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COVER NOTE

From: Secretary-General of the European Commission,
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 17 November 2017

To: Mr Jeppe TRANHOLM-MIKKELSEN, Secretary-General of the Council of
the European Union

Subject: COMMISSION STAFF WORKING DOCUMENT For the Council Shipping
Working party IMO - Union submission to be submitted to the 5th session
of the Sub-Committee on Ship Systems and Equipment (SSE 5) of the IMO
in London from 12 - 16 March 2018 concerning a to amend the "Guidelines
for the approval of fixed dry chemical powder fire-extinguishing systems for
the protection of ships carrying liquefied gases in bulk" (MSC.1/Circ.1315)

Delegations will find attached document SWD(2017) 417 final.

Encl.: SWD(2017) 417 final



Brussels, 17.11.2017
SWD(2017) 417 final

COMMISSION STAFF WORKING DOCUMENT

For the Council Shipping Working party

IMO – Union submission to be submitted to the 5th session of the Sub-Committee on Ship Systems and Equipment (SSE 5) of the IMO in London from 12 - 16 March 2018 concerning a to amend the "Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk" (MSC.1/Circ.1315)

COMMISSION STAFF WORKING DOCUMENT
For the Council Shipping Working party

IMO – Union submission to be submitted to the 5th session of the Sub-Committee on Ship Systems and Equipment (SSE 5) of the IMO in London from 12 – 16 March 2018 concerning a proposal to amend the "Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk" (MSC.1/Circ.1315)

PURPOSE

The document in Annex contains a draft Union submission to the 5th session of the Sub-Committee on Ship Systems and Equipment (SSE 5) of the IMO concerning a proposal to amend the "Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk" (MSC.1/Circ.1315). It is hereby submitted to the appropriate technical body of the Council with a view to achieving agreement on transmission of the document to the IMO prior to the required deadline of 5 January 2018¹.

Article 6(2)(a)(i) of Directive 2009/45/EC of 6 May 2009 on safety rules and standards for passenger ships² (that applies to vessels operating domestically carrying more than 12 passengers) applies SOLAS, as amended, to Class A passenger ships. Furthermore, the FSS Code applies to Class B, C and D ships constructed on or after 1 Jan 2003. Fixed fire-extinguishing systems are regulated by Directive 2014/90/EU of the European Parliament and of the Council of 23 July 2014 on marine equipment³, and more specifically by Commission Implementing Regulation (EU) 2017/306 indicating design, construction and performance requirements and testing standards for marine equipment⁴, MED/3.62. Dry chemical powder extinguishing systems based on MSC.1/Circ.1315. Therefore, the said draft Union submission falls under EU exclusive competence.

¹ The submission of proposals or information papers to the IMO, on issues falling under external exclusive EU competence, are acts of external representation. Such submissions are to be made by an EU actor who can represent the Union externally under the Treaty, which for non-CFSP (Common Foreign and Security Policy) issues is the Commission or the EU Delegation in accordance with Article 17(1) TEU and Article 221 TFEU. IMO internal rules make such an arrangement absolutely possible as regards existing agenda and work programme items. This way of proceeding is in line with the General Arrangements for EU statements in multilateral organisations endorsed by COREPER on 24 October 2011.

² OJ L 163, 25.6.2009, p. 1.

³ OJ L 257, 28.8.2014, p. 146.

⁴ OJ L 48, 24.2.2017, p. 1.

PROPOSAL TO AMEND MSC.1/CIRC.1315

Consideration of the proposal to amend the "*Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk*" (MSC.1/Circ.1315)

Submitted by the European Commission on behalf of the European Union

SUMMARY

<i>Executive summary:</i>	This document contains considerations about dry chemical powders to be used in fixed fire-extinguishing systems as provided for in the <i>Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk</i> " (MSC.1/Circ.1315) included in a new output established by MSC98.
<i>Strategic direction:</i>	5.2
<i>High-level action:</i>	5.2.1
<i>Planned output:</i>	5.2.1
<i>Action to be taken:</i>	Paragraph 11
<i>Related documents:</i>	MSC98/WP.1/Add.1, MSC98/20/8; MSC.1/Circ.1315

Introduction

1. At MSC98, with submission MSC98/20/8 the Republic of Korea proposed a new output to amend MSC.1/Circ.1315 with a view to ensure that the capabilities of dry chemical powder fire-extinguishing systems are fit for purpose. MSC98 agreed to establish a new output under the agenda of the Sub-Committee of ships systems and equipment with a view to amend the said Circular.

2. MSC.1/Circ.1315 was developed by the Sub-Committee on Fire Protection (FP) and agreed at its 53rd session and subsequently adopted at MSC86. As highlighted in MSC98/20/8, the MSC.1/Circ.1315 contains references to certain types of dry chemical powders which may be used as extinguishing means in the fixed systems. Dry chemical powders are defined in paragraph 2 "Definitions", under point 2.2 as "sodium bicarbonate or potassium bicarbonate" for

the only purpose of defining the available dry powders. However when the actual use of the dry chemical powder is determined in paragraph 3.4, only chemicals based on salts of potassium are listed for use.

