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TANKS */

Special Provisions of 6.8.4

Transmitted by the Government of Portugal

Introduction

1. This proposal follows the informal document INF.19 presented by the Government of Portugal at the last Joint Meeting in September 2006.
2. At this meeting, it became clear that delegates were interested to discuss this matter, given that the interpretation of the (TE) special provisions of 6.8.4 causes generally some difficulties.
3. These special provisions, as well as the other tank special provisions are indicated in column (13) of Table A by alphanumeric codes which may change the requirements of the tank code. The original (TE) special provisions were the equipment prescriptions in versions prior to the 2001 restructured RID/ADR. For this reason, this document uses the last version of the ADR (1999) prior to restructuring in order to establish a parallel between the special provisions (TE) and those equipment prescriptions referred in the 2007 edition.

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4. The special provisions may only perform their role of complementing the tank code effectively if they are clear and unambiguous. Only in this way will the competent authorities be able to write with total certainty on the approval document, and on the tank plate, only those provisions that the tank demonstrably complies with.

5. The use of expressions such as “may be” or “if... than” are dubious and should not be used. There are also certain special provisions which are redundant, and their merger with others or possible elimination should be considered.

Explanation

Special provisions for thermal insulation

6. The analysis of the special provisions (TE) in 6.8.4 (b) of ADR/RID shows that there are four special provisions concerning thermal insulation, as follows:

“TE4 Shells shall be equipped with thermal insulation made of materials which are not readily flammable.”

“TE5 If shells are equipped with thermal insulation, such insulation shall be made of materials which are not readily flammable.”

“TE13 Tanks shall be thermally insulated and fitted with a heating device on the outside.”

“TE14 Tanks shall be equipped with thermal insulation. The thermal insulation directly in contact with the shell shall have an ignition temperature at least 50 °C higher than the maximum temperature for which the tank was designed.”

TE4

7. Special provision TE4 is required only for four class 4.1 substances (flammable solids, self-reactive substances and solid desensitized explosives) as follows:

UN NO.	CLASS	P. G.	NAME AND DESCRIPTION	TANK CODE	SPECIAL PROV.
2304	4.1	III	NAPHTHALENE, MOLTEN	LGBV	TU27;TE4;TE6
2448	4.1	III	SULPHUR, MOLTEN	LGBV(+)	TU27; TE4;TE6
3176	4.1	II	FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.	LGBV	TU27; TE4;TE6
3176	4.1	III	FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.	LGBV	TU27; TE4;TE6

8. In RID/ADR 1999, UN 2304, item 15° and UN 2448 were substances of marginal 2401, item 5°, and UN 3179 was a substance of marginal 2401, item 15°. It can also be seen that marginal 211434 which applied to these substances, has precisely the same wording as the

current TE4. It can also be seen that the text of this marginal does not apply to other substances carried at elevated temperatures.

9. The term “not readily flammable” is not clearly defined. Does it mean that if the thermal insulation directly in contact with the shell has an ignition temperature at least 50 °C higher than the maximum temperature for which the tank was designed, it is not readily flammable? If this is so, it is possible to substitute TE4 for TE14.

TE5

10. Special provision TE5 is required for the following substances:

UN NO.	CLAS S	P. G.	NAME AND DESCRIPTION	TANK CODE	SPECIAL PROV.
1389	4.3	I	ALKALI METAL AMALGAM, LIQUID	L10BN(+)	TU1;TT3;TM2 TE5
1391	4.3	I	ALKALI METAL DISPERSION or ALKALINE EARTH METAL DISPERSION	L10BN(+)	TU1;TT3;TM2 TE5
1392	4.3	I	ALKALINE EARTH METAL AMALGAM, LIQUID	L10BN(+)	TU1;TT3;TM2 TE5
1407	4.3	I	CAESIUM	L10CH(+)	TU2;TU14;TE5; TE21;TT3;TM2
1415	4.3	I	LITHIUM	L10BN(+)	TU1;TT3;TM2; TE5
1420	4.3	I	POTASSIUM METAL ALLOYS, LIQUID	L10BN(+)	TU1;TT3;TM2; TE5
1421	4.3	I	ALKALI METAL ALLOY, LIQUID, N.O.S.	L10BN(+)	TU1;TT3;TM2; TE5
1422	4.3	I	POTASSIUM SODIUM ALLOYS, LIQUID	L10BN(+)	TU1;TT3;TM2; TE5
1423	4.3	I	RUBIDIUM	L10CH(+)	TU2;TU14;TE21;TT3; TM2; TE5
1428	4.3	I	SODIUM	L10BN(+)	TU1;TT3;TM2; TE5
2257	4.3	I	POTASSIUM	L10BN(+)	TU1;TT3;TM2; TE5
3401	4.3	I	ALKALI METAL AMALGAM, SOLID	L10BN(+)	TU1;TT3;TM2; TE5
3402	4.3	I	ALKALINE EARTH METAL AMALGAM, SOLID	L10BN(+)	TU1;TT3;TM2; TE5
3403	4.3	I	POTASSIUM METAL ALLOYS, SOLID	L10BN(+)	TU1;TT3;TM2; TE5
3404	4.3	I	POTASSIUM SODIUM ALLOYS, SOLID	L10BN(+)	TU1;TT3;TM2; TE5

