Appendix J. Bunkering Risk Assessment and Procedure and Checklist, Environmental Impact

RA 5.A001	BUNKERING OPERATIONS

Risk Management

Operation / Work activity being assessed:	BUNKERING OPERATIONS
	☒ Routine ☐ Non-routine
Generated by: Vessel ☒ (record the name) AMSTERDAM	☐ Office
Code number (to be assigned by the Office): 5.A001	

FREQUENCY CATEGORY		
5	Frequent - Possibility of repeated incidents	More often than once per voyage
4	Probable - Possibility of isolated incidents	Once per year
3	Occasional- Possibility of occurring sometime	Once per 5 years
2	Remote- Not likely to occur	Once per 10 years
1	Very unlikely- Practically impossible	Once per 30 years or more

CONSEQUENCE CATEGORY				
4	Human losses / fatalities	Major pollution / Full scale response	Excessive/ high cost damage >$1000000	Major national & internation al impact
3	Serious injury to personnel	Moderate pollution/ Significant resources commitment	Moderate cost or damage (100000 – 1000000$)	Considera ble impact
2	Number of minor injuries / Medical treatment for personnel	Little pollution / Limited response of short duration	Little cost or damage ($10000 – $ 100000)	Slight impact
1	Few minor injuries	Minimum pollution / Little or no response needed	Minimum cost / damage < $10000	Zero impact

RISK MATRIX

CONSEQUENCE \ FREQUENCY	1	2	3	4	5
1	L(1)	L(2)	L(3)	M(4)	M(5)
2	L(2)	M(4)	M(6)	M(8)	H(10)
3	L(3)	M(6)	M(9)	H(12)	H(15)
4	M(4)	M(8)	H(12)	H(16)	H(20)

High=Intolerable Risk Medium=Tolerable Risk Low=Acceptable Risk

Risk Assessment						
	Risk Identification		Risk Analysis	Initial risk evaluation		
No	Hazard	Potential hazardous event	Existing control measures	F	C	R
1	Approach/departure to/from bunkering area (congested traffic waters/anchorage area)	Moderate cost or damage	– Engine room preparation for arrival/departure – Handling of fuel oils – Bunkering Operations – Management of Fuel Oil (Supply and Transfer) – Use of Personal Protective Clothing and Equipment – Familiarization/training – Procedures for Handling Bunkers Containing H2S – Bunkering Operations	4	3	12
2	Inadequate Under Keel Clearance	Moderate cost or damage		4	3	12
3	Uncontrolled contact with the bunker barge during mooring/unmooring	– Moderate cost or damage – Serious injury to personnel		4	3	12
4	Substandard fendering / mooring equipment	– Moderate cost or damage		4	3	12
5	Inadequate access of personnel between ship / barge	– Serious injury to personnel		4	3	12
6	Substandard bunker hoses/connections	Moderate pollution		3	3	9
7	Lack of training/familiarization of crane operator	– Moderate cost or damage – Serious injury to personnel		4	3	12
8	Adverse weather/environmental conditions	Moderate cost or damage		4	3	12
9	Bunker Tank overflow	Moderate pollution		3	3	9
10	Inadequate crew training	– Moderate cost or damage – Serious injury to personnel		4	3	12
11	Inadequate maintenance condition of the bunker line	Moderate cost or damage		4	3	12
12	Inadequate internal communication	Moderate cost or damage		3	3	9

13	Bunkers with H_2S content	Serious injury to personnel		4	3	12
14	Flammability of the bunker tank vapour space	– High cost or damage – Serious injury to personnel		3	4	12
15	Manual handling	– Moderate cost or damage – Injury to personnel		3	3	9
16	Inadequate ship/barge, ship/ship co-operation/co-ordination /communication	Moderate cost or damage	Prior to commencing the operation, all pre-loading checks should be carried out & communication systems tested	4	3	12
17	improper bunker rate transfer	Moderate cost or damage	The loading rate should be checked regularly	1	3	3
18	Back pressure to bunkering hose & pipelines	Moderate cost or damage	Care should be taken when changing over tanks to avoid back pressure against the hose or loading lines	1	3	3
19	Topping off spill	Moderate cost or damage	Decrease topping-off transfer rate to limit air locks in the tank causing vent mist & give enough time to barge to stop transfer	1	3	3
20	Accident bunker spill from bunker piping, hoses residues	Moderate cost or damage	Upon completion of transfer, drain all hoses & lines to the tank or, if applicable, back to the barge, prior to disconnection	1	3	3
21	Accidental bunker spill by blowing air through bunker pipes to clean them	Moderate cost or damage	Ensure that the tank where the bunker line is drained, is only partly full and has sufficient ullage on completion of loading	1	3	3
22	Slip & fall on deck or loose hand grip	Serious injury to personnel		3	3	9

