COMITE MARITIME INTERNATIONAL

THE GOTHENBURG DECARBONISATION DISCUSSION PAPERS

GREEN VESSELS DISCUSSION PAPER

Comité Maritime International aisbl/ivzw

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NOTE FROM THE CHAIR OF THE INTERNATIONAL WORKING GROUP ON MARITIME DECARBONISATION

When the Comité Maritime International was founded in 1897, the transition from wind to steam was not yet complete. We are now on the cusp of a third energy transition, and decarbonisation is one of the most significant challenges of our era.

The maritime industry has increasingly become aware of the role it's called upon to play, mostly as a result of regulatory initiatives of the International Maritime Organisation and the European Union.

Overwhelmingly, attention is focused on the technical aspects of alternative fuels and energy efficiency, and on the policy ramifications, especially as those inform the regulatory environment.

This International Working Group was set up a year ago on a simple premise: maritime law has been largely absent from the decarbonisation debate, despite its unquestionable importance as a foundation of the entire edifice of maritime trade. And central in any discussion regarding maritime law is the CMI. It has been an honour and a privilege to chair this IWG, which brought together colleagues from several maritime jurisdictions.

The work of the IWG was presented at the CMI Colloquium in Gothenburg in May 2024 and is summarised in three Discussion Papers ("*The Gothenburg Decarbonisation Discussion Papers*"), which cover three separate, but related, areas: "*Green Fuels*" (on issues of civil liability for non-hydrocarbon fuels), "*Green Contracts*" (an outline of some contractual adaptations that decarbonisation may require) and "*Green Vessels*" (introducing definitions as to "readiness" of ships to consume new fuels).

This Note accompanies the Gothenburg Decarbonisation Discussion Paper on "*Green Vessels*". Reconciling the long life span of cargo ships with the uncertainty around future energy sources not only gives rise to technical dilemmas, but also creates contractual uncertainties. Industry participants discuss ships that may be "ammonia-ready" or "methanol-ready", but both the technical meaning and the legal content of

such descriptions are debatable. This Discussion Paper represents the work of the IWG, in collaboration with the Lloyd's Register Maritime Decarbonisation Hub, to produce a set of proposed definitions for the broad states of readiness, accompanied by technical notes and an outline of legal issues in selected jurisdictions. Of course, IWG's intention is not to go to the depth of notations or other technical standards or to interfere with the work of Classification societies. Similarly, IWG's intention is not to create templates of contracts and clauses. These will be matters for organisations such as the IMO, IACS and BIMCO, the work of whom the CMI will of course support. The IWG's intention is to contribute to the use of consistent terminology and definitions in relation to "Readiness" and to assist the legal community and those negotiating and drafting contracts by providing the clarity of a framework. It should also be emphasised that this will not be set in stone, and will evolve alongside the technological and regulatory landscapes.

The Gothenburg Decarbonisation Discussion Papers represent the first phase of IWG's work. The second phase will include more detailed analysis, involving – as and where appropriate – associations and organisations that can work with the CMI to address the issues identified.

I am grateful to the members of the IWG for their time and efforts, and to the members of the Steering Committee (Jolien Kruit, Neil Henderson and Charles Debattista) for their support and dedication.

London, July 2024

Haris Zografakis
Partner, Stephenson Harwood LLP
Chair
CMI International Working Group on Maritime Decarbonisation

COMITE MARITIME INTERNATIONAL

INTERNATIONAL WORKING GROUP
ON MARITIME DECARBONISATION

THE GOTHENBURG DECARBONISATION DISCUSSION PAPERS

ZERO-READY FRAMEWORK

CONTRACTUAL & TECHNICAL CONSIDERATIONS

GREEN VESSELS WORKSTREAM

DISCUSSION PAPER[1]

Introduction

1. Zero-carbon fuels, especially those of a provenance other than from conventional hydrocarbons, require adaptations to vessels' machinery and equipment. Over the last few years, an increasing number of ships are being designed, ordered and constructed as "ready" for using new fuels.

2. There are varied and potentially incompatible understandings of what such "Readiness" in terms of zero-carbon fuels may entail, and this is an area that needs to be addressed both from a technical, as well as a contractual perspective. Moreover, the content and substance of such Readiness will continue to evolve, as new technologies emerge and mature, and the regulatory framework develops.

3. Neither the IMO, nor any other supranational legislative body, so far has set standards. In an effort to bring a degree of clarity and assist the industry in reaching a common understanding as to what is meant by, and the various levels of, zero-carbon fuel readiness, CMI's International Working Group on Maritime Decarbonisation ("IWG") has worked with the Lloyd's Register Maritime Decarbonisation Hub ("MDH") in introducing a coherent approach to zero-readiness. This Discussion Paper outlines both the technical, as well as the contractual issues. Ultimately, common standards will need to be developed, and it is hoped that this Discussion Paper will assist.

4. The approach adopted was twofold:

   (a) The MDH defined the technical issues and relevant technical terms to describe the attributes necessary for a vessel to use a low or zero carbon fuel. The essence of that is summarised in the Zero Readiness Level Grid ("ZRLG"), with further explanations in MDH's Accompanying Notes. By way of illustration, a vessel is described as having Zero Readiness Level 5 (ZRL5), if the key components (main engine, fuel supply and containment systems etc.) only have Class Approval in Principle. By contrast, a vessel

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[1] The authors are the following members of the Comité Maritime International's International Working Group on Maritime Decarbonisation: Mark Broekhuisen (Van Traa Advocaten, The Netherlands), Niko Oertel (Damen Naval, The Netherlands and Germany), Chul-Won Lee (Kim & Chang, Korea), Andrew Rigden Green (Stephenson Harwood LLP, England and Hong Kong), Shohei Tezuka (Higashimachi LPC, Japan), Henry Zhu (Wei Tu, China), with comments and feedback from the Chair, Haris Zografakis (Partner, Stephenson Harwood LLP, London).

is described as ZRL2 if such systems are installed, and ZRL1 if commissioning trials have successfully been completed.

(b) The second step involved legal and contractual input from the perspective of major maritime jurisdictions.

5. The ZRLG and MDH's Accompanying Notes appear as Annexes One and Two to this Discussion Paper, and the two documents are cross-referred, where necessary.

6. As shipping is a global business, this Discussion Paper is a synthesis of contributions from various jurisdictions with heavy influence on shipbuilding, ship sale & purchase and charterparties (i.e., England, China, Germany, Japan, South Korea, Hong Kong, the Netherlands), which have been collected and distilled. Naturally, the intention is not to provide legal advice, but to outline the issues we have identified. A more detailed exposition of national laws appears in Annex Three[2].

7. Of course, IWG's intention is not to go to the depth of notations or other technical standards or to interfere with the work of Classification societies. Similarly, IWG's intention is not to create templates of contracts and clauses. These will be matters for organisations such as the IMO, IACS and BIMCO, whose work the CMI will of course support. The IWG's intention is to contribute to the use of consistent terminology and definitions in relation to "Readiness", and to assist the legal community and those negotiating and drafting contracts by providing the clarity of a framework. It should also be emphasised that this will not be set in stone, and will evolve alongside the technological and regulatory landscapes. .

