Executive summary: This document provides a proposal to include a new individual schedule for Metal Sulphide Concentrates, Self-heating, UN 3190, as a Group A and B cargo in the IMSBC Code.

Strategic direction: 5.2

High-level action: 5.2.3

Output: 5.2.3.3

Action to be taken: Paragraph 10

Related documents: Circular Letter No.3678; CCC 4/INF.5 and CCC 4/INF.6

Introduction

1 The purpose of this paper is to propose the inclusion of a new individual schedule for Metal Sulphide Concentrates, Self-heating, UN 3190, as a Group A and B cargo in the IMSBC Code. This proposal recognizes the approach taken by the E&T group that irrespective of the fact that this cargo is "normally" carried with a moisture content far below its Transportable Moisture Limit (TML), it should be classified as a Group A cargo if there is a risk of liquefaction when transported with a moisture content higher than the TML (DSC 17/4/2, paragraph 6.55).

2 Details of the cargo properties and test information are provided in documents CCC 4/INF.5 and CCC 4/INF.6. This information relates to a Copper Concentrate cargo which was classified as a Class 4.2 substance liable to spontaneous combustion (self-heating), UN 3190 in accordance with chapter 2.4 of the IMDG Code.

Description of the Cargo

3 Copper Concentrate is a concentrate from copper ore, produced by crushing and grinding the ore, followed by flotation of the concentrate metal to form a dark grey/green moist
fine powder. Copper Concentrate is used as the feed stock for Copper smelters in the production of copper metal.

4 These cargoes have been shipped from Australia on numerous occasions to ports in Asia and Europe. The material has been tested in all respects as required by the IMSBC Code to ensure the shipper can declare all cargo properties to the master prior to loading.

5 According to the IMO Solid Bulk Cargo Information Reporting Questionnaire, MSDS and test reports, provided in documents CCC 4/INF.5 and CCC 4/INF.6, this Copper Concentrate is a cohesive cargo, which provided a positive result for classification as a Class 4.2 self heating solid, inorganic, N.O.S. UN 3190, packing group III. It does not meet the criteria to be classified as a dangerous good in any other class. This material does not meet the conditions to be considered "harmful to the marine environment" under the revised MARPOL Annex V.

6 The draft schedule provided in the annex to this document was developed based on the existing "METAL SULPHIDE CONCENTRATES" schedule combined with the relevant precautions prior to loading (for the Class 4.2 risks) as contained in the existing individual schedule for "FERROUS BORINGS, SHAVINGS, TURNINGS or CUTTINGS UN 2793 in a form liable to self-heating".

7 While the draft schedule is based the "FERROUS BORINGS, SHAVINGS, TURNINGS or CUTTINGS UN 2793 in a form liable to self-heating" schedule, there is no evidence that the precautions required if the temperature of cargo in a hold increases during loading are necessary for safe carriage of Copper Concentrate. Accordingly, these precautions have not been included in the draft schedule.

8 The development of the draft schedule also took into account the individual schedule for "METAL SULPHIDE CONCENTRATES, CORROSIVE UN 1759" as agreed for inclusion in the draft amendments (04-17) to the IMSBC Code (see pages 32 to 35 of the annex to Circular Letter No.3678). This schedule was referenced to ensure already agreed formats and phrases were utilized, including the format of the tentative Bulk Cargo Shipping Name (BCSN).

Proposal

9 Noting that testing indicates that this bulk cargo:

.1 is liable to liquefy if carried with a moisture content exceeding its TML; and

.2 possesses Group B properties being classified as a Class 4.2 self-heating, inorganic solid, UN 3190,

Australia proposes a new individual schedule for METAL SULPHIDE CONCENTRATES, SELF-HEATING, UN 3190, as set out in the annex.

Action requested of the Sub-Committee

10 The Sub-Committee is invited to note the information in paragraphs 1 to 8 above and consider the proposal in paragraph 9 for a new individual schedule for METAL SULPHIDE CONCENTRATES, SELF-HEATING, UN 3190, as set out in the annex, with a view to incorporating the schedule into the IMSBC Code at the next opportunity.

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ANNEX

PROPOSED NEW INDIVIDUAL SCHEDULE

METAL SULPHIDE CONCENTRATES, SELF-HEATING, UN 3190
(See also Mineral Concentrates schedule)

This schedule shall only apply to cargoes that would fall under Packing Group (PG) III as specified in the IMDG Code if they were carried in a packaged form. This includes cargoes in PG III that may be exempted in packages of less than 450 litres or 3 m³.

Description
Mineral concentrates are refined ores in which the valuable components have been enriched by eliminating the bulk of waste materials. Generally the particle size is small although agglomerates sometimes exist in concentrates which have not been freshly produced.

The most common concentrates in this category are: zinc concentrates, lead concentrates, copper concentrates and low grade middling concentrates.

Characteristics

<table>
<thead>
<tr>
<th>Angle of repose</th>
<th>Bulk density (kg/m³)</th>
<th>Stowage factor (m³/t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable</td>
<td>1,700 to 3,230</td>
<td>0.31 to 0.59</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Class</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various</td>
<td>4.2[*]</td>
<td>A and B</td>
</tr>
</tbody>
</table>

[* This material may also meet MHB criteria of corrosive solids and/or solids that evolve toxic gas when wet.]

Hazard
This cargo may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of the Code.

These sulphide concentrates are liable to oxidation and will self-heat, with associated oxygen depletion and emission of toxic fumes. Moisture in the cargo will form sulphurous acid which is corrosive to steel.

Stowage & Segregation
Segregation as required for class 4.2 "Separated from" foodstuffs, and [all class 8 acids.] [Class 8 materials.]

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
When this cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

* This annex is presented in English only.
.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal or less than 0.56 m³/t, the tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be given to ensure that the tanktop is not overstressed during the voyage and during loading by a pile of the cargo forming.

Precautions
The temperature of this cargo shall be measured prior to and during loading. The temperature of the cargo in the stockyard shall be measured at points between 200 mm and 350 mm from the surface of the stockpile. The cargo shall only be accepted for loading when the temperature of the cargo prior to loading does not exceed 55°C.

It is recommended that means be provided for measuring the temperature of the cargo in the range 0°C to 100°C to enable the measurement of temperature of the cargo while being loaded and during voyage without requiring entry into the cargo space.

Entry into the cargo space for this cargo shall not be permitted until the space has been ventilated and the atmosphere tested for concentration of oxygen†. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of this cargo. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

Bilge system of a cargo space to which this cargo is to be loaded shall be tested to ensure it is working. Persons who may be exposed to the dust of the cargo shall wear gloves, goggles or other equivalent dust eye-protection and dust filter masks. Those persons shall wear protective clothing, as necessary.

When a Metal Sulphide Concentrate is considered as presenting a low fire-risk, the carriage of such cargo on a ship not fitted with a fixed gas fire extinguishing system shall be subject to the Administration's authorization as provided by SOLAS regulation II-2/10.7.1.4.

Ventilation
The cargo shall not be ventilated during the voyage

† Refer to the Revised recommendations for entering enclosed spaces aboard ships, adopted by the Organization by resolution A.1050(27).
Carriage
The appearance of the surface of the cargo shall be checked regularly during the voyage. If free water above the cargo or fluid state of the cargo is observed during the voyage, the master shall take appropriate action to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

For quantitative measurements of oxygen and toxic fumes liable to be evolved by the cargo, suitable detectors for each gas and fume or combination of these shall be on board while this cargo is carried. The detectors shall be suitable for use in an atmosphere without oxygen.

The concentrations of these gases in the cargo spaces carrying this cargo shall be measured regularly during voyage, and the results of the measurements shall be recorded and kept on board.

Discharge
No special requirements.

Clean up
Ensure that all residues are washed away and the holds thoroughly dried. Wet dust or residues will form corrosive sulphurous acid, which is dangerous to personnel and will corrode steel.

Emergency procedures

<table>
<thead>
<tr>
<th>Special emergency equipment to be carried</th>
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</thead>
<tbody>
<tr>
<td>Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emergency Procedures</th>
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</thead>
<tbody>
<tr>
<td>Wear protective clothing and self-contained breathing apparatus.</td>
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</table>

<table>
<thead>
<tr>
<th>Emergency action in the event of fire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batten down; use ship's fixed firefighting installation, if fitted. Exclusion of air may be sufficient to control the fire. <strong>Do not use water.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medical first aid</th>
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</thead>
<tbody>
<tr>
<td>Refer to the Medical First Aid Guide (MFAG), as amended.</td>
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</tbody>
</table>

Remarks
Fire may be indicated by the smell of sulphur dioxide.