



ROAD VEHICLE EMERGENCY AND RECOVERY

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Prepared by WG-1

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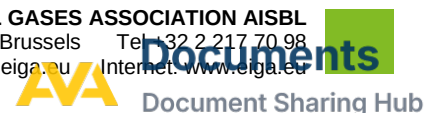


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Amendments to 81/06

Section	Change
all	The entire document has been reviewed and updated

Note: Exceptionally Technical changes from the previous edition are not underlined because there were too many changes.

1 Introduction

This publication has been prepared by experts from the Industrial Gases Industry to help minimise the effects of serious road vehicle incidents involving gases industry products by providing recommended guidance, training and procedures to be followed.

Road vehicle incidents involving gases industry products can be extremely serious. The dangers can be at their worst during the recovery operation, particularly, if the recovery is not managed in a safe and professional manner by those at the scene.

Due to the unplanned nature of any transport emergency, safety has to be given the highest priority.

This publication provides information about transported products, identification of the products and some of the design features of gases industry road transport equipment. The publication also provides advice on product handling, vehicle recovery, preparing transport emergency plans, safety aspects and training.

2 Scope and purpose

2.1 Scope

This publication is intended for all persons both within and outside the gases industry who could become involved in a gases industry road vehicle emergency or recovery operation. This can include hauliers under contract, emergency service personnel, vehicle recovery operators and members of other organisations, such as environmental agencies.

This publication provides guidance on road vehicle recovery, and on the following:

- product safety information;
- incidents where there is product release or potential product release;
- damage to pressure vessels/receptacles (e.g. cylinders, tubes and bundles) and manifolds;
- prevention of fire; and,
- fires which may have occurred.

Road transport equipment includes road tankers (vacuum insulated), road tankers (insulated), tank containers, multiple-element gas containers (MEGCs) and battery vehicles manufactured for the products covered in Section 4.0 when full, part full and nominally empty.

Other equipment, cylinder vehicles and vehicles owned by customers and used to carry pressure receptacles are not included, but some of the principles and guidelines may be applicable. Gases Industry railway wagons are not included in the scope of this publication, but the principles involved are generally similar.

The products of ADR Class 2 which are listed in Section 4.0 are included (compressed, refrigerated liquefied and dissolved gases). LPG products and other liquefied gases are not included within the scope of this document.

EIGA has published TP08 for training concerning vehicle emergencies and vehicle recovery. The training package contains an extensive collection of photos of typical equipment, recovery methods and other details. These are not shown in this publication in order to keep the publication at a reasonable length.

2.2 Purpose

The purpose is:

- to provide information to Gases Industry vehicle operators, hauliers under contract, Emergency Service personnel, vehicle recovery operators and members of other organisations (e.g. Environmental Agency);
- to provide guidance, training material and procedures to be followed in order to minimise the effects of a transport emergency event. This will include guidance relating to emergency incident planning, the procedures and actions to be followed during any transport emergency event;
- to provide specific Gases Industry product and vehicle/equipment information to promote maximum co-operation from all those involved in an incident, particularly the emergency services;
- to provide guidance on the follow up actions required to ensure that any lessons learned are considered, and incorporated into future emergency planning to avoid repetition of the transport emergency event.

3 Definitions

3.1 Publication terminology

3.1.1 Shall

Indicates that the procedure is mandatory. It is used wherever the criterion for conformance to specific recommendations allows no deviation.

3.1.2 Should

Indicates that a procedure is recommended.

3.1.3 May

Indicates that the procedure is optional.

3.1.4 Will

Is used only to indicate the future, not a degree of requirement.

3.1.5 Can

Indicates a possibility or ability.

3.2 Technical definitions

3.2.1 Battery vehicle

An assembly of cylinders, tubes, or bundles connected to a manifold and permanently mounted on a vehicle chassis such that the assembly is filled, transported and emptied as a single unit.

3.2.2 Bundles of cylinders

Transportable assemblies of cylinders which are inter-connected by a manifold and held permanently and firmly together in a frame.

3.2.3 Cylinder

Transportable pressure receptacles of a capacity not exceeding 150 litres.

Road Vehicle Incident:

An unplanned event, involving a Gases Industry road vehicle, which may have resulted in product release, or may result in product release, during recovery.

Road Vehicle Accident:

An unplanned event involving a Gases Industry road vehicle (and / or its equipment) where injury has occurred to persons or animals and / or the vehicle has been damaged, and / or has left the road.

Road Vehicle Emergency:

An unplanned event where a Gases Industry vehicle (and / or its equipment) has been damaged, or is liable to be damaged and there is product release or potential product release during recovery.

Emergency Services:

Members of the Police, Fire and Ambulance services.

Duty Officer:

The “on-duty” gases industry person assigned the task of initiating the response to a road vehicle incident or accident or an emergency.

Transport Emergency Team Leader:

The gases industry person responsible, at the scene, for the management of the gas industry involvement in a Road Vehicle Transport Event

Transport Emergency Co-ordinator:

The gases industry person responsible “at base” for assisting and co-ordinating the work of the Transport Emergency Team Leader.

Vehicle Recovery:

The operation of restoring a vehicle to its normal transport position, or to a position where it can be otherwise removed from the scene, following an incident, an accident or an emergency.

Vehicle Recovery Operator:

A vehicle recovery operator who operates under hire who has specialist heavy lifting, towing and recovery equipment.

Vehicle:

In this publication, “vehicle” refers to road tankers, tank containers, MEGCs and battery vehicles and/or their tractor units.

Road Tanker:

A vehicle to which has permanently attached a vacuum insulated or insulated pressure vessel designed to carry liquefied or refrigerated gases products. This may be self propelled or pulled by a motor vehicle.

Tank Container:

An article of transport equipment with an internal volume greater than 450 litres designed to carry liquefied or refrigerated gases products and fitted with devices permitting ready handling, particularly from one mode of transport to another.

Multiple-element gas container (MEGC):

MEGCs are multimodal assemblies of cylinders, tubes or bundles of cylinders which are inter connected by a manifold and which are assembled within a framework. The MEGC includes service equipment and structural equipment necessary for the transport of gases.

Tubes:

Seamless or composite transportable pressure receptacles of a capacity exceeding 150 litres and of not more than 3000 litres.

Cryogenic Liquid:

Refrigerated liquefied gases.

Cryogenic receptacles:

Transportable thermally insulated pressure receptacles for refrigerated liquefied gases of a capacity of not more than 1000 litres.

4 Vehicles and equipment

All personnel involved in dealing with a transport emergency event should be familiar with the vehicles and equipment involved. This includes a working knowledge of the following equipment:

4.1 Tank vehicles (road tankers and tank containers)

Tank vehicles (road tankers and tank containers) are generally:

Low pressure with working pressures of 5 bar or less generally used for refrigerated liquefied gases known as “air gases” (e.g. Nitrogen).

Medium pressure with working pressures above 5 bar up to 25 bar generally used for refrigerated liquefied gases (e.g. carbon dioxide or air gases) being transferred by differential pressure or by pump.

These can be either vacuum insulated or non-vacuum insulated (e.g. a foam insulation with metal cladding).

All these tanks are equipped with a discharge system that works either by using a pump or by using a pressure build up system for discharge by differential pressure.

The appropriate Process & Instrumentation Diagram (P&ID) should be displayed on each vehicle. (See Appendix A.)

4.1.1 Vacuum insulated tank / tanker

Vacuum insulated transport tanks are double walled. They consist of an inner vessel and an outer vacuum jacket. The space between the jacket and the inner vessel (inter space) contains special insulating material, and is evacuated of air. The inner vessel is the actual pressure vessel, which contains the gas to be transported. The outer vacuum jacket is designed for an external pressure of 1 bar and connects the vessels to the vehicle chassis by means of external sub-assemblies. The inner vessel is connected to the jacket by a support system on the outside of the inner vessel with a heat reducing path and is fitted with baffle plates on the inside to reduce dynamic loads during transport. It

is designed to fulfil all the loading requirements of ADR. If the vacuum is lost, for example due to a failed jacket, the insulating material is adequate to limit the pressure rise (known as boil off) due to normal ambient temperature such that it can be vented by the tank safety valves.

In general the following are the main piping connections to the inner vessel:

- bottom line for liquid filling and withdrawal (in some cases this may be a dip tube);
- top fill line;
- vent line; and
- line from the safety devices to the top of the tank.

Other connections are for gauging and artificial pressure raising.

The first valve immediately after the tank on the filling/withdrawal line may be a remote controlled emergency valve that can be pneumatically or hydraulically operated. Normally the design of these valves allows the valves to be opened mechanically in emergencies.

Depending on the position of an overturned tank it is possible that gas lines can be submerged in the liquid phase and liquid lines can be in the gas phase. Additionally gauging is likely to be inaccurate.

The inner vessel is protected against over pressure by safety valves (or in older tankers or special tankers rupture discs or both). These may be set to open at the maximum working pressure of the tank or the test pressure of the tank in the case of rupture discs. In addition to the safety devices for the tank all pipework where liquid gas can be trapped is fitted with relief devices.

A blow off plate, disc or a similar device that opens if the vacuum is lost, or if the space between the jacket and the inner vessel becomes pressurised, protects the outer jacket.

4.1.2 Non-vacuum insulated tank / tanker

Non-vacuum insulated tanks are typically not used to transport refrigerated liquefied gas products with temperatures of less than $-100\text{ }^{\circ}\text{C}$. A non-vacuum insulated transport tank consists of an inner pressure vessel, enclosed by an outer jacket. The space between the inner vessel and the outer jacket is filled with insulating material, usually closed cell polyurethane foam.

The outer jacket is normally made of thin plates of stainless steel or aluminium or fibre glass reinforced plastic. This protects the insulation against the environment and minor damage but does not form a gas tight seal.

The inner vessel is connected to the chassis by a low thermal conductivity support system and is usually fitted with baffle plates on the inside to reduce dynamic loads during transport. It is designed to fulfil all the loading requirements of ADR. If the outer jacket and parts of the insulation are damaged, the insulating material itself is adequate to limit the pressure rise (known as boil off) due to normal ambient temperature and abnormal conditions. Excess gas pressure can be relieved by the tank safety valves and rupture discs.

In general the following main connections are made to the inner vessel:

- a bottom line for liquid filling and withdrawal with a bottom valve (in some cases this may be a dip tube),
- a top fill line,
- a vent line and,
- a line from the safety devices to the top of the tank.

Additional connections are made for pressure gauging, level indication and other purposes.

The first valve immediately after the tank on the filling / withdrawal line may be a remote controlled emergency valve or a bottom valve that can be pneumatically or hydraulically operated. Normally the designs of these valves allow the valves to be opened mechanically in emergencies.

Depending on the position of an overturned tank it is possible that gas lines may be submerged in the liquid phase and liquid lines may be in the gas phase. Additionally gauging is likely to be inaccurate or obscured.

The inner vessel is protected against over pressure by safety valves (or in older tankers or special tankers rupture discs or both). These may be set to open at, or below, the maximum working pressure of the tank. In addition to the safety devices for the tank all pipework where liquid gas can be trapped is fitted with a relief device.

A blow off plate, disc or a similar device is not required to protect the outer jacket since these jackets are not gas tight.

4.2 Battery vehicles

Battery vehicles are typically used for the transport of compressed gas in high pressure cylinders, tubes or bundles.

It is typical for this type of equipment for the mass / weight of the transported product to be low in comparison to the total mass of the battery vehicle. The weight of the vehicle cannot, therefore, be substantially reduced by product removal. The discharge system of battery vehicles is simple and uses the pressure difference between the contents of cylinders / tubes and that of the static vessels / installation. The discharge coupling is typically situated at the rear of the vehicle. Battery vehicles are typically equipped with a manifold valve for each pack (isolated group) of receptacles, a main valve and a pressure indicator. In the case of toxic and / or flammable products there may also be a spring actuated emergency valve, which is usually closed during transport.

Note:

MEGCs are constructed in a similar manner to battery vehicles. The receptacles are assembled and permanently fastened within a frame, which is secured to a vehicle (or trailer) in a similar manner to a tank container.

They should therefore be treated in the same way as the equivalent type of battery vehicle concerning the hazards, whereas recovery methods may vary.

4.2.1 Battery vehicles constructed from cylinders

Battery vehicles manufactured with cylinders are assemblies of cylinders, permanently fastened together by mechanical means (known as packs). Each cylinder is connected to the other by a piping arrangement (known as a manifold) and each pack may be connected to a gallery manifold which leads to the outlet fill / discharge coupling via a main shut-off valve. In some cases there are separate couplings for filling and discharge.

The packs are permanently attached to the chassis by mechanical means such that the whole is filled, transported and emptied as a single unit.

The cylinders are combined into groups of not more than 5000 litres. Each group can be isolated by a shut-off valve.

For toxic gases each cylinder is also fitted with a valve.

The mechanical means used to attach the cylinders together and to the chassis is designed to withstand the accelerations defined in ADR and to avoid local stress concentration on the cylinder wall.

Battery vehicles of this type typically do not have safety relief devices.

The manifold system is designed according to the test pressure of the cylinders.

4.2.2 Battery vehicles constructed from tubes

Battery vehicles manufactured from tubes are assemblies of seamless tubes, each more than 150 litres but not more than 3000 litres capacity, permanently fastened together by mechanical means. The tubes can be combined into isolated groups of not more than 5000 litres.

Each tube is connected to the others by a piping arrangement (known as a manifold) and each group, if more than one, may be connected to a gallery manifold (which leads to the outlet / discharge coupling) via a shut off valve. The group(s) are permanently attached to the chassis by mechanical means such that the whole is filled, transported and emptied as a single unit.

Each group or individual tube can be isolated by a shut-off valve.

For toxic gases each tube is also fitted with a valve.

The mechanical means used to attach the tubes together and to the chassis is designed to withstand the accelerations defined in ADR and to avoid local stress concentration on the cylinder wall.

Battery vehicles of this type typically do not have safety relief devices.

The manifold system is designed according to the test pressure of the tubes.

4.2.3 Battery vehicles constructed from bundles

Battery vehicles manufactured from bundles are assemblies of bundles permanently connected to a manifold external to the bundles and permanently mounted on a chassis such that all the assemblies can be filled, transported and emptied as a single unit.

The bundles and the cylinders in a bundle are manufactured and approved according the requirements for bundles / cylinders for individual use.

Each bundle is fitted with a shut off valve and can be isolated.

For toxic gases each cylinder of the bundle is fitted with a shut off valve.

The mounting system is designed to withstand the accelerations defined in ADR. The mechanical means employed to permanently secure the bundle to the chassis is such that movement in relation to the chassis is avoided.

Battery vehicles of this type typically do not have safety relief devices.

The manifold system is designed according to the test pressure of the cylinders.

4.3 Weight of the vehicle / equipment and product

Maximum vehicle gross weights will vary according to the regulations of each particular country. The actual vehicle weight (including equipment) will depend on the design and construction of the vehicle and the product carried.

Maximum vehicle gross weights are shown on plate(s) attached to the vehicle and in the vehicle documentation.

4.4 Design, construction and general arrangement drawings

The design will depend on the individual gas company requirements and the manufacturer of the vehicle. Vehicles may vary in the way they are constructed, but the principles are usually the same. A typical illustration of a tanker cross section is given in Appendix B. Photographs of typical road transport equipment are shown in Appendix C, and a typical Process and Instrumentation Diagram (P&ID) is shown in Appendix A.

4.5 Design and construction details of pipework / manifolding arrangement

Transport equipment for refrigerated liquid gases usually has pipework constructed from either stainless steel or high purity copper.

Transport equipment for compressed gases will usually have pipework constructed from stainless steel, high purity copper or copper alloy.

All pipework is designed for the temperature and pressure ranges expected from the product and atmospheric conditions.

4.6 Contents and pressure gauges

Pressure gauges indicate the vessel pressure. In the case of transport equipment for compressed gases the pressure gauge indicates the quantity of gas carried. In the case of vehicles for refrigerated liquid gases a specific contents gauge indicates the amount of product. Other gauges are used for indicating pressures concerning the discharge system.

Warning

Following an accident/incident all gauges should be considered as being suspect and shall not be relied upon to provide accurate information as to the pressure and / or contents. Whilst pressure gauges can provide some indication as to pressure, contents gauges will never operate properly unless the tank is in an upright, or near upright, position and the gauges are undamaged.

4.7 Safety devices

4.7.1 Safety relief valves

These devices protect the tank and / or pipework from excessive pressure which could cause rupture.

These valves are spring loaded and will typically release pressure to the atmosphere.

Tank relief valves will start to open at their set pressure and be fully open at 110% of this set pressure. When the pressure reduces to below 90% the valves will re-seat.

During vehicle emergencies particular care shall be taken to avoid injury or equipment damage due to escaping product when these valves open unexpectedly.

Warning When the vehicle is in a non-upright position the risk is greater since there is a likelihood that these relief devices may vent liquid and the discharge may be directed towards personnel working in the area.

4.7.2 Burst discs

Burst discs protect the vessel and / or pipework from excessive pressure.

Burst discs have the following characteristics:

- They are specially manufactured single operation metal foil discs designed to rupture at a set pressure.

- When burst discs rupture the sudden noise generated can startle individuals in the vicinity.
- They do not re-seat following rupture and cannot be replaced whilst venting is taking place.
- installations CAN be fitted with a change-over system which will allow isolation of the failed disc. This will allow emergency replacement of the failed disc.

4.7.3 Emergency valves and emergency shut-off controls

Emergency valves are designed to prevent unintended loss of product in case of failure of other pipework components, or in case of an incident during filling or discharge. They normally require pressure (pneumatic or hydraulic) to open but are closed by spring pressure. During transport they are normally closed.

If required, and depending on the design, they can be opened using one of the following techniques:

- application of air / hydraulics from the vehicle;
- application of air / hydraulics from another vehicle;
- application of air from a foot pump;
- application of hydraulic fluid using a pump and reservoir;
- application of an inert gas from a cylinder through a pressure regulator; and
- using the mechanical wind-off device incorporated within the valve, if fitted.

Warning Care should be taken not to exceed the design pressure of the valve actuator as this may cause damage to the equipment.

In normal operation these valves are opened and closed by controls at the road transport equipment control cabinet. Additional remote controls mounted on the sides of the road transport equipment which allow emergency shut-off operation of the valve(s) may be installed. These remote controls shall be reset after activation to allow the valve(s) to be re-opened when it is again safe to do so.

4.7.4 Vacuum safety devices

A safety device is fitted to protect the outer jacket from bursting and / or the inner vessel from collapse should product leak into the vacuum interspace.

These devices can be one of the following:

- blow-off plate secured on the jacket (e.g. by springs) ;
- blow-out plug positioned in the vacuum line.;
- bursting disc.

In all cases there is no significant hazard from their operation. Plates and plugs shall be secured.

4.7.5 Anti-tow-away

Many gases companies fit an automatic safety device which prevents movement of the vehicle when one or more of the following occur:

- A product transfer and / or vent hose is connected to the road transport equipment pipework coupling.

- The road transport equipment control cabinet doors are open.

These devices typically operate by preventing the brakes from being released, EIGA Doc 63 *Prevention of Tow-Away Incidents* [3] for further information.

In addition, some vehicles are equipped with a warning system (e.g. light and / or buzzer) located in the driver's cab.

4.8 Product fill and discharge couplings

Some vehicles are fitted with hoses which are permanently connected by means of bolted flanged joints. Others have hoses which are removed during transport. In these cases the hoses are only connected during product transfer.

Couplings are product specific in order to minimise the risk of incorrect product being transferred. They are typically standardized for the filling lines using EIGA couplings, see EIGA Doc 909 *EIGA Cryogenic Gases Couplings for Tanker Filling* [7]. For the discharge lines, company specific couplings are generally used.

Specific tools can be required to connect and disconnect these couplings. Spark proof tools are required for flammable products. These tools are usually carried on the vehicle and should be handled with care.

Specific coupling equipment may be used by some gases companies and carried with their transport emergency equipment for the purpose of controlled emergency product transfer at the scene of an incident.

If such product transfer is necessary then care shall be taken to ensure that:

- the receiving tanker is returned to required purity before re-use;
- any specific coupling equipment is returned to the emergency team; and
- no unauthorised adapters become available for general use.

4.9 Tractor/trailer connection

Tractor/trailer couplings are standardised throughout most of the industry. However, there can be country specific variations. This could require specialist recovery vehicles.

5 Priorities

When preparing transport emergency plans (see also chapter 6) and when dealing with any transport emergency event there are a number of aspects to be considered, and include, but are not limited to:

5.1 Safety of individuals

At a transport emergency event it is likely there will be individual in the vicinity, and there safety is a priority. Individuals involved can include:

- those living in the local area;
- the driver(s) involved;
- any passers-by;
- any other individual(s) involved; and
- those attending to assist.

5.2 Animals

Consideration should be given to any animals that may be in the vicinity of a transport emergency event, these can include:

- domestic animals;
- wild animals; and
- farm animals if a vehicle has crossed into farmland.

5.3 Prevention of escalation of the transport emergency event

It is essential that a transport emergency event does not escalate beyond the original event. Precautions to ensure that this does not happen include, but are not limited to:

- preservation of tanker or battery vehicle integrity;
- prevention of product release;
- prevention of fire; and
- product handling to ensure the product is:
 - o retained
 - o safely disposed of; or
 - o transferred to another vehicle.

5.4 Prevention of impact on surroundings

A transport emergency event can lead to environmental damage, and these can include the following:

- Reopening of closed road(s), if closed;
- Minimising disruption to others;
- Inconvenience to other road users;
- Other services, for example trains, electrical supplies; and
- People in proximity.

5.5 Publicity unfavourable to the industrial gases industry

A transport emergency event can lead to unfavourable publicity to the industrial gases industry. It is important that following a transport emergency event that companies manage communication. Guidance includes:

- all reports shall be factual;
- professionalism when dealing with the media. (See Appendix D)

5.6 Legal aspects

Following a transport emergency event, there is a possibility of criminal or civil action being taken against companies and/or individuals. Member companies need to be aware of:

- potential claims; and
- prosecution.

Due to the above it is important that evidence is preserved, and events recorded in detail, such as diary log of event.

5.7 Cost of the transport emergency event

A transport emergency event can have many costs associated with it, both financial and others. These include but are limited to:

- impact on humans, which can include;
 - o fatality;
 - o injury; and
 - o compensation.
- damage to vehicle;
- damage to third party vehicle(s)/property;
- Claims;
- customer supply failure; and
- investigation and reports.

6 Transport emergency plan

A transport emergency event can occur anywhere, and at any time.

It is the responsibility of every company that transports gases to have emergency plan arrangements in place, which can cater for an emergency at any time. These companies shall also ensure that there are transport emergency plans in place which can cater for all transported products and geographical areas. These can include plans for assistance to or from other companies.

The purpose of any transport emergency plan is to ensure that all employees responsible for the transport of gases understand their responsibilities and actions to be taken with respect to a transport emergency event.

The plan should include all transport emergency events involving vehicles within the scope of this publication owned by or transporting gas products on behalf of a gases company, regardless of location, type of vehicle or product carried.

All managers responsible for transport and other personnel who may be required to assist following a transport emergency event are therefore included.

Each company shall have procedures in place for the personnel responsible for dealing with any road transport incident and clear action plans for these personnel to follow.

Failure to provide such a plan in advance can result in procedures having to be developed by personnel who, due to the on-going emergency, could be under considerable stress and pressure. This could lead to personnel not thinking and acting as logically and coherently as they would otherwise, and this could lead to decisions and actions being taken which are undesirable.

The transport emergency plan should include as a minimum the following:

- personnel who will be dealing the transport emergency event;
- equipment for the transport emergency event;
- communications planning, including:
 - o internal;
 - o external; and
 - o media.
- responsibilities;
- training;
- practical exercises and tests of the plan and people involved;
- ongoing contact with:
 - o other internal personnel;
 - o personnel from other gas companies;
 - o commercial vehicle recovery operators; and
 - o emergency services
- authority levels.

7 Contact list

Each company which transports gases shall ensure that sufficient competent personnel are always readily available to deal with a transport emergency event.

It is critical to the success of any transport emergency event response that the correct persons / organisations are contacted whenever required. Consequently it is important that a specific first-contact information form is provided to accurately and consistently record the incoming information, see Appendix E for a typical example.

Each company should ensure that sufficient and appropriate personnel who could be required to attend or assist remotely in a transport emergency event are contactable. They should ensure that these personnel can respond as required.

One or more persons, depending on geographical area or specific product, should be nominated at all times as being the duty officer. They may be responsible for being the focal point for all communication and actions during any transport emergency event during their duty period or until relieved by another nominated employee. Personnel responsible for transport at each gas industry location should consider which personnel could be a duty officer, transport emergency team leaders, transport emergency co-ordinators, and which personnel should be on their transport emergency event contact list.

The contact list may include the following:

- All gases industry and haulier personnel who could be involved including their availability and their responsibilities;
- Other contact telephone numbers required including, but not limited to:

- o emergency services general numbers;
 - o hospitals;
 - o commercial vehicle recovery operators;
 - o commercial vehicle service agents;
 - o crane hire companies;
 - o any air transport or ferry companies who may be used to transport expert personnel in an emergency; and
 - o appropriate regulatory agencies
- All appropriate gases industry offices, head office for the particular geography and all other Gases industry offices/branches, and all the personnel on their transport emergency event contact lists.
 - These include management teams, transport staff, media experts, vehicle engineering teams, safety staff, etc.
- The responsible person(s) of the haulier(s).

The personnel responsible for distribution activities at each location shall ensure that these contact lists are kept up to date and controlled. This should include all persons/organisations involved in the communications flow chart, see Appendix F for an example, and the following:

- internal gas company contacts;
- emergency services;
- mutual aid contacts; and
- heavy vehicle recovery contractors.

8 Transport emergency event equipment

The following should be made available:

- Appropriate Personal Protection Equipment to drivers as specified in the Instructions in Writing as being required by the driver or vehicle crew in an emergency.
- Equipment to enable the transport emergency event team to carry out rectification work and off load/dispose of the product. This may be carried in a transport emergency event trailer.

For a list of suggested equipment and an example of a typical transport emergency event trailer see Appendix G.

9 Communication flow chart

In any transport emergency event good communication is essential.

A carefully prepared communication flow chart will minimise the possibility of any errors or omissions.

This flow chart should indicate the chronological order of communication with all appropriate personnel / agencies. See Appendix F for example of a communication flow chart).