The contractual context

8. The contractual context for addressing Readiness is primarily within shipbuilding contracts ("SBC"), where most of the activity has focused on until now. However, Readiness will also become increasingly relevant in ship sale & purchase agreements/memoranda of agreement ("MOA") and Time Charterparties ("TC"). Moreover, financial arrangements that are linked to the construction and operation of vessels (loan agreements, leasing contracts, etc.), will equally require guidance as to the types of Readiness. Similar considerations arise for insurance contracts. Even beyond these types of transactions, defining Readiness will be relevant to the entire supply chain of services and materials, for example with original equipment manufacturers.

9. SBCs and MOAs are both contracts of sale for goods by description in common law jurisdictions respectively – SBCs a contract for work in some civil law jurisdictions. The key difference between an SBC and an MOA is that under an MOA the ship is already built and may be available for inspection. Thus, many of the issues highlighted below may be of less relevance to an MOA if the purchaser has had the opportunity to inspect the ship.

10. TCs are generally considered to be contracts for hire and services. In a similar way to SBCs and MOAs, the quality of the ship hired is set out in the description of the ship. The failure of the ship to meet those standards can have significant consequences on the charter.

Outline of the contractual issues in relation to Readiness

Incorporation of Zero Readiness Levels (ZRL)

11. Where the parties want to include zero-readiness capabilities of ships in the contract, they can use the ZRLG as a starting point for their negotiations. Regardless of whether the contract is subject to a common law jurisdiction or a civil law jurisdiction, one of the

[2] Additional input on national law of CMI members for future revisions will of course be invited.

described ZRLG definitions can be incorporated pursuant to the conditions set by the applicable law. The choice of the particular box of the ZRLG must always be clear and unambiguous and include the title and applicable version (as it is anticipated that the ZRLG will be updated over time). Often a mere cross-reference will be sufficient to include them. Parties are strongly encouraged, however, to consider not only the ZRLG, but also the Accompanying Notes in detail and set out relevant definitions and consequences of breach in the contract. Against this background, parties may consider attaching the applicable ZRLG as an annex to the agreement or include wording from the ZRLG and its Accompanying Notes directly in the contract for reasons of clarity and unambiguity and to prevent potential incorporation problems under the applicable law.

12. Civil law jurisdictions usually provide for a detailed regime to handle the (interpretation of) agreements and dealing with non-conformities. But just like common law jurisdictions, they also usually grant parties extensive freedom to deviate from, specify, and modify this regime. In the shipping industry for each SBCs, MOAs and TCs certain standard form contracts are widely used in both common law and civil law jurisdictions as the base contract in the market, which are then modified for the specific project and jurisdiction. For SBCs the Shipowners of Japan, this would be for example the CSTC or CMAC (SBC) forms; for MOAs, the Norwegian Saleform or NIPPONSALE and for TCs NYPE (most commonly the 1946 version, but also the 1993 and 2015 versions).

13. In this context, it is noteworthy that in South Korea, for example, several shipbuilding projects under a Green Ships policy have been initiated by governmental authorities, among others for survey, patrol and fishery guidance ships with small and midsized South Korean shipyards. These projects would not be contracted under the aforementioned widely used contract forms but under public procurement contracts with the Green Ships policy implemented in them.

14. Contract clauses regarding the ZRLG should be carefully drafted and, in all parties' (shipbuilder-buyer-financier, seller-purchaser, owner-charterer) interest, be clearly addressed during the contract negotiations. In the case of more substantial contracts that have been extensively negotiated, parties may consider documenting and retaining the various intermediate proposals and keep minutes of what the parties discussed (although one should be aware of the fact that in some jurisdictions these may not be legally relevant).

15. When drafting, parties should bear in mind that ambiguities in drafting of a limitation or exclusion will often be construed against the person seeking to rely on it. The definitions in the ZRLG and any references to it should clearly and accurately reflect the intention and interest of the contractual parties so as to minimise ambiguity and room for disputes for interpretation of the contract.

Description of the ship, fitness for purpose

16. Close attention needs to be paid to the description of the ship.

17. The UN Convention on the International Sale of Goods (CISG) does not apply to ships. Reference will need to be made to the applicable law in relation to any compulsory regime, implied terms or requirements. Generally, for SBCs and MOAs, the parties should ensure that (i) the goods will correspond to their description and (ii) the goods will be of satisfactory quality. Especially in SBCs, the zero-readiness level definition designated by the parties must be aligned with the ship's specifications. Parties must be particularly careful to include wording on each component/provision/design marked "Y" in the ZRLG for the designated zero-readiness level definition. Such wording should address the topics raised in the respective subsections of the Accompanying Notes. These subsections name the relevant technical topics the parties should consider in the (design) negotiations and drafting process.

18. In respect of TCs, in addition to the contractual requirement that the vessel must correspond to its description, there may be an implied term that the vessel will be seaworthy. There

are frequently modifications to this by the incorporation of the Hague/Hague-Visby Rules into the TC. The question of whether there is an obligation of "Greenworthiness" has, to the authors' knowledge, not yet been explored by the courts. However, if the vessel is said to be zero-carbon fuel ready, and is not, there would be a breach of contract. It is paramount to ensure that the vessel corresponds to the definition as described in the relevant zero-readiness level. The parties are advised to include wording on the components/provisions on board of the ship and respectively its design which lead to the agreed ZRLG definition.

19. Especially in civil law jurisdictions such as Germany and the Netherlands, the description of the vessel with a certain zero-readiness level definition may be interpreted as an "agreed quality" of the vessel which shall be delivered. The agreed quality can be the basis for potential non-conformity claims in connection with e.g., acceptance, defaults, damages, termination of contract and warranty. Parties should therefore pay attention to wording on the intended use of the vessel by the buyer, purchaser or charterer: Wording on the intended flag state, class definition or similar may indicate, depending on the grade of detail, a certain responsibility of the builder, seller or owner for the vessel's fitness for such purpose under the concept of "agreed quality", possibly even for future changes in regulation.

Warranties

20. SBCs, MOAs and TCs have slightly different approaches to warranties given by reason of the nature of the subject matter of the contracts.

21. With MOAs and TCs there is an existing ship. Therefore, the warranties given by the seller or owner, as the case may be, can be verified against an existing ship. The breach of such warranties may give rise to claims in damages. These damages would have to be shown to be caused by the breach. If the breach is such that it goes to the "heart" of the contract, it may entitle the innocent party to terminate the contract and claim damages for having lost that contract.

22. In an SBC, the situation is different as the warranties given cannot be verified until sea trials, or in some cases, a considerable time after delivery. There are accordingly several things to consider when contracting for the construction of a ZRLG vessel:

    a. Whether the failure of the builder to achieve the relevant ZRLG definition will be something that gives rise to damages alone, or whether it would give the buyer the right to walk away from the contract.

    b. Whether a failure to meet the ZRLG definition falls with the remedial regime of the SBC.

    c. Whether a liquidated damages regime may be appropriate for the failure to meet the ZRLG definition set out in the specifications.

    d. Whether the ZRLG vessel is capable of conversion to actually using zero-carbon fuel, when in the lifetime of the vessel is that contemplated and whether the warranty of the builder as to the convertibility or "readiness" decays over time (this may only become discoverable at the time of the proposed conversion).

    e. Whether warranties over third party supplied materials (valves, engines, OEM) assigned on delivery, expire.

