INTERNATIONAL MARITIME ORGANIZATION
4 ALBERT EMBANKMENT
LONDON SE1 7SR

Telephone: 020 7735 7611
Fax: 020 7587 3210

IMO

E

Ref. T3/1.01

MSC/Circ.1149
15 December 2004

ACCIDENTS INVOLVING BULK CARGOES NOT SPECIFICALLY LISTED IN THE CODE OF SAFE PRACTICE FOR SOLID BULK CARGOES (BC CODE)

1 The Maritime Safety Committee, at its seventy-ninth session (1 to 10 December, 2004), considered a preliminary report on an explosion during the transport of Hot Briquetted Iron/ Direct Reduced Iron (HBI/DRI) Fines as a result of which the vessel concerned was lost and six crew members were killed. In considering the report, the Committee:

.1 was advised of other accidents involving similar cargoes, which may evolve hydrogen in contact with water and may heat spontaneously and which may be described as:

Orinoco Iron Remet Fines;
Remet Fines (HBI);
Orinoco Remet Fines in Bulk; or
HBI Fines;

.2 noted with concern the lack of proper information on the above-mentioned cargoes and that they are not specifically listed in the BC Code; and

.3 confirmed that, for safe carriage of these cargoes, due regard should be given to the relevant general precautions in the BC Code and in particular to the appropriate precautions in the entries for "DIRECT REDUCED IRON (A) Briquettes, hot-moulded" and for "DIRECT REDUCED IRON (B) such as lumps, pellets and cold-moulded briquettes (not to be confused with ironsponge, spent)", noting that the properties of these cargoes are similar to those of dangerous goods of Class 4.3.

2 The Committee further endorsed the decisions of the DSC Sub-Committee to circulate the following DSC circulars (copies attached as annexes to this circular):

.1 DSC/Circ.26 regarding incidents involving the transport of Zinc Ingots wherein it was noted that, possibly due to the presence of Zinc Ashes not completely removed from the surface of the ingots, arsine accumulated in high concentrations in the cargo holds and thus recommends precautions for the carriage of this cargo; and

.2 DSC/Circ.27 detailing an explosion in a cargo hold loaded with re-cycled aluminium described as "Serox" or "Oxiton" which notes the possible formation of gases such as hydrogen, ammonia and acetylene.

3 The Committee, in view of the above,

.1 drew the attention, once again, of shippers, terminal operators, shipowners, ship operators, companies and charterers involved in the transport of solid bulk cargoes to:

.1 the need to provide the shipmaster with all relevant information on the cargo to be loaded in accordance with Chapters VI and VII of the SOLAS Convention, and the provisions of the BC Code; and

.2 the need, when transporting any solid bulk cargo, to consult the BC Code;

.2 recommended to shippers and shipmasters:

.1 to ensure, before loading any solid bulk cargo, the suitability of the hold and its equipment for the product to be transported;

.2 to ensure, before loading any solid bulk cargo, the suitability of the cargo for transportation;

.3 to seek advice, before loading any solid bulk cargo not specifically listed in the BC Code, from the competent authorities; and

.4 to only commence loading if all of the relevant safety criteria contained in the BC Code are met;

.3 recommended that shipowners, ship operators and companies should ensure that shipmasters and crews involved in the transport of solid bulk cargoes are trained in the provisions of the BC Code, including the safety measures contained therein, and to incorporate them into their safety management system procedure.

4 Member Governments are invited to bring the above information to the attention of shippers, terminal operators, shipowners, ship operators, companies, charterers, shipmasters and all other parties concerned requesting that appropriate action be taken, taking into account the provisions of the relevant IMO instruments when transporting solid bulk cargoes.

***

ANNEX 1

Ref. T3/1.01

DSC/Circ.26
7 October 2004

INCIDENTS INVOLVING TRANSPORT OF ZINC INGOTS

1 The Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC), at its ninth session (27 September to 1 October 2004), considered an investigation report submitted by Italy on three different ships carrying zinc ingots. Inside the holds of the above ships arsine was accumulated in high concentrations. Four crew members felt ill after entering into cargo holds and one of the crew members died in the local hospital.

Following investigations, the cargo present on board of the above ships was revealed to be Zinc Ingots 98.5% pure or less GOB (good ordinary brand).

2 The Italian Maritime Administration has issued a safety guideline which requires a special atmosphere's test in all cargo holds on board ships loaded with zinc ingots. These tests are carried out before opening cargo hatches, by a competent chemist, in order to guarantee that the atmosphere inside the holds is safe for entry/work during opening and unloading operations, taking into account the presence of toxic or flammable gases or other hazards.

