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24 April 2018

(English only)

RID: 9th Session of the RID Committee of Experts' standing working group
(Berne, 28 to 30 May 2018)

Subject: Informal working group on checklists for the filling and emptying of rail tank-wagons for liquids (The Hague, 28 February and 1 March 2018)

Proposal submitted by the Netherlands

Introduction

1. During the 8th meeting of the RID Committee of Experts' standing working group (Utrecht, 20 to 24 November 2017) (OTIF/RID/CE/GTP/2017-A, paragraphs 29-33), the standing working group invited a working group to develop revised checklists for the filling and emptying of tank-wagons for liquids. As in the new checklists for gas tank-wagons, the informal working group was invited in particular to cover as many of the obligations of the participants as possible.
2. On 28 February and 1 March the first meeting of the informal working group on checklists for the filling and emptying of rail tank-wagons for liquids took place at the Ministry for Infrastructure and Water Management in The Hague, Netherlands. Participating in this meeting were delegates from Belgium, France, Italy and the Netherlands, and representatives of CEFIC and MWV (Association of the German Petroleum Industry). For the list of participants, see annex 1.

Explanation from industry

3. Both the representatives of CEFIC and MWV presented the practical guidelines concerning safety and procedures currently used by the industry. The representative of CEFIC, presented the leaflet "Transport of dangerous goods: identification of defects in Rail Tank Cars", drafted by the Dutch VNCI and used in the Netherlands. This leaflet contains illustrations of service equipment and examples of known defects in this service equipment. The VNCI and CEFIC had very recently published this leaflet in English and on their websites. The representative of MWV presented a similar leaflet in German, which also included possible measures to be taken if a defect is detected. The informal working group concluded that these leaflets are very informative and could be used to complement the checklists. It was suggested that it might be an option to refer to these documents in RID. The representatives would propose this option within their organisations.

Minutes of the meeting

4. The informal working group decided to work on the checklists for filling and emptying of rail tank-wagons for liquids on the basis of the work done by the informal working group on the checklists for the filling and emptying of liquefied gas tank-wagons (Florence, 11-13 July 2017). The aim of the informal working group was to harmonise the checklists for the filling and emptying of rail tank-wagons for liquids with the newly drafted checklists for the filling and emptying of liquefied gas tank-wagons. It was agreed that the level of detail of the new checklists should be the same as that of the checklists drafted in Florence in order to avoid subsequent redrafting of these documents.
5. The principles observed for the checklists for the filling and emptying of liquefied gas tank-wagons were also used by this informal working group:
 - (a) only steps which are referred to directly in the obligations set out in RID would be established;
 - (b) where possible, the same terminology as used in RID would be used;
 - (c) where possible, avoid creating any kind of direct or indirect restriction in operators' instructions and procedures (each operator must be able to organise its own procedures freely).
6. In addition to these principles, it was also agreed that only safety-related issues should be part of the checklist. Based on this principle, actions relating to documentation were deleted from the checklist.
7. Based on the discussions it became clear that some of the wording in the checklists for gases needed to be adjusted to keep the documents aligned. These changes consisted of editorial changes; no substantial changes were made. The revised checklist for gases is included in annex 4.
8. The topic of heating systems was discussed. It became clear that, at the moment, discussions concerning the exact requirements for these systems were ongoing. Ultimately, the informal working group came to the conclusion that, because the heating systems are not referenced in the obligations set out in RID, requirements concerning the heating system should not be included in the checklists. However, comments were also received from UIP regarding the heating system and UIP was invited to send its comments to the standing working group in an informal paper.
9. At the end of the session, a preliminary draft text was prepared, which was sent to the parties who had expressed an interest in the work of the informal working group so that they could analyse the text in detail and provide their final comments and proposals. The draft text was also sent to the industry parties who developed the previous checklists for the filling and discharging of rail tank-wagons for liquids.
10. Because of the nature of the comments received and the limited time, it was decided not to host a second meeting to discuss the comments before the meeting of the standing working group in May. The work done by the informal working group is presented in this informal document, but the comments received have not yet been incorporated. The parties that did send comments were asked to send their comments in the form of informal documents for the standing working group in order to facilitate the discussion.

Conclusion

11. The RID standing working group is invited to discuss the amendments to RID proposed in Annex 2, the revised checklists for gases and liquids included in annexes 3 and 4, and to take action as it deems appropriate.

List of participants

Name	Company/Organisation
Arjan Walsweer	RIVM – National Institute for Public Health and the Environment (The Netherlands)
Niels Remers	RIVM – National Institute for Public Health and the Environment (The Netherlands)
Henk Brill	CEFIC
Jochen Conrad	OTIF
Katarina Guricová	OTIF
Caroline Bailleux	SSICF – DVIS Belgium
Benedetto Legittimo	Ministry of Infrastructure and Transport (Italy)
Andrea Ercole	ANSF – NSA Italy
Francesca Belinghieri	Federchimica
Filippo Abate	Federchimica
Andreas Witoszynskyj	Mineralölwirtschaftsverband e.V. (MWV)
Michel Korhel	Ministère de la Transition Écologique et Solidaire (France)

Proposed amendments

Proposal 1

1.4.3.3 Amend to read as follows (new text in bold and underlined):

"1.4.3.3 Filler

In the context of 1.4.1, the filler has the following obligations in particular:

- (a) he shall ascertain prior to the filling of tanks that both they and their equipment are technically in a satisfactory condition;

~~NOTE: — The filler shall establish procedures to check the correct functioning of the closures of the tank of a tank-wagon and to ensure the leaktightness of the closing devices before and after filling. Guidelines in the form of checklists for tank-wagons for liquids, issued by the European Chemical Industry Council (CEPIC), are available on the OTIF website (www.otif.org).~~

- (b) he shall ascertain that the date of the next test for tank-wagons, battery-wagons, wagons with demountable tanks, portable tanks, tank-containers and MEGCs has not expired;
- (c) he shall only fill tanks with the dangerous goods authorized for carriage in those tanks;
- (d) he shall, in filling the tank, comply with the requirements concerning dangerous goods in adjoining compartments;
- (e) he shall, during the filling of the tank, observe the maximum permissible degree of filling or the maximum permissible mass of contents per litre of capacity for the substance being filled;
- (f) he shall, after filling the tank, ensure that all closures are in a closed position and that there is no leakage;

~~NOTE: — The filler shall establish procedures to check the correct functioning of the closures of the tank of a tank-wagon and to ensure the leaktightness of the closing devices before and after filling. Guidelines in the form of checklists for tank-wagons for liquids, issued by the European Chemical Industry Council (CEPIC), are available on the OTIF website (www.otif.org).~~

- (g) he shall ensure that no dangerous residue of the filling substance adheres to the outside of the tanks filled by him;
- (h) he shall, in preparing the dangerous goods for carriage, ensure that the placards, marks, orange-coloured plates and labels as well as shunting labels are affixed on the tanks, on the wagons and on the containers in accordance with Chapter 5.3;
- (i) he shall, before and after filling tank-wagons with a liquefied gas, observe the applicable special checking requirements;
- (j) he shall, when filling wagons or containers with dangerous goods in bulk, ascertain that the relevant provisions of Chapter 7.3 are complied with.

NOTE: Guidelines in the form of checklists for tank-wagons for liquids and gases are available on the OTIF website (www.otif.org) to help the filler of gas tank-wagons for liquids and gases fulfil his safety obligations, particularly with respect to the leaktightness of tank-wagons.

