

---

**Economic Commission for Europe****Inland Transport Committee****Working Party on the Transport of Dangerous Goods**

English

13 January 2017

**Joint Meeting of Experts on the Regulations annexed to the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (ADN Safety Committee)****Thirtieth session**

Geneva, 23–27 January 2017

Item 5 (b) of the provisional agenda

**Proposals for amendments to the Regulations annexed to ADN:  
other proposals**

---

**Draft Amendment to the Regulations annexed to the ADN:  
3.2.3.1 Column 20 item 12 (e) used for transport of UN 1280  
Propylene Oxide and UN 2983 Ethylene Oxide and Propylene  
Oxide, mixture****Submitted by EBU/ESO****I. Introduction:**

The products Propylene Oxide (UN 1280) and the mixture of Ethylene Oxide and Propylene Oxide (UN 2983) are carried by a couple of ADN- G 11 barges in a dedicated way. In ADN 3.2 Table C, an ADN barge type C-11 is required minimally and additional requirement/remark #12 is applicable for only these two substances. In practice, barges of the ADN-type G 11 are used to carry these products, as there were no barges built of the type ADN-C 11.

Additional remark #12 stipulates that frequent internal cargo tanks inspections are necessary to inspect the cargo tanks. With Type X.1.1 tanks this frequently required cargo tank inspection does not contribute anything to a safe structure of the cargo tank and is therefore, superfluous.

**II. Table C, column 20, additional requirement number 12 for  
UN 1280 and UN 2983:**

Table C column 20 mentions additional requirement/remark #12:

“

*(e) The cargo tanks shall be entered and inspected prior to each loading of these substances to ensure freedom from contamination, heavy rust deposits or visible structural defects.*

*When these cargo tanks are in continuous service for these substances, such inspections shall be performed at intervals of not more than two and a half years.*

“

### III. Unnecessary requirement:

These products, classified under UN 1280 and UN 2983, have to be transported under inert gas circumstances, mentioned by Table C, column 20, remark 2:

*“Before loading, air shall be removed and subsequently kept away to a sufficient extent from the cargo tanks and the accessory cargo piping by the means of inert gas (see also 7.2.4.18).”*

The maximum acceptable O<sub>2</sub>% is <2 vol%. In practice, these inert circumstances mean <0.5 vol% O<sub>2</sub>.

As known, the process of rusting iron is a chemical reaction of iron and oxygen. Under inert conditions there is nearly no oxygen. The forming of rust by the absence of oxygen does not take place

For this reason it is unnecessary to inspect the cargo tanks

### IV. Overclassified barge type

Propylene Oxide (UN 1280) and the mixture of Ethylene Oxide and Propylene Oxide (UN 2983) are products of class 3, Packing Group I:

1280	PROPYLENE OXIDE	3	F1	I	3+unst.+N3+ CMR	C	1	1			95	0.83	1	yes	T2	II B	yes	PP, EP, EX, TOX, A	1	2; 12; 31
2983	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE, with not more than 30% ethylene oxide	3	FT1	I	3+6.1+unst.	C	1	1	3		95	0.85	1	no	T2	II B	yes	PP, EP, EX, TOX, A	2	2; 3; 12; 31

For both products, a type C 1 1 (type C, pressure tanks, independent cargo tanks) is required. This means cargo tanks, constructed for a maximum working pressure of 400 kPa (4 bar, ADN 9.3.2.11.1 sub c).

Transport takes place, however, in G11 (type G, pressure tank, independent cargo tank) which

usually constructed for a working pressure of 15.80 bars and a test pressure of 23 bars. This means a much heavier constructed cargo pressure tank, equipped with thicker hulls, etc.

### V. Comparison with requirements of other UNECE transport modes

With other relevant transport modes, a comparison is made:

**ADR(road):** there are comparable requirements for transporting these product over the road, for the inspection of tank cars, transport tanks, reservoirs and cylinders:

**ADR 6.7 Requirements for the design, construction, inspection and testing of portable tanks and MEGC’s**

*6.7.2 Specification of requirements for tanks intended for the carriage of substances of Class 1 and 3-9:*

*6.7.2.19.5 The intermediate 2,5 periodic inspection and test shall at least include an internal and external examination of the portable tank and its fittings with due regard to the substances intended to be carried, a leakproofness test and a check of the satisfactory operation of all service equipment.*

*Sheating, thermal insulation and the like shall be removed only to the extent required for reliable appraisal of the condition of the portable tank. For portable tanks intended for the carriage of a single substance, the 2.5 year internal examination may be waived or substituted by other test methods or inspection procedures specified by the competent authority or its authorized body.*

#### **RID (rail)**

6.8.2.4.2 and 6.8.2.4.3 states:

Periodical inspection each 8 years, intermediate inspection each 4 years.