23. In terms of remedial warranty, parties are encouraged to consider applicable warranty periods. Statutory warranty periods for remedial work may vary between different jurisdictions and may affect the contractual agreement. It is inherent to some of the ZRLG zero-readiness equipment on board to become operational sometimes only years after delivery. The question should be asked when the warranty period for such equipment shall commence. In this respect, under Japanese law, for example, a warranty claim for latent defects is subject to a one-year time bar, but this period is generally counted from when

such defect is known to the buyer. Regarding zero-readiness levels, however, an argument may be that any defect in relation to the equipment which will be used for complying with regulations which will come into force in some future should not be subject to the one-year time bar from delivery on the grounds that any such equipment will not be used at all right after her delivery and the buyer has no chance to be aware of any such defect within the agreed period. The court or tribunal may manipulate the time bar clause to read that, to the extent any such equipment is concerned, the one-year time bar may apply as from when the equipment has begun (or should have begun) to be used, but the prospect of such argument would highly depend upon the specific facts and agreed terms of the contract.

24. By contrast, under English law, the time-bar is either six years from the time when the cause of action accrued, or (if later) three years from the time when the defect became known, or ought to have become known.

25. MOAs often provide for a delivery "as is" regarding its condition and thus as the basis for potential warranty claims.

26. A further consideration in TCs will be whether during the lifetime of the TC either of the parties can require the vessel to be converted to zero-carbon fuel. Whether the owner can take the vessel out of service during the life of the TC, or whether the charterer can demand the vessel be converted. The other consideration will be who will pay for the conversion, and who will bear the risk of delay, or dysfunction.

Regulations

27. Given the rapidly changing regulatory environment, it is not inconceivable that the IMO, flag states or littoral states will implement legislation that requires action to be taken, whether that is that ships built after a certain time must meet certain levels of zero-readiness, or whether certain fuel types are mandated, or others banned, or more stringently regulated. Parties are strongly encouraged to consider how these changes may affect the construction costs, warranties and trading patterns and how the liabilities should be apportioned in the contractual relationship.

28. Under general principles, for example, various jurisdictions will not impose laws retroactively. However, consideration of the ability to in fact convert the ships to zero-carbon fuel, may be necessary in the event that nations pass laws that restrict the trading of hydrocarbon powered ships in their waters, or that impose strict limits on greenhouse gas output (even for onshore trading companies) that make hydrocarbon powered ships commercially unattractive. Particular consideration should be given to the ever-diminishing permitted outputs of greenhouse gas by Emissions Trading Systems and regulations such as FuelEU Maritime.

29. In the greater context of zero-readiness of ships it is worth noting that the China Classification Society (CCS) released their Rules for Green-Eco Ships 2022 on 30 December 2022, which took effect on 1 January 2023. The CCS Rules provide a very sophisticated and detailed system of definitions and rules for green-Eco ships, which covers detailed technical specifications and requirements to grant CCS definitions on green-Eco ships. The green-Eco ships mentioned in the CCS Rules already include low carbon and zero carbon fuels, e.g., LNG, ammonia, methanal, fuel cell, hydrogen fuel cell and biofuels, etc.

30. On 26 December 2023, five ministries of the Chinese central government jointly published the Action Plan for Green Development of Shipbuilding Industry (2024-2030), which provides high-level guidelines and targets of green-Eco shipbuilding industry.

Conclusion and next steps

31. While the ultimate destination of zero-carbon shipping has been set by the IMO, as well as individual counties, the path is uncertain, and many obstacles stand in the way. Alongside

the painstaking technical work required, a multitude of contractual arrangements will need to be reconsidered and adapted. The CMI IWG on Maritime Decarbonisation is hopeful that this Discussion Paper and the Zero Readiness Levels Grid will assist in the delineation of issues.

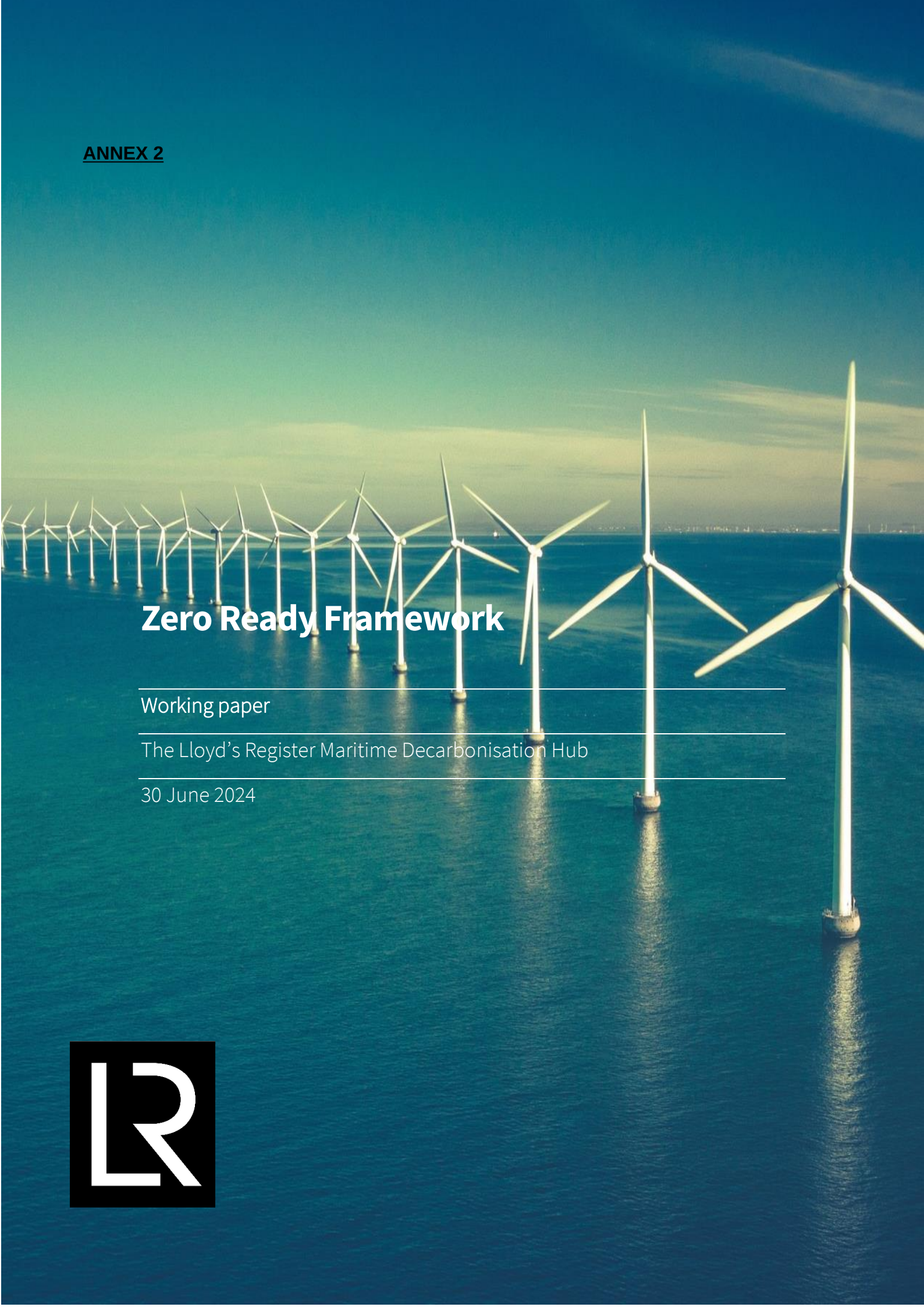
July 2024
Comité Maritime International
International Working Group on Maritime Decarbonisation –
Green Vessels Workstream

