

---

**Economic Commission for Europe****Inland Transport Committee****Working Party on the Transport of Dangerous Goods****104<sup>th</sup> session**

Geneva, 15-17 May 2018

Item 5 (a) of the provisional agenda

**Proposals for amendments to annexes A and B of ADR  
construction and approval of vehicles****26 March 2018****Report of the first informal WP.15 Working Group meeting  
on “Clarification of 9.3.4.2 ADR”****Transmitted by the Government of Germany****Bonn, 10th / 11th January 2018****Federal Ministry of Transport and Digital Infrastructure (BMVI)**

The informal WP.15 Working Group on “**Clarification of 9.3.4.2 ADR**” held its first meeting on 10 - 11 January 2018 in Bonn, Germany. Mr. H. Rein from the Federal Ministry of Transport and Digital Infrastructure (BMVI) chaired the meeting. Delegations from Finland, France, Germany, the Netherlands, Romania, Turkey and the United Kingdom, and one NGO expert representing IRU attended the meeting. Sweden sent some comments via e-mail to address issues for the Working Group’s discussion.

The mandate was as follows (see ECE/TRANS/WP.15/239 §43):

Investigate the hazards to which explosive substances and articles are exposed to during carriage, determine appropriate measures to mitigate these hazards and clarify the questions raised during the November 2017 session of WP.15, in particular:

- Minimum thickness of the material, if required
- Which materials fulfil the requirements of standard EN 13501
- Safety requirements regarding heat sources from outside the vehicle
- Which materials are allowed inside the load compartment
- Develop or amend the wording as necessary to modify sub-section 9.3.4.2 of ADR in the form of clear performance requirements.

**1. Opening of the Meeting**

The Chairman welcomes all participants and points out that WP.15 had decided during its last session of November 2017 (see report ECE/TRANS/WP.15/239 paragraphs 42-45) to set up an informal working group to be headed by Germany.

## **2. Adoption of the agenda**

The Working Group adopts the agenda drafted by the German delegation. TOP 5 “Examination of the need for protection against sparks” is complemented with “other threats and resulting safety targets”.

## **3. Current state of affairs**

The chairman explains that the work of the Working Group is derived from the mandate. In the WP.15, Germany had, among other things, raised the question of which safety target is the basis for 9.3.4.2 of ADR. In Germany, there are different views with regard to the interpretation of 9.3.4.2 and problems concerning the application of the provisions.

The Working Group is to have a fundamental discussion to find a final solution to this topic. The development during the last few years has shown that it is necessary to work diligently to find a rule that gives a clearer answer to the complex questions and to phrase it unambiguously in the ADR.

### **Background of the discussion on EX/III vehicles in 9.3.4 of ADR:**

The chairman shortly summarises the development of the set of regulations and the content-related discussions in WP.15 so far. He particularly points out what decisions have contributed to the current state of the provisions and how they are phrased in the current ADR.

The provisions on EX vehicles have been subject to discussions for a very long time. The specific provisions for Type I vehicles have already been abolished as these provisions are usually met by all vehicles today.

With regard to provisions on EX/II and EX/III vehicles:

The corresponding requirements were already specified during a WP.15 Working Group with a respective mandate in Tønsberg, Norway, in 2001 (the process was continued in 2003 and 2004). Based on the reports of this Working Group, it is possible to track the indeed difficult discussions that were held to specify the very general requirements for vehicle bodies. The discussions led to the current wording of the provisions which make reference to standards. However, due to the existing difficulties in applying the provisions, it can be assumed that the proposal to use these standards was not entirely successful. This proposal has also led to frequent and still ongoing discussions within WP.15 on a clarification of how to apply the regulations. Although the standards cited describe the fire and heat resistance of the body material, they do not describe the target that had originally been aimed at by the requirements for the body of EX/III vehicles.

However, the standards in connection with the current text of ADR led to EX/III vehicles being used across Europe without an internal wood sheeting of the load compartment, which had been common in many states before.

In Germany, the use of vehicles with inner metal walls was called into question by an inspection organization two years ago. Even after taking the ADR text, the standards cited therein and reports by WP.15 and the corresponding Working Groups into consideration, the German Ministry was not able to provide a clear interpretation of 9.3.4.2 (shall/may a metal body in accordance with the last sentence of 9.3.4.2 have metal cladding). Therefore, Germany decided to ask WP.15 for clarification (see ECE/TRANS/WP.15-102-GE-INF6e).

