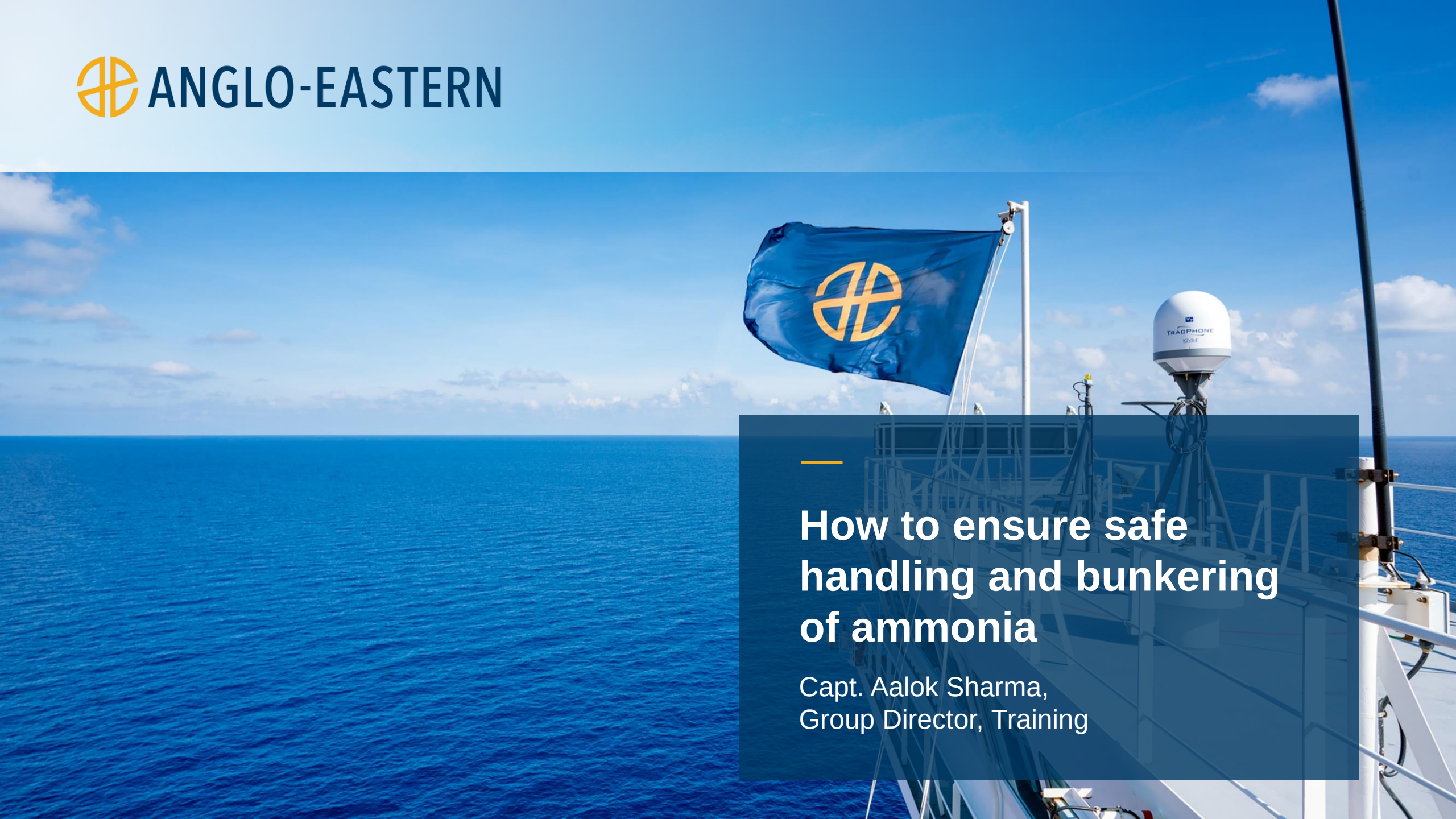


How to ensure safe handling and bunkering of ammonia

Capt. Aalok Sharma,
Group Director, Training

Reflections of 2023

DEADWEIGHT TONNAGE

Anglo-Eastern managed **52 million** DWT

or about **2.3** % of the world's total in 2023

Source: UNCTAD

Our vessels have **3.7 times** the **deadweight capacity of the world average** at 80304 MT versus 21564 MT per cargo vessels