11. According to ADR 1999, all these substances, with the exception of UN 3401, 3402, 3403 and 3404 which at the time were not classified, belonged to marginal 2471, item 11° (a). It can also be seen that marginal 211435 which applied to these substances, had precisely the same wording as the current TE5.

12. This provision does not require tanks to be fitted with thermal insulation. It prescribes the condition of “not readily flammable” where insulation is fitted, which raises the same issue as the one raised above for TE4.

- (a) How is it possible to assert that a tank complies with special provision TE5? When it is equipped with thermal insulation made of materials which are not readily flammable” or when it is not fitted with insulation?
- (b) In the latter case, what should be indicated in item 9.6 of the vehicle approval certificate (ADR Certificate, see paragraph 9.1.3.6 of ADR)?
- (c) Which measures should the inspecting authorities adopt regarding the transport of one of these substances if TE5 is not referred to in the ADR Certificate?

13. As the use of thermal insulation is not compulsory, TE5 should be eliminated to avoid dubious situations, and its contents should be considered as a construction requirement.

TE14

14. Curiously, TE14 is only required for the following substance:

UN NO.	CLASS	P. G.	NAME AND DESCRIPTION	TANK CODE	SPECIAL PROVISIONS
3257	9	III	ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flashpoint (including molten metals, molten salts, etc.)	LGAV	TU35;TC7;TE6;TE18;TE24

15. This substance was only classified in RID/ADR since 1997. According to marginal 2901 of RID/ADR 1999, it is classified under item 20° c). Marginal 211932 which applies to these substances, has the same wording as the current TE14, which does not, in our view, raise any doubts as to its interpretation.

16. For transport in tanks, this substance also requires compliance with special provisions TE6 and TE18, which are discussed further in this document.

TE13

17. TE13 applies only to UN 1829.

UN NO.	CLASS	P. G.	NAME AND DESCRIPTION	TANK CODE	SPECIAL PROVISIONS
1829	8	I	SULPHUR TRIOXIDE, STABILIZED	L10BH	TU32;TT5; TM3, TE13

18. This special provision corresponds to marginal 211833 of RID/ADR 1999. The type of insulation is not specified.

In any case, this does not raise any comments from the Government of Portugal.

Special provisions for valves

19. There are also other instances of overlap of special provisions, such as TE6 with TE23, and TE9 with TE11, as follows:

TE6 and TE23

20. “TE6: Tanks may be equipped with a device of a design which precludes its obstruction by the substance carried and which prevents leakage and the build-up of excess overpressure or underpressure inside the shell.”

“TE23: Tanks shall be equipped with a device of a design which precludes its obstruction by the substance carried and which prevents leakage and the build-up of excess overpressure or underpressure inside the shell.”

21. These two special provisions relate to the same device. The difference is that in TE23 the device is compulsory, while in TE6 it is optional.

