

LNG bunkering
Part 3 : Procedures and safety distances

AMENDMENT NO. 1

October 2023

1. Page 6, Foreword

- a) *Replace* “IAPH LNG bunker checklists (2019)” with “IAPH LNG bunker checklist – Truck-to-ship bunker operations – A, Version 4.0” and “IAPH LNG bunker checklist – Ship-to-ship bunker operations – A, Version 4.0” in the list of references.
- b) *Replace* “Annex B of ISO 20519 was adapted and Table D.1 of ISO/TS 18683 was reproduced in Annex D of this TR, and the IAPH LNG bunker checklists were adapted as Annex A of this TR with the permission of the International Organization for Standardization and the International Association of Ports and Harbors respectively.” with “Annex B of ISO 20519 was adapted and Table D.1 of ISO/TS 18683 was reproduced in Annex D of this TR with the permission of the International Organization for Standardization. Annex A of this TR was developed with reference to IAPH LNG bunker checklists.”

2. Page 11, 5.6.2 Determination of hazardous area

Replace “A hazardous area related to bunkering is where gas may be present and means any hazardous area in Zone 0, Zone 1 and Zone 2, as defined according to the requirements of IEC 60079-10-1 and applicable for:” with “A hazardous area related to bunkering is where gas may be present and means any hazardous area in Zone 0, Zone 1 and Zone 2, as defined according to the requirements of IEC 60079-10-1. Hazardous area for receiving ship and bunkering ship shall be defined according to IGF and IGC code as follows:”.

3. Page 12, 5.6.3 Determination of safety zone

Replace “hazardous area(s)” with “safety zones” in the 2nd sentence.

4. Page 14, 6.1 Planning phase

- a) *Insert* the following new subclauses:

6.1.2 Joint plan of bunkering operations (JPBO)

A joint plan for bunkering operations (JPBO) may be prepared for ship-to-ship bunkering operations. Bunker vessel operator shall draft the JPBO based on the bunker management plans of both vessels, the exchanged information and local specific information of the site and the agreements made during the compatibility check. Refer IAPH STS-A Version 4.0, Part A2 for topics to be covered in JPBO.

6.1.3 Bunker identification number (BIN)

A unique bunker identification number (BIN) shall be allocated to each ship-to-ship bunkering operations. BIN number shall be stated in all bunkering records. Bunker delivery note (BDN) number may be considered as BIN for bunkering operations.

- b) *Replace* subclause numbers “6.1.2”, “6.1.3” and “6.1.4” with “6.1.4”, “6.1.5” and “6.1.6” respectively.

5. Page 16, 6.3.4 Topping up procedures

Replace the heading “Topping up procedures” with “Topping off procedures”.

6. Page 20, Annex A, LNG bunkering checklists

Replace Annex A with the Annex as shown below:

Annex A (informative)

LNG bunkering checklists

A.1 Representatives for LNG transfer modes

The responsibility and accountability for the safe conduct of operations while a ship is performing an LNG bunkering is shared jointly between the identified representatives in each LNG transfer mode. Refer to Table A.1 for the representatives and the actions to be taken before the commencement of the LNG bunker operations.

Table A.1 – Representatives for LNG transfer modes

LNG transfer mode	Representatives	Actions to be taken before the commencement of LNG bunker operations
Ship-to-ship	Master and, if applicable, terminal representative	a) Agree in writing on the transfer procedures, including the maximum loading or unloading rates; b) Agree in writing on the action to be taken in the event of an emergency; c) Complete and sign the LNG bunker checklist; and d) Meet the port authority requirements (e.g. port marine notices/circulars) and terminal requirements/regulations.
Truck-to-ship	Master, LNG bunker truck operator and, if applicable, terminal representative	
Shore-to-ship	Master, LNG onshore bunker station operator and, if the bunker station is located on a terminal, the terminal representative	
Cassette bunkering	Master, operator of the LNG cassette equipment, if the cassette bunkering is located on a terminal, the terminal representative / operator	
<ol style="list-style-type: none"> 1. "Bunker facility", as shown in the following checklist, applies to all modes (i.e. ship-to-ship, truck-to-ship, shore-to-ship and cassette bunkering). 2. "Person-in-charge" (PIC) is an individual appointed by the bunker supplier to be responsible for the delivery and transfer of bunkers and the associated bunkering documentation (refer to 5.4.2). 3. "Receiving vessel" is the vessel that receives LNG bunkers to be used as fuel for its propulsion. 4. "Terminal" is any organisation responsible for the location of the bunkering. 5. "Bunker vessel" is the vessel that supplies LNG bunkers to a receiving vessel at sea or at a terminal. 6. "Bunker truck" is the tank trailer that supplies LNG bunkers to a receiving vessel at a terminal. 		

