ICMASS 2019

Developments in Europe UK Code of Practice Short Sea and Inland Waterway Operations

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Chairman UK MASRWG
13 November 2019

Developments in Europe

- A growing realisation that the developments in the capabilities built around autonomous vehicles offer a real opportunity to make a difference.
- SEA-KIT - X Prize winners 2019

- ISO meetings have clarified terms and terminology
- IMO RSE work continues towards MSC 102 in May 2020
- Version 3 of the UK Code of Practice released
- Considerable progress at UNECE on Inland Waterways

IMO Regulatory Scoping Exercise

Instruments to be considered

COLREGs 1972
CSC 1972
LL 1966
LL PROT 1988
SAR 1979
SOLAS 1974
SOLAS AGR 1996
SOLAS PROT 1978
STCW 1978
STCW-F 1995
STP 1971
SPACE STP 1973
TONNAGE 1969
…and Codes.

MARPOL 73/78
FAL 1972
SUA 2005
SALVAGE 1989
OPRC 1990
CLC 1969
NUCLEAR 1971
HNS 1996
…

UK Policy

Department for Transport

maritime 2050
NAVIGATING THE FUTURE

business services directly contribute £2 billion gross value added (GVA) to the UK economy. When impacts on the wider economy are accounted for, including the rest of the maritime sector, this rises to nearly £5 billion. The City of London is a global leader in this area; the largest share of worldwide marine insurance premiums and shipbroking transactions occur in the UK, comprising 35% and 26% of the global market respectively.

In addition to trade in goods, the UK enjoys a globally significant maritime tourism and leisure industry. Total revenue from the UK's leisure, superyacht and small commercial marine industry was put at £3.12 billion in 2017 with export success counting for just over 30% of the sector's total revenue. Our cruise sector is an exciting and fast growing one with 1.96 million cruises sold in the UK in 2017, half of which started at a British port.

The UK has played a leading role, through the IMO, in securing agreement to the target of a 50% greenhouse gas (GHG) emission reduction from the sector by 2050. Investment in maritime infrastructure, aimed at promoting the uptake of carbon neutral fuels and the generation of renewable energy such as using biomass or rotor sails, highlight the UK's commitment to environmental goals and the leading role business can play in achieving these.

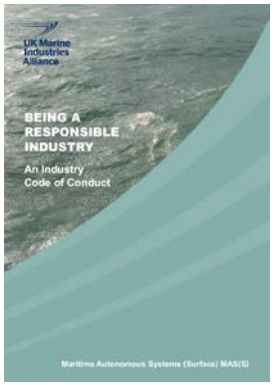
Macro issues such as the use of data and digitalisation will shape the future of the sector which is why technology is at the heart of this strategy. The UK has a long history of innovation and invention; the light bulb, the telephone, the World Wide Web, the television, and the jet engine are all British born creations. This rich history continues – several British companies are producing early-stage autonomous vessels, such as the SEA-KIT unmanned vessel. The UK maritime sector has a wide range of innovative and ambitious SMEs bringing new products to market that will improve performance and enable better business led decisions to be taken by the global maritime sector.

Fundamental to our success is our maritime people, their education and training with world-class universities and institutes providing top-level training for people within the maritime industry. The UK is a world leader in this regard. Moreover, it acts as an important source of thought leadership, setting the benchmark for the promotion of industry standards in safety, regulation, and seafarer welfare. The UK recognises that the statistic that just 4% of the 10,480 UK certified officers active at sea are female, a figure which is poorer still globally. The UK is actively working Maritime UK and specifically the Women in Maritime Task Force to address this imbalance. This should be a start on a much wider focus on determining the reasons why there is a lack of diversity and implementing policies to attract the best and most diverse talent to the sector both on shore and at sea.