INSPECTIONS

Every 24 hours, Anglo-Eastern vessels make an average of **60 port calls**

Every week, our fleet undergoes **26 PSC inspections**

Every week, our fleet undergoes **13 SIRE/oil major/ CDI inspections**

Every 7 minutes, an AE seafarer **signs on or off** an Anglo-Eastern vessel somewhere in the world

Per PSC inspection:

Our **deficiencies** are **68% lower** than the industry average*

Our **detentions** are **83% lower** than the industry average*

*Paris MoU

Our Services

Technical Ship Management

Full technical management for all types of vessels including:

- Budgeting
- Maintenance
- Inspections and audits
- Drydocking
- Operations
- Quality assurance
- Insurance and claims
- Procurement
- Manning
- Post fixture management

Crew Management

Crewing for all types of vessels including:

- Selection and employment
- Certification control & verification
- Training
- Appraisals
- Payroll
- Travel & visas
- Welfare
- Insurance

Technical Services

- Alternate fuel solutions
- Concept designs
- Plan approval
- Newbuilding supervision and conversion of 950+ ships across various shipyards in South Korea, Japan, China and Philippines
- Retrofit/modification consultancy
- Project management

Training

- Wholly owned, state of the art centres in India, Philippines, Ukraine and China.
- Fully accredited cadet academy training over 480 deck, engine, and electrical trainees from India each year.

Global coverage, local expertise

Ship Management

Hong Kong (HQ), Singapore, Hamburg, Antwerp, Goes, London, Miami, Mumbai, Montreal, Athens

