Sayı : 38591462 - 730.03.04 - 2019 - 6915 13/12/2019
Konu : ICS İnşa ve Ekipman Alt Komitesi, Dökme Yük ve Yolcu Gemileri Panelleri Ortak Toplantısı Hk.

Sirküler No :859

SAYIN ÜYEMİZ,

İlgi : Uluslararası Deniz Ticaret Odasının (ICS) 03/12/2019 tarihli ve CE(19)06 sayılı yazısı.

Uluslararası Deniz Ticaret Odası (ICS) tarafından gönderilen ilgi yazıda, ICS İnşa ve Ekipman Alt Komitesi, Dökme Yük Gemileri ve Yolcu Gemileri Panelleri Ortak Toplantısının 20 Kasım 2019 tarihinde gerçekleştirildiği bildirilmekte olup, son ve bir önceki toplantıya ilişkin raporlar Ek'te sunulmaktadır.

Son toplantı raporunda;
-Enerji Dizayn İndeksi,
-Balast Suyu,
-Yakın ve Gelecekte olacak Uluslararası Denizcilik Örgütü (IMO) Toplantıları,
-Dökme Yüklerin Taşınması,
-Gemi Yakıtları,
-Uluslararası Klas Kuruluşları Birliği (IACS) ve Tanınmış Kuruluşlar,
-Dökme Yük Gemileri ve Tankerlerin Yapısal Standartları,
-Can Kurtarma Teçhizatları,
-Gelecek Çalışma Programı,
-Denizcilik Komitesine İletilecek Konular,
-Diğer (demirleme ekipmanları, yeni ve mevcut ro-ro yolcu gemilerinde, ro-ro ve özel alanlarda yangınların meydana gelme ve geldiğinde sonuçlarının mimimize edilmesi konularında SOLAS Bölüm II-2'nin gözden geçirilmesi, ani kapatma valfleri kullanımı ve güvenilirliği) hususlara yer verilmektedir.

Bilgilerinizi arz/rica ederim.

Saygılarımla,

e-imza
İsmet SALİHOĞLU
Genel Sekreter

Ek: İlgi Yazı ve Ekleri (61 sayfa)

Dağıtım:

Gereği:
- Tüm Üyeler (WEB sayfası ve e-posta ile)
- Türk Armatörler Birliği
- S.S. Gemi Armatörleri Mot. Taş. Koop.
- Vapur Donatanları ve Acenteleri Derneği
- İMEAK DTO Şubeleri ve Temsilcilikleri
- GİSBİR
- GESAD
- Gemi ve Yat İhracatçıları Birliği
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Bilgi:
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- Yönetim Kurulu Başkan ve Üyeleri
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03 December 2019 **CE(19)06**

TO: **CONSTRUCTION AND EQUIPMENT SUB-COMMITTEE**
BULK CARRIER PANEL
PASSENGER SHIP PANEL

Copy: **Marine Committee**
All Full and Associate Members for Information

DRAFT MINUTES FOR THE COMBINED MEETING OF THE CONSTRUCTION & EQUIPMENT SUB-COMMITTEE, BULK CARRIER PANEL AND PASSENGER SHIP PANEL HELD ON WEDNESDAY 20 NOVEMBER 2019.

Action required: ***Members are invited to review the draft minutes for the combined meeting of the Construction and Equipment Sub-Committee, Bulk Carrier Panel and Passenger Ship Panel held 20 November 2019 and to note the date for the next combined meeting.***

Draft minutes for the meeting held 20 November 2019 are provided below. Final agreed minutes for the previous combined meeting of the Construction and Equipment Sub-Committee, Bulk Carrier Panel and Passenger Ship Panel held 2 May 2018 are attached as **Annex A**. **Members are particularly asked to note that the date of the next combined meeting of the Construction and Equipment Sub-Committee, Bulk Carrier Panel and Passenger Ship Panel will take place on Wednesday 10 June 2020 NOT 27 May 2020 as previously provisionally agreed at the meeting on 20 November. The change of dates has been necessitated in order to facilitate attendance of the Sub-Committee and Panel chair persons.**

Any comments on the draft minutes should be addressed to the undersigned and copied to jade.smith@ics-shipping.org .

John Bradshaw
Technical Director

Enclosures:

Annex A Final agreed minutes of the Construction and Equipment Sub-Committee, Bulk Carrier Panel Meeting and Passenger Ship Panel 2 May 2019.
Annex B Draft exhaust gas cleaning system (EGCS) malfunction flow chart.
Annex C CIMAC Guideline Marine fuel handling in connection to stability and compatibility.

INTERNATIONAL CHAMBER OF SHIPPING

Combined Meeting of the Construction and Equipment Sub-Committee, Bulk Carrier Panel and Passenger Ship Panel Wednesday 20 November 2019 38 St Mary Axe, London EC3A 8BH

DRAFT MINUTES

Statement of Compliance with Competition Law

ICS is firmly committed to maintaining a fair and competitive environment in international shipping. As such, it is the policy of ICS to comply fully with all applicable competition laws. ICS will endeavour to ensure that all meetings (including all committees, sub-committees and panels) will be conducted in compliance with applicable competition laws.

1. INTRODUCTION

The Chairman opened the meeting by welcoming all attendees, in particular Mr Shunichi Arisaka, who was attending for the first time after having been appointed as general manager of the JSA Europe district branch.

The attention of the Sub-Committee was drawn to the ICS Statement of Compliance (above) which was duly **acknowledged and agreed.**

The Sub-Committee was advised that there were no intended fire drills and therefore if the alarms went off the building would need to be evacuated.

2. MINUTES OF THE PREVIOUS MEETING

The draft minutes of the previous meeting of the Construction,and Equipment Sub-Committee, Bulk Carrier Panel and Passenger Ship Panel held 2 May 2019 were **approved** by the Sub-Committee and **agreed** as a true record. The agreed minutes are attached at **Annex A**.

3. MATTERS ARISING

No additional matters arising were identified other than those specifically addressed under other agenda items.

4. ENERGY EFFICIENCY AND AIR EMISSIONS

4.1 EEDI Beyond Phase 2 & Minimum Power

The Sub-Committee was updated on changes to the EEDI regulation which had been agreed at MEPC 74, and which should be adopted at MEPC 75. The Secretariat expressed concern that there may be a final attempt to increase the reduction rates for some sizes of container ship, however there is felt to be insufficient support among member States to re-open the discussion should such an attempt be made.

The Secretariat had prepared a draft submission to MEPC 75 calling on IMO to finalize the revised 2013 Interim guidelines for determining minimum propulsion power to

maintain the manoeuvrability of ships in adverse conditions. The submission recommends that this could be achieved by either retaining the interim guidelines and changing their status from “interim” to definitive guidelines, or by completing work on the level 2 simplified assessment method proposed by SHOPERA. This is a particularly urgent matter given the probable adoption of reducing shaft power to reduce GHG emissions from shipping in the short term (either within the EEXI proposed by Japan, or as a standalone measure). The Sub-Committee confirmed support for the Secretariat to proceed with the submission and requested that the Secretariat liaise with member States and other associations.

MEPC 75 is expected to consider document MEPC 74/6/1 (CLIA) which was not introduced at the last session of the Committee. The document proposes Available Lower Berth (ALB) capacity as a transport work proxy for cruise passenger ships, ICS will support the proposal.

Members confirmed their support for the Secretariat to submit the draft document on finalizing the revised 2013 Interim guidelines for determining minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions, and noted the information provided.

4.2 Global Sulphur Cap – Implementation of the revised fuel oil sulphur limit from 2020

The Sub-Committee was updated on recent outcomes at IMO, as detailed in the agenda notes. The long-awaited ISO/PAS 23263:2019 “Considerations for fuel suppliers and users regarding marine fuel quality in view of the implementation of maximum 0,50 % sulphur in 2020” had finally been published. The Secretariat had participated in a 2020 summit hosted by the IMO secretariat on 17-18 October, presenting ICS guidance on implementation of the Global Sulphur Cap as well as a meeting of industry stakeholders to share updates on their 2020 preparations hosted by IMO on 18 November 2019.

Members noted the information as provided.

4.3 Exhaust Gas Cleaning Systems (EGCS)

The Sub-Committee noted that the Secretariat had sent letters to the European Sea Ports Organization (ESPO) and the International Association of Ports and Harbours (IAPH). seeking further information on the issue of ports prohibiting the discharges from open loop EGCS. A meeting with IAPH had been arranged during the margins of the recent GHG intersessional working group meeting where IAPH had offered to co-operate with ICS on various issues including EGCS, Onshore Power Systems, alternative fuel infrastructure etc.

The Secretariat reiterated the request for Members to report any EGCS construction or operational issues encountered by their members. The Secretariat would raise any reported issues at the next Exhaust Gas Cleaning Systems Association (EGCSA) workshop, which they would be attending on 10-11 December 2019.

Following instruction from the Environment Sub Committee, the Secretariat had prepared the first draft a flow chart of actions to be undertaken by ships following an identified case of EGCS malfunction. The draft flow chart is based on the guidance provided in IMO circular MEPC.1/Circ.883, and is attached at Annex B.

Members noted the information provided and agreed to review the draft flow chart and notify the Secretariat of any concerns.

4.4 NOx Emissions

The Sub-Committee was updated on changes to the NOx Technical Code and amendments related to electronic record books and SCR certification requirements which had been adopted at MEPC 74, with an entry-into-force date of 1 October 2020. The Secretariat had recently attended a cold ironing workshop organised by the China MSA in Beijing. At this workshop it was apparent that China is according a high priority to reducing NOx emissions, the Secretariat considers it to be possible that China's domestic maritime emissions control areas could be extended to include NOx emissions in the near future.

Members noted the information provided.

4.6 Black Carbon Emissions

The Sub-Committee was updated on progress made at MEPC 74 where proposals submitted by Finland on further work on the matter of Black Carbon emissions had been agreed. A report is to be submitted to MEPC 77, with Member States and international organizations invited to submit concrete proposals to PPR 7. ICS had supported the Finnish proposal as a pragmatic way forward, in preference to less pragmatic alternatives which had been submitted by green NGOs. This future work will consider controlling Black Carbon emissions from marine diesel engines to reduce the impact on the Arctic and further consider the three recommended Black Carbon measurement methods (FSN, PAS & LII). The Secretariat considered that significant further work was needed to agree a robust, standardized measurement protocol before a control measure could be agreed and reminded the meeting of the complex nature of Black Carbon emissions. In response to a question as to the effect of Black Carbon emissions outside of coastal and Arctic areas the Secretariat considered that the public health effects of Black Carbon are a concern in coastal waters and in ports, and that the climate forcing effects of Black Carbon are a concern in Arctic waters, therefore Black Carbon emissions are of less significant when ships operate outside of from such areas. ICS supports further work to address emissions of Black Carbon but considers that any potential control measures should be supported by appropriate scientific data.

Members noted the information provided.

4.7 Development of Guidelines for Cold Ironing of Ships

The Sub-Committee was updated on the progress of work to develop operational guidelines for cold ironing. The Secretariat continued to participate in the correspondence group which had been re-established at SSE 6 and which was being coordinated by the China MSA. The correspondence group had faced some issues on how to address technical standards, some members were highlighting that the groups terms of reference were limited to development of operational guidelines and that as a result there should be no reference to technical standards. Other members, including ICS, considered that operational guidelines for electrical systems needed to reference appropriate technical standards to be of value to the industry since the electrical compatibility of systems was essential. Members agreed that it was important to include a reference to the appropriate IEC/ISO standards for cold ironing systems in the guidelines. In response to a question the Secretariat advised the meeting that those member States trying to remove references to technical standards had been unenthusiastic about the work from the outset.

As already advised, the Secretariat had recently attended a workshop on cold ironing organised by the China MSA. China has mandated cold ironing for some ship types, contingent on ships having been provided with cold ironing systems compatible with shore/terminal equipment. Similar initiatives to mandate cold ironing for cruise ships and container ships had been implemented in California, and some Canadian ports were also enthusiastic about the concept. China had installed over 6000 cold ironing connection points, of which approximately 2000 were large high voltage systems. As an alternative to cold ironing China accepts other equivalent zero emission at berth technologies. Members advised that ports in other areas such as Hamburg were progressing with the provision of cold ironing connections and that it was expected that this would continue and extend more widely. One option developed in California was a barge mounted exhaust gas cleaning technology which was connected to the ships exhaust stack, this was felt to be a questionable way forward.

Members noted the information provided.

5. BALLAST WATER

5.1 Ballast Water Management

5.1.1 BWM Convention update.

The Sub-Committee noted that the International Ballast Water Management Convention (BWM Convention) entered into force on 8 September 2017 and that as of 13 September 2019 according to IMO's GISIS Status of Treaties database the number of Contracting Governments was 81 representing 80.76% of the world's merchant fleet tonnage.

The Secretariat highlighted that as of 8 September 2019 the 2nd anniversary of entry into force (EIF) of the BWM Convention had passed and therefore over the next 5 years ships that were considered to be existing ships at the time of EIF of the BWM Convention will be required to comply with the D-2 ballast water discharge standard from the date of their 1st IOPP renewal on or after 8 September 2019 and will therefore need to the install and use of an approved Ballast Water Management System (BWMS).

The Secretariat further highlighted to the Sub-Committee the contents of circular MC(19)86 "Request for Ballast Water Management System Feedback" issued on 8 October 2019 emphasising the great importance of ICS receiving feedback from shipowners where issues with systems are encountered.

The Sub-Committee noted that the Marine Committee, in October, agreed that Members should take action as they deem appropriate to promote feedback being forwarded on an ongoing basis to ICS using the form attached to circular MC(19)86. Members of the Sub-Committee discussed the subject supporting fully the provision of feedback and in addition asked the Secretariat to look into providing an on-line version of the feedback questionnaire. During the discussion the Secretariat highlighted that the provision of the ship's IMO number in relation to a reported issue was simply to ensure that during the analysis of feedback any possible double counting would be avoided. Data relating to the ship concerned and the shipowner were for internal ICS use only and would not be reported to external parties.

The sub-committee noted the information provided.

5.1.2 BWMS Approval requirements.

The Sub-Committee noted that Ballast Water Management systems installed** on or after 28 October 2020 and used to comply with the BWM Convention must be approved

in accordance with the IMO Code for Approval of Ballast Water Management Systems (BWMS Code).

The Sub-Committee agreed that member National Shipowners Associations should remind their members of the BWMS approval requirement detailed above so that their shipowners can ensure that the systems they choose to install have the required approval.

The Secretariat advised that it had been in contact with the IMO Secretariat, working with a friendly member State, requesting IMO to update its list of approved ballast water management systems to include details of the type approval provisions under which each system had been approved. The Secretariat further advised that subsequent to its request IMO Secretariat had advised that it is in the process of updating its list as requested.

*Note: **Installed**** - *In accordance with the BWM Convention "Installed" in respect of a ship means the contractual date of delivery of the Ballast Water Management system to the ship. In the absence of such a date, the word "installed" means the actual date of delivery of the Ballast Water Management system to the ship*.

The sub-committee noted the information provided.

5.1.3 Validation of the compliance of individual BWMS with regulation D-2 of the BWM Convention in conjunction with their commissioning.

The Sub-Committee was advised that MEPC 74 had approved draft amendments to regulation E-1 of the BWM Convention in order to form the regulatory basis for the relevant survey item in the HSSC Guidelines regarding sampling and analysis during commission testing.

The Sub-Committee noted that with regards to the commissioning testing MEPC 74 had agreed the following:

- Commissioning testing should begin as soon as possible in accordance with BWM.2/Circ.70 *"Guidance* for the commissioning testing of ballast water management systems";
- Commissioning testing should not be applicable to ships that had already installed a BWMS and were certified for compliance with regulation D-2; and
- The analysis undertaken in the context of commissioning testing would be indicative.

The Sub-Committee further noted that MEPC had considered the concerns raised by ICS concerning paragraph 4.2 of BWM.2/Circ.70 *"Guidance for the commissioning testing of ballast water management systems"* which states that "representative samples should be analysed for all size classes included in the D-2 standard". This, in the opinion of the ICS Secretariat, creates an unwanted anomaly between what is envisaged for indicative sampling and analysis as part of BWMS commissioning testing and what is envisaged for PSC indicative sampling and analysis where there is no equivalent guidance stating that PSC analysis should cover all size classes in the D-2 standard. It was highlighted that since the revision of the G8 Guidelines in 2016 where indicative sampling and analysis during BWMS commissioning was first envisaged it had always been understood that it would mirror the indicative sampling and analysis envisaged to be conducted by PSC and no more. MEPC hearing the ICS concerns invited submissions on any appropriate changes to BWM.2/Circ.70 in light of the draft amendments to regulation E-1.

The Sub-Committee noted that the Secretariat intends to draft a submission to IMO PPR 7 to address the unwanted anomaly.

The sub-committee noted the information provided.

5.2 United States Ballast Water Regulation Developments.

The Sub-Committee was advised and noted that the USCG had now granted full USCG approval to 23 Ballast Water Management Systems and that in addition 7 further systems, never previously approved, were being reviewed for approval.

The sub-committee noted the information provided.

6. RECENT AND FORTHCOMING IMO MEETINGS

6.1 MEPC 74

6.1.1 EEDI and Minimum Power

See minutes under agenda item 4.1.