Note F: Frequency, C: Consequence, R: Risk

Risk Treatment				Residual risk evaluation		
Hazard No.	**Additional Risk Control Measures**	**Responsible**	**Action Timeline**	**F**	**C**	**R**
1	A. Ensure strict implementation of Company's pre-arrival test and procedures, in particular the testing of main engine and steering gear, well before entering in heavy traffic areas	Master / C/E	Prior to arrival	1	3	3
	B. Ensure close monitoring of navigation and traffic information and establish contact with VTS (if available) or Port Control	Master / Officer in charge	Continuous			
	C. Approach/depart with minimum (safe) speed consistent with adequate steering control	Master	Prior to arrival/during departure			
	D. Anchor Party stand-by	Officer in charge	Prior to arrival/departure			
	E. Maintain Bridge Watch Condition 2 and Engine Room Stand-by condition	Master / C/E	Prior to arrival/during departure			
2	Ensure the minimum UKC in accordance with Company's UKC policy taking into account the draft increase due to bunkering.	Master	Prior to arrival	1	3	3
3	A. Agree with the barge Master approaching procedures and monitor implementation. Suspend operation if you observe deviation from what has been agreed or if in doubt or if conditions have been changed.	Master	During approach	1	3	3
	B. Check that barge fenders have been rigged in proper position.	Master	During approach			
	C. Ensure continuous communication with barge Master during approaching.	Master / Officer in charge	During approach			
4	A. The Officer in charge should inspect visually and verify the proper condition of the barge's mooring lines, if used.	Officer in Charge	Prior to operation	1	3	3
	B. If barge mooring lines are not in an acceptable condition, then additional ship's mooring lines to be used	Officer in Charge	Prior to operation			
5	Proper and safe access should be provided to barge personnel using either accommodation ladder or personnel transfer basket. Ensure use of personnel safety gear.	Officer in charge	During operation	1	3	3
6	A. Ensure that the bunker hoses to be used are certified and tested.	C/E	Prior to operation	1	3	3
	B. Check visually the proper condition of the barge's hoses and flanges prior to commencement of transfer.	C/E	Prior to operation			
7	The Bosun should be the hose-handling crane operator provided that he has been prior familiarized to its use and authorized for that purpose.	C/O	Prior to operation	1	3	3

8	A. Local weather forecast should be closely monitored and operation aborted if required.	Master / Officer in charge	Continuous	1	3	3
	B. Additional mooring lines should be used, if deemed necessary	Master	During operation			
9	A. Verify that the bunker tanks' high level alarms are operational.	C/E / Engineer Officer (if delegated)	Prior to operation	1	3	3
	B. Ensure that an effective bunkering plan has been developed and reviewed by the involved personnel and that the Bunkering Safety Check List has been properly completed and signed.	C/E	Prior to operation			
	C. The bunker tank level should be monitored frequently and in accordance with the time periods set in the bunkering plan and bunkering safety checklist	C/E	During operation			
	D. The bunker pipeline line up should be verified by two persons (including the Chief Engineer).	C/E	Prior to operation			
10	It should be ensured that persons to take part in this operation have been briefed and it has been ensured that they have understood the bunkering plan, in order that strict adherence to this procedure is achieved	C/E	Prior to operation	1	3	3
11	A. During start up and at frequent time periods thereafter, the in-use bunker pipeline should be inspected to ensure that there are no leakages	Engineer Officer on duty	During operation	1	2	2
	B. It should be ensured that an annual bunker pipeline pressure test has been carried out in accordance with the company's procedures	C/E	Prior to operation			
12	All involved Officers and manifold watch should carry portable UHF/VHF radios.	C/E / C/O	During Operation	1	3	3
13	A. Bunker fuel tanks should be monitored for H2S content prior to, during and after bunkering. If H2S has been detected, the procedures for Handling Bunkers Containing H2S should be followed.	OOW	Continuous	1	3	3
	B. MSDS for bunkers lifted should be requested and be available onboard prior to commencement of the bunkering.	Master / C/E	Prior to operation			
14	Ullaging, dipping and sampling procedures must follow the relevant recommendations.	C/E / C/O	During Operation	1	4	4
15	During disconnection of the hose, attention should be given to avoid hand injury due to a sudden tension of the hose	Bosun	During disconnection	1	3	3
16	A. Effective ship/barge communication should be established prior to commencement of the operation and tested at frequent intervals during the operation.	Officer in charge / OOW	Continuous	1	3	3
	B. Before the bunkering operation commences, the Chief Engineer should agree with the barge Master in writing on the handling procedures	C/E	Prior to operation			

	including the maximum transfer rates and on the action to be taken in the event of an emergency during transfer operations. The Bunkering Safety Check List should be properly completed and signed.					
22	Wear safety shoes, helmet, leather gloves	Safety Officer	Before work done	1	3	3

