WHEN TRUST MATTERS



Rules and regulations driving safety in ship-shore interaction

ARCSOPT 2026, Perth

Morten Løvstad, VP – Global Business Director for Bulk Carriers

Thursday, October 22, 2026

Cargo Liquefaction - Background

- Loading iron ore fines (or other IMSBC Type A cargo) from ports during rainy season may pose a risk that moisture content (MC) is above Transportable Moisture Limit (TML). This may lead to rejecting the cargo due to safety reasons.
- This is a known problem in Port of Ilha Guaíba, and there are indications the same problems are now arising in Morebaya Port (iron ore from Simandou).
- It is possible to qualify Very Large Ore Carriers (VLOCs) as Specially Constructed Cargo Ships (SCCS) in accordance with the IMSBC Code, so they can safely load cargo with MC above TML for Type A cargo.
- VLOCs are practically the only ship type where it is feasible to safely load cargo with MC above TML, due to stability requirements.

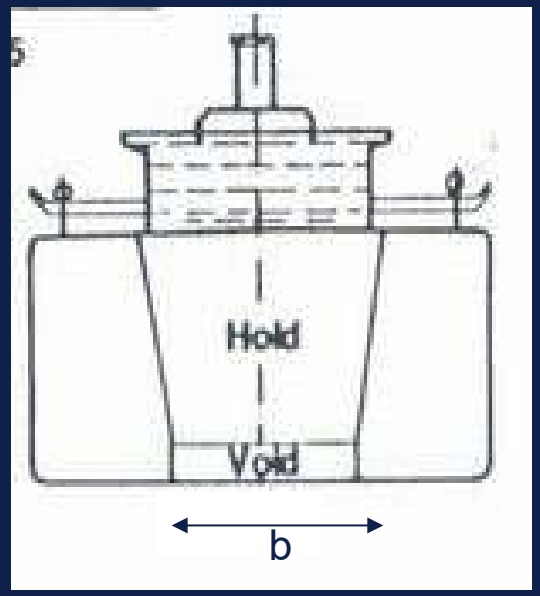


Iron ore fines – before and after liquefaction on a bulk carrier

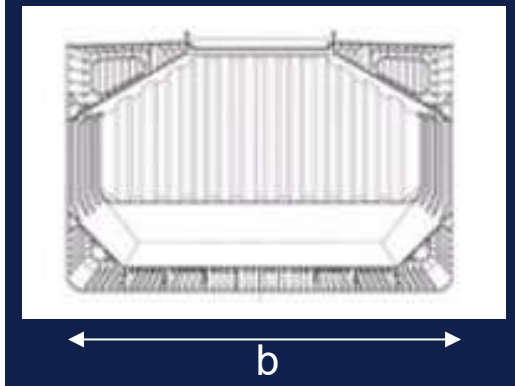
Why is a VLOC safer than a Newcastlemax for IMSBC type A cargo ?

- A VLOC may allow safe loading of cargo with MC>TML due to more narrow cargo hold (b) and therefore less stability problems.
- A Newcastlemax or Capesize may face sever stability risk if loaded with cargo where MC>TML, and may in worst case capesize and sink!

VLOC:



Newcastlemax:



Free Surface Moment:

$$FSM = \frac{l \times b^3 \times \rho_l}{12 \times \rho_w}$$

DNV ©

What does it take to get SCCS approval?

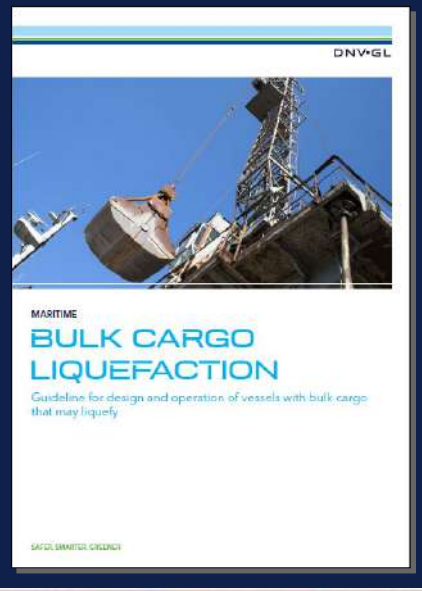
- We know from experience this is the case in Brazil, and indications from the cargo loaded from Simandou already shows MC values very close to TML (wet season start July and last until October).
- **Class approval -> Flag approval**
- **A vessel that are approved for loading cargo with MC>TML may be used year around and will basically be the only vessels that can safely load and transport such cargo during rainy season without special pecautions:**
  - *Newbuilding: strengthen the vessel to allow full dwt capacity*
  - *Existing vessel: calculate max allowable cargo intake that can still be safely loaded*