As a result of the discussions held during the last two WP.15 meetings (102nd and 103rd meetings), EX/III vehicles that have bodies without wood cladding were deemed permissible. However, the text proposed by Germany to clarify 9.3.4.2 of ADR was not adopted, as it focusses on a specific use case and does not consider any other alternative solutions.

#### **4. Development of a new proposal for WP.15**

Since WP.15 was not able to conclude the discussion during the last meeting, a Working Group was established to deliberate this topic in collaboration with several experts. The Working Group has set itself the aim to develop a proposal to amend the provisions of ADR in order to

adequately reflect the safety targets in the legislation and

phrase the safety targets in a way as to guarantee legal certainty without prohibiting alternative solutions to the technologies known today.

The Working Group agrees to initially develop an interim result in this first meeting. If necessary and desired by WP.15, the work shall be continued during another Working Group meeting.

The Netherlands hold a presentation to give an overview of the topic of “**EX protection of load areas**”, which had already been submitted to the 103rd session of WP.15. After the meeting, the presentation will be sent to all participants of the Working Group via email by the Working Group Secretariat.

The chairman assumes that the Netherlands presentation will address all relevant issues. The Working Group agrees to address the presentation in more detail under agenda item 5 and to discuss the different issues individually.

The Netherlands underline the necessity to better define the safety targets on the basis of the inherent properties of explosive substances.

In this context, the Netherlands also draw attention to a study conducted in 1995, which had been commissioned by Norway and Sweden: “Fire in tyres. Heat release rate and response of vehicles (SINTEF NBL – Norwegian Fire Research Laboratory, April 1995).” The study delivers data that permit the assumption that tyre fires seem to be a regular incident that needs to be considered.

The participants of the Working Group all receive the report as conference room paper by the Netherlands.

It can be retrieved from RISE Fire Research AS, at: <http://www.risefr.no/media/publikasjoner/upload/stf25-a95039.pdf>.

#### **5. Examination of the need for protection against risks**

The Working Group uses the structure of the Netherlands presentation as a basis for its discussion.

Different hazards are listed that are discussed more in detail and evaluated by the Working Group.

Heat transfer is regarded as the main hazard while shock or electrostatic discharge, in general, are considered to be other potential, but less problematic hazards. As packaging complying with the relevant provisions has to be used when carrying explosive substances, shocks or static discharges have no significant effect.

The Federal Institute for Materials Research and Testing (BAM) differentiates between explosion protection and protection of explosives. For this purpose, the explosives are tested unpackaged for mechanical, electrostatic and thermomechanical sensitivity. Usually, explosives are not electrostatically sensitive. There is a sensitivity to sparks in the case of black powder. In general, detonators are sensitive to sparks but are well protected since they are designed appropriately. As a consequence, sparks and electrostatics only need to be considered in the case of unpacked goods containing black powder and propellants.

The BAM is tasked with examining whether the modified text in 9.3.7.2 of ADR also contains special requirements for the protection against sparks and electrostatic discharge. UN 0450 is used as an example: Is there an evaporation hazard, and do substances and articles of compatibility group J in the load compartment, besides the electrical equipment, require special protection against sparks and electric discharge?

The Working Group agrees that the heat input presents a hazard that needs to be discussed later on. However, it is not necessary to consider shock resistance with regard to the load compartment.

In the Netherlands presentation an upper safe temperature limit for explosives of 150 °C is given.

The BAM assumes a more conservative value as the critical temperature with regard to the reaction of explosives and explains that a general definition in Germany provides that heat input should only be considered unremarkable up to a temperature of 120 °C.

The Working Group agrees that if explosive substances are exposed to a temperature of less than 120 °C, in accordance with current assumptions, it is not to be expected that a dangerous decomposition process will take place.

The question of what heat effect caused by external heat sources can be regarded as critical also includes non-compliant operation and incidents/accidents resulting from it.

In the past, ADR provisions contained a specific requirement to limit the heat input. Inner surface heating was to be limited to a maximum temperature of 120 °C over a period of 15 minutes to rule out critical situations. It seems reasonable to consider this limit in the description and evaluation of the material properties.

The Working Group addresses the provisions in 9.3.5 and 9.3.6 of ADR more in detail. Based on the Working Party's review of the wording of 9.3.5 of ADR in all 3 language versions (German, English, French), it can be assumed that a higher value than 80 °C is indeed not permissible at the surface of the load compartment floor under normal operating conditions.

Following a question from Finland, the Working Group also establishes that the provisions in 9.3.5 of ADR refer only to the propulsion engine and not to other auxiliary systems. Hence, the current provisions are only intended to cover propulsion engines in the classical sense. This was the state of the art at the time when the text of the regulations was written.

