

**Committee of Experts on the Transport of Dangerous Goods  
and on the Globally Harmonized System of Classification  
and Labelling of Chemicals**

**Sub-Committee of Experts on the Transport of Dangerous Goods**

**26 November 2010**

**Thirty-eighth session**

Geneva, 29 November –7 December 2010

Item 6 / 10 of the provisional agenda

**Miscellaneous proposals of amendments to the Model Regulations  
on the Transport of Dangerous Goods /  
Guiding principles for the Model Regulations**

**Transitional arrangements for portable tanks intended for  
the transport of liquids**

**Transmitted by the expert from the United Kingdom**

**Introduction**

1. At the thirty-seventh session of the Sub-Committee of Experts on the Transport of Dangerous Goods, the request from the International Tank Container Organisation contained in document ST/SG/AC.10/C.3/2010/13 was considered. It was not supported by the majority of Experts though some Experts including the United Kingdom voiced concern that some portable tanks would be prematurely scrapped.
2. The expert from the United Kingdom wishes to express his continued support for the principle of applying appropriate transitional periods for the continued use of portable tanks where the T-code allocated to entries in the Dangerous Goods List has been increased. The United Kingdom provides the following information in support of this principle.
3. UK industry has provided a substantial case study of the effects of the constant upgrading of allocated T-codes that could have an impact on the economic use of portable tanks throughout the world. In the light of that case study and one other included in this proposal, the Expert from the United Kingdom requests the Sub-Committee to reconsider its position on transitional periods for the continued use of existing portable tanks beyond the deadlines set out not only TP37 as requested by ITCO but also as set out in TP35 and TP38.
4. The expert from the United Kingdom is aware that this is an extensive topic to consider at the end of a biennium and there will not be enough time to discuss this paper fully let alone approve any text. Nevertheless the United Kingdom hopes that some time might be found to discuss this topic and he requests that this be put on the work for the next biennium when the UK will submit a working paper with more detailed proposals.

**Proposals**

5. The United Kingdom proposes that the transitional periods recommended in portable tank special provisions TP35, TP37 and TP38 be increased to [25 years] [14 years] [10 years].

6. The United Kingdom also proposes that guidance on the allocation of transitional periods when portable tank codes are increased in line with the decisions taken on the proposals be developed.

## **Justification – Background**

7. The portable tank, especially in the form of an ISO tank container, is one of the most expensive containment systems provided for dangerous goods in the Model Regulations. The minimum life expectancy of ISO portable tanks is 25 years. Investments in them are based on this time period. A typical amortization period used by the industry is seven years. The margins of profitability in the tank container operating industry are such that it is only after amortisation that a return on the investment may be achieved.

8. The provisions for the design, construction, inspection, testing, certification and use of portable tanks were substantially reviewed and updated by two working groups authorised by the Committee of Experts in the 1990s. The work of these working groups were endorsed by the UN Sub-Committee of Experts and led to the inclusion of the provisions of Chapters 4.2 and 6.7 in the 11th edition of the Model Regulations.

9. As a result of this work, the T-code allocated to some entries in the Dangerous Goods List were increased, some remained the same and in a few cases were lowered compared to what was previously recommended in the Model Regulations and in modal regulations such as the IMDG Code.

10. At that time the UN Sub-Committee chose not to make any recommendations as to the transitional period which should be allowed for the continued use of portable tanks not meeting the requirements laid down in the Dangerous Goods List at the turn of the century. Rather this was left to the modal authorities. The IMO took the lead in establishing a nine-year transitional period for continued use of portable tanks meeting the previously allowed lower design and construction parameters. This transitional period was adopted by the RID/ADR/ADN Joint Committee (see 1.1.4.3) and was also included in 49 CFR (see §171 14 (d) (4)).

11. Since then, the UN Sub-Committee have chosen to specify a transitional period by the allocation of a TPxx portable tank provision where it has been decided there should be a further increase in the T-code allocated to specific entries in the Dangerous Goods List. That period has so far been set at six years. The tank container industry suggests that this period of transition is financially difficult to cope with. The financial situation is exacerbated because for certain commercially important substances, there have been as many as three increases in the allocated T-code in as many biennia.