DNV ©

DNV was the first Class to introduce a Class notation for loading cargo with MC>TML

- DNV has been pioneering research on **cargo with high moisture content** and the impact on safety.
- DNV developed in close cooperation with VALE the **BCLIQ Class notation**.
- This notation signifies that a **vessel can safely load and transport Type A cargo with MC>TML**.
- The notation ensures the vessel complies with IMSBC Code as “Specially Constructed Cargo Ship”, SSCS, and will get Flag acceptance accordingly. This include careful evaluations of stability and strength criteria.
  - *VLOC strengthened (at newbuilding or FiS) to utilize full dwt capacity:* ***BCLIQ***
  - *Existing VLOC with no modification:* ***BCLIQ(partial)***

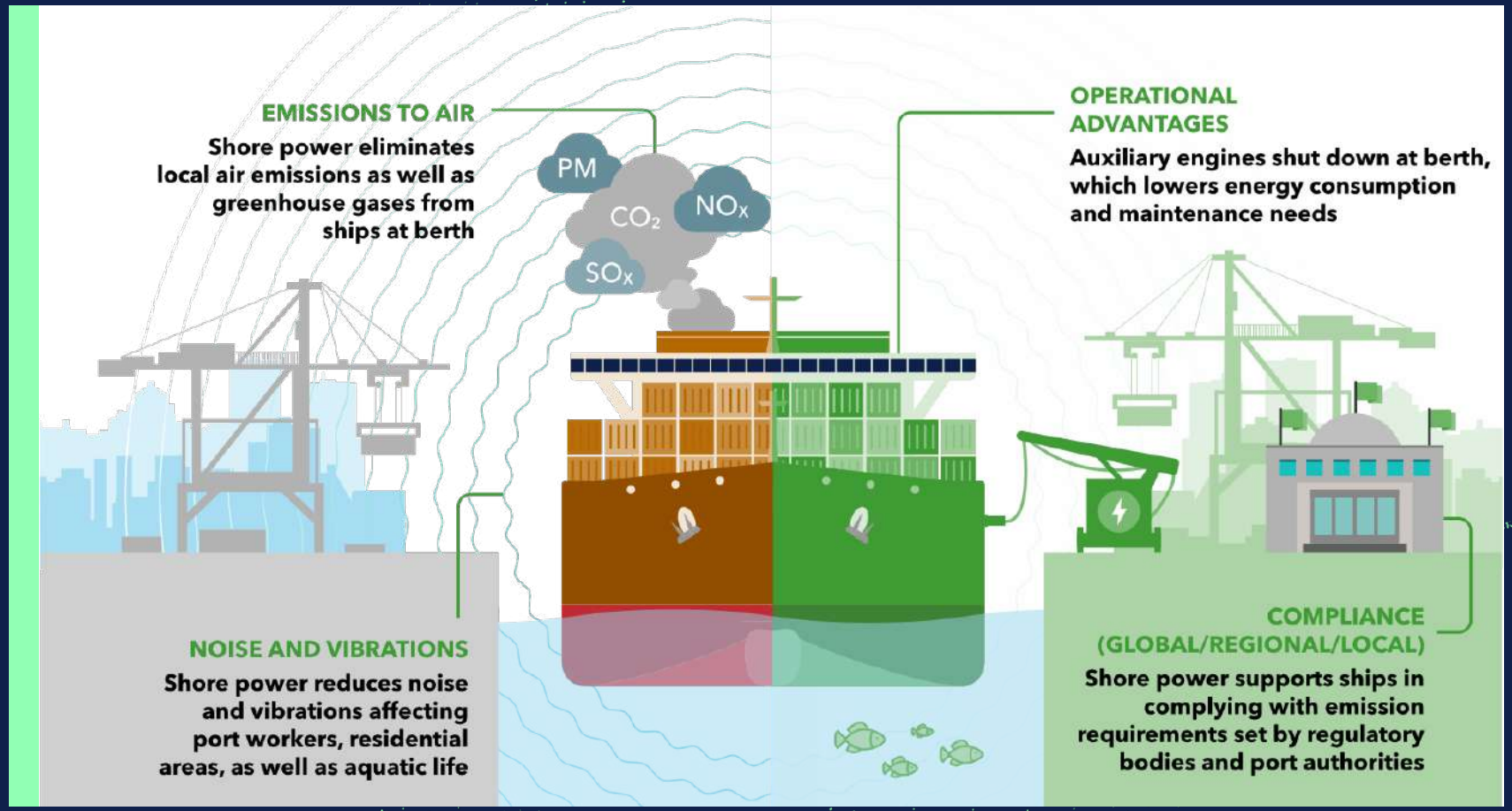




Iron ore fines – before and after liquefaction on a bulk carrier

DNV ©

Shore power - may deliver fuel savings and emission reduction – and other benefits