ANNEX 1

ZERO READINESS LEVELS GRID

Designated fuel:	**(Insert fuel here)**					
Component (as defined above)	**Criteria**	ZRL 1	ZRL 2	ZRL 3	ZRL 4	ZRL 5
Entire vessel	Commissioning trials successfully completed.	Y				
Main engine(s)	Engine installed onboard	Y	Y			
	Engine designed & tested for designated fuel(s).	Y	Y	Y		
	[2]AiP obtained	Y	Y	Y	Y	Y
Auxiliary engine(s)	Engine(s) installed onboard	Y	Y	Y		
	Engine designed & tested for designated fuel(s).	Y	Y	Y		
	AiP obtained	Y	Y	Y	Y	Y
FSS	Fuel supply components Installed	Y	Y			
	Provisions made for FSS components	Y	Y	Y		
	[3] Concept/design approved & tested	Y	Y	Y	Y	
	AiP obtained	Y	Y	Y	Y	Y
Fuel containment	Fuel storage systems installed	Y	Y			
	Space provided for fuel storage systems	Y	Y	Y		
	[3]Concept/design approved & tested.	Y	Y	Y	Y	
	AiP obtained	Y	Y	Y	Y	Y

ANNEX 2



Zero Ready Framework

Working paper

The Lloyd's Register Maritime Decarbonisation Hub

30 June 2024

Contents

1. Introduction

While Classification Societies have for many years offered notations, descriptive notes or recognitions of the 'ready' status of a vessel to use a range of alternative fuels, there is limited harmonization and uptake, together with limited recognition or understanding of the real status of the 'ready' capability in the wider marine community.

This challenge has been recognised by the Comité Maritime International (CMI) which has established an International Working Group (IWG) on decarbonisation. This working paper has been prepared for the purposes of, and in collaboration with the CMI IWG on Decarbonisation. For more information see the CMI discussion paper[1].

The paper defines generic language and terms that can be used by the shipping industry to describe alternative fuel readiness, i.e. the ability to clearly identify and recognise that a vessel can use a low or zero carbon fuel once operation using this fuel becomes feasible for the operational profile of the vessel. These definitions will provide the clarity over zero-carbon fuel readiness needed to enable a successful energy transition, by

- Providing a common language for use by shipping in analysis of the status of shipping fleets and in contracts related to specific vessels.
- Providing clarity to investors over the status of assets being invested in.
- Supporting charterers, insurers, prospective owners and shipyards with decision making on the path to decarbonisation.
- Enabling the industry to communicate its decarbonisation progress to other industry sectors and to the general public.
- Providing clear criteria against which to evaluate claims made about the alternative fuel readiness of vessels.

As such, this paper provides a common framework within which to structure existing approval processes. Nothing here is proposed as an alternative to current class societies' rules, readiness notations or descriptive notes. Rather, we suggest that the work of class

[1] Zero Ready Framework, Contractual and Technical Considerations, Discussion Paper, Comité Maritime International (CMI) International Working Group (IWG) on decarbonisation.

societies can be used to provide evidence of the achievement of these proposed readiness levels, ensuring consistency all the way from business decision making through to technical approval.

We define readiness level by major components required onboard the vessel, for use with a recognised alternative fuel. The recognised alternative fuel may be the only fuel used by the vessel or may be one of the fuels used, for example in a vessel powered by dual fuel engine(s).

2. Recognised alternative fuel

The term 'recognised alternative fuel', in the ambit of this framework, refers to a fuel that serves as a substitute for fossil fuels (currently used in shipping) and potentially contributes to shipping's decarbonisation. This document is intended to support the introduction of alternative fuels with zero or near-zero Greenhouse Gas (GHG) emissions. Although certain low-carbon fossil fuels, such as natural gas, can assist in decarbonisation, these could only act as short or medium-term solutions. Moreover, the technologies to use LNG or LPG as fuel to power ships are well established and not new to the maritime industry. Hence, there is no strong case to include these fuels in the scope of this framework.

To clearly layout the objective of this framework, only new and emerging alternative fuels in the maritime landscape are considered. Fuels that can meet these criteria, with a suitable supply chain based on renewable energy, include:

- Ammonia
- Hydrogen
- Methanol

Descriptions of these fuels and an explanation of production processes and supply chains to achieve zero or near zero GHG emissions can be found in Zero Carbon Fuel Monitor:

https://www.lr.org/en/expertise/maritime-energy-transition/maritime-decarbonisation-hub/zcfm/

The United States Department of Energy has further recognised the above fuels as alternative fuels through their Alternative Fuels Data Center, mentioned in it's website:

Alternative Fuels Data Center: Alternative Fuels and Advanced Vehicles (energy.gov)

This document describes vessel equipment and functionality in relation to these recognised alternative fuels, but not how the vessel is operated. A separate operational readiness framework will be required for assessing the readiness of a ship operator to deploy the vessel.

It is appreciated that the fuel development is a constantly evolving domain and hence, this framework is not limited to the above-mentioned alternative fuels. As technology and processes develop, a fuel that is deemed fit to achieve the decarbonisation goal could be included in the scope of this framework.

3. Definition of fuel capability

3.1 Alternative fuel capable vessel

A vessel that is proven to be capable of bunkering and operating using the designated alternative fuel for all onboard energy usage in all operating modes for which the vessel is designed, including operating at sea and whilst in port. All the components and systems defined separately (below) have been tested and proven to work together and the vessel has been tested, commissioned, and proven to be seaworthy with the designated alternative fuel.

4. Criteria used in readiness levels

4.1 Engine model designed & tested for designated fuel

The manufacturer has designed, built and tested a similar engine from the same series using the designated alternative fuel. The similar engine may already be operational and engine performance figures have been published (this provides a clear pathway to conversion).

(Applies to components: (i) Main engine, (ii) Auxiliary engines)

4.2 Alternative fuel components installed

The required major components for operation on the designated alternative fuel have been installed on the vessel, are complete and are ready for operation as part of a fully integrated system. The vessel continues to operate with this component in place without any adverse effects.

(Applies to components: (i) Fuel tanks/containment, (ii) Fuel Supply System (FSS))

4.3 Space provided for alternative fuel components

The space and structural support and/or reinforcement for the required components is present within the vessel enabling the component to be installed without structural changes to the vessel. The vessel continues to operate without any adverse effects.

(Applies to components: (i) Fuel tanks/containment, (ii) FSS)

4.4 Conceptual design for alternative fuel

A conceptual design for the component or system has been carried out and documented to current ship design standards. Evidence to show this criterion has been met could include an Approval in Principle (AiP) from a Classification Society for the component or system under question.

(Applies to components: (i) Fuel tanks/containment, (ii) FSS)

5. Component definitions

5.1 Entire Vessel

A ship fitted and integrated with all the systems and components required to safely use a designated alternative fuel, in all relevant operation modes.

5.2 Main engine(s)

The primary propulsion power unit(s) that provides power to the machinery that drives the ship through the water.

5.3 Auxiliary engine(s)

A secondary power unit that provides electrical power to the ship's various ancillary systems and equipment, beyond propulsion.

5.4 Fuel Supply System (FSS)

A suitable FSS (Fuel Supply System) for the designated alternative fuel has been installed. The system includes all the functions necessary to maintain operation of the fuel consumers using the designated fuels. This includes but is not limited to bunkering capability, pumps, heating, cooling, valves, pipework, monitoring, alarm and process control systems.

5.5 Fuel containment

The arrangement for the storage of the designated fuel including tank connection space, pressure relief venting systems, spill handling arrangements and, as applicable, cofferdams. It includes where fitted, a primary and secondary barrier, associated insulation and any intervening spaces, and adjacent structure if necessary for the support of these elements.