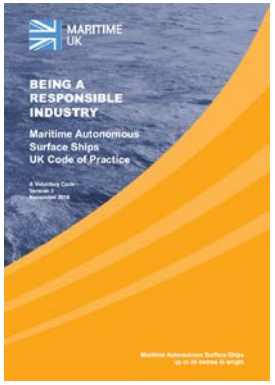
Photo courtesy of Hushcraft

https://www.gov.uk/government/publications/maritime-2050-navigating-the-future

UK Codes of Conduct & Practice



Code of Conduct
Published March 2016



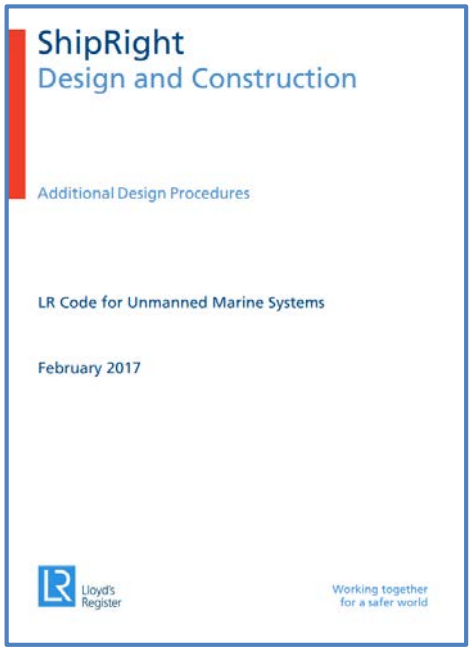
Code of Practice Version 2.0
Published 13 November 2018

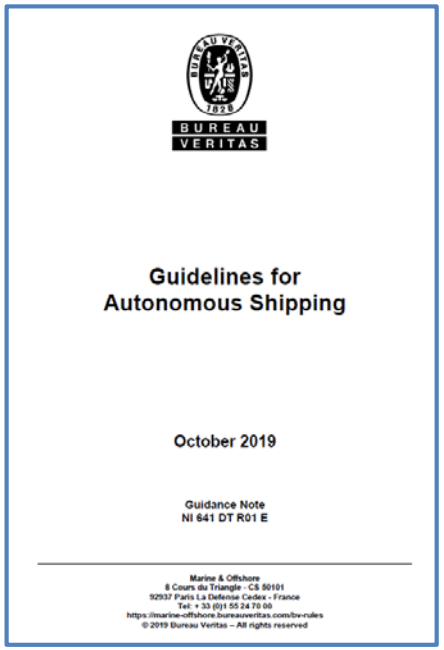
Version 3 published on 12 November 2019
This will combine the Codes of Conduct and Practice