1.4.3.7 Amend to read as follows (new text in bold and underlined):

"1.4.3.7 Unloader

1.4.3.7.1 In the context of 1.4.1, the unloader shall in particular:

- (a) ascertain that the correct goods are unloaded by comparing the relevant information on the transport document with the information on the package, container, tank, MEGC or wagon;
- (b) before and during unloading, check whether the packagings, the tank, the wagon or container have been damaged to an extent which would endanger the unloading operation. If this is the case, ascertain that unloading is not carried out until appropriate measures have been taken;

~~NOTE: — The unloader shall establish procedures to check the correct functioning of the closures of the tank of a tank-wagon and to ensure the leaktightness of the closing devices before and after unloading. Guidelines in the form of checklists for tank-wagons for liquids, issued by the European Chemical Industry Council (CEFIC), are available on the OTIF website (www.otif.org).~~

- (c) comply with all relevant requirements concerning unloading and handling;
- (d) immediately following the unloading of the tank, wagon or container:
 - (i) remove any dangerous residues which have adhered to the outside of the tank, wagon or container during the process of unloading; and
 - (ii) ensure the closure of valves and inspection openings;

~~NOTE: — The unloader shall establish procedures to check the correct functioning of the closures of the tank of a tank-wagon and to ensure the leaktightness of the closing devices before and after unloading. Guidelines in the form of checklists for tank-wagons for liquids, issued by the European Chemical Industry Council (CEFIC), are available on the OTIF website (www.otif.org).~~

- (e) ensure that the prescribed cleaning and decontamination of the wagons or containers is carried out; and
- (f) ensure that the wagons and containers once completely unloaded, cleaned, degassed and decontaminated, no longer display placards, marks and orange-coloured plates that had been displayed in accordance with Chapter 5.3.

1.4.3.7.2 If the unloader makes use of the services of other participants (cleaner, decontamination facility, etc.) he shall take appropriate measures to ensure that the requirements of RID have been complied with.

NOTE: Guidelines in the form of checklists for tank-wagons for liquids and gases are available on the OTIF website (www.otif.org) to help the unloader of gas tank-wagons for liquids and gases fulfil his safety obligations, particularly with respect to the leaktightness of tank-wagons.

Checklists for the filling and emptying of rail tank-wagons for liquids

Note by the Secretariat: The informal working group worked on the basis of the checklists for gas tank-wagons (see paragraph 4 of the report). Therefore, the changes indicated in tracking mode in the following lists represent changes to the checklists for gas tank-wagons.

Guidelines – introductory text

These guidelines have been developed in cooperation with CEFIC, ~~EIGA, AEGPL~~ [and UIP ?] in the form of checklists for tank-wagons for ~~gases-liquids~~ to help fillers and unloaders of ~~gas~~-tank-wagons comply with safety obligations, particularly with respect to the leaktightness of tank-wagons.

Filling and discharging of rail tank-wagons

Four checklists to help avoid leaks from tank-wagons carrying ~~gases of Class 2~~liquids of RID

Introduction

According to RID 1.4.3.3 (a) and (f), the filler shall ascertain that:

- prior to the filling both the tanks and their equipment are technically in a satisfactory condition,
- after filling that all closures are in a closed position and that there are no noticeable leakages.

According to RID 1.4.3.7.1 (b) and (d) ~~(ii)~~, the unloader

- shall before and during unloading, check whether the tank has been damaged to an extent which would endanger the unloading operation; ~~and~~
- shall, immediately following the unloading of the tank, ensure the closure of valves and inspection openings; ~~-~~
- remove any dangerous residues which have adhered to the outside of the tank, wagon or container during the process of unloading.

In addition, the filler and the unloader are required to comply with the requirements of ~~paragraphs 4.3.3.3 and 4.3.3.4 (Provisions for the filling of liquid gas tank-wagons) and~~ 7.5.1.2 (Provisions concerning loading, unloading and handling).

The filler and the unloader must establish procedures to check the correct functioning of the closures of the tank of a tank-wagon and to ensure the leaktightness of the closing devices before and after filling or unloading.

As the most frequent cause of leaks is incorrect filling or discharge processes, the main aim behind standardised checklists is to avoid leaks from tank-wagons for ~~gas-liquids~~ by means of correct and professional handling on the part of operating staff working for fillers and unloaders. They include the necessary steps (checkpoints) in the appropriate sequence, which is normally observed when filling or emptying ~~liquids~~gases into or from tank-wagons in the procedure to ensure leaktightness. They may need to be supplemented by the user with other specific operational steps/procedures (operating instructions).

Depending on the product and specification of the tank and fittings, tank-wagons may:

- be filled from the bottom through the bottom valve in conjunction with the external shut-off device (discharge valve, dry coupling) or from the top through the filling pipe or dome cover;

- discharged through the bottom shut-off device (discharge valve, dry coupling) or from the top through an attached dip tube.

~~Gases to which a tank code is assigned in column (12) of Table A of RID Chapter 3.2 containing the letter "B" in the third part must be:~~

- ~~filled from the bottom through three mutually independent closures, mounted in series, consisting of the bottom valve in conjunction with the external shut-off device (side valve, blank flange or screw cap); and~~
- ~~discharged through the bottom shut-off device (side valve, blank flange or screw cap).~~

~~Gases to which a tank code is assigned in column (12) of Table A of RID Chapter 3.2 containing the letter "D" in the third part, such as UN 1017, UN 1053, UN 1064, UN 1076 and UN 1079 shall be~~

- ~~filled from the top and~~
- ~~discharged from the top~~

~~through dip pipes in combination with other closing devices (triple closure in series, liquid phase valves and gas phase valve with blank flange, mounted on the manhole cover).~~

Four checklists have therefore been developed, covering respectively top filling, top discharge, bottom filling, and bottom discharge, top filling and top discharge.

They set out a chronological sequence of the steps necessary for the filling and discharge of tank-wagons. Using-If they use them as an aid, users can then be sure that they have followed the steps fully in the correct sequence. If one of the steps cannot be carried out properly, the filling or discharge process is interrupted or stopped until the discrepancy/fault is rectified. This should enable errors and unsafe situations to be recognised in advance and avoided. Damaged tanks or service equipment are not allowed for transport. Further measures have to shall be agreed with the tank-wagon operator (in accordance with the vehicle keeper marking on the wagon).

The term "suitable tool" used in the checklists means a tool with which the necessary force is generated by means of even leverage and damage to the sealing elements is avoided. The equipment used must be in compliance with the applicable international regulations, e.g. the regulation for explosive atmospheres regulations.

These checklists also reflect the obligations of the filler set out in paragraphs (b), (c), (d), (e) and (g) of RID 1.4.3.3 and the obligations of the unloader set out in paragraphs (a) and (c) of RID 1.4.3.7.1.

In addition to the different steps set out in these checklists

- According to paragraph (h) of RID 1.4.3.3, the filler shall also, in preparing the dangerous goods for carriage, ensure that the placards, mark, orange-coloured plates and labels as well as shunting labels are affixed on the tanks, on the wagon and on the containers in accordance with chapter 5.3 of RID;
- According to paragraphs (e) and (f) of RID 1.4.3.7.1, the unloader shall ensure that:
 - the prescribed cleaning, if applicable, of the wagons is carried out;
 - the wagons, once completely unloaded, and cleaned, ~~degassed and decontaminated~~, no longer display placards, marks and orange-coloured plates that had been displayed in accordance with Chapter 5.3 of RID.

In this document, the RID terminology is used. The following table includes equivalent expressions or examples usually used in the industry.

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RID terminology	Industry terminology or examples
closing devices	caps/blank (blind) flanges/manlids
external stop valve	side valve/discharge valve
filling device	loading arm/hose
discharge device	unloading arm/hose
internal stop valve	bottom valve
manhole cover	inspection lids/manlids
operational openings	filling and/or discharge openings
securing devices	devices to protect against unintentional opening of external and internal stop valves
service equipment	filling and discharge, breather, safety, heating and heat insulating devices and measuring instruments all equipment attached to the tank, such as filling and discharge equipment, safety devices, heat insulation devices, measuring instruments etc.

Disclaimer

This document is intended for information only and is provided in good faith. While it is accurate as far as the authors are aware, no representations or warranties are made about its completeness. Therefore, no responsibility will be assumed in relation to the contents of this document.

The checklist is a guide and does not exempt the various participants referred to in RID Chapter 1.4 from the respective obligations assigned to them under RID.

