having a rigid roof, rigid sidewalls, rigid end walls and a floor. The term includes vehicles with an opening roof.

9.2.1 Delete the reference to EX/II and EX/III vehicles in the row for 9.2.4.2.1.

Amend the paragraphs listed below as indicated:

9.2.2.4 Batteries

The battery terminals shall be electrically insulated or covered by **an** insulating battery box cover. If the batteries are not located under the engine bonnet, they shall be fitted in a vented box."

9.2.3.4.2 Trailers shall be fitted with an effective braking device which acts on all the wheels, is actuated by the drawing vehicle's service-brake control and automatically stops the trailer in the event of breakage of the coupling.

~~*NOTE: The use of trailers equipped only with an inertia braking system shall be limited to a maximum load of 50 kg net explosive mass.*~~

9.2.4.5 Exhaust system

The exhaust system ~~as well as the exhaust pipes~~ shall be so directed or protected to avoid any danger to the load through heating or ignition. Parts of the exhaust system situated directly below the fuel tank (diesel) shall have a clearance of at least 100 mm or be protected by a thermal shield.

9.3.2 Combustion heaters

9.3.2.1 Combustion heaters **may only** ~~shall not be installed in load compartments of~~ on EX/II and EX/III vehicles **for heating of the driver's cab and the engine**.

9.3.2.2 Combustion heaters shall meet the requirements of 9.2.4.7.1, 9.2.4.7.2, 9.2.4.7.5, 9.2.4.7.6. ~~and the following:~~

9.3.2.3 (a) The switch may be installed outside the driver's cab;
(b) ~~————— The device may be switched off from outside the load compartment; and~~
(c) It is not necessary to prove that the heat exchanger is resistant to the reduced after running cycle.

9.3.2.4 No fuel tanks, power sources, combustion air or heating air intakes as well as exhaust tube outlets required for the operation of the combustion heater shall be installed in the load compartment. ~~It shall be ensured that the heating air outlet cannot be blocked by cargo. The temperature to which packages are heated shall not exceed 50 °C.~~

9.3.3 EX/II vehicles

The vehicles shall be designed, constructed and equipped so that the explosives are protected from external hazards and the weather. They shall be either closed or sheeted. Sheeting shall be resistant to tearing and be of impermeable material, not readily flammable¹. It shall be tautened so as to cover the **loading area** on all sides, ~~with an overlap of not less than 20 cm down the sides of the vehicle, and be kept in position by a lockable device.~~

All openings in the load compartment of closed vehicles shall not have windows and shall have lockable, close-fitting doors or rigid covers. The driver's compartment shall be separated from the load compartment by a continuous wall.

9.3.4 EX/III vehicles

9.3.4.1 The vehicles shall be designed, constructed and equipped so that the explosives are protected from external hazards and the weather. These vehicles shall be closed. **The driver's compartment shall be separated from the load compartment by a continuous wall.** The loading surface, ~~including the front wall,~~ shall be continuous. **Load restraint anchorage points may be installed. All joints shall be sealed. All openings shall be capable of being locked. They shall be so placed and constructed as to overlap at the joints.** ~~The insulating and heat resisting properties of the body shall be at least equivalent to those of a partition consisting of a metal outer wall lined with a layer of fire proofed wood of 10 mm thickness; or~~

9.3.4.2 The **construction of the body shall be of a construction which shall ensure such as to ensure** that no flame penetration ~~of the wall~~ or hot spots of more than 120 °C on the inner ~~wall~~ surface will occur within 15 minutes from the start of a fire resulting from the operation of the vehicle, such as a tyre fire. **This shall be verified by the competent authority or a body designated by the competent authority.**

9.3.5 Engine and load compartment

The engine **propelling the vehicle** shall be placed forward of the front wall of the load compartment; it may nevertheless be placed under the load compartment, provided this is done in such a way that any excess heat does not constitute a hazard to the load by raising the temperature on the inner surface of the load compartment above 80 °C.

9.3.6 External heat sources and load compartment

(The text is left unchanged)

9.3.7 Electrical equipment

¹ In the case of flammability, this requirement will be deemed to be met if, in accordance with the procedure specified in ISO standard 3795:1989, samples of the sheeting have a burn rate not exceeding 100 mm/min.

9.3.7.1 The rated voltage of the electrical system shall not exceed 24 volts.

9.3.7.2 **Any lighting in the load compartment of EX/II vehicles shall be on the ceiling and covered, i.e. with no exposed wiring or bulb.**
In the case of Compatibility Group J, the electrical installation shall be at least IP65 (e.g. flame-proof Eex d). Any electrical equipment accessible from the inside of the load compartment shall be sufficiently protected from mechanical impact from the inside.

9.3.7.3 The electrical installation on EX/III vehicles shall meet the requirements of 9.2.2.2, 9.2.2.3, 9.2.2.4, 9.2.2.5.2 and 9.2.2.6.
The electrical installation in the load compartment shall be dust-protected (at least IP54 or equivalent) or, in the case of Compatibility Group J, at least IP65 (e.g. flame-proof Eex d).
