

EV / LIB fires (AS)



Potential additional challenges to consider when Electric Vehicles are involved



VAPOUR CLOUD EXPLOSIONS & TOXICITY OF FUMES



Recent Casualty on a Pure Car Carrier

Crew followed procedures and deployed Fixed System as designed.

Unfortunately despite being deployed, a major explosion took place in the Upper Deck resulting in deck being set up 2.5m over 100m

Full canopy deck displaced restricting access to Lifeboats & LSA equipment

Fire main displaced removing ability to boundary cool or fight accommodation fires.

Sensitivity: Internal

Potential additional challenges to consider when Electric Vehicles are involved

HEAT TRANSFER DUE TO MOLTON METALS



Molten aluminium will flow above 660oC

Possibly blocking Bilges and Scuppers

Transfer of heat downwards as well as upwards

Combustion of the wooden floors in containers

Toxic environment generated for personnel working in area.



Potential additional challenges regarding fires involving Electric Vehicles on Ships

SAFE ACCESS FOR CREW INTO OR FROM FIRE ZONE

Can the crew reach their mooring stations or muster stations safely?

Is there sufficient face and lung protection for crews if smoke fumes venting?

Do ships now need to carry sufficient full face and filter masks for periods on decks during abandonment or recovery when in close proximity to the vessel.



Potential additional challenges regarding fires involving Electric Vehicles on Ships



WATER DAMAGE TO BATTERIES DUE TO FIRE WATER



- Li-Ion Batteries submerged in water (particularly sea water) need careful monitoring.*
- Fire-fighting medium for crew responding is generally sea water through fire main.*
- Batteries in containers stowed in a cargo hold, or an EV's stowed in a deck susceptible*
- Incidents could occur through tilting or moving the battery or vehicles connected*
- Fire/venting of gases can occur while submerged (see recent Tesla videos) or just as a result of a breakdown in the battery structures through submersion*

Crew and Salvors (DK)



Above
deck

Fire Team
Training for **LIB?**



Cargo holds/decks
Is it safe for crew?



Professional help





Contain & Maintain





Guidelines

- early detection
- compartmentation
- fixed system
- boundary cooling
- monitor situation.
- help of professionals



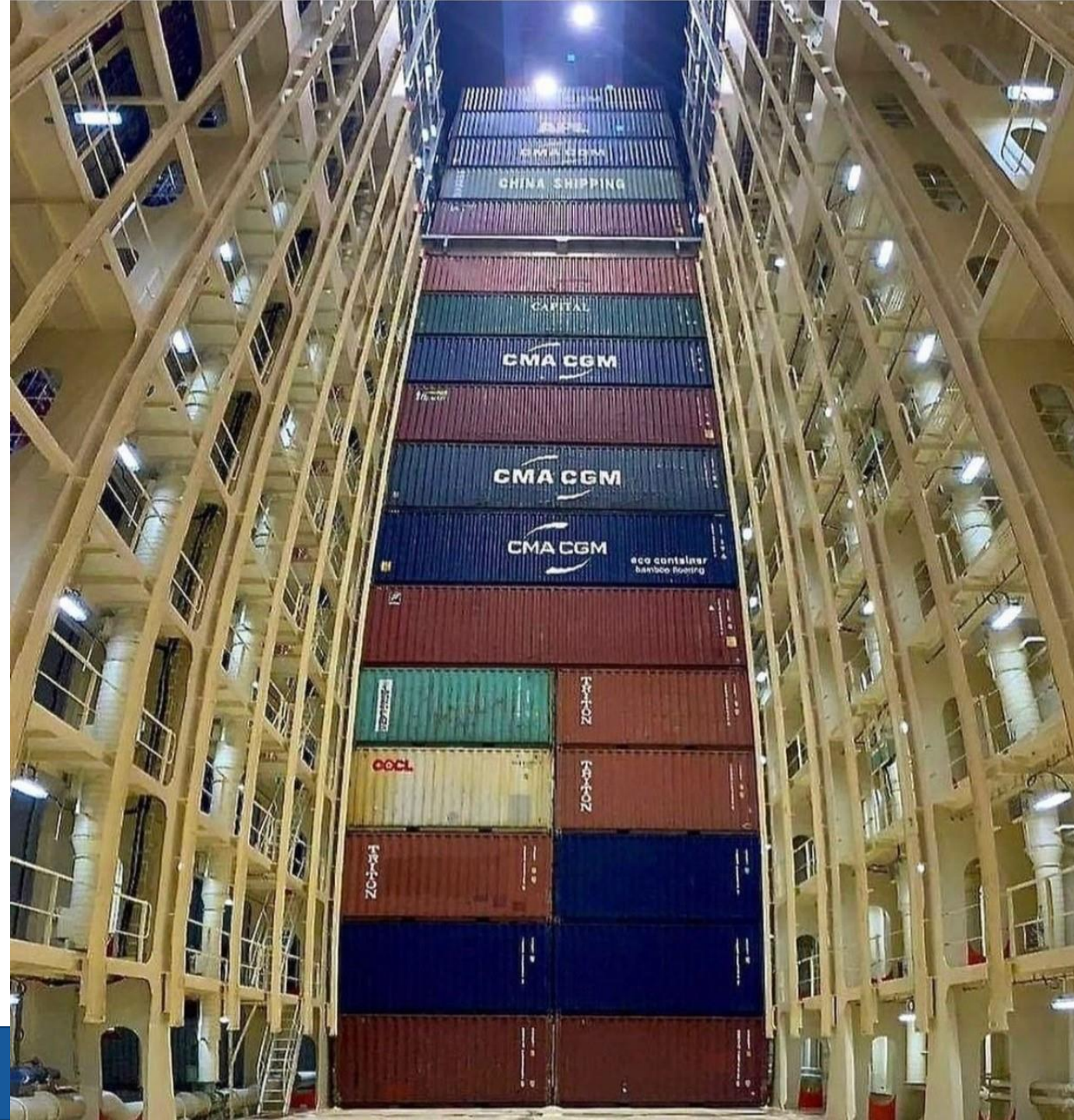
Shoreside support (PC)



