

## DESCRIPTION OF SMM BUNKERS SURVEY INSTRUMENT

### BRIEF DESCRIPTION

With this option the user can track record of Bunker quantity measurements in every voyage as well as he can instantly re-calculate the quantities remaining on board.

In order the module to help the user to determine how much bunkers the vessel has on board, the user must measure and input the contents of the vessels' bunkers tanks and the module will calculate the accurate quantities on every tank, taking into account the necessary ullage/sounding corrections due to vessel's trim and list.

The program includes ship's FO/DO Calibration Tables and Trim/Heel corrections. Once Drafts / Heel and each tank's content details (Density/ Sound-Ullage/Temp) are available, the C/E may instantly calculate and monitor the Bunkers R.O.B..

#### Features of Bunkers Survey Module for vessel and office application:

- Calculation of the **density of blended** bunkers.
- **Automatic synchronization** of data between vessel and office.
- Categorization / Definition of the vessels **tanks categories** as HSFO, LSFO, ULSFO, MDO etc.
- Corrected Weight in **Air or in Vacuum**.
- **Density** of the Bunkers can be corrected **retrospectively** when Samples Analysis is available.
- **Print-out tailored** to your good Company's needs
- Support for Customizable setting of the **alarm contents levels** for each F.O./D.O. tank, enabling the User to adjust such accordingly depending on your good Company's Policy and Conditions.
- Automatic Calculation of the **recommended Bunkers Quantities** basis on the abovementioned alarm tanks level for estimating required HFO/MDO/MGO **uplifts** for the next bunkering call.
- Insertion of **Upper Sulphur Content Limits** (3.5% HSFO, 0.5%, 0.1% ULSFO/LSMGO).
- Certain **colourization of program cells** depending on sulphur content.
- **Users' Manual** is incorporated in each Program with **detailed & extensive Instructions**
- **Inspection Title** as Drop-Down Menu.  
(on Arrival, upon Departure, After Bunkering, Before Bunkering, Free text)

#### Benefits of Bunkers Survey Module for vessel and office application:

- **Automatic corrections** for Trim/Heel/Density/Temperature.
- **Instantaneous** Calculations of Bunkers Weight
- **Improved efficiency** of operations, judgement and communication.
- **Timeline of all the recorded supplied Bunkers** and/or **Stocktakes**
- **Clarity & Transparency** based on official shipyard's documentation (Sounding/Calibration Tables) endorsed by SMM (UK) Ltd. as 3rd party.

## FREQUENTLY ASKED QUESTIONS

1. How the crew familiarization is achieved?
  - a. Manual is incorporated in each Program with detailed & extensive Instructions
  - b. Distant Training
  - c. Direct Replies to Email of Masters / Chief Officers / Chief Engineers with Cc to your good Company
  - d. User Friendliness of Software Interface with a brief description of required actions
2. How we can we handle tiresome ISM / SMS Amendments for alignment with this SMM Product?
  - a. SMM Software is tailored to your company's policy/S.M.S. meaning minor ISM/SMS alterations.
  - b. Just a quick reference to the SMM Software in place and their Manual Contents in ISM is, often, common and effective practice for the majority Shipping Companies.
3. Relative requirements of Programs (hardware, software, data exchange if any)
  - a. Light, server-based application running exclusively on Windows operating system environments
  - b. SMM Software can be operated by multiple users (clients) on a network
  - c. Sync Mechanism requires email access or *data import path* for the whole fleet or a desired path for each vessel.
  - d. Possible export in desired editable format, upon discussion and analysis.

