

# Methanol as marine fuel; Safety aspects



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# Why methanol?

- Methanol is a “clean” fuel (no sulphur and low NOx)
- Methanol is easier to handle and store than LNG.
- Compatible price with other alternative fuels
- The cost of conversion or newbuild to methanol is significantly lower than the cost for LNG.
- Methanol can be produced from sustainable sources

# Some characteristics

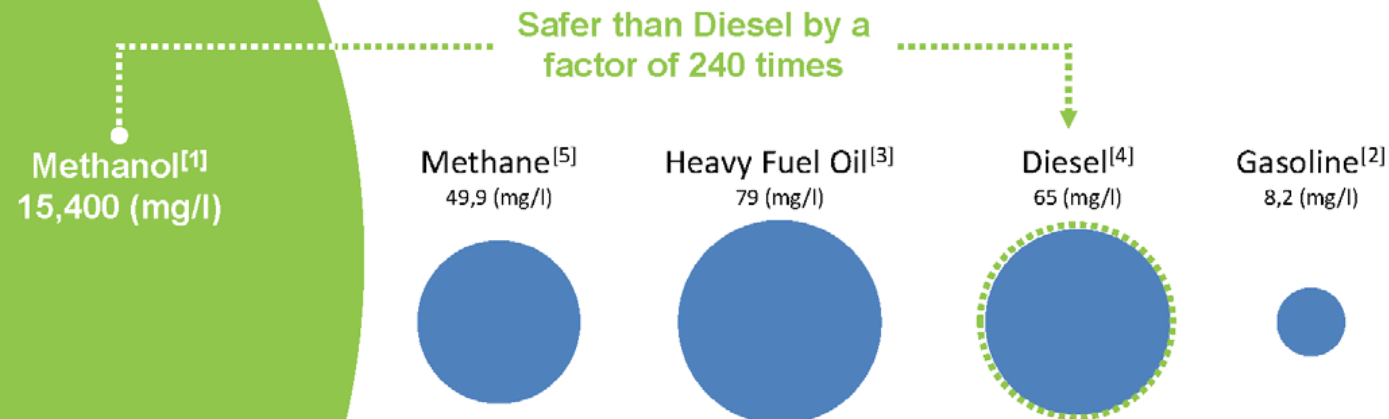
- Methanol is not a gas
- Liquid in ambient temperature
- Low flashpoint (11 C) **increased firerisk**
- High self ignition temperature (464 C)
- Clean exhaust gases
- Environment friendly



## SAFER FOR THE ENVIRONMENT

### LC50, LC = LETHAL CONCENTRATION FISH

*Concentration in water, at which half the marine population died within the specified test duration*



- <sup>[1]</sup> ECHA, European Chemicals Agency, registration dossier Methanol
- <sup>[2]</sup> Petrobras/Statoil ASA, Safety Data Sheet, ECHA registration dossier Gasoline
- <sup>[3]</sup> GKG/ A/S Dansk Shell, Safety Data Sheet
- <sup>[4]</sup> ECHA, European Chemicals Agency, registration dossier Diesel
- <sup>[5]</sup> ECHA, European Chemicals Agency, registration dossier Methane