https://www.maritimeuk.org/media-centre/publications/

Classification Societies

IACS International Association of Classification Societies





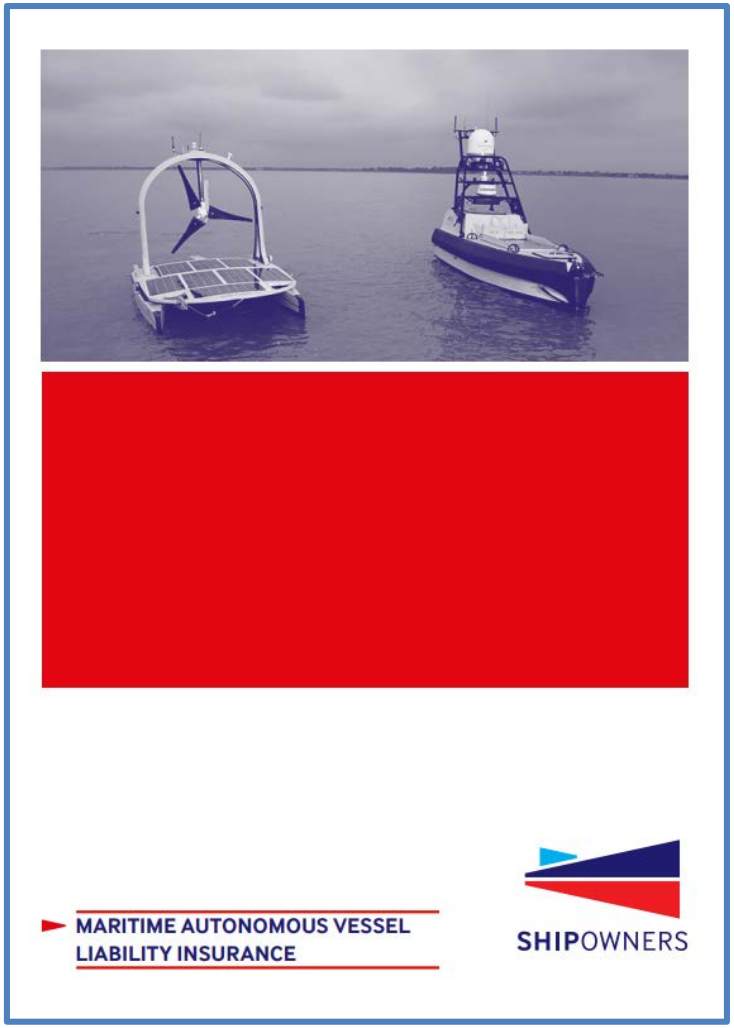
FOUNDED 1862 ABS

CHINA CLASSIFICATION SOCIETY

KR KOREAN REGISTER

Insurance

"Our specialist policy was developed to meet the liability insurance needs of owners and operators of autonomous and remotely operated vessels. Cover is provided on a plain language policy wording, underwritten on an 'all risks' basis, to provide a very comprehensive level of cover."

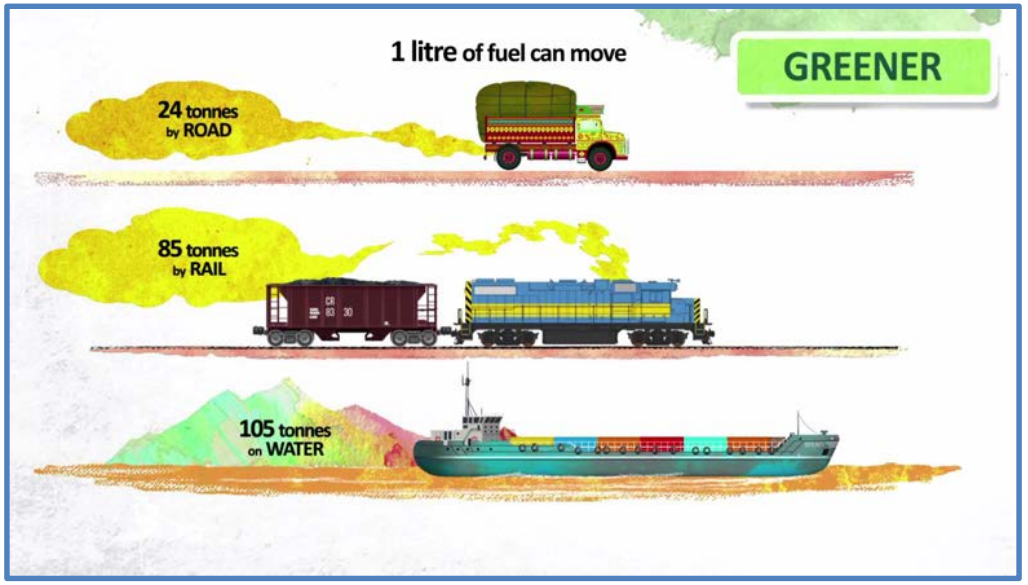


UNECE Meeting 7 Nov 19

8. Automation in inland navigation

- Following the decision of SC.3/WP.3 at its fifty-fifth session (ECE/TRANS/SC.3/WP.3/110, paras. 70–71), the Working Party may wish to consider and adopt a resolution to support the development of automation in inland navigation as resolution No. 95. SC.3 may also wish to approve a road map for international cooperation on the promotion and development of autonomous shipping (ECE/TRANS/SC.3/2019/12).
- SC.3 may wish to take note of the proposal on policy issues where a common approach is needed to facilitate automation in inland navigation (ECE/TRANS/SC.3/2019/13) and decide as appropriate.