A.2 Guideline for completing this checklist

A.2.1 Both bunkering and receiving vessels are encouraged to develop secure electronic tool(s) to complete and exchange the checklist for the intended bunkering operation.

A.2.2 The presence of the letters A, R or P in the Code column indicates the following:

- A (Agreement) – Indicates an agreement or procedure to be identified in the Remarks column of the checklist or communicated in some other mutually acceptable form.
- R (Re-check) – Indicates items to be re-checked at appropriate intervals, as agreed between both the parties, at periods stated in the declaration.
- P (Permission) – Indicates permission to be granted by authorities.

A.2.3 All checks should be jointly completed by the bunker facility and the receiving vessel by clearly indicating in the appropriate box. For the checks that are not applicable, the boxes are shaded in grey. The “if applicable” marked checks are not mandatory; users can skip these checks by indicating “N.A.” in the Remarks column. A copy of the completed checklist should be retained by both the bunker facility and the receiving vessel.

A.2.4 The joint declaration should not be signed until both parties have checked and accepted their assigned responsibilities and accountabilities. When duly signed, copies of these documents are to be kept for at least one year with the bunkering facility and receiving vessel.

A.3 Ship-to-ship LNG bunkering checklist

An example of a ship-to-ship LNG bunkering checklist is shown below.

A.4 Truck-to-ship LNG bunkering checklist

An example of a truck-to-ship LNG bunkering checklist is shown below.

SHIP-TO-SHIP LNG BUNKERING CHECKLIST

PART A – PLANNING STAGE CHECKLIST

(This part should be completed during the planning stage of LNG bunker operations)

This checklist can be used for an exchange of knowledge and agreements on safety items during the planning stage of an LNG bunkering to be conducted during the order placement for the bunkering operation.

JPBO number:	BIN / BDN number:
Receiving vessel's name:	Bunker vessel's name:
Receiving vessel's IMO number:	Receiving vessel's owner/operator/agent:
Delivery location:	Terminal/Port operator (if applicable):
Date of arrival:	Time of arrival:

Check	Receiving vessel	Bunker vessel	Terminal (if applicable)	Code	Remarks
1. Bunker vessel has checked with the implementing authority and terminal, if applicable, (including site incident responders) for the assignment and confirmation of the location of the LNG bunkering operations.				A, P	
2. The LNG bunker vessel has obtained the necessary permissions to go alongside the receiving vessel.				P	
3. All relevant personnel involved in the LNG bunker operation have the appropriate training and have been instructed on the particular LNG bunker system and procedures including fire control plan, emergency response procedures and contingency planning.				A	

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Check	Receiving vessel	Bunker vessel	Terminal (if applicable)	Code	Remarks
4. Inclement weather conditions e.g. thunderstorms, maximum wind and swell criteria for operations have been agreed on.				A	Stop bunkering operations at: _____ Disconnect transfer system at: _____ Unmoor at: _____ NOTE – In any case, all bunkering operations are to be suspended during thunderstorms with lightning strikes or gale warnings.
5. The receiving vessel and bunker vessel have agreed upon the mooring and fendering arrangement.				A	
6. The bunker operation area has been equipped with sufficient illumination.				A	
7. All LNG transfer and gas detection equipment has been certified, is in good condition and is appropriate for the service intended.				A	If applicable for terminal.
8. The bunker plan and procedures for bunkering, cooling down and purging operations have been agreed to by receiving vessel and bunker vessel and are made available to all concerned parties.				A	
9. The system and method of electrical isolation have been agreed upon by receiving vessel and bunker vessel.				A	
10. The safety/monitoring zone has been agreed upon and designated for controlled access				A	
11. Actions have been taken to eliminate sources of ignition surrounding transfer location and a potential LNG or NG release areas.				A	
12. All mandatory firefighting equipment is ready for immediate use.					
13. Personnel involved are not feeling unwell and are adequately rested as per applicable work and rest hour regulations (e.g. MLC 2006, STCW, or national regulations).				A	

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Check	Receiving vessel	Bunker vessel	Terminal (if applicable)	Code	Remarks
14. SIMOPs activities have been highlighted and defined in Part B checklist and have been completed before actual bunker transfer operations start.					
15. All relevant personnel have participated in the risk assessments as applicable and have been informed of the results and recommendations.					
16. All relevant parties have provided inputs in preparation of JPBO.					

Declaration

We, the undersigned, have jointly covered all items in Part A and are satisfied that the entries we have made are correct to the best of our knowledge.