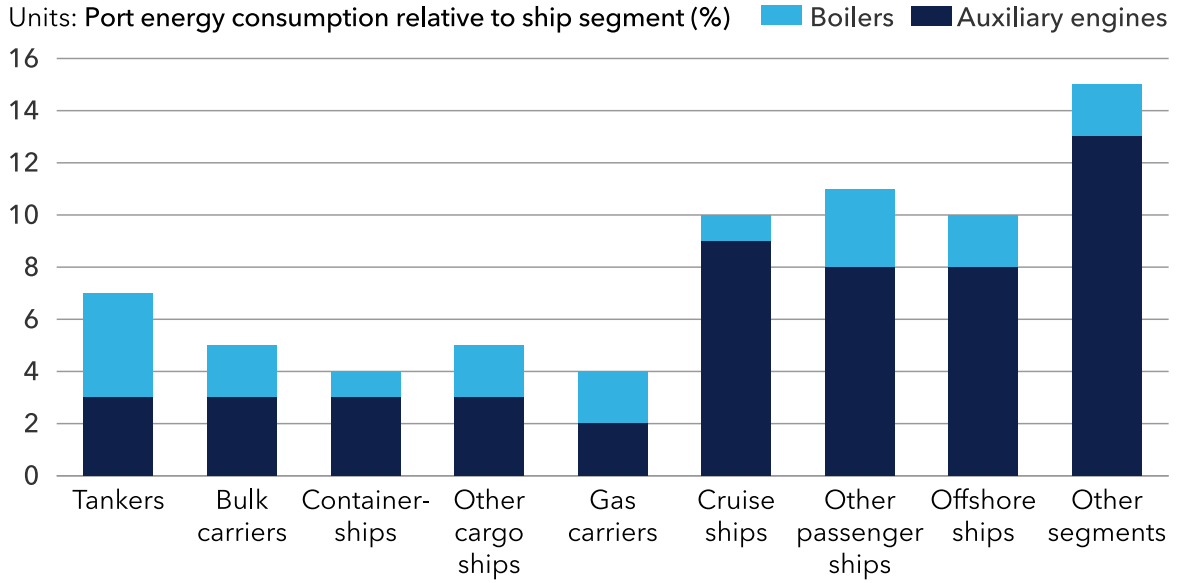


DNV ©

Fuel saving potential 3.5% of global consumption

- **Shore power replaces auxiliary engines** at berth but typically **not the boilers**, which can account for up to 50% of energy use.
- Potential **fuel savings** for ships >5,000 GT: **~3.5% of global consumption** if all engine use in port was replaced by shore power.
- Reduction potential **varies between 2% and 13%** across the different ship segments.

Modelled share of total fuel consumption in 2025 used in port for different ship segments, split between auxiliary engines and boilers



Source: DNV MASTER model, 2026

DNV ©

DNV

Only 3% of ports globally offer shore power, concentrated in cruise and container ports in Europe, China and California

