Container ship fires: Gard conference promotes the value of industry collaboration

Gard invited industry stakeholders, authorities and experts to address the growing concern with devastating fires aboard container ships. Efforts to stem the mis-declaration of dangerous cargo are essential and encouraged but that is only one facet of the solution. There is a profound need to bring fire detection and fire-fighting on-board container ships higher up on the safety agenda of regulators and the industry at large. The SOLAS regulations have not kept pace with the realities of the risks faced and there is an urgent need for review and revision.

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Container ship fires are a growing concern. Fires, originating from dangerous goods in containers, whether wrongfully declared or not, occur with alarming frequency. Gard's cargo claims team determined that on average there has been a fire onboard a container ship weekly during the first half of 2019 and this does not include "near misses". Obviously, such fires endanger the lives of the crew – a burning ship mid-ocean is a very dangerous place and being tasked to tackle such a fire exponentially adds to the risk.

The Increasing TEU volumes, carried on-board ever larger container ships increase the odds of having on board the single container with dangerous goods that may ignite, combust or explode. And, once a fire is started, the damage potential and fire-fighting challenges are much greater due to distances, volumes, stack heights and thereby lack of access and reach.

Severe containership fires, in addition to threatening the lives of the crew and risking damage to the environment, also cost the insurance industry millions of dollars in covering loss or damage to the vessel and equipment, and cargo losses. Carriers face a wide range of uninsured losses and commercial challenges including business interruption and reputational damage. Determination of liability and allocation of losses among the parties often results in complex and costly litigation.

Gard insures liability for owners and charterers and provides Hull and Machinery and Loss of Hire cover so we are a stakeholder. In late 2018, Gard started an initiative with the objective to better understand the causes of cargo-related container ship fires and what could be done to mitigate risks. As part of this initiative, Gard invited a variety of industry leaders and governmental authorities to our headquarters to discuss the subject matter and look for solutions. The two-day conference, 17-18 October was broadly attended by representatives from a number of leading container carriers, ship owners, charterers, insurers, flag states, fire experts, salvors and industry organizations including the International Maritime Organization (IMO), the International Group of P&I Clubs (IG), International Union of Marine Insurance (IUMI) The Nordic Association of Marine Insurers (CEFOR) , Cargo Incident Notification Systems (CINS), BIMCO, International Association of Classification Societies (IACS) and the World Shipping Council.

The Conference Speakers (from right to left):

Uffe V. Ernst-Fredriksen , Head of Cargo Management, Maersk Line/Chairman CINS, **Alf Martin Sandberg** , Special Adviser, Gard, **Dr. Jan Otto de Kat** , Director Containerships Market Sector, American Bureau of Shipping, **Martin Winkel** , Founder and CEO, Rosenby Engineering, **Michel Kooij** , Managing Director, Liberty Gasturbine Holland, **Bernhard Heibl** , Managing Partner, Radicos Technologies, **Fredrik Doksrød Olsen** , Senior Claims Adviser, Gard, **Per Martin Langaas** , Senior Manager, Gard, **Helle Hammer** , Chair IUMI Policy Forum, **Uwe-Peter Schieder** , Technical Expert, GDV (German Insurance Association), IUMI Loss Prevention Panel, **Dr. Roland Goertz** , Professor Bergische Universität, Chair of Chemical Safety and Fire Defence, **Jeroen de Haas** , Managing Director, BMT Netherlands, **Are Solum** , Senior Claims Executive/Lawyer, Gard, **Bram Sperling** , Senior Salvage Master, Ardent

In this article, we present an overview of this complex issue and share our views based on our analyses as well as the discussions at the Gard conference.

Root causes of container ship fires

Among speakers and participants there was broad consensus that the root cause of the fires is hazardous cargo: 10-12% of containerized cargo falls into the category of hazardous- or "regulated cargoes". The fundamental challenge is to carry such cargo in a safe manner on-board ships. Certain chemicals such as calcium hypochlorite, electronics, batteries and charcoal are among the dangerous cargos known to ignite inside cargo containers.

Shippers' mis-declaration of such cargo is probably the single biggest problem which needs to be tackled to prevent fires on-board. However, in our view, the problem is wider than that – many of the container ship fires we have seen arise out of other causes such as error in packing and securing of cargo as well as various manufacturing defects. In our experience, several container ship fires have been caused by self-heating, combustion or explosion of dangerous cargoes that have been properly declared and properly packed. The combustible nature of the cargo is an important risk factor in and by itself.

Addressing the cargo supply chain

Root causes originating from the global cargo supply chain and trade mechanisms need to be addressed. Studies conducted both in Europe and the US that have focused on accuracy of information concerning shipments of dangerous goods in containers reveal alarming statistics. More than 50% of shipments of dangerous goods proved to have deficiencies in terms of declarations or packing/securing for certain trades. The risk is endemic and real despite efforts by container liner operators to improve their routines – "Know Your Customers" programs, shipper and cargo screening and strengthening dangerous goods booking teams – to name a few. Conference participants heard about these initiatives and others including engaging with the authorities of some of the states where much of the dangerous cargo originates.

At the Gard conference, several interesting discussions emerged regarding how to develop quality in the cargo supply chain including mandatory liability insurance

for shippers and standard verification of shippers involved in transportation of dangerous goods.

