

Sixty-eighth session Geneva, 15 – 19 Mai 2000

UK POSITION PAPER ON PROPOSALS PRESENTED AT WP15 MEETING 15-19 MAY 2000

AGENDA ITEM No. 4 – TANK VEHICLES

Background Papers:

This UK Positions Paper refers to the following documents; TRANS/WP15/2000/4, -/9 and -/10, TRANS/WP15/1999/13, -/48, -/49 and -/51.

UK Position and Comments:

1. With reference to the Informal Working Group meeting held in Berlin on 11-12 January 2000 and recorded in the report; document TRANS/WP15/2000/4, the UK feels that some of its views are not fully reflected in the report.
2. There was little support at the meeting for changing ADR to a series of **unspecified** alternative arrangements. There was however, strong support for the proposals being developed **before** ADR is amended.
3. The UK considers that the details of alternative arrangements need to be available and understood by WP15 before any changes are made and **not** left to subsequent standardisation as suggested in minute 15 of the report. A full justification must therefore be made available for WP15 to consider.
4. The UK supports the development of alternative arrangements based on BAM Research Report 203 - '*Safety Levels of Tanks for the Transport of Dangerous Goods*'. As a first step we continue to seek clarification of a large number of claims and assumptions made in the Annex of TRANS/WP15/1999/51, which is based on Research Report 203. The list of questions tabled at the Berlin meeting was not appended to the report, but a shortened version is attached to this paper as **ANNEX 1**. The same questions apply to TRANS/WP15/2000/9 or any other proposal which is derived from Research Report 203.
5. The UK would expect that any 'alternative arrangements' be subjected to a Cost Benefit Analysis (an omission from minute paragraph 13 of the report). This Cost Benefit Analysis should take into account all Contracting Parties to the ADR and the UK is quite prepared to bear equivalent operating costs associated with benefits delivered in other countries – a correction to paragraph 19 of the report.

6. The course of actions proposed in document 2000/9 would not result in harmonisation across Europe - ie there would be different conditions in different countries, leading to barriers to trade among other things. Concern over this was also expressed at the Berlin meeting, a point which again was not reflected in the report of the meeting.

7. It is unclear what Germany's intentions are with respect to timescales. Are CEN standards to be delayed until changes are agreed in ADR or are these changes to ADR to be delayed until CEN standards are implemented based on existing ADR? How is on-going harmonisation to be assured? The UK would be concerned at any further delay to the introduction of tank standards.

8. With regard to the alternative equivalent wall thickness formula proposed in document TRANS/WP15/2000/10, it is unclear as to why the value of 2,2mm in Column 5 of Table 1 of this document is not in brackets? This value is purely a **theoretical** figure, which lies below the absolute minimum thickness value adopted at the November 1999 session of WP15, even for shells less than 1.80m diameter. (The Spanish proposal, document TRANS/WP15/1999/13 was adopted at the November meeting). Alternatively is it the intention to further reduce absolute minimum thicknesses of austenitic stainless steel? If not, the proposals will produce such small changes that in practice, the benefits of the change to the revised formula are questionable.

9. The adoption of the proposed new formula will be at variance with other international transport agreements, for example the IMDG code, which uses the existing cube root formula.

ANNEX 1

UK Comments on BAM Research Report 203: *'Safety Levels of Tanks for the Transport of Dangerous Goods'* Summarised in document TRANS/WP15/1999/51

1. There are a number of statements made in the above research report and document which require published data and further justification before they can be accepted internationally. Proposals contained in document TRANS/WP15/2000/9 are also based on this document and also therefore derived from the Research Report 203. The following are examples of statements which need further justification and clarification;
 - a) *"Accident research into the transport of dangerous goods in tanks by road have shown that --- "*
 - b) *"This can be accomplished in a detailed and quantified manner on the basis of a comparative risk evaluation performed by means of analytical and experimental accident simulations"*
 - c) *."In the Research Report 203 a method was developed"*
 - d) *"quasi-statistical considerations and investigations"*
 - e) *"BAM has carried out in its laboratories, tests for simulating accidental stresses from the outside and has evaluated these tests in order to determine comparable data"*
 - f) *"the is need to introduce a weighting factor"*
 - g) *"an appropriate investigation process was developed at BAM"*
 - h) *"it appears possible to change the formula"*
 - i) *"the following values are determined for the factors"*
 - j) Factor 'f₂' is effectively limited to a maximum of 1.4 times the datum value.

2. *"At least 50% of accidents (in particular serious accidents) are caused by impacts on the tank ends"*. This is certainly not true in the UK or the majority of countries and there

has been little support for this view in previous technical meetings. Typical UK serious accidents involve a rollover. Changes should deliver an improvement for the majority, rather than solve a particular problem of the minority.

3. The definition of Risk is accepted as the risk associated with the containment of the goods. It is not the total risk associated with the vehicle or the risk associated with transporting the total volume of a particular dangerous cargo. With respect to the vehicle, it does not include the risk of damage done by an overturned vehicle even if no goods are lost. With respect to the risk associated with the transport of the total volume of a particular cargo, the unladen weight of the tanks and the effect of the number of tanks on the road must also be considered.

4. The factor ' f_1 ' appears to deal with penetration resistance as it is related to the performance of a particular material on the specific resilience test (to obtain the specific energy absorption capacity). However, the test examines membrane bending strength and ductility, while actual penetrations involve a combination of punching, shearing and abrasion.

5. A decision is made in the research report to take factor ' f_3 form' as 0.5 for a cylindrical tank and 0.0 for a non-cylindrical tank. A circular cross section encloses the maximum area for a given periphery. If a portion of the cross section is flattened, as would be the case during an accident, the only way to maintain the cross sectional area is by stretching the material. This involves generating stresses well above the yield strength of the material. If the cross section is not maintained by stretching but is allowed to remain then the contents of the shell must be pressurised. Alternatively, if a non-circular cross section is flattened, the cross sectional area can be maintained by a slight deformation involving no stretching. Stress analysis easily shows that non-circular cross sections require only very low pressures to achieve a significant change of shape. This suggests that non-cylindrical shells can be safer when subjected to accident deformations than cylindrical shells. Therefore, the values of factor ' f_3 form' need further justification.

6. There is a concern over the premise that in order to counteract some uncertainties in the approach, the pass mark is set at 50% above the weakest of the base tank. If such large uncertainties exist, why is there such a complex assessment method? It also raises the question over whether there is a mandate to increase the safety levels of ADR by 50%?

7. The UK is particularly concerned that a move to cylindrical tanks would raise the centres of gravity of the vehicles and consequently increase the risks of rollovers occurring. At the very least, the centre of gravity height should be included in the calculation of the eventual safety coefficient ' R_n '.