



Marine Safety and Transportation of Ammonia

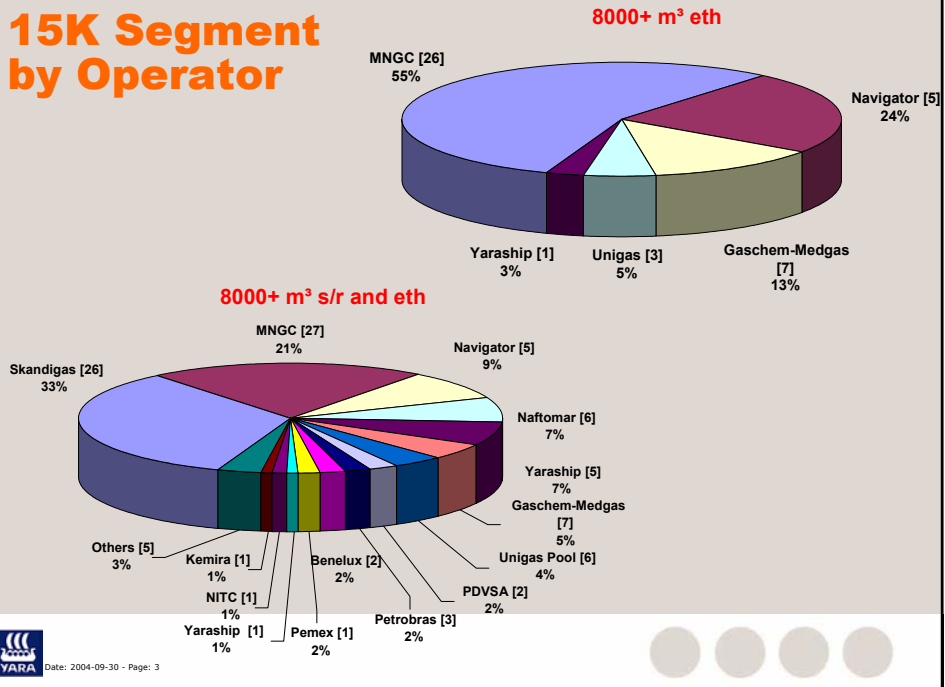
Dubai, October 4th 2024
Frank Bracquez

Global Ammonia Fleet

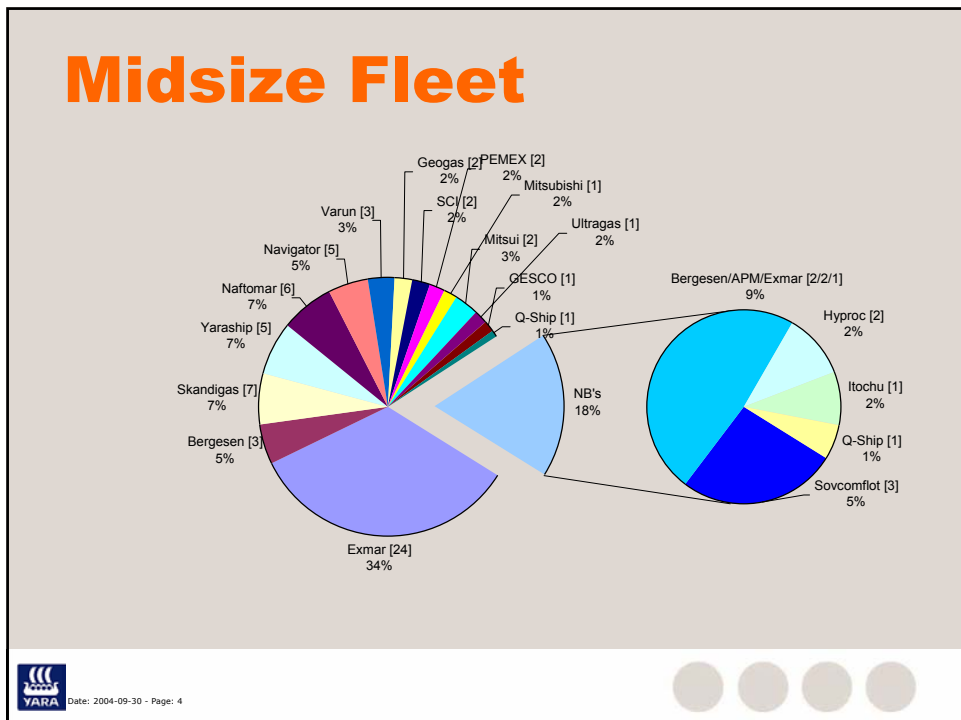
- Volume segment between 14 and 60.000 m³
 - LGC (50-60 m³) 24 ships
 - MGC (20-40 m³) 58 ships
 - < 20 m³ 107 ships
- Ship type: Fully Refrigerated & Semi Refrigerated
- Fleet Control
 - Individual Control vs Pooling
- Average Age 14 years
- Trade Paterns
 - FSU to Europe, USA, SE Asia
 - Trinidad to USA, S-America, Europe
 - AG to India, SE Asia
 - Indonesia to SE Asia, India
 - Alaska to Korea