Note F: Frequency, C: Consequence, R: Risk

RISK MANAGEMENT TEAM	
RANK / TITLE	**REMARKS**

RISK ASSESSMENT REVIEWED/APPROVED BY:					
DATE	**VESSEL**	**NAME**	**RANK / TITLE**	**SIGNATURE**	**REMARKS**

Note:

1. Original version of this RM must be taken for reference only, vessel has to do modifications in Risk Assessment & Risk Treatment section to make it vessel specific.
2. Further vessel has to declare her own Risk Management Team, any action requiring management system modification (or) office assistance must be notified to HSQE&En department in Montec office.
3. For Routine activities Risk Assessment to be reviewed minimum annually, or when circumstance changed from initial circumstances in which RA performed.
4. For Non-Routine activities Risk Assessment to be reviewed on each & every occasion, when respective job to be performed on-board.
5. For High Risk jobs prior to starting job, approval must be taken from vessel superintendent/DPA.

6.13 PROCEDURE ON THE TRANSFER OF BUNKER OIL BETWEEN SHIPS (WORKING AS BUNKER SHIP)

6.13.01 Purpose

The purpose of this chapter is to provide procedures related to transfer of bunker oil between ships (working as Bunker Ship).

These procedures are in addition to and complement applicable rules regulations, codes, guidelines and standards (in particular, ISGOTT, ICS/OCIMF Ship to Ship Transfer Guide)

6.13.02 Responsibility

It is the responsibility of Master to implement this procedure and to ensure compliance with applicable rules, regulations, codes, guidelines and standards.

Master shall instruct, supervise, identify and verify shipboard personnel who perform the tasks required by this procedure. Chief Officer shall assist the Master in these activities, as required by the Master.

All shipboard personnel who are assigned tasks covered by this procedure shall comply with this procedure.

6.13.03 Work Performance

Whenever a transfer of bunker oil between ships (working as Bunker Ship) has to be performed, the local regulation to be taken into account; wherever local regulation not stated the ICS/OCIMF Ship to Ship Transfer Guide shall be consulted and procedures followed.

6.13.04 Documentation, Filing and Verification

Checklists in accordance with local regulation take preference and shall be completed and reported as required by local authorities; wherever local regulation not stated the checklists according to Appendix 01 (to this chapter) FR-OTKR-002 shall be completed.

Chief Officer shall maintain duly completed checklists in a file, along with respective cargo documents for minimum 01 year (or) as stated by local regulations which ever is highest.

Verification of this procedure shall be done during Master's Review, Internal and External Audits

6.13.05 Authorisation and Approval

This procedure is authorised and approved by the Technical Director.

6.13.06 Distribution and Appendices

The Technical Director is responsible for the distribution of this procedure in all controlled copies of the Ship Operation Manual.

This procedure have below appendices: -

- Appendix 01 - Form register – FR-OTKR-002 – Ship-To-Ship Bunkering Safety Checklist *(only if local authority not have specific checklist)*

- Appendix 02 – Regulation for bunker operation in Danish Territorial Waters *(including bunker checklist)*
  - Order No. 733 of 25 June 2007 – Order on the transfer of bunker oil between ships in Danish territorial waters.
  - Order No. 570 of 04 June 2014 – Order on the transfer of liquid cargo between ships in Danish and Greenland territorial waters (STS operations)

- Appendix 03 – Regulation for bunker operation in PCFC - Trakhees controlled Port premises (Dubai, UAE). *(including bunker notification form and bunker safety checklist)*
  - Regulation PM-15.0: Rules & Regulations for Bunkering Operations

- Appendix 04 – Regulation for bunker operation in Dubai waters ***including anchorage area, ports, DMC and dry-dock.*** (Dubai, UAE). *(including bunker operation safety checklist)*
  - Dubai Anchorage Regulations – by Dubai Maritime City Authority (DMCA)
  - Bunker Operations safety Checklist – Ref. No. MAO-FRM-024 – Revision date: 05-2018.