Receiving vessel	Bunker vessel	Terminal (if applicable, for receipt only)
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date/Time:	Date/Time:	Date/Time:

PART B – PLANNED SIMULTANEOUS ACTIVITIES

(This part should be completed before actual bunker transfer operations start)

This checklist is applicable for concurrent bunker, cargo or other operations that may pose additional risk during the LNG bunkering. Simultaneous activities are only allowed if such activities were pre-approved and conform to the ship’s operational documentation. The risk assessment, including the applicable mitigation measures, should be recorded in the ship’s operational documentation.

Receiving vessel’s name:	Bunker vessel’s name:
Receiving vessel’s IMO number:	Receiving vessel’s owner/operator/agent:
Delivery location:	Terminal/Port operator (if applicable):

Check	Receiving vessel	Bunker vessel	Terminal (if applicable)	Code	Remarks
1. Planned simultaneous operations during LNG bunkering are in accordance with receiving vessel’s approved operational documentation.					JPBO
2. Implementing authority and terminal, if applicable, have been notified of the simultaneous bunker or cargo or other operations during LNG bunkering.				P	
3. Safety procedures, mitigation measures and implementation plan for simultaneous activities, as mentioned in the receiving vessel’s approved operational documentation, have been agreed upon and are being observed by all parties involved.				A R	
4. An effective means of communication between the receiving vessel and the terminal has been established and tested. The communication language has been agreed upon.				A R	VHF/UHF channel: _____ Primary system: _____ Backup system: _____

Agreed simultaneous operations

The risk assessment, including the applicable mitigation measures, should be recorded in the ship’s operational documentation and revised accordingly taking into consideration the current situation. The necessary mitigation measures should be in place.

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Activities	Receiving vessel	Bunker vessel	Terminal (if applicable)

Restrictions in LNG bunker/cargo operations

Activities	Receiving vessel	Bunker vessel	Terminal (if applicable)

Receiving vessel	Bunker vessel	Terminal (if applicable, for receipt only)
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date/Time:	Date/Time:	Date/Time:

PART C – PRE-TRANSFER CHECKLIST

(This mandatory part should be completed before actual transfer operations start)

This checklist identifies the required physical checks and elements that are verified verbally before the LNG bunkering commences. The safety of operations requires that all relevant statements are considered and the associated responsibility and accountability for compliance is accepted, either jointly or singly as agreed to by the parties.

Where either party is not prepared to accept an assigned accountability, a comment must be made in the Remarks column and due consideration should be given to assessing whether operations can proceed.

Where a particular item is considered to be not applicable to any one party, a note to this effect should be entered in the Remarks column.

JPBO number:	BIN / BDN number:
Receiving vessel's name:	Bunker vessel's name:
Receiving vessel's IMO number:	Receiving vessel's owner/operator/agent:
Delivery location:	Terminal/Port operator (if applicable):
Date of arrival:	Time of arrival:

Check	Receiving vessel	Bunker vessel	Terminal (if applicable)	Code	Remarks
1. Part A and Part B (if applicable) have been completed and signed before proceeding to complete Part C.					
2. The implementing authority and terminal, if applicable, have been notified of the start of LNG transfer operations and have been requested to inform other vessels in the vicinity.				A P	
3. All relevant parties have reviewed and agreed upon the final JPBO.					Refer to JPBO

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Check	Receiving vessel	Bunker vessel	Terminal (if applicable)	Code	Remarks
4. Roles by the bunker vessel and receiving vessel have been identified and posted, including the bunker plan and piping diagram, specifying location of tanks, valves, etc.				A	The roles and responsibilities of the personnel are stated in the JPBO.
5. Present weather and wave conditions are within the agreed limits.				A R	Stop bunkering transfer operations at: _____. Disconnect at: _____. Unmoor at: _____. NOTE – In any case, all bunkering operations are to be suspended during thunderstorms with lightning strikes or gale warnings.
6. The receiving vessel and the bunker vessel have been securely moored. Regulations with regards to mooring arrangements have been observed. Sufficient fendering has been put in place.				R	
7. Safe means of access between the receiving vessel and the bunker vessel has been established.					If applicable
8. All mandatory firefighting equipment is ready for immediate use.					
9. The bunker operation area is sufficiently illuminated.				A R	
10. The receiving vessel and bunker vessel are able to move under their own power in a safe and non-obstructed direction.				R	
11. Adequate supervision of the bunker operation by responsible officers is in place, both on the receiving vessel and at the LNG bunker vessel.					
12. An effective means of communication between the PIC, responsible operators and supervisors at the receiving vessel and bunker vessel has been established and tested. The communication language has been agreed upon.				A R	VHF/UHF channel: _____ Primary system: _____ Backup system: _____