## SCREENSHOTS

Please see below **Screenshots**:

The screenshot displays the 'Bunker Survey Instrument' software interface. At the top, it shows voyage details: Voyage No. 23, Port FLUJIRAH, Date Oct 23, 2018, and Supplier BP. Below this, there are two survey tables: 'Initial Survey' (dated Oct 23, 2017) and 'Final Survey' (dated Oct 23, 2018). The main data table lists compartments and their measurements:

Compartment	Full Volume (m <sup>3</sup> )	ASTM Units	Measurement	Density at 15°C or API at 60°F	Avg Temp (°C or °F)	Observ. Measurement (m)	Correct. Measurement (m)	Volume (m <sup>3</sup> )	Weight in Air (MT)	Sulphur Content (% m/m)	Density at 15°C or API at 60°F	Avg Temp (°C or °F)	Observ. Measurement (m)	Correct. Measurement (m)	Volume (m <sup>3</sup> )	Weight in Air (MT)	Sulphur Content (% m/m)	Added Volume (m <sup>3</sup> )	Added Weight (MT)	Mixed Density Calculator	
NO.3 FDT S	260.89	Density at 15°C Table 54B	Sound.	0.99	40.00	0.320	0.294	40.90	39.75	0.5	0.9149	49.00	1.640	1.640	244.22	217.41	0.917	203.32	177.66	0.9	
NO.4 FDT P	233.72	Density at 15°C Table 54B	Sound.	0.962	32.87	2.900	2.908	60.54	57.43		0.995	45.00	7.000	7.002	182.69	177.87		122.15	120.44		
NO.4 FDT S	233.72	Density at 15°C Table 54B	Sound.	0.986	36.80	2.500	2.492	48.45	47.00		0.99	46.00	6.000	5.998	152.87	147.96		104.43	100.96		
FO OVERFLOW T S	13.35	Density at 15°C Table 54B	Sound.	0.986	36.70	0.500	0.504	3.24	3.14		0.99	39.00	1.000	1.000	7.18	6.98		3.94	3.84		
Please enter Sounding measurement.																153.12	147.32	<b>TOTALS</b>		586.96	560.22
<b>HIGH LEVEL ALARM MARGIN</b>																92.58	89.88	<b>High Sulphur</b>		404.27	372.35
NO.3 FDT S ALARM LEVEL (90%) MARGIN 2.88 MT																60.54	57.43	<b>Low Sulphur</b>		182.69	177.87
NO.4 FDT P ALARM LEVEL (90%) MARGIN 31.20 MT																					
NO.4 FDT S ALARM LEVEL (90%) MARGIN 60.06 MT																					
FO OVERFLOW T S ALARM LEVEL (90%) MARGIN 4.90 MT																					

At the bottom, there are sections for 'Receipt Quantities', 'Vessel Quantities', and 'Difference'. The 'Receipt Quantities' table shows Volume 360.00 m<sup>3</sup> and Weight 355.00 MT. The 'Vessel Quantities' table shows Volume 433.84 m<sup>3</sup> and Weight 402.89 MT. The 'Difference' table shows Volume 73.84 m<sup>3</sup> and Weight 47.89 MT. There is also a 'Remarks' field containing 'LETTER OF PROTEST' and a 'Weight in Vacuum' button.

Bunker Survey Instrument

Voyage: SINGAPORE - BIK Port: SINGAPORE Date: Dec 17, 2018  
 Supplier: WORLDWIDE SUPPLIER Inspection: Upon Departure

Initial Survey										Final Survey																			
Date	Draft FWD		Draft AFT		Trim (+ Stern)	List (+ Port)	Date	Draft FWD		Draft AFT		Trim (+ Stern)	List (+ Port)	Density at 15°C or API at 60°F	Avg. Temp (°C or °F)	Observ. Measurement (m)	Correct. Measurement (m)	Volume (m³)	Weight in Air (MT)	Sulphur Content (% m/m)									
Oct 5, 2018	12	12.5	12.5	0.5	1	P	Oct 5, 2018	11.9	12.7	12.7	0.8	0.5	P	0.9	32.00	2.000	2.000	61.65	54.69	0.5	0.88	45.00	4.740	4.740	345.50	296.37	0.46	283.85	241.69
<b>TOTALS</b>										<b>TOTALS</b>																			
61.65 54.69										61.65 54.69																			
0.00 0.00										0.00 0.00																			