Considerations

3. Although sodium bicarbonate (NaHCO_3 , baking soda) and potassium bicarbonate (KHCO_3) are very similar powders, it is well known that potassium bicarbonate dry chemicals are more effective than sodium bicarbonate based dry chemical powder with particular regard to fires relevant to the protection of ships carrying liquefied gases in bulk. A vast scientific literature has been produced over the years. For example, the scientific publication "*Laboratory Evaluation of Bicarbonate Powders as Fire Suppressants*"⁵ contains a comparison between the two dry chemicals and comes to the conclusion that potassium bicarbonate is approximately 2.5 times more effective than sodium bicarbonate on a mass basis in extinguishing the flame (while it is 3 times more effective on a molecular basis). In "*Extinguishment of Natural Gas Pressure Fires*"⁶ a direct comparison is made between sodium bicarbonate and potassium powders concluding that potassium based powders are a superior dry chemical agent in extinguishing natural gas fires. In "*Extinction Studies Of Propane/Air Counter-flow Diffusion Flames: The Effectiveness Of Aerosols*"⁷, again sodium and potassium based powders are compared with potassium powders showing a clearly better extinguishing properties respect to the sodium based ones. In several other references, such as in "*A new type of fire suppressant powder of NaHCO_3 /zeolite nanocomposites with core-shell structure*"⁸ technologies are proposed to enhance, the otherwise poor, performances of sodium bicarbonate powders, however making them more expensive.

4. Expert opinions also indicate:

- concerns that the use of sodium based powder may lead to the clogging of pipelines in certain circumstances, which tends to be the most common reason for a malfunctioning of such firefighting systems.
- That sodium based powder tends to decompose at temperatures above 50°C , which may lead to the effects described above whereas potassium based powder will only decompose at much higher temperatures (above 100°C).
- that sodium bicarbonate powder consists of particles having irregular shapes, and this results in a poor flow of powder under discharge conditions.

⁵ Reed M. *et al*, US Naval Research Laboratory, International Conference on Ozone Protection Technologies, 1997,

⁶ Guise A. B., 'Extinguishment of Natural Gas Pressure Fires', Fire Technology Vol. 3 Issue 3, 1967, pp 175-193.

⁷ Fleming J.W., Reed M. D., Zegers E., Williams B., Shainson S. 'Extinction Studies Of Propane/Air Counter-flow Diffusion Flames: The Effectiveness Of Aerosols', Halon Options Technical Working Conference 12-14 May 1998, pp 403-414

⁸ Ni X., Kuang K., Yang D., Jin X., Liao G., "A new type of fire suppressant powder of NaHCO_3 /zeolite nanocomposites with core-shell structure", Fire Safety Journal, Vol. 44 issue 7, October 2009, pp 968-975

5. Concerning the use of the proposed standard BS EN 615 in order to specify requirements for the use of dry powders on gas tankers, it is noted that BS EN 615 does not provide any specifications for specific dry powders and their uses. BS EN 615 limits itself to the classification of the dry powders as Class A, B and C based on the claim of the manufacturer, without further specifying which powder can be used for which fire class. The BS EN 615 test method for resistance to caking and lumping in particular does foresee exposing the powder to merely a temperature of $48 \pm 3^\circ\text{C}$ during the test, which is just the temperature that sodium bicarbonate powder can still tolerate without caking or lumping, and which can be easily exceeded in real life circumstances. BN EN 615 may certainly be useful to set technical requirements for dry powder after a specific dry powder has been approved by IMO based on its extinguishing characteristics, but in our view it does not provide sufficient safeguards to ensure that firefighting systems on board ships carrying liquefied gases in bulk will function correctly under all foreseeable circumstances.

6. In view of the explanations above and in order to make an effective use of the timeframe given to develop amendments to MSC.1/Circ.1315, it is considered that technical analysis has provided sufficient evidence not to allow powders based on sodium bicarbonate for use on gas tankers.

7. MSC98/20/8 contains nonetheless some elements worth to investigate further such as the allowable mixing rate for such dry chemical powders on which MSC.1/Circ.1315 does not provide any guidance. However also in this case it should be made clear that only potassium bicarbonate based mixtures should be allowed and further discussed allowing in general terms additives for increasing the fluidity of the powder to avoid baking and caking phenomena.

8. [MSC1/Circ.1315 should contain guidance on at least two physical characteristics of fire-extinguishing powders, namely fluidity and fire-extinguishing capability:

1. - The dry chemical powder should be tested to ensure that it remains free flowing throughout the temperature range requested by the applicant. To this extent high temperature tests (up to 100 deg C) and hygroscopicity tests should be performed;
2. - The dry chemical powder should be demonstrated capable of extinguishing fires in liquefied gas cargoes. Representative equipment should be subjected to full-scale fire tests.

Tests procedures should be developed to assess fluidity and fire-extinguishing capabilities.]

Information about an ongoing product recall regarding dry powder not in conformity with MSC.1/Circ.1315

9. The application of MSC.1/Circ.1315 is mandatory for ships flying the flag of EU Member States. Respective firefighting systems are wheel marked and specific certificates are issued by conformity assessment bodies designated for this purpose by the administrations.

10. In 2016 some dry powder chemicals extinguishing systems installed on ships flying the flag of some EU MS were found not to be in compliance with MSC.1/Circ.1315 (whose application is mandatory for ships flying the flag of EU Member States. The systems contained sodium bicarbonate dry powder. A replacement plan for more than 40 ships was agreed by the manufacturer of the dry powder and the affected flag States with a view to substitute the sodium

bicarbonate dry powder with potassium bicarbonate dry powder at the first dry docking of the vessels concerned. Further information about the product recall can be provided to interested administrations.

Action requested of the Sub-Committee

11. The Sub-Committee is invited to note the information and take action as appropriate.