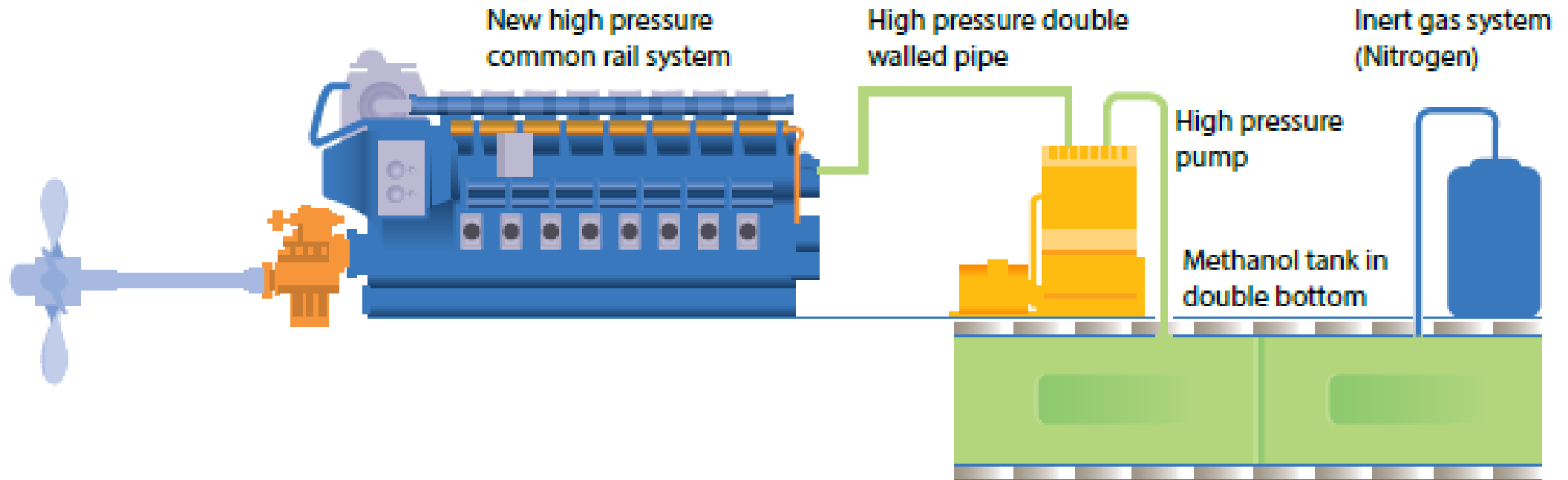
*Additional Source: Meyer-Werft*

# IGF CODE

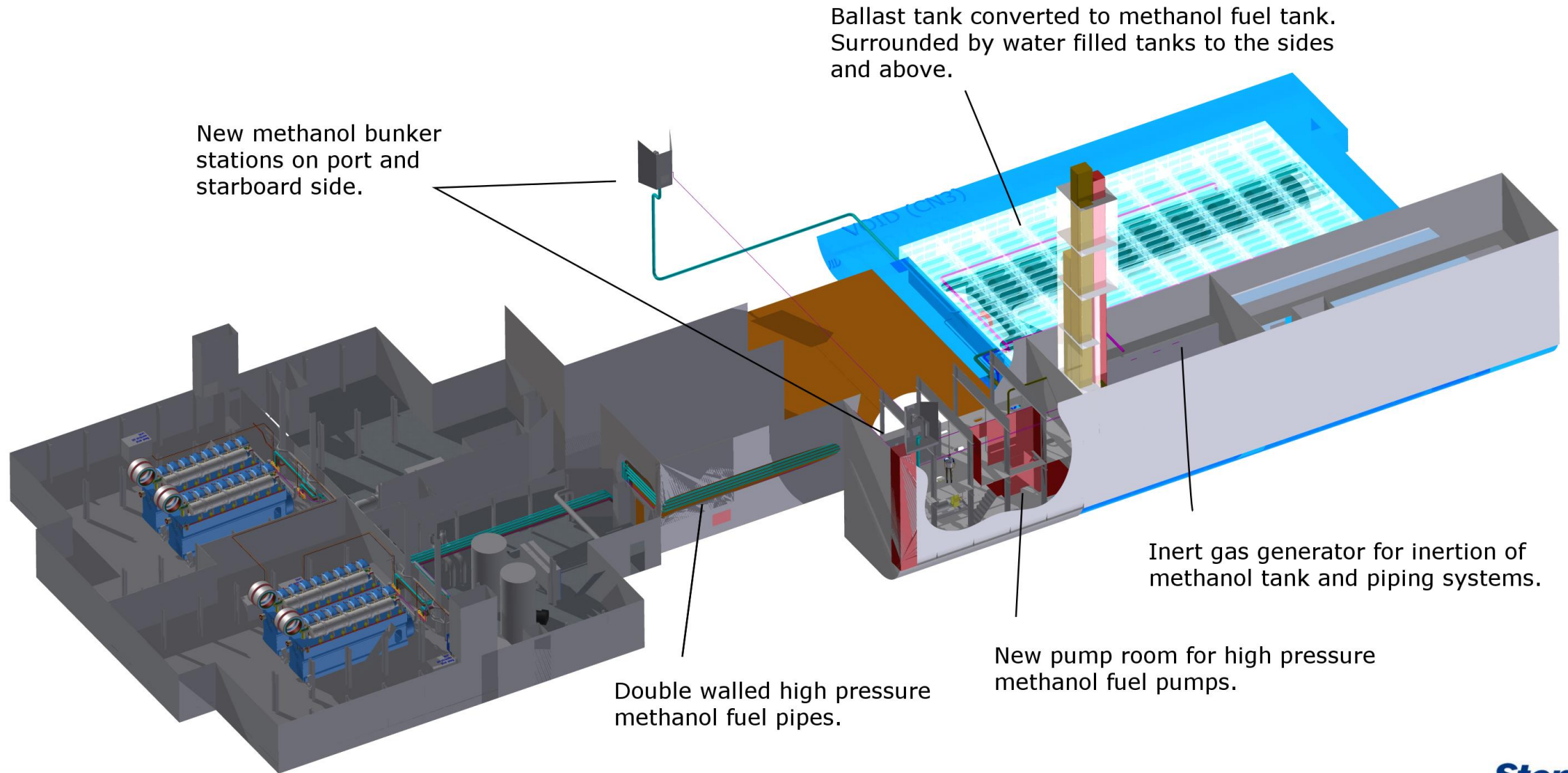
## INTERNATIONAL CODE OF SAFETY FOR SHIPS USING GASES OR OTHER LOW FLASH POINT FUELS