6. [(1)]Zero Readiness Levels (ZRL)

Designated fuel:	(Insert fuel here)					
Component (as defined above)	Criteria	ZRL 1	ZRL 2	ZRL 3	ZRL 4	ZRL 5
Entire vessel	Commissioning trials successfully completed.	Y				

Main engine(s)	Engine installed onboard	Y	Y			
	Engine designed & tested for designated fuel(s).	Y	Y	Y		
	[2]AiP obtained	Y	Y	Y	Y	Y
Auxiliary engine(s)	Engine(s) installed onboard	Y	Y	Y		
	Engine designed & tested for designated fuel(s).	Y	Y	Y		
	AiP obtained	Y	Y	Y	Y	Y
FSS	Fuel supply components Installed	Y	Y			
	Provisions made for FSS components	Y	Y	Y		
	[3] Concept/design approved & tested	Y	Y	Y	Y	
	AiP obtained	Y	Y	Y	Y	Y
Fuel containment	Fuel storage systems installed	Y	Y			
	Space provided for fuel storage systems	Y	Y	Y		
	[3]Concept/design approved & tested.	Y	Y	Y	Y	
	AiP obtained	Y	Y	Y	Y	Y

1. This table is aligned to new constructions alone and not for retrofits at this moment.
2. AiP: Approval in Principle of the concept/design, as provided by a Classification Society. It is assumed that an AiP indicates the demonstration of 'capable of conversion to operate on alternative fuels' requirement.
3. The existing Class mechanisms allow for design appraisal and approval through issuing a Machinery General Design Appraisal certificate. To induce a higher level of confidence in the design, it is proposed to conduct prototype testing and subsequently submitting the test result reports to the Class Society for appraisal. This is a step further to Approval in Principle (AiP) and is deemed to be a minimum requirement for this readiness table.

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ANNEX 3

NOTES ON NATIONAL LAW IN RELATION TO THE ZERO READY FRAMEWORK

A. German/Dutch law

1. As a starting point, it should be noted that both German and Dutch law provide for a complete regime to handle the (interpretation of) agreements and dealing with non-conformities. Parties have great freedom to deviate from, specify, and modify this regime.

2. Contract clauses regarding the zero-readiness level (ZRL) of vessels should be carefully drafted and, in both parties' (shipbuilder-buyer, seller-purchaser, owner-charterer) interest, be clearly addressed during the contract negotiations. In the case of more substantial contracts that have been extensively negotiated, parties may consider documenting and retaining the various intermediate proposals and keeping minutes of what the parties discussed.

3. The implementation of a ZRL in a German or Dutch law contract can be considered as an "agreed quality" (DE: *vereinbarte Beschaffenheit*, NL: *garantie*) of the vessel which shall be delivered. The agreed quality can be the basis for potential non-conformity claims in connection with e.g., acceptance, defaults, damages, termination of contract and warranty. Parties should pay attention with regard to wording on the intended use of the vessel by the buyer, purchaser or charterer: Wording on the intended flag state, class notation or similar may indicate, depending on the grade of detail, a certain responsibility of the builder, seller or owner for the vessel's fitness for such purpose under the concept of "agreed quality", possibly even for changes in regulation.

4. When drafting shipbuilding or ship sale & purchase contract parties should be aware that legal warranty periods for the vessel including all equipment on board will generally start with successful delivery. This will also apply for equipment on board which serves a certain readiness level but may only be put into service a considerable time after delivery. Should the parties – especially buyer or purchaser – want to have a custom-made solution for such equipment, this must be addressed explicitly in the contract for example by extended warranty periods for such equipment.

5. Against this background, parties are advised to use the ZRL as a starting point for their negotiations. A ZRL can be included in the agreement with reference to the LR Zero Ready Framework. The reference must be clear and unambiguous and include the title and applicable version (if more than one will have been released) of the LR Zero Ready Framework. Parties may consider attaching the applicable LR Zero Ready Framework as an annex to the agreement.

6. German law makes an important distinction between guaranteed quality (*Garantie*, strict liability) and general quality to be delivered (*Gewährleistung*, fault-based liability). Parties should consider which liability regime the ZRL shall be subject to. Dutch law on the other hand does not make such a clear distinction. Dutch contract law is generally based on a fault-based liability system, but parties are usually free to agree on a different system.

7. Especially for shipbuilding contracts: The ZRL designated by the parties must be aligned with the vessel's specifications. Parties are strongly advised to include wording on each component/provision/design marked "Y" in the table under no. 6 of the LR ZRLG for the designated ZRL. Such wording should address the topics raised in the Accompanying Notes. These subsections name the relevant technical topics the parties should consider in the (design) negotiations and drafting process.

8. Especially for ship sale & purchase contracts: The Parties are advised to include wording on

the components/provisions on board of the vessel respectively its design which lead to the agreed ZRL specification.

B. English and Hong Kong law

The following comments apply to both English and Hong Kong law unless otherwise specified.

Overview

1. Shipbuilding Contracts ("SBC") and Memoranda of Agreement ("MOA") (contracts for the sale and purchase of ships) are both contracts of sale for goods by description. The key difference between a Shipbuilding Contract and an MOA is that under an MOA the ship is already built and may be available for inspection. Thus, many of the issues highlighted below may be of less relevance to an MOA if the purchaser has had the opportunity to inspect the vessel.

2. Time Charters ("TC") are considered to be contracts for hire and services. In a similar way to SBCs and MOAs, the quality of the vessel hired is set out in the description of the vessel. The failure of the vessel to meet those standards can have significant consequences on the charter.

3. In order to ensure common standards and understanding of levels of zero-carbon fuel readiness ("ZRL"), certain definitions have been developed by the MDH to bring clarity to a developing market. These drafting notes are to assist parties in considering adopting the MDH ZRLdefinitions in SBCs and MOAs.

Form of Contract

4. Party autonomy is given very high precedent and there is no prescribed form for SBCs, MOAs or Time Charters. However, there is a strong preference for the Shipowners of Japan ("SAJ") form as the basis for SBCs and the Norwegian Saleform and less frequently the Nipponsale form for MOAs. Invariably these are adapted and amended for each transaction. Under the usual rules of contractual interpretation, specifically negotiated terms are given precedence over standard terms, and the principle of *contra proferentem* governs – that is any ambiguity in drafting of a limitation or exclusion is construed against the person seeking to rely on it.

5. These principles also apply to TCs. Again, there is no required format for a TC, however, the NYPE 1946 remains the most widely used form. This form is significantly out of date for zero-carbon fuels and will require significant modification in the event that it is used for a vessel capable of using zero-carbon fuels.

6. As such, there is no conceptual problem in referring to ZRL as drafted, even if it is a document that has not been included in the suite of documents during negotiation. Provided the parties can access ZRL, those terms can be incorporated simply by cross referring to them. Parties are strongly encouraged to consider them in detail and include relevant definitions and consequences of failure in their contracts.

Description of the vessel

7. Close attention needs to be paid to the description of the ship. Although Hong Kong has recently enacted the Convention on the International Sale of Goods, this law does not apply to the sale and purchase of ships, therefore the Sale of Goods Ordinance (which is materially identical to the English Sale of Goods Act) will continue to apply. Generally, there are very few terms implied into SBCs or MOAs, which are: (i) the goods will correspond to their description and (ii) the goods will be of satisfactory quality.