6.1.2 Underwater noise from ships

At MEPC 74 Transport Canada announced that they would be hosting a workshop to consider potential proposals for a new work output on reducing underwater vessel noise, for submittal to MEPC 75. The ICS Secretariat had been unable to attend the workshop, however the Chamber of Marine Commerce had done so to ensure that shipowners' were represented at the event. The meeting was advised that underwater noise was expected to become the next major issue on the IMO environmental agenda.

Members noted the information provided.

7. MATTERS RELATING TO THE CARRIAGE OF DRY BULK CARGOES

Members were advised that CCC 6 met 9 – 13 September with the following key outcomes with respect to dry bulk cargoes in accordance with MC (19)81.

Reclassification of ammonium nitrate based fertilizer (non-hazardous)

The CCC 6 sub-committee had considered proposals for replacing the existing schedule for ammonium nitrate based fertilizer (non-hazardous), with two individual schedules in the IMSBC Code and:

- Instructed a Drafting Group on IMSBC Code to further develop the draft individual schedules for ammonium nitrate based fertilizer cargoes, with the understanding that the technical issues would be considered by the E&T Group at its 33rd session; and

- Instructed the 33rd session of the E&T Group to consider a possible revision of CCC.1/Circ.4, after finalizing the two new individual schedules for ammonium nitrate based fertilizer cargoes.

Members noted that it is anticipated there will be two new individual schedules, ammonium nitrate based fertilizer MHB (OH) and ammonium nitrate based fertilizer

(unclassified), provided that all technical issues can be addressed during the E&T 33 and that they will be included in amendment 06-21 of the IMSBC Code.

Members noted the information provided.

8. FUEL RELATED MATTERS

8.1 IMO work

The Sub-Committee was updated on progress of the work being done by IMO correspondence groups on enhancements to the MARPOL Annex VI module in GISIS and on fuel safety.

Following a discussion on the issue of mandatory bunker licensing schemes, the meeting noted the decision of the Marine Committee that ICS should raise the issue of bunker supplier licensing at the IMO again, and that fuel should be tested before delivery to the ship in order to enhance the quality of fuel delivered to the ship.

Members noted the information provided.

8.2 Reporting fuel issues.

The Sub-Committee was informed that ICS and BIMCO are jointly working on the development of an online feedback tool which would help ships to report experiences and issues related to the use of 0.50% sulphur complaint bunker fuels. Any issues identified will be raised for consideration by the IMO Correspondence Group on fuel safety and subsequently at MSC 102.

Members noted the information provided and supported the work of the Secretariat in developing an on-line reporting tool.

8.3 Development of safety provisions for ships using low-flash point oil fuels

The Sub-Committee was updated on the progress of work of CCC 6 to develop amendments to the IGF Code to include safety provisions for ships using low-flashpoint oil fuels and which was to be progressed by a correspondence group.

The Sub Committee supported the concerns raised by ICS with respect to assumptions which had been used to underpin an evaluation of risk associated with the use of low-flashpoint diesel fuels which had been undertaken by DNV-GL. In particular, the boundary conditions used in the study were considered to be misrepresentative and significantly under estimated typical temperatures found on-board.

Members agreed that the Secretariat should base its work in the Correspondence Group on the following principles:

- Any attempt to undermine the SOLAS minimum flashpoint requirement of 60°C should be opposed as this requirement is clearly related to the worst-case ambient temperatures that conventional engine rooms are still subject to; and

- Additional provisions for safety of ships using these fuels should be proportional to the risk of formation of explosive gas vapours in the event of fuel leaks into engine rooms based on credible worst-case scenarios.

Members noted the information provided and agreed the basis of the Secretariats further work on the matter.

8.4 Amsterdam Rotterdam Antwerp (ARA) area fuel quality working group

The Secretariat continued to participate in, and support the work, of the ARA group. This work was delivering positive results as some ports in the area, such as Rotterdam, were now establishing fuel oil supplier licensing schemes.

Members noted the information provided.

8.5 CIMAC Guideline on Marine fuel handling in connection to stability and compatibility

ICS had participated in the 81st session of the working group 7 on fuels of the International Council on Combustion Engines (CIMAC) which finalised the CIMAC guideline on marine fuel handling in connection to stability and compatibility. The guideline is attached at **Annex C** and can also be downloaded for free at:

https://www.cimac.com/publications/publications350/cimac-wg07-guideline-marine-fuel-handling-in-connection-to-stability-and-compatibility.html

Members noted the information provided

9. IACS AND RECOGNISED ORGANISATIONS

9.1 IACS Interim Recommendations on Cyber Systems

The Sub-Committee was updated on recent progress of the work on the IACS Standards for cyber systems. A joint-industry working group on cyber systems continues to develop the consolidated recommendations for cyber resilient ships, and last met on 7 November at the ABS Offices in London, which ICS had attended. The Secretariat reported that industry concerns with respect to the inclusion of operational elements of cyber risk management have been considered, and these sections have largely been removed from the recommendations. Once the work is sufficiently mature, the document will be shared with Members. ICS, BIMCO and the co-authors of the industry guidance on Cyber Risk management, will review that document, with a view to providing a fourth revised version as appropriate.

Members noted the information provided.

9.2 IACS CSR External Advisory Group (EAG)

The Sub-Committee noted that the next meeting, EAG No.3, will be held in Tokyo at the ClassNK office on 10 January 2020 when IACS will table its initial thoughts relating to possible rule changes for 2020.

10. GOAL BASED IMO STRUCTURAL STANDARDS FOR BULK CARRIERS AND OIL TANKERS

The Sub-Committee noted this is a standing item on the Sub-Committee's agenda and there were no major developments to report on this agenda item since the last meeting.

11. LSA

The Sub-Committee was updated on the work of the ILG, which had met on 6 November 2019, with particular respect to the following items.

11.1 Potential IMO submission regarding the safety of single fall lifeboat/rescue boat hooks

The Sub-Committee noted progress on this issue, including discussions with the US Administration following their concerns regarding applicability of the amendments to some types of already approved hooks. These concerns are specifically related to the use of single fall boat hooks designed for use on liferafts which have then been approved for use on rescue boats.

The Secretariat will submit the same amendment text that was proposed at SSE 6 for amendments to the LSA Code along with a detailed description of the various considerations that took place in this regard.

Members noted the information provided.

11.2 Survival craft ventilation

The Sub-Committee was advised that the SSE LSA Correspondence Group on survival craft ventilation has now completed three rounds of correspondence, with the final report for SSE 7 having been issued. The Secretariat provided a verbal summary of the correspondence group report with respect to totally enclosed lifeboats, partially enclosed lifeboats and liferafts.

The Sub-Committee was further advised that although the discussion with respect to ventilation of 5 m3/person/hr for totally enclosed lifeboats could not be reopened, requirements for partially enclosed lifeboats and liferafts were still to be decided. This would most likely be progressed by a working group at SSE 7 and by a continuation of the correspondence group.

Members noted the information provided.

11.3 Capacity of LSA

MSC 100 had agreed that document MSC 100/17/6 should be considered by the SSE Sub-Committee. Work will commence at SSE 7, with a target completion date of 2024.

The Sub-Committee was advised that RINA are preparing submissions to MSC 102 and SSE 7. CLIA advised that they too are considering a submission to SSE 7.

Members noted the information provided.

11.4 Lifeboat restraints and strength requirements

MSC 101 had agreed to include an output on "Development of design and prototype test requirements for the arrangements used in the operational testing of free-fall lifeboat release systems without launching the lifeboat" in the post-biennial agenda of SSE based on proposals provided in document MSC 101/21/10 (Co-sponsored by a number of ILG members).

MSC 101 had further agreed that:

- the amendments to be developed should apply to all ships for which SOLAS chapter III requires the carriage of free-fall lifeboats;
- the instrument to be amended is the LSA Code, paragraph 4.7.6.4; and

- the amendments to be developed should enter into force on 1 January 2024, provided that they are adopted before 1 July 2022.

IACS intend to draft a follow up to MSC 101/21/10 for submission to SSE, with a view to potential co-sponsorship by other ILG members. The submission will be shared with members for their review and consideration if it is proposed that ICS should co-sponsor.

Members noted the information provided.

11.5 Launch of free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water

MSC 101 had agreed to include an output on "Amendments to SOLAS chapter III, LSA Code and resolution MSC.81(70) to remove the applicability of the requirements to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water" in the biennial agenda of the SSE Sub-Committee for 2020-2021, with a target completion year of 2020, and that:

- the amendments to be developed should apply to all ships to which SOLAS chapter III, the LSA Code and resolution MSC.81(70) apply;
- the instruments to be amended are SOLAS chapter III, the LSA Code and resolution MSC.81(70); and
- the amendments to be developed should enter into force on 1 January 2024, provided that they are adopted before 1 July 2022.

Members were advised that IACS had drafted a submission to SSE 7 concerning amendments to SOLAS Ch III, the LSA Code & Resolution 81(70) regarding application of the requirement to launch free-fall lifeboats with the ship making headway speeds up to 5 knots in calm water. The submission is currently being considered by Malta with a view to co-sponsorship.

Members noted the information provided.

11.6 LSA wire ropes

CLIA advised the Sub-Committee that they are drafting a document for submittal to MSC 102 on the subject of steel wire ropes. The draft document will be provided to ILG members and will be circulated to Members for consideration if it is proposed that ICS should co-sponsore.

Members noted the information provided.

11.7 LSA on container ships

The Sub-Committee was advised that the Container and Dangerous Goods Panels were concerned that the LSA requirements for container ships, specifically regarding survival craft and fire-fighting equipment may no longer be appropriate. These concerns were particularly but not exclusively, for very large and ultra large container ships with twin superstructure areas. For example, positioning of lifeboats and liferafts, and the possible locations of container stack fires.

The Container and Dangerous Goods Panels had established a working group of relevant experts under their remit to review and find a common way forward, with the following terms of reference;

1. Identify problems related to:

i. LSA requirements
ii. FFE requirements, and
iii. Other relevant safety-related requirements on large container ships.

2. Identify possible solutions to these problems, in the form of industry solutions or proposed amendments to SOLAS, LSA Code and/or FSS Code.

3. Report to the Container Panel for consideration and action as appropriate.

The working group held its first meeting on 17 September as reported in Circular CONT (19)12 and the Chair of the group (Mark Rawson – Liberia) gave a progress update to Members.

Members noted the information provided.

11.8 Lifeboat testing

The Sub-Committee was informed that the ILG had been notified by the UK that they were considering a New Unplanned Output paper to the IMO on lifeboats (LB) following statements by some LB service agents and ship operators that they have never tested the boat itself when completing 5yr testing.

The UK interpretation of the 5-year dynamic winch brake test is that the brake is applied during this test so it should also be tested when undertaking equivalent tests.

The UK requires either that the LB is loaded on the hooks to 110% or for a static equivalent load to be used to load the boat on the quayside.

The outcome of the previous ILG discussion regarding proof load and equivalent in relation to the 5yr LB test requirement was that most ILG members understood that testing of lifeboats and equipment was usually done with weights added to the boat or via a spreader attached to the davits, often undertaken during a drydocking period. Bahamas and Marshall Islands advised that they do not request anything further than the SOLAS / LSA Code requirements.

The UK considers that a circular or similar is required to provide consistency, the ILG had agreed that a consistent approach is preferable. The UK will review lifeboat testing requirements and consider a proposal for a more consistent approach for discussion by ILG members, IACS will consider the application of the requirements from a Class point of view and revert to the ILG.

Members noted the information provided.

11.9 Lifeboat weight testing

The Sub-Committee was advised that following the Tombara incident, the ILG had agreed that periodic weight testing of lifeboats and rescue boats on a consistent basis was desirable to check that no water ingress or other additional weights have been added. Such additional weight could expose the boat and its launching system to undue additional stresses.

The UK advised the ILG that any submission to MSC on lifeboats would also incorporate this issue and will review lifeboat testing requirements as noted in the previous point.

Members noted the information provided.

11.10 Free-fall lifeboat secondary means of launching

Members were advised that the UK had discussed concerns regarding the purpose of the secondary means of launching a free-fall LB with the ILG. Is it to provide a means of launching the boat loaded if the free-fall system doesn't work, or only for the lowering and recovery of an empty LB when completing crew familiarisation trials?

The ILG had been provided with some clarification from Bahamas that their understanding is that the secondary means of launching provides an alternative means to the free-fall launch, in cases where the free-fall could not be used, e.g. due to a system failure or where obstructions exist in the water.

Members noted the information provided.

12. FUTURE WORK PROGRAM

The Sub-Committee was invited to consider its future work programme taking into consideration the previous agenda items discussed and any relevant topics scheduled for consideration at forthcoming meetings of IMO. The following three work items were identified and agreed:

- Consideration of how ICS can secure feedback from Members and shipowners on matters of importance, in order to inform its work and ensure that when raising matters at IMO they are supported by appropriate data and information. The Secretariat was asked to identify options to enhance the level of engagement from shipowners in response to requests for information. This would better inform ICS positions on matters of importance (see also agenda item 5.1.1);

- Review SOLAS chapter II-2 and associated codes to minimize the incidence and consequences of fires on ro-ro spaces and special category spaces of new and existing ro-ro passenger ships – work with Interferry to avoid retro-active application of unrealistic requirements; and

- Reliability of quick closing (QC) valves.

13. ISSUES TO BE FORWARDED TO THE MARINE COMMITTEE

The Sub-Committee was invited to identify as appropriate, any specific issues to be forwarded for consideration by the Marine Committee. No items were identified on this occasion.

14. DATE OF NEXT MEETING

The Sub-Committee considered the date of its next meeting and provisionally agreed that the next meeting will be held Wednesday 27 May 2020, however following information from the respective chairs of the Bulk Carrier Panel and Passenger Ship Panel this date has been changed to **10 June 2020**.

15. ANY OTHER BUSINESS

15.1 Joint industry working group on anchoring equipment

The Sub-Committee was informed that the Secretariat had attended a joint industry working group on anchoring equipment, along with representatives from Intertanko, Intermanager, BIMCO and IACS as well as class/yard representatives. The working group had agreed that it would be beneficial to gather more evidence related to issues of concern raised at the meeting, notably, an increase in vessels losing anchors and

catastrophic failures of windlass motors (motor explosions). Multiple factors were evident in the reports given by IACS including environmental, human element and construction.

It was noted that there are class notations for design of the anchoring systems at deeper waters, up to 120 m, however it was agreed by the Sub-Committee that these should be basic requirements for anchoring arrangements and not optional notations. The Sub-Committee noted that there are mismatches between the design criteria utilised for anchoring arrangements and anchoring operations, causing a significant safety issue, and agreed that action is required.

ICS will continue its participation in the work and will seek further information and clarity on the situation from Members.

Members noted the information provided and supported further work by the Secretariat on the matter.

15.2 Review SOLAS chapter II-2 and associated codes to minimize the incidence and consequences of fires on ro-ro spaces and special category spaces of new and existing ro-ro passenger ships

The Sub-Committee was informed that the EU member States planned to submit a proposal to IMO to convert the recommendations of the interim guidelines for minimizing the incidence and consequences of fires in ro-ro spaces and special category spaces of new and existing ro-ro passenger ships (MSC.1/Circ.1615) into related SOLAS requirements.

The interim guidelines are based on the FIRESAFE study carried out by EMSA. In spite of the FIRESAFE study having already concluded that would not be cost effective to prohibit open ro-ro spaces on existing ships and only cost effective for one of three new design types, the European member States were able to insert a general prohibition of open ro-ro spaces in the interim Guidelines when the matter was discussed at SSE 6. Following industry pressure, the Guidelines acknowledge that the scope of this provision should be for new ships, but the lack of justification, or even the obvious contradiction to FIRESAFE, was ignored by some member States. The planned European submission may include proposals for a retroactive application for the prohibition of open ro-ro spaces.

In the ensuing discussions, the following views were expressed:

- There is a lack of ample justification for the benefits that might be achieved by applying the prohibition even for new builds;

- The additional requirement for ventilation for the closed ro-ro spaces will lead to an increase in the power requirements and consequently the GHG emissions from these ships; and

- Retroactive application of the requirements may lead to stability issues if these closed compartments are flooded with water during a firefighting scenario.

The Sub Committee agreed that ICS should work with INTERFERRY to develop a submission for SSE , detailing the concerns on the applicability of the proposed new requirements.

15.3 Quick closing valve operation and reliability

At its last meeting the Marine Committee had considered issues which had been identified with the non-functioning of quick-closing valves and a finding that such issues had resulted in a significant number of detainable deficiencies by Port State Control. Some of these issues were reported as occuring soon after commissioning and sea trials of new ships, raising concerns that it may be a design issue of one or more types of quick-closing valves. The matter had been referred to the C&E Sub-Committee for further consideration and action, as appropriate.

It was agreed that the Secretariat should invite Members to seek feedback from their members with the intention of establishing whether this was a significant problem and to inform what, if any, further work should be undertaken on the matter by ICS.

Members agreed that the Secretariat should add a new item to the work program of the Sub-Committee and seek feedback from Members on the matter.