- **IGF code ready for LNG in September -15**
- **The IGF correspondence group continued with development of guidelines for Methyl- and Ethyl alcohols and Fuel cells. First draft -17**
- **The same safety measures was used for the alcohols (liquid) as for gasified LNG which in some cases are contraproductive**
- **Alternative designs backed with riskassessments are still necessary**

# Metanol conversion



# Methanol conversion on Stena Germanica



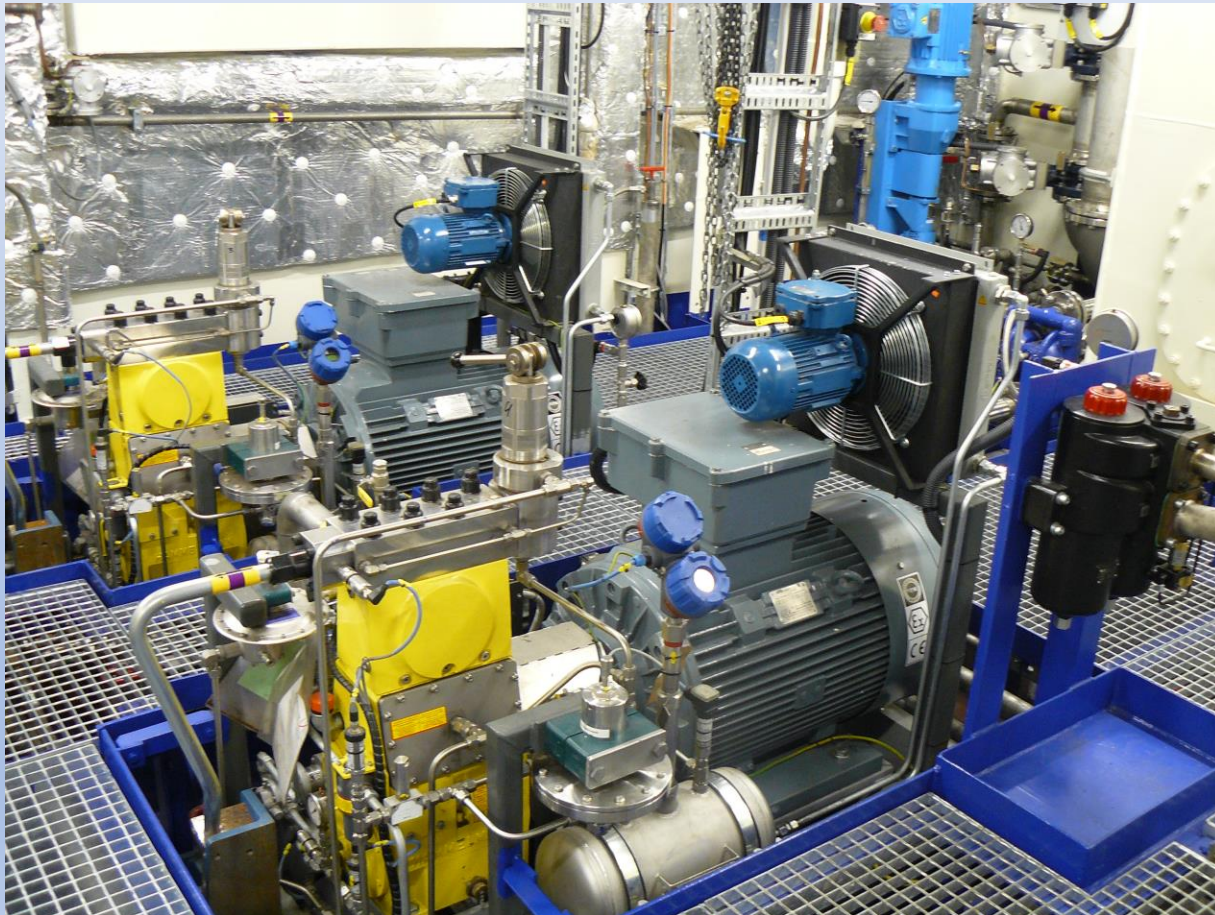


