

Ammonia as a Marine Fuel

Safety Handbook

Rev.02 - June 2023

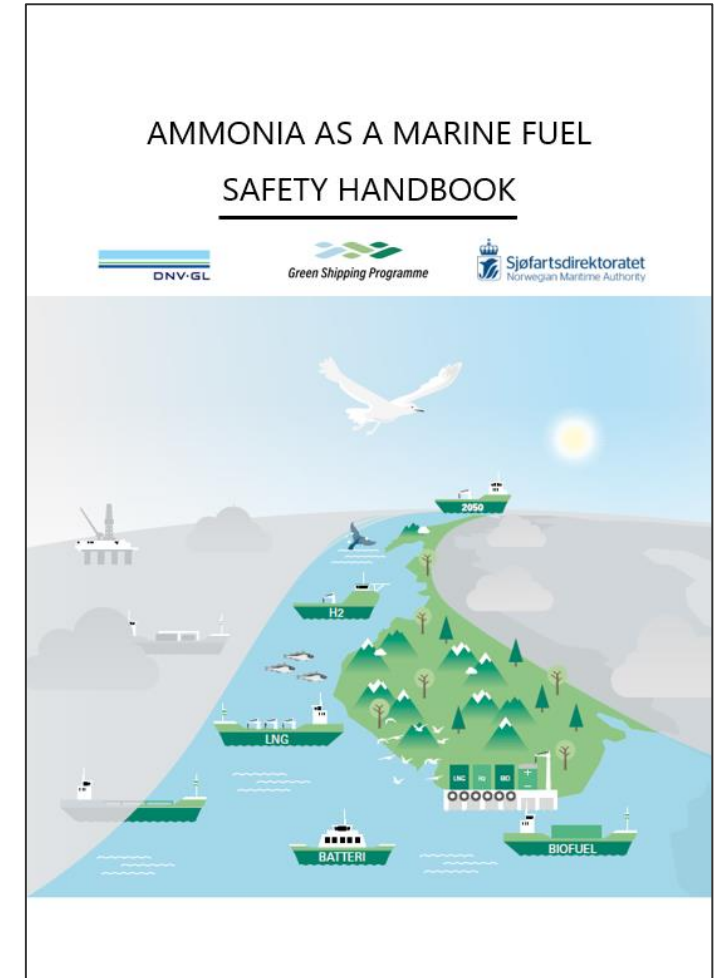


Why an Ammonia Safety Handbook from GSP?

To provide **practical guidance on safety aspects of ship design** in the development of ammonia fuelled ships for ship owners, yards and designers



The first version January 2021 was developed in the first GSP Ammonia as fuel pilot



New version June 2023



- Ammonia powered tanker



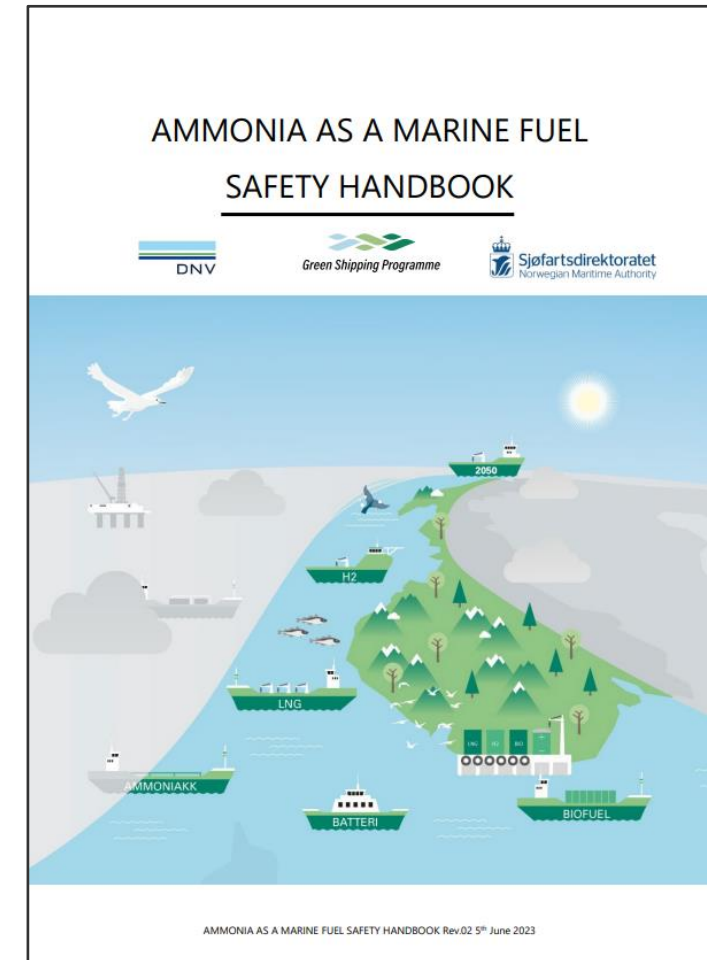
- Ammonia powered bulk carrier



- Ammonia powered trawler

Nordic Roadmap
**Future Fuels
for Shipping**

- Technical and regulatory analysis



Available at: <https://greenshippingprogramme.com/reports/>

Possible safety barriers addressing toxicity of ammonia

Toxic exposure protection -
definitions of toxic zones

Ammonia release mitigation
system (ARMS) collecting and
handling operational releases of
ammonia

Revise alarm levels to provide
warnings of toxic levels of
ammonia

Arrange mustering stations
and LSA away from toxic
hazards

Arrange Safe Haven where
personnel onboard can take
refuge

Toxicity hazards

Performing risk assessment
specific for ammonia

Sufficient personal
protective equipment (PPE)

Apply water spray
systems to reduce
extent of toxic
vapours

Avoid portable tanks for
ammonia
No ESD protected
machinery spaces

Indefinite holding time
for ammonia storage
tanks

Extensive and ship-
specific fuel handling
manual

The Ammonia as a Marine Fuel Safety Handbook

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