



Chemical Business Association

SEMI BULK DISCHARGE PROCEDURE RECOMMENDED CODE OF PRACTICE



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Disclaimer

The aim of the Code of Practice is to increase the level of safety for all persons involved in the specific operation of Semi Bulk discharge and the information is given in good faith and belief in its accuracy at the time of publication, but it does not imply any legal liability or responsibility by the CBA

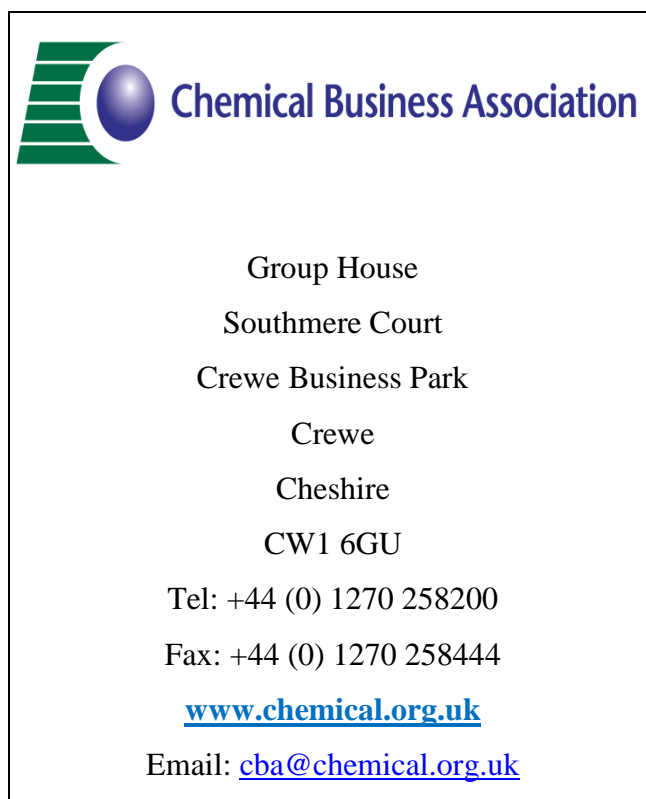
The semi bulk discharge procedure has been designed to provide CBA members with guidance on the minimum operational Health and Safety requirements and should not be used in isolation.

Users of this Code should pay regard to any relevant legislation or authoritative recommendations, which may have evolved subsequently to the date of publication.

This Guidance is not an authoritative interpretation of the Law, but if you do follow the Code, you will normally be doing enough to comply with the Law. Health and Safety Inspectors may refer to this Guidance as illustrating good practice.

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FOREWORD

“The Health and Safety Executive (HSE) was involved with the Chemical Business Association in producing this guidance. HSE endorses the guidance as it follows a sensible and proportionate approach to managing health and safety. Health and Safety inspectors seeking to secure compliance with the law may refer to this Guidance as illustrating good practice.”

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1. SCOPE

The purpose of this Code of Practice (COP) is to provide guidance to those members involved in the distribution of chemicals by the transfer from semi-bulk containers into customer's storage installations.

The term "semi-bulk container" relates to Intermediate Bulk Containers (IBCs) as defined in chapter 1.2 of the ADR regulations¹ with capacities up to 3m³. There are many types of IBC available, see annex one, the suitability for use against this COP is the responsibility of the user

It is recognised that each Chemical Distributor will have its own procedures but it is intended, that as a minimum, such procedures should comply with the principles outlined in this Code of Practice.

For the purpose of this COP the delivery process is considered to involve the following key steps:

- ✓ the Pre-Delivery Inspection of a customer's storage installation to confirm it's suitability to receive product;
- ✓ the Discharge Authorisation process;
- ✓ the Discharge Process;
- ✓ the Response to Emergencies.

The COP provides guidance for all these stages of the delivery process.

It is recognised that there are a wide range of chemicals, which are delivered via the use of semi-bulk systems. As a consequence, it is not possible to produce product specific guidance.

However, wherever possible, reference to practices relevant to specific hazards is included in the COP.

Companies should consider the specific properties and hazards of the materials being delivered before deciding whether this form of delivery is appropriate. Companies should also ensure the containers, equipment and transfer technique is fully compatible with the substance being handled

2. PRE-DELIVERY INSPECTION OF CUSTOMER'S INSTALLATIONS

Prior to the first delivery to a customer's installation a pre delivery inspection must be carried out to confirm that the proposed delivery can be carried out safely and without risk to either the driver, the customer's employees or to members of the public.