High Level Alarm Margin  
 No2 H.F.O.T. PALARM LEVEL (90%) MARGIN -23.08 MT

Grade	RMG 380	Receipt Quantities	Vessel Quantities	Difference	Remarks
High Sulphur Limit	3.5% m/m	Volume 285.00m³	283.85m³	-1.15 -0.41%	TEMPERATURE METERS TO BE CHANGED
Low Sulphur Limit	0.1% m/m	Weight 244.00MT	241.69MT	-2.31 -0.96%	

Bunker Survey Instrument

New Survey Ctrl+N  
 Open Survey Ctrl+O  
 Save Survey Ctrl+S  
 Delete Survey  
 Print Survey Ctrl+P  
 Import Surveys  
 Export Surveys  
 Define Compartment Groups  
 Define Compartment Sulphur  
 Define Compartment Alarm Levels  
 Define Compartment ASTM Units  
 Auto-retrieve latest Bunker Survey data  
 Data Synchronization  
 Bunker Survey User's Manual  
 Verified Test Conditions Manual  
 About Multiload  
 Exit

Voyage: SINGAPORE - BIK Port: SINGAPORE Date: Dec 17, 2018  
 Supplier: WORLDWIDE SUPPLIER Inspection: Upon Departure

Initial Survey										Final Survey																			
Date	Draft FWD		Draft AFT		Trim (+ Stern)	List (+ Port)	Date	Draft FWD		Draft AFT		Trim (+ Stern)	List (+ Port)	Density at 15°C or API at 60°F	Avg. Temp (°C or °F)	Observ. Measurement (m)	Correct. Measurement (m)	Volume (m³)	Weight in Air (MT)	Sulphur Content (% m/m)									
Oct 5, 2018	12	12.5	12.5	0.5	1	P	Oct 5, 2018	11.9	12.7	12.7	0.8	0.5	P	0.9	32.00	2.000	2.000	61.65	54.69	0.5	0.88	45.00	4.740	4.740	345.50	296.37	0.46	283.85	241.69
<b>TOTALS</b>										<b>TOTALS</b>																			
61.65 54.69										61.65 54.69																			
0.00 0.00										0.00 0.00																			

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Low Sulphur Limit	0.1% m/m	Weight 244.00MT	241.69MT	-2.31 -0.96%	

Fuel Oil Grade A Diesel Oil Grade A Fuel Oil Grade B Diesel Oil Grade B Fuel Oil Hybrid

Bunker Survey Instrument

Voyage: SINGAPORE - BIK Port: SINGAPORE Date: Dec 17, 2018  
 Supplier: WORLDWIDE SUPPLIER Inspection: Upon Departure

Initial Survey										Final Survey																			
Date	Draft FWD		Draft AFT		Trim (+ Stern)	List (+ Port)	Date	Draft FWD		Draft AFT		Trim (+ Stern)	List (+ Port)	Density at 15°C or API at 60°F	Avg. Temp (°C or °F)	Observ. Measurement (m)	Correct. Measurement (m)	Volume (m³)	Weight in Air (MT)	Sulphur Content (% m/m)									
Oct 5, 2018	12	12.5	12.5	0.5	1	P	Oct 5, 2018	11.9	12.7	12.7	0.8	0.5	P	0.9	32.00	2.000	2.000	61.65	54.69	0.5	0.88	45.00	4.740	4.740	345.50	296.37	0.46	283.85	241.69
<b>TOTALS</b>										<b>TOTALS</b>																			
61.65 54.69										61.65 54.69																			
0.00 0.00										0.00 0.00																			

High Level Alarm Margin  
 No2 H.F.O.T. PALARM LEVEL (90%) MARGIN -23.08 MT

Grade	RMG 380	Receipt Quantities	Vessel Quantities	Difference	Remarks
High Sulphur Limit	3.5% m/m	Volume 285.00m³	283.85m³	-1.15 -0.41%	TEMPERATURE METERS TO BE CHANGED
Low Sulphur Limit	0.1% m/m	Weight 244.00MT	241.69MT	-2.31 -0.96%	