#### **IMO (seagoing vessels)**

In line with IMO, these substances may be carried in IMO-Type 2 Chemical tankers (Ships carrying liquid chemicals in bulk, comparable with ADN-type C). IBC 15.8.5 describes the requirements to carry these products in those ships; a tank inspection is required each 2 years. It is likely that the ADN has used this inspection sequence. Under the ADN, these products are only to be transported in pressurized cargo tanks.

When transported in Gas-ships (Type-IMO 1G, 2(P)G, 3G), in line with IMO 9.7.3, an inspection is required only each 5 years during Class Survey.

## **VI. Comparison with shore storage legislation**

After consultation with several European main suppliers of the mentioned products, it appears that the shore tanks are not inspected with a 2,5 year interval.

The inspection for the PO tanks are arranged in line with pressure tank regulations (above 0,5 bar) and

atmospheric tanks (below 0,5 bar). In there the tanks are inspected every 6 years for pressure tanks and

every 10 years for atmospheric tanks.

## **VII. Results of inner cargo tank inspections**

Carriers/barge owners of ADN-G-barges that have much experience in the transport of the above mentioned products, confirm that the regularly tank inspections do not deliver any relevant information. There are no signals from which can be concluded that there are findings of contamination, heavy rust deposits or visible structural defects. This might be no surprise as the transport is dedicated, under inert atmosphere and in an strongly overclassified cargo tank type.

## **VIII. Experience in practice:**

12(e) states: “to ensure freedom of contamination, heavy rust deposits or visible structural defects.” In practice there are other options to check on the above three requirements:

#### **Contamination:**

- The barges used in this trade are dedicated for a long period.
- These cargoes are transported in one cargo grade per shipment
- Cargoes are transported in independent cargo tanks. Contamination from adjacent tanks is not possible.

- During the transport cargo samples are taken on a regularly bases. These samples are used for quality purpose. Even small contamination will thus be found very quickly.
- Therefore contamination with other products is not possible or will be found instantly.

Heavy rust deposits:

- Industry experience is that even after a period between two special surveys (5-6 years), no heavy rust deposits are found in the cargo tanks.
- The low oxygen percentage in barge and shore tanks will eliminate limit the possibility of rust development-
- The cargo tanks are always operated as closed systems. Tank pressure is always above atmospheric pressure. Entry of oxygen which might cause oxidation is prevented under all situations.
- During the transport cargo samples are taken on a regularly bases under closed conditions. These samples are used for quality purpose. Even small rust particles will thus be found very quickly.
- Therefore the undetected development of heavy rust deposits is not possible.

Visible structural defects:

- According to Table C in the ADN the cargoes can be transported in a C.1.1 tank. Practice is that the product is transported in a G.1.1 tank. A x.1.1 tank is an independent pressure tank.
- Tanks are therefore positioned in a hold space.
- Tanks are self-supporting so no structural elements are present at the inside of the tank. Only a vacuum ring and internal piping is present, but these are not part of the tank structure.
- If any structural defects are present, these can also be seen and detected from the hold space.

## IX. Conclusions:

The following conclusion have been drawn in the proposal:

- Based on the above an internal inspection after 2,5 years is for the reasons mentioned under 3.2.3.1 12(e) not necessary and superfluous. It does not contribute anything regarding safety but does raise unnecessary risks, costs and has a negative environmental impact;
- ADR has an possible exemption for the intermediate survey for dedicated transports, by which the intermediate inspection can be extended to the 5-yearly survey. RID uses a 4-yearly inspection sequence;
- The 2 yearly inspection sequence which is found in additional requirement/remark #12 is probably used from the IMO-Regulation but is applicable for liquid tankers. For Gas-tankers only intermediate tank inspections are required during the 5-yearly special survey.

## X. Proposal:

The EBU/ESO proposes to strike the second paragraph of 12 (e) and insert the following:

“When these cargo tanks are in continuous service for these substances, no repetitive internal inspections are required after the initial internal inspection for the first loading. Additional internal tank inspection is to be done during special survey periods.”.

3.2.3.1 12 (e) will then become:

*(e) The cargo tanks shall be entered and inspected prior to each loading of these substances to ensure freedom from contamination, heavy rust deposits or visible structural defects.*

~~When these cargo tanks are in continuous service for these substances, such inspections shall be performed at intervals of not more than two and a half years.~~

*When these cargo tanks are in continuous service for these substances, no repetitive internal inspections are required after the initial internal inspection of the first loading. Additional internal tank inspection is to be done during special survey periods.*

## **XI. Safety impact:**

As there are no findings, even after 5 years of using the cargo tanks of the ADN G-11 in a dedicated trade under inert conditions, in combination with the fact that as oxygen is not present and thus the rust process cannot take place on the inner side of the cargo tank and tank structure, there is not any safety impact if the internal 2½ -yearly inspection would be skipped and the cargo tanks are inspected within the 5-yearly Class Survey. This, fully in line with IMO-Regulations regarding Gas-ships.

---