

Mooring System Management Plan (MEG 1.9)

NEW CHALLENGES

MEG 4 guidelines introduced requirements for a Mooring System Management Plan Register as well as for a risk-based approach on handling maintenance and retirement criteria for mooring lines. Ship operators are challenged not only to handle the operational information on mooring lines use while the vessel is at dock or during STS operations, but also to assess the handling of mooring lines from past data included at the fleet register.

DYNAMARINE approaches this challenge with a pioneering service which includes the development of the MSMP manual along with a dynamic monitoring of mooring line performance through a performance database (DYNAMOORE).

THE ADVANTAGES OF A DATABASE (DYNAMOORE)

The database will accept input from the vessel by use of automatic forms (either in XL or HTML). The forms will include the following process:

1. Register of vessel existing and new mooring gear
2. Short reporting in case of failure or line replacement

The output from the database will be the following:

1. Recordkeeping on use of Mooring lines
2. Statistics between fleet vessels or same or equivalent mooring lines
3. Benchmarking on Maintenance/ use/ failure of equivalent mooring lines in relation to conditions/ locations/ manufacturers etc with respect to the participating vessels.
4. Input from rope manufacturers (subject to participation)

DYNAMARINE considers that vessel operators should focus on the process associated with the registry of mooring line performance and condition assessment criteria. We believe that by providing a powerful monitoring tool to vessel operators, they will gain a good control on the performance of their mooring systems on board vessel that will assist them in extending their life period through proper management.

SCOPE of the MSMP

The objective for the MSMP is to ensure that all assessed risks are effectively managed through the design and operation of the mooring system. Its aim is to ensure that during mooring operations, no harm comes to ship or terminal staff or damage to the ship or terminal/facility it is interfacing with, and that the mooring system meets applicable regulations, codes and recommended practice.

The MSMP contains details of items that may be ship or operator specific (e.g. parts of the operator's SMS), and guidance on items that should be retained in a Mooring System Management Plan Register (MSMPR) that stays with the ship throughout its life-cycle.

INCURRED COSTS/ SUBSCRIPTION



The cost for the preparation of the plan is Euros 150 with one year free subscription at the database. There are additional costs as shown at table 1, depending on the availability of data and should the STS supplement be requested.

REQUIRED Process

The development of the MSMP is ship specific. It contains information on the mooring apparatus of the vessel and relies on the provision of data from the ship. Below table outlines the required data. It is produced in electronic form (softcopy) with the option to deliver it in hard cover folder which may be utilized for the filing of relevant documents.

Table 1

PART	DESCRIPTION	CLIENT INPUT	EXTRA COST IF THE CLIENT INPUT IS NOT AVAILABLE
A	General Ship Particulars	<i>Q88 or Vessel Description</i>	n/a
B	Mooring equipment design Philosophy	<i>Type of available mooring lines on board – Certificates with:</i> <ul style="list-style-type: none"> • MBL • Material • Manufacturer • Length • Elongation • Date of purchase 	n/a
C	Detailed list of Mooring Equipment	<ul style="list-style-type: none"> • Attached Excel spreadsheet completed • Mooring Arrangement Plan 	If spreadsheet is not available, then an additional 200 Euro will apply per vessel category
D	Inspection, Maintenance and retirement strategies	<i>Relevant processes from SMS</i> <ul style="list-style-type: none"> • Inspection Process + FORM • Maintenance process • Retirement criteria 	n/a
E	Risk and change Management, safety or personnel and human factors	<i>Risk Assessment related to:</i> <ul style="list-style-type: none"> • Mooring/ unmooring operations <i>Company Policy on snap back safeguards</i> <i>Mooring training processes as per SMS</i> <i>External auditing/ training processes (if)</i>	n/a
F	Records and Documentations	n/a	n/a
G	Mooring System Management Plan Register	<i>Form of Mooring line running hours if available for review</i>	n/a
STS	STS Supplement (optional) ¹	<i>Vessel General Arrangement</i>	800 Euro per vessel category

¹ STS Supplement Option

As part of the JPO (OCIMF STS Guide paragraph 5.2) a mooring plan should be prepared for both participating vessels. Several different plans have been evidenced from the industry which are not consistent with vessel compatibility and basic requirements of STS guidelines, MEG and industry best practices.