A competent person representing the supplying company must carry out this inspection.

The inspection must be recorded, dated and signed off by the supplier and it is also recommended that the customer sign off the document. Suppliers must ensure that this inspection takes place, irrespective of whether the customer has previously received the product from another source unless that previous source copies their document to the Supplier. Copies from the customer are not considered acceptable.

It is important to recognise that the pre delivery inspection does not validate the mechanical integrity of the customer's installation. It is the customer's responsibility to maintain his installation to acceptable standards. This should be made clear to the customer prior to the start of any pre delivery inspection. Suppliers should be

¹ ADR – European Agreement concerning the International Carriage of Dangerous Goods by Road
<https://www.unece.org/trans/danger/danger.html>

careful not to extend the scope of their comments so as to imply approval of the customer's installation beyond the remit of the inspection.

The format for any pre delivery inspection will vary from company to company. However, the inspection report should, as a minimum, include following:

- ✓ Customer name and address
- ✓ Telephone/fax number
- ✓ Contacts including job descriptions.
- ✓ Date(s) of inspection(s)
- ✓ Name of inspector/auditor
- ✓ Product(s) name
- ✓ Storage tank details e.g.
 - diagram of tank fittings, vent and overflow arrangements
 - nominal capacity
 - material(s) of construction
 - inlet line details, including the type of connections etc.
 - Venting facilities, vents should be 3 times the filling line diameter unless a restrictor is used
 - instrumentation
 - safety arrangements
 - Is the unloading valve locked or are there other arrangements to ensure a visiting driver cannot connect and unload without customers knowledge?
 - unloading area constraints
 - any special area or product specific requirements e.g.
 - earthing arrangements for the delivery of flammable liquids, special area classifications (DSEAR)
 - specific PPE requirements
 - any specific arrangements for dealing with spillages/hose washings.

Semi-bulk discharge is intended to only take place into fixed bunded installations using industry-accepted connections. . The placing of unloading hoses into IBC's or other containers presents a significant risk both of spillage and spraying of the delivered product and as such should not be an accepted practise. If proper connections are used and any spillage is bunded unloading into IBC's having the correct connections can be considered but only after a specific risk assessment. Consideration in this assessment should be given to the fact that the receiving container would normally be empty

During the course of the inspection, the supplier and the customer must agree the delivery procedure to be used, including arrangements such as:

- ✓ booking in
- ✓ authorisation of paperwork
- ✓ arrangements for supervision of the discharge
- ✓ taking of samples
- ✓ emergency procedures.

All this information must be recorded.

The unloading by any bulk discharge where the vehicle or connecting pipework is on a public road/footpath is not normally acceptable but there occasional situations where it is unavoidable. In these situations a separate risk assessment must be carried out before the delivery and if it is deemed acceptable to discharge then during the delivery the area affected must be clearly identified and barriers to access in place. The risk assessment should consider all the issues with regard to the need for semi-bulk discharge and should only decide in favour if there is no safer alternative.

Pre-printed inspection forms are recommended and a copy of a typical pre-delivery inspection form is appended (**Appendix 1**).

It is vital that customer installation details are kept up to date and it is recommended that suppliers institute an “installation change/defect” reporting system to alert them to any changes, which might lead to an unsafe condition at the point of delivery.

3. DISCHARGE AUTHORISATION

The specific discharge authorisation procedures for each installation must be agreed at the pre delivery inspection visit.

The specific written instructions for the delivery process are the responsibility of the supplying company.

A customer’s employee must be present at the start and at the completion of the discharge. Whilst it is recognised that he may not be present throughout the discharge process, it must be possible for the driver to summon assistance if required.

It is necessary that, for each delivery, a record of the customer’s authorisation to proceed with the delivery is kept. This record can be made part of the normal delivery documentation or be a separate document. In this latter case, the authorisation record could be combined with a driver installation defect reporting form. This could act as a double check prior to delivery commencing. A typical discharge authorisation form is appended **(Appendix 2)**.

4. THE DISCHARGE PROCESS

Each supplying company must provide its delivery drivers with written discharge procedures.

Drivers must be trained in the application of these procedures and also any customer or product related variations from any standard procedure.

As well as outlining the procedure to be followed with regard to delivery authorisation and the detailed actions to be taken to complete the discharge, the procedures should also outline the PPE requirements, the emergency actions to be taken in the event of, for example, a spillage or dealing with a suspected blockage during the discharge process.