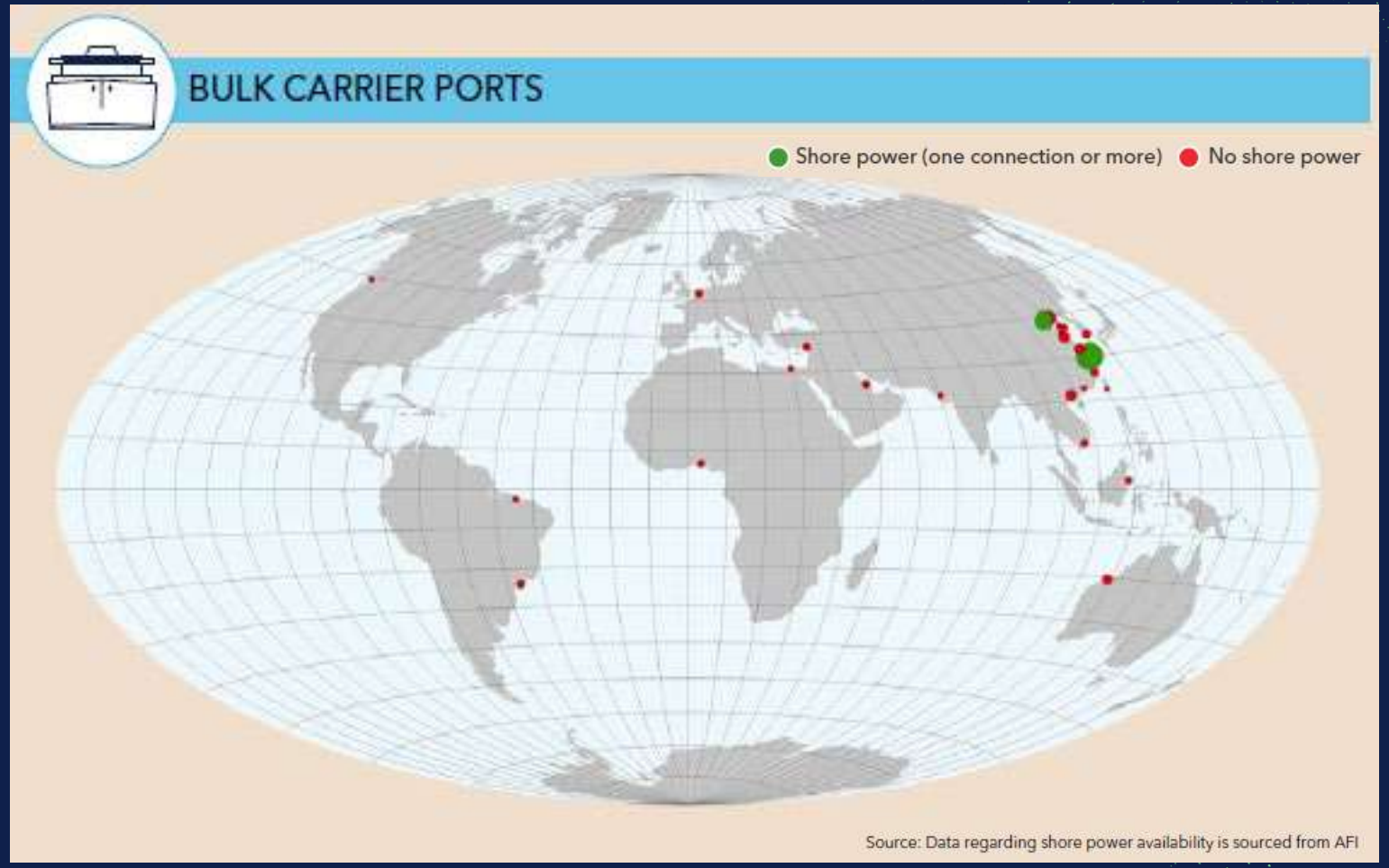
Shore power (SP) availability globally and by region for ships (>5,000 GT) for selected segments

Area	Container		Cruise		Bulk		Tank		Total share of SP
	Ports	SP ports	Ports	SP ports	Ports	SP ports	Ports	SP ports	
Globally	1 066	43	1 113	41	1 792	18	1 853	2	3 %
EU, China, California (US)	319	28	386	25	496	8	543	2	5 %
EU	215	8	365	15	321	0	414	1	2 %
EU TEN-T core ports	85	8	115	14	101	0	111	1	16 %

Source: DNV AFI, 2026

DNV ©

Only 3% of ports globally offer shore power - 1% of bulk carrier specific ports (mostly in China)