8. In respect of TCs, in addition to the contractual requirement that the vessel must correspond to its description, there is an implied term that the vessel will be seaworthy. There are frequently modifications to this by the incorporation of the Hague/Hague-Visby Rules into the TC. The question of whether there is an obligation of "Greenworthiness" has not yet been explored. However, if the vessel is said to be zero-carbon fuel ready, and is not, there would be a breach of contract. It is paramount to ensure that the vessel corresponds to the definition as described in the relevant ZRL.

9. In SBCs and MOAs, the tension that parties need to be particularly aware of is the difference between the general description of the vessel in the preamble and the technical specification of the vessel. There is no regime at law that will say which takes precedence, and frequently it is the description of the ship such as: *"this is a contract for a ship ready to burn zero carbon fuel" v. a ZRL3 definition, which has some of the components for zero-carbon fuel installed, but not yet operational.*

10. Given party autonomy and the vast implications of vessels not meeting their description, parties are encouraged to consider carefully each particular definition and whether it is appropriate to their transaction. They are encouraged to define as precisely as possible the expectations of both parties to minimise conflicts.

11. English and Hong Kong law will not step in to make parties agree something they have not agreed to. Therefore, leaving issues to be decided at a later stage, such as the level of readiness to be agreed is strongly discouraged. If a future decision needs to be put in a contract, parties must put in place a mechanism for the decision to be made, otherwise no decision will be made at all as the courts will consider such a term unenforceable.

Warranties

12. SBCs, MOAs and TCs have slightly different approaches to warranties given by reason of the nature of the contracts.

13. With MOAs and TCs, there is an existing vessel and the warranties given by the seller or owner as the case may be can be verified against an existing vessel. The breach of such warranties may give rise to claims in damages. These damages would have to be shown to be caused by the breach. If the breach is such that it goes to the "heart" of the contract, it may entitle the innocent party to terminate the contract and claim damages for having lost that contract.

14. In an SBC there are several things to consider when contracting for the construction of a ZRL vessel:
    a. Whether the failure of the builder to achieve the relevant ZRL will be something that gives rise to damages alone, or whether it would give the buyer the right to walk away from the contract.
    b. Whether a liquidated damages regime may be appropriate for the failure to meet the ZRL set out in the specifications.
    c. Whether the ZRL vessel is capable of conversion to actually using zero-carbon fuel, when in the lifetime of the vessel is that contemplated, whether the warranty of the builder as to the convertibility or "readiness" decays over time.
    d. Whether warranties over third party supplied materials (valves, engines, OEM) assigned on delivery, expire.

15. A further consideration in TCs will be whether during the lifetime of the TC either of the parties can require the vessel to be converted to zero-carbon fuel. Whether the owner can take the vessel out of service during the life of the TC, or whether the charterer can demand the vessel be converted. The other consideration will be who will pay for the conversion, and who will bear the risk of delay, or dysfunction.

Regulations

16. Given the rapidly changing regulatory environment, it is not inconceivable that the IMO, flag states or littoral states will implement legislation that requires action to be taken, whether that is that vessels built after a certain time must meet certain levels of zero-readiness, or whether certain fuel types are banned, or more stringently regulated. Parties are strongly encouraged to consider how these changes may affect their construction costs, warranties and trading patterns and how the liabilities should be apportioned.

17. Under general principles, neither English nor Hong Kong law will impose laws retroactively. However, consideration of the ability to in fact convert the vessels to zero-carbon fuel, may be necessary in the event that nations pass laws that restrict the trading of hydrocarbon powered vessels in their waters, or that impose strict limits on GHG output (even for onshore trading companies) that make hydrocarbon powered vessels commercially unattractive. Particular considerations should be given to the ever-diminishing permitted outputs of GHG by Emissions Trading Systems and regulations such as FuelEU.

18. Parties to SBCs may consider, if future conversion is possible or necessary, whether options may be considered with the original builder.

19. Parties to TCs may consider how their trading patterns may be affected by the availability of zero-carbon fuels. Parties to TCs will have to carefully consider the changing Emissions Trading Systems globally and FuelEU in particular.

Other potential claims

20. In the changing world of zero-carbon, it is possible that claims may arise from other rights and obligations than the contracts. For example, claims may arise from third parties claiming that the zero-readiness claims are insufficient – essentially greenwashing claims. As countries impose stricter regulations on Scope 3 emissions reporting, consideration may need to be given to the construction process, to the lifetime of the vessel prior to its acquisition and to how the vessel is traded. All of these considerations will need to be factored in. Under both English and Hong Kong law, the principles of tort may allow third parties to make against vessels and their owners.

C. Japanese law

Overview of Japanese law

1. Japan is a civil law jurisdiction, the law of which stipulates a complete set of contractual terms for sale and construction of goods such as ships. However, Japanese law adopts the principle of freedom of contract. The terms in the law codes can therefore be deviated or modified unless such deviation or modification is against public policy in Japan or mandatory provisions of applicable codes.

Form of contracts, governing law and dispute resolution

2. It is understood that most shipyards in Japan use so-called SAJ form as the basis of their shipbuilding contract for commercial vessels. Japanese law and arbitration in Tokyo Maritime Arbitration Commission of The Japan Shipping Exchange Inc. ("TOMAC") are widely adopted as the governing law and dispute resolution.

3. For sale and purchase of ships, whilst SALEFORM is the most common standard form in the global market, NIPPONSALE is also widely used by Japanese shipowners as sellers, where Japanese law and TOMAC arbitration are often agreed as the shipbuilding contracts based on the SAJ form.
   Regarding charterparties, NYPE and other standard form for each type of vessel is

commonly used for ocean going vessels, where English law and London arbitration are often agreed to except some charterparties between Japanese owners and operators, where Japanese law and TOMAC arbitration are sometimes selected.

Definitions

4. Terms used in shipbuilding and S&P contracts are normally defined in various provisions in the contract, rather than being gathered in a set of definition clauses. The SAJ form and NIPPONSALE do not include reference to the Zero Readiness Level (ZRL) of vessel, so parties are free to negotiate and agree to adopt any definitions in their own contracts. The definitions should clearly and accurately reflect the intention and interest of the contractual parties so as to minimise ambiguity and room for disputes for interpretation of the contract.

5. As regards the set of definitions currently considered in LR, there should be no problems in adopting these in a contract governed by Japanese law unless such definition(s) is/are against public policy in Japan. That said, such issues/disputes are practically unlikely to arise in relation to public policy in Japan.

Warranty / Fitness for purpose

6. It is not currently common to have a warranty or fitness for purpose clause which specifically refers to ZRL in shipbuilding and S&P contracts.

7. In shipbuilding contracts, a standard warranty clause in the SAJ form is widely used as the basis instead, where the warranty of the builder expires within one year of the delivery.

8. In this respect, warranty claim for latent defects under Japanese contract law is subject to one-year time bar too, but this period is counted from when such defect is known to the buyer rather than the time of delivery as provided for in the SAJ form. Assuming the warranty under Japanese contract law applies, then a claim for breach of warranty concerning equipment related to ZRL shall be subject to a one-year time bar from when the shipowner is aware of any such defect.

9. Regarding ZRL, however, an argument may be that any defect in relation to the equipment which will be used for complying with regulations which will come into force in some future should not be subject to the one-year time bar from delivery on the grounds that any such equipment will not be used at all right after her delivery and the buyer has no chance to be aware of any such defect within the agreed period. The court or tribunal may manipulate the time bar clause to read that, to the extent any such equipment is concerned, one-year time bar may apply as from when the equipment has begun (or should have begun) to be used, but the prospect of such argument would highly depend upon the specific facts and agreed terms of the contract.