Fuel Oil Grade A Diesel Oil Grade A Fuel Oil Grade B Diesel Oil Grade B Fuel Oil Hybrid

No2 H.F.O.T.P

ASTM Units  
 Density at 15°C Table 54B

Initial Survey			
Avg. Temp (°C)	Volume (m³)	Density at 15°C	Sulphur (% m/m)
32.00	61.65	0.9	0.5

Barge / BDN

Density at 15°C		Sulphur (% m/m)	
0.92	0.6		

Final Survey			
Avg. Temp (°C)	Volume (m³)	Density at 15°C	Sulphur (% m/m)
45	345.5	0.9164	0.582

OK Cancel

CONDITION :SINGAPORE 09-11-2018 BUNKERS SURVEY PRINT-OUT SAMPLE

**DIESEL OIL GRADE B BUNKER SURVEY**

INSPECTION UPON DEPARTURE

Voyage: SINGAPORE - BIK  
 Port: SINGAPORE  
 Grade:

Date: Nov 30, 2018  
 Supplier: WORLDWIDE SUPPLIER

**INITIAL SURVEY**

Compartment	Full Volume (m <sup>3</sup> )	I N P U T	Date: Oct 5, 2018 14:00		Trim: 0.50m Stern			List: 1.00° Port				
			Measurement Observ. (m)	Correct (m)	Volume (m <sup>3</sup> )	%	Density 15°C or API 60°F	Average Temp. (°C/°F)	V.C.F.	W.C.F.	Weight in Air (MT)	Sulphur (‰/m)
M.D.O.T. S (Low)	85.80	S	1.000	1.000	26.25	30.6	0.84	35.00	0.9830	0.8389	21.65	0.1
MDO SERV TK (Low)	23.20	S	5.100	5.100	23.20	100.0	0.84	45.00	0.9745	0.8389	18.97	0.1
					49.45	T O T A L S					40.61	
					0.00	HIGH SULPHUR					0.00	
					49.45	LOW SULPHUR					40.61	

**FINAL SURVEY**

Compartment	Full Volume (m <sup>3</sup> )	I N P U T	Date: Oct 5, 2018 14:00		Trim: 0.50m Stern			List: 1.00° Port				
			Measurement Observ. (m)	Correct (m)	Volume (m <sup>3</sup> )	%	Density 15°C or API 60°F	Average Temp. (°C/°F)	V.C.F.	W.C.F.	Weight in Air (MT)	Sulphur (‰/m)
M.D.O.T. S (Low)	85.80	S	5.870	5.870	85.80	100.0	0.84	42.00	0.9771	0.8389	70.33	0
MDO SERV TK (Low)	23.20	S	5.100	5.100	23.20	100.0	0.84	46.00	0.9736	0.8389	18.95	0
					109.00	T O T A L S					89.28	
					0.00	HIGH SULPHUR					0.00	
					109.00	LOW SULPHUR					89.28	

Compartment	Full Volume (m <sup>3</sup> )	%	Initial Survey		Final Survey		Additional		
			Volume (m <sup>3</sup> )	Weight in Air (MT)	Volume (m <sup>3</sup> )	Weight in Air (MT)	Volume (m <sup>3</sup> )	Weight (MT)	
M.D.O.T. S	85.80	30.59	26.25	21.65	100.00	85.80	70.33	59.55	48.68
MDO SERV TK	23.20	100.00	23.20	18.97	100.00	23.20	18.95	0.00	-0.02

Sulphur Limit		Supplier Quantities		Vessel Quantities		Difference	
High:	0 ‰/m/m	Volume	0 m <sup>3</sup>	Volume	59.55 m <sup>3</sup>	0	0
Low:	0 ‰/m/m	Weight	0 MT	Weight	48.67 MT	0	0