Apparently, there is no uniformity on minimum expected information, as evidenced. Provided mooring plans depend on the computer skills of the responsible person rather on procedures. Hence, there is no standard for Masters to follow and rely upon. This may result is confusion and delays during STS Mooring operations.

The preparation of such plans may take place for three typical participating vessels for STS Operation. A sample plan is shown at ANNEX I.

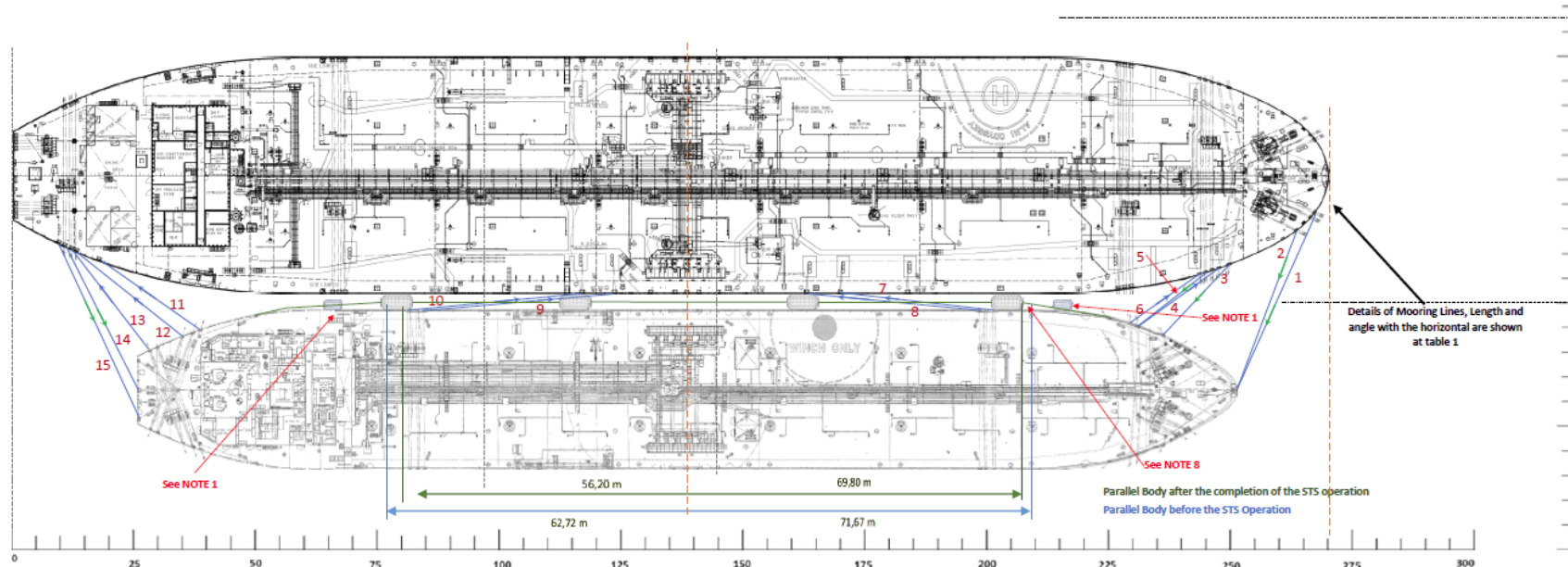
Such Mooring diagrams show the proposed mooring line type, length, angle with horizontal, estimated freeboard change and baby fender arrangement before and after the STS operation, according to the latest OCIMF guidelines.

The benefit of such Plans is the following:

1. The Master gains an understanding of the detailed Mooring Arrangement during STS;
2. The Direction (angle) and lead distance of lines is accurately produced;
3. The risk for mooring tail failure is minimized;
4. The Master has a visual representation of the primary & secondary fender location and necessary adjustments;
5. These plans assist both master's and the POAC to establish a constructive safety meeting prior to the operation;

The plans are produced and submitted to the MASTER for their review.

