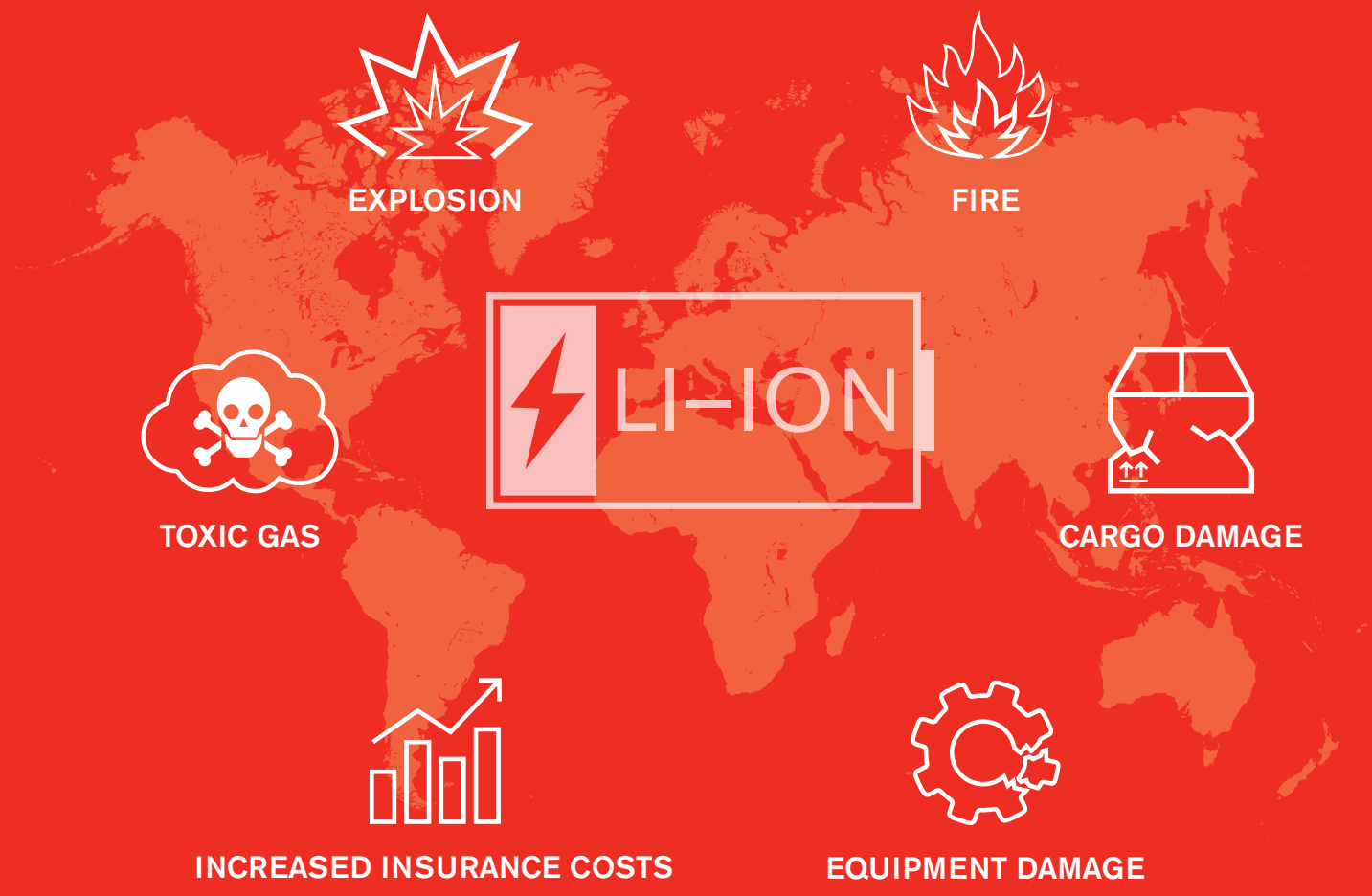
Lithium-ion batteries

Understand and mitigate the risk of handling, storing and transporting Lithium-ion batteries

Lithium-ion batteries are used in everything from small hand-held devices to electric vehicles and battery energy storage systems (BESS). While very safe in normal use, they can fail dangerously and quickly in a process called 'thermal runaway' if they are physically, thermally or electrically abused. This can result in toxic and explosive gas emissions, self-sustaining fires and explosions.

Transport and logistics operators involved in handling, storing or transporting lithium-ion batteries should understand and follow all national and international safety rules and guidance for lithium-ion batteries, and communicate these to everyone in their supply chains.

What are the risks?



How can you mitigate these risks?

The key to mitigating the risk of handling, storing and transporting lithium-ion batteries is ensuring the batteries have been properly manufactured and tested, carry the required labelling and documentation, have been packed and packaged correctly and that all national and international regulations and guidance is followed for both the handling and storage.

CARGO PRE-CHECKS

- Ensure the cargo has been declared correctly under the applicable modal specific regulations.
- Check the cargo has a correctly completed a Dangerous Goods Declaration (DGD) and Packing Certificate, even for smaller (special provision 188) batteries.
- Make sure the manufacturer has included a test summary document in compliance with Section 38.3 of the UN Manual of Tests and Criteria.
- Verify that the batteries have short-circuit prevention.
- Check there are no visible leaks, damage, smoke or flames, and that packaging is in good condition and strong enough to survive a drop from at least 1.2 m.
- Understand the state of charge of the batteries to be shipped and undertake a risk assessment.

CONTAINER PACKING

- Map out the expected ambient temperature through voyage and consider using reefer units if OEM guidelines are exceeded.
- Follow the CTU Code and ensure that stacking and stowage will not result in excessive forces.
- Load batteries in the correct orientation as shown on the package labelling.
- Where practicable, don't ship batteries with other dangerous goods that might react or create a harmful reaction with lithium-ion batteries.

STOWAGE ON SHIPS

- Transport containers carrying lithium-ion batteries in line with the stowage and segregation requirements of the shipping line, keeping them separated from other dangerous cargoes where practicable.
- Only stow lithium-ion batteries which are damaged or defective (special provision 376), or for disposal or recycling (special provision 377), on deck, not in the holds.
- Stow containers away from sources of heat, such as heated fuel tanks, machinery spaces or the top-level stowage on deck.
- Only stow containers in locations where effective firefighting and cooling can be carried out in an emergency.

INCIDENT DETECTION AND RESPONSE

- Undertake a robust fire risk assessment for the individual facilities, equipment and operation and consider installing fire and gas detection alarm systems to aid early detection and water mist and drencher systems to help control a fire incident.
- Ensure all parties are trained in the specific risks associated with lithium-ion batteries. Regularly review emergency procedures and conduct emergency drills to practice and critically test emergency responses.
- Consider the PPE requirements, first aid provisions and training for all parties that could be exposed to hazards resulting from a lithium-ion battery fire.

REMEMBER

- Know your customer, verify correct cargo declaration.
- Physical, thermal or electrical abuse of lithium-ion batteries can lead to a dangerous thermal runaway, resulting in toxic gas emissions, fires and explosions.
- Verify the most suitable state of charge for the batteries being carried and risk assess.
- Consider the likely ambient temperature through the supply chain.
- Everyone in the supply chain must be trained in the risks of handling, storing and transporting lithium-ion batteries and what to do in case of a thermal runaway.

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