There are a number of techniques for transferring product from an IBC to the customer’s storage tank, for example:

- ✓ transfer under gravity,
- ✓ transfer by discharge pump,
- ✓ transfer using discharge air compressor,
- ✓ transfer using compressed air or nitrogen.

Each has its own particular requirements. However, there a number of common steps which must be followed:

- ✓ prior to the driver connecting up the transfer hose(s), he must ensure that the correct discharge point has been identified.
- ✓ the driver should assess, as far as is practicable, that the facility and the associated safety provisions, are satisfactory. The driver should make sure that he is familiar with any safety or emergency procedures relating to the customer’s operations, which he would be required to follow.
- ✓ the driver should wear the PPE specified in his written procedures. As a minimum, for transfer operations of this type, he should wear;

- full chemically resistant suit,
 - helmet & visor (visors can only be used if goggles are also worn)
 - goggles
 - Chemically resistant gloves
 - safety Wellington boots.
- ✓ the driver should ensure that, before removing any closures eg. IBC “dust” caps, pipe-work, blank flanges etc. all valves are in the closed position. The customer’s representative should remove any closures on the customer’s installation unless permission has been formally given, by the customer, for the driver to carry out this task. When removing any closures, care should be taken to initially release the lower end of any fitting, so that any residual product/pressure is directed downwards.
- ✓ under the supervision of the customer’s representative, the driver should check gaskets, the cleanliness of the discharge connections and that the proposed method of hose coupling is adequate.
- ✓ The driver should ensure that only gaskets compatible with the product are used.
- ✓ in the case of flammable liquids, the customer’s inlet fittings, the supplier’s hose and the IBC must be electrically linked together, so as to avoid problems associated with a build-up of static electricity. This will usually be via an earthing lead, incorporated within the hose, and via the customer’s own earthing arrangements.
- ✓ This electrical connection must be completed before the discharge of product begins.
- ✓ Where a scrubber is fitted, to control fumes displaced from the customer’s storage tank, the driver should confirm with the customer’s representative that the water supply is on and that the scrubber is operational.
- ✓ The driver should confirm with customer’s representative, the arrangements for venting of lines and equipment and for the washing out of hoses.
- ✓ On the completion of the transfer, the driver must ensure that he obtains a signature from the customer’s representative to confirm that the delivery has been completed in a satisfactory manner. This signature also establishes proof of the actual delivery.

To assist in the development of individual company delivery procedures a typical discharge procedure is appended (**Appendix 3**).

The procedures have been developed assuming the discharges are for a single product. In the event of a multi compartment or multi tank, discharge consideration should be given to additional precautions included within Appendix 4.

It is recommended that a responsible person checks the paperwork after it is returned from the driver to ensure these procedures are being followed. That person should countersign/initial and date the paperwork as having been checked.

5. THE RESPONSE TO EMERGENCIES

Suppliers should ensure that their procedures and driver training includes, as a minimum, the following key principles;

- ✓ The driver should remain at the side of the vehicle throughout the discharge operation. He should always be in a position to respond quickly to deal with any emergency situation, which might arise.

As mentioned previously, the driver should be familiar with the customer's requirements with regard to his actions in the event of a site emergency. He should also make himself aware of the location of any safety/emergency equipment, which he might reasonably be expected to use e.g. alarms, safety showers, eyewash provision, water supplies and fire extinguishers.

- ✓ in the event of a problem during the discharge operation, the driver should, if it is safe to do so, stop the discharge operation.
- ✓ the driver must report any problems to the customer's representative without delay. In addition, he should report the problem to his line manager as soon as possible.
- ✓ the driver must, at all times, ensure that he is wearing appropriate PPE when dealing with emergencies.
- ✓ the driver must ensure that he reports any injuries suffered during the discharge or in dealing with any emergencies to the customer's representative and to his line manager as soon as is practicable.