FORM OTKR-002 SHIP-TO-SHIP BUNKERING ANOTHER VESSEL – SAFETY CHECKLIST

Port / Anchorage		**Berth No.**	
Agent		**Date & Time**	
Bunker Supply Company		**Bunkering Vessel Name**	
Bunker Receiver Company/ Operator		**Receiving Vessel Name**	

No	Safety Precautions	Bunker Supplier	Bunker Receiver	Remarks
1	Are moorings appropriate and secured?			
2	Are personnel for tending of moorings designated?			
3	Is boom positioned, effectively enclosing transfer area?			
4	Is an Oil Transfer Procedure displayed prominently?			
5	Has Initial loading rate been agreed with receiving vessel?			_____m3/h
6	Has loading rate been agreed with receiving vessel?			_____m3/h
7	Has topping-off rate been agreed with receiving ship?			_____m3/h
8	Has transferring maximum pressure been agreed with receiving vessel?			_____Bar
9	Are oil transfer hoses pressure tested, tagged?			
10	Are oil transfer hoses properly supported?			
11	Are oil transfer hoses free of damage/kinks/bulges?			
12	Are all flanges/drain cocks/valves checked for leaks?			
13	Are all unused manifolds blanked and valves closed?			
14	Is bilge and ballast piping effectively segregated?			
15	Are drip trays placed, plugged and free of liquid?			
16	Are deck scuppers effectively plugged?			
17	Is communication system established and tested?			System: Backup system:
18	Is oil spill equipment ready for emergencies?			
19	Is emergency shut-down in place and tested?			

20	Are all personnel at their positions?			
21	Is deck lighting sufficient during the night time?			
22	Is red flag displayed or red light switched on?			

Additional Comments:-

.....
Master Name & Signature
Bunkering Vessel

.....
Master/Chief Engineer Name & Signature
Receiving Vessel

Environmenatal Aspect register related to consequence leading to Environment Damage

S.No.	Applicability	Aspect	Impact	Significance	Eliminate, Isolate or minimise	Controls	check/is it working?	Persons Responsible
1	Ship	Cargo Pollution - Oil & checmical cargo	degradation to sea & marine life	Can range from lesser impact to major impact	Isolate, Minimise	double hull tankers, class surveys confirming vessel condition & seaworthiness, intenal technical inspection, Training to personnel	Class Certificates, Technical Inspection report, Annual internal audit	For Vessel - Master
2	Office / ship	Garbage (or) Waste generation	Degradation to the land	Can range from lesser impact to significant impact	Minimise	Garbage quantity log, garbage seggregation, Training to personnels	Garbage log, Annual internal audit	For Office - HSQE&En Management representative For Vessel - Master
3	Office / ship	Paper consumption	Depletion of natural resource - trees	Can range from lesser impact to significant impact	Minimise	double side printing, print only absolutely required documents	Annual internal audit	For Office - HSQE&En Management representative For Vessel - Master
4	Office / ship	Air emission	Degradation of the air quality (and) Depletion of natural resource - Oil	Likely to cause significant impact	Minimise	1. Company vehicle run on manufacturer recommended speed, annual test on vehicle emission, target in reducing electricity consumption in office to reduce carbon footmark. 2. Ship machinery to be maintained as per manufacturer standard to have fuel optimization.	Vehicle test report, Vessel PMS (Machinery maintenance record), Annual internal audit	For Office - HSQE&En Management representative For Vessel - Master
5	Office / ship	Noise	Noise pollution	Can range from lesser impact to significant impact	Isolate, Minimise	Remove, relocate or repair the noise creating equipment or item, proper insulation to reduce noise level	Annual internal audit	For Office - HSQE&En Management representative For Vessel - Master
6	Office / ship	Grey Water generation	Degradation to the land, Depletion of natural resource - water	Can range from lesser impact to significant impact	Minimise	Water leakage to be arrested, taps to be closed when not in use	Number of incidents / accidents logged, Annual internal audit	For Office - HSQE&En Management representative For Vessel - Master
7	Ship	Ballast water including species getting transferred from one place to other	degradation to sea & marine life	Can range from lesser impact to significant impact	Minimise	Ballast water exchange during passage, and follow vessel specific ballast Water Management Plan (BWMP)	Ballast Water record book, Annual internal audit	For Vessel - Master
8	Ship	Antifouling paint - bio-cide released in sea water	degradation to sea & marine life	Can range from lesser impact to significant impact	Minimise	Use class approved antifouling paint	Antifouling certificate issued by class, Annual internal audit	For Vessel - Master
9	Ship	Ozone depleting gases - release to atmosphere	degradation of UV protecting ozone layer	Can range from lesser impact to significant impact	Minimise	Maintain Ozone depleting substance (ODS) record, Training to personnel	ODS record, Annual internal audit	For Vessel - Master