

Inspection on a Ship without Abatement Method

Enforcement provisions of Sulphur Directive

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- Preliminary Ideas
- Inspection of Ship without Abatement Method
- Final remarks

Marine Fuels - Terminology

- **ISO 8217 Specifications for Marine Fuels:**

- Residual fuels
- Distillate fuels

- **MGO** (Marine gas oil) - made from distillate only, 100% distillate type fuel

- **MDO** (Marine diesel oil) - Blend of heavy gasoil, containing small amounts of black refinery feed stocks

- **IFO** (Intermediate fuel oil)- Blend of gasoil and heavy fuel oil

- **MFO** (Marine fuel oil) - same as HFO (just another "naming").

- **HFO** (Heavy fuel oil) - Pure or nearly pure residual oil, 100% residual type fuel

Table 1 - Distillate Marine Fuels

Characteristic	Unit	Limit	Category				Test method
			DMR	DMA	DMU	DMB	
Kinematic Viscosity at 40°C	mm ² /s	max.	5,500	4,500	3,000	11,000	ISO1104
Density at 15 °C	kg/m ³	max.	1,400	2,000	3,000	2,000	see 7.1 ISO1871 or ISO1104
Cetane Index	-	min.	40	40	40	30	ISO4264
Flash Point	°C	min.	1,00	1,50	1,50	2,00	see 7.2 ISO1104
Cloud Point	°C	min.	40.0	40.0	40.0	40.0	see 7.3 ISO 2170
Hydgen: sulfur	mg/kg	max.	2,00	2,00	2,00	2,00	ISO1104
Sulfur content	mg/kg	max.	0.5	0.5	0.5	0.5	ISO1104
Total sediment by hot filtration	mg/kg	max.	-	-	-	0.10	see 7.4 ISO 10487-2
Oxidation stability	h	min.	25	25	25	25	ISO1104
Carbon residue (micro method) on 10% volume distillation residue	max.	0.30	0.30	0.30	0.30	0.30	ISO 10487-2
Carbon residue (macro method)	max.	-	-	-	-	0.30	ISO1104
Cloud point	°C	max.	-18	-	-	-	ISO1104
Pour point (max)	winter quality	°C	max.	-6	-6	-6	ISO1104
	summer quality	°C	max.	0	0	0	ISO1104
Appearance	-	-	clear and bright	clear and bright	clear and bright	clear and bright	see 7.5
Water	undetectable	max.	-	-	-	0.30	ISO1104
Asph.	max.	0.010	0.010	0.010	0.010	0.010	ISO1104
Stability, corrected value for diameter (see 7.6, at 10 °C)	min.	100	100	100	100	100	ISO1104



Marine Fuels – Reference Price



	IFO380	IFO180	MDO	MGO
Singapore	285.00	300.00	476.00	489.00
Rotterdam	246.00	268.00	-	466.00
Houston	269.50	365.50	-	582.00
Fujairah	293.00	316.00	-	789.00

Source: Bunker World
(\$/mT, 01/02/2015)

Combustion Machinery



Auxiliary
Engines

Emergency
Generators



Life and
Rescue Boats
Inert Gas
Generator
(Tankers)