Crewing

India, Philippines, Ukraine, China, Latvia, United Kingdom

Training Centres

India, Philippines, Ukraine

Agency

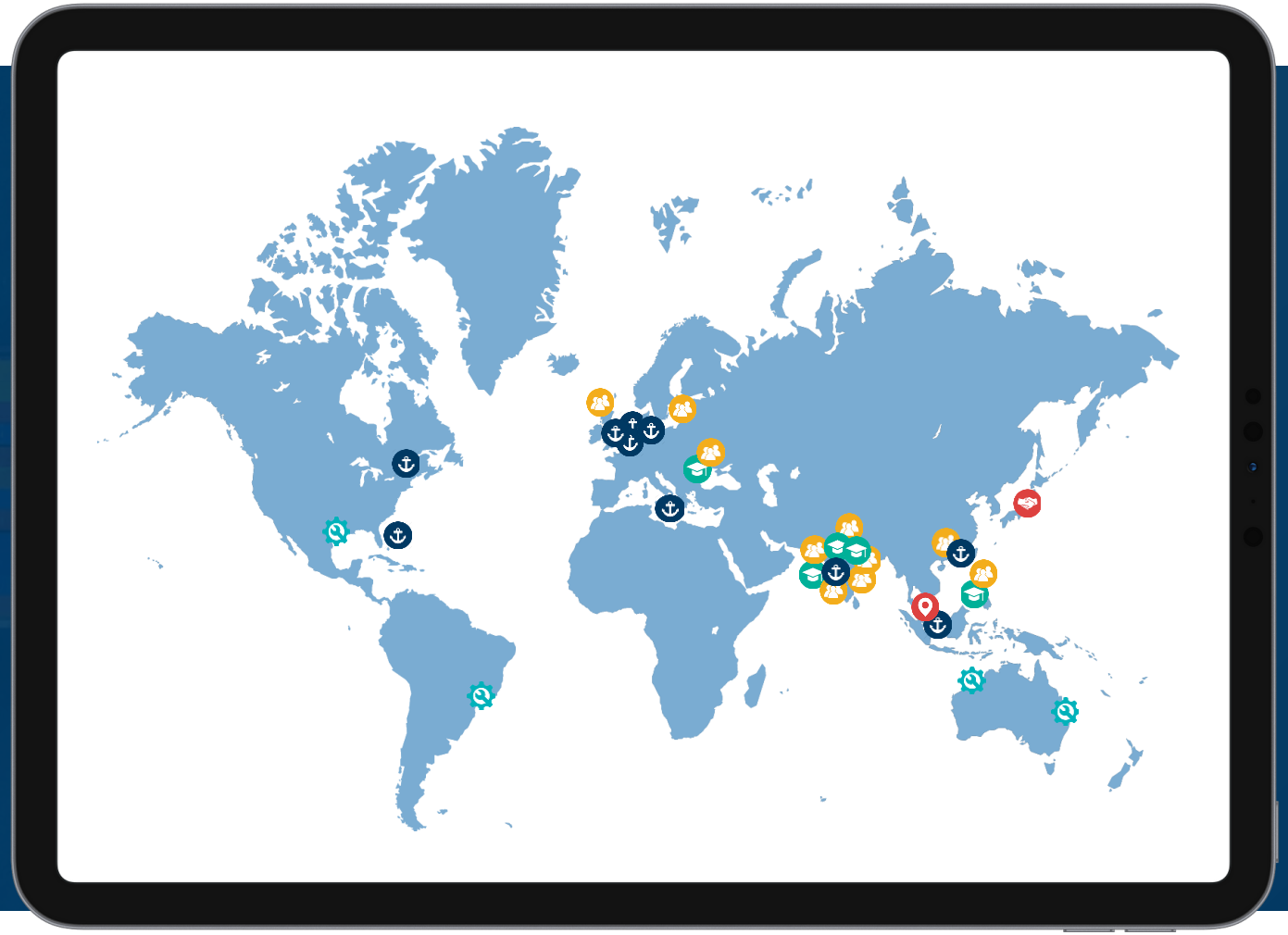
Singapore

Client Liaison

Tokyo

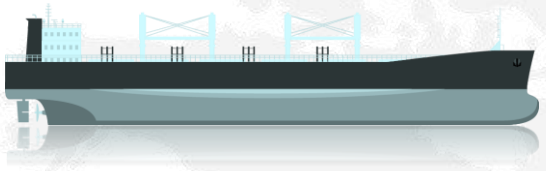
Technical & Marine Support

Houston, Rio de Janeiro, Brisbane, Port Hedland



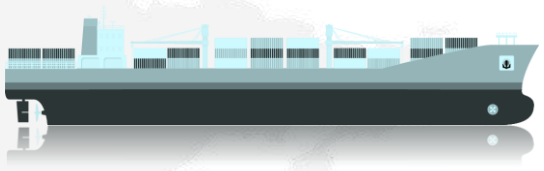
Our fleet

We manage a diverse fleet of **730 vessels**, spanning across ship types



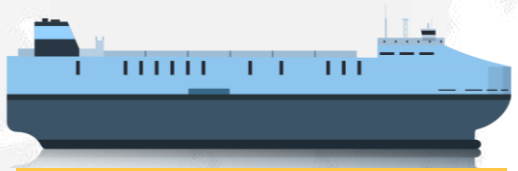
299 – Bulk Carrier

234 – Tanker (Oil/Chem)