3 The Sub-Committee's attention was drawn to the conclusion of the investigation that:

.1 the first test on board of the first ship revealed a concentration of arsine of 10 ppm. Such tests had been carried out around a week after the accident and after the holds of the ship had been left open for some time. This supposes that the concentration of arsine in the atmosphere of the closed holds at the time of entry of the crew members was much higher than the 10 ppm stated above;

.2 afterwards official sanitary reports confirmed that the arsine (arsenic hydride: AsH3), evidently present in the holds of the first and second ships in higher concentration in comparison to the threshold's limit, was responsible for the death of a sailor and the hospitalization of other crew members;

.3 the tests on board the third ship revealed a concentration of arsine of 3 ppm in the holds. Precautionary tests of the port chemist avoided an incident on board this ship because the level of concentration of arsine was also in this case, dangerous to the human health;

.4 the above report shows two common characteristics: the presence of arsine and fresh water;

.5 the development of arsine was possibly due to the presence of zinc ash not completely removed from the surface of ingots;

.6 tests carried out on board other ships carrying only zinc ingots of 99.995% purity or more SHG (special high grade) had not revealed any detectable concentration of arsine inside the cargo holds.

4 It is therefore recommended that, in transporting zinc ingots 98.5% pure or less GOB (good ordinary brand), particular attention should be paid to the following:

.1 wet cargo should not be loaded and weathertightness of hatches should be ensured;

.2 the cargo should be kept dry and not be handled during precipitation;

.3 suitable gas detectors for the measurements of hydrogen and arsine and, at least, two sets of self-contained breathing apparatus, additional to those required by regulation II-2/10.10 of the 1974 SOLAS Convention, as amended, should be provided;

.4 continuous mechanical ventilation is required. Ventilation should be such that any escaping gases cannot reach living quarters on or under deck;

.5 entry into the holds without wearing the self-contained breathing apparatus must not be permitted until ventilation of the holds has been carried out and after tests reveal no detectable concentration of arsine/flammable gases inside the holds;

.6 tests must be carried out before opening cargo hatches, by a competent person, in order to guarantee that the atmosphere inside the holds is safe for entry/work during opening and unloading operations, taking into account the presence of toxic or flammable gases or other hazards; and

.7 possible ignition sources as well as hotwork, burning, smoking, electrical sparking should be eliminated during handling and transport.

5 Member Governments are invited to bring the above information to the attention of shipowners, ship operators, companies, shipmasters, shippers and all other parties concerned, requesting that appropriate action be taken when transporting such cargoes.

***

ANNEX 2

Ref. T3/1.01

DSC/Circ.27
7 October 2004

EXPLOSION IN A CARGO HOLD LOADED WITH RECYCLED ALUMINIUM

1 The Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC), at its ninth session (27 September to 1 October 2004), considered the casualty report of the explosion in a cargo hold of a ship which occurred on 2 December 2002, resulting in injuries to crew members and the subsequent loss of the ship.

2 At the time of the accident, the ship was carrying an aluminium oxide cargo originating from the processing of recycled aluminium (brand-named "Serox" or "Oxiton") which is used for cement production. This cargo had been carried as non-dangerous goods since its introduction as "Serox" or "Oxiton".

3 The accident was reported to have been caused by the fact that the cargo came into contact with water resulting in generation of flammable gas at a speed which resulted in the formation of an explosive air/gas mixture in a closed and poorly ventilated hold. Through the investigation of the casualty, this cargo was classified as a class 4.3 product under UN. 3170 "ALUMINIUM SMELTING BY-PRODUCTS", but it was not documented as such by the shipper.

4 Similar accidents have occurred in the past and to prevent such accidents when carrying these cargoes, all requirements for the carriage of dangerous goods should be strictly observed, in particular:

.1 requirements of documentation for cargo as required by regulation VII/7-2 of the SOLAS Convention;

.2 the general requirements of the BC Code; and

.3 requirements of the entry for ALUMINIUM SMELTING BY-PRODUCTS UN 3170 in the Code of Safe Practice for Solid Bulk Cargoes (BC Code), including continuous mechanical ventilation.

5 The “Hazard” section of the BC Code schedule for UN 3170 indicates possible formation of gas such as Hydrogen, Ammonia and Acetylene. It should be noted that in this incident and others of a similar nature that the smell of Ammonia, a gas, was noticed during cargo operations. The presence of Ammonia would generally indicate the presence of additional gases which may be flammable. It is therefore advisable that if Ammonia is found present, suitable preventive measures are taken as further outlined.

6 Member Governments are invited to bring the above information to the attention of shipowners, ship operators, companies, shipmasters, shippers and all other parties concerned, requesting that appropriate action be taken when transporting such cargoes.

_____