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Check	Receiving vessel	Bunker vessel	Terminal (if applicable)	Code	Remarks
13. The emergency stop signal and shutdown procedures have been agreed upon, tested, and explained to all personnel involved. Emergency procedures and plans and the contact numbers have been made known to the PIC.				A	Emergency stop signal: _____
14. The ship shore link and ESD systems on both the receiving vessel and bunker vessel, including automatic valves or similar devices have been tested, found to be in good working order, and are ready for use. Both ESD systems are linked, the closing rates of the ESDs have been exchanged.				A	Primary ship shore link: _____ Secondary ship shore link: _____ ESD receiving vessel: _____ seconds. ESD bunker vessel: _____ seconds.
15. The safety/monitoring zone has been established and all relevant personnel have been informed. The safety zone is free of other ships, unauthorised persons, objects and ignition sources. Appropriate signs to mark this area have been put in place, where applicable.				A R	Refer to JPBO
16. Safety procedures and mitigation measures for the prevention of falling objects have been agreed upon and are being observed by all parties involved.				R	
17. External doors, portholes and accommodation ventilation inlets have been closed as per Operations Manual(s).				R	
18. The gas detection equipment has been operationally tested and found to be in good working order.					If applicable for terminal.
19. Safety Data Sheets (SDS) for the delivered LNG are available.				A	
20. Regulations with regards to ignition sources are in place and observed.				R	

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Check	Receiving vessel	Bunker vessel	Terminal (if applicable)	Code	Remarks
21. Personnel involved in the connection and disconnection of the LNG transfer system and personnel in the direct vicinity of these operations make use of the appropriate protective clothing and PPE. Sufficient suitable protective clothing and PPE equipment are ready for immediate use.					
22. A (powered) emergency release coupling has been installed and is ready for immediate use.					
23. The water spray system has been tested and is ready for immediate use. This includes the hull and deck protection against cryogenic temperature that should be in place.					
24. Spill containment arrangements are of an appropriate material and volume, in position, and empty.					
25. All bunker transfer equipment (not limited to control valves, piping, transfer systems, gauges, level alarms and high-pressure alarms) is well maintained, operational, correctly set and in good working order.				A	
26. The receiving vessel's bunker tanks are protected against inadvertent overfilling at all times, tank content is constantly monitored and alarms are correctly set.				R	
27. All safety and control devices on the bunker vessel and receiving vessel have been checked, tested and found to be in good working order.					
28. Pressure control equipment and boil off / subcooler / reliquefaction equipment is operational and in good working order.					

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Check	Receiving vessel	Bunker vessel	Terminal (if applicable)	Code	Remarks
29. LNG transfer system is in good condition, properly rigged, supported, properly connected, leak tested and certified for the LNG transfer. This includes checking of initial bunker line up and ensuring that unused connections are closed, blanked and bolted.					
30. The LNG bunker connection between the receiving vessel and the bunker vessel has been provided with compatible and safe connection couplings. ERS in the LNG bunker connections are in place, have been visually inspected for functionality and found to be in a good working order.					
31. The LNG bunker connection between the receiving vessel and the bunker vessel has adequate electrical isolating means in place.					
32. LNG transfer system has been properly connected and purged with nitrogen.					Oxygen content after purging: _____ Dew point temperature: _____
33. Cooling down process is in compliance with manufacturer's recommendation.					
34. The vessels' emergency fire control plans are located externally and available for use. This should also provide the need for an international shore connection, which should be ready for use.				A	Location fire plan: _____ Location international shore connection: _____
35. Smoking rooms have been nominated and smoking restrictions are being observed.				A	On receiving vessel: _____ On bunker vessel: _____

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Receiving vessel	Bunker vessel	Terminal (If applicable, for receipt only)
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date/Time:	Date/Time:	Date/Time:

PART D – LNG TRANSFER DATA

(This part should be completed before actual transfer operations start)

LNG transfer data contains the transfer data to be agreed upon. In Part D the information over temperature, density, volume, transfer rate, pressure and the physical quantity unit to be used for the LNG bunkering, are exchanged and agreed upon by the parties.