TE6

22. TE6 is required for the following substances:

UN NO.	CLASS	P. G.	DESCRIPTION	TANK CODE	SPECIAL PROVISIONS
2304	4.1	III	NAPHTHALENE, MOLTEN	LGBV	TU27;TE4, TE6
2448	4.1	III	SULPHUR, MOLTEN	LGBV(+)	TU27;TE4 ; TE6
3176	4.1	II	FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.	LGBV	TU27;TE4 ; TE6
3176	4.1	III	FLAMMABLE SOLID, ORGANIC, MOLTEN,	LGBV	TU27;TE4 ; TE6
3257	9	III	ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flashpoint (including molten metals, molten salts, etc.) filled at a temperature higher than 190°C.	LGAV	TU35;TC7; TE6; TE14;TE18;TE24
3257	9	III	ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flashpoint (including molten metals, molten salts, etc.) filled at or below 190°C.	LGAV	TU35;TC7; TE6; TE14;TE24

23. The text of TE6 was amended in the 2005 version of RID/ADR. Originally (RID/ADR2001), it had the same wording as marginal 211436 of RID/ADR1999 which was as follows: “Shells... may be equipped with valves opening automatically inwards or outwards under the effect of a difference of pressure of between 20 kPa and 30 kPa (0.2 bar and 0.3 bar).” In relation to UN 3257, this same text was inserted in marginal 211932.

24. The issues raised for special provision TE5 also apply to this provision, i.e.

- (a) How is it possible to assert that a tank complies with this special provision? When it is fitted with or not fitted with the device?
- (b) In the latter case, what should be indicated in item 9.6 of the vehicle approval certificate (ADR Certificate)?
- (c) What measures should the inspecting authorities adopt regarding the transport of one of these substances if TE6 is not referred to in the ADR Certificate? It should be borne in mind that the use of such a device is not compulsory.

25. Another issue that appears relevant to the Government of Portugal is the definition of overpressure. Is overpressure defined in relation to atmospheric pressure, maximum working pressure or tank design pressure?

TE23

26. TE23 is required for the following substances:

UN NO.	CLASS	P. G.	NAME AND DESCRIPTION	TANK CODE	SPECIAL PROVISIONS
3375	5.1	II	AMMONIUM NITRATE EMULSION OR SUSPENSION or GEL, intermediate for blasting explosives, liquid	LGAV (+)	TU3;TU12;TU39; TE10;TA1;TA3; TE23
3375	5.1	II	AMMONIUM NITRATE EMULSION OR SUSPENSION or GEL, intermediate for blasting explosives, liquid	SGAV (+)	TU3;TU12;TU39; TE10;TA1;TA3; TE23

27. These substances were not classified in RID/ADR 1999. They were classified in RID/ADR 2003, but they could not be carried in tanks. In the RID/ADR 2005 version, the substances are described in the above table. This special provision does not raise any issues other than the issue of overpressure referred to in relation to TE6.

TE9 and TE11

28. “TE9: Tanks shall be fitted in their upper part with a shut-off device preventing any build-up of excess pressure inside the shell due to the decomposition of the substances carried, any leakage of liquid, and any entry of foreign matter into the shell”.

“TE11: Shells and their service equipment shall be so designed as to prevent the entry of foreign matter, leakage of liquid or any building up of dangerous excess pressure inside the shell due to the decomposition of the substances carried”.

29. These two special provisions relate to the same device. The difference is that in TE9 the device must necessarily be fitted in the upper part of the tank, while in TE11 fitting it in this location is optional. In practice however, it is only possible to locate this device in contact with the gaseous phase or the vapours from the substance, i.e. in the upper part of the tank.

TE9

30. This special provision is required for the following materials:

UN NO.	CLASS	P. G.	DESCRIPTION	TANK CODE	SPECIAL PROVISIONS
2015	5.1	I	HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with more than 70% hydrogen peroxide	L4DV(+)	TU3;TU28; TC2;TE8; TE9; TT1
2015	5.1	I	HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with more than 60% hydrogen peroxide and not more than 70% hydrogen peroxide	L4BV(+)	TU3;TU28; TC2;TE7; TE8;TT1 TE9
2426	5.1		AMMONIUM NITRATE, LIQUID, hot concentrated solution, in a concentration of more than 80% but not more than 93%	L4BV(+)	TU3;TU12; TU29;TC3; TE9; TE10;TA1

31. This special provision corresponds to marginal 211532 (1) of RID/ADR 1999 and does not raise any issues other than the issue of overpressure already referred to in relation to TE23 and TE6.