Remarks

MASTER/VESSEL'S SIGNATURE

CHIEF ENGINEER'S SIGNATURE

NOTE: S = Sounding Input, U = Ullage Input

DEMO SHIPPING CO.												
M/V SMM EXTERNAL			11 - 30 - 2018			10:32:00			Page: 3			
CONDITION :SINGAPORE 09-11-2018 BUNKERS SURVEY PRINT-OUT SAMPLE												
<b>DIESEL OIL GRADE A BUNKER SURVEY</b>												
INSPECTION UPON DEPARTURE												
Voyage: SINGAPORE - BIK				Date: Nov 30, 2018								
Port: SINGAPORE				Supplier: WORLDWIDE SUPPLIER								
Grade:												
<b>INITIAL SURVEY</b>												
		Date: Oct 5, 2018 14:00			Trim: 0.50m Stern			List: 1.00° Port				
Compartment	Full Volume (m³)	I N P U T	Measurement		Volume (m³)	%	Density 15°C or API 60°F	Average Temp. (°C/°F)	V.C.F.	W.C.F.	Weight in Air (MT)	Sulphur (‰/m)
			Observ. (m)	Correct (m)								
No2 H.F.O.T. S (Low)	345.50	S	2.000	2.000	104.05	30.1	0.85	35.00	0.9833	0.8489	86.85	0.09
L.S.D.O.T. S (Low)	85.80	S	0.500	0.500	14.25	16.6	0.82	35.00	0.9822	0.8189	11.46	0.06
LS DO SERV (Low)	23.20	S	5.020	5.020	23.20	100.0	0.83	45.00	0.9739	0.8289	18.73	0.05
					141.50	T O T A L S					117.04	
					0.00	HIGH SULPHUR					0.00	
					141.50	LOW SULPHUR					117.04	
<b>FINAL SURVEY</b>												
		Date: Oct 5, 2018 14:00			Trim: 0.50m Stern			List: 1.00° Port				
Compartment	Full Volume (m³)	I N P U T	Measurement		Volume (m³)	%	Density 15°C or API 60°F	Average Temp. (°C/°F)	V.C.F.	W.C.F.	Weight in Air (MT)	Sulphur (‰/m)
			Observ. (m)	Correct (m)								
No2 H.F.O.T. S (Low)	345.50	S	4.420	4.420	345.50	100.0	0.85	40.00	0.9791	0.8489	287.17	0
L.S.D.O.T. S (Low)	85.80	S	5.700	5.700	85.80	100.0	0.81	45.00	0.9726	0.8089	67.50	0
LS DO SERV (Low)	23.20	S	5.020	5.020	23.20	100.0	0.84	55.00	0.9659	0.8389	18.80	0
					454.50	T O T A L S					373.47	
					0.00	HIGH SULPHUR					0.00	
					454.50	LOW SULPHUR					373.47	
<b>Summary Comparison</b>												
Compartment	Full Volume (m³)	Initial Survey			Final Survey			Additional				
		%	Volume (m³)	Weight in Air (MT)	%	Volume (m³)	Weight in Air (MT)	Volume (m³)	Weight (MT)			
No2 H.F.O.T. S	345.50	30.12	104.05	86.85	100.00	345.50	287.17	241.45	200.31			
L.S.D.O.T. S	85.80	16.61	14.25	11.46	100.00	85.80	67.50	71.55	56.04			
LS DO SERV	23.20	100.00	23.20	18.73	100.00	23.20	18.80	0.00	0.07			
<b>Sulphur Limit</b>		<b>Supplier Quantities</b>			<b>Vessel Quantities</b>		<b>Difference</b>					
High:	0 ‰/m/m	Volume	0 m³	313 m³	0	0						
Low:	0 ‰/m/m	Weight	0 MT	256.42 MT	0	0						
<b>Remarks</b>												
MASTER/VESSEL'S SIGNATURE						CHIEF ENGINEER'S SIGNATURE						
NOTE: S = Sounding Input, U = Ullage Input												
M U L T I L O A D												

**WE CAN SAIL TOGETHER.....**

**S.A. Malliaroudakis Maritime (UK) Ltd.**

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