DNV ©

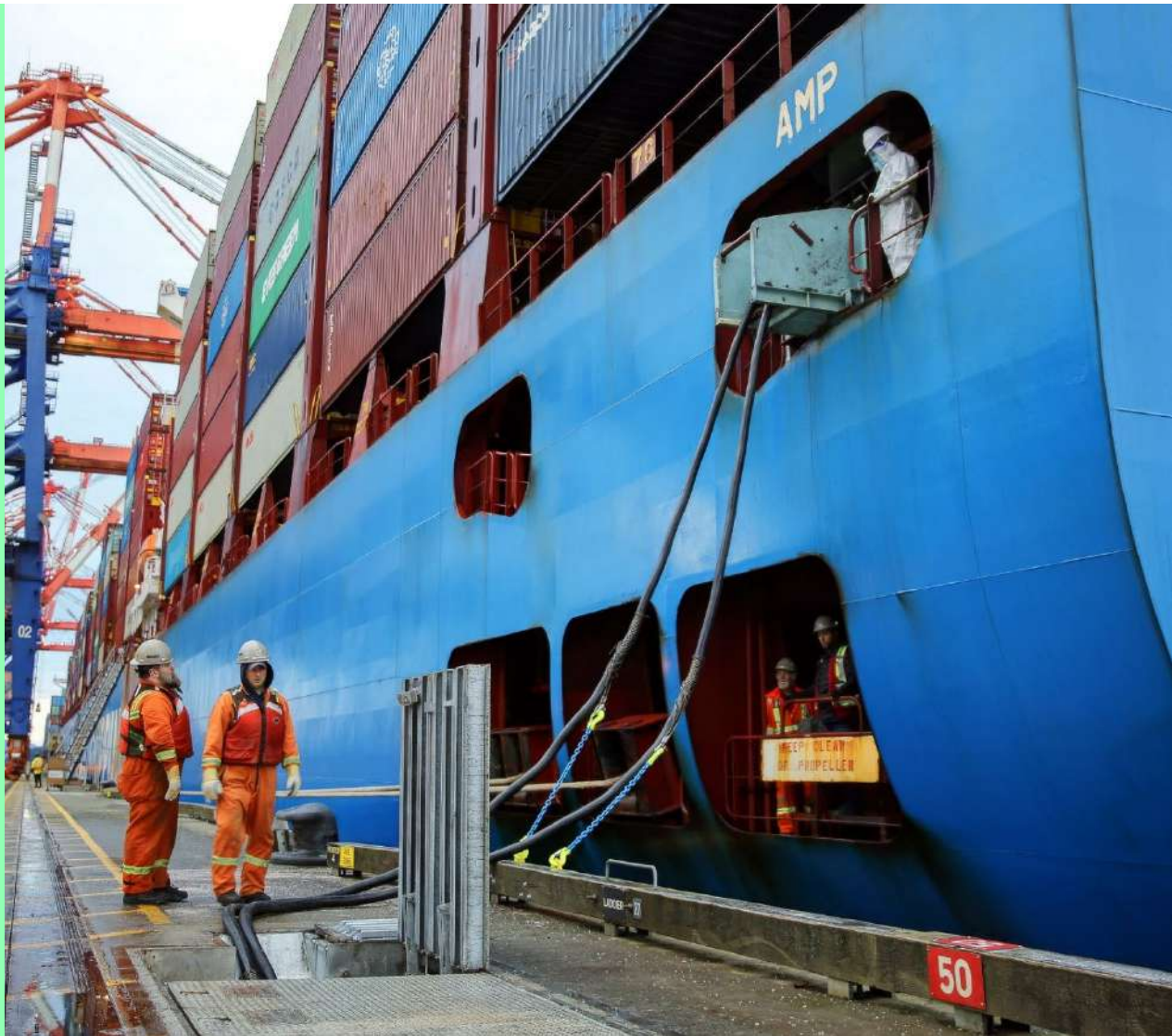
Scaling shore power depends on regulation and incentives that unlock port-side investment

Barriers

- **High Capex and complexity** for site-specific electrical infrastructure
- **Grid and permitting constraints** delay high-power berth deployment
- **Coordination gap** between port investment and ship retrofit decisions

Enablers

- **Clear regulation** to create supply and demand certainty
- **Public co-funding and incentives** to de-risk early investments
- **Standardization ensuring** ship-shore interoperability



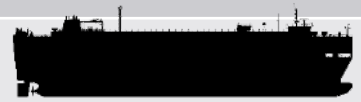
DNV ©

IEC/IEEE 80005-1 High-Voltage standard, current document



Changed from “normative” to “informative” due to limited use…

Main Body	
General requirements applicable to all ship types and all shore connection installation (Ship and Shore)	

ANNEX (ship specific, e.g. power demand, number of plug& socket connection, placement of the cable-management system.	
Annex A (informative) Ship-to-shore connection cable	
Annex B (normative) Additional requirements for Roll-on Roll-off (Ro-Ro) cargo ships and Ro-Ro passenger ships	
Annex C (normative) Additional requirements for cruise ships	
Annex D (normative) Additional requirements of container ships	
Annex E (informative) Additional requirements of liquefied natural gas carriers (LNGC)	
Annex F (informative) Additional requirements for tanker	
Annex G (normative) Additional requirements for vehicle carriers	

IEC/IEEE 80005-series Past – Present - Future



Done (resent past):

Publication of IEC/IEEE 80005-3, Low Voltage

Ongoing (present):

- Maintenance work on IEC/IEEE 80005-1, High-Voltage.
  - Updates to the whole document including a completely revised ANNEX F for tanker based on OCIMF recommendations (will most likely again become “normative”)
  - Will include a **new annex for bulk carrier based on Intercargo INF**
  - Intercargo has established a liaison with IEC/IEEE JWG 28 and has commented the current standard document
  - JWG-28 will meet in Copenhagen beginning of June to discuss comments and to implement changes to the documents

Main points of incompatibility between China domestic shore power standard vs International standard for bulk carriers