TE11

32. This special provision is required for the following substances:

UN NO.	CLASS	P. G.	DESCRIPTION	TANK CODE	SPECIAL PROVISIONS
1791	8	II	HYPOCHLORITE SOLUTION	L4BV(+)	
1791	8	III	HYPOCHLORITE SOLUTION	L4BV(+)	
1908	8	II	CHLORITE SOLUTION	L4BV(+)	
1908	8	III	CHLORITE SOLUTION	L4BV(+)	
2014	5.1	II	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	L4BV(+)	TU3;TC2; TE8; TE11; TT1
2984	5.1	III	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 8% but less than 20% hydrogen peroxide (stabilized as necessary)	LGBV	TU3;TC2; TE8; TE11; TT1
3149	5.1	II	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURE with acid(s), water and not more than 5% peroxyacetic acid, STABILIZED	L4BV(+)	TU3;TC2; TE8; TE11 ; TT1

33. Special provision TE11 corresponds to marginal 211532 (2) and marginal 211834 (2) of RID/ADR 1999, and does not raise any further issues.

TE18

“TE18: Tanks intended for the carriage of substances filled at a temperature higher than 190 °C shall be equipped with deflectors placed at right angles to the upper filling openings, so as to avoid a sudden localized increase in wall temperature during filling.”

34. TE18 is only required for the following substance:

UN NO.	CLASS	P. G.	DESCRIPTION	TANK CODE	SPECIAL PROVISIONS
3257	9	III	ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flashpoint (including molten metals, molten salts, etc.), filled at a temperature higher than 190°C.	LGAV	TU35;TC7;TE6;TE14; TE18; TE24

35. This is a special provision applying exclusively to UN 3257, which may be carried at a temperature below 190 °C, even if the tank has been designed for a higher temperature. In this case, should the tank approval document contain a reference to provision TE18 or not? Should the tank have deflectors or not? And what is the situation if it has deflectors but the material was loaded at a temperature below 190 °C?

36. In order to solve the problem, the French Government submitted a proposal to divide UN 3257 into two entries (see document TRANS/WP.15/AC.1/2005/63). This proposal was accepted and forms part of amendments already approved for RID/ADR 2007, as follows.

(1)	(2)	(13)
3257	ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flash-point (including molten metals, molten salts, etc.), filled at a temperature higher than 190 °C.	TU35 TC7 TE6 TE14 TE18 TE24
3257	ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flash-point (including molten metals, molten salts, etc.), filled at or below 190 °C.	TU35 TC7 TE6 TE14 TE24

(Ref. Doc.: TRANS/WP.15/AC.1/2005/63)

37. As stated by the Government of Portugal at the RID/ADR meeting in September 2005 when the proposal was presented, we believe that it is not possible for the competent authorities to monitor the filling temperature of the substances.

38. In addition, if the fitting of deflectors is designed to protect the tank against thermal shock at the time of filling, why are these devices not required for other substances that are filled at elevated temperatures?

39. It is also necessary to bear in mind that deflectors are not like other types of device such as valves, which can be easily fitted to and removed from a tank. Deflectors are welded to the shell of the tank and are fitted when the tank is constructed. For this reason, these devices have the same useful life as the tank since their removal could cause significant damage to the tank shell.

40. This being so, should not deflectors be regarded as a provision for the construction of these tanks, and apply to all substances transported at elevated temperatures?

Proposal

41. In accordance with the explanations given above, the Government of Portugal proposes the following:

(a) Delete special provisions TE4, TE5, TE6, TE9, TE18. (6.8.4 (b) and column (13) of Table A).

(b) Assign TE11 to UN numbers 2015 and 2426 instead of TE9. TE14 will remain, and will be the only special provision of thermal insulation. Assign TE14 to UN numbers 2304, 2448 and 3176 instead of TE14.

(c) The special provision TE5 should become a construction requirement. Therefore, it is proposed to amend 6.8.2.1.25 to read as follows:

“6.8.2.1.25 The thermal insulation directly in contact with the shell shall have an ignition temperature at least 50 °C higher than the maximum temperature for which the tank was designed for, and shall be so designed as not to hinder access to, or the operation of, filling and discharge devices and safety valves”.

(d) The special provision TE18 should also become a construction requirement. It is proposed to insert a new paragraph 6.8.2.1.XX as follows:

“6.8.2.1.XX Tanks with design temperature above 190 °C shall be equipped with deflectors placed at right angles to the upper filling openings, so as to avoid a sudden localized increase in wall temperature during filling”.

(e) Insert the following definition in 1.2.1:

“Overpressure” means an increase of pressure effectively developed in a tank or in a packaging, measured above of its maximum working pressure, or maximum allowable working pressure.