"Intermediate bulk container" (IBC) means a rigid, or flexible portable packaging, other than those specified in Chapter 6.1, that:

- a) Has a capacity of:
- i. not more than 3 m³ for solids and liquids of packing groups II and III;
 - ii. not more than 1.5 m³ for solids of packing group I when packed in flexible, rigid plastics, composite, fibreboard and wooden IBCs;
 - iii. not more than 3 m³ for solids of packing group I when packed in metal IBCs;
 - iv. not more than 3 m³ for radioactive material of Class 7;
- b) Is designed for mechanical handling;
- c) Is resistant to the stresses produced in handling and transport as determined by the tests specified in Chapter 6.5;

Material	Category	Code
METAL		
A. Steel	for solids, filled or discharged by gravity	11A
	for solids, filled or discharged under pressure	21A
	for liquids	31A
B. Aluminium	for solids, filled or discharged by gravity	11B
	for solids, filled or discharged under pressure	21B
	for liquids	31B
N. Other than steel or aluminium	for solids, filled or discharged by gravity	11N
	for solids, filled or discharged under pressure	21N
	for liquids	31N
Flexible		
H. Rigid plastics	for solids, filled or discharged by gravity, fitted with structural equipment	11H1
	for solids, filled or discharged by gravity, freestanding	11H2
	for solids, filled or discharged under pressure, fitted with structural equipment	21H1
	for solids, filled or discharged under pressure, freestanding	21H2
	for liquids, fitted with structural equipment	31H1
	for liquids, freestanding	31H2
HZ. Composite with plastics inner receptacle ^a	for solids, filled or discharged by gravity, with rigid plastics inner receptacle	11HZ1
	for solids, filled or discharged by gravity, with flexible plastics inner receptacle	11HZ2
	for solids, filled or discharged under pressure, with rigid plastics inner receptacle	21HZ1
	for solids, filled or discharged under pressure, with flexible plastics inner receptacle	21HZ2
	for liquids, with rigid plastics inner receptacle	31HZ1
	for liquids, with flexible plastics inner receptacle	31HZ2

CUSTOMER INSTALLATION INSPECTION

Semi-bulk discharge is intended to only take place into fixed bunded installations using industry-accepted connections. . The placing of unloading hoses into IBC's or other containers presents a significant risk both of spillage and spraying of the delivered product and as such should not be an accepted practise. If proper connections are used and any spillage is bunded unloading into IBC's having the correct connections can be considered but only after a specific risk assessment. Consideration in this assessment should be given to the fact that the receiving container would normally be empty

INSPECTION BY:

Date:

PRODUCT:

Load Size:

CUSTOMER ADDRESS:

Tel. No:

Fax. No:

STOCK TANK DETAILS.

No. and description:

Condition:

Capacity:

Material and lining:

Overflow size/location:

Leading to:

Vent size/location:

(Note - Vent size should be 3 times inlet size, unless restrictor fitted)

Leading to:

Is fume scrubber fitted?

Is tank heated?

Type of heating:

Bund dimensions:

How are tank contents measured?

Is storage tank labelled?

Is the storage tank regularly inspected?

STOCK TANK OUTLET/DRAIN LINES.

No. of outlet valves?

Type:

Bore:

Location of outlet valves?

Size of outlet lines:

Material:

No. of drain valves:

Type:

Bore:

Location(s) of drain valves?

Size of drain lines:

Material:

FILLING LINE DETAILS.

Material:

Bore:

Length:

Does filling line enter at tank top?

Max. height of filling line above ground level:

For flammable liquids:

Is the tank earthed?

Is splash filling avoided?

Has the filling line been pressure tested before use?

DISCHARGE AUTHORISATION

SUPPLYING COMPANY:

DATE OF DELIVERY:

CUSTOMER:

ADDRESS:

PRODUCT(S) DELIVERED:

QUANTITY:

DELIVERY AUTHORISATION.

I/We state that our storage installation is fit for purpose and will accept the product and the quantity stated above. I/We confirm that the delivery paperwork corresponds to the product being delivered and is that requested on the original purchase order placed with the above supplier.

I/We are satisfied that the correct discharge location has been identified, that the correct connections have been made and that the discharge may proceed.

For the receiving Customer.

Signed:

Print Name: Date:

CONFIRMATION OF DELIVERY COMPLETION.

ONLY TO BE SIGNED ON SATISFACTORY COMPLETION OF THE DELIVERY.

I/We confirm that the above discharge has been completed satisfactorily.

For the receiving Customer.

Signed:

Print Name: Date:

TYPICAL SEMI BULK DISCHARGE PROCEDURE.

1 PRE-JOURNEY ROUTINE

The following checks, in addition to your normal pre journey vehicle checks, must be carried out before leaving your site;

- ✓ check that you are aware of any special requirements or constraints, which relate to the receiving customer's installation.
- ✓ check that all the paperwork is in order and confirm that the IBC's on the vehicle correspond to the details on the delivery paperwork.
- ✓ check that all the necessary equipment is loaded e.g. additional hoses, couplings earthing equipment and any other equipment which might be specified in the "special instructions" section of your delivery paperwork.
- ✓ check that you have all the required safety equipment and that it is good condition.