[October 2017]

[The checklists are a new version of the checklists originally developed jointly by](#)

- [Verband der Chemischen Industrie e.V. \(German Chemical Industry Association\) \(VCI\)](#)
- [Mineralölwirtschaftsverband e.V. \(Association of the German Petroleum Industry\) \(MWV\)](#)
- [Unabhängiger Tanklagerverband e.V. \(Independent Tank Storage Association\) \(UTV\)](#)
- [Vereinigung der Privatgüterwagen-Interessenten \(Association of Private Goods Wagon Users\) \(VPI\).](#)

Points relevant to leaktightness for filling rail tank-wagons (top filling) for liquids (for inclusion in checklists) – with explanations/examples

1. Before filling			
	Check	Explanation	okOK
1.1 ¹	Tank and <u>service</u> equipment in technically faultless condition (visual inspection from the ground).	<p>Before clearance for filling, the tank and its items of <u>service</u> equipment must be <u>visually</u> checked to ensure that they <u>are in conformity with RID do not show any evident -damage.</u></p> <p><u>No damage to tank and items of equipment that can endanger the filling.</u></p> <p><u>Verification refers e.g. to the valves, closing devices, the manhole cover, damage on the shell, thermal insulation.</u></p>	
<u>1.2¹</u>	<u>Verify that the date of the next tank inspection date has not expired.</u>	<u>RID requires the next tank inspection date to be shown on every side of the wagon to inform the filler of the date of expiry.</u>	
<u>1.3</u>	<u>Verify that the dangerous goods are authorised for carriage in this tank.</u>	<p>This verification includes the verification of the tank code and the special provisions indicated on the tank, taking into account the tank hierarchy in <u>4.3.4.1.2.</u></p> <p>Note: In case that <u>If multi-compartment tanks are used, the provisions of 4.3.2.3.6 have to be fulfilled shall be met.</u></p>	
<u>1.4</u>	<u>The last load and its compatibility with the new load must be determined.</u>	<p><u>The last load must be determined from data reported in the transport documents and by comparison of the product name with the UN number on the orange-coloured plates and with the product on the loading order.</u></p> <p><u>In case of inconsistencies, clarification is needed, e.g. product analysis.</u></p>	
<u>1.25¹</u>	Bottom valve (internal stop-valve) closed and secured against unintentional opening, no leakages visible (visual inspection).	The shut-off devices (valves) must clearly indicate whether the valve position is “open” or “closed”. There must be no leakage, i.e. there must be no drips on the valves. If drips are found, further measures are necessary. This also applies to observing the closure sequence in accordance with RID when discharging residues.	

¹ Points 1.1, 1.2 and 1.5 to 1.47 may also be carried out upon arrival at the facilities (arrival check) rather than directly before filling.

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1.36 ¹	Discharge valve (external stop-valve) closed (on opposite side also), no leakages visible (visual inspection).	External shut-off devices must be checked manually or with <u>a-suitable tools</u> to ensure that they are closed. Any safety devices to protect against unintentional opening must be used if available. There must be no leakage, i.e. there must be no drips on the valves. If drips are found, further measures are necessary. This also applies to the closure sequence in accordance with RID when discharging residues.	
1.74 ¹	Closing device (e.g. screw thread, blank flange) closed on both sides.	There must be no leakage, i.e. there must be no drips on the outlets. If drips are found, further suitable measures are necessary. To close the cap, only <u>a-suitable tools</u> may be used, with which the necessary force is generated by means of even leverage and damage to the sealing elements is avoided.	
1.58	Check dome cover/dome cover sealing and other operational openings in the dome area for visually faultless condition. Visual inspection: if the dome is not opened during filling (e.g. chemical dome cover) and shows no sign of leakage and if the threads are in a proper condition, there is no need to open the dome cover to check the seals.	Torn or otherwise damaged dome cover seals must be replaced.	
1.9	<u>The filling devices are properly connected and the stop-valves (if present) are opened. Before proceeding it must be checked again that there are no leakages.</u>	<u>The specific operating instructions must be followed.</u>	
1.10	<u>The maximum degree of filling must be determined to ensure that it will not be exceeded.</u>	<u>The filling degree must be determined taking into account the maximum loading mass on the wagon plate (load categories) and the maximum degree of filling laid down in 4.3.2.2.1.</u> <u>Note: The residual load (product that is still present in the tank-wagon before loading) must also be taken into account.</u>	

2. During filling			
	Check	Explanation	okOK
2.1	Degree of filling observed.		
2.21	Supervise filling procedure. <u>Supervise filling operation to ensure safe operation throughout the process and prevent overfilling.</u>	<u>Permanent supervision will prevent dangerous situations, such as overfilling and will enable rapid emergency response, if necessary.</u>	

3. After filling			
	Check	Explanation	okOK
3.1	Verify that there is neither no overloading nor overfilling.	<p>Immediately after filling, the tank-wagon must be checked again to ensure that it is not overloaded or overfilled, as determined in 1.10.</p> <ul style="list-style-type: none"> <u>Overloading means exceeding the maximum gross mass of the tank-wagon.</u> <u>Overfilling means exceeding the maximum (product related) filling degree, according to RID 4.3.2.2.1.</u> <p><u>These checks must be carried out by using calibrated measuring devices (e.g. by weighing on a calibrated weighbridge). The overloading or overfilling must be remedied by immediate discharge of the excessive load in a safe manner.</u></p> <p><u>Further measures have to shall be agreed with the tank-wagon operator (in accordance with the vehicle keeper marking on the wagon), because:</u></p> <ul style="list-style-type: none"> <u>Overfilling of the tank may generate pressure build-up above the maximum calculation pressure. In this case, the tank-wagon must be emptied completely and must be inspected and tested before bringing- being brought back into service.</u> <u>An overfilled tank may cause excessive forces on bearings and axles. If overfilling has occurred, it must be checked whether the bearings and axles have been overloaded before bringing- the tank-wagon is brought back into service.</u> 	
3.12	Bottom valve (internal stop-valve) closed and secured (visual inspection).	The bottom valve is in a recognisably closed position and secured against unintentional opening.	
3.23	Closing device (e.g. screw thread, blank flange) opened. Discharge valve (external stop-valve) closed and secured, no leakages visible (visual inspection). Then check closing device (e.g. screw thread, blank flange) closed.	External shut-off devices and fittings must be checked manually or with a suitable tools to ensure they are closed. Any safety-securing devices to protect against unintentional opening must be used, if available.	

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3.34	Operational openings (e.g. dome cover, pressure pipe, inspection openings, vapour return pipe, dip tube) properly closed with the right gaskets, and must be tightened with suitable tools, and leaktight. There must be no leakages (visual inspection).	If tools are used to close and tighten the closing devices, use only suitable tools. The blank flanges on the closure that have been used must be equipped with new -suitable new gaskets. Bolts in blank flanges must be of the proper length. There must be no leakages detected by appropriate methods, e. g. testing devices.	
3.45	Outside of tank free of dangerous residues.		
3.56	Closing device is leaktight <u>both sides</u> (visual inspection).	If the closing device was only used on one side, it only needs to be checked on this side if the other (unused) device has been sealed or secured and it can thus be ascertained that it has not been used. One component of a final check is to ensure that there are no leaks at all, i.e. there must be no drops on the valves and outlets. If drips are found, further suitable measures are necessary.	
3.6	Handover report is signed/clearance.	The proper condition is documented. Effectiveness check is carried out on a random basis and is documented.	

Points relevant to leaktightness for emptying-unloading rail tank-wagons (top discharge) for liquids (for inclusion in checklists)– with explanations/examples

1. Before unloading			
	Check	Explanation	okOK
1.1 ²	<u>Tank and service equipment in technically faultless condition (visual inspection).</u>	<p><u>Before clearance for filling, the tank and service equipment must be visually checked to ensure that they do not show any evident damage.</u></p> <p><u>No damage to tank and items of equipment that can endanger the unloading.</u></p> <p><u>Verification refers e.g. to the valves, closing devices, the manhole cover, damage on the shell, thermal insulation.</u></p>	
1.4 ²	<u>The stop-valves and the Closing device (e.g. screw thread, blank flange) are closed both sides and there are no leakages.</u>	<p><u>It must be confirmed that the stop-valves must be confirmed are closed.</u></p> <p><u>Seals can help to determine that closing devices and valves have not been handled by other parties. In case of own seals, it should be verified that they are in the same proper condition as when they are installed. It can be assumed that valves on tank-wagons returning with original seals are still leaktight.</u></p>	
1.3	<u>Ascertain that the product in the tank-wagon is the correct one.</u>	<u>The load must be determined from particulars in the transport documents and by comparison with the UN number on the orange-coloured plates and with the product on the unloading order. In case of inconsistencies, clarification is needed, e.g. product analysis.</u>	
1.4	<u>The discharge devices are properly connected and the stop-valves are opened.</u>	<p><u>The specific operating instructions must be followed.</u></p> <p><u>Only use suitable tools.</u></p>	
1.5	<u>Before proceeding it must be checked again that there are no leakages.</u>		
4.2	Tank and items of equipment closed in such a way that nothing can escape uncontrolled.		
4.3	No damage to tank and items of equipment (no danger for unloading procedure) ascertained.	Notify damaged tanks and items of equipment/do not clear for transport.	
4.4	Before opening the closing device (e.g. dome cover, blank		

² Point 1.1 may also be carried out upon arrival at the facilities (arrival check) rather than directly before unloading.