Incinerator



Oil Fire
Boilers

Fuel Service System



Sulphur Inspection – Main issues

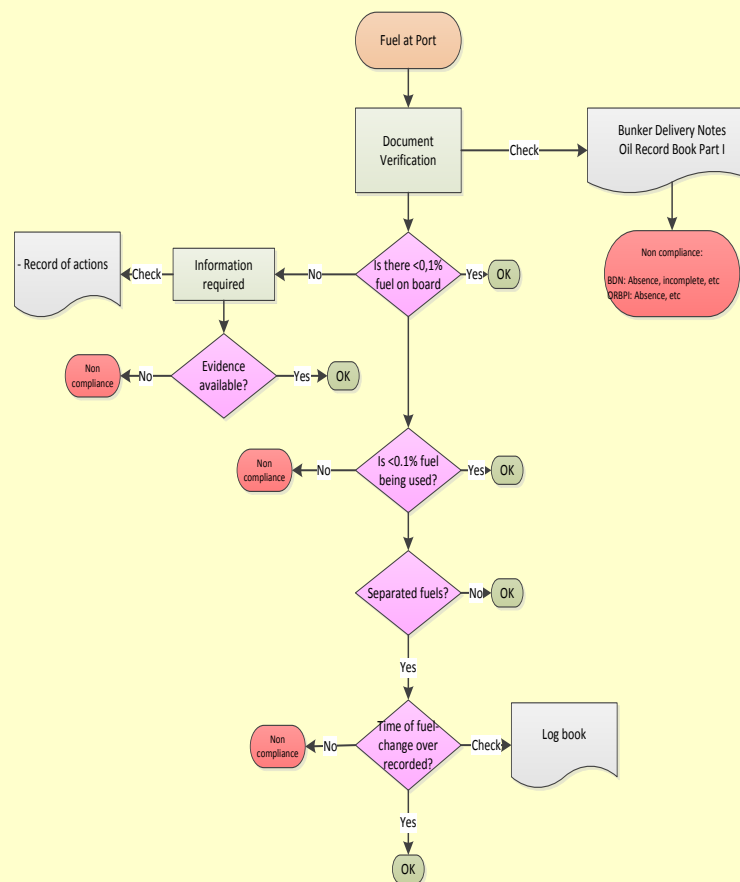


- **Regarding fuels, the Sulphur Inspection should be limited to determining whether the ship:**
 - is using the correct fuel at the time of the inspection at port, and
 - was using the correct fuel in the territorial seas on its last voyage.
- **Compliance can be ascertained through checking the following documents:**
 - Bunker Delivery Notes,
 - Oil Record Book Part I,
 - Fuel logs,
 - Quantity and quality benchmarks from the tanks at the starting point of verification period,
 - Fuel change-over plan,
 - Record of navigational activities and daily reports fuel line diagrams, and
 - Information on which fuel is in which tank.

Inspection On board– Fuel being used at port

- On all Ships, focus is on:
 - Sulphur content up to 0,1%
- Change-over time recorded in logbook