As 9.3.6 addresses in particular sources of heat other than the engine, that may also be under the load compartment, it deals currently only with exhaust systems. Finland remarks that it is possible to place equipment under the load compartment to recuperate braking energy into electricity to charge traction batteries, which may cause heat. It was said that at the time this kind of equipment would have been unknown and may need to be subsumed.

However, nowadays, the topic of alternative electric drivetrains has to be reconsidered. Therefore, the Working Group states that the topic of electrical equipment with regard to fire development and in particular against the background of the current discussion on the increasing electrification of automotive drive systems should be considered more in detail for ADR and WP.15. However, due to insufficient background knowledge, the Working Group prefers not to address this issue during this meeting.

As a result of the discussion on how to tackle tyre fires, different measures are proposed. The Working Group regards a tyre pressure monitoring system that runs permanently to avoid damage from fire as desirable. Germany would like to examine the current state of the implementation of this monitoring system and would particularly like to consult WP.29 on the state of the art of this technology. It is planned to provide information on this topic in the report.

Since the working groups meeting we have now received information from our expert colleagues at the Federal Ministry of Transport and Digital Infrastructure (Division LA 27 - Vehicle technology - vehicle safety and innovative technologies) on the current state of the art of tyre pressure monitoring systems on the market.

Regulation (EC) No 661/2009 of the European Parliament and the Council of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor defines, among other things, requirements for the type-approval of motor vehicles in the context of tyre pressure monitoring systems.

In accordance with the Regulation, vehicles of category M1 (passenger cars) have to be equipped with an accurate tyre pressure monitoring system capable of giving, when necessary, an in-car warning to the driver when a loss of pressure occurs in any tyre, in the interests of optimum fuel consumption and road safety (has been applicable to new types since 1 November 2012 and to vehicles registered for the first time since 1 November 2014).

It was stated in the recitals of the aforementioned Regulation that the Commission should examine whether it is feasible to prescribe tyre pressure monitoring systems for other vehicle categories as well and, if this is the case, to propose a corresponding amendment to this Regulation. So far, the Commission has not presented any results.

Result:

Currently, there are only provisions on tyre pressure monitoring systems for vehicles of category M1 (passenger cars). Therefore, on a short term basis, it will not be possible to prescribe such systems for HGVs as there are no technical requirements for truck tyre pressure monitoring systems. In WP.29, there is no such discussion that would tackle this issue in more detail.

With regard to tyre fires, the Working Group puts particular emphasis on the question of whether it can be ensured that the heat input caused by tyre fires is limited either with suitable mudguards or with designs that deflect heat. In any case, the requirements for wall and floor designs need to be considered. In addition, it is necessary to avoid tyre fires causing heat input at specific points. The structure of the load compartment is to stay intact even if a fire burns for a longer time. The Working Group agrees to describe the requirements as a safety target.

In the case of vans (with load compartment and driver's cab), it considers it reasonable to include a more detailed requirement for the fire resistance of the partitions in the regulations. If possible, a standard should be referenced for this purpose.

The Working Group favours a requirements-based specification of the materials used. Today's requirements for the suitability of materials for wall and floor structures have to be clearly described. The Working Group emphasizes that it does not want to dictate any provisions that prohibit the use of certain construction materials, such as aluminium or others. Therefore, the current requirements need to be revised, in particular taking into account the wording proposed by Sweden.

The working group decides to use the earlier requirements for heat transfer of a limit of 120 °C to be reached in 15 minutes in case the wall is exposed to a fire as a baseline. It is

absolutely necessary to amend this provision by adding information on the test procedure and evaluation of the test results. Finland points out that it would be advisable to make reference to an existing standard that might even provide for a calculation. The Working Group endorses this proposal.

Germany has agreed to provide information on the evaluation - for instance of construction products - at another Working Group meeting. If there are ISO or EN standards, it will be examined how to apply them and whether the contained calculation methods can be accepted.

## **6. Conclusions of the meeting and further steps towards the WP.15**

Germany will draw up the minutes of the Working Group meeting in the form of a report and coordinate it with the participants. The different assumptions and proposals of the Working Group are to be recorded in the minutes. Germany will submit the minutes as an informal document at the WP.15 meeting in May 2018 for scrutiny and agreement.

If WP.15 agrees to the proposed procedure, another Working Group meeting will take place. The Working Group is to examine the results of the mandates described and clarify the pending issues. The objective is to present an official proposal and wording for ADR 2021.

Germany is willing to invite the informal Working Group to another meeting in Bonn. As a precaution, the dates for a meeting are already set for 1/2 October 2018.

---