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	flange) check that it is leaktight.		
1.5	Closing device (e.g. dome cover, blank flange) opened, discharge device connected.	To open closing devices, only use suitable tool, with which the necessary force is generated by means of even leverage and damage to the sealing elements is avoided.	
1.6	Internal and external stop-valves opened.	Opening sequence according to instructions.	

2. During unloading

	Check	Explanation	okOK
2.1	<u>Supervise the unloading operation to ensure safe operation throughout the process. No damage to tank and items of equipment (no danger for unloading procedure) ascertained.</u>	<p><u>For unloading, the operating instructions of the tank-wagon must be complied with.</u></p> <p><u>Permanent supervision will prevent dangerous situations and will enable rapid emergency response, if necessary. Notify damaged tanks and items of equipment/do not clear for transport.</u></p>	

3. After unloading

	Check	Explanation	okOK
3.1	Check whether <u>the tank is emptied.</u>	Suitable measures are, e.g. sight glass or use flow meters in the discharge device pipes, weighing, change in pump noise, product no longer carried.	
3.2	<u>Verify that stop-valves are closed and secured and there are no leakages.</u>	<p><u>If tools are used to close and tighten stop-valves, use only suitable tools.</u></p> <p><u>Any securing devices to protect against unintentional opening of stop-valves must be used, if available.</u></p> <p><u>There must be no leakages.</u></p>	
3.3	<p><u>Closing devices are installed correctly with the right gaskets and have been tightened with suitable tools.</u></p> <p><u>There must be no leakages.</u></p>	<p><u>If tools are used to close and tighten the closing devices, use only suitable tools.</u></p> <p><u>The closures must be equipped with suitable gaskets. They must be in a proper condition and must be replaced when necessary.</u></p> <p><u>Bolts in blank flanges must be of the proper length.</u></p>	
3.4	<u>After unloading, the tank, the service equipment and the opening devices (e.g. pressure pipe, inspection openings, dip tube)</u>	<u>Final (visual) check of all closing devices and valves.</u>	

	<u>must be checked again to ensure that there are no leakages.</u>	<u>There must be no leakages detected by appropriate methods, e.g. testing devices.</u>	
<u>3.5</u>	<u>The lockable cap (dome cap) must be locked and sealed (when fitted).</u>		
3.2	Operational openings (e.g. dome cover, pressure pipe, inspection openings, dip tube) closed and leaktight (visual inspection).		
3.36	Outside of tank free of dangerous residues.		
3.4	Handover report is signed/clearance.	The proper condition is documented. Effectiveness check is carried out on a random basis and is documented.	

Points relevant to leaktightness for filling rail tank-wagons (bottom filling) for liquids ~~(for inclusion in checklists)~~
~~with explanations/examples~~

1. Before filling			okOK
	Check	Explanation	
1.1 ³ 4	Tank and <u>service</u> equipment in technically faultless condition (visual inspection from the ground).	<u>Before clearance for filling, the tank and its items of service equipment must be visually checked to ensure that they are in conformity with RID do not show any evident damage.</u> <u>No damage to tank and items of equipment that might endanger the filling.</u> <u>Verification refers e.g. to the valves, closing devices, the manhole cover, damage on the shell, thermal insulation.</u>	
1.2 ³	<u>Verify that the date of the next tank inspection has not expired.</u>	<u>RID requires the next tank inspection date to be shown on every side of the wagon to inform the filler of the date of expiry.</u>	
1.3	<u>Verify that the dangerous goods are authorised for carriage in this tank.</u>	<u>This verification includes the verification of the tank code and the special provisions indicated on the tank, taking into account the tank hierarchy in 4.3.4.1.2.</u> <u>Note: If in case that multi-compartment tanks are used, the provisions of 4.3.2.3.6 have to be fulfilled shall be met.</u>	
1.4	<u>The last load and its compatibility with the new load must be determined.</u>	<u>The last load must be determined from data reported in the transport documents and by comparison of the product name with the UN number on the orange-coloured plates and with the product on the loading order.</u> <u>In case of inconsistencies, clarification is needed, e.g. product analysis.</u>	
1.5 ³	<u>Bottom valve (internal stop-valve) closed and secured against unintentional opening, no leakages visible (visual inspection).</u>	<u>The shut-off devices (valves) must clearly indicate whether the valve position is “open” or “closed”. There must be no leakage, i.e. there must be no drips on the valves. If drips are found, further measures are necessary. This also applies to observing the closure sequence in accordance with RID when discharging residues.</u>	
1.2 ⁶	Discharge valve (external stop-valve) closed (on opposite side	External shut-off devices and fittings must be checked manually or with a	

³ ~~Points 1.1, and 1.2 and 1.5 to 1.7 may also be carried out upon arrival at the facilities (arrival check) rather than directly before filling.~~

⁴ ~~Points 1.1, 1.2 and 1.5 to 1.7 may also be carried out upon arrival at the facilities (arrival check) rather than directly before filling.~~

23	also), no leakages visible (visual inspection).	suitable tools to ensure that they are closed. Any safety devices to protect against unintentional opening must be used if available. There must be no leakage, i.e. there must be no drips on the valves. If drips are found, further measures are necessary. This also applies to the closure sequence in accordance with RID when discharging residues.	
1.7 ³	<u>Closing device (e.g. screw thread, blank flange) closed on both sides.</u>	<u>There must be no leakage, i.e. there must be no drips on the outlets. If drips are found, further suitable measures are necessary. To close the cap, only suitable tools may be used.</u>	
1.8	<u>The filling devices are properly connected and the stop-valves on the filling side are open and the closing devices on the opposite side are closed. Before proceeding it must be checked again that there are no leakages.</u>	<u>The specific operating instructions must be followed.</u>	
1.9	<u>The maximum degree of filling must be determined to ensure that it will not be exceeded.</u>	<u>The filling degree must be determined taking into account the maximum loading mass on the wagon plate (load categories) and the maximum degree of filling laid down in 4.3.2.2.1.</u> <u>Note: The residual load (product that is still present in the tank-wagon before loading) must also be taken into account.</u>	
4.3	Filling device attached and internal and external stop-valve on the filling side open; closing device on opposite side closed.	The specific operating instructions for filling must be observed.	