Receiving vessel's name:	Bunker vessel's name:
Receiving vessel's IMO number:	Receiving vessel's owner/operator/agent:
Delivery location:	Terminal/Port operator (if applicable):
Receiving vessel's draft upon arrival:	Bunkering vessel's draft upon arrival:
Receiving vessel's draft upon departure:	Bunkering vessel's draft upon departure:

Agreed physical quantity unit (PQU) m³ tonnes Others:

Density: _____

Agreed operation Gassing up Cooling down Bunkering

Cargo measurement method CTMS Mass flow meter Others:

Vapour return arrangement Required Not required Not connected

Agreed starting conditions	Receiving vessel		Bunker vessel		Unit
	Tank 1	Tank 2	Tank 1	Tank 2	
LNG tank temperature:					°C/°F*
LNG tank pressure:					bar/ psi* (gauge)
LNG tank available capacity:					PQU

* delete as appropriate

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Receiving vessel information:

Agreed LNG transfer operations	Tank 1	Tank 2	Unit
Agreed quantity to be transferred:			PQU
Starting rate:			PQU per hour
Max transfer rate:			PQU per hour
Topping off rate:			PQU per hour

Receiving vessel information:

Agreed maximum and minimum	Maximum	Minimum	Unit
Pressure during bunkering at manifold:			bar/psi* (gauge)
Pressure at the bunker line:			bar/psi* (gauge)
Pressure in the LNG bunker tanks:			bar/psi* (gauge)
Temperature of the LNG:			°C/°F*
Filling limit of the LNG bunker tanks:			%

* delete as appropriate

Declaration

We, the undersigned, have jointly covered all items in Part B, Part C and Part D and are satisfied that the entries we have made are correct to the best of our knowledge.

We have also made arrangements to carry out repetitive checks as necessary and agreed that those items coded 'R' in the checklist should be re-checked at intervals not exceeding _____ hours.

If, to our knowledge, the status of any item changes, we will immediately inform the other party.

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Receiving vessel	Bunker vessel	Terminal (if applicable, for receipt only)
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date/Time:	Date/Time:	Date/Time:

Record of repetitive checks						
Date:						
Time:						
Bunker vessel	Vapour pressure:	bar/psi* (gauge)	Tank 1			
			Tank 2			
	Liquid temperature:	°C/°F*	Tank 1			
			Tank 2			
	Vapour temperature:	°C/°F*	Tank 1			
			Tank 2			
	Volume:	PQU	Tank 1			
			Tank 2			
	Discharging rate:	PQU/hour				
	Discharged quantity:	PQU				
	Manifold pressure:	bar/psi* (gauge)	Liquid line			
			Vapour line			

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	Manifold temperature:	°C/°F*	Liquid line					
			Vapour line					
Receiving vessel	Vapour pressure:	bar/psi* (gauge)	Tank 1					
			Tank 2					
	Liquid temperature:	°C/°F*	Tank 1					
			Tank 2					
	Volume:	PQU	Tank 1					
			Tank 2					
	Manifold pressure:	bar/psi* (gauge)	Liquid line					
			Vapour line					
	Manifold temperature:	°C/°F*	Liquid line					
			Vapour line					
	Initials of receiving vessel:							
	Initials of bunker vessel:							

PART E – LNG BUNKER OPERATION COMPLETION CHECKLIST
(This part should be completed after transfer operations have been completed)

This checklist is used upon completion of the LNG bunker operation. It outlines the considerations of the post bunker operation checks including disconnection of the transfer system and finalisation of the operation.

Check	Receiving vessel	Bunker vessel	Terminal (if applicable)	Code	Remarks
1. LNG transfer system has been properly drained, purged with nitrogen and is ready for disconnection.				A	
2. Remote and manually controlled valves have been closed and ready for disconnection. Test for hydrocarbon (HC) levels prior disconnection of the LNG transfer system.				A	HC < 2% by volume
3. Relevant parties have been notified on "ready to disconnect".				A	
4. After disconnection, the monitoring zone has been deactivated. Appropriate signs have been removed.				A	
5. Relevant parties have been notified that LNG bunker operations have been completed.				A	Time notified: _____ h.
6. Relevant documents have been signed and exchanged.					
7. Near-misses and incidents have been reported to implementing authority and/or terminal.					If applicable. Report number: _____

Declaration

We, the undersigned, have jointly covered all items in Part E and are satisfied that the entries we have made are correct to the best of our knowledge.

Receiving vessel	Bunker vessel	Terminal (if applicable, for receipt only)
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date/Time:	Date/Time:	Date/Time:

TRUCK-TO-SHIP LNG BUNKERING CHECKLIST

PART A – PLANNING STAGE CHECKLIST

(This part should be made during the planning stage of LNG bunker operations)

This checklist can be used for an exchange of knowledge and agreements on safety items during the planning stage of an LNG bunkering to be conducted during the order placement for the bunkering operation.