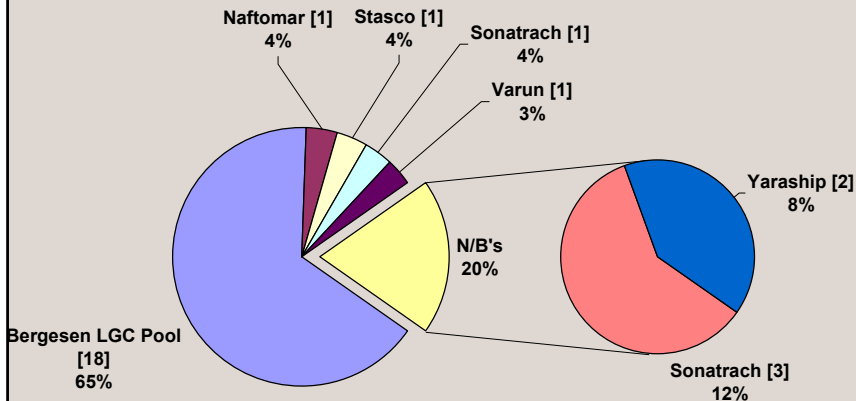
15K Segment by Operator



Midsized Fleet



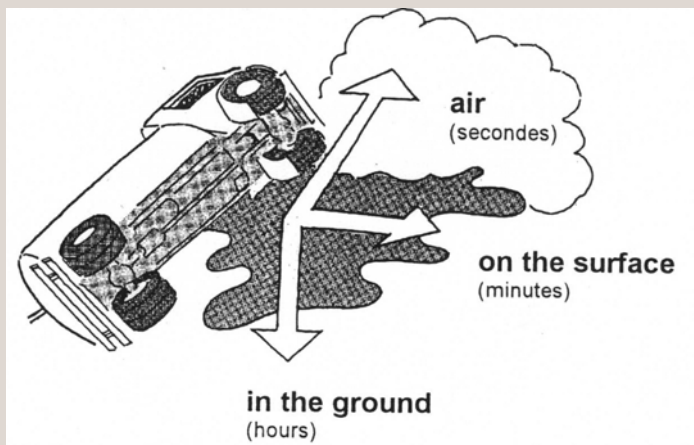
50 – 60 K Segment by Operator



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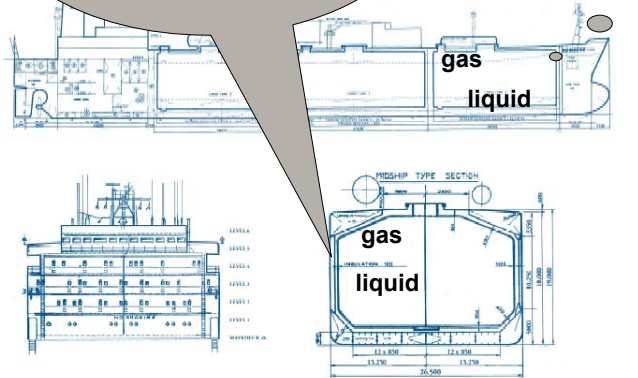
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Ammonia Shipping &

- Heat input from air & water
- Formation of aerosols
- Rising cloud
- Part absorbed by the seawater
- Impact considerable

- Invisible cloud
- Heat input from air
- Cloud lighter than air
- Relative small impact

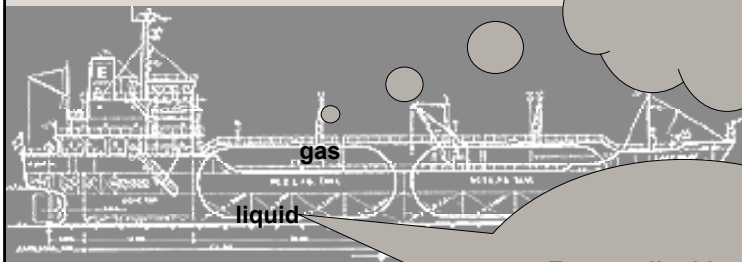


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Safety

2 possible scenarios with SR/FP ships

- Heavy vapour outflow
- Strong Aerosol formation
- Extreme Heat out of air
- Stage 2 Heat drawn out of water



- Extreme liquid outflow
- Formation of aerosols
- Vapourising = cloud
- Extreme Heat drawn from water
- Extreme Heat drawn out of air



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Regulatory Frameworks

- Ship's design, construction and equipment
- Flag (registered ownership) & ownership – Flag State Control
- Management (technical and crewing)
- Classification
- CDI or OCIMF inspection schemes
- Port state control
- Commercial vettings
- Industry Self Regulation



Recent Regulatory Issues

- STCW
- ISPS
- Vessel's age
- Port state control and the paris MOU
- Ammonia shipping as a public risk



Why should we bother?

- **Government initiatives, jurisdiction and post incident comments show that the Shipping Industry regulators consider the Shipowner and the Charterer as co-venturers (partners), in the gas transportation and are seperately and/or jointly responsible for its outcome.**



Because we learned some lessons

- **Erica: The registered owner was untracable: The Charterer was held liable**
- **Cerda: Detained by Port State Control: Charterer received extreme bad publicity**
- **Neptune Dorado: Was detained in San Fransico: The Owners and Charterer where under investigation by the FBI**
- **The USCG regulation 96 (September 18 2002) implies that a ship relays the name and address of both Owner and Charterer**
- **Prestige: Charterer was accused for repeatedly chartering in “black-listed” ships**



Yara's Minimum Requirements

- **Yara as an Industry leader needs to set its rules which are more stringent than what is customary**
- **We opt for long term control (owning or time chartering)**
- **Contractors (Owners & Managers) need to apply our standards**
- **Strong emphasis on crew competence and training**
- **We apply the same standards on our terminals as on the ships**
- **Strong emphasis on a safe and solid ship-shore interface**
- **Our global ship chartering policy focused on safety above economics**
- **In house vetting system**
- **LTI (Lost Time Incidents) are considered as the evaluator.**



Conclusion

- **We will set a trend promoting global standards (realistic)**
- **All operators need to apply the same standards, bad publicity in the LPG or LNG shipping will also affect our trade**
- **Ship vetting and audits of owner's and manager's offices are our work tool**
- **Strong cooperation with the responsible maritime governments and law makers**
- **Safety & Quality "pooling" with rest of the maritime gas industry**



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Thank you for your attention.



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