

e4ships in the rule developement for inland water ships

hySOLUTIONS GmbH

e4ships & Zero-Emission Shipping Symposium | Hamburg | 08.09.2022

- ≡ Lloyd's Register in IWW
- ≡ IWW fleet
- ≡ Statutory legislation
- ≡ e4ships – fuel cells in maritime application
- ≡ Content ES-TRIN
- ≡ e4ships - rule developement



- ≡ Founded in London in 1760
- ≡ Owned by LR Foundation
- ≡ Charitable organisation
- ≡ Fully independent from industry
- ≡ Providing compliance, risk and consultancy services
- ≡ No. 3 class society in no. of ships and GT
- ≡ Leading class society in IWW
- ≡ Recognised by nearly all flag states
- ≡ Recognised by EMSA, CCNR, EU, ADN



- ≡ IWW Technical Sub Committee

- ≡ Involvement in legislative bodies:
 - ≡ Make proposals for legislation
 - ≡ Check technical requirements
 - ≡ Maintain relationship with authorities
 - ≡ Assist clients with derogations
 - ≡ Chairman of ad-hoc working groups
 - ≡ Chairman of GERC



	Rhine	Danube	Other
≡ Dry cargo ships	6.950	2.650	1.550
≡ Tankers	1.450	200	20
≡ Tugs and pushers	1.350	650	750
≡ Passengers ships			1.800
≡ Cabin passenger ships			400
≡ Total approximately	18.000 ships		



- ≡ Average age dry cargo ships 35 years
- ≡ Average age tankers 15 years

- ≡ 60% IWW fleet is Dutch owned
- ≡ 80% private owners

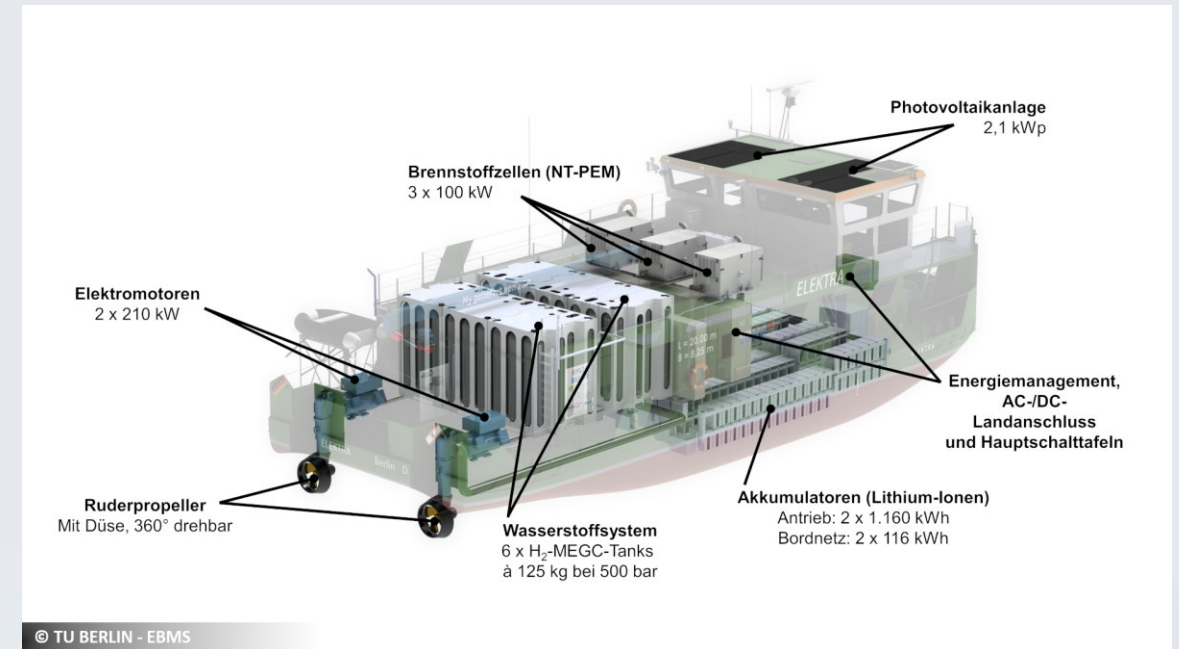
- ≡ LR market share existing fleet
 - ≡ 850 / 1.250 ADN tankers
 - ≡ 200 / 400 cruise ships



- ≡ CESNI Committee, Strasbourg
 - ≡ European Directive 2016/1629 → ES-TRIN
 - ≡ Secretariat done by CCNR
 - ≡ 27 contributing countries + class societies + industry
 - ≡ Meetings 2 x per year (Com.)
 - ≡ Meetings 4 x per year (W.G.)
 - ≡ Meetings 4-6 x per year (ad-hoc W.G.)
- ≡ Ad-hoc working groups:
 - ≡ PAX, ELEC, FC



- ≡ e4ships - fuel cells in maritime use
- ≡ With the four lighthouse projects ELEKTRA, Pa-X-ell, RiverCell and MultiSchIBZ, the German shipbuilding industry has demonstrated practical systems for essential ship types and transport tasks
- ≡ Broad introduction of high-performance fuel cell systems in international shipping requires the legal support of binding approval regulations