Receiving vessel's name:	Bunker truck operator's name:
Receiving vessel's IMO number:	Receiving vessel's owner/operator/agent:
Delivery location (if available):	Terminal/Port operator:

Check	Receiving vessel	Bunker truck	Terminal/Port	Code	Remarks
1. Terminal/Port has been informed of the LNG bunkering operations.				A	
2. All necessary permissions for the bunkering operation have been obtained.				P	
3. All relevant personnel involved in the LNG bunker operation have the appropriate training and have been instructed on the particular LNG bunker equipment and procedures, including fire control plan, emergency response procedures and contingency planning.				A	
4. Inclement weather conditions e.g. thunderstorms, for operations have been agreed on.				A	NOTE – In any case, all bunkering operations are to be suspended during thunderstorms with lightning strikes or gale warnings.
5. The bunker location is accessible for the LNG supplying truck and the total truck weight does not exceed the maximum permitted load of the quay or jetty.					If applicable.
6. The receiving vessel and Terminal/Port have agreed upon the mooring and fendering arrangement.				A	
7. The bunker operation area has been sufficiently illuminated.				A	

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Check	Receiving vessel	Bunker truck	Terminal/Port	Code	Remarks
8. All LNG transfer and gas detection equipment is certified, in good condition and appropriate for the service intended.				A	If applicable for terminal.
9. The bunker plan and procedures for bunkering, cooling down and purging operations have been agreed to and are made available to all concerned parties.				A	
10. The system and method of electrical isolation have been agreed upon by receiving vessel and bunker truck.				A	
11. The safety/monitoring zone has been agreed upon and designated for control access. Escape route for both receiving vessel and bunker truck has been agreed.				A	
12. Actions have taken to eliminate source of ignition surrounding transfer location and a potential LNG or NG release areas.				A	
13. All mandatory firefighting equipment is ready for immediate use. Appropriate personal protective equipment has been identified and available.					
14. Personnel involved are not feeling unwell and are adequately rested as per applicable work and rest hour regulations (e.g. MLC 2006, STCW, or national regulations).				A	

Declaration

We, the undersigned, have jointly covered all items in Part A and have satisfied ourselves that the entries we have made are correct to the best of our knowledge.

Receiving vessel	Bunker truck	Terminal/Port
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date/Time:	Date/Time:	Date/Time:

PART B – PLANNED SIMULTANEOUS ACTIVITIES

(This part should be completed before actual bunker transfer operations start)

This checklist is applicable for concurrent bunker, cargo or other operations that may pose additional risk during the LNG bunkering. Simultaneous activities are only allowed if such activities were pre-approved and conform to the ship’s operational documentation. The risk assessment, including the applicable mitigation measures, should be recorded in the ship’s operational documentation.

Receiving vessel’s name:	Bunker truck operator’s name:
Receiving vessel’s IMO number:	Receiving vessel’s owner/operator/agent:
Delivery location (if available):	Terminal/Port:

Check	Receiving vessel	Bunker truck	Terminal/Port	Code	Remarks
1. Planned simultaneous operations during LNG bunkering are in accordance with approved operational documentation.					
2. Terminal/Port has been notified of the simultaneous bunker or cargo or other operations during LNG bunkering.				P	
3. Safety procedures and mitigation measures for simultaneous activities, as mentioned in the receiving vessel’s approved operational documentation, have been agreed upon and are being observed by all parties involved.				A R	

Agreed simultaneous operations

The risk assessment, including the applicable mitigation measures, should be recorded in the ship’s operational documentation and revised accordingly taking into consideration the current situation. The necessary mitigation measures should be in place.

Activities	Receiving vessel	Bunker truck	Terminal/Port

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Restrictions in LNG bunker/cargo operations

Activities	Receiving vessel	Bunker truck	Terminal/Port

Receiving vessel	Bunker truck	Terminal/Port
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date/Time:	Date/Time:	Date/Time:

PART C – PRE-TRANSFER CHECKLIST

(This mandatory part should be completed before actual transfer operations start)

This checklist identifies the required physical checks and elements that are verified verbally before the LNG bunkering commences. The safety of operations requires that all relevant statements are considered and the associated responsibility and accountability for compliance is accepted, either jointly or singly as agreed to by the parties.

Where either party is not prepared to accept an assigned accountability, a comment must be made in the Remarks column and due consideration should be given to assessing whether operations can proceed.

Where a particular item is considered to be not applicable to the any one party, a note to this effect should be entered in the Remarks column.