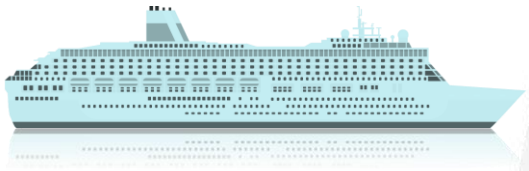


74 – Container

60 – Gas



24 – Ro-Ro



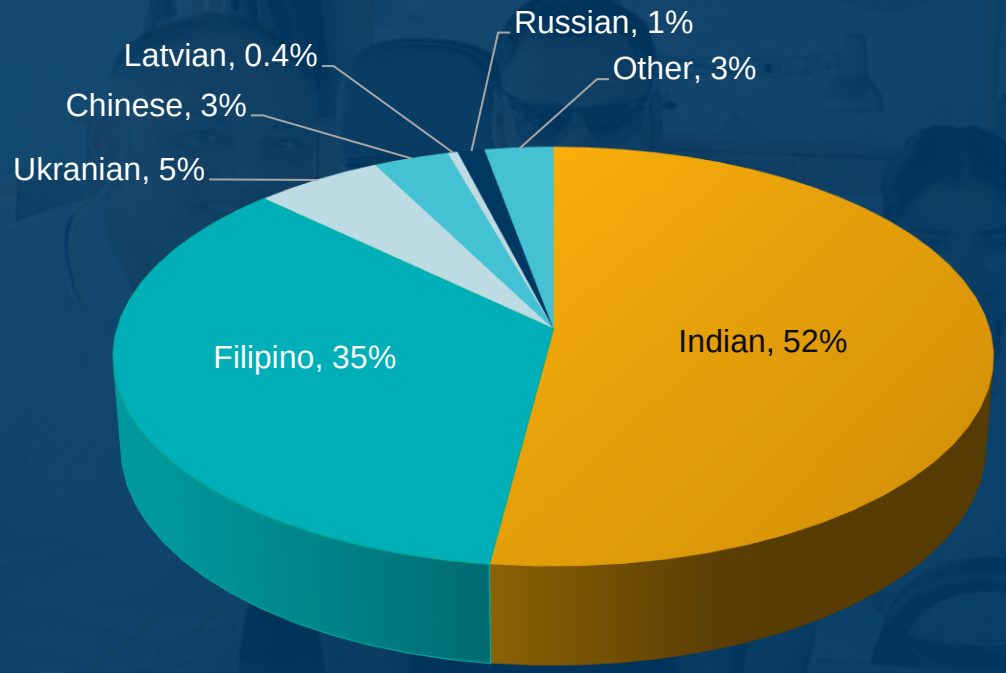
11 – Passenger

11 – Heavy-lift

17 – Others including offshore

Our people

Our people are the most important drivers of our success.



Over

2,250

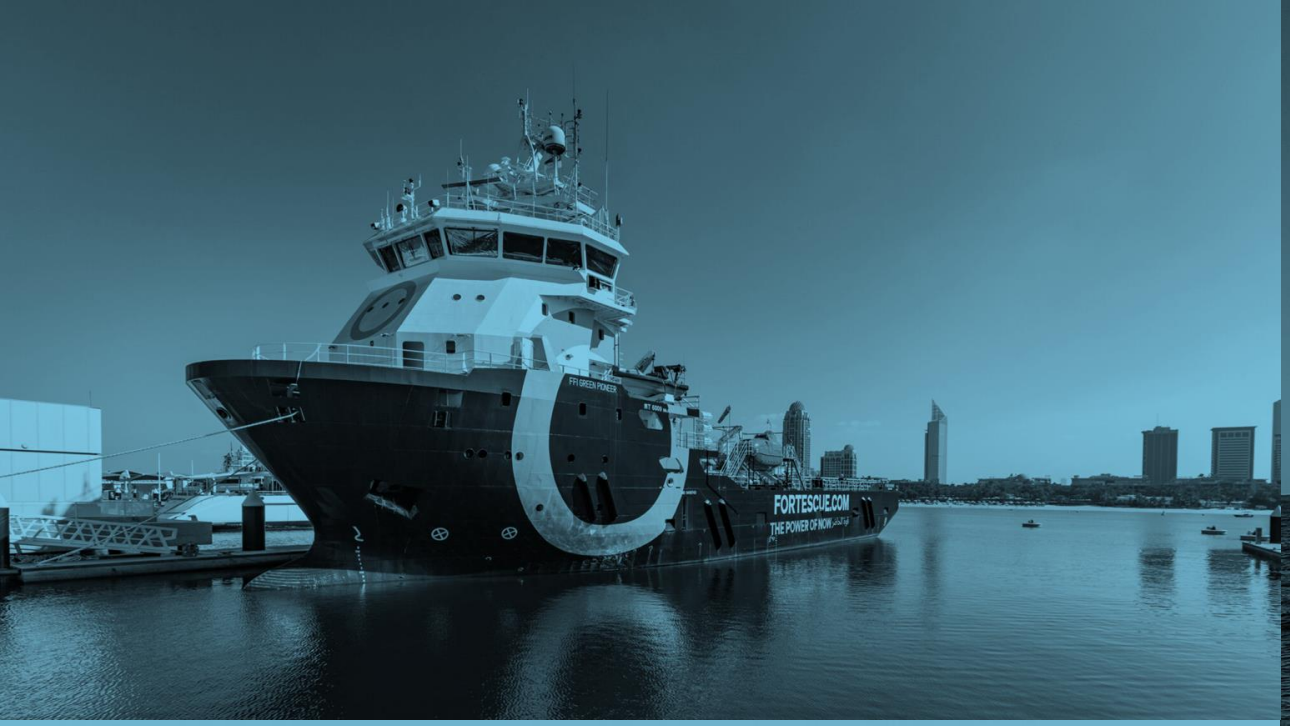
shore employees

More than

39,000

active seafarers.