2. During filling			
	Check	Explanation	okOK
2.1	Degree of filling observed.		
2.21	<u>Supervise filling operation to ensure safe operation throughout the process and prevent overfilling.</u> Supervise filling procedure.	<u>Permanent supervision will prevent dangerous situations, such as overfilling and will enable rapid emergency response, if necessary.</u>	

3. After filling			
	Check	Explanation	okOK
3.1	Verify that there is no neither overloading nor overfilling.	<p>Immediately after filling, the tank-wagon must be checked again to ensure that it is not overloaded or overfilled, as determined in 1.9.</p> <ul style="list-style-type: none"> Overloading means exceeding the maximum gross mass of the tank-wagon. Overfilling means exceeding the maximum (product related) filling degree, according to RID 4.3.2.2.1. <p>These checks must be carried out by using calibrated measuring devices (e.g. by weighing on a calibrated weighbridge). The overloading or overfilling must be remedied by immediate discharge of the excessive load in a safe manner.</p> <p>Further measures have to be agreed with the tank-wagon operator (in accordance with vehicle keeper marking on the wagon), because:</p> <ul style="list-style-type: none"> Overfilling of the tank may generate pressure build-up above the maximum calculation pressure. In this case, the tank-wagon must be emptied completely and must be inspected and tested before bringing-being brought back into service. An overfilled tank may cause excessive forces on bearings and axles. If overfilling has occurred, it must be checked whether the bearings and axles have been overloaded before bringing-the tank-wagon backis brought back into service. 	
3.42	Closing sequence observed (from inside to outside), internal and external shut-off and closing devices closed in accordance with operating instructions.	To close cap and handwheels for the discharge valves, use only a suitable tools, with which the necessary force is generated by means of even leverage and damage to the sealing elements is avoided.	
3.32	Bottom valve (internal stop-valve) closed and secured (visual inspection).	The bottom valve is in a recognisably closed position and secured against unintentional opening.	
3.34	Closing device (e.g. screw thread, blank flange) opened. Discharge valve (external stop-valve) closed and secured, no	External shut-off devices and fittings must be checked manually or with a suitable tools to ensure that they are closed. Any safety- securing devices	

	leakages visible (visual inspection). Then check closing device (e.g. screw thread, blank flange) closed.	to protect against unintentional opening must be used, if available.	
3.45	Closing device (e.g. screw thread, blank flange) correctly mounted (seals present and checked), closed with suitable tools and leaktight (visual inspection).	There must be no leakage, i.e. there must be no drips on the outlets. If drips are found, further suitable measures are necessary. To close the cap, only a suitable tools may be used, with which the necessary force is generated by means of even leverage and damage to the sealing elements is avoided.	
3.56	Operational openings (e.g. dome cover, pressure pipe, inspection openings, vapour return pipe, dip tube) properly closed and leaktight (visual inspection) with the right gaskets, and must be tightened with suitable tools. There must be no leakages.	<u>If tools are used to close and tighten the closing devices, use only suitable tools. The blank flanges on the closure that have been used must be equipped with new-suitable new gaskets. Bolts in blank flanges must be of the proper length.</u> <u>There must be no leakages detected by appropriate methods, e.g. testing devices.</u>	
3.67	Outside of tank free of dangerous residues.		
3.78	Closing device is leaktight both sides (visual inspection).	If the closing device was only used on one side, it only needs to be checked on this side if the other (unused) device has been sealed or secured and it can thus be ascertained that it has not been used. One component of a final check is to ensure that there are no leaks at all, i.e. there must be no drops on the valves and outlets. If drips are found, further suitable measures are necessary.	
3.8	Handover report is signed/clearance.	The proper condition is documented. Effectiveness check is carried out on a random basis and is documented.	

Points relevant to leaktightness for emptying-unloading rail tank-wagons (bottom discharge) for liquids (for inclusion in checklists) – with explanations/examples

1. Before unloading			
	Check	Explanation	okOK
1.1 ⁵	<u>Tank and service equipment in technically faultless condition (visual inspection from the ground).</u>	<p><u>Before clearance for filling, the tank and service equipment must be visually checked to ensure that they do not show any evident damage.</u></p> <p><u>No damage to tank and items of equipment that can endanger the unloading.</u></p> <p><u>Verification refers e.g. to the valves, closing devices, the manhole cover, damage on the shell, thermal insulation.</u></p>	1.1 ¹
1.4 ²	<u>The stop-valves and the closing device (e.g. screw thread, blank flange) are closed both sides <u>and there are no leakages.</u></u>	<p><u>It must be confirmed that the stop-valves must be confirmed are closed.</u></p> <p><u>Seals can help to determine that closing devices and valves have not been handled by other parties. In case of own seals, it should be verified that they are in the same proper condition as when they are installed. It can be assumed that valves on tank-wagons returning with original seals are still leaktight.</u></p>	
1.3	<u>Ascertain that the product in the tank-wagon is the correct one.</u>	<u>The load must be determined from particulars in the transport documents and by comparison with the UN number on the orange-coloured plates and with the product on the unloading order. In case of inconsistencies, clarification is needed, e.g. product analysis.</u>	
1.4	<u>The discharge devices are properly connected and the stop-valves are opened.</u>	<p><u>The specific operating instructions must be followed.</u></p> <p><u>Only use suitable tools.</u></p>	
1.5	<u>Before proceeding it must be checked again that there are no leakages.</u>		
4.2	Tank and items of equipment closed in such a way that nothing can escape uncontrolled.		
4.3	No damage to tank and items of equipment (no danger for unloading procedure) ascertained.	Notify damaged tanks and items of equipment/do not clear for transport.	
4.4	Before opening the closing device (e.g. screw thread, blank		

⁵ Point 1.1 may also be carried out upon arrival at the facilities (arrival check) rather than directly before unloading.

	flange) check that it is leaktight.		
4.5	Closing device (e.g. screw thread, blank flange) opened, discharge device connected.	To open cap and release handwheels for the discharge valves, only use suitable tool, with which the necessary force is generated by means of even leverage and damage to the sealing elements is avoided.	
4.6	Internal and external stop-valves opened.	Opening sequence according to instructions.	

2. During unloading			
	Check	Explanation	okOK
2.1	Supervise the unloading operation to ensure safe operation throughout the process. No damage to tank and items of equipment (no danger for unloading procedure) ascertained.	Notify damaged tanks and items of equipment/do not clear for transport.	

3. After unloading			
	Check	Explanation	okOK
3.1	Check whether tank is empty and the, discharge devices <u>are</u> empty (visual inspection or other suitable measure).	Other suitable measures are, e.g. sight glass or use flow meters in the discharge device pipes, weighing, change in pump noise, product no longer carried.	
3.2	Bottom valve (internal stop-valve) closed and secured (visual inspection).	Lever position closed. Closing sequence observed (from inside to outside), internal and external shut-off and closing devices are closed in accordance with the operating instructions. The bottom valve is in a recognisably closed position and secured against unintentional opening. <u>If tools are used to close and tighten stop-valves, use only suitable tools.</u>	
3.3	Closing device (e.g. screw thread, blank flange) opened. Discharge valve (external stop-valve) closed and secured, no leakages visible (visual inspection). Then check closing device (e.g. screw thread, blank flange) closed.	Closing sequence observed (from inside to outside), internal and external shut-off and closing devices are closed in accordance with the operating instructions. External shut-off devices and fittings must be checked manually or with <u>a-suitable tools</u> to ensure that they are closed. Any safety devices to protect against unintentional opening must be used if available. <u>If tools are used to close and tighten the closing devices, use only suitable tools.</u> <u>The closures must be equipped with suitable gaskets. They must be in a proper condition and must be replaced when necessary.</u>	

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		<u>Bolts in blank flanges must be of the proper length.</u>	
3.4	Closing device (e.g. screw thread, blank flange) correctly mounted (seals present and checked), closed with suitable tools and leaktight on both sides (visual inspection).	If the closing device was only used on one side, it only needs to be checked on this side if the other (unused) device has been sealed or secured and it can thus be ascertained that it has not been used. To close cap and release handwheels for the shut-off device, use only a suitable tool, with which the necessary force is generated by means of even leverage and damage to the sealing elements is avoided. There must be no leakage, i.e. there must be no drips on the outlets. If drips are found, further suitable measures are necessary. To close the cap, only a suitable tool may be used, with which the necessary force is generated by means of even leverage and damage to the sealing elements is avoided.	
3.5	Operational openings (e.g. vapour return pipe) closed and leaktight (visual inspection).		
<u>3.5</u>	<u>After unloading, the tank, the service equipment and the opening devices (e.g. pressure pipe, inspection openings, dip tube) must be checked again to ensure that there are no leakages.</u>	<u>Final (visual) check of all closing devices and valves.</u> <u>There must be no leakages detected by appropriate methods, e.g. testing devices.</u>	
<u>3.6</u>	<u>The lockable cap (dome cap) must be locked and sealed (when fitted).</u>		
<u>3.7</u>	<u>Outside of tank free of dangerous residues.</u>		
3.7	Handover report is signed/clearance issued.	The proper condition is documented. Effectiveness check is carried out on a random basis and is documented.	