Multi agency response



Access and distance to travel



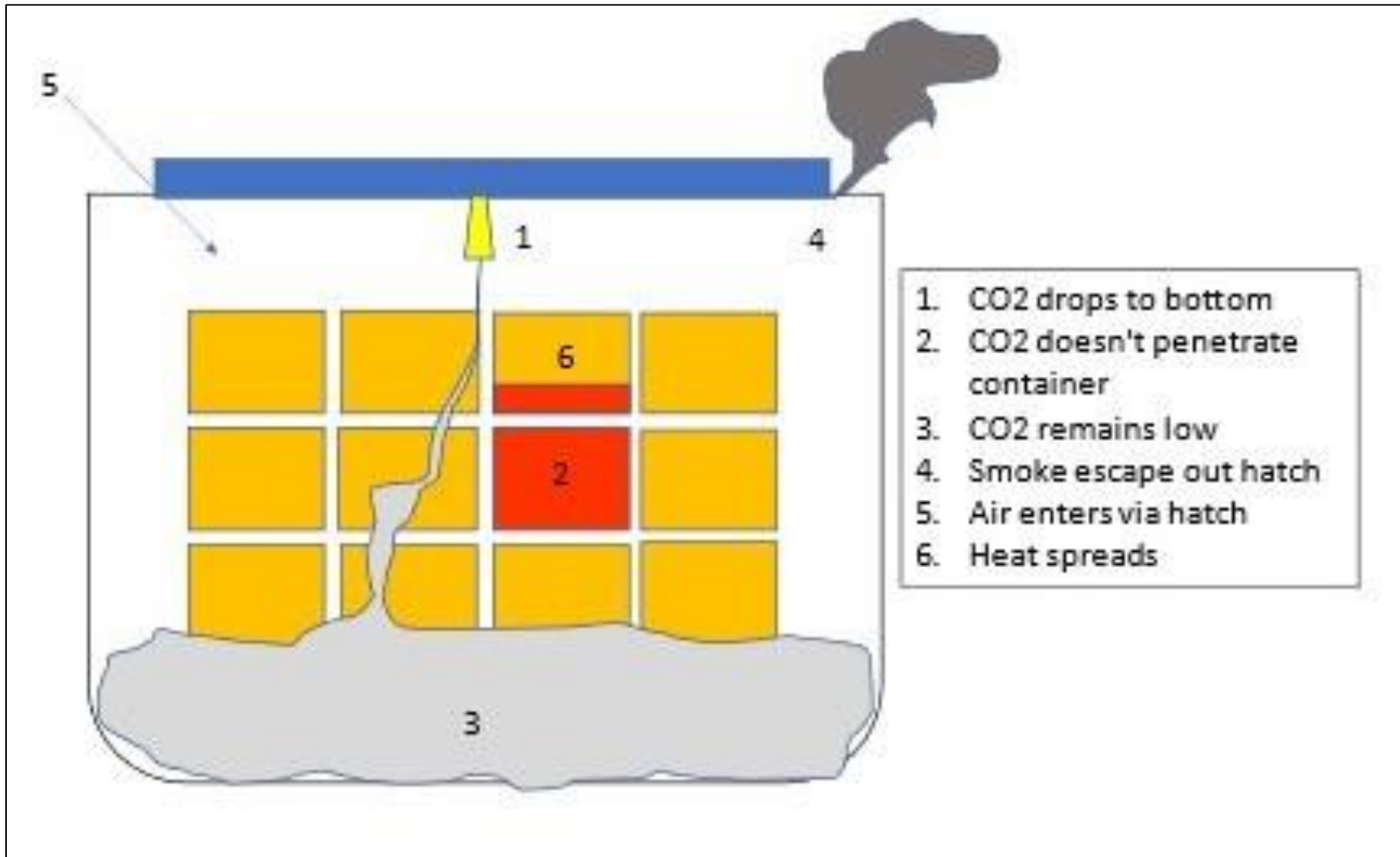
EV Cars



**LIB into
containers**



CO2 in holds



Water into hold
Some vessel have hatch cover sprinklers

- Assist with containing fire
- Issue is setting up supply Hose



Port chemist



External heat checking





Committing teams?



Removal of burning containers





Damaged containers