12. The United Kingdom suggests that the impact this pattern of repetitive increase in the allocated T-code for such substances on the tank container industry has not necessarily been fully taken into account when taking such decisions.

## **Justification – Statistical Evidence – T-codes for liquids and solids**

13. At the present time there are about 2800 entries in the Dangerous Goods List. Of these, approximately 1100 liquids and solids are allocated to a T-code indicating that transport in portable tanks should be allowed.

14. Since the 11th edition of the Model Regulations was published and, more importantly, when these provisions were introduced into the modal regulations in 2000/2001, the T-code assigned to 536 of these entries has changed at least once – i.e. close to 50% of all the entries.

15. In 34 cases there have been three changes to the allocated T-code in three biennia.

16. By comparison with the Packing Instructions, IBC Packing Instructions and Large Packing Instructions for these entries in The Dangerous Goods List have remained or will remain substantially unchanged. On statistical grounds alone, the number of changes made to the T-codes place a significant burden on the ISO tank container industry compared to the burden placed on packaging/IBC/Large Packagings suppliers and users.

## **Justification – Financial Impact – T11 Code Portable Tanks**

17. The ISO tank container industry is careful in selecting the portable tanks it purchases. As an example, the industry has determined that a T11 portable tank with a capacity of 24000 litres represents the best investment when factors such as:

- Tare mass
  - Number of substances available for transport, both dangerous goods and non-dangerous with liquid densities which will afford useful payloads i.e. in the range 0.65 to 1.0
  - The dangerous goods which are permitted to be transported in T11 portable tanks taking into account the hierarchical table at 4.2.5.2.5
- are considered.

18. This care in selecting T11 means that to change the allocated code for any entries in The Dangerous Goods List to any of the T2, T3, T4, T5, T6, and T7 codes will have a reduced impact on the financial stability of the ISO tank container industry bearing in mind what is said below in 19.

19. The rules governing for the minimum degree of filling for portable tanks, taken generally by the industry to be 80%, can have a significant cost impact if the liquid density is high so that small capacity tanks are needed so as to ensure the minimum degrees of filling are complied with. In such cases a significant financial burden falls on the industry, as the fleets used for such substances, mixtures and solutions may have to be replaced with little prospect for any further use in the market for such small tanks.

## **Justification – Financial Impact – T-code changes T8, T9, T10 and higher than T11**

20. The ISO tank container industry does not easily cope with changes to T-code where allocated T-code changes from a lower T-code to either T8, T9, T10 and/or to a T-code in excess of T11. Where such portable tanks must be used, a change in T-code can have a major impact on the industry. The impact may be:

- Important alterations to the filling plant at the consignor in order to change to loading top discharge tanks with a capital expenditure, timing and ongoing cost implication

- Important alterations to the discharge plant at the consignee in order to change to unloading from the top with a capital expenditure, timing and ongoing cost implication
- Changing the fleet of tanks from general purpose bottom outlet tanks to tanks dedicated to the transport of that substance. The use of top discharge tanks for routine loading outbound and return with another cargo is impractical. Changing from bottom discharge tanks to top discharge tanks can be said to more than double the transport costs because the tanks, de facto, have to be dedicated to the transport of just one substance, mixture or solution on a round-trip basis
- Possible redundancy of the tanks which have to be removed from service as no further alternative use can be found with associated costs of removing from service, the cost of substituting the replacement tanks and the cost of cleaning and storing the redundant tanks until further work can be obtained for them (if any).
- Unexpected financial liabilities for the investors in the fleet of tanks for which no further use can be found. The tanks may have been financed over a longer period than the transitional period resulting in a significant liability on the part of the owner/operator owing repayments to banks which are no longer supported by a revenue stream. The situation is likely to be worse for smaller operators.

## **Justification – Financial Impact – A Case Study**

21. The substance dimethyl sulphate, UN 1595, Class 6.1, Packing Group I and now identified as a substance toxic by inhalation is a commercially important substance world wide. Among the producers, there is one located in the Mumbai region of India. It is estimated that this manufacturer has in the region of 450 ISO tank containers in use transporting this substance world wide, particularly to North America and Europe. The T-code for this substance has been changed three times.

