**CODAN**

A. **What can be done to improve the fire detection in a container cargo under deck?**

"Improve=detect (what) * time"

Cargo hold

1. Revisit the requirement for sensors – type and sensitivity. What is used in the onshore e.g. Sound spectrum analysis?
2. Location of sensors in cargo holds/ventilation – defined by fire simulations and not rigid rules.
3. Thermographic cameras and CCTV

Container

4. Adhesive temperature gauge(s) (label) fitted on the container connected to an onboard network

B. **What can be done to improve the fire detection in a container cargo on deck?**

As under A3,4

C. **What can be done to enable a more precise and quick fire localization?**

5. Interconnect A 2,3,4 and container data (age, type of container with cargo manifest) in a Machinery learning monitoring model supported by ship and shore.

D. **What can be done to compensate the deficiencies of $CO_2$ with regard to smothering a fire in a container stow under deck?**

6. Quick response – release.
7. CO2 system decentralized and capacity increased
8. System modification of ME exhaust system – connect exhaust system to cargo hold bilge system and inert the cargo hold with a booster fan. Unlimited exhaust gas.

E. **What can be done to improve the confinement of a fire in containers under deck to the particular cargo hold?**

9. Response time
10. Passive fire protection insulation – AX0 maintain

**F. What can be done to improve the confinement of a fire in containers on deck to the particular bay or section thereof?**

11. Response time
12. Water Monitors fitted on every lashing bridge for remote operation

G. **What can be done to improve active firefighting on deck bearing in mind reduced crew and local conditions?**

13. Remote operation of fire hydrants supported by intel from sensor systems(analysis) and shore experts
14. Crew should monitor the fire from distance – report and revise remote operation of systems.

H. **What can be done to protect vital ship structures under deck and on deck from excessive heat?**

15. Vital structures are defined as the engineroom on Maersk Hornam?
16. Revisit IMDG code – could a barrier of specific low risk cargoes or empty container be stowed adjacent.

I. **What can be done to improve the protection of deck house and life-saving appliances?**

17. Fixed water spray, closed ventilations system as on tankers

Other:

The Contain project raises a number of unknowns e.g. time for smoke/fire to escape a container all depended on the characteristic of the container.

https://brandogsikring.dk/files/Pdf/FogU/Contain/DBI%20CONTAIN%20Project%20-%20Final%20Report.pdf