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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

Forty-fifth session
Geneva, 23 June – 2 July 2014
Item 4 (c) of the provisional agenda
Listing, classification and packing: miscellaneous

Classification and hazard communication provisions for crude oil

Transmitted by the experts from Canada and the United States of America[1]

Background

1. North America is experiencing a significant increase in crude oil supply, bolstered both by growing production in the Canadian oil sands and the recent expansion of shale oil and natural gas production in the United States of America and Canada.

2. North American shale oil and natural gas extraction has been mostly in geographic areas not linked to traditional crude oil or natural gas pipelines, resulting in an increase in surface transport. Surface transport has also enabled crude transport to different refinery capacities situated across North America. This mostly "younger" crude is being found to contain significantly higher "light ends" than what has been traditionally transported as UN 1267.

3. This significant and exponential increased in surface movement of crude oil has led authorities within Canada and the United States of America to carefully consider transport safety impacts as well as potential impacts to the environment. These efforts have been prioritized based on a series of major accidents across North America involving crude oil transport by rail - including a catastrophic incident brought to the attention of the Sub-Committee at its previous session that caused numerous fatalities and destroyed much of Lac Mégantic, Quebec, in July 2013.

4. The increased production and experience has led to a renewed focus within North America on assessing the adequacy of the current provisions governing crude oil transport.

[1] In accordance with the programme of work of the Sub-Committee for 2013-2014 approved by the Committee at its sixth session (refer to ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

While an assessment of relevant rail operational conditions have been major components of this effort, a significant portion of the experience gained is relevant to all modes and would benefit from broader review and discussion within the Sub-Committee. The purpose of this paper is to initiate discussions relevant to the experience recently gained, to raise important questions regarding the proper classification of - and transport provisions for – crude oil, and to invite the Sub-Committee to consider whether a review of the existing UN entries, assigned classifications, and transport provisions is warranted. This discussion may also eventually encumber other petroleum products such as natural gas condensates.

5. In particular, the Sub-Committee is invited to consider whether the current entries for crude oil in the Dangerous Goods List adequately distinguish between what can be significant variations in the flammable gas content of crude oils from different sources (see discussion below relevant to classification).

Discussion

6. This document contains no proposals. The Sub-Committee is invited to provide feedback as a first step towards evaluating the efficacy of the current provisions of the Model Regulations based on an evolving understanding of the risks inherent in the transport of crude oil. Specifically, based on the information available on various types of crude oils in global transport today, the Sub-Committee is requested to provide feedback with respect to the classification and hazard communication elements of the Model Regulations currently applicable to crude oil.

(a) Classification

Unlike other Class 3 manufactured goods, organic materials from oil and gas production represent a unique challenge in regards to classification. Differences in the chemical makeup of the raw material can vary day-to-day and from well head-to-well head. Unprocessed crude oil may present unique hazards based on the specific dissolved gas content, posing different hazards in transport. Would further distinctions beyond merely identifying the packing group relevant to the flammable liquid hazard or the flammable gas content of the crude be appropriate to account for the differing hazards posed by what can be significant quantities of dissolved flammable gases? What is the most appropriate measure of this volatility – boiling point or vapour pressure? Is the proposed measurement method a calculation based on the properties of the material or an observed value? What are the most appropriate sampling and testing procedures? And finally, at what threshold should revisions to the regulatory requirements be considered?

(b) Hazard communication

The current flammable liquid entries in the Dangerous Goods List provide for a distinction in hazard by the assignment of packing groups based on the liquid’s boiling and flash points. However, lighter crude oil with a higher quantity of dissolved flammable gases pose a significantly different risk than heavier crude oils that do not have such a high constituency of more volatile components. Would enhanced hazard communication distinguishing more volatile crude oils be beneficial for transport workers and emergency response personnel? If so, would a new table entry for such a material be sufficient?

Conclusion

7. The Sub-Committee is invited to consider appropriate next steps to ensure that the provisions of the Model Regulations adequately address the risks posed by the transport of crude oil. Based on the feedback received at this session, the experts from Canada and the United States of America would be willing to prepare specific proposals for consideration at a future session.