Taking the next steps in solving the global issue of container fires

An Industry Roundtable

15th November 2023

Safetytech Accelerator

Taking the next steps in solving the global issue of container fires

Safetytech Accelerator and Lloyd's Register held an industry round-table event to discuss the key issue of container fires, causes, impacts and potential solutions with a particular focus on technology deployment. The principal driver for this event has emerged through the Cargo Fire & Loss Innovation Initiative (CFLII) which is a collaborative technology acceleration programme involving shipping companies and maritime insurers. Supported by Safetytech Accelerator this industry led initiative has been looking at the challenges associated with cargo fires onboard ships, specifically early-stage fire detection.

Global Engagement for a global issue

We were delighted to welcome passionate participants from across the globe, representing diverse supply chain interests. Their valuable insights and willingness to take positive actions underscore the gravity of this complex, interconnected and multi-faceted issue.

Over-arching discussions:

During this closed roundtable event, some of the principal stakeholder concerns were discussed and delegates explored what actions could help remove the potential for container cargo fires. Key talking points included:

- The escalating impact of container fires
- Sustainability and reliability of the supply chain
- Ensuring supply chain compliance
- The transformative role of technology in addressing challenges, e.g. cargo screening
- The sharing of supply chain data to mitigate risks

Assurance of the supply chain was highlighted as a collective responsibility there are many instances where goods are not declared/mis-declared, incorrectly packaged and secured resulting in spillages, fires, loss of life and environmental damage. Those attending agreed that the safety of the supply chain should be viewed holistically where all stakeholders should recognise their role, understand interdependencies, and appreciate how training, regulatory compliance, enforcement and technologies play pivotal roles in meeting the challenge of cargo-fires head-on. In this regard the maritime supply chain was observed to be notably more fragmented in comparison to the transport of airfreight.

Although a significant number of causes for fires do occur during the maritime transport segment, including during loading/unloading operations and incidents when underway, it was widely recognised that many of the root causes of onboard container fires, and indeed fires occurring elsewhere in the supply chain relate to activities or processes removed from the mode of transport or transport segment in which the fires occur. As such, the international, intermodal, multi-stakeholder nature of global maritime supply chains brings unique challenges in ensuring the safe, reliable and sustainable shipment of goods.

Wide-ranging Insight

There were a range of authoritative views expressed during the event covering a wide spectrum of issues, some of which are recorded below:

- The impact, disruption and costs involved with a container fire are significant anywhere but, most impactful during vessel transportation. Early detection and containment onboard were considered the most critical factors to prevent escalation where unknown adjacency risks may rapidly escalate the fire scenario.

- Incident data shows an increasing number of reported container fires onboard ships with shipping risks heavily influenced by supply-chain decisions and actions far removed from the vessel. There is a clear need to manage critical cargoes throughout the supply chain.

- Challenges related to the occurrence of cargo misdeclaration/non-declaration have included, proper application of process checks & procedures, visibility and monitoring of container contents, cost drivers, fragmentation in regulations, the level & volume of inspections, including reporting and finally the extent of consistent & robust enforcement to influence compliance have emerged as critical issues.

- To improve regulatory compliance, it was widely viewed that training and increased awareness of the applicable requirements would create positive change.

- For the declaration of goods reference was made to an approach where goods should be 'considered dangerous until proven otherwise' to enhance positive goods declarations.

- Addressing this problem requires a holistic approach. Technology, as a catalyst for change, coupled with education, training, and collaboration, can play a pivotal role in mitigating the impact and driving sustainability in the supply chain.

Global Engagement: Political, Economic, Social, Technological, Environmental & Legal Factors

The topics and views discussed shone a light on many of the significant influential factors, both positive and negative, related to the challenge of eradicating container cargo fires. An attempt has been made to capture some of these high-level aspects through a simple PESTLE chart that can be found on the last page of this document.

Technological Developments

Various technological developments have been highlighted together views on barriers for adoption.

Of particular relevance to the risk profiling of container shipments and their assessment of fire risk are tracking solutions and cargo screening applications. Used in combination with other 'know your customer' activities developed by mainline operators there is the potential to target container inspections and drive positive behaviour around the correct declaration of cargoes. During the discussions it was highlighted that work is underway to develop industry platforms that will apply uniform cargo-screening technology.

Certainly, the collection of increased data through the digitalisation of container shipping operations represents an increasing opportunity for the application of machine learning and adaptive artificial intelligence in identifying shipping risks.

Improving connectivity solutions with transport assets, shipped goods and indeed ships themselves is another area where there are ongoing developments which can be levered to address container fires. This was defined as an area of interest for the majority of stakeholders.

The message regarding collaboration and data sharing was loud and clear, for matters regarding supply-chain safety and sustainability, this was considered critical.

Next Steps

The roundtable event has captured a small amount of the available knowledge from those attending and this document is readily acknowledged not to be complete in terms of subject knowledge or stakeholder input. It is indeed not intended to be and merely represents a snapshot of views sampled at a point in time.

A full supply-chain stakeholder map has not been provided however undertaking steps to understand the interconnection of parties within global maritime trade via transport units would be of considerable value. Further, it is suggested that an activity to map the key risk areas through the supply chain and plot/prioritise solutions from a technology, people & process standpoint should be considered. This is a key activity that should be considered should a collaborative activity on this subject be developed.