- ≡ e4ships - fuel cells in maritime use
 - ≡ e4ships is supporting actively the developement of the regulatory framework by proposing rules, reviewing regulatory proposals, providing guidance and advise
 - ≡ The regulatory subject have been constantly expanded: Fuel Cells, Methanol Storage and Supply, Hydrogen Storage and Supply



Project RiverCell © Meyer Werft

- ≡ ES-TRIN 2021-1
 - ≡ Definitions and procedures
 - ≡ Structure and stability
 - ≡ Lay-out of vessel (wheelhouse, accomodation)
 - ≡ Freeboard
 - ≡ Safety equipment
 - ≡ Electrical installation
 - ≡ Navigational equipment
 - ≡ Requirements for specific ship types
- ≡ Changes in ES-TRIN 2023-1
 - ≡ Emissions
 - ≡ Waste water collection
 - ≡ Thrusters aft of aft peak bulkhead
 - ≡ Equipment
 - ≡ Retractable wheelhouses
 - ≡ Recreational craft
 - ≡ Passenger ships
 - ≡ Alternative fuels Chapter 30
 - ≡ Annex 8 (LNG, fuel cells, methanol, hydrogen)

≡ CESNI regulatory work

- | | |
|------------------------|--|
| ≡ General requirements | ES-TRIN 2023 (entry into force January 2024 in EU/CCNR) |
| ≡ Fuel Cells | ES-TRIN 2023 (entry into force January 2024 in EU/CCNR) |
| ≡ Methanol storage | Interim guidelines for pilot projects and collection of experience
ES-TRIN 2025 |
| ≡ Hydrogen storage | ES-TRIN 2025 |

- ≡ Final draft requirements for low flashpoint fuels including specific requirements for fuel cells
 - ≡ Restructured and updated general requirements for all low flashpoint fuels
 - ≡ Restructured requirements for storage and use of LNG
 - ≡ New requirements for energy converter: fuel cells
 - ≡ Definitions
 - ≡ Fuel cell spaces
 - ≡ Fuel piping systems
 - ≡ Reformer
 - ≡ Buffer vessels
 - ≡ Fuel cell systems
 - ≡ Ventilation systems
 - ≡ Exhaust systems
 - ≡ Purging systems
 - ≡ Control, monitoring and safety systems

- ≡ Final draft requirements for methanol storage
- ≡ Definitions
- ≡ Meoh fuel tanks
- ≡ Piping sytems
- ≡ Drainage systems
- ≡ Arrangement for entrances and other openings
- ≡ Bunkering systems
- ≡ Fuel supply
- ≡ Fire safety
- ≡ Control, monitoring and safety systems



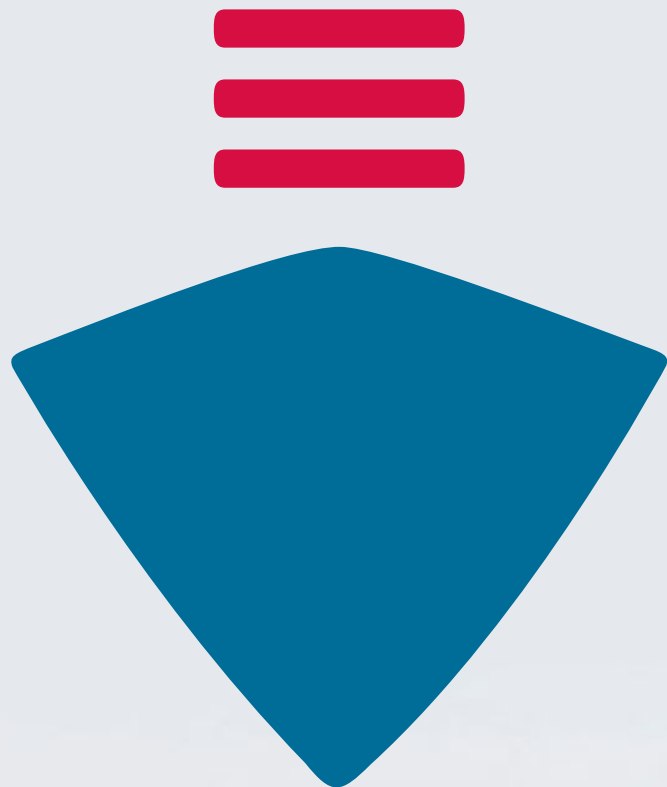
Project RiverCell © Meyer Werft

≡ Draft requirements for hydrogen storage

- ≡ Definitions
- ≡ GH2 containment systems (including swappable systems)
- ≡ GH2 piping systems
- ≡ LH2 containment systems
- ≡ LH2 piping systems
- ≡ Drainage systems
- ≡ Arrangement for entrances and other openings
- ≡ Ventilation systems
- ≡ Filling limits
- ≡ Gas supply system
- ≡ Fire safety
- ≡ Control, monitoring and safety systems



ELEKTRA



Many thanks for your attention!

e4ships

c/o hySOLUTIONS GmbH

torsten.hacker@lr.org

info@e4ships.de

www.e4ships.de