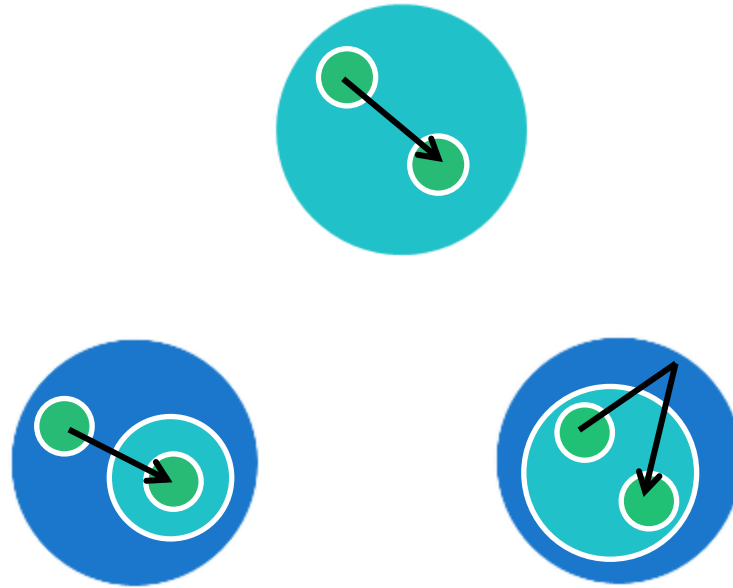
Fuel being used at Port



Inspection On board – Ship's Last voyage



Inspection
in a SECA
port



- Port
- SECA
- Non SECA

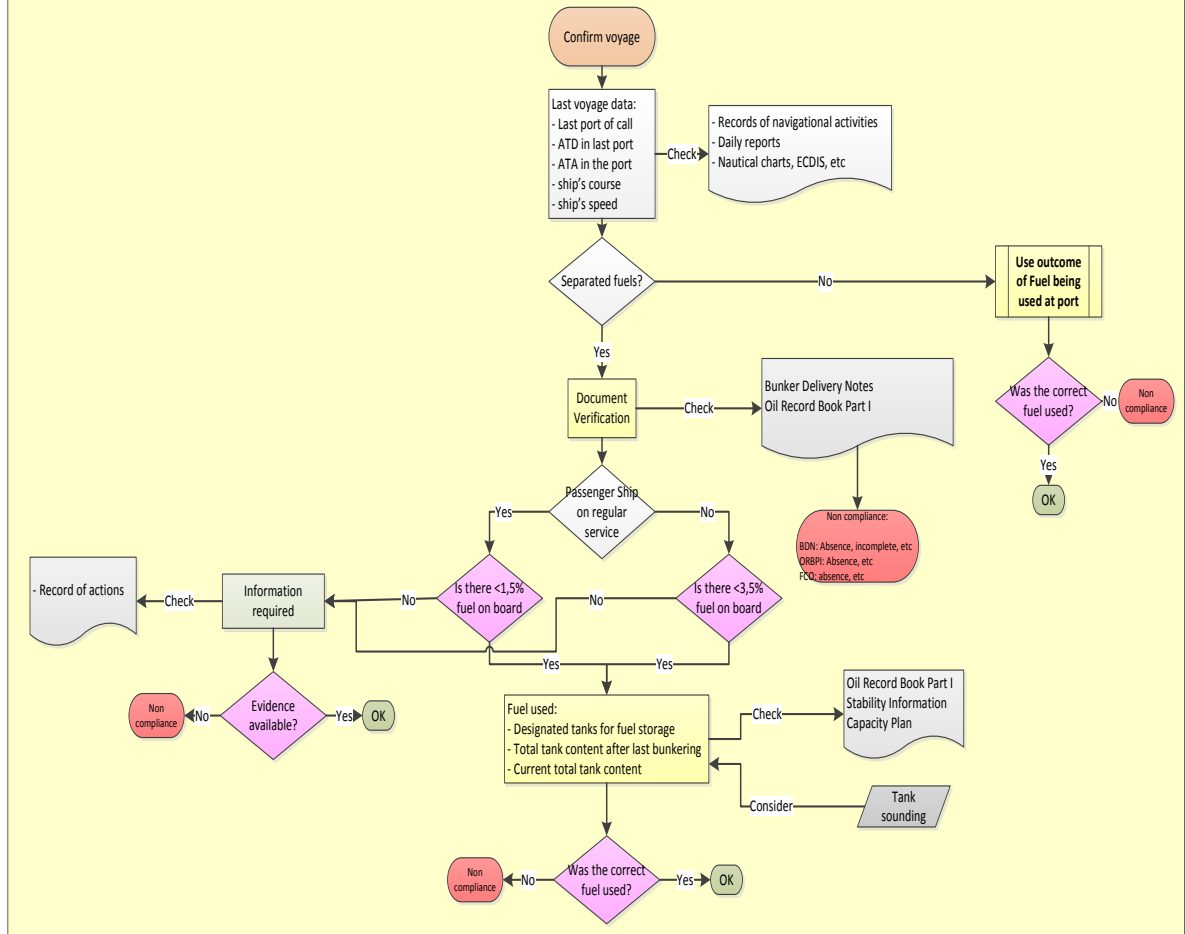
Inspection
in a non
SECA port



Port/Jurisdictional Waters Outside SECA

- On all Ships, focus is on:
 - Sulphur content up to 3,5%
 - worldwide average sulphur content of residual fuel oil supplied is 2,4% (IMO MEPC.192(61))
- On Passenger Ships in regular service, focus is on:
 - Sulphur content up to 1,5%
- No fuel change-over checks