42 nationalities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SERAPHINE


CMA CGM
CMA CGM MASAI MARA

Dual fuel

Our dual-fuel expertise

Existing dual-fuel vessels under Anglo-Eastern technical management - 35

Dual-fuel type	Ship Type	Vessels
LNG	Oil / Chem. tanker	6
	Bulk	4
	Ro-Ro [1]	2
LPG	Gas carrier	8
Ammonia DF	Multi purpose platform supply vessel[3]	1
Ammonia ready	Container [2]	4
	Chem. tanker	3
	Bulk Carrier	5
Methanol ready	Container	2

Dual fuel journey

2019

AE Training center receives DG approval for IGF basic and advanced courses

2021

Acquires Wartsila LCHS and LNG bunkering simulator

Conducts first basic and advanced IGF course

2023

Courses extended to Delhi and Manila to expand the capacity

Build up the shore awareness and capacity for future fuels

2024

Conducted Ammonia courses for crew and shore staff

Develop training programs for ammonia, methanol and hydrogen as marine fuel

2025

Bunker stations for hands on training

Ammonia and Methanol simulator

Dual Fuel – Pathway

Shore staff engagement workshop for Future fuels

Ship specific familiarisation, hand holding support for key operations and training material at the time of takeover

In house value addition courses

Trainer capacity being constantly build up

Industry partnership for enhancing the knowledge base

Future fuels

Continue to engage with industry to learn about future fuels and involved in the development of design standards , training and competence standards

Industry representation and partnership

Chair of the Ammonia Fuel Technical Committee at the Society for Gas as Marine Fuel (SGMF).

Core work group for developing guidelines for ammonia, methanol, and hydrogen as marine fuel at the Maersk Mc-Kinney Moller Centre for Zero Carbon Shipping.

Core work group in the maritime just transition task force in developing training and competency guidelines for global seafaring community.

Member of the Standard Club Alternative Fuel Advisory Panel.

Work group with MPA for developing Temporary Crew Training requirements for Ammonia Fueled vessels.

Let’s focus on just one of the them – Ammonia as marine fuel

Key considerations associated with the use of ammonia as a marine fuel focused on safety devices, process safety and occupational health and safety training are:

- ***Ammonia’s toxicity poses new challenges***, requiring knowledge of its physical and chemical properties, hazardous profile and human exposure threshold limits.
- New knowledge of ***ammonia fuel supply system design***.
- New ***maintenance and inspection regimes***.
- ***New working practices*** for ammonia handling onboard the ship, including work permits, toxic space entry, management of change.
- Definition of hazardous and **toxic zones onboard** the ships and **Personal Protective Equipment** (PPE) requirements for entry and operation within these zones.
- Enhanced PPE requirements and ammonia-specific **emergency response strategies**.
- Continued training on the use of new equipment and safety systems, in addition to training on the use of PPE and emergency response to ammonia incidents onboard the ship.

Bunkering and ship operations – Challenges

- Unlearning before we can learn
- Engine room - Safe OR hazardous zone
- Knowledge of having handled Ammonia as cargo, is not enough!!

Critical !

Knowledge and Competency would not be sufficient

Need a MINDSET change also

Bunkering and ship operations – Safe and secure

Focus on raising awareness on the Design aspects

- Sprinkler system,
- gas sensor,
- emergency stopping devices,
- double walled pipelines

Procedure in practice and made ship specific

- Shipboard procedures and manuals for ship specific bunkering operations
- Emergency and contingency response procedures
- *Key is Industry guidance turned into simple procedures and work instructions*

Training and continued engagement for operational safety

- Classroom training and onboard familiarization – Virtual and immersive
- Training solutions built along with the makers – Pre boarding and Onboard engagement
- Simulators and Hands on training bunker stations
- Onboard observers at the yard
- Subject matter expert team for undertaking the initial operation

Thinking out of the box is an understatement

Dual fuel training

Engagement tools

Experiential and immersive learning is the key to raise awareness and provide Just in Time learning.