Based on the conversation and in very broad terms an initial breakdown of this supply chain into the following stakeholder categories has been made together with an initial assessment of influence on eradicating fires within Container Transport Units (CTU):

Category	Description & Influence on CTU fires
Container Manufacturer/CTU Operator	**MAKES & MAINTAINS THE CONTAINER** Correct construction standard & maintenance of the container. Fittings & equipment to provide in-container cargo monitoring
Goods manufacturer	**MAKES SHIPPED GOODS** Compliance with National/International standards, correct packing and goods designation
Shipper	**CONSIGNS GOODS FOR SHIPMENT** Correct consignment and declaration of the goods Identification of non-compliances
Container Packers	**PLACE THE GOODS IN THE CONTAINER** Correct securing and segregation of cargoes Identification of non-compliances and damage
Logistics Company, Mainline Shipping Company, Freight Forwarder, NVOCC, CHA	**ARANGES TRANSPORT OF THE GOODS** Correct material designations, checks and validates shipping requirements
Marine Terminal Operator	**LOAD & UNLOAD GOODS ON SHIPS** Planning & adherence with the vessels stowage plan and segregation requirements
Port Authorities	**RESPONSIBLE FOR ACTIVITIES IN A PORT AREA**
Ship owner/operator/ Mainline Shipping Company	**TRANSPORTS THE GOODS VIA SEA** Planning & adherence with the vessels stowage plan and segregation requirements
Insurers	**INSURES AGAINS LOSS DURING TRANSIT** Entities / parties that provide insurances which variously cover loss or damage to cargo, CTUs, ships and other means of conveyance. Sets policy requirements
Regulators (National / International)	**SET STANDARDS AND PROCESS REQUIREMENTS**
Inspection Authorities	**ENFORCES REQUIREMENTS** Ability to take enforcement actions at national level.
Cargo Owners	**PLACES THE ORDER FOR THE CARGO** Define the shipping requirements
Consumers	**END USER OF THE CARGO** Societal expectations on shipment of goods

Table 1: Stakeholders Influence on Container Transport Units (CTU) fires

Understanding more fully the wide-ranging degrees of influence and practices currently in place in the supply chain by the categories above will also aid the understanding of causes, key risk areas and, in the case of technology opportunities, the development of prioritised actions.

A concept of a *'CargoSafe Corridor'* was discussed to consider encompassing the above with the necessary supply chain stakeholders. An analogy has been made to the current *Green Corridors* that are being successfully established to bring together stakeholders to support the energy transition on specific trading routes. In such a way the suggested *'CargoSafe Corridor'* would work with supply chain stake holders to minimise container fire risks by ensuring best-practice and technology innovations were applied at key points in the supply chain on nominated trade routes.

This proposal would require multi-stakeholder collaboration and data sharing between partners, potentially also involving National Authorities. An idealised scenario would include trading routes between collaborative nations with established stakeholder connections. Stakeholders could include cargo owners, insurers, Regulators, terminal operators, port authorities and shipping companies. Due account would need to be made of any applicable anti-competition requirements. This proposed approach would allow 'proof of concept' or technology trials to be validated for the management of high-risk cargos and trading areas.

Should there be sufficient backing of this concept then Safetytech Accelerator would be willing to consider framework development through the existing Cargo Fire & Loss Innovation Initiative (CFLII) by expanding Anchor Partners to include terminal operators, port authorities and other stakeholders. Should your organisation be willing to participate in this development then Safetytech Accelerator would be keen to hear from you.

Summary

Despite being relatively short in duration this roundtable provided considerable impact in terms of positive stakeholder engagement and industry insight. As such we would like to thank all attendees for their time, knowledge and enthusiasm in discussing this issue.

About Safetytech Accelerator

Safetytech Accelerator, established by Lloyd's Register, is the first fully dedicated technology accelerator focused on advancing innovation in safety critical industries, with a mission to make the world safer, more resilient, and more sustainable through the wider adoption of technology.

About Lloyd's Register

Trusted maritime advisors, partnering with clients to drive performance across the ocean economy.

Lloyd's Register (LR) is a global professional services group specialising in marine engineering and technology. We were created more than 260 years ago as the world's first marine classification society, to improve and set standards for the safety of ships. Today, we are a leading provider of classification and compliance services to the marine and offshore industries, helping our clients design, construct and operate their assets to accepted levels of safety and environmental compliance. We also provide advice, support and solutions on fleet performance and operation, voyage optimisation, enhancing our clients' digital capability. Our digital solutions are relied upon by more than 20,000 vessels. In the race to zero

emissions, our research, technical expertise and industry-firsts are supporting a safe, sustainable maritime energy transition.

Lloyd's Register Group is wholly owned by the Lloyd's Register Foundation, a politically and financially independent global charity that promotes safety and education.

For more information, go to www.lr.org

P E S T L E

POLITICAL	ECONOMIC	SOCIOLOGICAL	TECHNOLOGICAL	LEGAL	ENVIRONMENTAL
Geopolitical relationships	Global Trade Volume	Globalisation and Trade	Automation and Robotics	International Conventions and Treaties	Climate Change
International Trade Policies	Economic Growth	Labour Force & Demographics	Internet of Things (IoT)	National and Regional Laws	Environmental Regs and Compliance
National Trade Policies	Commodity Prices	Technological Advancements (Acceptance)	Data Analytics	Port State Control	Air Pollution
Trading Blocks	Exchange Rates	Environmental Sustainability	Distributed Ledgers	Liability and Insurance	Water Pollution
Maritime Regulations	Shipping Rates	Safety and Security	Cloud Computing	Environmental Regulations	Waste Pollution
Port Regulations	Surcharges	Public Perception and Reputation	Artificial Intelligence (AI)	Labour Laws and Standards	Life-Cycle Assessment
Taxation & Subsidies	Shipping Fleet Capacity	Education	Natural Language Processing	Trade and Sanctions	
Labour Regulations	Regulations and Policies	Safety culture	Global Connectivity		
Environmental Regulations	Infrastructure and Port Development				
Sanctions & Embargoes	Global Economic Stability				

Table 2:Mapping factors of influence on container transportation.