22. Until the end of 2009, T10 portable tanks were allowed for the transport of this substance.

23. From 2010 until the end of 2014, T14 portable tanks are required.

24. From 2015, T20 portable tanks must be used.

25. The cost of one ISO tank container for the transport of this substance may be put at current prices at roundly US \$20000 though this could be a conservative estimate. The figure is estimated on the basis of the following cost elements:

- The capital cost of each tank container
- The transport cost of positioning the new, empty, tank container from the place of manufacture such as Port Elisabeth, Republic of South Africa or Nantong, Peoples' Republic of China.
- Payment of any import dues which are necessary
- Collection of the tanks already in service, transporting them to a suitable depot with cleaning facilities for such a difficult substance to clean given its TIH properties. Cleaning top discharge tanks, in any case, is more difficult and costly than cleaning tanks with bottom outlets.
- Storage costs of the redundant tanks until further work, if any, can be found for them or until such time as disposed of as scrap
- Any financial penalties payable to finance companies

26. It can be said, therefore, that the cost of the original investment in the 450 T10 ISO tank containers, their substitution by T14 and then six years later by T20 ISO tank containers is in the order of US \$9,000,000 per round of changes, nearly US \$27 million in total. This example is just for one manufacturer of the substance. There are several major producers of this substance who could be equally affected by this sudden (to them) imposition of cost by changes to the Model Regulations.

27. As the liquid density of this substance is 1.3322, the ISO tank containers will be comparatively small in capacity and are top discharge; this presents the owner/operators great difficulty in finding alternative work for them. In any case, it is normal practice for a loader who might consider making an alternative use of these tank containers to ask what was the previous cargo. Upon learning that this is a TIH substance such as dimethyl sulphate, even though the cleaning may have taken place, new loaders may well reject them.

## **Justification – A Second Case Study**

28. The UN Sub-Committee have re-designated phosphorus oxychloride as a TIH substance and increased the allocated T-code from T7 to T20. As this substance has a liquid density of 1.67, very small capacity ISO tank containers are needed. We are unable to say how many ISO tank containers are in service at present for the transport of this liquid but the net effect of this increase in T-coding will make it very difficult for the industry to find alternative use for them. The possible consequence of this increase may be to scrap the tank altogether. Further, consignors will be faced with the capital and additional running costs of altering the filling points as will consignees to altering their discharge facilities.

## **Justification – Availability of Stainless Steel Plate**

29. It is common practice within the ISO tank container industry to construct the shells and much of the service equipment from low carbon austenitic stainless steels such as AISI 316 and AISI 316L, equivalent to DIN 1.4401, DIN 1.4404 etc. These steels have been found to be satisfactory over the years and, moreover, afford a level of safety that industry considers to be higher than the minimum safety requirements for the metals which are authorised in Chapter 6.7 for the construction of portable tanks in that their elongation factors before yield commences is greater than these minima. Such steels may elongate by up to 60% before yielding. This property means that under impact, the tank shell is rarely broached.

30. There are a number of steel mills around the world who can manufacture these steels but when the thickness of plate as determined by the application of the rules of Chapter 6.7 is taken into account, the number of mills which can produce plate of suitable dimensions (to reduce the amount of welding needed, for example) at the required thickness is low.

31. In the case of dimethyl sulphate, the required minimum equivalent shell thickness has been increased from 6mm to 8mm. As, when converted to the thickness required in austenitic steel, this is not in great demand world wide, there is a possibility that insufficient stainless steel plate will be available to construct the required number of substitute tanks within the transitional period which, for practical application is TP37 minus T35 = 2 years.

32. This effect will impact in the same way in similar situations where the T-code is changed frequently.

## **Guiding Principles – Allocation of Transitional Arrangements**

The United Kingdom considers that in the future there should be guidance given in the allocation of transitional arrangements for the continued use of existing portable tanks added to the Guiding Principles. This guidance should take into account the effect of the changes when:

- There is a change from bottom discharge to top discharge requirements
  - The affected substances have high liquid densities
  - The costs and lead times associated with the procurement of replacement portable tanks taking into account the impact of an increase in shell thickness and the available plate supplies
  - The lead times associated with the conversion of filling plant to top discharge where this is imposed
  - The lead times associated with the conversion of discharge plant to top discharge where this is imposed
  - The availability of suitable cleaning stations and residue disposal after cleaning
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