# Double wall pipes and inert gas system





# Air tight pump room, high and low pressure





# Ships Fire monitoring ME room

Smoke sensor

Flame sensor

Fire alarm panel



Call point



Stena Germanica



# Bunker station

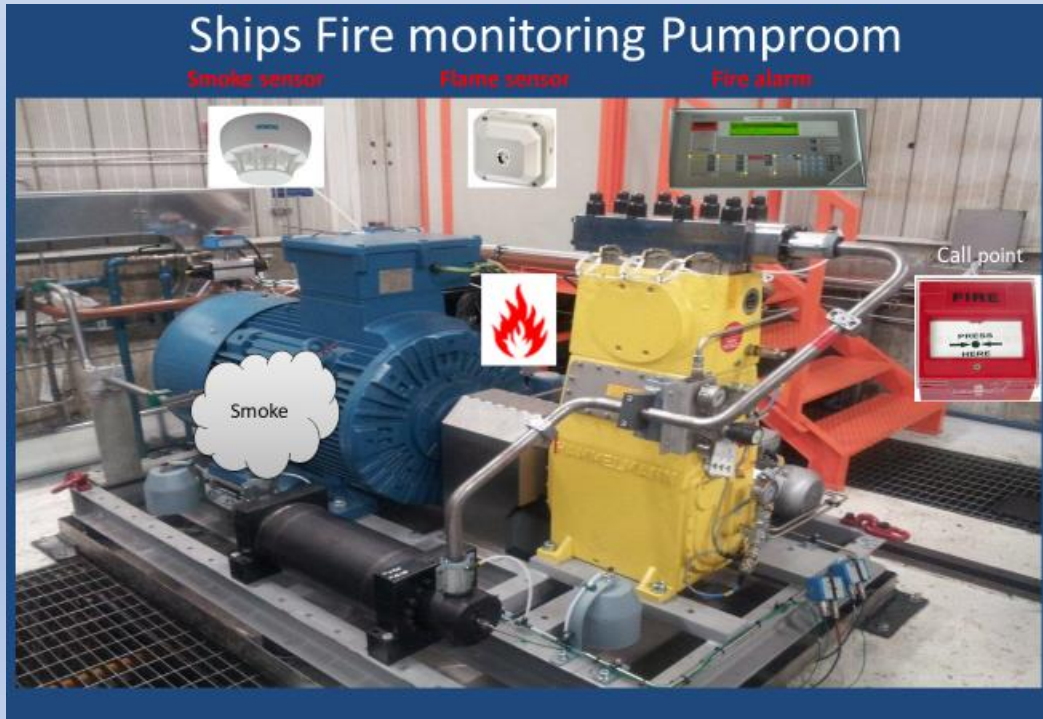




# Training

## Safety systems

Fire alarm, Local protection,  
CO2 and Gas alarm  
Monitoring and control



## Fire fighting

Water mist  
CO2  
Alcohol resistant foam



# Zero vision fuel

$\text{CO}_2$

$\text{H}_2\text{O}$