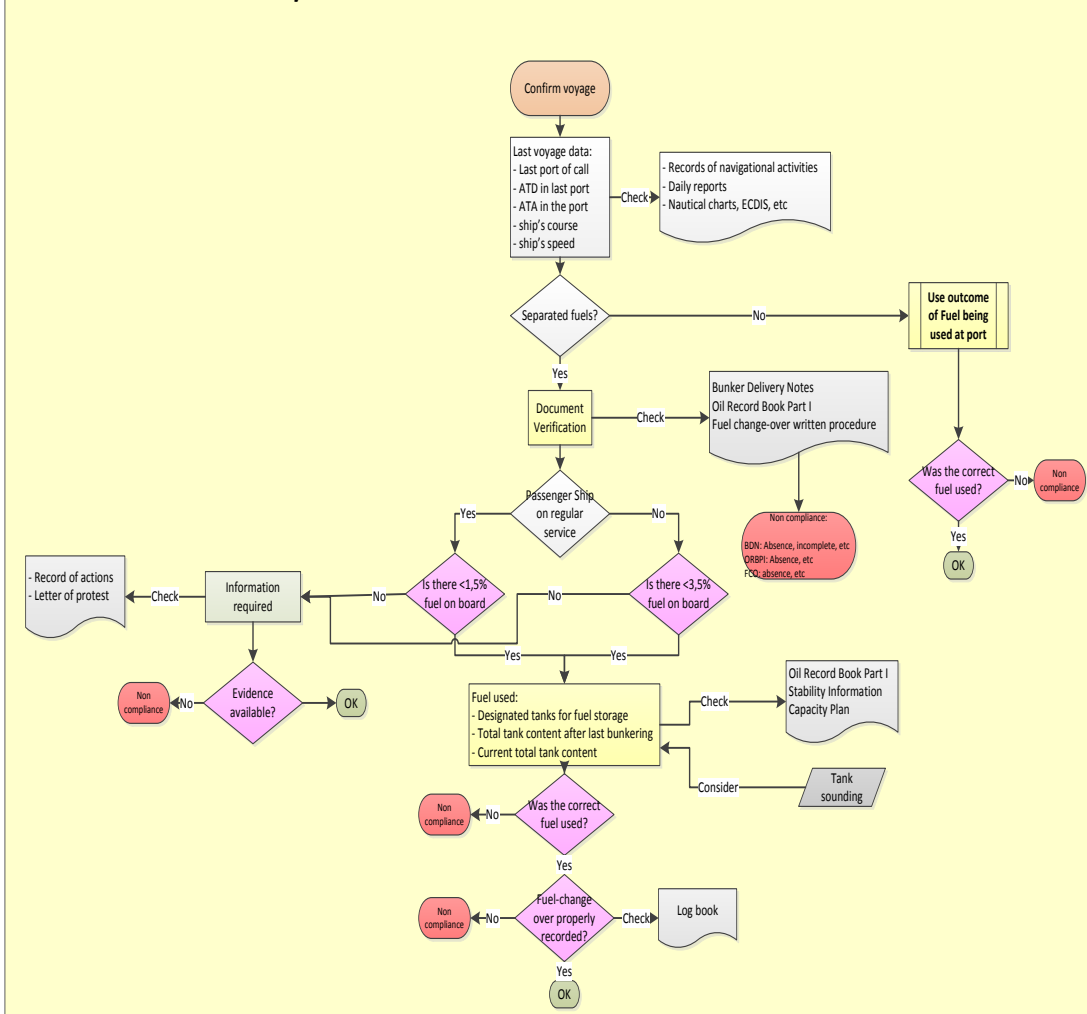
Fuel used at Sea – Outside SECA



Port/Jurisdictional Waters Inside/Outside SECA

- On all Ships, focus is on:
 - Sulphur content up to 0,1% in SECA leg
 - Sulphur content up to 3,5% (1,5%) in non SECA leg
- Fuel change-over required

Fuel used at Sea – Inside/Outside SECA



How to Estimate Fuel Consumption



1. Quantity of fuel at start of verification period and remaining amount on board:

- Bunker Delivery Notes
- Oil Record Book Part I
- Daily Reports

2. Rough estimation of consumed amount:

$$\text{Fuel Consumption Estimation (FCE)} = \frac{SFC \times 0,75 \times MCR \times d}{10^6 \times v} \text{ tons}$$

- SFC is the Specific Fuel Consumption (190 g/kWh may be used as default)
- MCR Is the rated installed power as in EIAPP or engine nameplate in kW
- d is the distance in nautical miles
- v is the speed knots as in Daily Reports

Example of Fuel Consumption Estimation

Bulkcarrier 85906 GT; Port of Inspection: Gdynia ATA: 23/01/2015; Last port: Rotterdam ATD:20/01/2015

Name of Ship: M/V My Ship

Official Name: 413567

MACHINERY SPACE OPERATIONS

Date	Code	Item	Record of operations
19/12/2014	H	26.1	Sines, Portugal
		26.2	Start 09:10 Stop 12:35
		26.3	Bunkered 150 m ³ MGO
			No.1 MGO Added 150 m ³ ; Ret. 245 m ³
			Service Tank MGO Ret. 46 m ³
			M. Gooday

Signature of Master

DAILY NOON REPORT

1. Date/Time (L.T./GMT): 20/01/2015
2. Geographical Position
Lat.: 51.8850° N Long.: 4.2867° E
3. Dist. Run: 14 Nm
4. Steaming time: hrs
5. Av.speed: 14 kts
6. Distance to go: 1030 Nm
7. Total steaming time: 1 hrs
8. M.E: RPM
9. Wind direction/force: NW/2
10. Sea State: 2
11. R.O.B: IFO= 3823 MT MDO= 184 MT TOTAL LO = Ltr ME SUMP TK=
12. Daily Consumption: IFO
13. Port of Destination and ETA: Gdynia ETA 23/01/2015
14. Remarks:

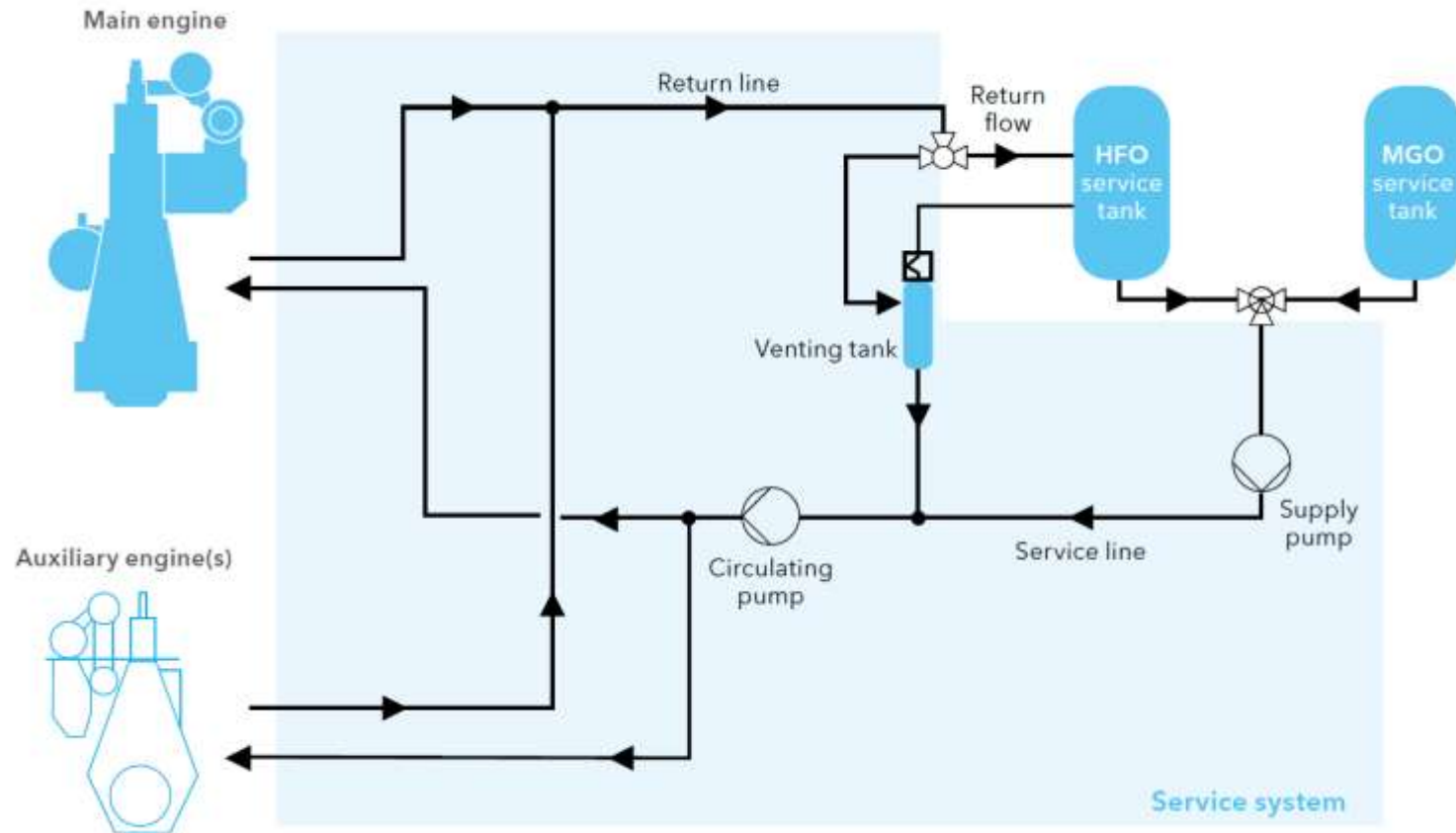
250 MT

170 MT
consumed

184 MT
R.O.B

$$FCE = \frac{190g/kWh \times 0,75 \times 14324kW \times 1050nm}{10^6 \times 16} = 134 \text{ tons (< than amount consumed)}$$

Visual Inspection – Fuel Service System



Non availability of compliant fuel



- **Ships found not to be in compliance with the Sulphur Directive may be required to**
(Art. 4a.5b):
 - present a record of the actions taken to attempt to achieve compliance, and
 - provide evidence that attempts were made to purchase compliant fuel in accordance with its voyage plan
and, if it was not made available where planned, that attempts were made to locate alternative sources
for such marine fuel and that, despite best efforts to obtain compliant marine fuel, no such marine fuel
was made available for purchase.
- **The ship shall notify its flag State and the authorities of port of destination**

Sampling

- Should the observations confirm the ship meets the Directive requirements then the inspection should end
- Proof may be needed in order to substantiate any non-compliances found
- Sulphur Inspectors may however decide on the need to sample the fuel in the tanks
- Cases of on board mixing of marine fuels (HFO/IFOs) from different bunker suppliers
- Cases of potential on board contamination of the MGO
- Sealed bunker samples: information from the shipowner



Thank you!

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