10. The SAJ form expressly excludes any other warranties which are not expressly provided for in the contract. General warranty for fitness for purpose would therefore be excluded in a shipbuilding contract based on the SAJ form unless the same is stipulated therein.

11. If the contract is interpreted that the builder warranted the vessel's fitness for purpose (i.e., she will comply with the relevant regulations which will become in force in the future), then unfitness which will appear in the future may be subject to claim. However, the interpretation will be made very carefully and all circumstances such as the industry standard, prospect of future regulation and the parties' act/omission as of the time of contract will be taken into account in determining breach of warranty.

12. As regards S&P contracts, a ship shall be delivered on an "as is" basis under the standard terms of SALEFORM and NIPPONSALE. Thus, no warranty issue should arise in respect of ZRL unless the parties specifically agree to a warranty term for ZRL.

Claim in tort and other grounds

13. A buyer of a ship may claim in tort in addition to or instead of a contractual claim if there is negligence on the part of the builder in the design, material or workmanship of the ship. Under Japanese law, a claim in tort is subject to the following time bar: the earlier of (i) three years from when the loss or damages and the injuring party are known to the innocent party or (ii) twenty years from the time of the tortious action/omission.

14. A buyer may also claim pursuant to Product Liability Act for defect which caused loss of or damages to human or property within the earlier of (i) three years from when such loss or damage and the injuring party are known to the innocent party or (ii) thirty years from delivery of the goods in question. However, this Act does not apply if the latent defect merely causes incompliance with relevant regulations but no loss of or damages to human or property arose.

D. Observations on practice in the PRC

Format

1. In addition to many ship building projects adopting common law contract terms and applying English / HK / Singapore law, many Chinese shipyards also use Ship Building Contract (SBC) terms basing on CSTC or CMAC forms or even other forms on project basis, applying Chinese law and through dispute resolution methods of arbitration before Chinese arbitration institutes such as CMAC, CIETAC or litigation before Chinese courts, particularly those projects between Chinese shipyards and Chinese owners.

2. Similar to SBC, there are many ship sale and purchase (S&P) forms used by Chinese sellers or buyers applying Chinese law with arbitration or court litigation in China as dispute resolution.

3. In the business of ship chartering, often English/HK/Singapore law and arbitration could be adopted by international business for Charter Parties (CP), however, for Chinese domestic trades in particular, Chinese law and Chinese arbitration/court litigation are very commonly used.

Framework/Structure of definitions

4. In all areas of contracts, there is no unified definition system, definitions are included in various provisions. Usually, parties will agree on definitions contract by contract, though they may refer to specific industrial or state standards, where definitions could be provided for.

5. It is worth noting that the China Classification Society (CCS) released their Rules for Green-Eco Ships 2022 on 30 December 2022, which took effect on 1 January 2023. The CCS Rules provide a very sophisticated and detailed system of definitions and rules for green-Eco ships, which covers detailed technical specifications and requirements to grant CCS definitions on green-Eco ships. And the green-Eco ships mentioned in the Rules already include low carbon and zero carbon fuels, e.g., LNG, ammonia, methanal, fuel cell, hydrogen fuel cell and biofuels, etc.

6. Then on 26 December 2023, five ministries of the Chinese central government jointly published the Action Plan for Green Development of Shipbuilding Industry (2024-2030), which provides high-level guidelines, targets of green-Eco shipbuilding industry.

7. Such CCS Rules and Action Plan will at some point need to be in line with the ZRL system or its definitions.

Warranty issues?

8. Normally for PRC parties, warranty issues mainly rely on contractually agreed specifications or industrial/state standards.

9. So far, it is not common to have a specific warranty clause for ZRL.

10. However, with CCS Rules and other possible state or industrial standards in place, it is possible that the Chinese parties will need to adopt the specifications and requirements as in the Rules and/or the standards so as to qualify the ship's green-Eco definitions or quality standards.

11. As for the time bar relating to possible latent defects, the basic rules under the Product Quality Law is that the claimant shall make such claims for personal or property damage within 2 years starting from the time that the damage is known or should have been known. On top of such 2-year limit, the maximum time period for filing claims is 10 years commencing from when the defected product was delivered to the consumer for the first time unless the expressly warranted safe use period has not yet expired. However, it might be questionable whether the rules under the Product Quality Law facing consumers are applicable to SBC as relating to industrial products all the time. If not, then the general time bar of 3 years under the Civil Code regulating including contract disputes should apply.

12. For that equipment installed for future use, it is advisable that the parties shall take into considerations as of how to manage the warranty issues at the contract negotiation stage.

Fitness for purpose issues? Or right to reject and refund?

13. Normally any warranties which are not included in the SBC or compulsory industrial / state standards are not binding or applicable.

14. With CCS Rules and other possible state or industrial standards in place, it is possible that the Chinese parties will need to adopt the specifications and requirements as in the Rules and/or the standards. In any case if the Rules and/or national/industrial standards will be of compulsory effect, then the same must be applied.

Upgradability and rework?

15. Upgradability would always be an issue per agreement between Builder and Buyer subject to adjustment of price, delivery schedule and other terms. Normally, upgradability would not necessarily just be limited to ZRL matters but could also be according to other possible change of rules and standards, industrially, commercially, or compulsorily.

16. The Action Plan is a high level guidance on Chinese shipbuilding industry, it might be recognized as a guideline for parties to negotiate their SBC, in which the shipbuilding works might be completed at later stage of the 5 year plan or even later, under such scenario and as the legislation and regulation are progressing very fast, the parties will need to take into considerations how to comply with such guidance as in the Action Plan as the rules/standards might be changed/upgraded as time goes by, and the parties will need to make advance arrangement for possible compulsory upgrades.

Adoption of these definitions under non-English/common law?

17. There should be no problems in adopting these in a contract governed by Chinese law unless such definition(s) is/are against public policy in China. That said, we consider such issues/disputes may practically arise as far as the contract is governed by Chinese law.

E. Observations on practice in Korea

What "base" SBC?

1. Even for Green Ships (eco-friendly vessels), when built by a large Korean shipbuilder, it is generally understood that the so-called Shipbuilders Association of Japan ("SAJ") form based shipbuilding contract ("SBC") are executed.

2. Most of the newbuilding projects for commercial vessels in Korea are SBCs based on the SAJ form, with exceptions for orders specified by buyers requiring in house forms, such as LNG carriers for the Qatar Energy/Qatar Gas's North Field Expansion Project or ice breaking LNGCs. These standard forms appear to be used for Green Ship SBCs, including those for dual-fuel propulsion vessels in most cases.

3. However, in Korea, following the Ministry of Oceans and Fisheries' recent policy on Green Ships, the Korean government has been actively replacing older government vessels (such as those operated by the Korea Coast Guard, the Ministry of Oceans and Fisheries, and local governments, including survey ships, patrol ships, fishery guidance ships, training ships, etc.) with Green Ships. Many new design/building projects have been actively initiated in recent years, primarily involving small and medium-sized Korean shipyards. Unlike commercial ship contracts, these public vessel contracts are not based on the SAJ form but follow the terms and conditions of public procurement contracts under the "THE ACT ON CONTRACTS TO WHICH THE STATE IS A PARTY."

Framework/Structure of definitions?

4. To date, we have not found any specific case where definition of the "Green Ships" is stipulated within the SBC signed by Korean shipbuilders.

5. It appears that the parties attempt to make reference of the equipment and systems related to eco-friendly fuel and systems in the Technical Specification of the SBC. Otherwise, the parties make reference to the compliance with the relevant rules such as International Maritime Organization's (IMO) eco-friendly regulations (such as the Energy Efficiency Design Index (EEDI) regulation). The notation of the classification society is also used.

6. In Korea, progress has been made in the context of the legislation compared to contractual terms and conditions. A statute has been enacted to define "Green Ships" in order to support the development and enhance the use of Green Ships and to introduce certification of the Green Ships and equipment.

    a. According to Article 2 of the Act on Promotion of Development and Distribution of Environment-Friendly Ships (abbreviated as the "Green Ships Act"), "Green Ships" refer to the following types of ships:

        (1) A ship designed using technology that reduces marine pollution or increases ship energy efficiency (measured in terms of energy used by a ship in connection with transportation expressed as a percentage of CO2 generation), complying with the standards set by Joint Ordinance of the Ministry of Trade, Industry and Energy and the Ministry of Oceans and Fisheries (hereinafter referred to as "Joint Ordinance");
        (2) A Ship using environmentally friendly energy sources prescribed by Joint Ordinance, such as liquefied natural gas, as their power source;
        (3) An electric propulsion ship that uses electric energy charged from an electricity source as its power source;
        (4) A hybrid ship using a power source by combining gasoline, diesel oil, liquefied petroleum gas, natural gas, or fuel prescribed by Joint Ordinance with electric energy (including electric energy charged from an electricity source);
        (5) A fuel cell propulsion ship powered by electric energy generated through the use of hydrogen, etc. as its power source;

Warranty issues / Fitness for purpose issues

7. For SBCs based on the SAJ form, requirements for the "Green Ships" will ultimately be addressed as issues of compliances with the rules & regulations and/or satisfaction of the Technical Specifications.

8. In case the requirements for "Green Ships" specified by the rules & regulations or Technical Specifications are not satisfied at the time of delivery, such non-compliance can become a ground for rejection at the time of delivery depending on the approval of the classification society and/or the seriousness of the non-compliance.

9. In cases where equipment or systems using eco-friendly fuel fail to operate after the delivery, the SAJ form-based SBCs will address the issue through warranty claims. From the buyer's perspective, a back-to-back warranty claim can be filed against the supplier of the said equipment or system.

10. After the delivery, a warranty issue may arise in case the delivered vessel fails to meet the required or expected level of Technical Specifications in relation to the assessment of carbon emissions or energy efficiency index or grade. We could not confirm any case where warranty claim was raised for the above reason. Presumably, this would be attributable to the very recent introduction of the EEXI and CII regulations.

    a. In theory, disputes over such warranty claims could be raised in the future.

    b. However, unlike other defects related to the breakdown of general equipment or lack of performance, it will be difficult for the buyers to support warranty claim based on the failure to meet the energy efficiency. This is because the above failure can be significantly influenced by post-delivery operation conditions, such as the quality of the fuel used, the vessel speed, the sailing conditions, etc. Thus, conducting a root cause analysis for such warranty claims shall be considerably more complex, making it difficult for the buyer to argue or prove the defect.

    c. Even if the claim pertains to a breach of fitness for purpose under English law, rather than a warranty issue, the technical and practical challenges previously mentioned still apply.

    d. Unlike speed warranty claims and/or fuel consumption warranty claims, it would not be easy to verify energy efficiency performance during commissioning. Therefore, performance guarantees/performance liquidated damages within SBCs may not be an appropriate tool in order to allocate the risk between the parties at the time of the delivery.

    e. For instance, verification of the boil-off gas (BOG) rate of LNG carrier's cargo containment system (CCS) can be confirmed at the time of the actual operation of the vessel after the delivery. This is because the performance of BOG rate heavily depends on actual operating conditions by each voyage.

    f. Moreover, while SAJ form-based SBCs include contractual termination provision in case performance liquidated damages surpass a specific threshold prior to the delivery, this may not apply in terms of the eco-friendly fuel capacity warranty as the measure of such capacity can be confirmed only after the delivery.

Upgradability / Rework Obligations

11. At this stage, the technically foreseeable upgradability requirement involves substitute of the ship's fuel by the eco-friendly energy source and/or installing additional carbon capture and storage (CCS) equipment.

12. When it comes to either changing the ship's fuel or installing CCS equipment, it is impractical to incorporate a reserve design at the time of the conclusion of SBC. Moreover, it is highly impractical for buyers to commission the construction of such ships with allowances for extra space, displacement, and capacity of commercial vessels.

    Converting Ship Fuel to Eco-friendly Alternatives

    a. It is widely recognized that converting a vessel's fuel to eco-friendly alternatives typically necessitates a retrofitting process, lasting over a year and incurring significant cost.
    b. Some shipowners are considering the retrofit (instead of replacing existing ships by newbuilding ships) of their operational fleet to use eco-friendly fuel, in collaboration with ship classification and shipyards.
    c. However, this approach is not deemed commercially or technically viable for all shipowners to consider and implement.

    Plan to install CCS equipment

    d. Given that the CCS technology is still in its early stages, it remains difficult to ascertain which CCS equipment/system will become commercially viable for ships.

13. Regarding the low sulphur regulation, existing ships were required to make changes such as switching to low sulphur fuel or installing desulphurization scrubbers, while new ships were built to meet the new regulations at the time of the conclusion of the SBC. Similarly, the IMO regulations on carbon emissions can be introduced in a phased, step by step manner, without retroactive application. Therefore, the regulatory framework may differ between the newbuilding vessels and those already employed in operation. As such, it would be highly challenging to enact a statute or even to agree among the parties to the SBC, in the case of newbuildings, that builders should be obliged to retroactively implement environmental regulations that were not introduced or foreseen at the time of construction, simply because they have been introduced after completion or delivery.

14. Consequently, it seems impractical to require that the builders incorporate eco-friendly regulations to be introduced ex post facto in the ships that have completed construction, unless such requirements were already reflected in the technical specifications or the rules & regulations which were effective at the time of construction. Even in case design changes should be made during construction due to the change of the law and regulation in this regard, this should be treated as change orders, with builder being compensated for the cost impacts and/or time impacts through additional payments and extension of the delivery dates.

15. If new or stricter eco-friendly regulations on carbon emissions after a ship's completion and delivery, retrofitting work would need to be carried out at the shipyard that built the ship or at another shipyard. This means that such post-delivery regulations fall outside the standard scope of builder obligations under the SBC.

Adoption of these definitions under non-English/common law

16. See the Definitions of the Green Ships Act introduced in Section 2 above.

17. NATIONAL LAW STATUTORY ISSUES - PUBLIC POLICY?

    a. Even if certain national laws and regulations become mandatory, a SAJ form-based SBC (subject to English law) cannot retroactively impose burden to meet such regulations on builders. Instead, if the parties agree, then these regulations should be incorporated into the specifications or the rules & regulations at the time the SBC is executed.
    b. Since the risk ultimately lies with the buyer/owner, it is necessary for the buyer/owner to sufficiently review and anticipate in advance the national law that

will apply to the ports where the newly built vessels will enter. Therefore, if there is a national law stricter than the IMO regulation standards, such stricter national standard should be referred to in the specifications of the SBC.