Scrap metal fires – is the IMSBC code adequately addressing the risks?

Gard continues to see some very serious scrap metal fires affecting our portfolio as well as in the media more generally.

Published 27 January 2025

The global scrap steel market is forecast to jump to over one billion metric tons by 2033 as part of increased expectations for waste recycling in the green transition. The size of individual scrap cargoes has also been increasing as scrap facilities grow in size and consolidate exports at major facilities. This means that much larger bulk carriers are now loading scrap cargoes. In one Gard case the cargo was over 40,000 m/t across five holds. Smaller vessels continue to load from facilities with draft restrictions and which may be close to populated areas.

Recent cargoes

Most of Gard's cases and those reported in accident investigations appear to concern scrap metal declared by shippers as Group C, which under the IMSBC Code is cargo which is neither liable to liquefy (Group A) nor to possess chemical hazards (Group B). Images and accounts of scrap metal fires associated with such non-hazardous declarations paint a more concerning risk picture. Accident investigation reports speak of rapidly developing fires with intense heat and heavy smoke threatening harm to the crew, shore fire fighters as well as local residents. Some fires have taken days to extinguish and in one Gard case the temperatures reached in the hold were sufficient to melt the tank top. In another reported case the vessel sank at the berth leading to pollution. In some fire cases a cargo recycled from waste was returned to waste with large quantities of contaminated fire-fighting water needing to be disposed of.

Categories of scrap metal in the IMSBC Code

As mentioned in our earlier article on the Safe handling and carriage of scrap metal in bulk there are two main categories of scrap metal covered in the IMSBC Code, namely Scrap Metal (Group C) and Ferrous materials in the form of iron metal borings, shavings, turnings or cuttings (Group B). The Scrap Metal Group C schedule states under Hazard:

"No special hazards. Low fire risk except when cargo contains swarf (fine metal turnings liable to spontaneous combustion) refer to the entry for FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS UN 2793 in this Code"

That means only scrap metal cargoes containing such borings, shavings, turnings or cuttings are considered a fire hazard requiring a Group B declaration with extra precautions to be taken including temperature monitoring prior to and during loading. The Group B Hazard states:

"These materials are liable to self-heat and ignite spontaneously, particularly when in a finely divided form, wet or contaminated with such materials as unsaturated cutting oil, oily rags and other combustible matter".

Lack of screening of cargoes

It is, however, apparent from several serious scrap metal fires involving Group C declarations that the cargoes contained quantities of combustible and/or potentially hazardous foreign materials, such as batteries, rubber, plastics, wood, foam, oils/greases, gas bottles and rags which do not qualify for Group B status. In one accident report an experienced representative of the scrap facility highlighted to investigators the fire dangers associated with lithium-ion batteries and their increasingly prolific use: “It’s becoming more of a problem every month, every year in our industry”. The same investigation pointed to scrap industry guidelines calling for all grades to be free from foreign materials, save for negligible amounts. It is apparent from reported cases and some of Gard’s cases that there was limited screening of scrap sourced from public and commercial recycling facilities in preparation for shipment.

A review of the IMSBC Code?

The question posed in the title of this alert is whether the IMSBC code is adequately addressing the risks of scrap metal fires. A review of the schedules may consider a widening of the Group B definition. It should be recognized that crew may find it difficult to detect foreign material and so rely on shippers’ screening controls for removing hazardous materials to acceptable levels. It is also of note that the Group B schedule recommends compacting the cargo during loading (to reduce the amount of air to support combustion). Accident reports point to this very process of compacting as the likely trigger of some fires and most do indeed occur during or shortly after loading. Lithium-ion batteries that have sufficient charge and become mechanically damaged can undergo a thermal runaway process which can result in a flammable electrolyte being ejected from the cell casing and being ignited by the heat generated within the battery. By this process lithium-ion batteries can become a potent ignition source.

Both scrap schedules also state that “This cargo shall be kept as dry as practicable before loading…” since wetting increases the self-heating risk, but keeping scrap dry is impractical since it is largely stored outdoors, and water is sometimes used for dust suppression.

The schedules might also be improved in relation to “emergency action in the event of fire” which only applies for Group B cargoes and cautions against use of water unless in port where copious amounts may be used, stability permitting. If cargo over-heating or a fire situation is developing at sea the advice is to batten down and the schedule references the effectiveness of early application of inert gas. Similar considerations may be relevant in the early stages of all scrap fires also in port. As mentioned above, most of the fires occur during loading and shore fire fighters will often turn up to take charge but often with a lack of ship knowledge. In the absence of expert advice on ship fires, the situation may be made even worse.