Short Sea Crossings & Inland Waterways



ABSC

ZULU ASSOCIATES
MISSION AND STRATEGY (1)

- ZULU Associates (ZA) is a platform for innovation, development, integration and investment of the marine link in logistic chains.
- ZA is focussed on achieving solutions that progress towards Zero Emission and United Nations sustainability targets, with **Inland Autonomous Vessels** (IAV), **Marine Autonomous Surface Ships** (MASS) and Zero Emission propulsion.
- ZA works together, and has agreements with, various partners to address these aspects for Inland Waterway Transport and Short Sea Shipping.
- ZA is also involved as an active participant in dialogues with relevant authorities to adapt existing regulations for autonomous operation of vessels.

ZULU ASSOCIATES

ZULU ASSOCIATES
MISSION AND STRATEGY (2)

- The strategic view is that the technologies required to have MASS commercially operational in 2 to 3 years are available today.
- The development of MASS will make the operation of small vessels competitive versus large vessels on inland waterways, on coastal, and on cross channel routes.
- The advantage of relatively small vessels is that there is less need for power and therefore it becomes far easier and less costly to make these vessels evolve towards zero emission propulsion.
- They also need much less (harbour) infrastructure, making the use of marine transport far more flexible and applicable.

ZULU ASSOCIATES

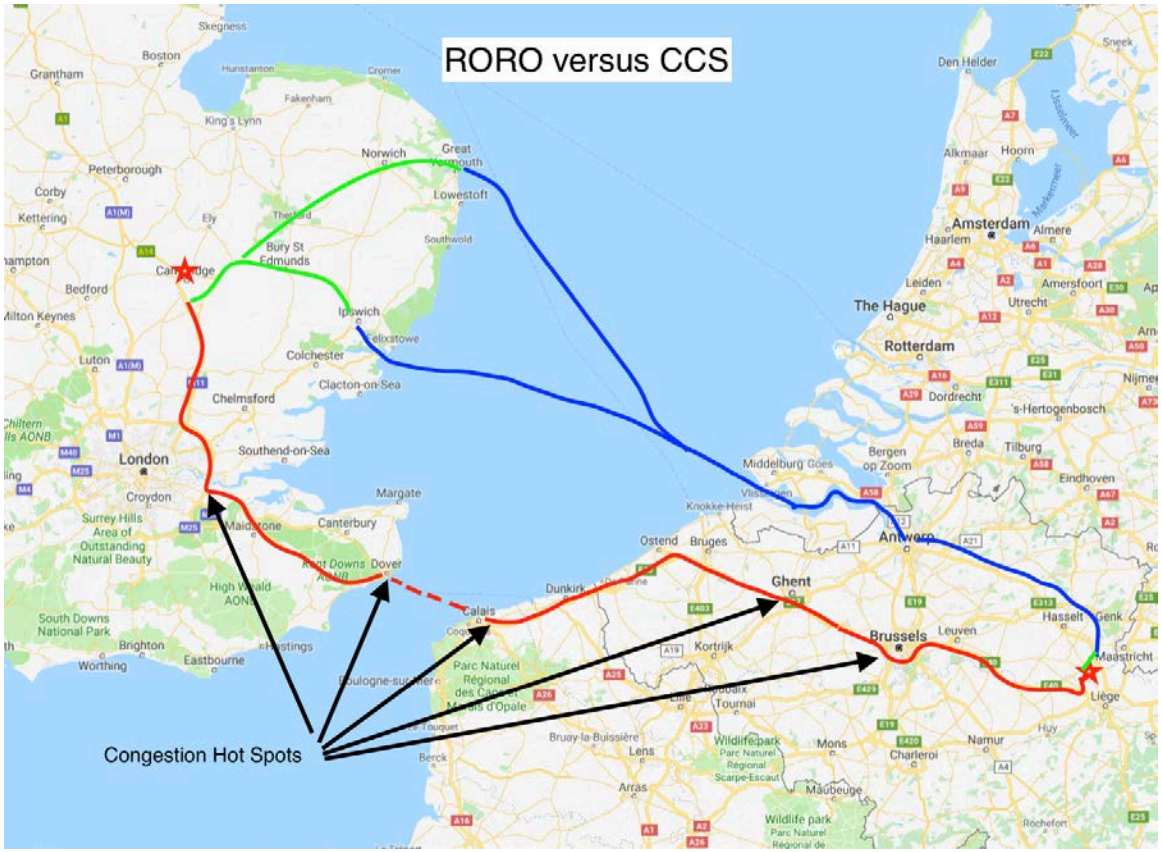
ZULU ASSOCIATES
MASS Business Case

- Two market segments :
  - *the existing 3.000 ton fleet, where many vessels are old and will need either replacement or at least costly re-engine refurbishments to fulfil the IMO 2020 emissions targets.*
  - *Alternative to (unsustainable) logistics chains with RORO content.*