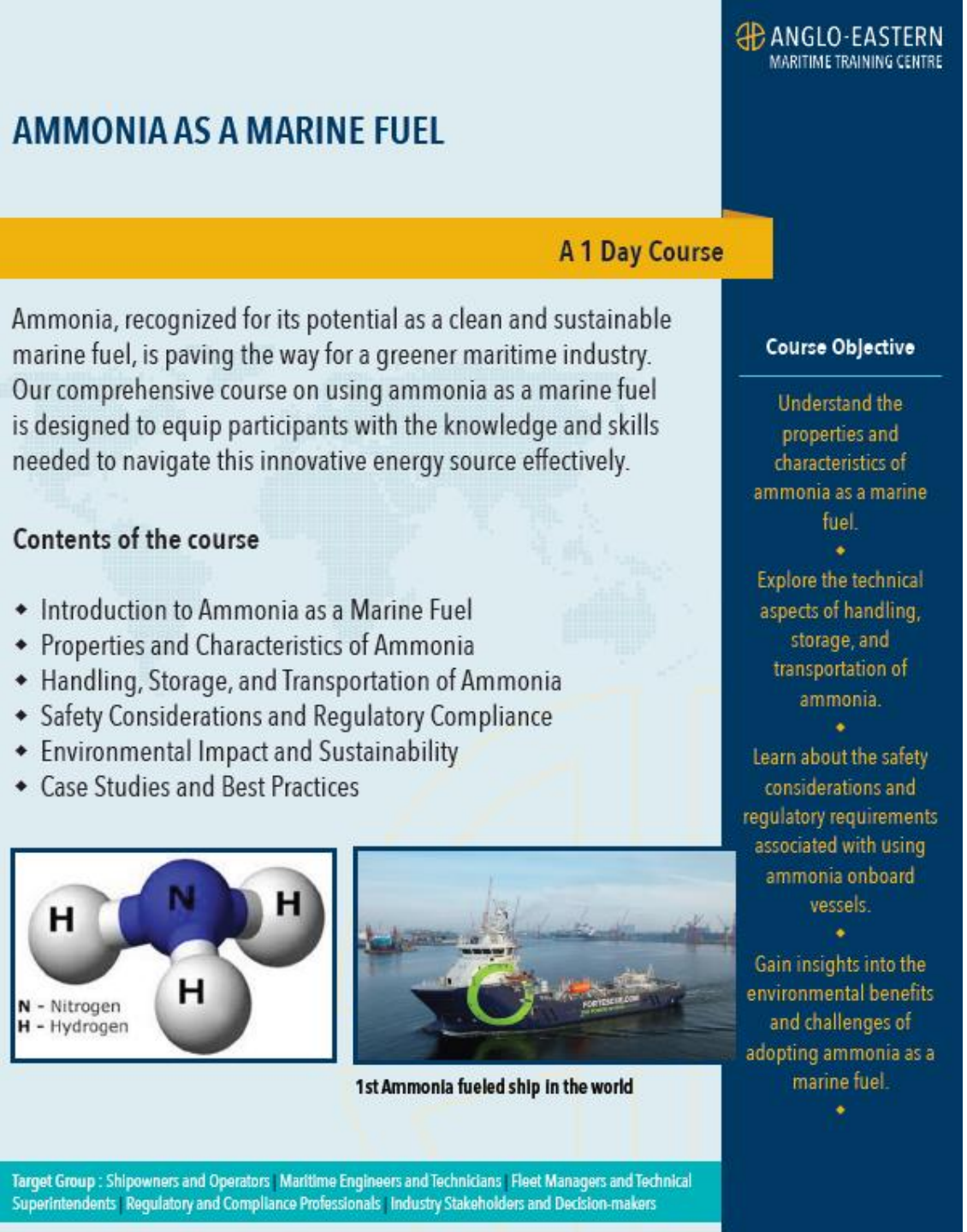
Challenges

- Is it generic or ship specific?
- Does classroom training complement onboard training?

How well will we carry out the 10th or the 50th bunkering operations ?

