

# Enclosed Spaces

*An introduction by the TT Club for 8<sup>th</sup> Black Sea Ports & Shipping, 2019*

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Without sufficient oxygen the body starts to shut down very quickly

.....two primary implications being heart failure and brain damage

.....in the event of heart failure the brain can survive for approximately 6 minutes but after around 5 minutes irreversible damage can be sustained

*rescue operations are therefore time critical!*

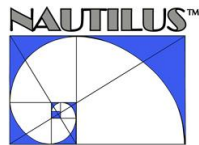
# AN INTRODUCTION TO THE TT CLUB

**1100+**

**80%**

**95%**

**46%**





# WHAT ARE ENCLOSED SPACES?

## Definitions

- Health and Safety Executive (UK) definition
- IMO Resolution A.1050(27) from 2011





## Examples

- Cargo holds
- Containers
- Access ladder spaces
- Ballast tanks
- Fuel tanks
- Silos



**Lloyds List 12<sup>th</sup> June 2019**

**“Oxygen depletion fatalities on the rise”**

**Asphyxiation caused by a lack of oxygen is the cause of a number of deaths, particularly on bulkers.**

**Since 1999, 140 fatalities have been reported, 25 of which were in 2018**

# WHY ARE ENCLOSED SPACES DANGEROUS?

## Examples of risks

- Lack of oxygen / presence of CO<sub>2</sub> (carbon dioxide)
- Fumigants
- Flammable or toxic vapours
- Dust





## CO2 – “The Silent Killer”

### Oxygen deficient atmospheres

19.50%	Minimum acceptable oxygen level
15-19%	Decreased ability to work strenuously. Impaired coordination.
12-14%	Respiration increases. Poor judgement.
10-12%	Respiration increases. Blue lips.
8-80%	Mental failure. Fainting. Nausea. Vomiting. Unconsciousness.
6-8%	Fatal in eight minutes exposure. 50% fatal after six minutes exposure. Possible recovery after four-five minutes exposure.
4-6%	Coma after around 40 seconds exposure. Fatal.

# EXAMPLES OF FATAL INCIDENTS

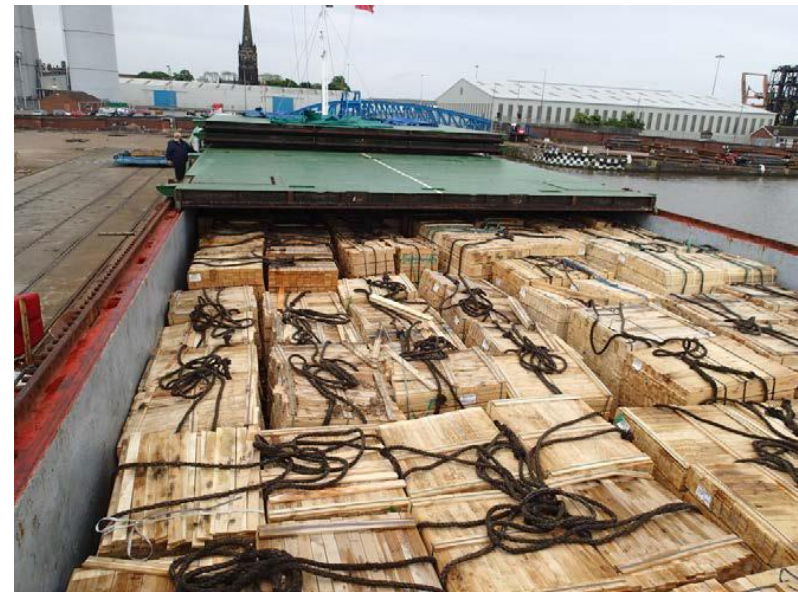
## Fatal incident in Indonesia

mv. Sumiei , discharged palm kernels, 24<sup>th</sup> February 2018.



## Fatal incident in the UK

mv. Suntis , discharging a cargo of sawn timber, 26<sup>th</sup> May 2014.

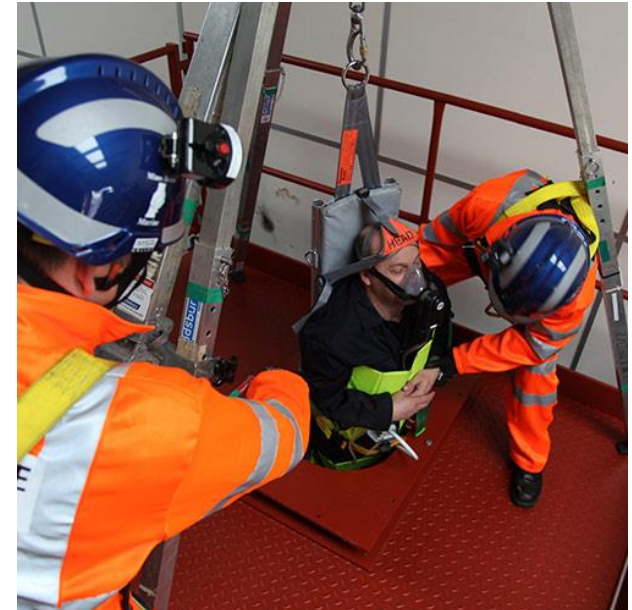




# RISK MANAGEMENT

## How to prevent CO<sub>2</sub> incidents (HSE “Confined spaces” OCM1)

- Awareness
- Assume that confined spaces are unsafe!
- Restrict access
- Unavoidable?
- Emergency arrangements
- Continuous training of staff!



# Thank you

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