

SUB-COMMITTEE ON CARRIAGE OF  
CARGOES AND CONTAINERS  
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Agenda item 6

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## AMENDMENTS TO THE IMDG CODE AND SUPPLEMENTS

### Safe transport of polymerizing substances

Submitted by ICS

#### SUMMARY

*Executive summary:* The shipping industry has identified inconsistencies in the supply chain of polymerizing substances and regulatory disparity in the IMDG Code, which may cause safety risks for crew and vessels at sea. This document proposes amendments to the IMDG Code to help ensure and enhance appropriate risk mitigation in the sea transport of polymerizing substances.

*Strategic direction, if applicable:* Other work

*Output:* OW 3

*Action to be taken:* Paragraph 14

*Related documents:* None

#### Introduction

1 Amendment 38-16 to the International Maritime Dangerous Goods (IMDG) Code introduced UN numbers for polymerizing substances, as well as new definition "self-accelerating polymerization temperature (SAPT)" and special provision (SP) 386.

2 According to section 2.4.2.5.1 of the IMDG Code, polymerizing substances are defined as "substances which, without stabilization, are liable to undergo a strongly exothermic reaction resulting in the formation of larger molecules or resulting in the formation of polymers under conditions normally encountered in transport" (i.e. polymerization), and considered as such when, inter alia, "their self-accelerating polymerization temperature (SAPT) is 75°C or less under the conditions (with or without chemical stabilization as offered for transport) and in the packaging, IBC or portable tank in which the substance or mixture is to be transported."

3 In section 1.2.1 of the Code, the SAPT is defined as "the lowest temperature at which polymerization may occur with a substance in the packaging, IBC or portable tank as offered for transport." The SAPT must be determined in accordance with the test procedures established for the self-accelerating decomposition temperature for self-reactive substances in accordance with part II, section 28 of the Manual of Tests and Criteria.

4 SP 386, which applies to polymerizing substances, reads as follows:

"When substances are stabilized by temperature control, the provisions of 7.3.7 apply. When chemical stabilization is employed, the person offering the packaging, IBC or tank for transport shall ensure that the level of stabilization is sufficient to prevent the substance in the packaging, IBC or tank from dangerous polymerization at a bulk mean temperature of 50°C, or, in the case of a portable tank, 45°C. Where chemical stabilization becomes ineffective at lower temperatures within the anticipated duration of transport, temperature control is required. In making this determination factors to be taken into consideration include, but are not limited to, the capacity and geometry of the packaging, IBC or tank and the effect of any insulation present, the temperature of the substance when offered for transport, the duration of the journey and the ambient temperature conditions typically encountered in the journey (considering also the season of year), the effectiveness and other properties of the stabilizer employed, applicable operational controls imposed by regulation (e.g. requirements to protect from sources of heat, including other cargo transported at a temperature above ambient) and any other relevant factors."

5 Therefore, sufficient stabilization of a polymerizing substance can be ensured by the person offering the packaging, IBC or tank for transport through the employment of:

- .1 a chemical inhibitor;
- .2 temperature control; and
- .3 a chemical inhibitor and temperature control, if the inhibitor is not effective at lower temperatures within the anticipated duration of transport.

6 At the same time, the person responsible for the consignment operation is required to follow special provisions (as set out in section 7.3.7.5, combined with the requirements of section 7.3.1 of the Code and as applicable through SP 386) for substances stabilized by temperature control and whose determined SAPT (with or without chemical stabilization), as offered for transport, is 50°C or less for packagings and IBCs; or 45°C or less for portable tanks.

## **Discussion**

7 For the safe carriage by sea of the stabilized polymerizing substances, it is important that the shipper/consignor be directly required to ensure and confirm that the level of stabilization of the polymerizing substance is sufficient for the anticipated duration of transport, taking into consideration the conditions and factors set out in SP 386.

8 However, it is observed that, according to SP 386, the requirement to ensure that the level of stabilization is sufficient to prevent polymerization is placed on the "person offering the packaging, IBC or tank" rather than the shipper/consignor named in the dangerous goods declaration. On the other hand, section 7.3.7.5, which combined with the requirements of section 7.3.1 of the Code and as applicable through SP 386, contains special provisions for temperature control appropriate to "those responsible for the consignment operations in the dangerous goods transport supply chain."

9 The disparity in the wording of these two provisions can lead to uncertainty as to the level of safety of consignments handed over to the carrier. Specifically, SP 386 places requirements on the "person offering the packaging", i.e. a party/supplier that may not necessarily be the shipper/consignor who assumes responsibility for the accuracy of information provided in the dangerous goods declaration.

10 Uncertainty arises, in particular through the frequent situations where the shipper/consignor named in the dangerous goods declaration is different from the person offering the packaging or the manufacturer. As suppliers may not always be able to exchange fully accurate information among themselves, e.g. regarding the method of stabilization needed or the type of container used, the level of stabilization may eventually not be appropriate for the intended voyage when the packaging is delivered to the sea carrier. Alternatively, factors to be taken into consideration, as set out in SP 386, e.g. ambient temperature conditions typically encountered in the journey, may not always be accessible to previous suppliers, and therefore, a stabilization may not be appropriate for the specifics of the voyage. Therefore, the shipper/consignor's declaration to the sea carrier may be practically limited in that they are able to only confirm that sufficient stabilization has been ensured to the extent declared to them by the previous suppliers.

11 A simple confirmation from the shipper/consignor that the polymerizing substance is stabilized in accordance with SP 386 may not always be sufficient to help secure the safety of the crew and the vessel at sea, due to the discrepancies identified above.

### **Proposals**

12 To ensure and enhance the appropriate risk mitigation associated with polymerizing substances in sea transport, it is proposed to place the requirement to ensure that the level of stabilization is sufficient in order to prevent the substance in the packaging, IBC or tank from dangerous polymerization, directly on the shipper/consignor named in the Dangerous Goods Declaration.

13 It is further proposed to additionally require the shipper/consignor to specify and confirm the following in the dangerous goods declaration:

- .1 indication of the SAPT; and
- .2 that the chemical inhibitors employed are sufficient for the anticipated duration of transport and expected ambient temperatures during sea transport, as well as transshipment; and
  - .1 that no temperature control is necessary; or
  - .2 if a temperature control is required, the kind of cooling requirements/container type used, as applicable, in accordance with section 7.3.7.3.2 of the IMDG Code.

### **Action requested of the Sub-Committee**

14 The Sub-Committee is invited to consider the proposals contained in paragraphs 12 and 13 above and take action, as appropriate.