Digital footage Fuel gas supply system room

Ammonia – Marine fuel training program



- Ammonia fuel training program has been developed inhouse.
- The training is regularly updated and also includes ammonia bunkering.
- This training can be tailor made to vessel specific as required.

PPE for Ammonia handling

Chemical Protection Suit

Positive Pressure Mask with filter

Chemical gloves & HAZMAT boots

Face Respirator

Diphoterine aerosol cans

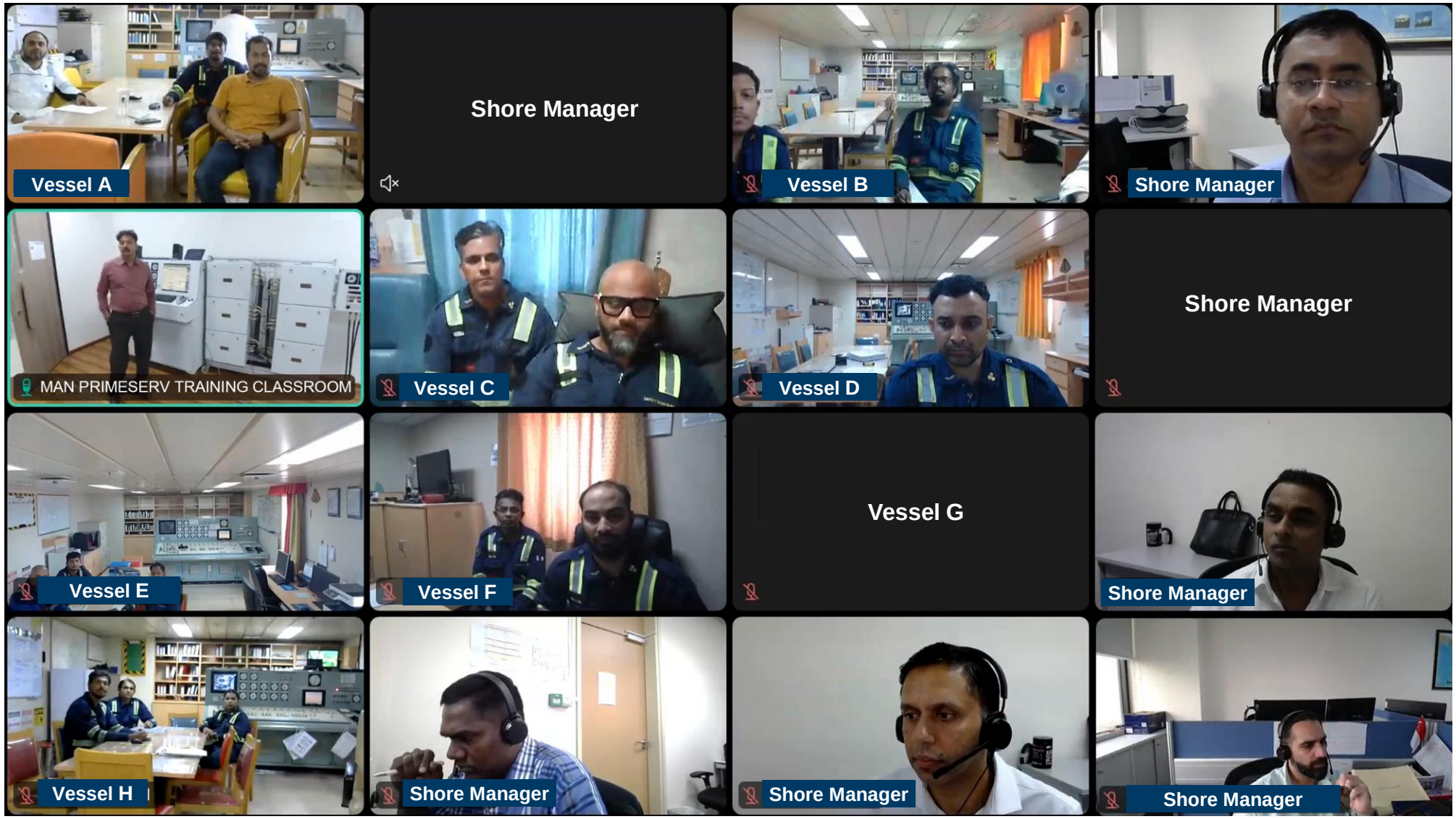
Portable Gas Detectors

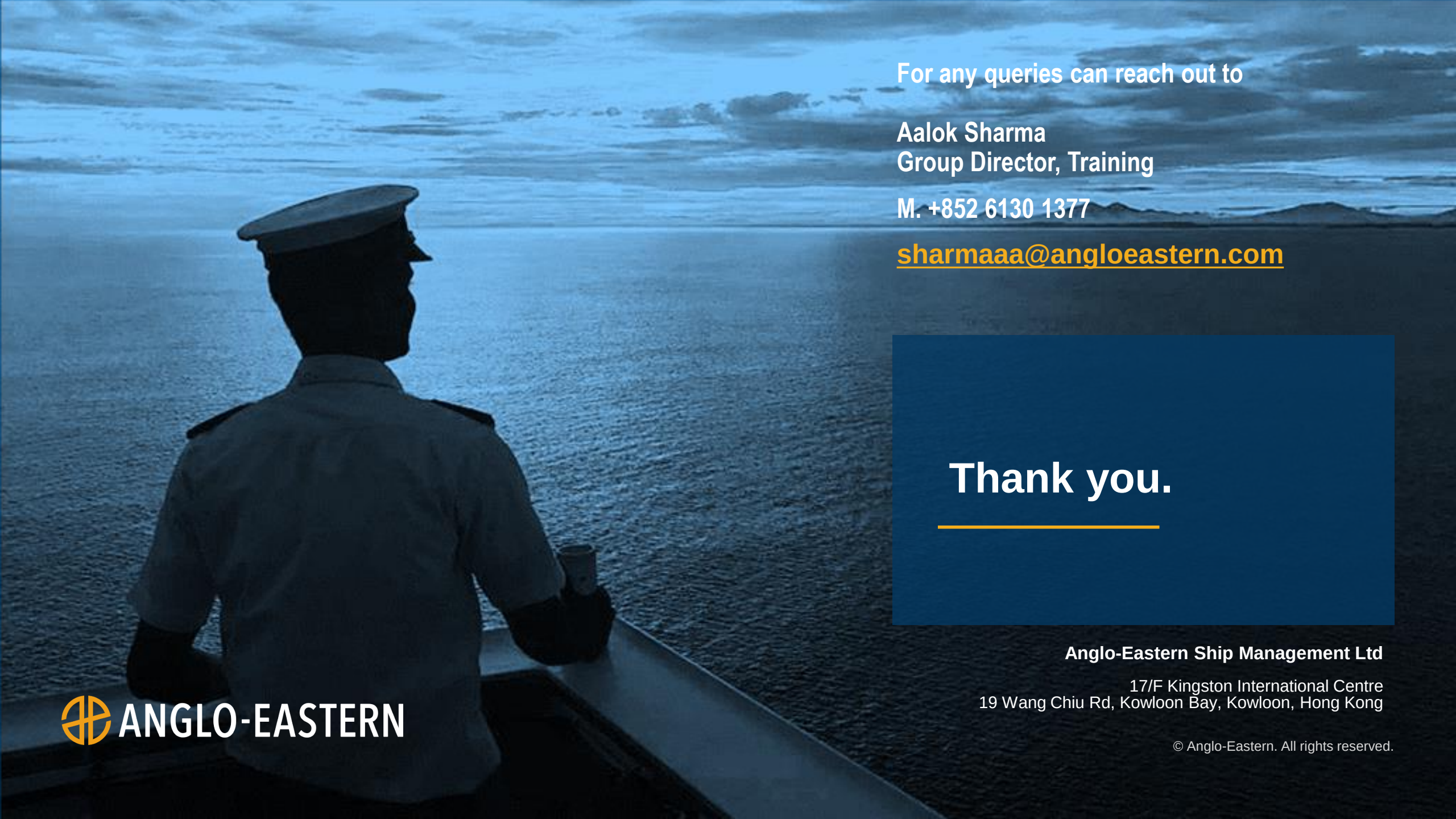
PPE for Ammonia handling

Fully encapsulated gas suit

Decontamination shower

Leveraging the technology to get ship and shore on “One Screen”





For any queries can reach out to

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Thank you.

ANGLO-EASTERN

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