MOORING PLAN – MT TEST 1 WITH MT TEST 2



Details of Mooring Lines, Length and angle with the horizontal are shown at table 1

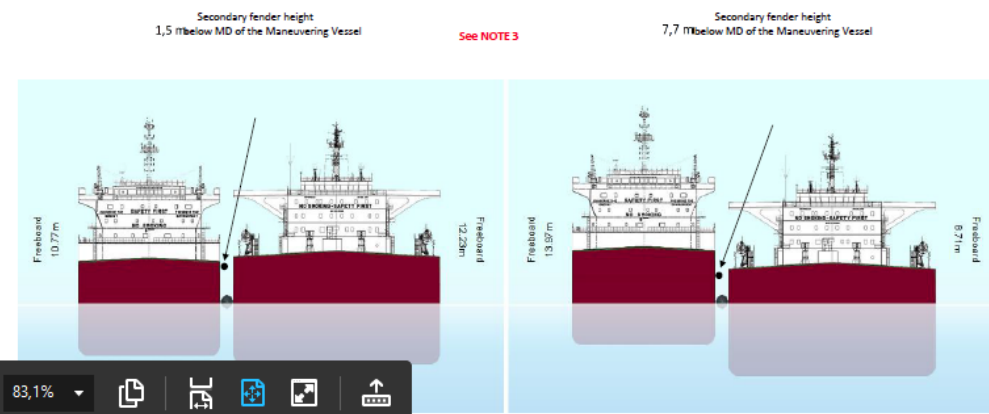
LEGEND	
TEST 1 LOA	274,00 m
TEST 2 LOA	228,60 m
Maneuvering Vessel	TEST 2
Discharging Vessel	TEST 2
TYPE OF OPERATION	REVERSE OPERATION
Type of Primary Fenders	4 pcs 3300 x 6500 50 kPa
Berthing Energy	72 TM
Fender Energy absorption	185 TM
Fender Safety Factor	2,57
Normal Range(1-2)	
TRANSFER QUANTITY	ABT 40000 MT
TEST 1 DISPLACEMENT	ABT 60000 MT
TEST 2 DISPLACEMENT	ABT 120000 MT
Berthing Coefficient "c"	80000
MAX APPROACHING VELOCITY	0,20 m/s
WEATHER CONDITIONS	CALM

Table 1) MOORING LINES				
A/A	LINE	PROVIDING SHIP	LENGTH [m] CHOCK to CHOCK	LINE ANGLE
1	WIRE	TEST1	39 m	65°
2	WIRE	TEST1	34 m	69°
3	WIRE	TEST1	20 m	46°
4	WIRE	TEST2	21 m	35°
5	WIRE	TEST1	18 m	37°
6	WIRE	TEST2	18 m	34°
7	WIRE	TEST2	32 m	6°
8	WIRE	TEST2	36 m	5°
9	WIRE	TEST2	40 m	5°
10	WIRE	TEST2	36 m	5°
11	WIRE	TEST2	25 m	34°
12	WIRE	TEST2	29 m	34°
13	WIRE	TEST2	26 m	52°
14	WIRE	TEST1	32 m	62°
15	WIRE	TEST1	39 m	64°

- NOTES**
1. Portable chock is required for secondary fender as no closed chock is available
 2. All mooring lines should be wires
 3. The vertical position of the secondary fender should be adjusted during the operation.
 4. Actual vessel displacement prior the STS is subject to confirmation
 5. Fender calculation is based on Reverse Lightering Operation and Calm weather conditions.
 6. All Mooring lines are lead through closed chocks on both vessels.
 7. Lines 1, 2, 3, 4, 5 require a protective sleeve
 8. Fender pennants (or distances, starting from forward fender) FRWD Bitt to fender No. 1=3=41m, Fender 3 to 4= 31m, Fender No. 4 to aft Bitt= 26m

Scale in meters

BEFORE THE OPERATION AFTER THE OPERATION



Navigation controls: Hand icon, Zoom in (+), Zoom out (-), 83,1% zoom level, Copy icon, Rotate icon, and other standard software navigation symbols.