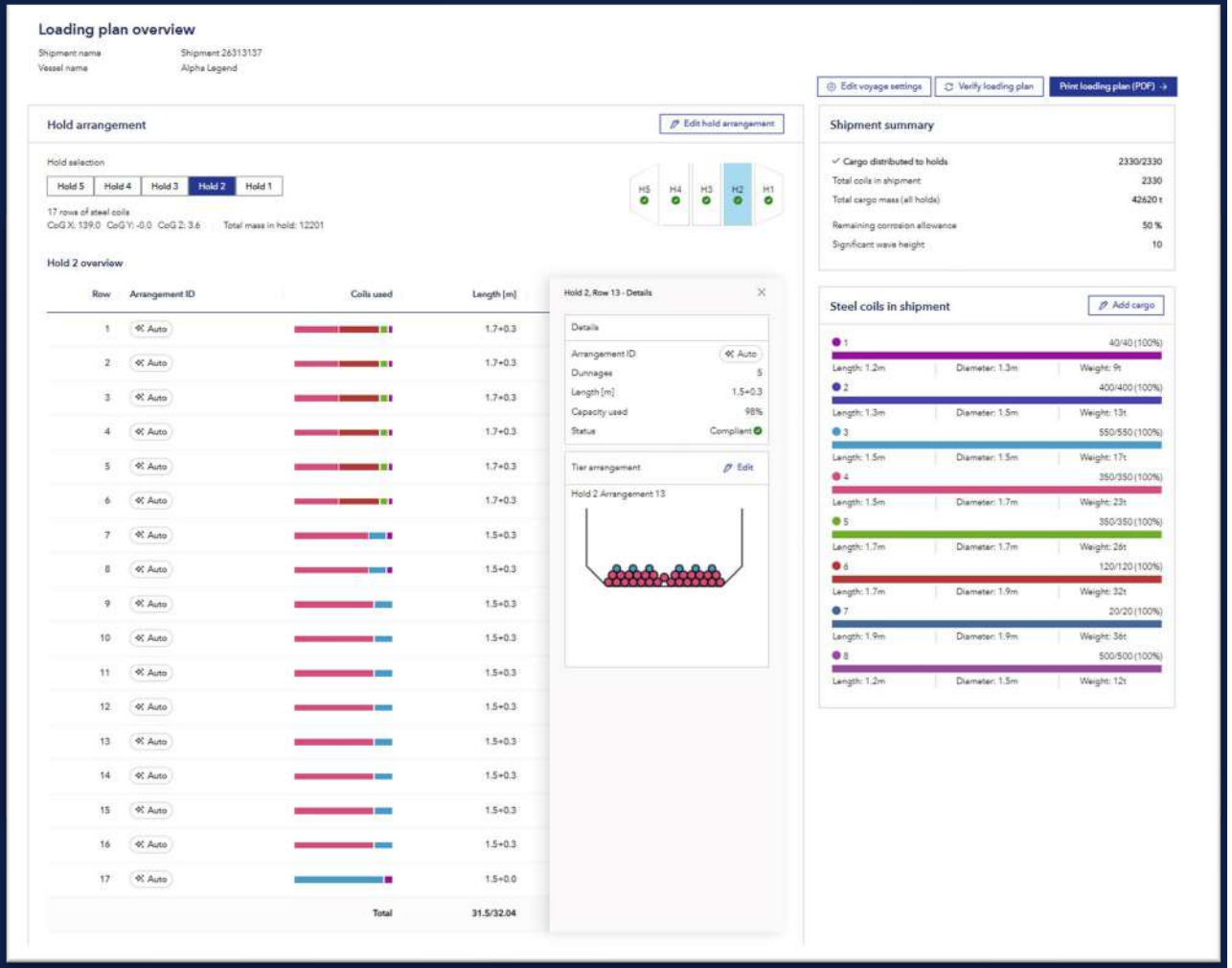
Plug and socket connection:

- IEC/IEEE 80005-1 requires a minimum of **five pilot pins** (for two independent safety loops). If more than one cable is installed, an interlock shall be used so that no cable remains unused.
- Chinese standard prescribe connectors with **three pilot pins** only

Cable management system:

- Chinese standard prescribe to place the cable management system **onboard**
- Both Intercargo-INF and all IEC/IEEE 80005-1 (except for CV) prefer capble management system on **shore side.**