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29 May 2019 **CE(19)03**

TO: **CONSTRUCTION AND EQUIPMENT SUB-COMMITTEE**
BULK CARRIER PANEL
PASSENGER SHIP PANEL

Copy: **Marine Committee**
All Full and Associate Members for Information

DRAFT MINUTES FOR THE COMBINED MEETING OF THE CONSTRUCTION & EQUIPMENT SUB-COMMITTEE, BULK CARRIER PANEL AND PASSENGER SHIP PANEL HELD ON THURSDAY 2 MAY 2019.

Action required: ***Members are invited to review the draft minutes for the combined meeting of the Construction and Equipment Sub-Committee, Bulk Carrier Panel and Passenger Ship Panel held 2 May 2019 and to especially note the revised date for the next combined meeting.***

Draft minutes for the meeting held 2 May 2019 are provided below. Final agreed minutes for the previous combined meeting of the Construction and Equipment Sub-Committee and Bulk Carrier Panel held 15 November 2018 are attached as **Annex A**. Attached as **Annex B** are the final agreed minutes of the previous Passenger Ship Panel meeting held 30 November 2016. **Members are particularly asked to note that the date of the next combined meeting of the Construction and Equipment Sub-Committee, Bulk Carrier Panel and Passenger Ship Panel will take place on Wednesday 20 November 2019 NOT 13 November 2019** as previously provisionally agreed at the meeting on 2 May. The change of dates has been necessitated as a consequence of IMO MEPC 74 recently deciding that the 6th Meeting of the IMO Intersessional Working Group on Reduction of GHG Emissions from Ships (ISWG GHG 6) will take place 11 to 15 November 2019.

Any comments on the draft minutes should be addressed to the undersigned and copied to jade.smith@ics-shipping.org .

Jonathan Spremulli
Principal Director - Marine

Enclosures:

Annex A Final agreed minutes of the Construction and Equipment Sub-Committee and Bulk Carrier Panel Meeting 15 November 2018;

Annex B Final agreed minutes of the Passenger Ship Panel 30 November 2016.

INTERNATIONAL CHAMBER OF SHIPPING

Combined Meeting of the Construction and Equipment Sub-Committee and Bulk Carrier Panel on Thursday 2 May 2019
38 St Mary Axe, London EC3A 8BH

DRAFT MINUTES

Statement of Compliance with Competition Law

ICS is firmly committed to maintaining a fair and competitive environment in international shipping. As such, it is the policy of ICS to comply fully with all applicable competition laws. ICS will endeavour to ensure that all meetings (including all committees, sub-committees and panels) will be conducted in compliance with applicable competition laws.

1. INTRODUCTION

The Chairman opened the meeting by welcoming all attendees noting that this was now, as agreed by the Marine Committee at its last meeting in March a joint meeting of the Construction and Equipment Sub-Committee, Bulk Carrier Panel and Passenger Ship Panel (hereafter referred to as the Sub-Committee). It was noted that the decision to make this meeting a joint meeting with the Passenger Ship Panel was taken noting that the Passenger Ship Panel had its last meeting on 30 November 2016. Rather than wait for the number of passenger ship specific items to become such that it justified a standalone meeting at a point in the future it was felt that it was prudent to have a combined meeting so that any passenger ship issues could be raised and addressed in a timely manner. The Sub-Committee was advised that combined meeting arrangements would continue to be reviewed by the Secretariat in conjunction with the Chair of the Passenger Ship Panel.

The attention of the Sub-Committee was drawn to the ICS Statement of Compliance (above) which was duly **acknowledged and agreed.**

The Sub-Committee was advised that there were no intended fire drills and therefore if the alarms went off the building would need to be evacuated.

Regarding the agenda the Chairman highlighted that in relation to agenda item 5 concerning Ballast Water the Secretariat had arranged for a presentation to be provided to the Sub-Committee by Mark Riggio, President of the Ballastwater Equipment Manufacturers Association (BEMA) following which there would be an opportunity for a brief question and answer session. It was noted that that the intention of the presentation was for BEMA to provide an introduction to their newly formed organisation so that ICS can develop an ongoing relationship enabling both associations to work together on issues that may arise going forward with ballast water equipment, noting that the requirement to install and then use systems really starts to come into effect for those ships built before 8 September 2017 from 8 September this year. The Sub-Committee was further advised that the presentation which would be provided via a conference call would take place immediately following consideration of agenda item 3. Details of the presentation are provided under the minutes of agenda item 5.

2. MINUTES OF THE PREVIOUS MEETING

The draft minutes of the previous meeting of the Construction and Equipment Sub-Committee and Bulk Carrier Panel held 15 November 2018 were **approved** by the Sub-Committee and **agreed** as a true record. The agreed minutes are attached at **Annex A**. The Sub-Committee in addition **approved** the draft minutes of the previous meeting of the Passenger Ship Panel held 30 November 2016 which were **agreed** as a true record. The agreed minutes are attached at **Annex B**.

3. MATTERS ARISING

No additional matters arising were identified other than those specifically addressed under other agenda items.

4. ENERGY EFFICIENCY AND AIR EMISSIONS

4.1 EEDI Phase 3 & Minimum Power

The Secretariat provided an update on EEDI beyond Phase 2. ICS had submitted a commenting paper which supported the recommendations of the correspondence group which had considered the matter, other than for containerships where the proposal of the World Shipping Council (WSC) to introduce Phase 3 for all containerships in 2022 but with a variable reduction rate starting at 30% had been supported. Although the Secretariat considered that the Committee had agreed to retain a Phase 3 starting year of 2025 for bulk carriers and tankers, there was a concern that some member states may again try to bring this forward to 2022 at MEPC 74. The Sub-Committee was advised that the European Union member states were now expected to support the WSC proposal for container ships, this was a positive development since there had been some pressure within Europe to demand a Phase 3 reduction of 40% for small container ships. This positive development was believed to be primarily as a result of effective support for the WSC proposal by Germany, Denmark and Sweden.

The Sub-Committee then considered the proposal of Germany et al in document MEPC 74/5/5 to introduce the option of a shaft power limitation in order to reconcile strengthening EEDI requirements and the need to satisfy the requirements of the interim guidelines for minimum power provided in MEPC.1/Circ.850/Rev.2. Additionally, Denmark has submitted an alternative method to provide ships with additional power/torque which could be used in adverse conditions in document MEPC 74/5/17 along with a proposal from China provided in document MEPC 74/5/31. Although the concept of a shaft power limitation to provide additional reserve power is supported in principle by ICS, the Secretariat highlighted a number of concerns, including, inter alia:

- As the power difference between the engine rating required for EEDI compliance and that required to comply with the requirements of MEPC.1/Circ.850/Rev.2 becomes greater it is unclear whether the shaft power limitation concept would offer a viable solution;
- Operating engines at high turn down ratios determined by the EEDI rating could negatively impact engine efficiency, reliability and local emissions (NOx, SOx, PM); and
- If agreed the measure could be used as a justification to push through inappropriate final minimum power guidelines, based on an assumption that allowing reserve power negates all concerns over the weather assumptions used to underpin the simplified assessment method.

For these reasons ICS had submitted a commenting paper, document MEPC 74/5/26, which offered support for the proposals of Germany et al in principle but which called for

any decision to be deferred until final minimum power guidelines had been agreed and an analysis undertaken to confirm the efficacy of the shaft power limitation proposal. The Secretariat considered the proposal of Germany to be technically valid in terms of making provision for additional reserve shaft power. The proposal of Denmark was also considered to be technically valid in terms of facilitating additional reserve power however it was less clear and the proposal of China could be supported in principle subject to concluding final minimum power guidelines.

Members were generally supportive of the ICS position, however a number of concerns were raised, including, inter alia:

- The shaft power limitation addressed a pressing need and it was a matter of concern that the lack of progress on finalising minimum power guidelines could delay progress;
- There were questions over engine certification and what power rating would be used for this certification;
- Further downsizing of engine power risked reducing the sea state conditions which would be considered severe in the future, meaning more frequent use of the reserve power rating would be necessary;
- Frequent use of the reserve power rating risked the measure being seen as a means to defeat the EEDI regulation, with a consequential political and reputational risk to IMO regulation and the industry;
- Some ships, such as offshore support vessels, needing an excess of power to operate;
- The shaft power limitation concept had been identified by some member states as a measure to assist in implementing short term GHG reduction measures in addition to facilitating compliance with strengthening EEDI requirements; and
- The measure could disincentive innovation by allowing ship yards to reduce engine power still further in preference to developing new propulsion technologies and hull optimisation.

Following an extensive discussion, it was agreed that ICS should take a lead in calling for the minimum power guidelines to be finalised. The Secretariat would work with IMO member states which had a known interest in the matter (for example, Greece, Liberia and Panama) and the Royal Institution of Naval Architects (RINA) to develop proposals for completing final minimum power guidelines.

Action – Secretariat to develop a potential submission on finalisation of minimum power guidelines for MEPC 76.

4.2 EEDI and ships with Ice Class notations

The Sub-Committee was advised that at MEPC 73 it had been agreed to use HELCOM recommendation 25/7 to define ice classes for the purposes of applying corrections in the EEDI calculation for ice strengthened ships. The correspondence group established to consider EEDI beyond Phase 2 was tasked with further development of ice correction factors however the weight of work and contentious nature of wider EEDI matters (such as starting years and required reduction rates) had the unfortunate effect of limiting the effort invested in ice strengthened ships by the correspondence group and those working groups established to consider the matter at IMO meeting sessions.

4.3 Global Sulphur Cap - Implementation of the revised fuel oil sulphur limit from 2020

Members were informed about the following salient outcomes related to the Global Sulphur Cap from PPR 6:

- Amendments to MARPOL Annex VI on in-use, on board and delivered fuel oil samples have been agreed for approval at MEPC 74 in May 2019. ICS had raised the issue of requiring on board samples from ships' bunker tanks without confirming arrangements and adequate guidance for sampling. PPR 7 is expected to continue work on this issue;

- Amendments to Appendix VI of MARPOL Annex VI on verification procedures for fuel oil samples have been agreed. 95% confidence factor has been accorded to the ship's in use and on board fuel samples, while the MARPOL delivered sample will not have any confidence limit.

- 2019 Guidelines for consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI has been finalized. The final version includes a reference that Administrations and port State control authorities may take into account the implementation plan when verifying compliance with the 0.50% sulphur limit requirement. The Sub-Committee also decided to include a recommendation for Administrations to test fuel oil samples from bunker barges or shore terminals.

- As part of the work on the implementation guidelines, a standard template for Fuel Oil Non Availability Report has been agreed.

- Based on the related decision made by MSC 100 on an ICS co-sponsored submission, the Sub-Committee prepared a draft MSC MEPC Circular addressing the delivery of compliant fuels by suppliers;

- 2019 Guidelines for port State control under MARPOL Annex VI has been finalized; and

- The Sub-Committee also considered the need for guidance on the disposal of remaining non-compliant fuel oil on board. The Sub Committee could not reach a decision on this issue and invited further concrete proposals to MEPC 74 where, based on an intervention from ICS, the issue would be considered as a matter of urgency.

4.4 Fuel oil safety matters

The Sub Committee noted the following decisions related to fuel oil safety made by MSC 100:

1. Addressing fuel safety issues at MSC: MSC 100 agreed to include a new output on "Development of further measures to enhance the safety of ships relating to the use of fuel oil". MSC 101 will begin consideration on proposals under this new output.

2. Register of bunker suppliers: MSC 100 noted that the requirement to maintain a register of bunker suppliers was under the purview of MARPOL and agreed that the proposed bunker supplier licensing schemes should be addressed by MEPC. ICS has submitted a related proposal to MEPC 74. The submission is co-sponsored by BIMCO, INTERTANKO, INTERCARGO, IPTA and WSC.

3. GISIS module for fuel oil safety matters: MSC 100 supported the enhancement of GISIS to provide greater granularity in fuel safety reports and invited MEPC 74 to advise MSC 101 on improvements to GISIS in this regard. ICS has co-sponsored a related submission (MEPC 74/5/20) which will be considered by MEPC 74.

The Sub-Committee was informed that in order to utilize the new output on fuel oil safety that has been accepted by MSC, the Secretariat has developed and submitted a proposal (MSC 101/8/2) to deal with issues related to the supply of low-flashpoint fuels. This submission has been co-sponsored by INTERTANKO, INTERCARGO and IPTA.

One of the proposals contained in the submission MSC 101/8/2 is for the IMO to consider developing guidelines for ships to address situations where the BDN for a supplied fuel oil shows flash point complaint with regulation 4.2.1 of SOLAS chapter II-2, but the master has independent test results of the fuel sample taken by the ship during the bunkering which indicate non-compliance. A comment was made that, as it stands, there exists no explicit requirement for BDNs to state the flash point of the fuel being provided. The Secretariat provided a response that the provisions contained in the submission were based on the large majority of BDN samples that have been reported to IMO GISIS which have the respective flash points specified in them. Furthermore, it is noted that the requirement for the BDN to declare compliance with all the requirements of regulation 18.3 of MARPOL Annex VI as per Appendix V of the annex, indirectly requires a declaration that the fuel oil being supplied meets the relevant flash point requirements as per SOLAS Chapter II-2. Notwithstanding this, the Sub Committee endorsed the view that the proposal should also address the need for an unambiguous requirement for BDNs to state the flash point of the fuel being supplied.

The Secretariat informed the Sub Committee that the verbal introduction of the submission will therefore be amended to highlight this point.

Follow up action from the last Sub-Committee meeting

The last meeting of the Sub Committee had instructed the Secretariat to consider options to address the existing issue that if a ship receives fuel which is not in accordance with the declaration made in the BDN then as soon as the ship is aware of this fact as a result of fuel analysis it must inform relevant authorities and insurers and may face significant consequences.

The Sub Committee was informed that based on this instruction and in order to gain sufficient guidance from IMO on this issue, ICS has co-sponsored a related submission (MEPC 74/10/13) with INTERTANKO which will be considered at MEPC 74.

4.5 Exhaust Gas Cleaning Systems (EGCS)

Members were informed about the following salient outcomes from PPR 6 on the issue:

- The Sub-Committee agreed that the revised 2015 EGCS Guidelines be prepared as a new set of Guidelines (e.g. 2020 EGCS Guidelines) that will only apply to new installations fitted after a specific date, and existing EGCSs approved in accordance with 2015 EGCS Guidelines will not need to be approved again;

- The Sub-Committee encouraged interested Member States and international organizations to undertake further scientific research and to submit results to future sessions to facilitate the work on the revision of the 2015 EGCS Guidelines. PPR 6 also requested IMO to explore the possibility of GESAMP carrying out a review of the relevant scientific literature and also overseeing a modelling study of the impacts

of discharge washwater from exhaust gas cleaning systems and to inform the Sub-Committee at its next session;

- ICS highlighted concerns about the IMO having this discussion so late and highlighted the risk that it may generate uncertainty in the industry;

- The Committee noted the urgent need for guidance on failure of a single monitoring instrument and on recommended actions to take if the EGCS fails to meet the requirements, and a draft MEPC Circular will be submitted to MEPC 74, consolidating the interim guidance contained in appendix 6 to the report of the CG along with related comments.

Members noted that the Environment Sub Committee and the Marine Committee had considered the EU submission to MEPC 74 proposing a new output for evaluation and developing harmonized rules and guidance on the discharge of liquid effluents from EGCS. The Marine Committee had endorsed the view of the Environment Sub Committee that the Secretariat should support the concept of a harmonized approach to developing rules and guidance on this issue while specifying that any such measures should be based on sound technical evidence and that the principle of grandfathering is maintained throughout the process. During a brief discussion on the draft text of intervention to this submission that was circulated as MC(19)40, further comments were made regarding the suitability of the wording used for the intervention.

Action - Consequently, the Secretariat was instructed to amend the draft intervention to take into account the comments made and circulate the final draft to Members. An updated intervention has subsequently been circulated as MC(19)46.

Additionally, based on the query from an ICS Member Association, the Sub Committee considered formulating an ICS position on the issue of non-short term exceedances indicated by scrubber monitoring systems. This issue will be considered by MEPC 74 as part of the guidance on failure of a single monitoring instrument and recommended actions to take if the EGCS fails to meet the requirements as provided in the document MEPC 74/5/8. The issue raised was specifically with the time period of 1 hour suggested before any malfunction should be reported to the flag and port State's Administration along with an explanation of the steps the ship operator is taking to address the failure. Based on discussions on this issue, the Sub Committee agreed that in order to preserve a level playing field in the operation between ships using different means to achieve compliance with the sulphur requirements, ICS should support the contents of MEPC 74/5/8 as submitted.

4.6 NOx Emissions

The Sub-Committee was updated on NOx related developments. A number of new IACS unified interpretations which were necessary to accommodate the forthcoming North Sea and Baltic NOx emission control areas and recording changeover between different NOx emission Tier models had been agreed at PPR 6. In addition, PPR 6 had also invited interested member states and international organizations to report experiences with the operation of SCR fitted engines which had been certified under MARPOL Annex VI, with particular respect to long term performance and ammonia slip, to a future session.

The Sub-Committee was also informed that France had submitted a technical feasibility study for the implementation of an Emission Control Area (ECA) in the Mediterranean Sea, which was a precursor to a likely future application to designate the Mediterranean

Sea as an ECA. Such an application would need the positive support of all the Mediterranean Sea littoral states and it was assumed that the necessary discussions to secure such support were underway.

Members noted the information provided.

4.7 Black Carbon Emissions

The Committee was advised that PPR 6 had recommended to MEPC 74 that the terms of reference for the existing work item on Black Carbon (which had been agreed at MEPC 62) should be considered as having been completed. MEPC 74 would be considering further work on the reduction of the impact on the Arctic of Black Carbon emissions from international shipping, the Secretariat proposed supporting proposals provided in document MEPC 74/10/8 (Finland et al) which provided a rational and scientific approach to further developing this matter. An alternative proposal to proceed directly to a prohibition on the use of HFO in the Arctic to reduce emissions of Black Carbon (document MEPC 74/10/12, Pacific Environment & CSC) were considered to be counterproductive and not supported by available measured data. The Secretariat considered that further work would be needed to define a robust measurement technique and protocols before Black Carbon control measures could be agreed.

Members noted the information provided.

4.8 Development of Guidelines for Cold Ironing of Ships

The Sub-Committee was updated on progress being made by IMO to develop operational guidelines for cold ironing. ICS continued to participate in this work and supported completion of suitable operational guidelines.

There was a discussion of the ICS policy on cold ironing, this was a nuanced position which supported cold ironing where electricity could be supplied from low carbon sources but which questioned the appropriateness of cold ironing in cases where, for example, electricity was generated by coal fuelled power plants. The Sub-Committee noted the local emissions benefits of cold ironing, however the GHG benefits were less certain. The Secretariat advised that these were policy matters which had been agreed by the Marine Committee as part of the process to develop a series of joint industry submissions to ISWG-GHG5 and that the agreed position on cold ironing was a compromise position which had been developed in order to secure joint industry support for these submissions.

Members noted the information provided.

5. BALLAST WATER MANAGEMENT UPDATE

5.1 Presentation from Ballast Water Equipment Manufacturer's Association (BEMA)

Following consideration of agenda item 3 the President of BEMA, Mark Riggio, delivered a presentation to the Sub-Committee titled "*Introduction to the Ballast Water Equipment Manufacturers' Association*". Subjects covered included:

- Mission;

- Purpose;
- Members and types of membership;
- Leadership;
- What BEMA can do for you;
- How to reach BEMA.

Following the presentation there was a short Q&A session during which the Sub-Committee was advised that:

BEMA was looking at how to tier itself in order to provide assurance to those using its members' products and services;

BEMA could possibly work with ICS to develop a joint BEMA/ICS FAQ document using the already available ICS document as a base document;

With respect to BEMA having a 24/7 contact point for queries this was not currently possible as they hadn't the resources but that BEMA was in its infancy and this may be taken forward at some point in the future but in the meantime any queries would be answered asap;

BEMA shared the understanding that efficacy testing during BWMS commissioning was intended to take the form of indicative testing of local waters that had been treated and was simply to replicate the indicative sampling and analysis that could be performed by PSC.

The Chair on behalf of the Sub-Committee thanked Mr Riggio for his presentation and noted that ICS through Jonathan Spremulli had been invited to attend BEMA's Annual Meeting as a guest to discuss how BEMA and ICS could work together.

Action: The Sub-Committee encouraged the Secretariat to continue to build the relationship with BEMA and look at ways of working together.

5.2 Ballast Water Management Convention Developments.

5.2.1 Status of ratification of the BWM Convention.

The Sub-Committee was advised that the IMO Secretariat reported at PPR 6, held 18 to 22 February 2019, that as of the 26 July 2018, that the number of Contracting Governments was currently 79, representing 80.94% of the world's merchant fleet tonnage.

(Post meeting note: As of 24 May 2019 according to IMO's GISIS Status of Treaties database the number of Contracting Governments was 81 representing 80.76% of the world's merchant fleet tonnage)

The sub-committee noted the information provided.

5.2.2 Validation of the compliance of individual BWMS with regulation D-2 of the BWM Convention in conjunction with their commissioning.

The Sub-Committee recalled that MEPC 73 in 2018 had considered a submission from Japan (MEPC 73/4/5), expressing the view that there were still a number of implementation issues that needed to be addressed before making mandatory the validation of compliance of BWMS with the D-2 standard during commissioning. The

submission from Japan had proposed to keep mandatory validation in abeyance until data and experience had been gained.

It was further recalled that MEPC 73 had decided that the validation should not be kept in abeyance and approved BWM.2 circular 70 on Guidance for the commissioning testing of ballast water management systems. Importantly it was agreed that the validation should be analysed using indicative analysis methods not detailed analysis and that ambient water should be accepted for testing regardless of the level of challenge it poses to the BWMS.

The Sub-Committee clarified that as reported in the ICS report of MEPC 73, MC(18)99, it is to be understood that a positive test result using indicative analysis of treated ambient local waters doesn't prove that the system is fully effective as the challenge to the system presented by the ambient waters will vary from location to location. However, should the system fail the indicative analysis then the system has not met the D-2 efficacy standard and a significant problem exists which should be corrected by the shipyard and BWMS manufacturer prior to the system being accepted. The efficacy test at the time of commissioning effectively emulates the type of indicative sampling and analysis that may be conducted by PSC once the ship is in operation and using its BWMS to comply with the D-2 standard.

It was further noted MEPC 74 will consider proposals for related amendments to regulation E-1.1.1 of the BWM Convention to make efficacy test using indicative analysis as part of commissioning of systems mandatory.

5.2.3 Contingency measures in the ballast water management plan.

The Committee was advised that MEPC 73 discussed proposals relating to when elements introduced by the Guidance on contingency measures under the BWM Convention (BWM.2/Circ.62) should be included in the ballast water management plans of ships.

It was reported that MEPC had agreed that this is to be left to each Member State to decide on the possible timing for the incorporation of information on contingency measures into the ballast water management plans for ships flying their flag. MEPC had further agreed to the addition of the following new paragraph 4.3 (under the section "Non-Mandatory Information") in part B of the Guidelines for ballast water management and development of ballast water management plans (G4):

"4.3 The ballast water management plan may include contingency measures developed taking into account guidelines developed by the Organization."

The sub-committee noted the information provided.

5.2 United States Ballast Water Regulation Developments.

The Sub-Committee noted that at the time of the meeting the USCG had granted full USCG approval to 17 systems and in addition 9 further systems were being reviewed for approval and that details of the Coast Guard Type Approval Certificates can be found on the USCG Approved Equipment List at: http://cgmix.uscg.mil/Equipment/Default.aspx .

6. RECENT AND FORTHCOMING IMO MEETINGS

6.1 MEPC 74

6.1.1 EEDI and Minimum Power

See minutes under agenda item 4.1.

6.1.2 Underwater noise from ships

The ICS Secretariat reported it had attended a technical workshop on quiet ships hosted by Canada and held at IMO 30 January to 1 February 2019. Members in attendance at the workshops included: KVNR, VDR and UK CoS. The purpose of the workshop was to explore technical and engineering matters related to quieting ships to reduce the impact of underwater noise on marine species. That said, operational measures were discussed in the margins, in particular routeing and operational speed reductions. There was an aspiration for a 3dB global reduction in ambient noise over a decade. This would equate to a 50% reduction in ambient noise and was viewed by some as a means of reversing the current trend of increases in ambient noise. Whilst some data is available, the ICS Secretariat expressed the view that without a baseline measure of the current contribution of global fleet to ambient noise, and the noise performance of ships, it would be impossible to establish such a target and determine feasible / cost-effective measures for noise reduction. Members shared the concerns of the Secretariat on this matter. The Sub-Committee was advised that there were potential co-benefits between energy efficiency and noise reduction, however it was important not to assume that all noise reducing techniques could improve energy efficiency since evidence presented at the workshop indicated that quieter ships are not necessarily more efficient. One Member highlighted some significant short comings with the evidence being used by Canada to support their calls for a 3dB global reduction since it was based on data collected in enclosed waters around Vancouver harbour and not representative of open waters for which there was an absence of data. It was also noted that the most significant sources of anthropogenic marine noise originated from military activities, such as sonar systems.

The Sub-Committee was advised that Members should expect to see positive proposals to develop IMO instruments to control underwater noise from ships to be submitted to MEPC 75 or MEPC 76 and that this was expected to become a significant work item in the years ahead and the Secretariat would continue to monitor developments closely.

The Sub-Committee noted the information provided.

6.2 SDC 6

6.2.1 Mooring arrangement design, equipment and fittings - Amendments to SOLAS regulation II-1/3-8 on design of mooring arrangements

The sub-committee noted that SDC 6 had finalized draft amendments to SOLAS regulation II-1/3-8 and that they would enter into force 1 January 2024, subject to approval from MSC 101 and adoption by MSC 102. The amendments will:

- Require mooring arrangements of ships of 3000 gross tonnage and above are designed to address occupational safety and safe mooring of the ship, and to recommend that this requirement is applied to ships of less than 3000 gross tonnage, so far as reasonably practical; and

- Recommend mooring equipment including lines to be maintained in a suitable condition for the intended purpose.

In addition, the sub-committee noted that the draft Guidelines were also finalized:

- Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring (Guidelines on design);

- Guidelines on the inspection and maintenance of mooring equipment including lines; and

- Revised guidance on shipboard towing and mooring equipment (MSC.1/Circ.1175/Rev.1).

The sub-committee noted that during SDC 6 ICS had expressed the view that:

- Requiring any ship specific information on mooring arrangement design in undefined documentation with statutory status has the potential to introduce uncertainty in the context of demonstration of compliance, particularly in the case of port State Control inspections; and

- Whilst there remain questions regarding the Guidelines ability to support uniform implementation, documentary evidence of compliance with the provisions of SOLAS regulation II-1/3-8.7 should be limited to the statutory certification required by SOLAS chapter I.

6.3 SSE 6

6.3.1 Onboard lifting appliances and anchor handling winches (OLAW)

The Sub-Committee was advised that SSE 6 had made good progress on the matter of Onboard lifting appliances and anchor handling winches (OLAW). The Sub-Committee agreed to use the proposals provided by Japan and ICS in document SSE 6/9/2 rather than work of the correspondence group as the basis for finalizing draft new SOLAS regulation II-1/3-13, which was considered to be a positive development. Agreement had been reached on a number of important issues, including using a SWL threshold of 1000kg in the regulation, Administrations will however be free to apply the new SOLAS regulation to all OLAW is at their discretion in their own respective national regulations. The requirements maintained an alignment with ILO Convention 152. Equipment covered by the draft new SOLAS regulation will be any load-handling ship's equipment: used for cargo loading, transfer, or discharge; used for raising and lowering hold hatch covers or moveable bulkheads; used as engine room cranes; used as stores cranes; used as hose handling cranes; used for launch and recovery of tender boats and similar applications; and used as personnel handling cranes. The design and construction of new lifting appliances will be subject to the requirements of a recognized organization. Anchor handling winches will need to be designed and constructed in accordance with the requirements of the Administration, based on the Guidelines for anchor handling winches being developed. The through life management of OLAW and loose gear is addressed in separate Guidelines, not the SOLAS regulation. The SOLAS regulation states that OLAW and loose gear shall be managed based on the recommendations in Guidelines developed by the Organization. This should allow the application of the

certification regime of SOLAS chapter IX (ISM) rather than SOLAS chapter I to this aspect of new and existing OLAW and loose gear.

Importantly, unless the provision of SOLAS chapter I on maintenance of condition after survey applies, an inoperative OLAW or item of loose gear will not be grounds for considering a ship as unseaworthy or delaying the ship in port, even if repair facilities are available.

The Secretariat considers the outcome to be a compromise which should not pose any additional administrative burden to Companies that already responsibly manage their OLAW and loose gear. Essentially the new SOLAS regulation and guidelines for loose gear codify existing good practice which is already applied by most ships.

There was some discussion over certification and the interaction with the ISM Code, it was clarified that the structural elements of lifting gear, such as crane pedestals, would be included within the SafCon Certificate survey regime whilst loose gear would be addressed via ISM. This was consistent with existing practice. In response to concerns at the term “competent person” it was clarified that this related to “competent person” as defined in the new OLAW requirements, and not in the context of STCW. Again this reflected existing practice and it was considered that the industry already managed the process of designating competent persons and ensuring such persons had the necessary skill and competency.

The Secretariat continued to participate in the correspondence group which had been established at SSE 6 to work intersessionally.

Members noted the information provided.

6.3.2 Review SOLAS chapter II-2 and associated codes to minimize the incidence and consequences of fires on ro-ro spaces and special category spaces of new and existing ro-ro passenger ships

The Sub Committee noted that during the finalisation of draft interim guidelines for minimizing the incidence and consequences of fires in ro-ro spaces and special category spaces of new and existing ro-ro passenger ships at SSE 6, ICS had expressed concerns in enforcing what are essentially *de facto* new SOLAS amendments through interim guidelines. This includes requirements applicable to new ships for increased fire integrity of ro-ro decks separating ro-ro spaces and that vehicles spaces and ro-ro spaces should be either closed ro-ro spaces or weather decks. The guidelines have been submitted to MSC 101 for approval.

The Sub-Committee was informed that based on discussions with INTERFERRY on this issue, ICS is co-sponsoring a commenting paper to MSC 101 detailing our concerns on the guidelines. The submission has been co-sponsored by ICS, INTERFERRY and RINA. The Sub Committee noted the submission and endorsed the Secretariat’s views on this issue.

Action – The Sub Committee agreed to recommend Member National Associations to raise this issue with their respective national Administrations with a view to supporting the submission MSC 101/14/8 when it come up for discussions at MSC 101.

7. MATTERS RELATING TO THE CARRIAGE OF DRY BULK CARGOES

The Sub-Committee was advised and noted that since the notes of the meeting were distributed the report concerning the Stellar Daisy has been published and the Secretariat was now reviewing the report concerned to assess what future action may be warranted.

8. FUEL RELATED MATTERS

8.1 ICS Guidance to Shipping Companies and Crews on Preparing for Compliance with the 2020 Global Sulphur Cap

The Sub-Committee was informed that the ICS guidance on implementation of the 2020 global sulphur cap will be updated to include the standard FONAR template and other related outcomes following MEPC 74 to be held in May 2019. The Sub-Committee also noted that the current version of the guidance has been submitted to MEPC 74 for information.

8.2 IMO best practice guidelines on assuring fuel quality.

The Sub Committee noted that the work of the correspondence group on guidance for best practice for Member State/coastal State on fuel quality has been completed and the draft guidance has been submitted for approval at MEPC 74.

8.3 Amsterdam Rotterdam Antwerp (ARA) area fuel quality working group.

The Sub-Committee noted that the ARA fuel quality group continued to consider fuel quality matters, including quality assurance of fuels and licensing of bunker suppliers and that the next meeting of the group will be held in September 2019.

8.4 Joint industry project (JIP) for the development of guidance on potential safety and operational issues related to the supply and use of 0.50% maximum sulphur fuels.

The Sub Committee noted the Secretariat's continued participation in the joint industry project (JIP) developing guidance in order to address the impact of new fuel blends or fuel types on fuel and machinery systems. Members were provided updates from the technical review meeting of this project conducted on the 24 and 25 April 2019. It is envisaged that the final version of the guidance will be ready by middle of May 2019. The final version will have elements added from the ISO PAS standard. The Secretariat informed the Sub Committee that this final version will be circulated among Members for review.

9. IACS AND RECOGNISED ORGANISATIONS

9.1 IACS Interim Recommendations on Cyber Systems

The Sub Committee noted that:

1. In November 2018, the ICS Secretariat and representatives from other industry associations, manufacturers and insurers met with the Chairman of the IACS General Purposes Committee (GPG) and the IACS Secretariat to discuss the concerns. Whilst this meeting did not discuss the technical content of the Interim Recommendations, it did address:

    - Conceptual issues and the overall approach to the IACS Recommendations, taking into account the need for them to be implementable;

- Structural issues, in particular the need for a more concise set of recommendations which were easier to work with during both development and implementation; and
- Coordination and cooperation issues, in particular the relationship between the IACS Cyber Panel and the JWG/CS.

2. On 10 January 2019 the JWG/CS met to discuss in more detail how to take things forward. On the basis of the discussions at this meeting, the ICS Secretariat prepared a concept document which was further developed by the Chairman of the IACS Cyber Panel and the GPG representative of Lloyd's Register. This document was agreed by the JWG/CS and fed into a joint meeting of the IACS Cyber Panel and the JWG/CS on 23 January 2019.

At the joint meeting of the IACS Cyber Panel and the JWG/CS progress was made on addressing the conceptual, structural and coordination and cooperation issues previously raised.

In particular, agreement to move towards a single or small number of goal-based recommendations supported by specific rules relating to cyber systems in general, and increasingly onerous requirements based on the level of integration on board. The level of integration is considered the main differentiator of risk between ships.

Following the meeting, the ICS Secretariat shared further ideas with the Chair of the IACS Cyber Panel on how to proceed in developing a recommendation which achieved this outcome.

Regarding next steps, the Sub Committee was advised that the industry representatives are pushing for IACS to finalise a timeline and actions so that substantial progress could be reported to MSC 102 (if necessary) in 2020. However, the next meeting of the JWG/CS was still to be confirmed.

9.2 IACS CSR External Advisory Group (EAG)

The Sub-Committee was informed that Mr. Maurizio d'Amico (Chairman of ICS C&E Sub Committee), Mr. Dimitrios Fafalios (Chairman of ICS Bulk Carrier Panel) and Mr. Jonathan Spremulli (ICS Principal Director - Marine) attended the last meeting of the EAG on 15 January 2019 where IACS tabled a number of possible rule change proposals (RCPs) for 2019. Members of the EAG had commented on the possible RCPs and IACS will now finalise those RCPs which it intends to continue to take forward and these will be circulated across industry stakeholders for feedback.

10. GOAL BASED IMO STRUCTURAL STANDARDS FOR BULK CARRIERS AND OIL TANKERS

The Sub-Committee noted this is a standing item on the Sub-Committee's agenda and there were no major developments to report on this agenda item since the last meeting.

11. LSA

11.1 Potential IMO submission regarding the safety of single fall lifeboat/rescue boat hooks

Members noted that SSE 6 agreed that further consideration on this matter was necessary and, therefore, invited revised proposals to SSE 7.

The Sub-Committee was informed that the UK has expressed support for the submission and has also agreed to discuss with the US regarding not opposing the submission on the basis that the US did not have an experience of associated incidents, because other Member States did.

The Sub Committee endorsed the Secretariats intention to develop proposals for inclusion in a submission to SSE 7.

11.2 Survival craft ventilation

The Sub-Committee noted that SSE 6 decided to retain the draft amendments to the LSA Code with respect to ventilation requirements for totally enclosed lifeboats, despite concern previously to MSC 100 (MSC 100/9/10) regarding the practical feasibility of the proposed draft amendments to the LSA Code requiring ventilation of 5 m3/person/hr for newly installed totally enclosed lifeboats.

The Sub-Committee further noted that concerns were again expressed during the working group at SSE 6 by the United States, Canada, the United Kingdom & ICS that the agreed performance standard of 5 m3/hr/person might not maintain a long-term CO2 concentration limit of 5,000 ppm as a performance standard for establishing a habitable atmosphere in totally enclosed lifeboats and that it was recommended that the 5,000 ppm CO2 concentration limit would be a better criterion for establishing a performance standard inside totally enclosed lifeboats. This would provide the necessary design flexibility for manufacturers to determine the best means of maintaining a habitable environment in not only totally enclosed lifeboats, but also any survival craft.

In addition to being an inappropriate criteria applying the agreed ventilation rate of 5 m3/person/hr to survival craft other than totally enclosed lifeboats is likely to bring unintended consequences in terms of equitable application.

The sub-committee were advised that the work on ventilation on survival craft, other than totally enclosed lifeboats would commence via correspondence group, which ICS would participate in.

11.3 Capacity of LSA

The Sub-Committee noted that MSC 100 agreed that document MSC 100/17/6 should be considered by the SSE Sub-Committee and work will commence at SSE 7, with a target completion date of 2024.

Members recalled that the proposal recommends that the LSA Code requires amendment to ensure that proposed seating arrangements properly allow adequate space to ensure the accommodation and survival of the number of persons the design is certified to carry.

The proposed output is “Assessment on the Practicality of Survival Craft Arrangements”. The output will examine the existing LSA Code and pertinent documents, assess their suitability for the LSA design conditions including remote rescue, and propose suitable amendments to the Code.

11.4 Lifeboat restraints and strength requirements

The Sub-Committee noted that ICS has co-sponsored a submission to MSC (MSC 101/21/10) for a new output to develop design and prototype test requirements for the arrangements used for operational test of free-fall lifeboat release system without launching the lifeboat and will deliver an intervention in support.

11.5 LSA wire ropes failures

The Sub-Committee noted that CLIA are considering a submission to MSC 102 regarding steel wire ropes.

The Sub-Committee further noted advised that RINA are considering a draft submission to MSC regarding alternative materials for lifeboat falls and if so decided to proceed will provide the draft submission for circulation to ILG members for review and comment in due course with a view to co-sponsorship and/or support in plenary.

11.6 LSA on container ships

The sub-committee noted that the Container Panel had expressed concern that the LSA requirements, specifically regarding survival craft are no longer appropriate for very large and ultra large container ships with twin superstructure areas, for example positioning of lifeboats and liferafts, and the possible locations of container stack fires.

Further consideration on this issue is required to find appropriate solutions, which may require amendments to the LSA Code.

The sub-committee decided that a working group of relevant member experts should be established under the remit of the Container and Dangerous Goods Panels to review and find a common way forward. The Secretariat will issue a Circular to members outlining the issue and requesting member involvement in the working group.

The Sub-Committee decided to establish a working group to review and develop an ICS position and potential submission to IMO.

11.7 Lifeboat testing

The Sub-Committee noted that the UK has advised the ILG of a potential submission to MSC 102 on lifeboat testing as they have identified that some lifeboat service agents and ship operators have stated that they have never tested the boat itself when completing 5yr testing.

The UK's interpretation of the 5yr testing dynamic winch brake test is that the system is tested if the brake would be applied during the normal test and that the whole system should be tested when undertaking an equivalent test. The UK requires either the Lifeboat to be loaded on the hooks to 110% or for a static equivalent load to be used to load the boat on the quayside.

The sub-committee noted that if the UK drafts a submission to IMO, it was recommended to circulate to ILG members in advance, for review and comment with a view to co-sponsorship and/or support in plenary.

12. FUTURE WORK PROGRAM

The Sub-Committee was invited to consider its future work programme taking into consideration the previous agenda items discussed and any relevant topics scheduled for consideration at forthcoming meetings of IMO. No further work items were identified.

13. ISSUES TO BE FORWARDED TO THE MARINE COMMITTEE

The Sub-Committee were invited to identify as appropriate, any specific issues to be forwarded for consideration by the Marine Committee. No items were identified on this occasion.

14. DATE OF NEXT MEETING

The Sub-Committee considered the date of its next meeting and provisionally agreed that the next meeting will be held Wednesday 13 November 2019 (**NB see change of date of meeting to <u>20 November 2019</u> reported below**).

IMPORTANT Post meeting note: Subsequent to the meeting of the Sub-Committee IMO MEPC 74 decided that the 6th Meeting of the IMO Intersessional Working Group on Reduction of GHG Emissions from Ships (ISWG GHG 6) will take place 11 to 15 November 2019. This has necessitated the date of the **next combined meeting of the Construction and Equipment Sub-Committee, Bulk Carrier Panel and Passenger Ship Panel to be changed** from the provisional date of Wednesday 13 November 2019 **<u>to Wednesday 20 November 2019</u>**.

15. ANY OTHER BUSINESS

15.1 Lube Oil Arrangements for Engines

The Sub Committee noted the information provided by the Secretariat on the recent incident involving the loss of propulsion on the cruise ship Viking Sky on 23 march 2019, wherein initial findings have suggested low lubricating oil levels as the underlying cause.

The Sub Committee noted the Secretariats concerns that this incident would be conflated with the unfortunate sinking of the cargo ship El Faro in October 2015 in which loss of propulsion due to low lube oil pressure to the main engine resulting from a sustained list was identified as a contributing factor.

The Sub Committee noted the Secretariat's concerns over the initial findings in the Viking Sky incident being similar to the issue that led to the loss of propulsion on the El Faro which it believes will prompt an IMO review of the related SOLAS requirement for all ships. Following a brief discussion on this issue, the Sub Committee agreed that the final investigation report of the Viking Sky incident needs to be reviewed before any further action could be identified.

15.2 Safety issue identified on chemical tankers

The Sub-Committee recalled the previous information regarding a safety issue identified by the IMO Casualty Analysis Correspondence Group relating to fires in forecastle stores on chemical tankers.

The Sub-Committee noted that this issue was discussed at the combined Chemical Carrier and Oil Tanker Panel meeting 27 February 2019, as reported in Circular CC (19)02 & OT (19)02.

The incidents involved the following ships:

- **Border Heather** (Oil tanker - 2004);
- **Royal Diamond 7** (Chemical/product tanker – 2012 (1st explosion)); and
- **Liang Sheng** (Chemical/product tanker - 2014).

The common cause was the presence of cargo vapour in a space (the forecastle store, Bosun's store or bow thruster compartment) which was classified by the Administration, shipyard and classification society as safe. Consequently, the space contained electrical installations appropriate for a safe area but inappropriate for a hazardous area. Whilst the spaces would usually be safe, under certain foreseeable conditions (inappropriate or failed isolation of a gas-freeing system from cargo piping) these spaces became hazardous as they contained a potential source of vapour release (IEC Standard 60092-502:1999, table 1).

Following a further review of the marine safety incident investigation reports and statutory developments, the Secretariat provided the Panels with a summary of the findings.

The Panel noted that:

- All of the ships were less than 10,000 gross tonnage;

- The human element was a contributing factor in at least two of the incidents to the presence of flammable cargo vapour in supply ducts for gas freeing systems;

- The incident on the Border Heather indicate that any space associated with or containing piping that is, at any time, connected to the cargo system should be considered as a dangerous space;

- The Royal Diamond 7 indicated that piping that is, at any time, connected to the cargo system should include supply ducts for gas freeing systems which may pass through service or machinery spaces otherwise considered as safe. This includes if the isolation of the gas-freeing system includes physical separation by way of a spectacle blind flange;

- Where supply ducts for gas freeing systems pass through service or machinery spaces otherwise considered as safe, measures should be taken to mitigate against the risk of ignition in the event of flammable cargo vapour migrating into gas-freeing systems. This could be achieved either by having electrical equipment which is safe for the hazardous zone, or introducing gas tight boundaries between supply ducting and the space; and

- No statutory work by the Organization has taken place to address the risk identified.

Consequently, there is the potential for a hazard to be present on tankers which Companies should be aware of. It may therefore be necessary to provide advice which encourages Companies to:

- Consider inspecting forecastle service or machinery spaces to identify piping and ducting arrangements which could result in the presence of flammable cargo vapour in a space otherwise considered safe. This should include in the event of inappropriate or failed isolations of gas-freeing systems from cargo pipework; and

- Should any such arrangements be identified which the Company considers could present a risk of fire, the Company should consult with the ship's classification society.

The sub-committee noted that the Panel had agreed that the ICS Secretariat should:

1. Consult with OCIMF and INTERTANKO for their views, which was undertaken but no information was available/provided; and
2. Circulate appropriate advice to Members and Companies, as necessary, which was circulated under Circular CC (19)03 & OT (19)03.

15.3 Pilot Protection Shelters

The sub-committee were advised that the Secretariat had been approached by the IMPA Secretariat regarding the need for pilot protection shelters on ships. IMPA's members have reported concerns over the adverse impact of exposure in cold and warm weather on the performance of pilots and the safety of pilotage. Recalling the requirements of the Panama Canal Authority, IMPA's members are of the view that the need for shelter is not limited to the Panama Canal. However, it is acknowledged that the Panama Canal Authority requirements for arrangements of pilot platforms and shelters may not be the most suitable, and do not apply to all ships transiting the Canal. The options being considered are: robust permanent shelters, half enclosed bridge wings, or fully enclosed bridges.

The Secretariat raised this issue with Members due to the costs of such arrangements would be borne by shipowners and operators. The ICS Secretariat had requested, but not received, information from IMPA on specific cases in which pilot exposure during pilotage was a contributing factor in a maritime safety incident, or the frequency of occasions on which port entry has been delayed or pilots have been unable to safely conduct pilotage because of the risk of exposure. The sub-committee were advised that on this basis it was difficult to establish a compelling need.

The sub-committee agreed that this was not something ICS should support and that no further action was required.

The Sub-Committee agreed no further action is required.

15.4 FFE on Container Ships

The sub-committee noted that the Container Panel had also expressed concern that the Fire Fighting Equipment (FFE) requirements are insufficient or inappropriate for very large and ultra large container ships and that alternative solutions are needed, for example to reach a fire on the top of a container stack and also for fire protection of the accommodation block.

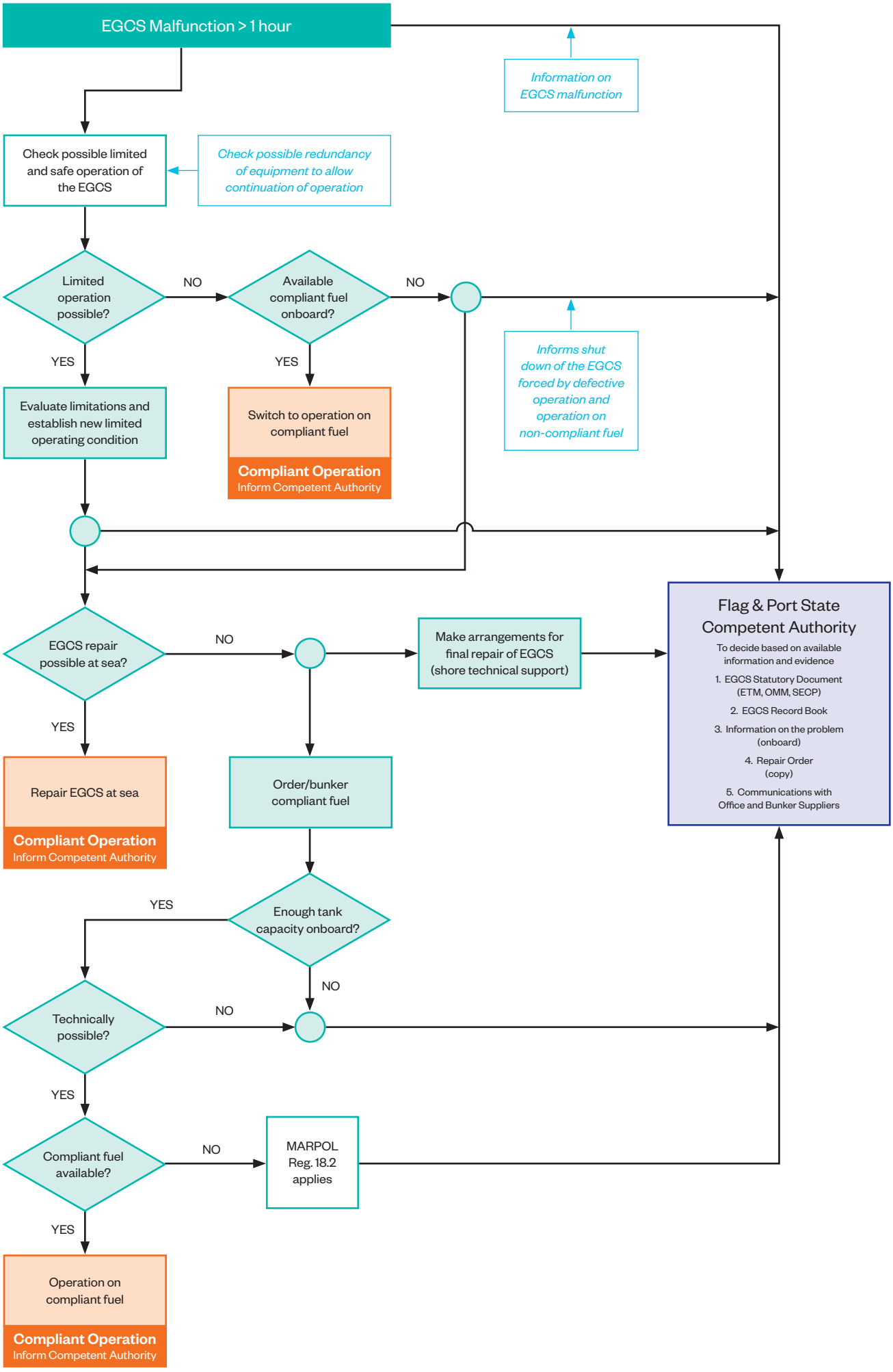
Further consideration on this issue is required to find appropriate solutions, which may require amendments to the FSS Code.

The sub-committee noted that the amendments to SOLAS reg 10.1.2 entered into force 1 January 2016 should address this issue. The sub-committee agreed however that the working group established under LSA on container ships, should review, but that if the amendments to SOLAS were considered appropriate to address this issue then no further action was required.

The sub-committee agreed that the working group to be established to review LSA on container vessels. The sub-committee also agreed the working group should also review FFE requirements as appropriate but if considered adequate no further action is required.

15.5 Change of Sub-Committee Secretary

The Sub-Committee noted that due to a change of roles and responsibilities within the Marine Department it has been agreed that John Bradshaw will replace Jonathan Spremulli as the Secretary to the Construction and Equipment Sub-Committee and Bulk Carrier Panel. Sunil Krishnakumar will also replace Matthew Williams as the Secretary to the Passenger Ship Panel. Additionally, so long as the Sub-Committee and 2 panels meet jointly Sunil Krishnakumar will assist John Bradshaw in the secretarial duties.


EGCS Malfunction > 1 hour
Information on EGCS malfunction
Check possible limited and safe operation of the EGCS
Check possible redundancy of equipment to allow continuation of operation
Limited operation possible?
NO
Available compliant fuel onboard?
NO
YES
YES
Informs shut down of the EGCS forced by defective operation and operation on non-compliant fuel
Evaluate limitations and establish new limited operating condition
Switch to operation on compliant fuel
Compliant Operation
Inform Competent Authority
EGCS repair possible at sea?
NO
Make arrangements for final repair of EGCS (shore technical support)
Flag & Port State Competent Authority
To decide based on available information and evidence
1. EGCS Statutory Document (ETM, OMM, SECP)
2. EGCS Record Book
3. Information on the problem (onboard)
4. Repair Order (copy)
5. Communications with Office and Bunker Suppliers
YES
Repair EGCS at sea
Compliant Operation
Inform Competent Authority
Order/bunker compliant fuel
YES
Enough tank capacity onboard?
NO
Technically possible?
NO
YES
Compliant fuel available?
NO
MARPOL Reg. 18.2 applies
YES
Operation on compliant fuel
Compliant Operation
Inform Competent Authority

CIMAC
INTERNATIONAL COUNCIL ON COMBUSTION ENGINES

01 | 2019

CIMAC Guideline

Marine fuel handling in connection to stability and compatibility

By CIMAC WG7 Fuels

The first edition of this CIMAC Guideline was approved by the members of the CIMAC WG7 ‘Fuels’ in November 2019.

Content

1 Scope

This guidance aims to provide a practical and working understanding of the definition of stability and compatibility of marine fuel oils and how these two specific fuel properties may be best managed in the supply chain and on-board ships.

This compliments and expands on the information given in ISO/PAS 23263:2019 “Considerations for fuel suppliers and users regarding marine fuel quality in view of the implementation of maximum 0.50% Sulphur in 2020” (hereafter referred to as “the PAS”). The PAS has been written to support the International marine fuel standard ISO 8217:2017, to which this guideline will also refer.

Details on the accepted available test methodologies for stability and for predicting compatibility are included, covering their applicability and correct interpretation. All stakeholders involved, in the supply and/or use of marine fuel oil are invited to adopt this guidance as ’the common industry approach’ on the subject matter.

2 Introduction

Essentially all existing marine fuels, distillates and residuals, are to some degree mixtures or blends of a range of hydrocarbon fractions both in terms of the base hydrocarbon products from which they have been produced and from subsequent blending, to meet certain specification requirements.

Already a factor of existing fuels, marine fuel stability is addressed in ISO 8217:2017 by test method ISO 10307-2. It is the responsibility of the supplier to ensure that the fuel as delivered is stable.

It is the responsibility of the engineers on board to apply best practice fuel management to mitigate the risk of mixing incompatible fuels; this is best achieved through defining a ship specific storage segregation strategy and where this cannot be avoided by applying a concise commingling plan. Various methods are available for determining the compatible nature of a specific fuel with other fuels.

This document provides an overview of the commonly accepted and available test methods applicable to fuel stability. In addition, the methods that can be used to evaluate compatibility between fuels, either by direct testing and/or through forward prediction will be covered.

2.1 Stability in the context of IMO 2020

Traditionally, for the residual fuels, blending was principally in terms of viscosity control but then, with the greater availability of high-density refinery products, density also became a blending factor. The increasing restrictions on marine fuel sulphur content, defined by MARPOL Annex VI Regulation 14.1.3, have changed the primary blend target from viscosity and density to sulphur.

Whereas viscosity and/or density are at a relatively consistent level within the same fuel grades in the pre-2020 fuels, the implications of this mean that marine fuels post 2020 are expected to result in a wide variability of fuel formulations and characteristics alike.

Despite this variability in characteristics against a single ordering specification, CIMAC still recommends all marine fuels be purchased under ISO 8217:2017[1] in its entirety[2]. In addition, the fuels shall be sulphur compliant in accordance to statutory requirements.

3 PART 1 – Understanding Stability and Compatibility

3.1 The complexity of residual fuel oils

It is important to appreciate that residual marine fuel's chemical composition is difficult to define as it much depends upon the source of the crude oil and the manufacturing processes. The constituents of a residual fuel however include asphaltenes, resins and liquid hydrocarbons.

The generic term 'asphaltenes' covers a wide range of heavier hydrocarbon structures of high molecular weight and high carbon/hydrogen ratios, the exact constituents being dependent on the crude source and choice of blend stocks. The nature of the liquid hydrocarbons will determine the fuels capability to maintain the asphaltenes in suspension and remain in a stable condition allowing this important source of energy to take part in the combustion process. (See Annex A for a more detailed chemical explanation).

If the asphaltenes cannot be retained in their suspended (colloidal) state, they will drop out as sludge and the fuel has become unstable. Any break in the suspension results in an irreversible unstable condition, with potential serious operational implications, the likes of which are explained later in this document.

The terminology used when talking about the risk of asphaltenes precipitation is:

- Stability: The fuel as supplied
- Compatibility: The ability of two fuels forming a stable mix when commingled
- Stability Reserve: A measure of the ability of an oil to maintain asphaltenes in a dispersed state and prevent flocculation of the asphaltenes

3.2 Stability

Since asphaltene-free fuels cannot precipitate asphaltenic sludge by themselves, it is not applicable to discuss asphaltene stability for such fuels.

The stability of a residual fuel is defined by its resistance to precipitate asphaltenic sludge despite being subjected to forces, such as thermal and ageing stresses, while handled and stored under normal operating conditions.

ISO 8217:2017 specifies that fuels must be stable.

[1] This guideline can also be used in conjunction with earlier editions of ISO 8217 when an earlier edition is included in the commercial agreement between seller and buyer
[2] See also ISO/PAS 23263:2019

3.2.1 Factors influencing stability

Fuel formulation

The first influence is in the formulation of the fuel blend itself. It is the responsibility of the supplier to formulate the blend to ensure that the fuel is stable and that the fuel's stability reserve is sufficient (see 3.4) to withstand the anticipated influences and conditions on board ship.

Thermal and mechanical stresses

The main influences on board ship are the direct thermal and mechanical stresses likely to be faced during storage, handling and through centrifugal treatment.

Storage time

Extended storage time can degrade the fuel to eventually break up, become unstable and deposit asphaltenic sludge.

Since there is no definitive way of assessing how long a fuel will remain homogenous and stable during storage, handling or treatment on board, it is recommended to apply "first-in first-out" principle on the use of fuel batches (see CIMAC Recommendation 25). Prior CIMAC advice has suggested to use fuels within 6 months, however, with the introduction of VLSFOs this period might need to be reduced.

3.3 Compatibility

Compatibility is the term used for the ability of two or more fuels to be comingled without evidence of material separation; or in other words, no asphaltenes precipitating when the fuels are mixed. It should be noted that two perfectly stable fuels can be incompatible resulting in asphaltenic sludge precipitation when mixed. In addition, two fuels may be compatible at some mixing ratios and incompatible at other mixing ratios – or they can be compatible or incompatible over the entire mixing ratio.

3.4 Stability Reserve

Stability reserve is an indication of the capacity for one fuel to absorb another fuel without asphaltenes dropping out of suspension. Several factors, e.g. the nature of the actual asphaltenes and the nature of the fuel oil, impact this capacity.

Part 2 of this CIMAC guideline describes test methods that might be used to obtain information on the stability reserve.

Currently ISO 8217:2017 does not include test methods that indicate stability reserve.

3.5 Consequences of unstable fuel

Fuels which are unstable are essentially unusable since the precipitated asphaltenes, together with the entrained fuel, forms excessive sludge concentration in tanks and can readily choke purifiers, filters, fuel injection equipment and even fuel lines themselves. Under such conditions fuel treatment is often impossible and even transfer becomes problematic. In the case of thermal instability, problems will normally be encountered in the purifier or service system fuel oil heaters.

In either case, even if great care and focus are taken in using the onboard cleaning system, the precipitated material can form a hard adhering, coke like material which is not easily removed other than by manual means.

Figure 1: Examples of asphaltenic sludge precipitation

The consequence therefore of a ship having an unstable fuel in its system can be severe and the only resolution is very often to manually remove the fuel from the tanks, unblocking pipe work, heaters, filters and other fuel system components, if necessary.

From a ship perspective, the impact of an unstable fuel is identical to the impact of having mixed two incompatible fuels, however, the responsibilities are very different. It is the responsibility of the supplier to provide a stable product whereas it is the responsibility of the engineers on board to apply best fuel management practice to mitigate the risk associated with mixing incompatible fuels.

3.6 Practical steps mitigating the risk of a fuel becoming unstable on board

It requires knowledge of fuel characteristics and their compatible nature to effectively apply precautionary measures handling and using marine fuels in order to mitigate potential risks and associated consequences.

The ship's primary objective when managing fuels on board should be to avoid mixing two differently sourced fuels and segregating the different fuels during storage. It is recognized however, that some degree of commingling on board the ship may be difficult to avoid, particularly in the fuel transfer, settling, service and supply circuits e.g. when switching between fuels and having to load on top of the 'unpumpable' fuels remaining in the storage tanks below the suction level.

Thermal stresses can lead to the fuel in storage becoming unstable. Consequently every efforts should be taken to prevent the fuel being unnecessarily heated over extended periods.

The following steps may be considered for mitigating the risks of either receiving an unstable fuel or creating an incompatible mixture through inadvertently commingling on board.

Stability as supplied:

1. Order the fuel to the ISO 8217:2017 specification which includes the stability test method ISO 10307-2
2. Select supplier considering recommendations in the guidance document MEPC.1/CIRC.875 ‘Best practices for purchasers.’
3. Request the Certificate of Quality (CoQ) from the supplier prior to receiving bunker and compare characteristics with that of fuels already on board. Widely diverse characteristics to one another, such as density, viscosity and carbon residue may indicate potential incompatibility issues
4. Be proactive in minimising mixing of fuels especially fuels with widely different properties
5. Perform compatibility tests between all fuels, even if segregation is applied, either on board and/or in laboratories on shore
6. If mixing in tanks is anticipated, ensure compatibility checks are made between the two fuels in accordance with the anticipated ratio and in the order of mix prior to commingling (see Chapter 4). For each compatibility test run, ratios of around 10/90, 50/50 and 90/10 are recommended as a minimum. If the mixing ratio is known, compatibility testing should be done using the actual ratio between existing fuel in the tank and the new fuel to be loaded on top.
7. Maintain a record of the compatibility between fuel tanks
8. Apply “first-in first-out” fuel inventory principle

4 PART 2 – Test methods explained

4.1 Introduction

The industry offers a number of options for confirming the stability of the fuel and to test for the compatibility between fuels. Whilst stability requires just the one fuel to undergo the test, the compatibility test to date has always required a sample of both fuels to be available in the laboratory or on board the ship for the test to be carried out.

A comprehensive review of the test methods on the market has shown that there are test methods available which – without having both fuels in the same laboratory - can provide some level of prediction of the compatibility between two or more fuels.

In this section, all the main test methods on offer today will be addressed and their suitability, advantages and disadvantages for use on marine residual fuels will be identified.

4.2 Test methods for evaluating stability and compatibility

There are a number of listed test methods for evaluation of stability and compatibility, however, not all are sufficiently reliable for use on residual marine fuels.

By testing the stability of a mixture of two or more fuels, it is possible to obtain an indication of the compatibility between the mixed fuels.

Table 1 lists the test methods suitable for determining the stability of marine residual fuels.

Test method	Reference	Applicability		
		Stability	Compatibility (=stability of mixture)	Prediction of compatibility without testing
Total sediment (TSE, TSP, TSA)	ISO 10307 (ASTM D4870, IP 375/390)	✓	✓	No
Spot test*	ASTM D4740	✓	✓	No
S-value	ASTM D7157	✓	✓	✓
P-value	ASTM D7112	✓	✓	✓
P-ratio	ASTM D7060	✓	✓	✓

** Accuracy will be impacted by waxy fuels (see section 4.4)*

Table 1:Test methods which are available and can be applied to marine fuels

Table 2 lists other test methods which are not further discussed in this guideline for one or more of the following reasons:

- do not have criteria for evaluating the stability or compatibility of fuels; and/or
- are not standardized; and/or
- require significant scientific recognition and cross industry experience to uniformly apply and interpret

Test method	Reference
Separability Number	ASTM D7061
Toluene Equivalent (TE)	N/A
Xylene Equivalent (XE)	N/A
Bureau of Mines Correlation Index (BMCI)	N/A
BMCI / CCAI / TE / XE	N/A

Table 2: Test methods which cannot be applied to predict compatibility

4.3 Sediment methods

Common for the sediment test methods is that they can be used to evaluate the stability of a fuel or compatibility when testing the sediments of a mixture between fuels.

Compatibility between two fuels cannot be predicted through the individual sediment results of the fuels.

4.3.1 ISO 10307-1 (Existent Total Sediment, TSE)

TSE measures the amount of sediment present in a fuel at a particular moment by filtration and weighing the amount of sediment on the filter. TSE includes organic and inorganic sediment.

4.3.2 ISO 10307-2 (Potential Total Sediment, TSP - Procedure A)

TSP is the total sediment after ageing a sample of residual fuel for 24h at 100°C under prescribed conditions i.e. the amount of sediment after stressing the fuel through heating.

This method is expected to show the maximum amount of sediment that is likely to form when applying thermal stress.

4.3.3 ISO 10307-2 (Accelerated Total Sediment, TSA - Procedure B)

TSA is the total sediment after dilution of a sample of residual fuel with a paraffinic solvent (hexadecane) under carefully controlled conditions, followed by storage for 1h at 100°C i.e. the amount of sediment after stressing the fuel chemically and storage at 100°C for 1 hr.

This method is expected to show the maximum amount of sediment that is likely to form when applying a combination of chemical and thermal stress.

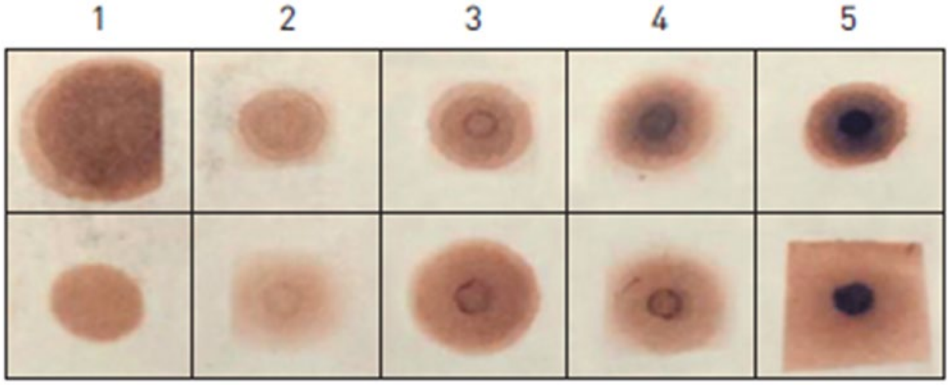
4.4 ASTM D4740 (Cleanliness / compatibility)

This test requires that one of the fuels is a residual fuel oil as, otherwise, there will be no asphaltenes to drop out. The method is designed for two purposes:

1. The determination of the cleanliness of residual fuel oil (fuels containing asphaltenes); and
2. The compatibility of a residual fuel oil with a blend stock applicable for fuel oils with viscosity up to 50 cSt at 100 °C.

A drop of a fuel (1) or a blend of two or more fuels (2) is put on a test paper and heated to 100°C. After 1h, the test paper is removed from the oven, the resultant spot is examined for evidence of precipitation and rated for stability against ASTM D4740 ‘5 level rating’ scale. When a spot is more

distinctive in the centre of the filter paper, it indicates that asphaltenes have dropped out which implies that the fuel or mixture of fuels at the blending ratio is unstable.



Spot rating description:

1 : Homogeneous spot (no inner ring)
2 : Faint or poorly defined inner ring
3 : Well-defined thin inner ring, only slightly darker than the background
4 : Well-defined inner ring, thicker than the ring in reference spot No. 3 and somewhat darker than the background
5 : Very dark solid or nearly solid area in the center. The central area is much darker than the background

Spot rating interpretation (See Annex B for further images of the spot test):

- Ratings 1 and 2 indicate the two fuels are compatible in the used mixing ratio
- Rating 3, Caution
- Rating 4 and 5 indicate the fuels are incompatible in the used mixing ratio

4.4.1 Limitation of the spot test method

Whereas the spot test method (ASTM D4740) is the practical option for onboard evaluation of the compatibility between fuels, it has certain limitations that it is important to take note of:

- Waxy (more paraffinic) fuels may result in a false negative interpretation, i.e. indicate that the fuels are incompatible although they are actually compatible
- Care should be taken evaluating spots that are not clearly distinctive (as the examples in Figure 2). In case of doubt, it is recommended to segregate fuels and await analysis results from the laboratory

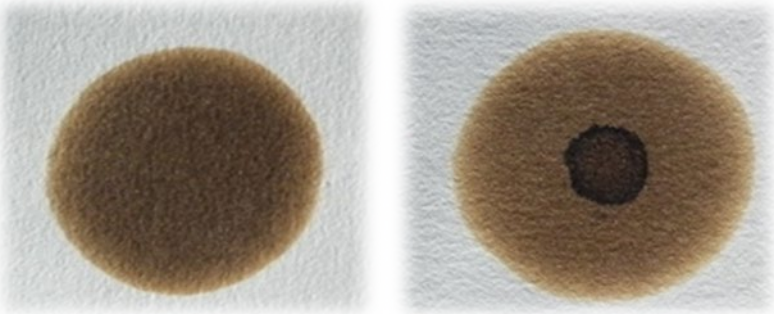


Figure 2:Two very distinctive spots being a rating of 1 and 5 respectively

4.5 ASTM D7157, ASTM D7112 and ASTM D7060

These methods generally all involve:

- addition of an aromatic solvent (e.g. toluene/xylene/methylnaphthalene)
- titration with a non-aromatic solvent (e.g. heptane,hexadecane)
- optical detection of asphaltenes precipitation for determining stability parameters or parameters that can be used for guidance on compatibility of crude oils or fuels

A summary of the methods is provided in Table 3.

	ASTM D7157 (Rofa)	ASTM D7112 (Porla)	ASTM D7060 (Zematra)
Stability parameters	Sa, So and S-value *	SBN, IN, Po, Pa, P-value *	FR_{max} and Po *
Scope	HFO, residues, crude oils **Asphaltenes > 0.5%**	HFO, residues, crude oils **Asphaltenes > 0.05%**	HFO, residues, **Asphaltenes > 1.00%**
Principle	Determination of intrinsic stability of asphaltenes in an oil	Determination of stability & compatibility by titration and optical detection of precipitated asphaltenes	Determination of the maximum flocculation ratio and peptizing power
Sample quantity	1 to 9g	20g	5 to 9g
Duration of analysis	60 to 90 minutes	60 to 90 minutes	40 to 180 minutes

**Refer to 4.5.1 for the definition of the terms*

Table 3: Comparison of the test methods for the determination of stability parameters

4.5.1 Terms

Stability

Parameters related to the stability of a fuel are:

- S- and P-value, P-ratio (see 4.5.4): intrinsic stability
  - Indication of the stability or available solvency power of an oil with respect to precipitation of asphaltenes
  - The higher the value, the better the stability
- So and Po: peptizing power of the oil medium
  - Ability to dissolve an asphaltene or maintain an asphaltene in colloidal dispersion
  - The higher the value, the better the capability of the fuel oil matrix to keep the asphaltenes dispersed
- Sa and Pa, FR_{max}: peptizability of asphaltenes
  - Ability of asphaltenes to remain in a colloidal dispersion
  - The higher the value, the higher the capacity of the asphaltenes to remain dispersed

The relationship/balance between So, Po and Sa, Pa and FR_{max} provides information on the level of stability reserve of a fuel oil although stability reserve is not a quantified parameter.

Compatibility

Blending model parameters which can be used to obtain guidance on compatibility of fuels:

- SBN : Solubility blending number
  - Measure of the oil's ability to keep asphaltenes in solution
- IN : Insolubility number
  - Measure of the degree of asphaltenes insolubility
  - A higher number indicates a higher risk for asphaltenes precipitation

Only parameters obtained from the same test method can be used to obtain indication on the degree of compatibility e.g. results of ASTM D7157 (Rofa) cannot be used in combination with results of ASTM D7060 (Zematra) or ASTM D7112 (Porla).

4.5.2 ASTM D7157

Analysis according to ASTM D7157 provides the Sa, So and S-value from which the SBN and IN can be derived [1]:

IN = 100 x (1 - Sa)

SBN = IN x (1 + (S-1) x density /1000); where density must be in kg/m3

A fuel is considered unstable when the S-value is below 1. The higher the S-value, the less risk of asphaltenes precipitating from the fuel.

4.5.3 ASTM D7112

Analysis according to ASTM D7112 provides the Solubility Blending Number (SBN) and the Insolubility Number (IN) in addition to Po, Pa and P-value.

A fuel is considered unstable when the P-value is below 1. The higher the P-value, the less risk of asphaltenes precipitating from the fuel.

4.5.4 ASTM D7060

Analysing according to ASTM D7060 provides the FR_{max} and Po. Po/FR_{max} is called the P-ratio and a fuel is considered stable when the Po is higher than the FR_{max}, i.e. when P-ratio = Po/FR_{max} is greater than 1. The higher the P-ratio, the less risk of asphaltenes precipitating from the fuel.

4.5.5 Compatibility model: ASTM D7157 and ASTM D7112

The oil compatibility model is based on Solubility Blending Number (SBN) and Insolubility Number (IN) and the following approximations:

- The maximum IN, INmax, of the two fuels (i.e. the less stable asphaltenes) is the limiting factor
- SBN varies linearly

The model takes the mixing ratio of the two fuels into consideration by calculating the volumetric average of the SBN's of the individual fuels, SBN_{mix}:

$$SBN_{mix} = \%\ Fuel_A \times SBN_{,\ fuel\ A} + \%\ Fuel_B \times SBN_{,\ Fuel\ B}$$

Recognising the complexity of asphaltene stability, a certain degree of uncertainty is considered by means of introducing a “margin for error”. In the criteria below a factor of 1.4 [2] is used:

Stable mix: $SBN_{mix} > 1.4 * IN_{max}$
Critical mix: $IN_{max} < SBN_{mix} < 1,4 * IN_{max}$
Unstable mix: $SBN_{mix} < IN_{max}$

Table 4: Compatibility model applicable for ASTM D7157 and ASTM D7112

Example 1 :

Fuel	***SBN***	***IN***
Fuel A	90	41
Fuel B	69	17
Blend of fuel A and fuel B; Ratio 50/50	SBN_{mix} = (0.50 x 90) + (0.50 x 69) = 79.5	IN_{max}= 41 1.4 x IN_{max} = 57.4

The Fuel A and Fuel B mix meets the stability requirement of Table 4 (as $SBN_{mix} > IN_{max}$) and is therefore considered to be stable. The interpretation can also be illustrated as shown in Figure 3.

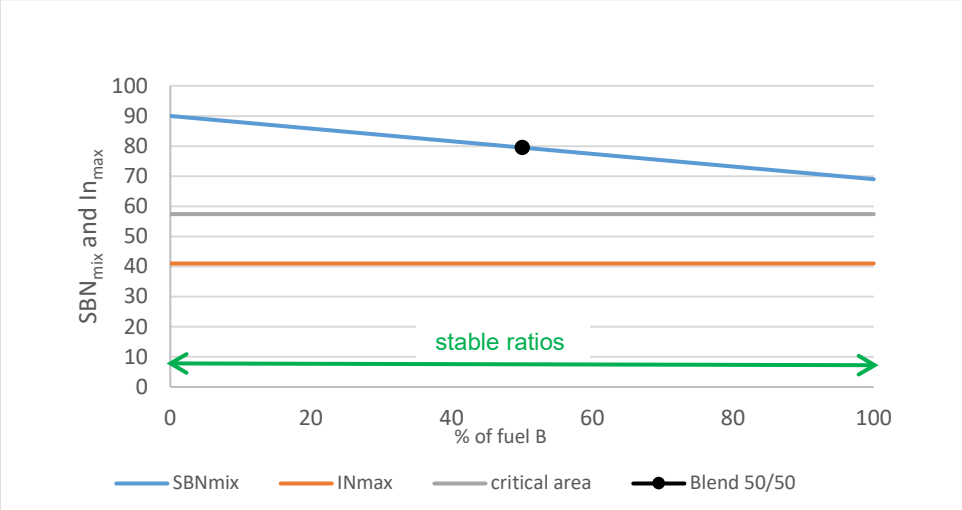


Figure 3: Interpretation of compatibility between Fuel A and Fuel B

Example 2:

Fuel	***SBN***	***IN***
Fuel C	79	39
Fuel D	13	24
Blend of Fuel C and Fuel D; Ratio 10/90	SBN_{mix} = (0,10 x 79) + (0,90 x 13) = 19,6	IN_{max} = 39 1.4 x IN_{max} = 54.6

The 10/90 mix between Fuel C and Fuel D does not meet the requirement of Table 4 (as $SBN_{mix} < IN_{max}$) and is therefore considered unstable. The interpretation is illustrated in Figure 4.

From the graphical presentation, it can be seen that mixing the two fuels in a 50/50 ratio is predicted to be a critical mix and that mixing in 90/10 ratio is predicted to be a stable mix.

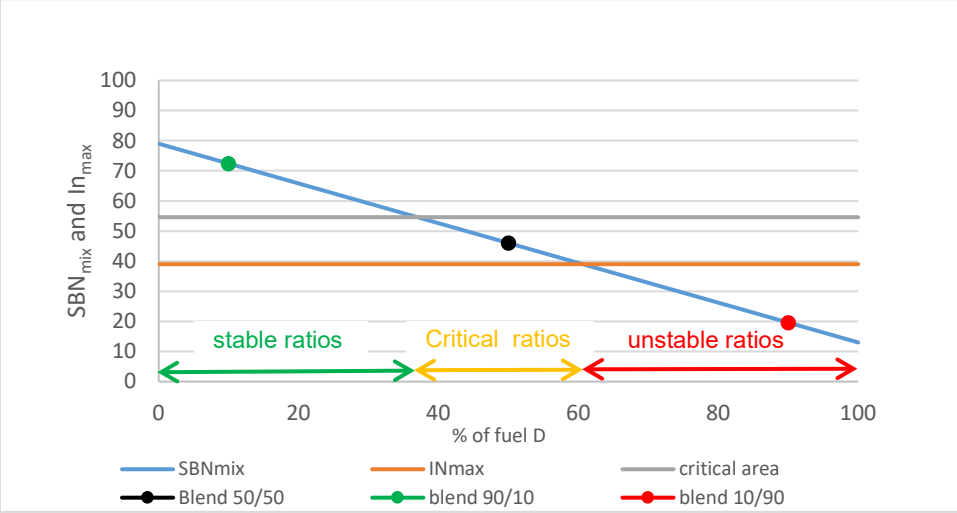


Figure 4: Interpretation of compatibility between Fuel C and Fuel D

4.5.6 Compatibility model: ASTM D7060

For ASTM D7060, the following compatibility model applies:

- $FR_{max(max)}$: The highest of the FR_{max}'s of the two fuels
- $Po_{(mix)}$: The volumetric average of the Po's of the individual fuels

Whereas the ASTM D7157 and ASTM D7112 applies a margin for error to take uncertainties into account, the data from ASTM D7060 better compare with the ones from the other two methods if no margin for error is applied. This might be because of the different solvent and titration agents imply more stringent parameters.

Example 3:

Fuel	*FR_{max}*	*Po*
Fuel E	27	51
Fuel F	63	110
Blend of Fuel E and Fuel F; ratio 90/10	$FR_{max(max)}$ = 63	$Po_{(mix)}$ = (0,90 x 51 + 0,10 x 110) = 56,9

Figure 5 illustrates the unstable area where $Po_{(mix)} < FR_{max(max)}$. Mixing in the ratio of 90/10 between fuel E and F is predicted to result in an unstable mix. The fuels are incompatible when mixed in ratios below 20.3% of fuel F.

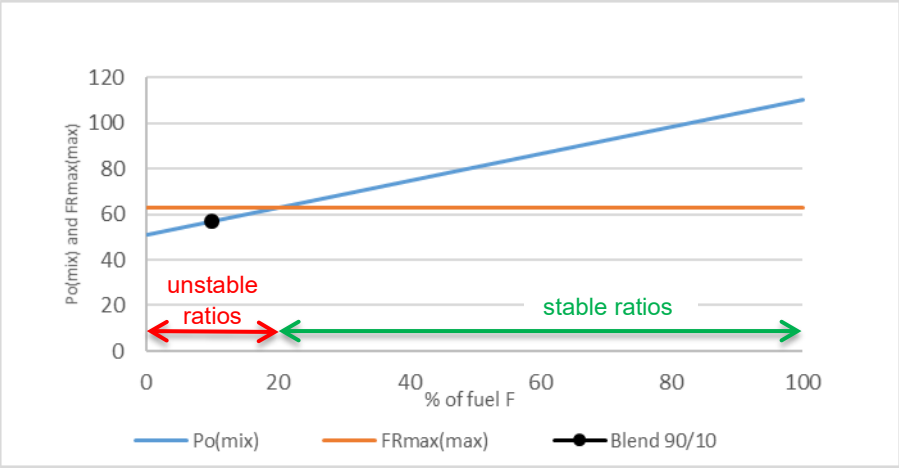


Figure 5: Compatibility diagram for fuels E and F based on ASTM D7060

Example 4:

Fuel	***FR_{max}***	***Po***
Fuel G	50	93
Fuel H	86	107
Blend of Fuel G and Fuel H	$FR_{max(max)}$ = 86	

Figure 6 illustrates that Fuel G and Fuel H are predicted to be compatible over the entire mixing ratio.

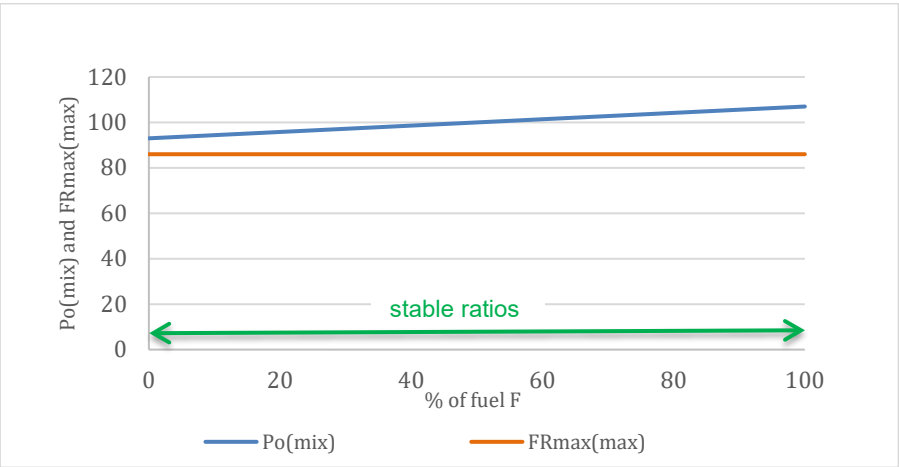


Figure 6: Compatibility diagram for fuels G and H based on ASTM D7060

5 Summary / Conclusions

Stability and compatibility of marine fuels both relates to asphaltenes dropping out of suspension resulting in asphaltenic sludge being formed.

> ***Stability*** *is the term used for fuels as supplied and as per ISO 8217, it is the responsibility of the fuel supplier to provide a stable fuel to the ships.*
>
> ***Compatibility*** *is the term used when evaluating if two (or more fuels) can be mixed without asphaltenes coming out of suspension. As such compatibility is a handling issue and the responsibility of the operator.*

From an operational perspective, the result of having an unstable fuel or having mixed two incompatible fuels, causing the fuel mixture to become unstable, is identical as asphaltenic sludge will precipitate in the storage tanks, block filters and or separators leading to operational problems. Good practices therefore need to be applied to minimise the risk of having to manage an unstable fuel on board.

Several test methods to evaluate fuel stability exist have been highlighted in this paper, however, their applicability and accuracy varies. Not all have been standardised and some neither have sufficient scientific recognition nor industry experience to apply for marine fuel oils, at present.

Only one method (ASTM D4740) is available as providing a useful onboard screening tool for compatibility between two fuels of which one must be of a residual (RM) nature. It should be noted that this method can give a higher rating number when waxier fuels are involved potentially resulting in a false negative result, i.e. fuels which are actually compatible may be deemed less compatible or incompatible by the method.

The most effective way to determine a fuel's stability or compatibility between two or more fuels, is using test methods that can only be applied in a controlled laboratory setting.

The test method ISO 10307-2 Potential Total Sediment (TSP) is used as the definition for a stable fuel in ISO 8217:2017 when the TSP is below 0.10% m/m.

The three test methods: ASTM D7157, D7112 and D7060 with the prediction model offer a tool to evaluate the degree of compatibility of fuels without the need to test the fuels mixed together. Before applying the predictive models, the fuels shall be tested by the same test method for comparative purposes. Whilst these three test methods may be used for determining stability of a fuel and to predict the degree of compatibility, they are less practical as a routine test method where the TSP (ISO 10307-2) remains applicable and can be more easily run along with ASTM D4740.

6 Members of CIMAC WG7 Fuels

Alfa Laval
Boll Filter
BP Oil International Ltd
Bureau Veritas fuel testing services
Caterpillar
CEPSA
Chevron
Chevron Oronite
CMA Ships
DNV-GL
Exxon Mobil
French Ministry of Defense
GEA
IMarEST
Infineum
Innospec Fuel Specialties
International Chamber of Shipping
Intertek Shipcare
Lloyd's Register FOBAS
Maersk Line
MAN Energy Solutions
Japan Engine Corporation
Mitsui O.S.K. Lines
NYK Line / Nippon Yuka Kogyo
Parker Hannifin
Petroleum Geo-Services
Shell
Total
VISWA Lab Corporation
VPS
Wartsila
Win GD
World Fuel Services

7 References

[1] US58771634A - Process for blending potentially incompatible petroleum oils, I Wiehe, R Kennedy, 1999

[2] Concawe report 11/19, Study to evaluate test methods to assess the stability and compatibility of marine fuels in view of the IMO MARPOL Annex VI Regulation 14.1.3 for 2020 Sulphur requirements

8 Glossary of important, repeating terms

PAS	Publically Available Specification
ULS MGO	Low sulphur Marine Gas Oil, Sulphur max 0.10% (m/m) (no heating required)
HS MGO	High sulphur Marine Gas Oil, Sulphur above 0.10% (m/m) (no heating required)
ULSFO RM	Ultra low sulphur fuel oil, Residual properties, Sulphur max 0.10% (m/m) (heating required)
ULSFO DM	Ultra low sulphur fuel oil, Distillate properties, Sulphur max 0.10% (m/m) (no heating required)
VLSFO RM	Very low sulphur fuel oil, Residual properties, Sulphur max 0.50% (m/m) (heating required)
VLSFO DM	Very low sulphur fuel oil, Distillate properties, Sulphur max 0.50% (m/m) (no heating required)
LSFO	Low sulphur fuel oil, Sulphur max 1.00% (m/m), (heating required)
HSFO	High sulphur fuel oil, Sulphur above 1.00% (m/m), (heating required)

9 Annex A

9.1 What can influence stability - the chemistry explanation

In order to have a deeper understanding of asphaltene stability it can be helpful to grasp the basic chemistry of Residual Hydrocarbon Products (RHPs), the base components for fuel oil blending, not least it demonstrates the complexity of the residual marine fuel that ships so readily use. RHPs are streams recovered as residual products from different conversion units, after separation of the lighter products (distillates) has been carried out via distillation. The chemical matrix of RHPs is much more complex than the one in the distillates, but a high-level classification can be carried out on the basis of the separation achieved via SARA analysis (Saturates, Aromatics, Resins and Asphaltenes).

Saturates

Saturates are the sum of paraffins and naphthenes, i.e. organic molecules that do not contain double bonds. Naphthenes differ from paraffins because they are cyclic structures.

Paraffinic chains can be bound to naphthenic rings in more complex structures.

Aromatics

Aromatics are components containing one or more benzene rings. Paraffinic chains can be bound to aromatic rings in more complex structures.

Asphaltenes

Asphaltenes are a complex array of different molecular structures with very high molecular weight. The backbone is made of aromatic rings fused together and/or bound to each other via paraffinic chains. They also contain a certain amount of ‘heteroatoms’ (nitrogen, oxygen, sulfur) and heavy metals (such as Nickel and/or Vanadium), which are bound to the backbone through the heteroatoms.

Asphaltenes are also defined as the fraction of RHPs which is soluble in toluene but not in a specific paraffinic solvent. If that solvent is n-heptane, those asphaltenes are defined as “C7-asphaltenes”. If that solvent is pentane, those asphaltenes are defined as “C5-asphaltenes”.

Asphaltenes are not really ‘dissolved’ in the RHP matrix, but they are rather ‘peptized’, i.e. they tend to form very finely dispersed agglomerates, which under certain circumstances, can coalesce and precipitate as sludge. This is a typical behaviour of colloidal dispersions.

Resins

Resins have a similar structure to asphaltenes but their molecular weight is lower and they have a negligible metals content. Resins are usually defined at an operational level as the fraction of RHPs that is soluble in n-heptane and pentane but insoluble in liquid propane. This definition is, however, not universal and the way resins are identified in different refinery layouts can vary considerably. It can be said that they represent an “intermediate” between asphaltenes and saturates/aromatics.

Maltenes

The sum of saturates, aromatic and resins constitutes the maltenes.

9.2 Asphaltene stability

The stability of asphaltenes depends on a delicate balance with the maltenes, mostly based on the basic chemistry concept that 'like dissolves like'. As asphaltenes have a substantial aromatic character, they tend to be stabilized by predominantly aromatic maltenes (such as light cracked streams).

The presence of resins also brings a stabilization factor, as they tend to form a 'bridge' between asphaltenic agglomerates and the rest of the maltene phase.

Saturates, on the other hand, tend to have a detrimental effect on asphaltenes stability, as their chemistry is very different. Their interaction with asphaltenes is generally lower than for aromatics and resins. Among the saturates, the waxy streams (such as hydrocracker bottoms and high pour point vacuum gasoil), show the worst effect on asphaltenes stability due to their high paraffinic character.

Among different types of asphaltenes, a higher polarity will also negatively influence the solubility behaviour in a maltene phase. Polarity is related to the amount of heteroatoms in the asphaltenes structure and it can increase for some types of asphaltenes due to oxidation processes, if such asphaltenes are exposed for a long time to air.

An additional factor influencing asphaltenes peptization is temperature, especially in the presence of crystallized paraffinic waxes at low temperature. If waxes separate from the maltenes phase at lower temperature as crystals, that phase will increase its solubility power for asphaltenes, which may give a high apparent solvency power for the asphaltenes in that sample. As the temperature increases, more waxes get dissolved back into the maltene phase, decreasing its solvency power and potentially result in asphaltene flocculation.

The following illustration demonstrates the process by which a stable fuel will become unstable and precipitate asphaltenes, when mixed with another incompatible fuel.

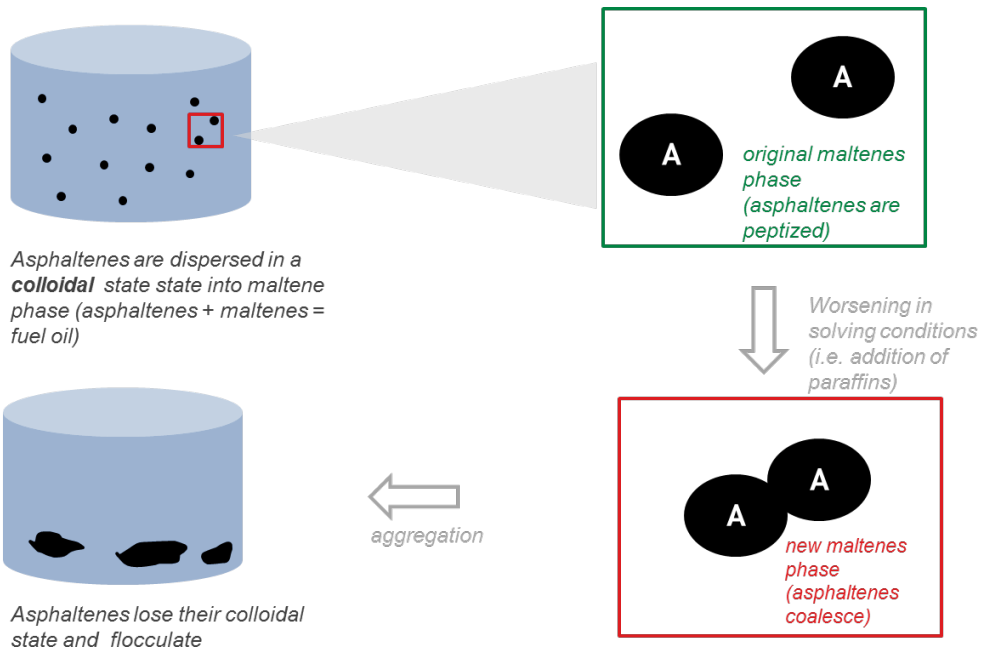
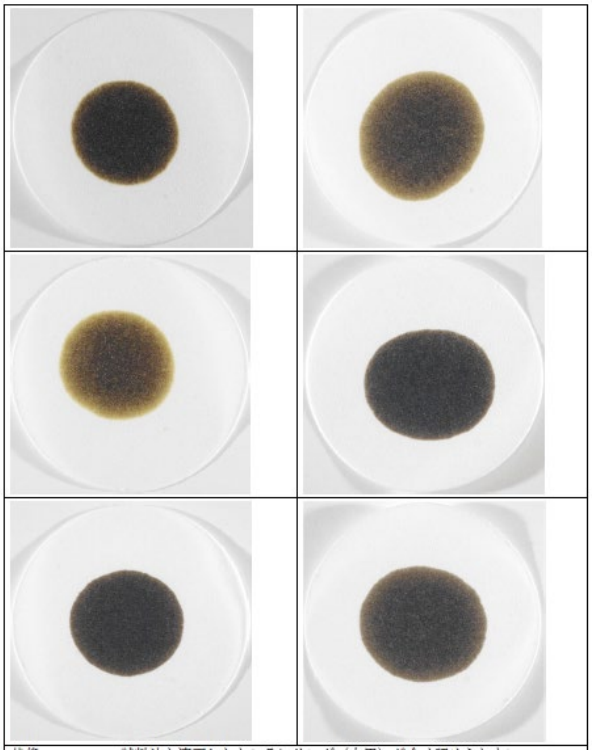
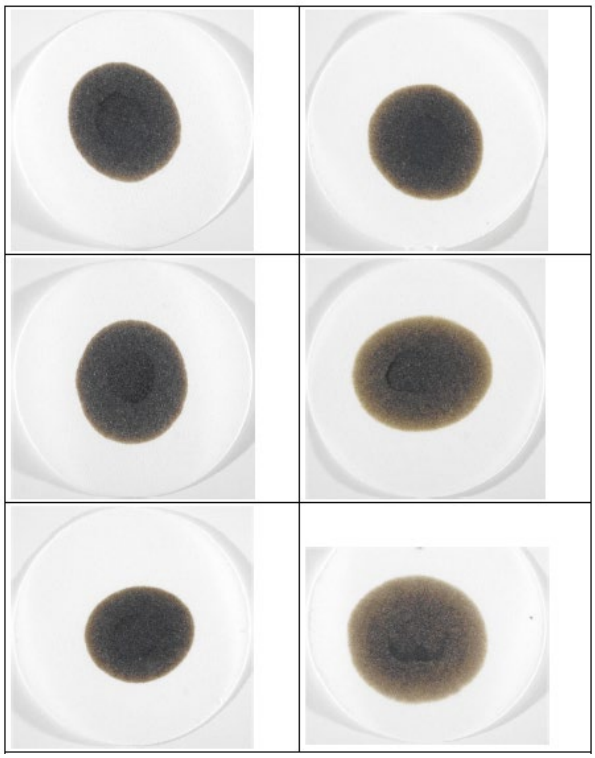
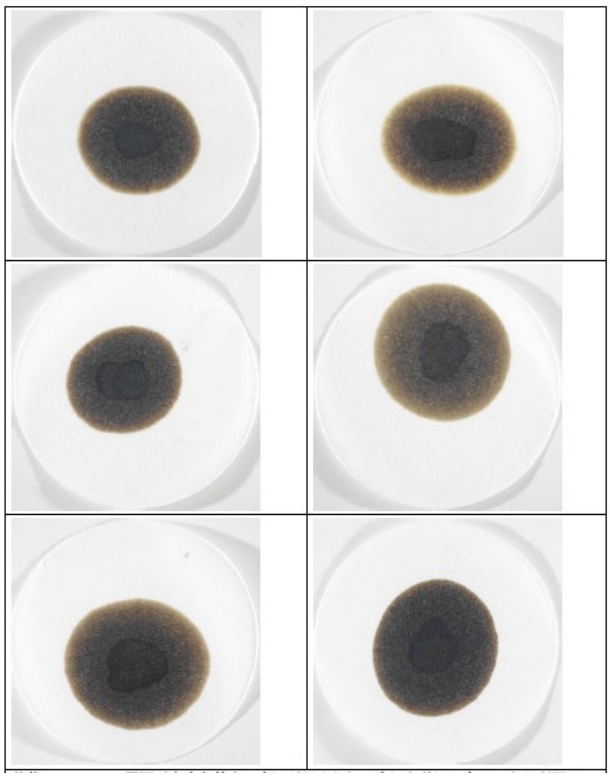
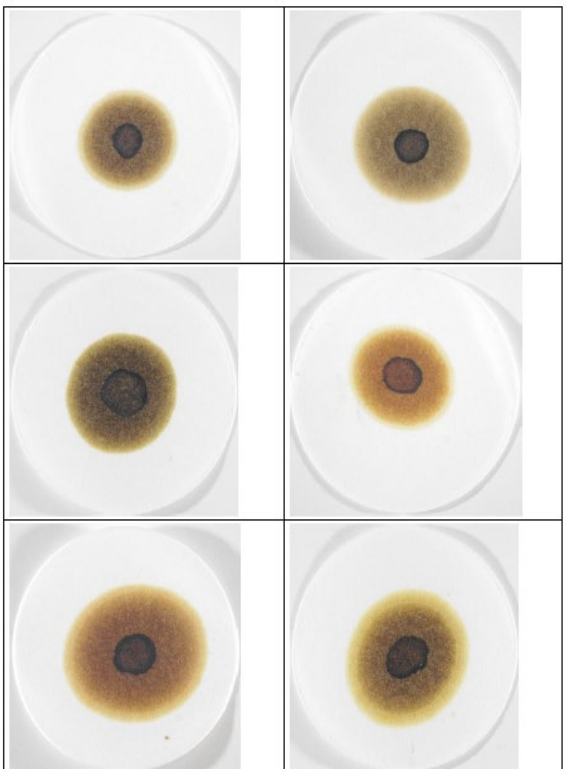


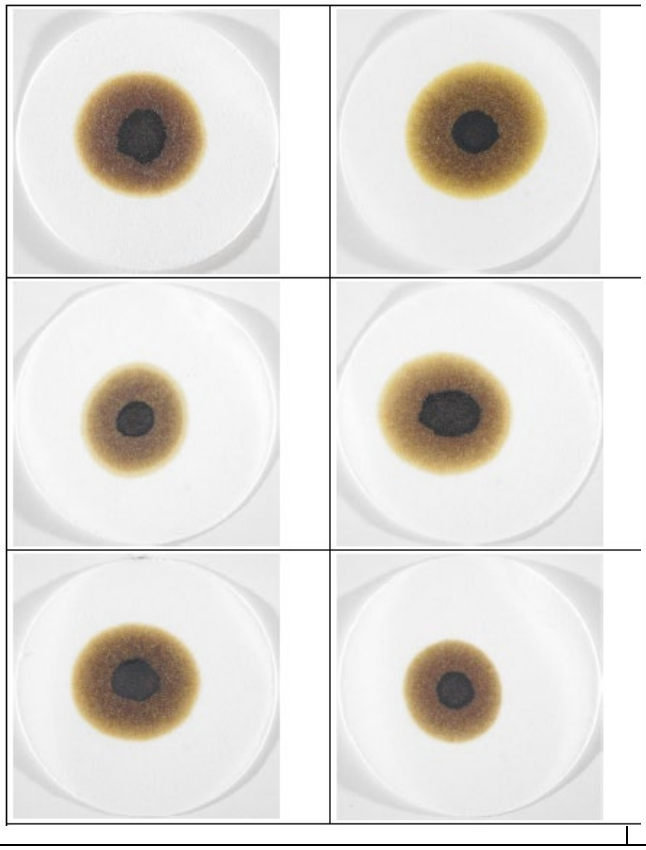
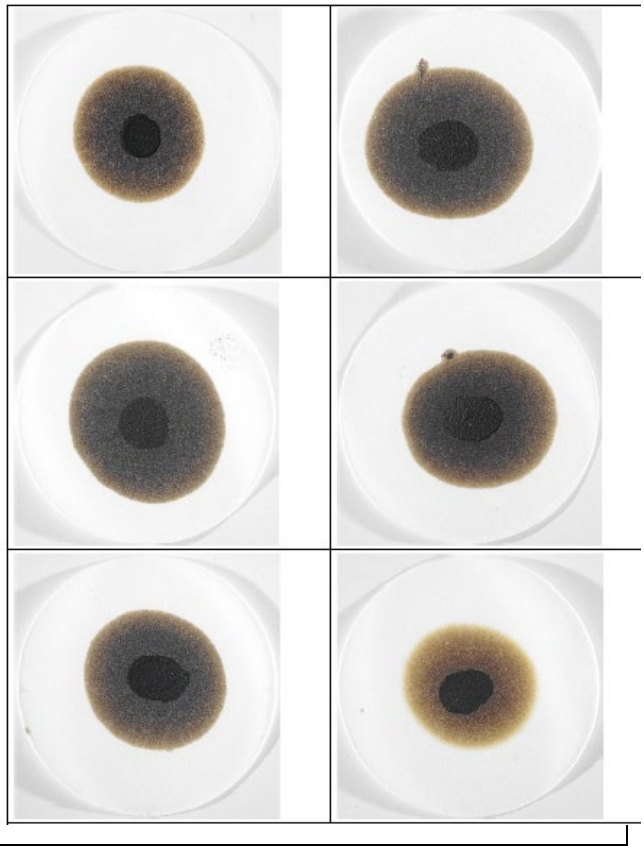
Figure 7: Asphaltene stability in maltenes

10 Annex B – ASTM D4740 – Reference ‘Spot test’ images

The following tables illustrate further examples of the ‘spot test’ filter results (images supplied by kind permission of NYK Line / Nippon Yuka Kogyo).

Rating 1	**Rating 2**
No inner ring, homogenous spot. The fuel mix is stable, two fuels mixed are compatible at tested ratio.	Faint or poorly defined inner circle The fuel mix is stable, two fuels mixed are compatible at tested ratio.
	

Rating 3	Rating 4
Well-defined thin inner ring, only slightly darker than the background Caution: Indicates that the fuel may be incompatible in the used mixing ratio. 	Well-defined inner ring, thicker than the ring in reference spot No. 3 and somewhat darker than the background Indicates the fuels are incompatible in the used mixing ratio resulting in an unstable product. 

Rating 5 Very dark solid or nearly solid area in the centre. The central area is much darker than the background. Indicates the fuels are incompatible in the used mixing ratio resulting in an unstable product.	**Rating 5** Very dark solid or nearly solid area in the centre. The central area is much darker than the background. Indicates the fuels are incompatible in the used mixing ratio resulting in an unstable product.
	

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