Several container carriers announced this year that they will impose penalties for mis-declaration of hazardous cargoes. Generally, this seems to have been well received, although some have questioned whether possible penalties would be enforceable in practice. We believe such preventive measures are positive and necessary. Shippers are likely to improve their practices if they know that there is a higher chance of wrongful cargo bookings being detected through inspections and that there will be consequences for sloppy or, even worse, fraudulent practices.

To further discourage rogue shipments, authorities could do more to prosecute offenders and bring them to justice. The IMO urges governments to implement inspection programs for dangerous goods, yet few seem to have acted on this so far. It is questionable whether any such programs would extend to cargo not seemingly dangerous as per the cargo declarations. Governments and shipping lines may have little appetite for these inspections, given the cost and their influence on speed within a highly competitive supply chain.

In an ideal world a shipper's mis-declared cargo would not get through the container line's booking checks. However, even if one container line's diligent dangerous goods booking team rejects a booking, it remains open to the shipper of that cargo to try another container line because container lines are sharing space on-board through alliances. To date, they have been unable to share the identity of rogue shippers or develop a common cargo screening system within the alliances to prevent a rogue shipper finding a weak link.

Given all these supply chain challenges and the volume of shipments, the reality today is that unsafe shipments will slip through even the tightest prevention net. It therefore becomes necessary for shipping companies to further enhance focus on what they can control – the ship and crew.

Fire detection and fire fighting on board

There will always be a risk of cargo generated fires as long as dangerous goods are shipped. The question is whether modern container ships are equipped and prepared to deal with a fire adequately without endangering the crew

Chemical decomposition of cargo such as calcium hypochlorite creates heat but a resulting fire comes late in the chain of reactions. Fire detection on-board container ships today is largely based on detection of smoke, not temperature. When the fire is detected by smoke in the cargo hold, it is often too late. At this stage, it is likely too dangerous for crew to enter the cargo hold, and the remaining option is to release the limited amount of CO_2 on board. Releasing CO_2 in the cargo hold, has, however, proved to be insufficient for extinguishing fires inside a container. The CO_2 does not penetrate the container and container hatches are not tightly sealed meaning the CO_2 escapes before the fire can be extinguished.

Fires in containers on deck present their own challenges. The larger ships may have container stacks up to 30 meters high, so many containers will be out of reach to crew with fire hoses. The current SOLAS requirements are largely the same as for other cargo vessels, with some minor additional requirements for container vessels constructed after 1 January 2016. The regulations appear to represent a compromise following years of debate and today's experts' opinion concerning the required

equipment is that it will be of very limited value in most container ship fire scenarios.

Innovation in firefighting equipment

Our conference gave experts and key stakeholders an arena to share knowledge, experience and perspectives about opportunities, including what may be learned from other industries and fields such as the military, offshore, mining, aviation, construction and land-based industries. Selected companies developing equipment for fire detection and firefighting were also invited to speak and to present their products. The purpose was to demonstrate that there are solutions available if there is a will in the container shipping industry to improve. Companies presenting included:

• Radicos Technologies GmbH (Germany) – producing temperature monitoring for road tunnels and greenhouses, that could be installed in cargo holds allowing the vessel to monitor temperature changes down to less than 0.1 degrees Celsius.

• Rosenby Engineering (Denmark) - remote firefighting equipment to penetrate containers also at heights.

• Liberty Gasturbine (The Netherlands) – Adaptation for marine use of equipment used to extinguish fires in mines by way of constant supply of inert gas mixed with water.

Looking ahead

The fire safety objectives of SOLAS are to prevent fires and explosions and reduce risk to life, environment and property, as well as contain fires in compartment of origin (SOLAS Part A, Reg. 2, paragraph 1.1). It was said by several during the conference that these objectives are not met onboard the container ships of today. There will be no viable solution to address the risk of fire aboard modern container ships without revised IMO regulations (SOLAS).

Fire statistics suggest that there is an urgent need for change. Some shipping companies have invested in firefighting equipment in excess of SOLAS requirements. The conference heard, however, from Classification Societies that not many had taken up more comprehensive measures contained in additional Class Notations. Shipping companies need a level playing field, so a review and revision of existing regulations need to be explored. Recent developments appear unsustainable in impacting human, environmental and property risks. As an industry we must do more than continue to count container ship fire cases and shake our heads. If more is done timely and on a collective basis, the first billion-dollar loss in this shipping segment may be avoided.

We expect to be further involved in discussions with the German Flag State which is working on a submission on these exact issues to be proposed to the IMO Marine Safety Committee in 2020. We are prepared to continue efforts together with others, e.g. engaging with the IUMI expert group, as well as with CEFOR, CINS and the with the International Group of P&I Clubs.

History has shown that effective mitigation measures can be found in relation to large and complex risks arising from shipping activities. Oil spills from tankers have been dramatically reduced over the past 50 years through a combination of international, regional and national laws and regulations, stricter quality vetting by charterers, improved ship design, improved operational standards, more scientific approach to prevention and response, as well as generally a higher regard for the consequences of pollution to the marine environment, business and society at large. Where there is a will, there is a way.

Now, we feel the time has come for trying to make container shipping even safer. Together.