2 ON ARRIVAL AT THE CUSTOMER'S PREMISES.

On arrival at the customer's premises the driver should;

- ✓ present the delivery notes at the gatehouse, stores or plant office, confirm that the details are correct and await the customer's instructions.
- ✓ when the vehicle is parked at the designated discharge point, the driver must have his delivery paperwork signed by a customer's representative to confirm that the delivery process can proceed. The customer's representative must unlock the unloading point in order for the driver to connect after the signature is obtained.
- ✓ the driver must ensure that he observes all the safety measures required by the customer. Any unexpected changes to normal procedures should be politely queried and, if necessary, referred to the driver's line manager.
- ✓ the driver should pay particular attention to deliveries involving either "fuming" or "flammable" liquids.
- ✓ for "fuming" liquids, the driver must confirm that any "scrubbing" equipment is operational and, if required, that any IBC venting arrangements are in order. For "flammable" liquids, the driver must confirm that all the necessary earthing equipment is available.
 - Special venting arrangements may also be required. The need for any of the above requirements should have been agreed at the Pre Delivery Inspection of the customer's installation and highlighted in the "special instructions" section of the delivery paperwork.
- ✓ the driver should confirm with the customer's representative what arrangements exist for the venting of the IBC at the end of the discharge and also the arrangements for washing out hoses etc.

3 PRE-DISCHARGE ROUTINE

The following procedure should be observed as a normal system. However, special discharge procedures may apply to suit particular customer arrangements. Always ensure that safe working practice is incorporated in any variance from these procedures. The customer's installation should have been subject to a pre-delivery inspection

- a) Implement Section D (Customer's Installation Inspection Records). If satisfactory, continue. If not, report to base for further instruction.
- b) Any driver involved in this type of transfer operation or when attempting to clear a blockage must wear a **full chemically resistant suit, goggles, hardhat, chemically resistant gauntlets, Safety Wellingtons boots**. The driver may also wear a **visor** but this would be additional to goggles.
- c) Prior to any connections the product name, grade and strength must be checked as being the same as the labels on the IBC's for discharge, the authorised Despatch Note/Form and the customer's inlet point. If they do not all match, **STOP** and report to base.

Note also that this is reconfirmed for each individual tank connection as per Section (f) of this same section.

- d) Ensure that the bottom valve on the IBC is closed before removing the safety secondary closure camlock cap. Remove the dust cap (acting as a secondary seal) from the valve on the IBC. The customer's representative should remove the closure on the customer's inlet point. Take care to release the lower end of any fittings initially, so that any residual product/pressure is directed downwards.
- e) Under the supervision of the customer's representative, inspect hoses, gaskets and couplings for defects, ensure cleanliness of discharge point and securely couple-up the delivery hose camlocks, or other connections as appropriate. In the case of flammable liquids, the customer's inlet fitting, hose and the IBC must all be electrically linked together. This will be via an earthing lead incorporated with the hose and by the customer's own lead, if available, but the IBC and customer inlet point **must** be electrically connected before discharge starts.

Dedicates hoses must be used for Solvent deliveries to avoid the possibility of cross contamination from water, corrosives etc.

- f) Complete "Final Checks Before Discharge" form, sign and obtain customer's signature **PRIOR TO EACH INDIVIDUAL TANK DISCHARGE.**
- g) Where a scrubber is fitted to control fumes discharged from the customer's tank, confirm with the customer's representative that the water supply is on and the scrubber is draining.
- h) Assist customer in taking a sample if applicable.

DISCHARGE METHODS

During the following discharge methods if at steps 1(c), 2(c) or 3(d), the customer declines the invitation to open his own inlet/reception valve, then the driver must contact base to receive further direction. Customers are invited to open their reception valve for each individual IBC.

1. COMPRESSOR DISCHARGE.

The following section describes the normal procedure to be followed for a delivery involving the use of an on-board discharge compressor - typically a Drum compressor driven via a power take -off unit installed on the delivery vehicle. Compressor Discharge must never be used for the unloading of flammable liquids as the air/vapour mixture on completion of the discharge presents a serious explosion risk.