Award-winning solution to optimize and safely load steel coils or product cargo



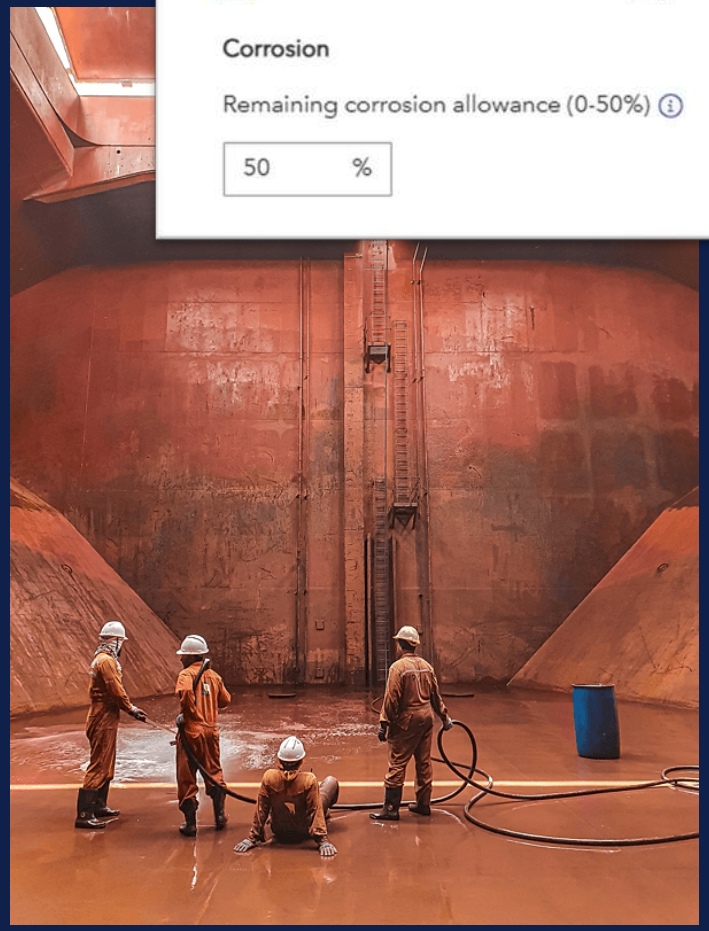
Steel Load Planner v2.0

After 2 years of experience and use on 100 vessels, we now introduce Version 2.0:

- *Radically simplified input - and **auto generated, optimized** loading plans in 2 minuts!*

- ***One page dashboard** with easy overview of full cargo and stowage plan, and capacity ultization*





Steel Load Planner v2.0

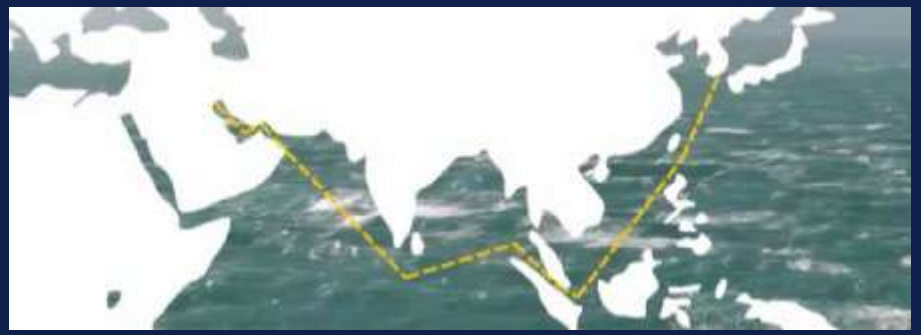
After 2 years of experience and use on 100 vessels, we now introduce Version 2.0:

- *Radically simplified input - and **auto generated, optimized** loading plans*
- ***One page dashboard** with easy overview of full cargo and stowage plan, and capacity ultization*
- *Increase cargo intake even more:*
  - *Reduced **corrosion diminution** for vessels with documented conditions*

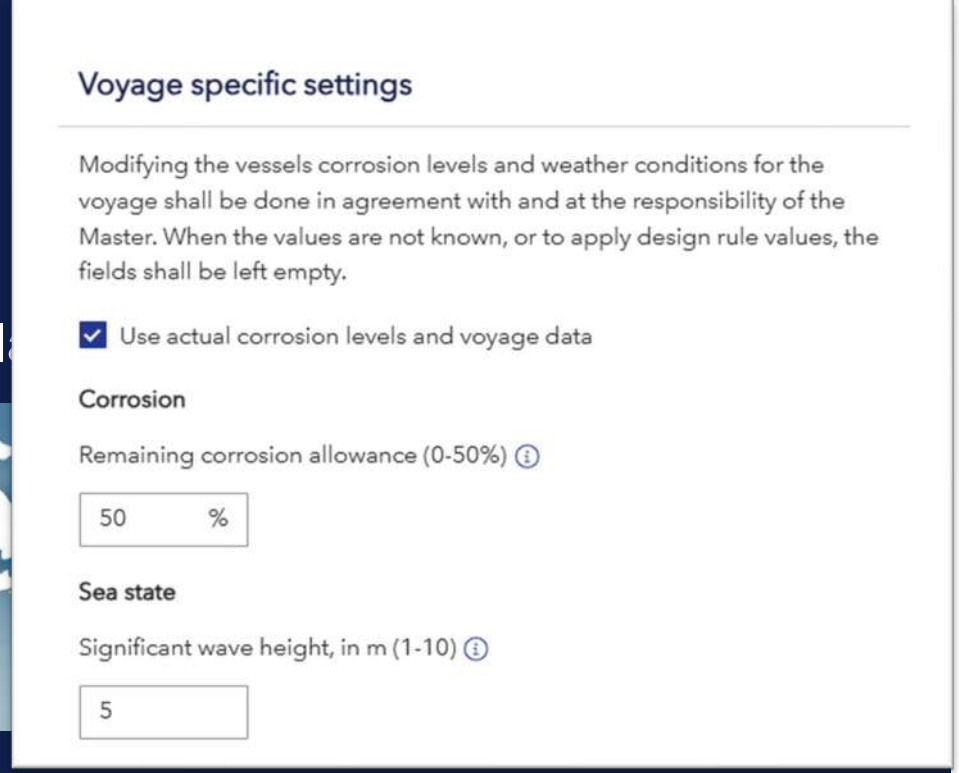
North Atl



East Asia Route



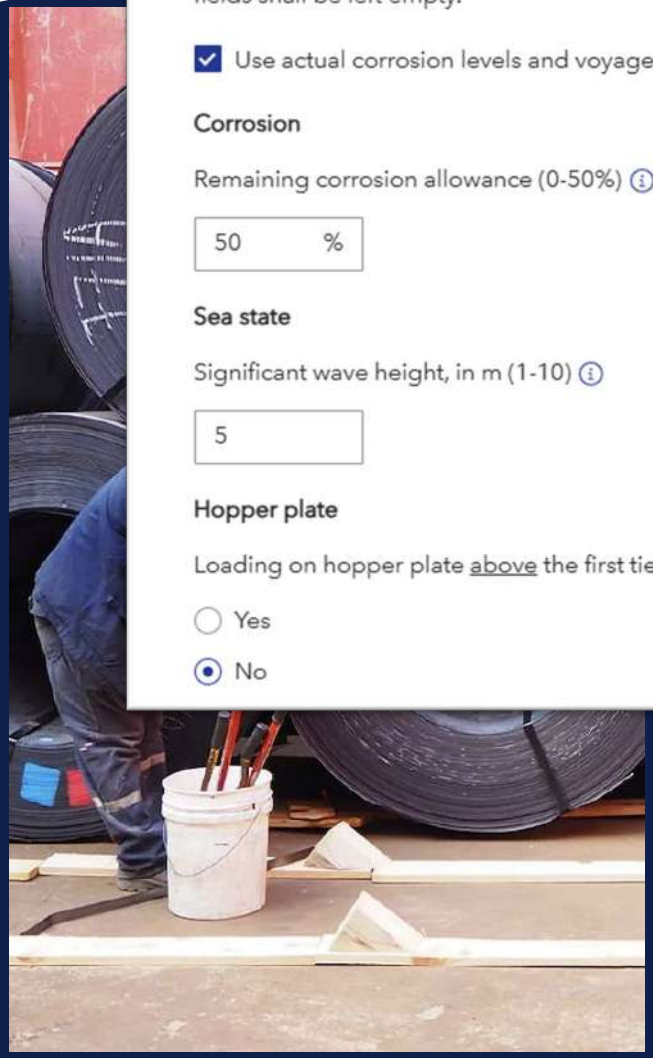
Calmer seas = less motions and lower accelerations



Steel Load Planner v2.0

After 2 years of experience and use on 100 vessels, we now introduce Version 2.0:

- *Radically simplified input - and **auto generated, optimized** loading plans*
- ***One page dashboard** with easy overview of full cargo and stowage plan, and capacity ultization*
- *Increase cargo intake even more:*
  - *Reduced **corrosion diminution** for vessels with documented conditions*
  - *Reduced dynamic accelerations for **short voyages** in **mild seas***



Voyage specific settings

Modifying the vessels corrosion levels and weather conditions for the voyage shall be done in agreement with and at the responsibility of the Master. When the values are not known, or to apply design rule values, the fields shall be left empty.

Use actual corrosion levels and voyage data

Corrosion

Remaining corrosion allowance (0-50%)

50 %

Sea state

Significant wave height, in m (1-10)

5

Hopper plate

Loading on hopper plate above the first tier

Yes

No

Steel Load Planner v2.0

After 2 years of experience and use on 100 vessels, we now introduce Version 2.0:

- *Radically simplified input - and **auto generated, optimized** loading plans*
- ***One page dashboard** with easy overview of full cargo and stowage plan, and capacity ultization*
- *Increase cargo intake even more:*
  - *Reduced **corrosion diminution** for vessels with documented conditions*
  - *Reduced dynamic accelerations for **short voyages** in **mild seas***
  - *Optimized number of **dunnages***
  - *Utilize full capacity of **hopper tank***



Morten Løvstad - VP, Global Business Director – Bulk Carriers

Morten.lovstad@dnv.com

+47 97563009

www.dnv.com

Contact card (vCard):

WeChat: