2020 GUIDANCE

6 Months (M) Planning

FUEL OIL SYSTEM READINESS
Segregation modifications for fuel oil tanks system completed, system lines tested, and crew familiarization training conducted, action plan agreed with manufacturers completed.

SAMPLING READINESS
All sampling points identified and appropriate sampling valve installed, procedure for onboard and in-use samples completed and crew familiarization training conducted.

OIL TANKS READINESS
Tank cleaning for designated fuels storage arranged, lub oil spare tank arrangement for dual fuel carriage, additional containment system for the possible overflow of sludge volume due to tank cleaning requirements.

PROCUREMENT READINESS
Procurement contracts and quality procedure/certification to purchase compliant fuels from bunker suppliers along vessel routes negotiated and agreed, disposal of non-compliant fuel with buyer(s) arranged and permit obtained.

ON-BOARD READINESS
Fuel switch-over requirement arranged and full training on the utilization/switch-over operation as well as handling unavailability of compliant fuel for crews completed, issuance of reminder that non-compliant fuel needs to be disposed.

COMPLIANCE READINESS
Ship maintenance regime to include mitigating compatibility issues, carriage ban arrangement, emission monitoring, equipment inoperability, CEM malfunction etc.

What-If Scenarios

Compliant Fuel not available at port
- Submit Fuel Oil Non-Availability Report (FONAR) to next port of call & inform Port State/Flag State
- Report to IMO MARPOL Annex VI GISIS module
- Submit evidence to support efforts to obtain compliant fuel
- Arrange to lift compliant fuel at the first available port of call

Scrubber System not in operation
- Inform Flag & Port State for non-functional scrubber
- Make arrangement to repair scrubber at nearest port of call
- Update SSEP Log Book
- Inform port state for non-availability and make arrangement for bunkering of compliant fuel
- If repair duration is uncertain, consult the administration

Analysed VLSFO results have uncertainties
- Raise Bunker Dispute Form
- Run additional purification/filtration with low throughput for fuel with high cat-fines
- Adjust heater or use chiller to improve fuel viscosity and to maintain viscosity within the Engine Maker’s Recommendation limit
- Commingle with compatible fuel/or use appropriate additives to improve stability
- For high sulphur content exceeding limit, make preparation to debunker non-compliant fuel

Carriage of Non-Compliant Fuel on-board
- Make arrangement to dispose non-compliant fuel (HSHFO) by 1st March 2020 due to “Carriage Ban”
- Clean system & tanks to bunker compliant fuel
- Obtain a Carriage of Non-Compliant Fuel exemption letter from Flag State, to be produced to Port State Control from 1st Jan 2020 onwards

Ports & sea areas prohibit scrubber discharges
- Perform change-over to compliant fuel using the fuel change-over calculator prior to entering prohibited areas
- Switch to closed loop system, if available
- Make arrangement with reception facilities to collect scrubber effluent discharges for closed/hybrid scrubber
Global Emissions
85% SOx Decrease

Compliance
26% Average Fuel Price increase

Energy
2.5% Average energy increase (scrubbers)

P&L
13% Average OPEX increase

Note: Data obtained through SSA members survey and consultation.

TYPES OF ALTERNATIVE FUELS & LOCATIONS

- LNG
- METHANOL
- ETHANOL
- BIO-FUEL

- Singapore
- Rotterdam
- Fujairah
- China
- US
- Canada
- Norway
- Japan
- Korea etc.

- Rotterdam
- Japan
- New-Zealand
- Europe
- North America
- Asia Pacific (via trucks)

- US
- Europe (via trucks)

- Rotterdam
- Finland
- US (via trucks)

ANNUAL BUNKER TONNAGE SUPPLIED IN SINGAPORE ACCORDING TO TYPE IN 2018 & PREDICTED SUPPLY IN 2020

Singapore Actual Supplied Tonnage (million tonnes) in 2018
- MGO/LSMGO
- Very Low Sulphur Fuel Oil (VLSFO)
- High Sulphur Heavy Fuel Oil (HSHFO)

Singapore Predicted Supply Tonnage (million tonnes) in 2020

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>No. of Suppliers: 12*</th>
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<tbody>
<tr>
<td>MGO/LSMGO product only</td>
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<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>No. of Suppliers: 30**</th>
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</thead>
<tbody>
<tr>
<td>VLSFO &amp; HSHFO products</td>
<td></td>
</tr>
</tbody>
</table>

* This list is non-exhaustive.

Note: Data obtained through SSA members survey and consultation.

This list is non-exhaustive.

1 https://safety4sea.com/imo-sets-2020-as-implementation-date-for-0-5-sulphur-cap/
2 http://www.mpa.gov.sg/web/portal/home/port-of-singapore/services/bunkering/bunkering-statistics
Familiarisation of fuel change over sequence with in 3 months prior to regulations kick in

Safety Risk: Vessel Collision
Configure alert/alarm system when switching fuel
Additional watch-keeping when performing fuel change over
Avoid performing fuel switch over in Port and Areas of restricted navigation, such as TSS, Rivers, Channels etc.

Recommended Mitigating Actions:
Perform fuel change over well in advance in order to ensure smooth transition to avoid any blackout situations

Familiarisation of fuel change over sequence within 3 months prior to regulations kick in

Compliance Risk: Vessel Detention
Use portable sulphur meter to test onboard and in-use fuel samples sulphur content
Ensure all logs are properly maintained and recorded
Delivered MARPOL LSFO has 0.47% Sulphur or less documented (+5% confidence level)

Recommended Mitigating Actions:
Safety briefings to include LSFO non-availability or non-operational scrubber
Obtain Flag State approval for carriage of non-compliant fuel till March 2020

Operational Risk: Damage to Critical Assets
Perform CLO Scraper Down Analysis every 3 months to maintain desired TBN/FE ratio
Use purifiers at low throughput and test purifier efficiency of removing catfines at testing before/after
Develop correct Purification Procedures, based on fuel bunkered i.e. correct use of gravity disc/purification temperatures
Install acceptable micron backwash filter to reduce catfines & check/clean filters regularly

Recommended Mitigating Actions:
Use purifiers at low throughput and test purifier efficiency of removing catfines at testing before/after

Operational Risk: Incorrect combustion affecting emission values
Install new fuel pump plunger/barrel and injection nozzle for low viscosity LSFO
Use new type of nozzles and adjust Air/Fuel ratio for boiler
Ensure appropriate Low TBN CLO/LO to avoid fouling of M/E, A/E rings/grooves

Recommended Mitigating Actions:
Ensure appropriate Low TBN CLO/LO to avoid fouling of M/E, A/E rings/grooves

Commercial Risk: Onboard Fuel Contamination
Frequently use portable sulphur meter to test onboard and in-use fuel samples sulphur content
Test for compatibility prior to any commingling
Drain water from fuel tanks to avoid settling of catfines

Recommended Mitigating Actions:
Monitor for sludge in tank & clean bunker tank residues frequently
Avoid mixing & do not use fuel without knowing its specifications

Commercial Risk: Supplied Fuel Quantity & Quality Disputes
Install mass flow meters with correct viscosities range
Fuel test report to be delivered by accredited testing labs within 4 hours

Recommended Mitigating Actions:
Install mass flow meters with correct viscosities range
Transition Clause between Charterer & Operator on tank/system fitness
Avoid taking bunker from unreliable suppliers that do not comply with MARPOL Annex VI

Types of Risks Assessed
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Disclaimer: All information is provided in good faith for guidance and reference purposes only. This guidance does not constitute legal advice and are offered based on the member’s knowledge and experience.

Brought to you by Singapore Shipping Association
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Contact SSA Tech Desk: +65 6305 2272