- ZA plans to develop a fleet of these vessels (30+) to respond to the market demand and provide these to shipping lines, logistic companies and end users.

ZULU MASS Business Case
RORO Flows - Additional Elements

- Transfer existing flows from RORO hubs to smaller (inland) ports : more efficient total logistic chain
  - *Shorter transits on land*
  - *Direct connections to Inland Waterways by MASS operations*
  - *Less road freight used*
  - *Less congestion on roads and at major ports*
  - *More redundant systems*
- Less propulsion power needed for same net cargo move
  - *Less emissions*
  - *Possible use of alternative propulsion to lower propulsion costs*

ZULU MASS Use Case : Cambridge – Liege Flow



400 Kilometres reduction for road transport

ZULU MASS Concept

- Autonomous operation equipment on vessel for present waterway infrastructure
- No crew on vessel during passage
- Remote Control Centre (RCC) in continuous contact
- Autonomous equipment capable of situation awareness and complexity analysis (levels)
- Situation awareness communicated from vessel to RCC
- RCC intervention in steps pending on situation needs of actual level
- Fall back safety action

ZULU MASS
Advantages Short Sea vs Deep Sea

- Short voyages, large part in territorial waters.
- Frequent in-harbour presence.
- Availability of (more economical) land-based communication.
- Nearby (emergency) intervention teams.
- Continuous control by authorities (Coast Guard, MDK, Nederlands Loodswezen,..).
- Higher need for emission reduction.

ZULU MASS

Length Overall	90.0 metres	Beam mid.	15.0 metres
Draft mid.	5.50 metres	Air draft limit (Assumed)	9.10 metres (ab. WL)
Service Speed	10.5 knots (85% MCR)	TEU Capacity	149+ (varies with air draft)

