
Economic Commission for Europe

English

Inland Transport Committee**22 January 2015****Working Party on the Transport of Dangerous Goods****Joint Meeting of Experts on the Regulations annexed to the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)****Twenty-sixth session**

Geneva, 27-30 January 2015

Agenda item 6

Reports of informal working groups

Report of the 7th Meeting of the informal working group “Explosion protection on tank vessels”

Transmitted by the Central Commission for the Navigation of the Rhine

Introduction

The 7th meeting of the informal working group “explosion protection on tank vessels” was held on 14 and 15 January 2015 in Berlin, Bundesanstalt für Materialforschung und –prüfung (BAM).

Participants:

Y. Adebahr-Lindner, BAM; H.-J. Braun, CIPA; J.-P. de Maat, MINIENM; K. den Braven, BLN;

D. Gerstenkorn, BDB; H. Klopp, DNVGL; U. Körschgen, BAV; F. Krischok, BAM; M. Pötzsch, BAM;

N. Remers, RIVM; T. Speermann, BDB; R. Vermeulen, FuelsEurope; K. Vinke, LR; E. Brandes, PTB

The informal working group dealt with the topic ‘modification of the explosion concept of the recent ADN.

Result

Based on the discussions during the 25th meeting of the ADN Safety Committee (CCNR_ZKR_ADN_WP15_AC2_52de, VI. Berichte informeller Arbeitsgruppen (TOP 5)

CCNR_ZKR_ADN_WP15_AC2_52e, VI. Reports of informal working groups (agenda item 5), CCNR_ZKR_ADN_WP15_AC2_52fr, VI. Rapports des groupes de travail informels (point 5 de l'ordre du jour)

CCNR_ZKR_ADN_WP15_AC2_52ru, VI. Доклады неофициальных рабочих групп (пункт 5 повестки дня))

the informal working group proposes the following basic concept for the modification, that means the improvement of the explosion protection on tank vessels :

A. Basic-safety measures to be complied with in an area designated from onshore as zone 2 (for example terminals, locks)

All tank vessels having an ADN certificate of approval have to be equipped as follows:

1. Surface temperatures have to be below 200°C
2. Electrical equipment has to be of the type “limited explosion risk” (comparable zone 2) as defined in ADN 1.2.1 whereas the surface temperature is limited to 200°C
3. If there is equipment which is not able to fulfill these requirements mentioned in 1. and 2., such equipment has
 - either to be switched off or
 - in rooms where such equipment is installed an overpressure of 0,1 kPa has to be assured accompanied by a continuous control of the concentration of flammable substances (as just required in **9.3.x.52.3**) if the tank vessel stays in or near to an onshore zone 2. The gas detection system has to be calibrated with n-Hexane. The limiting value for switching off the ventilators etc. (see **9.3.2.52.3**) is 20% of the lower explosion limit of n-Hexane.

Further hazards which may be caused by non-electrical equipment (e.g. mechanical sparks) are considered too low to justify any safety measures to be part of the basic-safety measures.

The hazards of any influx of explosive vapours/air mixtures from outside the ship during regular voyage on the river are considered also slim. Thus this doesn't justify any further measures to be taken.

B. Addition safety measures to be complied with in case the product list of the ship contains substances which need explosion safety measures

Tank vessels, whose product list contains substances where explosion protection is compulsory **in addition to A** the following changes are proposed:

1. The recent zone concept shall be modified as proposed to the safety committee in WP15-AC2-22-inf23g:
 - Specifying a zone 2 on board the ship
 - Explosion protection requirements also for non-electrical equipment within the zones on board the ship
 - The electrical and the non-electrical equipment used within the respective zone on board the ship has to fulfill the requirements applicable for that zone
 - Additional measures to prevent that explosive vapour/air mixtures from the cargo (zone) enter the area of housing, wheelhouse etc. outside the cargo area.
2. If the product list contains substances of temperature class T4, T5 or T6 the respective maximum surface temperature is applicable
3. Autonomous protective systems (high velocity valves, flame arrestors etc) have to be chosen according the requirements given in Table C

C. Table C

Table C shall stay unchanged, because Table C contains substance specific information. With the temperature classes T1 and T2 in column 15 a footnote shall be added explaining that this temperature class can not be used because according to **A** a maximum surface temperature of 200°C is required.

Justification

The recent ADN regards electrical equipment of type “limited explosion risk” (comparable zone 2) outside the cargo area as sufficiently safe during loading, unloading and degassing for vessels the product list of which contains substances for which explosion protection is necessary.

The informal working group expects a remarkable added value to the safety to widen and enlarge these requirements of the recent ADN to

1. All tank vessels independent of their product list
2. The whole vessel (if not possible measures as asked for in 9.3.x.52.3 have to be taken)
3. The stay in or near to an onshore zone 2.

The informal working group expects a remarkable added value to the safety when

limiting the maximum surface temperature to 200°C or in case of vessels carrying substances of temperature class T4, T5 and T6 to the respective maximum surface temperature

with vessels the product list of which contain substances where explosion protection is necessary when

- specifying a zone 2 on board the vessel
- extending the explosion safety requirements to nonelectrical equipment which is used within the respective zone on board the ship
- specifying measures to avoid the spreading of explosive vapour/air mixtures created by the product carried to areas outside the cargo area (housing, wheelhouses etc)

(The requirements according to 9.3.x.52.3 during degassing or loading and unloading even if there is no onshore zone 2 define).

By these proposals all ADN vessels accommodate for risks by explosive vapour/air mixtures from outside the vessel, independent of the entries in their product list.

The informal working group sees this basic concept feasible for new vessels.

The informal working group asks the safety committee to discuss this proposal.