Revised checklists for the filling and emptying of liquefied gas tank-wagons

Guidelines – introductory text

These guidelines have been developed in cooperation with CEFIC, EIGA, AEGPL and UIP in the form of checklists for tank-wagons for gases to help fillers and unloaders of gas tank-wagons comply with safety obligations, particularly with respect to the leaktightness of tank-wagons.

Filling and discharging of rail tank-wagons

Four checklists to help avoid leaks from tank-wagons carrying gases of Class 2 of RID

Introduction

According to RID 1.4.3.3 (a) and (f), the filler shall ascertain that:

- prior to the filling both the tanks and their equipment are technically in a satisfactory condition,
- after filling that all closures are in a closed position and that there are no noticeable leakages.

According to RID 1.4.3.7.1 (b) and (d) (ii), the unloader

- shall before and during unloading, check whether the tank has been damaged to an extent which would endanger the unloading operation and
- shall, immediately following the unloading of the tank, ensure the closure of valves and inspection openings.

In addition, the filler and the unloader are required to comply with the requirements of paragraphs 4.3.3.3 and 4.3.3.4 (Provisions for the filling of liquid gas tank-wagons) and 7.5.1.2 (Provisions concerning loading, unloading and handling).

The filler and the unloader must establish procedures to check the correct functioning of the closures of the tank of a tank-wagon and to ensure the leaktightness of the closing devices before and after filling or unloading.

As the most frequent cause of leaks is incorrect filling or discharge processes, the main aim behind standardised checklists is to avoid leaks from tank-wagons for gas by means of correct and professional handling on the part of operating staff working for fillers and unloaders. They include the necessary steps (checkpoints) in the appropriate sequence, which is normally observed when filling or emptying gases into or from tank-wagons in the procedure to ensure leaktightness. They may need to be supplemented by the user with other specific operational steps/procedures (operating instructions).

Gases to which a tank code is assigned in column (12) of Table A of RID Chapter 3.2 containing the letter "B" in the third part must be:

- filled from the bottom through three mutually independent closures, mounted in series, consisting of the bottom valve in conjunction with the external shut-off device (side valve, blank flange or screw cap); and
- discharged through the bottom shut-off device (side valve, blank flange or screw cap).

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Gases to which a tank code is assigned in column (12) of Table A of RID Chapter 3.2 containing the letter "D" in the third part, such as UN 1017, UN 1053, UN 1064, UN 1076 and UN 1079 shall be

- filled from the top and
- discharged from the top

through dip pipes in combination with other closing devices (triple closure in series, liquid phase valves and gas phase valve with blank flange, mounted on the manhole cover).

Four checklists have therefore been developed, covering respectively bottom filling, bottom discharge, top filling and top discharge.

They set out a chronological sequence of the steps necessary for the filling and discharge of tank-wagons. Using-If they use them as an aid, users can then be sure that they have followed the steps fully in the correct sequence. If one of the steps cannot be carried out properly, the filling or discharge process is interrupted or stopped until the discrepancy/fault is rectified. This should enable errors and unsafe situations to be recognised in advance and avoided. Damaged tanks or service equipment are not allowed for transport. Further measures ~~have to~~ must be agreed with the tank-wagon operator (in accordance with the vehicle keeper marking on the wagon).

The term "suitable tool" used in the checklists means a tool with which the necessary force is generated by means of even leverage and damage to the sealing elements is avoided. The equipment used must be in compliance with applicable international regulations, e.g. the regulation for explosive atmospheres regulations.

These checklists also reflect the obligations of the filler set out in paragraphs (b), (c), (d), (e) and (g) of RID 1.4.3.3 and the obligations of the unloader set out in paragraphs (a) and (c) of RID 1.4.3.7.1.

In addition to the different steps set out in these checklists

- According to paragraph (h) of RID 1.4.3.3, the filler shall also, in preparing the dangerous goods for carriage, ensure that the placards, mark, orange-coloured plates and labels as well as shunting labels are affixed on the tanks, on the wagon and on the containers in accordance with chapter 5.3 of RID;
- According to paragraphs (e) and (f) of RID 1.4.3.7.1, the unloader shall ensure that:
 - the prescribed cleaning, if applicable, of the wagons is carried out;
 - the wagons, once completely unloaded, cleaned, and degassed and decontaminated, no longer display placards, marks and orange-coloured plates that had been displayed in accordance with Chapter 5.3 of RID.

In this document, the RID terminology is used. The following table includes equivalent expressions or examples usually used in the industry.

RID terminology	Industry terminology or examples
closing devices	caps/blank (blind) flanges/manlids
external stop valve	side valve/discharge valve
filling device	loading arm/hose
discharge device	unloading arm/hose
internal stop valve	bottom valve
manhole cover	inspection lids/manlids
operational openings	filling and/or discharge openings

securing devices	devices to protect against unintentional opening of external and internal stop valves
service equipment	filling and discharge, breather, safety, heating and heat insulating devices and measuring instruments all equipment attached to the tank, such as filling and discharge equipment, safety devices, heat insulation devices, measuring instruments etc.

Disclaimer

This document is intended for information only and is provided in good faith. While it is accurate as far as the authors are aware, no representations or warranties are made about its completeness. Therefore, no responsibility will be assumed in relation to the contents of this document.

The checklist is a guide and does not exempt the various participants referred to in RID Chapter 1.4 from the respective obligations assigned to them under RID.

October 2017

Points relevant to leaktightness for filling tank-wagons (bottom filling) for gases

1. Before filling			
	Check	Explanation	OK
1.1 ¹	Tank and service equipment in technically faultless condition (visual inspection from the ground).	<p>Before clearance for filling, the tank and service equipment must be visually checked to ensure that they do not show any evident damage.</p> <p>No damage to tank and items of equipment that might endanger the filling.</p> <p>Verification refers e.g. to the valves, closing devices, the manhole cover, damage on <u>the shells</u>, thermal insulation.</p>	
1.2 ¹	Verify that the date of the next tank inspection has not expired.	RID requires the next tank inspection date to be shown on every side of the wagon to inform the filler of the date of expiry.	
1.3	Verify that the dangerous goods are authorised for carriage in this tank.	This verification includes the comparison between the data shown on the movable panel and the permitted gases listed on the tank plate.	
1.4	The last load and its compatibility with the new load must be determined.	<p>The last load must be determined from data reported in the transport documents and by comparison of the product name (reported on the plate of the tank-wagon) with the UN number on the orange-coloured plates and with the product on the loading order.</p> <p>In case of inconsistencies, clarification is needed, e.g. product analysis.</p>	
1.5	The external stop-valves and the closing devices are closed (on opposite side also) and there are no leakages on both liquid and gas phase.	<p>It must be confirmed that the external stop-valves are closed.</p> <p>Seals can help to determine that closing devices and valves have not been handled by other parties. In case of own seals, it should be verified that they are in the same proper condition as when they are installed. It can be assumed that valves on tank-wagons returning with original seals are still leaktight.</p>	
1.6	Check whether the "emergency screws" of the internal stop-valves (gas and liquid phase) are in the "safe" position.	The emergency screw or "ice breaking screw" might have been used if the internal stop-valve could not be opened in a normal way (e.g. because of ice forming on the bottom of the tank). By turning this screw into the internal stop-valve, the valve opens and as a consequence, the safety mechanism no longer closes the internal stop-valve automatically when the rail hook is removed. The valve is no longer functional and is blocked in the open position. For mechanical stop-valves: check whether the bottom valves are locked. For hydraulic valves: check whether the two bolts are present in/near the hydraulic oil reservoir.	
1.7	The filling devices are properly connected to both	The specific operating instructions for filling the tank-wagon must be observed.	

1. Before filling			
	Check	Explanation	OK
	liquid and gas phase and internal and external stop-valves on the filling side are opened.	The use of a rail hook or similar devices is mandatory to open the internal stop-valves. The sequence of opening the valves is: first the internal stop-valves and then the external stop-valves.	
1.7.1	Verify that the internal stop-valves are leaktight and secured against unintentional opening. Before proceeding check again that there are no leakages.	Make sure that the internal stop-valves are leaktight and secured against unintentional opening. Leaktightness can be verified by depressurizing the T-pipe and then by using a manometer to check that the pressure is not rising again.	
1.8	The maximum degree of filling must be determined to ensure that it will not be exceeded.	The degree of filling must be determined taking into account the maximum loading mass on the movable panel (load categories). Note: The residual load (product that is still present in the tank-wagon before filling) must also be taken into account.	

2. During filling			
	Check	Explanation	OK
2.1	Supervise filling operation to ensure safe operation throughout the process and prevent overfilling.	For filling, the operating instructions of the tank-wagon must be complied with. Permanent supervision will prevent dangerous situations, such as overfilling and should enable rapid emergency response, if necessary.	

3. After filling			
	Check	Explanation	OK
3.1	Verify that there is neither overloading nor overfilling.	<p>Immediately after filling, the tank-wagon must be checked again to ensure that it is not overloaded or overfilled, as determined in 1.8.</p> <ul style="list-style-type: none"> Overloading means exceeding the maximum gross mass of the tank-wagon. Overfilling means exceeding the maximum (product related) filling degree, according to RID 4.3.3.2.5 <p>These checks must be carried out using calibrated measuring devices (e.g. by weighing on a calibrated weighbridge). The overloading or overfilling must be remedied by immediate discharge of the excessive load in a safe manner.</p> <p>Further measures have to be agreed with the tank-wagon operator (in accordance with vehicle keeper marking on the wagon) because:</p> <ul style="list-style-type: none"> Overfilling of the tank may generate pressure build-up above the maximum calculation pressure. In this case, the tank-wagon must be emptied completely and must be inspected and tested before bringing back into service. An overfilled tank may cause excessive forces on bearings and axles. If overfilling has occurred, it must be checked whether the bearings and axles have been overloaded before bringing the tank-wagon back into service. 	
3.2	The correct closing sequence of the valves (from inside to outside) must be complied with.	Internal and external stop-valves must be closed in accordance with the operating instructions of the tank-wagon.	
3.2.1	Verify that the internal stop-valves are leaktight and secured against unintentional opening.	<p>Make sure that the internal stop-valves are leaktight and secured against unintentional opening. Leaktightness can be verified by depressurizing the T-pipe and then by using a manometer to check that the pressure is not rising again.</p> <p>Ensure that the valves are locked (e.g. securing pin).</p>	
3.2.2	Verify that external stop-valves are closed and secured against unintentional	Any securing devices to protect against unintentional opening of external stop-valves must be used, if available.	

3. After filling			
	Check	Explanation	OK
	opening (on opposite side also) and there are no leakages on liquid and gas phase.	There must be no gas leakages.	
3.3	<p>Closing devices are properly installed using the correct gaskets and are tightened with suitable tools.</p> <p>There must be no gas leakages</p>	<p>Bolts in <u>blank</u> flanges must be of the proper length.</p> <p>If tools are used to close and tighten the closing devices, use only the right suitable tools to ensure that no excessive torque is generated and that sealing elements are not damaged, e.g. caps of screw couplings must be tightened by means of a wrench, not by a hammer.</p> <p>The closures must be equipped with suitable gaskets. They must be in a proper condition and replaced when necessary.</p>	
3.4	After filling, the tank and service equipment must be checked again to ensure that there are no leakages.	Final (visual) check of all closing devices and valves on both sides.	

¹ Points 1.1 and 1.2 may also be carried out upon arrival at the facilities (arrival check) rather than directly before filling.

Points relevant to leaktightness for unloading tank-wagons (bottom unloading/discharge) for gases

1. Before unloading			
	Check	Explanation	OK
1.1 ¹	Tank and service equipment in technically faultless condition (visual inspection from the ground).	<p>Before clearance for unloading, the tank and service equipment must be checked to ensure that they do not show any evident damage.</p> <p>No damage to tank or items of equipment that might endanger unloading.</p> <p>Verification refers e.g. to the valves, closing devices, the manhole cover, damage to <u>on the</u> shells, thermal insulation.</p>	
1.2	The external stop-valves and the closing devices are closed (on opposite side also) and there are no leakages on both liquid and gas phase.	<p>It must be confirmed that the external stop-valves are closed.</p> <p>Seals can help to determine that closing devices and valves have not been handled by other parties. In case of own seals, it should be verified that they are in the same proper condition as when they were installed. It can be assumed that valves on tank-wagons returning with original seals are still leaktight.</p>	
1.3	Ascertain that the product in the tank-wagon is the correct one.	The load must be determined from particulars in the transport documents and by comparison of the product name (reported on the plate of the tank-wagon) with the UN number on the orange-coloured plates and with the product on the unloading order. In case of inconsistencies, clarification is needed, e.g. product analysis.	
1.4	Check whether the "emergency screws" of the internal stop-valves (gas and liquid phase) are in the "safe" position.	The emergency screw or "ice breaking screw" might have been used if the internal stop-valve could not be opened in a normal way (e.g. because of ice forming on the bottom of the tank). By turning this screw into the internal stop-valve, the valve opens and, as a consequence, the safety mechanism no longer closes the internal stop-valve automatically when the rail hook is removed. The valve is no longer functional and is blocked in the open position. For mechanical stop-valves: check whether the bottom valves are locked. For hydraulic valves: check whether the two bolts are present in/near the hydraulic oil reservoir.	
1.5	The discharge devices are properly connected to both liquid and gas phase and internal and external stop-valves on the unloading side are opened.	<p>The specific operating instructions for unloading the tank-wagon must be observed.</p> <p>The use of a rail hook or similar devices is mandatory to open the internal stop-valves.</p> <p>The sequence of opening the valves is: first the internal stop-valves and then the external stop-valves.</p>	

1. Before unloading			
	Check	Explanation	OK
1.6	Before proceeding check again that there are no leakages.		
2. During unloading			
	Check	Explanation	OK
2.1	Supervise the unloading operation to ensure safe operation throughout the process.	For unloading, the operating instructions of the tank-wagon must be complied with. Permanent supervision will prevent dangerous situations and should enable rapid emergency response, if necessary.	
3. After unloading			
	Check	Explanation	OK
3.1	Check whether tank-wagon and discharge device are empty of liquefied gas (by means of suitable measures).	Suitable measures are: level indicating device, weighing, "no flow" sensors, etc. E.g., the T-pipe and discharge device can be emptied by purging with nitrogen.	
3.2	The right closing sequence of the valves (from inside to outside) has to be complied with.	Internal and external stop-valves must be closed in accordance with the operating instructions. These instructions are usually displayed on the tank-wagon.	
3.2.1	Verify that the internal stop-valves are leaktight and secured against unintentional opening.	Make sure that the internal stop-valves are leaktight and secured against unintentional opening. Leaktightness can be verified by depressurizing the T-pipe and then by using a manometer to check whether the pressure is rising again. Ensure that the valves are locked (e.g. securing pin).	
3.2.2	Verify that the external stop-valves are closed and secured (on opposite side also) and there are no leakages on both liquid and gas phase.	If tools are used to close and tighten the external stop-valves, use only the right <u>suitable</u> tools to ensure that no excessive torque is generated and that sealing elements are not damaged. Any securing devices to protect against unintentional opening of external stop-valves must be used, if available. There must be no gas leakages.	
3.3	Closing devices are	Bolts in <u>blank</u> flanges must be of proper length.	

3. After unloading			
	Check	Explanation	OK
	properly installed using the correct gaskets and are tightened with suitable tools. There must be no gas leakages.	If tools are used to close and tighten the closing devices, use only the right <u>suitable</u> tools to ensure that no excessive torque is generated and that sealing elements are not damaged , e.g. caps of screw couplings must be tightened by means of a wrench, not by a hammer. The closures must be equipped with suitable gaskets. They must be in a proper condition and must be replaced when necessary.	
3.4	After unloading, tank and service equipment must be checked again to ensure that there are no leakages.	Final (visual) check of all closing devices and valves on both sides.	
3.5	The pressure in the tank must be sufficient to counter an inadmissible external overpressure (the tank must be protected against underpressure).	When the external overpressure might be greater than the tank resistance, adequate measures must be taken to protect the tank against deformation. This is especially applicable for low pressure liquefied gases, e.g. sufficient pressure can be achieved by filling them with nitrogen or another inert gas.	

¹ Point 1.1 may also be carried out upon arrival at the facilities (arrival check) rather than directly before unloading.

Points relevant to leaktightness for filling tank-wagons (top filling) for gases

1. Before filling			
	Check	Explanation	OK
1.1 ¹	Tank and service equipment in technically faultless condition (visual inspection).	<p>Before clearance for filling, the tank and service equipment must be visually checked to ensure that they do not show any evident damage.</p> <p>No damage to tank and items of equipment that can endanger the filling.</p> <p>Verification refers e.g. to the valves, closing devices, the manhole cover, damage on the shell, thermal insulation.</p>	
1.2 ¹	Verify that the date of the next tank inspection date has not expired.	RID requires the next tank inspection date to be shown on every side of the wagon to inform the filler of the date of expiry.	
1.3	Verify that the dangerous goods are authorised for carriage in this tank.	This verification includes the comparison between the data shown on the wagon plate and the permitted gases listed on the tank plate.	
1.4	The last load and its compatibility with the new load must be determined.	<p>The last load must be determined from data reported in the transport documents and by comparison of the product name (reported on the plate of the tank-wagon) with the UN number on the orange-coloured plates and with the product on the loading order.</p> <p>In case of inconsistencies, clarification is needed, e.g. product analysis.</p> <p>Note: Top filling tank-wagons are usually used for one specific product.</p>	
1.5	The stop-valves and the closing devices are closed and there are no leakages on both liquid and gas phase.	It must be confirmed that the stop-valves are closed.	
1.6	<p>The filling devices are properly connected to both liquid and gas phase and the stop-valves are opened.</p> <p>Before starting the filling, it</p>	The specific operating instructions for filling the tank-wagon must be observed.	

1. Before filling			
	Check	Explanation	OK
	must be checked again that there are no leak-ages.		
1.7	The maximum degree of filling must be determined to ensure that it will not be exceeded.	<p>The filling degree must be determined taking into account the maximum loading mass on the wagon plate (load categories).</p> <p>Note: The residual load (product that is still present in the tank-wagon before loading) must also be taken into account.</p>	
2. During filling			
	Check	Explanation	Ok
2.1	Supervise filling operation to ensure safe operation throughout the process and prevent overfilling.	<p>For filling, the operating instructions of the tank-wagon must be complied with.</p> <p>Permanent supervision will prevent dangerous situations, such as overfilling and will enable rapid emergency response, if necessary.</p>	
3. After filling			
	Check	Explanation	OK
3.1	Verify that there is neither overloading nor overfilling.	<p>Immediately after filling, the tank- wagon must be checked again to ensure it is not overloaded or overfilled, as determined in 1.7.</p> <ul style="list-style-type: none"> Overloading means exceeding the maximum gross mass of the tank-wagon. Overfilling means exceeding the maximum (product related) filling degree, according to RID 4.3.3.2.5 <p>These checks must be carried out by using calibrated measuring devices (e.g. by weighing on a calibrated weighbridge). The overloading or overfilling must be remedied by immediate discharge of the excessive load in a safe manner.</p> <p>Further measures have to be agreed with the tank-wagon operator (in accordance with vehicle keeper marking on the wagon) because:</p> <ul style="list-style-type: none"> Overfilling of the tank may generate pressure build-up above the maximum calculation pressure. 	

3. After filling			
	Check	Explanation	OK
		<p>In this case, the tank-wagon must be emptied completely and must be inspected and tested before bringing back into service.</p> <ul style="list-style-type: none"> An overfilled tank may cause excessive forces on bearings and axles. If overfilling has occurred, it must be checked whether the bearings and axles have been overloaded before bringing the tank-wagon back into service. 	
3.2	Verify that stop-valves are closed and secured and that there are no leakages on both liquid and gas phase.	<p>Any securing devices to protect against unintentional opening of stop-valves must be used, if available.</p> <p>There must be no gas leakages detected by appropriate methods, e.g. testing devices.</p>	
3.3	<p>Closing devices must be installed properly with the right gaskets, and must be tightened with the right tools.</p> <p>There must be no gas leakages.</p>	<p>If tools are used to close and tighten the closing devices, use only the rightsuitable tools to ensure that no excessive torque is generated and that sealing elements are not damaged. The blank flanges on the closure that have been used must be equipped with new suitable gaskets. Bolts in <u>blank</u> flanges must be of proper length.</p> <p>There must be no gas leakages detected by appropriate methods, e. g. testing devices.</p>	
3.4	After filling, the tank and service equipment must be checked again to ensure that there are no leakages.	<p>Final (visual) check of all closing devices and valves.</p> <p>There must be no gas leakages detected by appropriate methods.</p>	
3.5	The lockable cap (dome cap) must be locked and sealed (when fitted).		

¹ Points 1.1 and 1.2 may also be carried out upon arrival at the facilities (arrival check) rather than directly before filling.

Points relevant to leaktightness for unloading tank-wagons ([top unloadingdischarge](#)) for gases

1. Before unloading			
	Check	Explanation	OK
1.1 ¹	Tank and service equipment in technically faultless condition (visual inspection).	<p>Before clearance for filling, the tank and service equipment must be visually checked to ensure that they do not show any evident damage.</p> <p>No damage to tank and items of equipment that can endanger the unloading.</p> <p>Verification refers e.g. to the valves, closing devices, the manhole cover, damage on the shell, thermal insulation.</p>	
1.2.	The stop-valves and the closing devices are closed and there are no leakages on both liquid and gas phase.	<p>The stop-valves must be confirmed closed.</p> <p>Seals can help to determine that closing devices and valves have not been handled by other parties. In case of own seals, it should be verified that they are in the same proper condition as when they are installed. It can be assumed that valves on tank-wagons returning with original seals are still leak-tight.</p>	
1.3	Ascertain that the product in the tank-wagon is the correct one.	The load must be determined from particulars in the transport documents and by comparison of the product name (reported on the plate of the tank-wagon) with the UN number on the orange-coloured plates and with the product on the unloading order. In case of inconsistencies, clarification is needed, e.g. product analysis.	
1.4	The discharge devices are properly connected to both liquid and gas phase and stop-valves are opened.	The specific operating instructions for unloading the tank-wagon must be observed.	
1.5	Before proceeding it must be checked again that there are no leakages.		

2. During unloading			
	Check	Explanation	OK
2.1	Supervise the unloading operation to ensure safe operation throughout the process.	<p>For unloading, the operating instructions of the tank-wagon must be complied with.</p> <p>Permanent supervision will prevent dangerous situations and will enable rapid emergency response, if necessary.</p>	

3. After unloading			
	Check	Explanation	OK
3.1	Verify that stop-valves are closed and secured and there are no leakages on both liquid and gas phase.	<p>If tools are used to close and tighten stop-valves, use only <u>the rightsuitable</u> tools to ensure that no excessive torque is generated and that sealing elements are not damaged.</p> <p>Any securing devices to protect against unintentional opening of stop-valves must be used, if available.</p> <p>There must be no gas leakages.</p>	
3.2	<p>Closing devices are installed correctly with the right gaskets and have been tightened with the right tools.</p> <p>There must be no gas leakages.</p>	<p>If tools are used to close and tighten the closing devices, use only <u>the rightsuitable</u> tools to ensure that no excessive torque is generated and that the sealing elements are not damaged.</p> <p>The closures must be equipped with suitable gaskets. They must be in a proper condition and must be replaced when necessary.</p> <p>Bolts in <u>blank</u> flanges must be of proper length.</p>	
3.3	After unloading, the tank and service equipment must be checked again to ensure that there are no leakages.	<p>Final (visual) check of all closing devices and valves.</p> <p>There must be no gas leakages detected by appropriate methods, e.g. testing devices.</p>	
3.4	The lockable cap (dome cap) must be locked and sealed (when fitted).		
3.5	The pressure in the tank must be sufficient to counter an inadmissible external overpressure (the tank must be protected against underpressure).	<p>When the external overpressure might be greater than the tank resistance, adequate measures must be taken to protect the tank against deformation.</p> <p>This is especially applicable for low pressure liquefied gases, e.g. sufficient pressure can be achieved by filling them with nitrogen or another inert gas.</p>	

¹ Point 1.1 may also be carried out upon arrival at the facilities (arrival check) rather than directly before unloading