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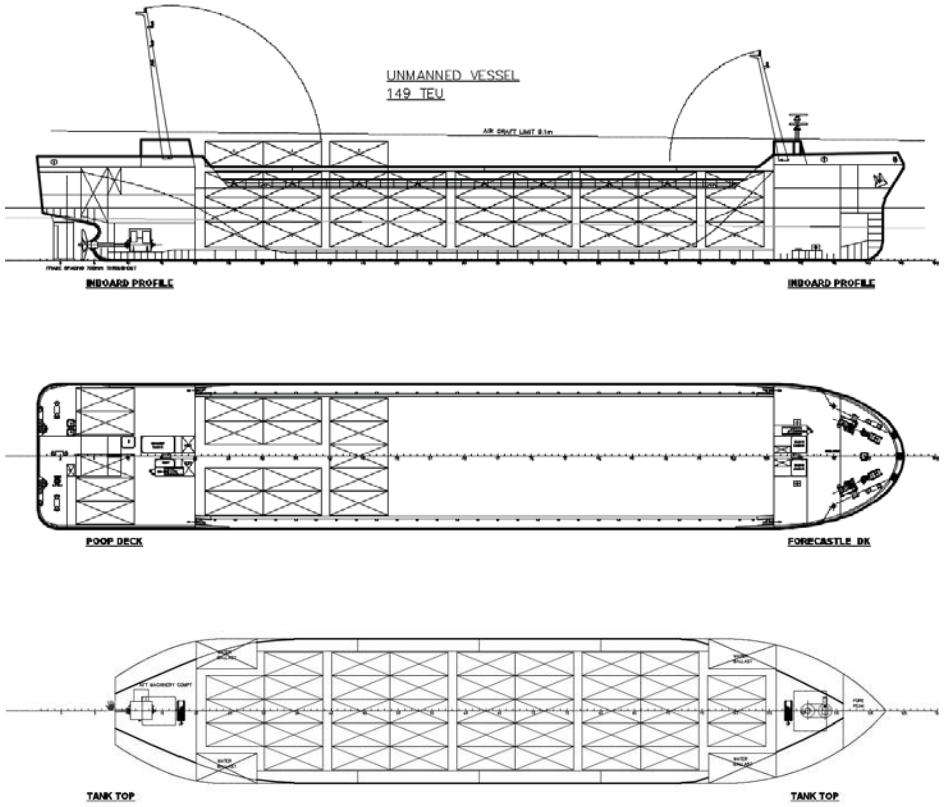
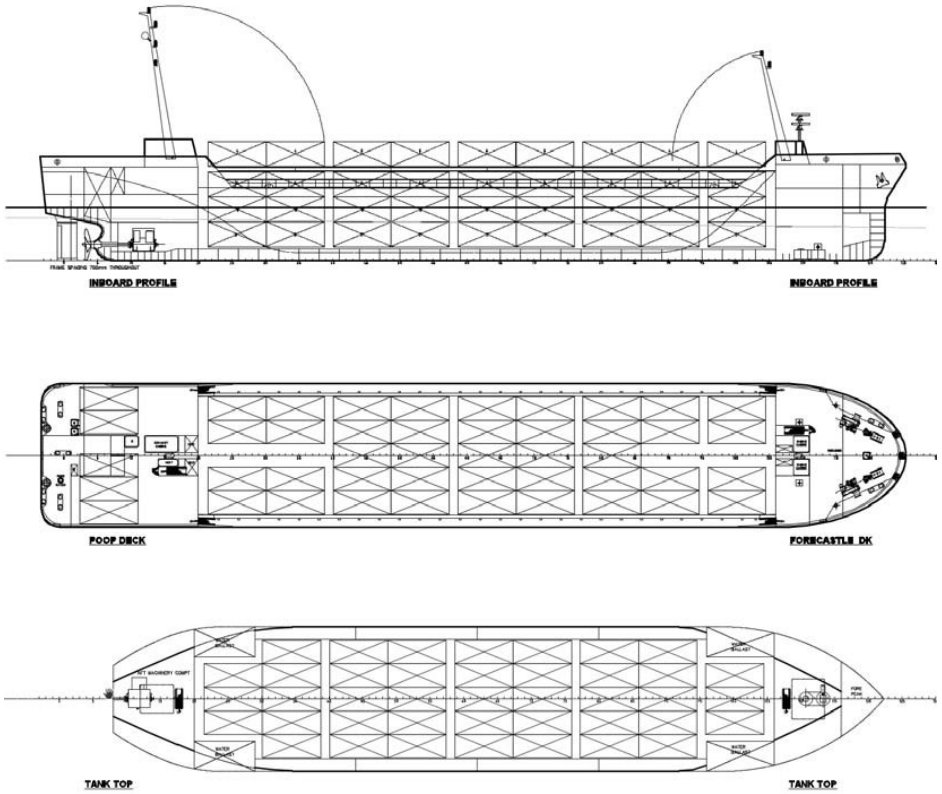
ZULU MASS
Time Line

Forming Consortium	-	2019/2020
Design	-	2019/2020
Negotiations on Regulations	-	2019/2021
Commercial Negotiations	-	2019/2021
Building Vessel	-	2020
Start Testing	-	2021
Start Commercial Operations	-	2022

Unmanned General Arrangement (air draft constrained)



Unmanned General Arrangement (no air draft constraints)



ZULU MASS

Bow Quarter Manned

ZULU MASS

Bow Quarter Unmanned

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ZULU MASS
Alternative Propulsion

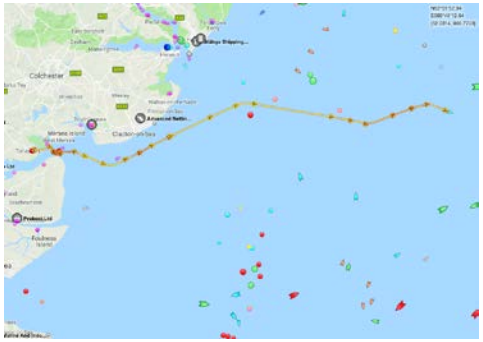
- Diesel Electric
- Hydrogen
- Electric
- Wind powered
- Bow Foil

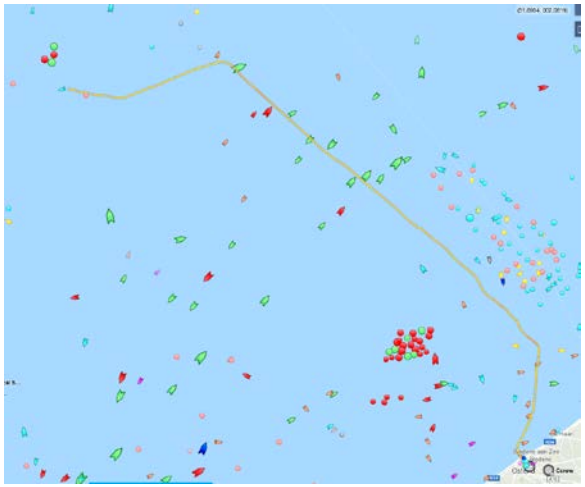
ZULU MASS - ABSC Services
Full Service Charter

- Vessel
- Insurance
- RCC operations
- Bunkering
- Maintenance
- Berth charges
- Manning

MASS SHORT SEA: 6 – 8 May 2019
Cross Channel : SEA-KIT Oyster Boat Run

ZA, through its Anglo Belgian Shipping Company subsidiary, was part of the initiative in May this year to sail a 12m SEA-KIT vessel successfully from the UK to Belgium and back, remotely controlled from a base control station in the UK.





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Regulation – Tripartite response to an initial ABSC query - Letter 21 October 2019

"During the summer months you have approached the administrations of Belgium, the Netherlands and the United Kingdom with a query on an initiative that you would like to pursue on the operation of autonomous ships on routes between the three countries. In this respect you also distributed a note on a possible Tri-partite Agreement (TPA) to this effect between the three administrations. In your query you put forward that the aim of your initiative is to operate short sea vessels as MASS, including the ability to sail to inland destinations, within the next 2 years.

On behalf of the three administrations I herewith react to your query.

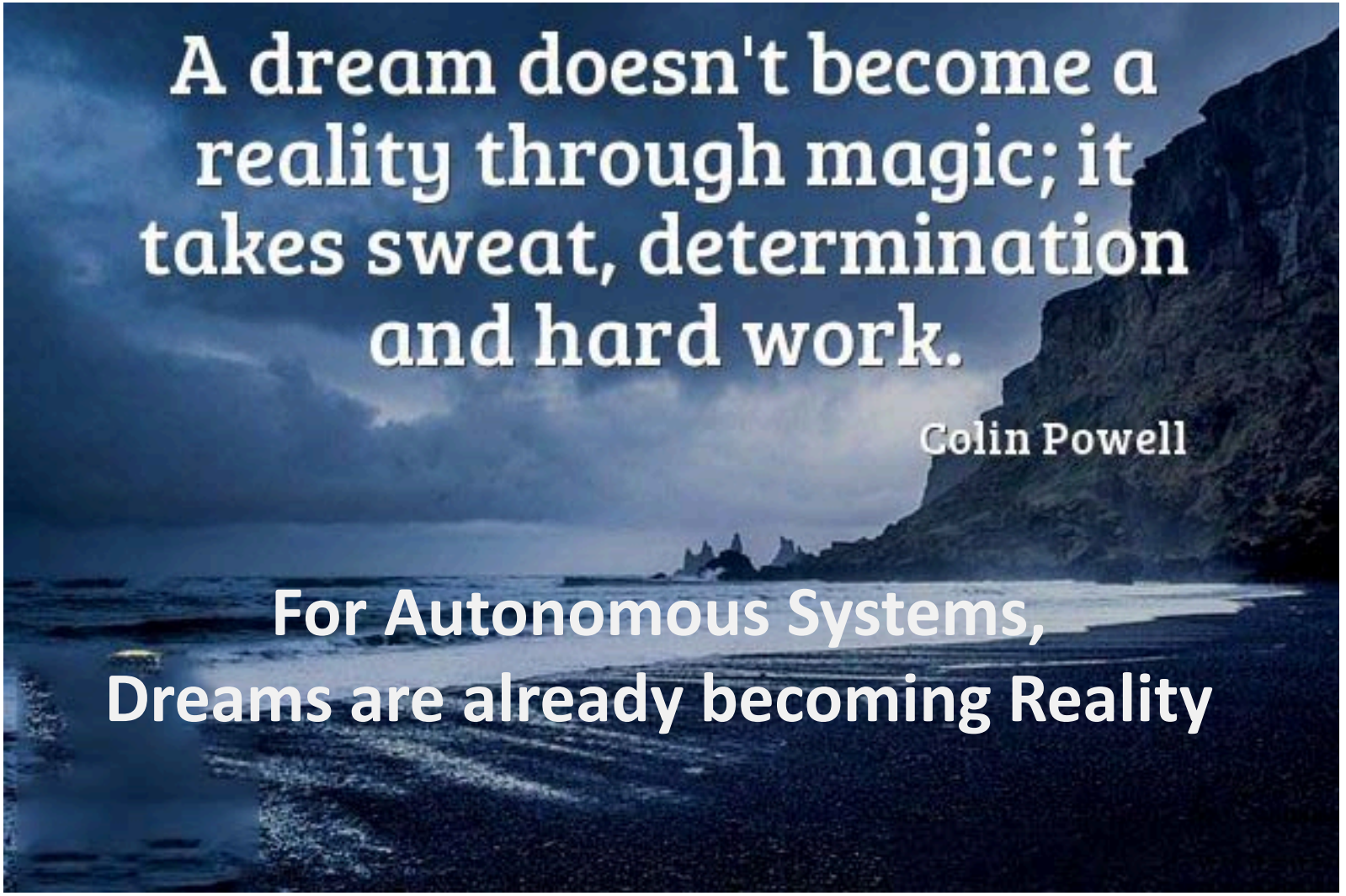
The administrations of Belgium, the Netherlands and United Kingdom have been in contact about your query, and about further cooperation on cross-border experiments with MASS in general. On the latter subject this resulted in the mutual intention to engage in a Memorandum of Understanding (MoU) in which strengthened collaboration on cross-border MASS experiments between our administrations will be captured.

Under the anticipated MoU we envisage to accommodate applications for cross-border trials, although without specifying dedicated or specific routes. And trial in this respect means (as per the recently adopted MSC.1/Circ.1604 – Interim guidelines for MASS trials) an experiment or series of experiments, conducted over a limited period, in order to evaluate alternative methods of performing specific functions or satisfying regulatory requirements prescribed by various IMO instruments, which would provide at least the same degree of safety, security and protection of the environment as provided by those instruments. Such applications will be dealt with on a case-by-case basis.

In the case that you would wish to pursue your initiative, I would like to point out for your information that several foreseen actions (some of which are covered in your note on the TPA) will have to be initiated/provided by the applicant, such as determination of the desired sailing area for the experiment, the timeframe of the experiment, the concept/level of MASS operation during the experiment, risk assessment, onboard and onshore staff involved in the experiment etc. The applicant should also clarify its ambition/intention for the experiment, i.e. which technique(s) does the experiment encompass and for which purpose/function(s).

In this respect we would appreciate to receive from your side your concrete plans so that we are able to assess the viability of an actual application for MASS trials."

Reality Check



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