- a) Before commencing the discharge process, the driver must wear the prescribed PPE. In addition to his normal protective equipment he must wear, a full PVC chemically resistant suit, visor and goggles.
- b) The driver must check that the labelling on the IBC's and the discharge point match with the delivery paperwork. If they do not then he must not proceed with the delivery and report to both the customer's representative and his own line manager.
- c) Ensure that all valves on the IBC are closed before removing any closures/caps. The closure on the customer's inlet point should be removed by the customer's representative. Care should be taken to initially release the lower end of any fittings, so that any residual pressure or product is directed downwards.
- d) Under the supervision of the customer's representative, check the condition of any couplings, gaskets or hoses for cleanliness and signs of damage. If everything is in order couple up the delivery hose. The driver must ensure that only gaskets compatible with the product being delivered are used.
- e) Where a scrubber is fitted to control any emissions from the customer's storage installation, the driver must confirm with the customer's representative, that the system is on and is functioning.
- f) The driver should assist the customer's representative in the taking of any required samples.
- g) The driver should confirm that the IBC outlet valve is closed and then remove the dust cap/secondary seal from the top of the IBC. He should then fit the pressure hose to the IBC.
- h) Fit the pressure hose to the compressed air take off point.
- i) Check that the drain lines on your, or the customer's equipment are closed. Ask the customer's representative to open the discharge point inlet line valve and then open the outlet valve of the IBC. Check that there is no leakage from the discharge hose, the connections and, where practicable, the customer's inlet line.
- j) Open the compressed air inlet valve on the IBC checking that any vent valves are closed.
- k) Start the compressor and open the valve on the compressed air supply line. Check that the pressure control valve on the compressor unit is operating correctly.

Maintain pressure at the lowest level consistent with a satisfactory discharge rate.

The driver must ensure that the pressure rating of the IBC is not exceeded.

- l) As the pressure builds up and product is transferred to the customer's tank, check for any leakage.
- If possible, monitor the rate of transfer product using the customer's tank contents gauge. Remember not to rely on this alone, as experience has shown that many systems are unreliable or inaccurate.
- If it is practical, allow the discharge pressure to fall at the final stages of the discharge process. This will keep any vented fumes or vapours to a minimum.
- m) When the product transfer is completed, allow time for the line to blow clear into the stock tank.
- This stage of the discharge process is particularly important since excess pressure can lead to unacceptable emissions to the environment.
- If the customer permits it, allow the IBC to depressurise by venting through the customer's system.
- n) When the venting is complete, close all valves and shut down the compressor. Close the customer's inlet valve and the IBC discharge valve.
- o) In the event that total depressurisation is not achieved through the customer's system, the driver should confirm with the customer's representative that it is permitted for him to carefully vent the IBC to atmosphere. If permitted, the driver should make sure that this operation does not affect people who may be in the area. When the IBC is completely depressurised close the IBC vent valve and disconnect the compressed air supply hose.
- p) Disconnect the product delivery hose taking care to minimise any uncontrolled spillage of residual product. Follow the agreed procedure for the disposal of any residual product and for the washing out of hoses etc.
- q) Replace all the blanks/caps on the IBC inlets and outlets. Ensure load is secure and close the curtains.
- r) Protective clothing may now be removed.
- s) The driver must obtain, from the customer's representative, a signature confirming that the delivery of product has been completed safely. This also confirms "proof of delivery."
- t) **IF AN UNSAFE SITUATION ARISES AT ANY TIME DURING THE DELIVERY, IT MUST BE STOPPED, IF SAFE TO DO SO, AND THE CUSTOMER'S REPRESENTATIVE ALERTED. REPORT ANY ACCIDENTS/INCIDENTS AS SOON AS POSSIBLE TO YOUR LINE MANAGER.**

2. **NITROGEN DISCHARGE METHOD**

- (a) Before commencing the discharge process, the driver must wear the prescribed PPE. In addition to his normal protective equipment he must wear, a full PVC chemically resistant suit, visor and goggles.
- (b) Confirm that the IBC outlet valve is closed and then remove the dust cap from the top of the IBC and fit the valve manifold unit to the IBC.
- (c) Fit the pressure head to the nitrogen cylinder and fit the short nitrogen hose from the pressure head to the sealed pre-set pressure reducer. Fit the long hose from the outlet of the reducer to the IBC manifold unit (long brass connection).
- (d) Check that the drain valves on the line are closed. Invite the customer's representative to open the customer's reception valve and open the outlet valve on the IBC. Check to ensure that there is no leakage from hose or connections.
- (e) Open the inlet valve on the IBC manifold unit, checking that the vent valve is closed. Check that the pressure control valve on the pressure head unit is closed (fully anti-clockwise), open the gas cylinder and adjust the pressure to read **no more than the pressure rating of the IBC.**

Maintain pressure at a minimum level sufficient to discharge the IBC.

Do not exceed the IBC pressure rating

- (f) Check for product leakage as pressure builds up in the IBC and product begins to transfer. In cases of any leakage, take the necessary actions where applicable as described in Section J.
- (g) Where practicable, allow the discharge pressure to fall at the final stages of discharge, so that any vented fumes or vapours are kept to a minimum.
- (h) When product transfer is completed, allow time for the customer's pipeline to be blown clear into the storage tank point. Under normal circumstances, allow the IBC to depressurise by venting through the customer's system.
- (i) When discharge is complete, shut down the nitrogen supply and close the inlet valve on the manifold unit.
- (j) Close the customer's inlet valve.
- (k) Close the IBC discharge valve.
- (l) Open the vent valve on the manifold. In the event of total de-pressurisation not being achieved through the customer's system, you should obtain authorisation from the customer's representative to carefully release all pressure, in a safe place by the careful operation of the IBC vent valve, taking care that you do not affect people or the environment by these actions. Remove the unit.
- (m) Close the IBC vent valve when the IBC is completely de-pressurised.
- (n) Disconnect the product delivery hose or pipe, initially at the customer's end, remembering to open the lower part of the fitting first in order to direct any spillage downwards.
- (o) After confirming the arrangements for discharge hose washing, thoroughly wash out flexible hoses and secure them safely on your vehicle.

- (p) Replace blank plates or cap to the IBC outlet. The customer's representative should replace the cap or closure to their tank point.
- (q) Protective clothing may now be removed.
- (r) Obtain a signature from the customer's representative on the Despatch Note in order to signify the safe operation of the discharge procedures and to establish proof of the actual delivery completion.
- (s) The driver should remain at the side of the vehicle throughout the discharge operation. He should always be in a position to deal quickly with any emergency situation, which may arise. He should not be seated in the vehicle cab during the product discharge operation.
- (t) **STOP DISCHARGE AT ANY TIME IF NECESSARY.**
- (u) **REPORT ANY SUSPECT DELIVERIES OR INCIDENTS AS SOON AS POSSIBLE, TO BASE. USE THE APPROPRIATE DOCUMENT, FOR A WRITTEN REPORT ON RETURN.**

3. **DISCHARGE BY GRAVITY OR PUMP**

THE USE OF POSITIVE DISPLACEMENT PUMPS IS NOT PERMITTED UNLESS WRITTEN AUTHORITY FROM TECHNICAL SERVICES MANAGER IS OBTAINED

- (a) Before commencing the discharge process, the driver must wear the prescribed PPE. In addition to his normal protective equipment he must wear, a full PVC chemically resistant suit, visor and goggles.
- (b) After checking that the outlet valve is closed, remove the IBC outlet blank plate or cap. The closure on the customer's inlet point should be removed by the customer's representative. Take care to release the lower part of fittings initially so that any residual product/pressure is directed downwards.
- (c) Under the supervision of the customer's representative, securely couple up the delivery hoses or pipes as appropriate.
- (d) **Gravity or pump discharge procedures require the IBC to be vented** so that a vacuum effect is not produced within the tank, which could cause the implosion of the IBC or prevent discharge of the product. This can be achieved by ensuring the IBC has fitted a vacuum release valve or by releasing and loosening the lid.
- (e) Invite the customer's representative to open the customer's product inlet valve.
- (f) Open the IBC discharge valve, then check to ensure that there is no leakage from the hose or the connections.
- (g) Certain customers have vent-return systems which allow vapours to circulate between their storage tank and the vapour ullage section of IBC's. These systems should be utilised wherever practicable. Connection compatibilities should be established before arrival on site and should be referred to as "Special Instructions" on the Despatch Note/Form.
- (h) In the above procedure, drivers are required to use their practical expertise and particular care to ensure the safe discharge of the product.
- (i) Where applicable, arrange for the customer's pump to be started by the customer's representative or start own vehicle pump.
- (j) In cases of any leakage, take the necessary actions where applicable, as described in Section J.

- (k) When transfer is complete, close the customer's inlet valve and the IBC outlet valve. Switch off the pump. **(Note:** If pump discharge ensure that the pump is not switched off until this is done, unless a dry-run protection system has already shut the pump off).
- (l) Close and secure the IBC vent.
- (m) Disconnect any tank venting equipment if used during the discharge process, e.g. flexible connections to customer's vent systems.
- (n) Disconnect the product delivery hose or pipe, initially at the customer's end, remember to open the lower part of the fitting first in order to direct any spillage downwards.
- (o) After confirming the arrangements for discharge hose washing, thoroughly wash out flexible hoses and secure them safely on your vehicle.
- (p) Replace blank plates or cap to the IBC outlet. The customer's representative should replace the cap or closure to their tank point.
- (q) Protective clothing may now be removed.
- (r) Obtain a signature from the customer's representative on the Despatch Note in order to signify the safe operation of the discharge procedures and to establish proof of the actual delivery completion.
- (s) The driver should remain at the side of the vehicle throughout the discharge operation. He should always be in a position to deal quickly with any emergency situation, which may arise. He should not be seated in the vehicle cab during the product discharge operation.
- (t) **STOP DISCHARGE AT ANY TIME IF NECESSARY.**
- (u) **REPORT ANY SUSPECT DELIVERIES OR INCIDENTS AS SOON AS POSSIBLE,**

4. DEALING WITH EMERGENCY SITUATIONS.

The following sections deal with the two most common problems likely to arise during the discharge process.

4.1 Leakage of product during discharge.

- i) Ensure that the prescribed protective clothing is worn.
- ii) If possible, isolate the leak by closing the relevant valve
- iii) Ensure that persons in the area are warned and kept clear, then inform the customer's representative in order that they can implement their own safety procedures.
- iv) The driver should close the IBC pressure inlet valve and shut off the compressor.
- v) The driver should close the IBC outlet valve and the customer's inlet valve.
- vi) If it is safe to do so the driver should open the IBC vent valve. The driver should make sure that this action does not add to the problems of the original leak i.e. by releasing "fumes."
- vii) If possible make the necessary adjustments to the pipelines and/or gaskets.
- viii) In all cases, the driver should use his training and experience to assist the customer's staff to implement their emergency control procedures.

4.2 Suspected blockage in the discharge hose or customer's inlet line.

If at any time the driver suspects that a line blockage has occurred, the following sequence of actions should be implemented:

- i) As above, all the prescribed PPE should be worn.
- ii) Start by closing the IBC outlet valve.
- iii) Quickly close the compressor air supply line valve and switch off the compressor.
- iv) Alert the customer's representative and request that they stand by with a water hose.
- v) Relieve any pressure in the IBC by slowly venting from the top of the container or from the air supply pipeline, as appropriate. Leave the IBC open to atmosphere.

Open the IBC outlet valve to attempt to depressurise the discharge hose. Once any excess pressure appears to have been released close all valves, including the customer's inlet valve.

- vi) If the customer's pipework has a drain or sample valve, use it to carefully relieve any pressure or to remove any liquid from the line. After this operation make sure that all drain valves are closed.
- vii) Disconnect the discharge hose from the customer's inlet pipework, keeping the fittings pointing downwards. Any spilled material should be treated via the customer's effluent system if possible. If not, follow the guidance given by the customer.
- viii) Disconnect the hose from the IBC and wash out in accordance with the customer's directions, checking for any evidence of a blockage in the hose.
- ix) If the blockage is in the discharge hose either clear the blockage or use an alternative hose. Any "blocked" hose must be made safe before transporting it back to your site.
- x) If the problem is within the customer's pipework, fit the IBC closures e.g. camlock's or flanges.
- xi) Contact your line manager and await any further instructions.

ADDITIONAL SAFETY PRECAUTIONS FOR MULTI PRODUCT DISCHARGES

In addition to the checks made for single product discharges, the following points should be considered when required to discharge two or more products to the same customer.

- ✓ Additional precautions should be taken to ensure that the product is discharged into the correct tank. It is necessary for the customer to confirm that not only re discharge. This should be done by the customer signing off each product prior to their discharge into the customer's installation.
- ✓ Consideration should be given to limiting the products for multi-product loads to one per delivery note, thereby reducing the possibility of a mix up in identification of the product.
- ✓ It is recommended that the driver should sign the delivery note accepting each product, and require him to mark the tank or pot number on the delivery note to confirm that he is aware which product is contained in each IBC.
- ✓ Consideration should be given to tagging the outlet manifold of the tank or compartment with a break seal. It is preferable that the break seal should have the product name or number written on the seal so that prior to discharge, the driver can check that the correct product is contained within the IBC or compartment.