Receiving vessel's name:	Bunker truck number:
Receiving vessel's IMO number:	Receiving vessel's owner/operator/agent:
Delivery location:	Terminal/Port:
Date of arrival:	Time of arrival:

Check	Receiving vessel	Bunker truck	Terminal/Port	Code	Remarks
1. Part A and Part B (if applicable) have been completed and signed before proceeding to complete Part C					
2. The implementing authority and/or terminal has been notified of the start of LNG transfer operations and has been requested to inform other vessels in the vicinity.				A P	
3. Roles by the bunker truck and receiving vessel have been identified and posted.				A	
4. Present weather and wave conditions are within the agreed limits.				A R	NOTE – In any case, all bunkering operations are to be suspended during thunderstorms with lightning strikes or gale warnings.
5. The receiving vessel and terminal/port have been securely moored. Regulations with regards to mooring arrangements have been observed. Sufficient fendering has been put in place.				R	

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Check	Receiving vessel	Bunker truck	Terminal/ Port	Code	Remarks
6. A safe means of access between the receiving vessel and the terminal/port has been established.					
7. All mandatory firefighting equipment is ready for immediate use.					
8. The bunker operation area is sufficiently illuminated.				A R	
9. The receiving vessel and bunker truck are able to move under their own power in a safe and non-obstructed direction.				R	
10. Adequate supervision of the bunker operation by responsible officers has been put in place, both on the receiving vessel and at the LNG bunker truck.					
11. An effective means of communication between the PIC, responsible operators and supervisors at the receiving vessel and bunker truck has been established and tested. The communication language has been agreed upon.				A R	VHF/UHF Channel: _____ Primary System: _____ Backup System: _____
12. The emergency stop signal and shutdown procedures on the bunker truck and receiving vessel have been agreed upon, tested, and explained to all personnel involved. Emergency procedures and plans and the contact numbers have been made known to the PIC.				A	Emergency Stop Signal: _____
13. The ESDs on both the receiving vessel and bunker truck, including automatic valves or similar devices have been tested, found to be in good working order, and are ready for use. Both ESD systems have been linked, the closing rates of the ESDs have been exchanged. ESD manual activation is tested.				A	ESD receiving vessel: _____ seconds. ESD bunker truck: _____ seconds.

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Check	Receiving vessel	Bunker truck	Terminal/ Port	Code	Remarks
14. The safety/monitoring zone has been established. The safety zone is free of other ships, unauthorised persons, objects and ignition sources. Appropriate signs to mark this area have been put in place, where applicable.				A R	
15. Safety procedures and mitigation measures for the prevention of falling objects have been agreed upon and are being observed by all parties involved.				R	
16. External doors, portholes and accommodation ventilation inlets have been closed as per Operations Manual(s).				R	
17. The gas detection equipment has been operationally tested and found to be in good working order.					If applicable for terminal.
18. Safety Data Sheets (SDS) for the delivered LNG are available.				A	
19. Regulations with regards to ignition sources are in place and observed.				R	
20. Personnel involved in the connection and disconnection of the LNG transfer system and personnel in the direct vicinity of these operations make use of the appropriate protective clothing and PPE. Sufficient suitable protective clothing and PPE equipment is ready for immediate use.					
21. Emergency release coupling has been installed and is ready for immediate use.					
22. The water spray system has been tested and is ready for immediate use. This includes the hull and deck protection against cryogenic temperature that should be in place.					If applicable.

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Check	Receiving vessel	Bunker truck	Terminal/ Port	Code	Remarks
23. Spill containment arrangements are of an appropriate material and volume, in position, and empty.					
24. All bunker transfer equipment (not limited to control valves, piping, transfer systems, gauges, level alarms and high-pressure alarms) is well maintained, operational, correctly set and in good working order.				A	
25. The receiving vessel's bunker tanks are protected against inadvertent overfilling at all times, tank content is constantly monitored and alarms are correctly set.				R	
26. All safety and control devices on the bunker truck and receiving vessel have been checked, tested and found to be in good working order.					
27. Pressure control equipment and boil off or reliquefaction equipment is operational and in good working order.					If applicable.
28. LNG transfer system is in good condition, properly rigged, supported, properly connected, leak tested and certified for the LNG transfer. This includes checking of initial bunker line up and ensuring that unused connections are closed, blanked and bolted.					
29. The LNG bunker connection between the receiving vessel and the bunker truck is provided with compatible and safe connection couplings. ERS in the LNG bunker connections are in place, have been visually inspected for functionality and found to be in a good working order.					
30. The LNG bunker connection between the receiving vessel and the bunker truck has adequate electrical isolating means in place.					

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Check	Receiving vessel	Bunker truck	Terminal/Port	Code	Remarks
31. LNG transfer system has been properly connected and purged with nitrogen.					Oxygen content after purging: _____ Dew point temperature: _____
32. Vapour connections are properly connected or blanked and bolted.					If applicable.
33. The truck engine is switched off during the connection and disconnection of the LNG transfer system, as well as during purging and LNG transfer.					If applicable. Unless the truck engine is required for the purging or transfer of LNG.
34. The truck has been electrically grounded and the wheels have been chocked to prevent inadvertent drive away.					
35. The vessels' emergency fire control plans are located externally and available for use. This should also provide the need for an international shore connection, which should be connected and ready for use.				A	Location fire plan: _____ Location international shore connection (if applicable): _____
36. Smoking restrictions have been observed.				A	

Receiving vessel	Bunker truck	Terminal/Port
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date/Time:	Date/Time:	Date/Time:

PART D – LNG TRANSFER DATA

(This part should be completed before actual transfer operations start)

LNG transfer data contains the transfer data to be agreed upon. In Part D the information over temperature, density, volume, transfer rate, pressure and the physical quantity unit to be used for the LNG bunkering, are exchanged and agreed upon by the parties.

Receiving vessel's name:	Bunker truck number:
Receiving vessel's IMO number:	Receiving vessel's owner/operator/ agent:
Delivery location:	Terminal/Port:
Date of arrival:	Time of arrival:

Agreed physical quantity unit (PQU) m³ tonnes Others:

Density: _____

Cargo measurement method Level gauge Mass flow meter Others:

Vapour return arrangement Required Not required Not connected

Agreed starting temperatures and pressures	Receiving vessel		Bunker truck	Unit
	Tank 1	Tank 2		
LNG tank temperature:				°C/°F*
LNG tank pressure:				bar/ psi* (gauge)
LNG tank available capacity:				PQU

* delete as appropriate

Receiving vessel information:

Agreed LNG transfer operations	Tank 1	Tank 2	Unit
Agreed quantity to be transferred:			PQU
Starting rate:			PQU per hour
Max transfer rate:			PQU per hour

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Agreed LNG transfer operations	Tank 1	Tank 2	Unit
Topping off rate:			PQU per hour

Receiving vessel information:

Agreed maximum and minimum	Maximum	Minimum	Units
Pressure during bunkering at manifold:			bar/psi* (gauge)
Pressure at the bunker line:			bar/psi* (gauge)
Pressure in the LNG bunker tanks:			bar/psi* (gauge)
Temperature of the LNG:			°C/°F*
Filling limit of the LNG bunker tanks:			%

* delete as appropriate

Declaration

We, the undersigned, have jointly covered all items in Part B, Part C and Part D and are satisfied that the entries we have made are correct to the best of our knowledge.

We have also made arrangements to carry out repetitive checks as necessary and agreed that those items coded 'R' in the checklist should be re-checked at intervals not exceeding _____ hours.

If, to our knowledge, the status of any item changes, we will immediately inform the other party.

Receiving vessel	Bunker truck	Terminal/Port (if applicable, for receipt only)
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date/Time:	Date/Time:	Date/Time:

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Record of repetitive checks										
Date:										
Time:										
Receiving vessel	Pressure:	bar/psi* (gauge)	Tank 1							
			Tank 2							
	Temperature:	°C/°F*	Tank 1							
			Tank 2							
	Volume:	PQU	Tank 1							
			Tank 2							
Bunker truck	Pressure:	bar/psi* (gauge)								
	Temperature:	°C/°F*								
	Volume:	PQU								
	Flow rate:	PQU per hour								
Initials of receiving vessel:										
Initials of bunker truck:										
Initials of terminal:										

PART E – LNG BUNKER OPERATION COMPLETION CHECKLIST
(This part should be completed after transfer operations have been completed)

This checklist is used upon completion of the LNG bunker operation. It outlines the considerations of the post bunker operation checks including disconnection of the transfer system and finalisation of the operation.

Check	Receiving vessel	Bunker truck	Terminal	Code	Remarks
1. LNG transfer system has been properly drained, purged with nitrogen and is ready for disconnection.				A	
2. Remote and manually controlled valves have been closed and ready for disconnection. Test for hydrocarbon (HC) levels prior disconnection of the LNG transfer system.				A	HC < 2% by volume
3. After disconnection, the monitoring zone has been deactivated. Appropriate signs have been removed.				A	
4. Relevant parties have been notified that LNG bunker operations have been completed.				P	Time notified: _____ hrs.
5. Near-misses and incidents have been reported to implementing authority and/or terminal.					Report number: _____

Declaration

We, the undersigned, have jointly covered all items in Part E and are satisfied that the entries we have made are correct to the best of our knowledge.

Receiving vessel	Bunker truck	Terminal
Name:	Name:	Name:
Signature:	Signature:	Signature:
Date/Time:	Date/Time:	Date/Time: