

AEISG

**AUSTRALIAN EXPLOSIVES
INDUSTRY AND
SAFETY GROUP**

CODE OF PRACTICE

MOBILE

PROCESSING

UNITS

VERSION 1.2 FEBRUARY 2005

ABOUT THE AEISG

The Australian Explosives Industry and Safety Group (AEISG), (originally known as the Australian Explosives Manufacturers Safety Committee) was initially comprised of representatives from Dyno Nobel Asia Pacific Ltd (previously Dyno Wesfarmers Limited), Orica Explosives (previously ICI Explosives), Union Explosives Espanol (UEE, previously ERT), and Total Energy Systems (TES), was formed in 1994. Since then, the AEI&SG membership has expanded and broadened.

Current membership includes:

Australian Defence Industries Limited
Dyno Nobel Asia Pacific Limited
Orica Australia Limited
Quin Investments Pty Ltd
Roche Blasting Services
UEE Explosives (Australia) Pty Ltd

The goal of the AEISG is to continuously improve the level of safety throughout our industry in the manufacture, transport, storage, handling and use of, precursors and explosives in commercial blasting throughout Australia.

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Section 1 – Scope and Definitions

1.1 Scope and Interpretation of the Code

- 1.1.1 This code sets out the requirements for the design, and operational management of Mobile Processing Units used in the manufacturing and blending of explosives that are used in surface and underground blasting and other explosive operations such as the on site manufacture of packaged explosives known as field packaging.

1.1.2

This code applies to the transport of dangerous goods and other materials using Mobile Processing Units on public roads and the mixing and delivery of such dangerous goods and other materials throughout Australia

- 1.1.3 This code also includes the on-site¹ carriage of small quantities of detonators and boosters intended for immediate use on tasks directly related with the operation of the MPU. It also includes the carriage of small quantities of explosives samples for return to the MPU operator's depot for quality monitoring purposes.

1.1.4

Nothing in this Code applies to vehicles, or equipment on vehicles, that is not covered or included by definition in this Code. The vehicles and their equipment must comply with the Australian Dangerous Goods Code (ADG Code), Australian Explosives Code (AEC) and the requirements of the relevant Competent Authority

- 1.1.5 This Code has been developed by its members to outline the minimum requirements for a specialised type of vehicle known as a Mobile Processing Unit, that does not comply with the AEC or the ADG Code to achieve an equivalent level of safety.

1.2 General Description of Mobile Processing Units

1.2.1 Scope

This section covers the definition of a Mobile Processing Unit and describes typical configurations for a range of standard applications.

1.2.2 Definition of a Mobile Processing Unit

For the purposes of this code a Mobile Processing Unit (MPU) is defined as follows:

A Mobile Processing Unit (MPU) is:-

- **a vehicle mounted plant which can carry its own ingredients, can manufacture or blend a Class 1 explosive and which contains its own delivery system for the explosive or**
- **A vehicle mounted bulk explosives container which contains its own delivery system for the explosive.**

Notes:

- (a) The definition excludes bulk transport systems which do not include an integral manufacturing, blending or delivery component. The AEC or ADG Code covers such bulk transport systems, (eg. Road tankers containing bulk ammonium nitrate emulsions and bulk deliveries of ammonium nitrate).

¹ In this context “on-site” means within the boundaries of the mine site.

- (b) MPUs may be configured to carry ingredients and other task related materials in separate containers. These ingredients and materials may be dangerous goods and may be incompatible under the ADG Code.
- (c) The range of ingredients and task related materials used may include Class 1 explosives. The range of component materials which may be used is listed in Section 7.2
- (d) MPUs may be configured as;
 - (i) An integrated self propelled vehicle, processing plant and delivery system (eg. A cab/chassis combination);
 - (ii) A self propelled vehicle with the processing plant and delivery system as a demountable unit (eg. A flatbed truck with a skid mounted plant), or
 - (iii) A vehicle with a processing plant and delivery system designed to be towed as a trailer vehicle.

An MPU may tow a trailer of additional raw materials subject to the combined vehicle meeting Dangerous Goods transport requirements.

1.2.3 Typical or Standard Configurations for Mobile Processing Units

It is an important design feature of MPU types 1.2.3.1, 1.2.3.2, 1.2.3.3, and 1.2.3.4 above that the explosive product is manufactured as part of the delivery system i.e. all vehicle manufactured explosive is removed from the vehicle immediately following manufacture and apart from minor residues the vehicle carries no explosive material.

1.2.3.1 ANFO Units

ANFO units mix ammonium nitrate prills and a combustible liquid, usually diesel oil, to form an explosive. Extra ingredients such as aluminium powder and polystyrene beads may also be added. The mixing process is typically a mixing auger. The delivery system is usually an auger, a slide or a pneumatic blow loading arrangement.

1.2.3.2 Emulsion Units

These vehicles carry ammonium nitrate emulsion, ammonium nitrate and fuel oil in containers such as tanks, bins and bowls. These are mixed on the MPU to produce the explosive. Additional materials (eg “effect chemicals”) may be added to modify the properties of the explosive to obtain the desired operational effect.. Typically these units can produce a range of explosives by varying the ratios of the ingredients.

These units have a number of trade and generic names, including but not limited to, Triple T, Triple P, Mobile Sensitising Unit (MSU), Mobile Manufacturing Unit (MMU), and Bulk Explosives Vehicle (BEV).

1.2.3.3 Slurry Trucks

These vehicles carry an oxidising solution, a ‘premix’ consisting of solid fuels in powder form, a cross-linker and a gasser solution. The oxidising solution normally contains ammonium nitrate as a major ingredient but may also contain other ingredients such as inorganic nitrates. A thickening agent may be separate or included in the oxidiser solution. The ingredients are mixed on the truck to form the explosive. The addition of the cross-linker is usually required to complete the gelling of the explosive.

1.2.3.4 Bulk Emulsion Explosive Delivery Vehicles

These vehicles carry a tank of emulsion and a separate container of a sensitising agent such as effect chemicals. The sensitising agent is mixed with the emulsion as part of the explosive delivery system.

1.2.3.5 Repump Vehicles

Typically, these vehicles carry a sensitised bulk emulsion, bulk emulsion blend, or watergel which is delivered directly into the blast hole.

1.2.3.6 Pre-blended ANFO Trucks

Typically these vehicles contain a bulk container of blended ANFO and a system for delivering the ANFO directly to the blast hole.

1.2.3.7 Bowl Trucks

These vehicles carry only minor quantities of ingredients during their journey from depot to the initial point of delivery. The major ingredients and effect chemicals are added to the bowl on-site and batch mixed in the bowl and then delivered to blast holes as required. Bowl trucks perform similar duties to type 1.2.3.5 and 1.2.3.6 at the delivery point of the blast site,

1.3 Definitions

For the purpose of this Code, unless the contrary intention appears:

“ADG Code” means the sixth edition of the Australian Dangerous Goods Code, commonly known as ADG6.

“ADG7” means the 7th but currently unpublished edition of the ADG Code. It is used in this MPU Code to indicate regulations which do not exist in the current ADG but do exist in the UN Orange Book and are expected to appear in ADG7 when it is published.

“ADR” means Australian Design Rules unless a different meaning is given in a footnote.

“AEC” means the second edition of the Australian Code for the Transport of Explosives by Road and Rail (known as Australian Explosives Code)

“ANE” means an ammonium nitrate based emulsion, suspension or gel currently with the UN No 3375.

“ANFO” means a mixture of nominally 94 parts by weight of porous ammonium nitrate with 6 parts of a suitable fuel such as diesel fuel.

“approved” means approved by the relevant Regulatory Authority.

“attachment system” means

- (a) system for attaching a bulk container to a vehicle; and
- (b) includes all components of the system.

“authorised explosive” means an explosive defined and classified in accordance with the laws relating to explosives in a State or Territory.

“authorised officer” means an officer appointed by a Regulatory Authority

“bulk container” means an IBC or any other container capable of carrying dangerous goods in bulk, but excludes a tank that is part of a vehicle.

“Code” means this Code and includes any other code, supplement or standard applied, referenced, adopted or incorporated in this Code.

“Competent Authority” means the regulatory authority, listed as a competent authority in the ADG Code, having jurisdiction.

“container” means anything in or by which dangerous goods are wholly or partly encased, covered, enclosed, or packed and includes any components or materials necessary for a container to perform its containment function.

“dangerous goods” means goods specified as dangerous goods under the ADG Code.

“dismountable tank” means a tank designed to be carried on a vehicle but does not form part of the vehicle

“effect materials” are materials added on site by an MPU which have the effect of changing a mix of non-explosive materials to an explosive composition

“EWP” means an Elevated Work Platform

“field packaging” means the discharge of a finished product at an approved location into an approved package, container, or separate loading equipment which is intended for immediate use or temporary storage in a ready use or “working party” magazine

“incompatible” has the meaning given to it in the ADG Code.

Note: incompatible may relate to goods transported with dangerous goods, containers used to transport dangerous goods and equipment used in the transport of dangerous goods.

“ingredients” is a generic term used in this Code to include all oxidisers, fuels, effect materials, sensitisers and any other items which are consumed in the manufacture and/or delivery of explosives in and from an MPU as described in Section 1.2.

“liquids” are goods which at 50 deg C have a vapour pressure of not more than 300kPa (3 bar) which are not completely gaseous at a temperature of 20 deg C and a pressure of 101.3 bar, and which have a melting point or initial melting point of 20 deg C or less at a pressure of 101.3 kPa. A viscous substance for which a specific melting point cannot be determined be subjected to the ASTM 4359-90 test; or to the test for determining fluidity (penetrometer test) prescribed in Section 2.3.4 of Annex A of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)².

“Mobile Processing Unit” (MPU) is:-

- **a vehicle mounted plant which carries its own ingredients, can manufacture or blend a Class 1 explosive and which contains its own delivery system for the explosive or**
- **a vehicle mounted bulk explosives container which contains its own delivery system for the explosive.**

(See also Section 1.2.2)

“operating entity” means the person or entity employing the MPU for its intended use.

“operator” means the person who drives and/or physically operates the MPU.

“owner” means the person or entity having legal title to the MPU

“portable tank” means a demountable tank that is designed:

- (a) to be loaded onto and unloaded from a vehicle when filled; and
- (b) so that goods can be transferred when filled from one mode of transport to another without intermediate reloading.

² United Nations Publication ECE/TRANS/160

“power take-off” means a mechanical device that is driven by the main propulsion engine of the truck and which provides power to drive auxiliary equipment such as hydraulic pumps.

“prime contractor” means the person, in conducting a business for or involving the transport of dangerous goods by road, undertakes to be responsible, or is responsible, for the transport of goods by road.

“road regulations” means:

- (a) in relation to the Australian Capital Territory and the Jervis Bay Territory the *Road Transport Reform (Dangerous Goods) Regulations 1997* of the Commonwealth; and
- (b) in relation to a State or the Northern Territory, the *Road Transport Reform (Dangerous Goods) Regulations 1997* of the Commonwealth as adopted and applied as the law of that state or the Northern Territory as the case may be.

“tank” means a container other than an IBC that is used, or designed to be used to transport dangerous goods in the form of a gas or a liquid in bulk, and includes fittings, enclosures and any other equipment that forms part of the container.

“trailer” means a vehicle which is designed to be towed, or is towed by another vehicle but does not include a vehicle propelled by a motor that forms part of the vehicle.

“ullage” means the difference between the capacity of a container and the net contents of the volume of the container, calculated as a percentage as follows:

$$\text{ullage} = \frac{(\text{capacity} - \text{net volume of contents}) \times 100}{\text{Capacity}} \text{ and applies to liquids only}$$

“vehicle” means a road vehicle and does not include a unit of transport that operates on or uses a railway track. (Note the definition of a trailer)

1.4 List of Codes, Standards, Rules and Other Instruments Referred to in This Code

The following Australian Standards and Handbooks are referred to in this Code:

- AS 1418.10 – Cranes (including hoists and winches) – Elevated work platforms
- AS 1678 – This group of standards contains ‘Emergency Procedure Guides – Transport’
- AS 1851.1 – Maintenance of fire protection equipment – Portable fire extinguishers and fire blankets
- AS 2187.2 – Explosives – Storage, transport and use - Storage
- AS 2053 - Conduits and fittings for electrical installations
- AS 2809.1 – Road tank vehicles for dangerous goods – Part 1: General requirements
- AS 2809.2 – Road tank vehicles for dangerous goods – Part 2: Tankers for flammable liquids
- AS 2809.4 - Road tank vehicles for dangerous goods – Part 4: Tankers for toxic and corrosive cargoes
- AS 3790 – Portable warning triangles for motor vehicles
- AS D26 – Tube fittings with Dryseal with American standard taper pipe with unified threads for automotive and industrial use.
- “ADG7” – Currently unpublished edition of the ADG Code. See definition above.
- AEISG (formerly AEMSC) – CODE OF GOOD PRACTICE-PRECURSORS
- MDG 15 (NSW Coal Mines Only)
- National code of practice – Heavy vehicle Modifications – Bulletin No 6.

Section 2 – Regulatory Requirements

2.1 General Requirements

2.1 The owners and operators of MPUs must abide by legislative requirements which may include any relevant Codes and Standards, of the relevant State or Territory having jurisdiction over the MPU..

2.1.1 It is the responsibility of the owners and operators of the MPU to determine and comply with all applicable regulatory requirements pertaining to their operations.

2.1.2 Typically some or all of the following licences and authorisations are required:-

- (1) A vehicle licence to carry dangerous goods or explosives
- (2) A licence to manufacture explosives
- (3) The driver/operator to hold a licence to carry dangerous goods and/or explosives.
- (4) The explosives to be mixed must be approved or authorised
- (5) A shotfirers ticket (not necessarily held by the driver/operator).
- (6) Appropriate vehicle registration.

Note: Licensing requirements are administered by individuals states or territories.. The detailed requirements may vary and must be complied with.

2.1.3 The owner or operator of the MPU must have a copy of the relevant licences in the vehicle where required to do so.

2.1.4 The manufacturer or supplier of raw materials must ensure the raw materials have been properly classified.

2.1.5 When designing associated facilities such as raw material depots, the requirements of the relevant Australian Standards, Codes and regulatory authorities must be incorporated in the designs.

2.1.7 The operator of an MPU must only operate if appropriately licensed.

2.1.8 The operating entity of an MPU must ensure a copy of this Code of Good Practice is available to the operator of the MPU at the location where the MPU is based..

2.1.9 The operating entity must ensure that all MPU operators have been adequately trained and assessed to operate the particular vehicle they control and must keep written training records to that effect.

2.2 Insurance and Public Liability

2.2.1 The owner and operating entity of an MPU must ensure that an MPU is covered by a policy of insurance or other form of indemnity in respect of:-

- Property damage, personal injury, (excepting consequential economic loss) arising out of any fire, explosion, leakage, or spillage of dangerous goods in, on or from the MPU or a container transported on the MPU; and
- costs incurred by or on behalf of a government authority in a clean up resulting from an event of any kind referred to immediately above
- Public Risk insurance as required by the AEC.

2.2.2 Consideration be given to the insurance requirements of repair and maintenance contractors

(Note: The current ADG Code requires an insurance cover of not less than \$2,500,000 per event for a vehicle carrying dangerous goods in bulk)

Section 3 - Placarding of MPUs and Trailers

3.1 Scope

This Chapter sets out the requirements for marking and placarding of MPUs and trailers towed by MPUs.

3.2 General Requirements

- 3.2.1 An MPU must be placarded unless it has been cleaned of all dangerous goods to, at least, the extent that residual amounts of dangerous goods do not pose an additional risk to emergency services or other personnel in the event of an accident.
- 3.2.2 To comply with the minimum cleaning requirements of Section 3.2.1 there must be a documented cleaning procedure and an available record on the MPU which shows that the procedure has been carried out. Otherwise the MPU must be placarded unless all traces of dangerous goods have been removed.
- 3.2.3 An MPU must be placarded as per Table 3.3.4 as follows:
 - 3.2.3.1 Trailers must be placarded as per the ADG Code.
 - 3.2.3.2 When MPUs and trailers are used in combination, no additional placarding is required unless the MPU is carrying explosives in which case an "EXPLOSIVES" placard is to be displayed on the rear of the trailer.
 - 3.2.3.3 If an MPU is carrying explosives, "EXPLOSIVES" placards must be fitted to the rear and sides of the MPU vehicle.
- 3.2.4 MPU carrying detonators and other Class 1 explosives in approved segregation devices must, if the threshold quantity of explosives being carried is above the threshold quantity stipulated by the AEC, be placarded with:
 - (1) An explosives class label at the front of the MPU
 - (2) Emergency Information Panels on the two sides and rear of the MPU
 - (3) The containers carrying the explosives and detonators be clearly marked 'EXPLOSIVES' and 'DETONATORS' as appropriate in letters not less than 50mm high.
 - (4) An 'EXPLOSIVES' placard on all four sides of the MPU
- 3.2.5 An MPU carrying residual amounts of explosives in hoses, augers, pumps and sample containers need not show an 'EXPLOSIVES' placard. (Note; The residual amounts of explosives must not pose an additional risk to emergency services or other personnel in the event of an accident.)
- 3.2.6 In addition to the above the individual containers on an MPU must be clearly marked as to their contents
- 3.2.7 If there is no 'EXPLOSIVES' placard on the vehicle or the word 'EXPLOSIVES' does not appear on the Emergency Information Panel an 'EXPLOSIVES' placard must be clearly displayed at the site of manufacture.
- 3.2.8 All signs must be weatherproof and be legible when displayed.

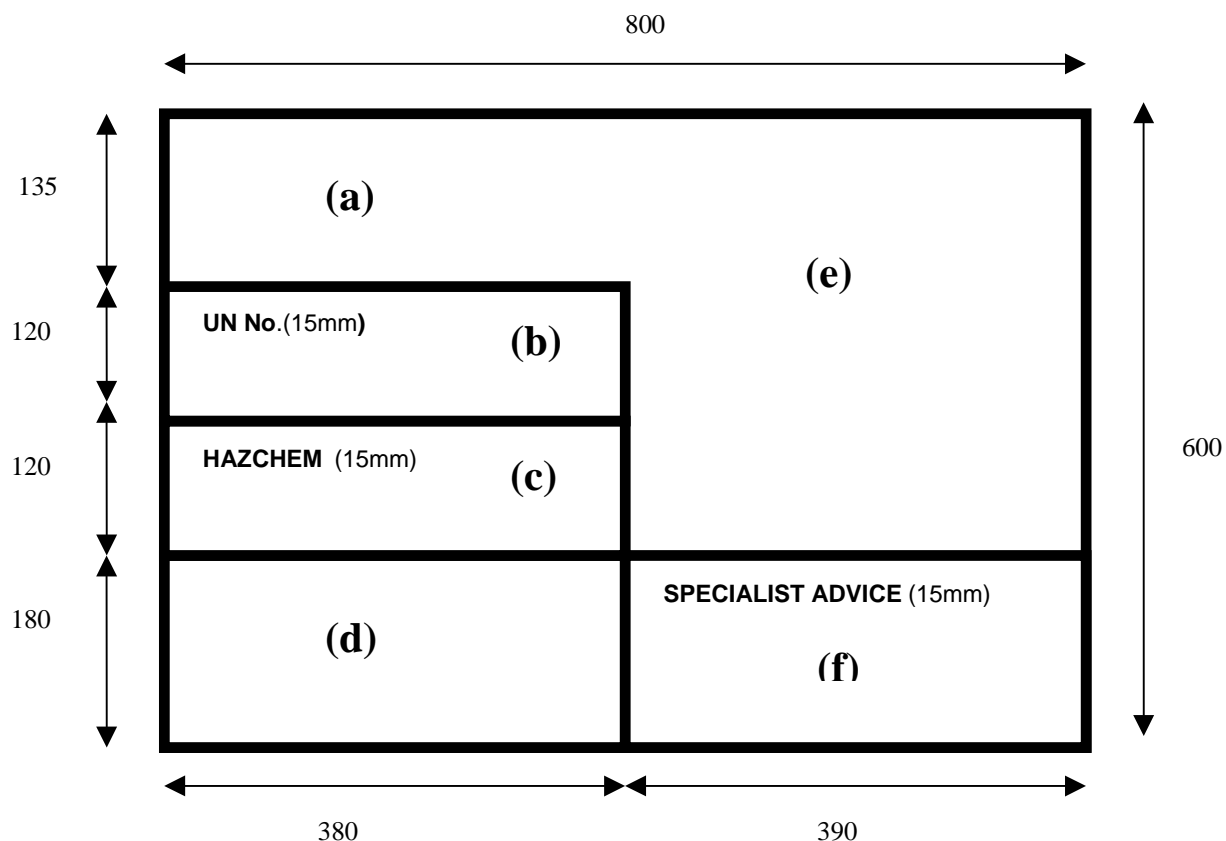
3.3 Details of Placards

- 3.3.1 Class Label (Diamond)
 - (1) The class label must correspond with the class label on the Emergency Information Panel.
 - (2) The class label must not be less than 250 mm square
- 3.3.2 'EXPLOSIVES' Placards

The placard must display the word 'EXPLOSIVES' in red capital letters, not less than 150 mm high, on a white background.

3.3.3 Emergency Information Panels

Emergency Information Panels must be substantially of the format and design shown below



Drawing dimensions are shown in mm. Lines should be 10mm thick. Where not shown in the drawing the dimensions of the detailed particulars are given below. Guidance on the information required for spaces (a), (b), (c) and (e) in Section 3.3.4.

The particulars which must be displayed on the Emergency Information Panel are as follows:

- (1) In space (a) – the authorised name or proper shipping name for the material being carried. Where the proper shipping name includes the expression 'N.O.S.' – that expression must be included. The name of the substance(s) which contribute most to the hazards may be included. The details must be marked in letters 50 mm high.
- (2) In space (b) - the UN Number for the dangerous goods in numerals 100mm high.
- (3) In space (c) – the Hazchem code assigned to the material in letters and numbers 100mm high. If the letter [S], [T], [Y], or [Z] appears in column 4 of the table shown in Section 3.3.4 , the letter must be in reverse print, that is a white letter on a black background.
- (4) In space (d) – the expressions 'IN EMERGENCY DIAL' – in letters of 30mm and 'OOO, POLICE OR FIRE BRIGADE' - in letters and numerals 50mm high.
- (5) In space (e) – the class label (and subsidiary risk label if applicable) of the material being carried.' For a single class label the sides must be 250mm. If a subsidiary risk label is required the main class label must have sides of 200mm and the secondary label sides of 150 mm.

- (6) In space (f) – the name and telephone number (including STD code) of the organisation in Australia providing expert information and advice concerning the physical and chemical properties of the materials being carried. This information must be marked in letters and numerals 40mm high. In quoting emergency telephone numbers consideration should be given to the operability of those numbers in the area in which the vehicle is operating.

3.3.4 Details of information to be shown on the Emergency Information Panels

Type of Vehicle	Space (a) Proper Shipping Name	Space (b) UN No	Space (c) Hazchem	Space (e) Class Label
ANFO Units	AMMONIUM NITRATE	1942	1[Y]E	5.1
Emulsion Units (containing non-Class 1 emulsions)	AMMONIUM NITRATE EMULSION		1[Y]E	5.1
Emulsion Units (containing Class 1 emulsions)	EXPLOSIVES, BLASTING, TYPE E	0332	E	1.5D
Slurry Trucks	AMMONIUM NITRATE EMULSION		1[Y]E	5.1
Bulk Emulsion Explosive Delivery Vehicles (containing non-Class 1 emulsions)	AMMONIUM NITRATE EMULSION	3375	1[Y]E	5.1
Bulk Emulsion Explosive Delivery Vehicles (containing Class 1 emulsions)	EXPLOSIVES, BLASTING, TYPE E	0332	E	1.5D
Repump Vehicles	EXPLOSIVES, BLASTING, TYPE E	0332	E	1.5D
Pre-blended ANFO Trucks	EXPLOSIVES, BLASTING, TYPE B	0082	E	1.1D

NOTE:

For detailed descriptions of the MPU types in column 1 see detailed MPU descriptions in clauses 1.2.3 to 1.2.9 on pages 6-7.

3.3.5 Mounting requirements for placards

- (1) Each placard must be securely fixed to the vehicle in a substantially vertical plane. It may be placed securely in a frame attached to the vehicle.
- (2) The placard must not be obscured.
- (3) The placard must be durable and weather resistant
- (4) The letters and numerals on the placard must be legible
- (5) The lowest edge of a placard frame must be at least 450mm above the ground.
- (6) Where, because of obstructions, an Emergency Information Panel can not be mounted as a whole on the rear of a vehicle the panel may be divided into two parts and mounted on either side of the obstruction.

Section 4 – Documentation

4.1 General

- 4.1.1 Shipping documentation and emergency information in the manner prescribed below must be carried with an MPU which is carrying dangerous goods on public roads.
- 4.1.2 Documentation must be in English
- 4.1.3 Documentation must be legible
- 4.1.4 Documentation must be carried in hard copy

4.2 Entries on a Shipping Document

- 4.2.1 The consignor's name, address and telephone number. The address and telephone number will normally relate to the base depot of the MPU.
- 4.2.2 Each type of dangerous goods must be described as follows:
 - (1) The proper shipping name of the goods
 - (2) The class of the goods
 - (3) The subsidiary risk of the goods (if any)
 - (4) The UN No of the goods
 - (5) The packing group designator of the goods (if any)
 - (6) A description of the container in which the goods are held (eg bin, tank)
 - (7) An aggregate quantity of the goods.
- 4.2.3 The shipping document may contain additional information, such as the sending and delivery address of the load. This must be placed after the information prescribed in 4.2.1 and 4.2.2.
- 4.2.4 Where a part load of an MPU is discharged, provision must be made to update the shipping document to reflect an estimate of the revised aggregate quantities before the MPU goes onto a public road. It must also be updated with the sending and delivery addresses of the remaining quantity.
- 4.2.5 Residual amounts of explosive in the delivery system of the MPU need not be recorded, but the shipping document should be amended to show "Residues only".

4.3 Emergency Information

4.3.1 Required emergency information

The owner and driver of an MPU must ensure that the following emergency information is carried:

- (1) The Dangerous Goods - Initial Emergency Response Guide in relation to the particular dangerous goods; or
- (2) An emergency procedure guide for the dangerous goods transported on the MPU and an emergency procedure guide in relation to a vehicle fire on the MPU.

4.3.2 Format of emergency information

The 'emergency procedure guide' in relation to particular dangerous goods, is a guide outlining procedures to be taken in the event of an emergency and which is either:

- (1) In the form, or substantially in the form, of an emergency procedure guide for the goods published by Standards Australia (AS 1678).
- (2) In a form approved by a Competent Authority in relation to goods of that kind

4.3.3 Location of shipping documentation and emergency information

The shipping documentation and emergency information must be located in an emergency information holder which meets the following requirements.

- (1) of a size and shape suitable for holding the shipping documentation and emergency information
- (2) marked with the words 'emergency procedure guides' or 'emergency information' in red letters at least 10mm high on a white background
- (3) securely located on the inside door of the cabin. (If the construction of the MPU does not allow the holder to be attached to the door – in a conspicuous position near the door.) If the MPU is a trailer the emergency information holder must be in the cabin of the prime mover or other towing vehicle.

Section 5 – MPU Design

5.1 Scope

This section sets out the requirements for the design of MPUs and associated equipment.

5.2 Requirements for MPUs

5.2.1 General Requirements

- (1) A documented risk assessment process must be carried out on all MPU designs and should include requirements for fall protection in the case of working at heights. {See 5.2.1(8)}
- (2) An MPU vehicle engine must not have a spark ignition engine..
- (3) An MPU vehicle must be in safe mechanical condition and, in the case of a vehicle travelling on public roads must comply with the registration requirements pertaining to the relevant state or territory.
- (4) All fixed fittings, pipework and auxiliary equipment must not protrude beyond the nominated width of the vehicle. Movable fittings must be secured within the nominated width of the vehicle when the vehicle is in transit.
- (5) All fixed fittings, pipework and auxiliary fittings must be adequately secured to the vehicle.
- (6) Concealed hollows should be avoided in all fittings. (A typical example is end sealed tubing.). Where concealed hollows exist provision for inspection, venting and decontamination must be provided.
- (7) All load securing devices must be in good condition and effective for their designed purposes
- (8) The design and mounting of the vehicle body must conform to the requirements of ‘National code of practice – Heavy vehicle Modifications – Bulletin No 6’.
- (9) The use of copper zinc and their alloys on an MPU should be limited to those components (mainly electrical) for which no realistic alternative is available. Any such copper and zinc containing components need to be inaccessible to MPU ingredients or manufactured product.

5.2.2 Auxiliary Engines

If an auxiliary motor is fitted to power the mixing units and/or the transfer equipment it must be located as close as possible to the front of the vehicle and meet the following requirements:

- (1) All parts of the engine and exhaust system which may be exposed to overhead spillage must be appropriately shielded.
- (2) The exhaust must discharge away from storage containers at a level not lower than the top of the highest part of the mixing equipment and tanks
- (3) Spark ignition engines must not be used

5.2.3 Vehicle Exhausts

Vehicle exhausts will conform to the following requirements:-

- (1) The exhaust system for a propulsion engine must be vertical, located at the rear of the cabin and be shielded in accordance with AS 2809 Parts 1 and 2.
- (2) Where an EWP is used, or the vehicle is intended for underground use, a low level front discharge exhaust is permitted when approved by the Competent Authority.
- (3) For auxiliary engines the exhaust must be directed away from personnel, materials and equipment.
- (4) Hot exhaust pipes are to be shielded where necessary.

5.2.4 Tank and Container Requirements

Tanks and containers must be designed to prevent incompatible materials from mixing To achieve this they will meet the following requirements:-

- (1) Be of sound construction
- (2) Be made of suitable materials that are compatible with the materials they are to contain.. For liquids, tanks must be constructed in accordance with the design criteria of AS 2809.4-2001 with respect to tank materials. Where incompatible goods are located in adjacent compartments of a tank, the separating wall should be stronger than the minimum specified in AS 2809.4-2001.
- (3) Maintain their integrity during normal operations
- (4) Provide adequate venting where required
- (5) Be secured to the vehicle, in such a manner as to restrain a force of twice the gross mass of the fully loaded tank or container, in any direction. {See also 5.2.1(8)}
- (6) Provide adequate weather protection for their contents
- (7) Individual compartments in a tank carrying liquids must be fitted with baffles conforming to AS 2809 Part 2 if the capacity of the compartment is greater than 8600 litres.
- (8) All valves and fittings to the tanks must be protected from being damaged in the event of an accident. Fittings to the tops of tanks containing liquids be protected by roll over coamings which comply with AS 2809.2 and
- (9) Vents fitted to fuel oil tanks (combustible liquids) must have appropriate devices to seal the tank in the event of a vehicle roll over.
- (10) If the tank is pressurised it must comply with AS1210.
- (11) Tanks are to be provided with suitable pressure relief devices.

5.2.5 Electrical Requirements

- (1) Batteries containing liquid electrolyte must :-
 - (a) be secured to prevent movement in the event of a vehicle roll-over
 - (b) Be in an accessible position and

- (c) Have a substantial, acid resistant and ventilated cover which is electrically insulated on the side adjacent to the battery terminals
- (2) A battery isolation switch must:
 - (a) be provided in an easily accessible position outside the cabin to the rear of the driver
 - (b) be clearly labelled to show its function and method of use
 - (c) isolate all process equipment except critical instrumentation which requires the maintenance of electrical supply.-and
 - (d) automatically open the alternator field coil circuit immediately before the battery is isolated if the engine is fitted with an alternator
 - (a) Electrical cabling outside and to the rear of the cabin must be installed in conduit complying with ASD 26 or AS2053 to protect it against mechanical damage (eg rubbing and impact) and chemical ingress.
 - . Soft wall, spaghetti type conduit does not comply with AS2053)
- (4) Electrical cables :
 - (a) Be of adequate physical strength and flexibility
 - (b) Have adequate current carrying capacity and
 - (c) Have terminals of an insulation gripping type, except on the battery and starter cables
- (5) Each circuit, except the starting circuit, must be protected by a fuse or manual reset circuit breaker as follows:
 - (a) the current rating of the fuse or circuit breaker must not exceed the rated current carrying capacity of the conductor, and
 - (b) Circuit breakers must be of the manual reset type with instantaneous short circuit protection capable of repeatedly opening the circuit in which it is used without failure.
- (6) All metallic equipment fitted to the vehicle must be bonded so that it is electrically continuous and at equal potential.

5.2.6 Rear Impact Protection

A system must be provided to protect the bulk container(s) from rear impact and must be:-

- (1) Structurally sound and in accordance with the design requirements of AS 2809.1-1999 and ADR where the vehicle is required to operate on public roads,
- (2) Attached only to the chassis or sub-frame of the vehicle
- (3) At least 150mm clear of the bulk container or any liquid carrying container,
- (4) Extend at least the full width of the bulk container,

- (3) Where compliance is at variance with the general design principles of AS 2809.1-1999 and ADR, a documented risk assessment and engineering analysis is to be performed to demonstrate that the variation to the design of the rear impact protection provides adequate protection to the bulk container(s).

5.2.7 Emergency Stop

- (1) The mixing and delivery systems must be fitted with an emergency stop, appropriately labelled and in the following positions:
 - (a) inside the cabin, and
 - (b) In easy reach of the operator monitoring the operations such as at the control panel or at the discharge point.
- (2) The emergency stop must effectively stop the process and, when reset, the process equipment not automatically restart.

5.2.8 Stability

The side angle stability must conform to clause 2.1.2 of AS 2809 1

5.2.9 Elevated Work Platforms (EWPs)

Where an MPU is fitted with an EWP the EWP must conform to AS 1418.10 and the licensing requirements for EWPs

5.3 Trailers

5.3.1. In addition to conformance with ADR for motor vehicles and trailers each trailer must meet the following requirements:

- (1) Every trailer, other than a semi-trailer must;
 - (a) Have at least two axles and at least two wheels on each axle when standing free, and
 - (c) Remain stable under all conditions of loading.
- (2) Trailers must be registered and appropriately licensed for the carriage of dangerous goods or as an MPU.

5.4 Modification of MPUs

The owner of an MPU must have a Standard Operating Procedure for modification and changes to MPUs. The procedure must provide for:

- (1) Recording modifications
- (2) Updating relevant drawings
- (3) Assessing and managing risk associated with the modification through the use of documented hazard review assessments.
- (4) Ensuring changes to the vehicle conform fully to the requirements of 'National code of practice – Heavy vehicle Modifications – Bulletin No 6' and to this Code..
- (5) Ensure that any modification does not affect the validity of an existing licence issued by the relevant regulatory authority.

Section 6 - Requirements for Pumps and Augers

6.1 General Requirements

6.1.1 High Friction and 'Dead Spots'

High friction and 'dead spots' which may result in overheating under confinement must be avoided.

(Note: Examples of dead spots include hollow shafts, hollow rotors and sealing arrangements. Examples of friction include metal to metal fouling, over tightened packed glands and high friction sealing arrangements. Consideration must also be given to failure modes.)

6.1.2 Suitability for Purpose

Pumps, augers and other transfer equipment must be:

- (1) of an appropriate design
- (2) constructed of materials with compatible with the product being transferred
- (3) of suitable rating
- (4) Designed to prevent the introduction of foreign bodies into the process. This may include the use of filters or screens on inlets to the transfer equipment.

6.2 Pumps

6.2.1 No Flow Protection

All pumps used in the handling of ammonium nitrate emulsions and solutions must have pump protection systems that are regularly inspected or tested and documented. The system must be capable of detecting and preventing dead heading (sudden pressure rise) and dry operation (temperature rise) of the pump. Systems must be of the "fail safe" type.

Examples of pump protective elements are -

- (1) Thermofuse or temperature trips at the pump inlet, mid-point or outlet.
- (2) Over-and-under pressure trips, near the pump outlet.
- (3) Bursting discs.
- (4) Drive torque limit devices.
- (5) Drive speed limiting devices.
- (6) Feed hopper level controls.
- (7) No flow detection.
- (8) Time out or countdown automatic shut down system.

6.2.2 One Way Operation

Pumps must be operated in one direction only unless an effective pump management system, eg; pump monitors, interlocks, procedures, signs and training, is in place, in order to control the potential hazards of reverse operation.

Pumps will be configured to have adequate Net Positive Suction Head (NPSH) Where possible pumps will have the shaft sealing device on the suction side of the pump

6.3 Augers

6.3.1 Hollow Shafts

The use of hollow shafts should be avoided. If hollow shafts are used they must be set up so that:

- (1) Ingress of ammonium nitrate and potential pressure build up is prevented (eg by the use of plastic plugs)
- (2) Inspection and cleaning of the hollow sections must take place before maintenance activities – particularly activities involving heat.

6.3.2 Bearings

Outrigger bearings are recommended. (This may not be possible for a central bearing on a long shaft.) Bearings should be selected and installed to reduce the possibility of hot spots affecting raw materials or product in the event of a bearing failure.

Section 7 – Segregation of Goods

7.1 Scope

- 7.1.1 This section deals with the segregation requirements for goods carried on MPUs.
- 7.1.2 In this section incompatible goods are those goods defined as incompatible in Chapter 9 of the ADG Code.
- 7.1.3 Segregation devices may be employed to permit the carriage of incompatible goods. Segregation devices are to be manufactured to conform to the design principles listed in the ADG Code (Supplement 3 – Segregation Devices) and AEC.

7.2 Classes of Dangerous Goods Carried in MPUs

The incompatible goods to be carried on an MPU are described in this section.

7.2.1 Combustible Liquids

The combustible liquids must meet the criteria for a combustible liquid within the meaning of a combustible liquid in AS1940. Diesel fuel oil is commonly used. .

7.2.2 Class 5.1

- (1) Ammonium nitrate
- (2) Solutions of ammonium nitrate (may contain other minor ingredients)
- (3) Solutions of ammonium nitrate and other inorganic nitrates (may contain other minor ingredients)
- (4) Ammonium nitrate emulsions suspensions and gels conforming to UN 3375
- (5) Urea/ammonium nitrate eutectics

7.2.3 Class 1.5

Ammonium nitrate emulsions and watergels which meet the requirements of a Class 1.5 explosive as set out in Chapter 4 of the UN Model Regulations and Part 1 of its Manual of 'Tests and Criteria'.

7.2.4 Class 1.1 (ANFO Mixtures)

These are mixtures of ammonium nitrate and fuel oils. The fuel oils must meet the requirements for a combustible liquid. Other solid fuels listed in 7.2.5 (1), (2) and (3) may be incorporated in the ANFO mixture.

7.2.5 Solid Fuels including Classes 4 or 9.

Typical solid fuels include:

- (1) Aluminium powder
- (2) Polystyrene beads
- (3) Pulverised rubber
- (4) 'Premix' – solid fuels for watergels

7.2.6 'Effect' Chemicals

Minor quantities of 'effect' chemicals, which may be dangerous goods may also be carried in quantities up to 205 litres per container. Typically, two to three containers may be carried on the MPU. 'Effect' chemicals may be added in small quantities and are used to control the final properties of the explosive. Examples include gasser solutions (containing sodium nitrite), cross-linkers and pH modifiers.

7.2.7 Detonators and Other Class 1 Explosives

Detonators and other Class 1 explosives (eg boosters) may also be carried on site in sufficient quantities for immediate use at the blast site.

7.2.8 Other Items

In addition to the items listed above MPUs may carry other materials. These would include, but not be limited to:

Bulking agents to reduce density e.g. glass or plastic microballoons

Water for cleaning and/or processing purposes.

7.3 Segregation Requirements

7.3.1 Combustible Liquids

- (1) Combustible liquids must be carried in a separate tank to all other materials on the MPU or a separate compartment within a tank which meets the tank requirements as set out in Section 5.2.4
- (2) There must be no direct connection between the combustible liquid tank(s) and other tanks or containers on the MPU.

Notes 1. A combustible liquid line and a Class 5.1 liquid line may be directly connected to an in-line mixer provided that adequate provision is made to prevent reverse flow in each line.

2. In this context a pipe which runs from a combustible liquid tank to a mixing unit is not regarded as a direct connection if an air gap is provided at the end of the pipe and the mixing unit.)

7.3.2 Class 5.1, Class 1.5, Class 1.1 (ANFO Mixtures).

The Class 5.1, Class 1.5 and Class 1.1 (ANFO mixtures) listed in Sections 7.2.2, 7.2.3 and 7.2.4. may be carried in separate tanks or containers or be carried in separate compartments of the same tank or container. The design must be such as to prevent inadvertent mixing of the different materials.

Note: Solutions containing sodium nitrite must be carried in a separate tank container unless it can be proven that the nitrite solution and other materials on the vehicle are not incompatible with other materials carried within the meaning given to that term in the ADG Code.

7.3.3 Solid Fuels

The solid fuels listed in 7.2.5 which are not incorporated in the ANFO mixture must be carried in separate containers or in separate compartments of the same containers

7.3.4 'Effect' Chemicals, Water

Individual 'effect' chemicals and water must be carried in separate containers or tanks as appropriate and in conformance with the segregation requirements of the ADG Code.

7.3.5 Detonators and Other Class 1 Explosives

(a) These may only be carried when segregated by an approved segregation device which segregates the detonators from other explosives. The quantity of detonators must not exceed 125 units and the quantity of other explosives must not exceed 25Kg. Segregation devices must comply with the requirements of the Australian Explosives Code..

(b) If larger quantities of detonators or other explosives are required to be transported on the MPU approval on a case-by-case basis is required from the authority having jurisdiction.

(c) If quantities of Class 1 explosives greater than Category 2 loads, as defined in the AEC, are carried on an MPU the vehicle must display signage that complies with the AEC.

7.4 Modification of container or compartment contents.

Where containers and or compartments on an MPU contain incompatible dangerous goods these must be clearly labelled and the materials carried in them not changed for the life of the vehicle unless the proposed changes have been reviewed and duly authorised using the procedures listed in Section 5.4 "Modification of MPU's" of this Code.

Section 8 – Operational Requirements

8.1 Operating Manual

- 8.1.1 Each MPU must have available to the operator at all times an operating manual covering the safe operation of that specific MPU. The operating manual must be produced using a documented risk assessment process.
- 8.1.2 The operating manual must cover;
- (a) The safe operation of the equipment fitted to the MPU;
 - (b) Procedures to manufacture or blend the explosives for which the MPU is licensed.
 - (c) Emergency procedures for the MPU

8.2 Safety Equipment

The following paragraphs set out the minimum safety equipment requirements for MPUs.

8.2.1 Fire extinguishers:

- (1) Fire extinguishers must be fitted in accordance with the following table:

Application	Minimum Requirements
In every cabin	One dry chemical extinguisher of 10B rating
MPU licensed up to and including 10000kg	One dry chemical extinguisher of 60B rating or Two dry chemical extinguishers of 30B rating
MPU licensed capacity exceeding 10000kg	Two dry chemical extinguishers of 60B rating or One dry chemical extinguisher of 80B rating plus Two foam extinguishers of 20B rating

- (2) Fire extinguishers must be located as follows:
- (a) Accessible from normal operating positions; and
 - (b) Mounted in properly attached quick release brackets in appropriately distributed locations;
- (3) The fire extinguishers must be inspected and tested in accordance with AS1851.1

8.2.2 Emergency Kit

The emergency kit carried by an MPU must include:

- (1) One set of three double sided reflector signals that comply with AS3790;
- (2) One battery powered flame proof electric torch complying with AS2380.7
- (3) One pair of wheel chocks unless the vehicle is fitted with spring or MaxiBrakes; and
- (4) PPE suitable for the materials being carried in accordance with the ADG Code and the relevant MSDS and;

(5) Spill control kit

8.2.3 First aid kit:

A first aid kit must be carried and configured in accordance with relevant State and Territory regulations. It must include an eye wash kit, filled and ready for use and of at least 250ml capacity and be carried inside the cabin in a readily accessible location.

8.3 Transfer Operations and Equipment

8.3.1 Loading of raw materials into an MPU must be done in a safe manner to prevent spillage or injury to persons.

8.3.2 Loading hoses and attachment devices must be maintained in a serviceable condition.

8.3.3 All transfer equipment, including delivery hoses, must be adequately restrained to ensure control is maintained during transfer operations and during normal transport.

8.3.4 The parking brake of the MPU must be applied when transferring products.

8.3.5 The mixing and delivery system must be designed and arranged so that the operator (from the normal operating position) can:-

- (1) Observe (directly or by suitable remote means) the explosive delivery process during operations, or
- (2) Has adequate communication with another operator who has a suitable view.

8.3.6 (1) When transferring product, the system must not be left unattended.
(2) If, when transfer is complete, the unit is not to be immediately reloaded with the same product, it shall be cleaned of residual quantities in accordance with the Decontamination Schedule of Appendix 1 at the appropriate level and in accordance with the operating procedures for that type of vehicle.

8.3.7 Power Take Off Units

Where a power take off unit (PTO) is fitted to the vehicle for the transfer of product its manner of operation be one of the following:

- (1) For vehicles with a manual transmission and full in cabin controls only, the PTO may be engaged at any time.
- (2) For vehicles with a manual transmission and out of cabin controls only, the PTO may be engaged at any time but the high idle function not be operated until the vehicle is in neutral gear and the parking brake is fully applied.
- (3) For vehicles with an automatic transmission and in cabin controls only, the PTO may be engaged whilst in gear. Auxiliary controls may be operated but the main mixing controls must not be operated unless the vehicle is in either the park or neutral position and the parking brake has been fully applied.
- (4) For vehicles with an automatic transmission and out of cabin controls only the PTO must not be engaged unless the vehicle is in the park or neutral position and the parking brake has been fully applied.

(Note: For vehicles with dual controls, the respective in cabin and out of cabin controls must be applied as appropriate.)

8.4 Ullage Requirements and Filling Ratios

- 8.4.1 For MPU design where it can be demonstrated that ullage has no effect on the safe operation or stability of the vehicle, the requirements of the ADG Code do not apply. This may be the case where high viscosity materials, that is materials which are solids by definition in the ADG Code, are being carried by the MPU.

Where this requirement cannot be met, ullage requirements and filling ratios are to be maintained in accordance with the provisions of the ADG Code.

8.5 Audits

- 8.5.1 The owner of an MPU must have a comprehensive, documented audit program in place to ensure that:

- (1) The MPU is licensed;
- (2) The MPU is mechanically sound and can be operated safely
 - (1) The driver/operator is licensed to ADG Code and AEC Code requirements
 - (2) Adequate training has been provided to driver/operators;
 - (3) Vehicle checks are carried out at the commencement of each shift;
 - (4) The MPU is periodically calibrated;
 - (5) All operational and safety equipment is effective;
 - (6) Correct signage is displayed and
 - (7) The MPU complies with the requirements of this Code.

- 8.5.2 Audits must be conducted annually and the results recorded. The head of the audit group must be a person who is not directly in charge of MPU operations.

8.6 Training

The MPU owner must ensure that all MPU operators are adequately trained in the operation of the unit for which they are responsible. Such training must be suitably assessed and documented.

8.7 Maintenance

- 8.7.1 Each MPU owner must have up formal procedures to document the type of work to be done and the appropriate standard of vehicle cleanliness to be achieved prior to work commencing. These procedures will recognise the need for rigorous cleaning prior to hot work being carried out on the MPU compared with minimal cleaning required prior to, say, changing a wheel. A suggested matrix between cleanliness standards and type of work to be carried out is given in Appendix 1.

- 8.7.2 The tables of Appendix 1 are illustrative of the process to be followed. Each MPU owner will develop and document similar procedures.

- 8.7.3 All maintenance work on an MPU requires a formal Work Permit signed by the MPU owner or his delegate prior to commencement of work. Work requiring the use of flame tools of any type will require a formal Clearance Certificate from the same person.

- 8.7.4 **Hours of Work**
The MPU owner must ensure that hours of work for each individual operator comply with National Transport Industry guidelines.

8.8 Communication Equipment

Each MPU must be equipped with communication equipment which, in an emergency, is capable of communicating with the MPU's base and/or the base station of the mine or quarry on which it operates

Section 9 – Transport Procedures

9.1 Scope

This section describes the requirements for operation of an MPU when in transit between loading and delivery sites. This will usually entail transport on both public roads and within mine lease boundaries.

9.2 Public Roads

9.2.1 Breakdowns

If an MPU constitutes a traffic hazard (eg. disabled or stopped on a road) other road users must be alerted by:

- (1) Use of flashing hazard lights (where fitted)
- (2) Use of vehicle parking lights
- (3) Placing at least one double sided reflector signal (three are recommended) on the ground at right angles to the direction of traffic in each of the following locations;
 - (a) not less than 50 metres or more than 150 metres in front of the vehicle
 - (b) not less than 50 metres or more than 150 metres behind the vehicle
 - (c) beside the vehicle on the side closer to traffic.

9.3 Passengers

9.3.1 No person may ride in the cabin of an MPU carrying a placarded load apart from the following:

- (1) An employee or other person authorised by the owner of the vehicle or the prime contractor or.
- (2) An authorised officer, police officer, officer of an emergency service, or person authorised to ride in the MPU by such a person.

9.4 Parking Requirements

9.4.1 When parking a placarded MPU;

- (1) The parking brake must be fully applied; and
- (2) The vehicle must not be parked in gear unless the vehicle is fitted with a device to prevent the engine from starting if the vehicle moves, and the device is engaged.

9.4.2 A placarded MPU transporting dangerous goods other than Class 1 must not be parked or left standing in;

- (1) A built up area with public access;
- (2) Within 15 metres of any building in which there is likely to be a concentration of people (other than a building or premises where the vehicle is loaded or unloaded);
- (3) Any other place in which there is likely to be a concentration of people; or
- (4) Within 8 metres of another vehicle which is transporting a placard load of dangerous goods.

- 9.4.3 An MPU placarded as a Class 1 vehicle must comply with Table 8.1 of the AEC.
- 9.4.4 A vehicle may be left parked or standing in the circumstances mentioned in section 9.4.2 above;
- (1) If it is reasonable to do so;
 - (2) For the purpose of loading or unloading the MPU;
 - (3) If the vehicle has broken down;
 - (4) Because of a dangerous situation;
 - (5) To comply with the requirement of any law; and
 - (6) If the vehicle is not parked or left standing for any longer than is necessary; or
 - (7) If the Competent Authority or any other local, State or Territory authority responsible for regulating the use or parking of vehicles has approved the place as a place in which an MPU may be left parked or standing.
- 9.4.5 An MPU must not be parked or left standing within 15 metres of a naked flame.
- 9.4.6 A battery isolation switch must be left open whenever the vehicle is unattended unless it is necessary to leave the vehicle lights on to prevent a traffic hazard or comply with any law.

9.5 Selection of Routes

- 9.5.1 An MPU must observe any requirements or restriction on the selection of routes or times of travel which have been determined by the Competent Authority.
- 9.5.2 An MPU should wherever practical avoid heavily populated or environmentally sensitive areas, congested crossings, tunnels, narrow streets, alleys or sites where there is or may be a concentration of people.
- 9.5.3 Routes should be pre-planned and checked wherever possible.
- 9.5.4 Routes should be selected to minimise the risk of personal injury or harm to the environment or property during the journey.

9.6 Customer Sites

The owner or operating entity of the MPU must conform to the transport and traffic procedures operating on the mine site, quarry or construction site as applicable.

9.7 Emergencies

- 9.7.1 The driver of an MPU involved in an accident that results in a dangerous situation must:
- (1) Notify the emergency services of the incident as soon as possible
 - (2) Notify the owner the owner or prime contractor and
 - (3) Provide reasonable assistance to the emergency services
- 9.7.2 The driver of the vehicle should, in a safe and practical manner:
- (1) Carry out emergency procedures recommended in emergency information provided, including EPGs.
 - (2) Carry out the local emergency plan;

- (3) Prevent any other vehicles, dangerous goods or explosives from coming within a safe distance specified in the emergency information carried in the vehicle;
- (4) Warn any person in the vicinity who may be at risk;
- (5) Prevent or minimise the escape of any transported material and its entry into the surrounding environment.

Section 10 –Security

10.1 Security Classification

10.1.1 Loads other than Class 1.

. This MPU Code proposes to classify UN3375 materials as “High Consequence Dangerous Goods” for security purposes i.e. these materials will be handled under the constraints expected to be imposed by the seventh edition of the ADG Code..

10.1.2 Class 1 Loads

Where an MPU is required to be placarded as a Class 1 vehicle the High Security Risk Load requirements of the Addendum to the AEC endorsed by the Explosives Competent Authority Sub Committee apply and must be complied with.

10.2 Security Mechanism

Ammonium nitrate emulsions, suspensions and gels (hereinafter referred to as “ANE”) are usually carried in bulk and therefore lend themselves to a “Chain of Custody” approach similar to that documented in detail in the PACIA Code of Practice for the Distribution of Ammonium Nitrate. This Code documents a method of improving the accountability of all persons and organisations in the distribution chain with the objectives of:

- having security plans in place to investigate and deal with any discrepancies and where necessary to activate the product Security Plan
- requiring all drivers and users to undergo personal security checks as required by the relevant State or Territory regulations
- measuring and documenting any ANE returned with the vehicle.
- Measuring and accounting for ANE rendered unsaleable by reason of contamination and/or spillage
- Measuring and accounting for ANE recovered during maintenance of fixed plant or vehicles
- Recycling or environmentally acceptable disposal of any ANE rendered unsaleable for any reason
- Accurately reconciling quantities of ingredients consumed by the MPU with the quantity of explosives placed “down the hole”
- Instituting procedures and equipment to ensure the location of vehicles delivering and/or processing ANE is confirmed at intervals not exceeding two hours

All MPU owners will draw up plans specific to their MPU configuration(s) to implement the principles listed under 10.2

APPENDIX 1

DECONTAMINATION SCHEDULE

The attached tables detail the relationship between the type of work involved and the standard of decontamination required for maintenance to the *material storages and processing equipment* of an MPU regardless of type.

They are not applicable to maintenance of vehicle specific mechanical and minor electrical equipment such as light globes where the use of flame tools is not involved e.g. wheel changing. In these cases the required degree of bin emptying and other measures will be determined by considerations of vehicle stability, load rating of jacks and other relevant mechanical considerations.

The following Table I details the required level of contamination and is to be used with the information from Table 2.

TABLE 1

Grade	Requirements.
1.	<ol style="list-style-type: none"> 1. Bins and Tanks must be emptied 2. Exterior of equipment must be cleaned 3. Equipment containing residual product is not opened or disconnected. Residual product may be left in hoses, augers or bins
2.	<ol style="list-style-type: none"> 1. Bins and tanks must be emptied. 2. Exterior of equipment must be cleaned 3. Equipment containing product must be disconnected and all material removed by flushing with water/steam.
3.	<p>As stipulated by “2” – with the additional requirements</p> <ol style="list-style-type: none"> 1. Equipment must be cleaned of residual material using water flush or steam. 2. Equipment must be inspected for hidden cavities; - these spaces be drilled and flushed with water/steam. Hollow sections such as auger shafts must be considered as hidden cavities.
4.	<p>As stipulated by “3” – with the additional requirement.</p> <p>Equipment must be clearly identified as being contaminant free.</p>
5.	<p>Decontamination of equipment used for molecular explosives – refer manufacturer for specifics.</p>

TABLE 2

Work to be Conducted	Location	Grade
Non hot work maintenance	On site	1
Non hot work maintenance	Off site	2
Hot work	Any location	3
Disposal of equipment	Any location	4
Equipment used for molecular explosives	Any location	5
Shipping/transfer of equipment	Any location	4

Detailed procedures to implement this decontamination schedule must be drawn up and maintained by each member company.