DEPARTMENT OF MINES
WESTERN AUSTRALIA

Explosives and Dangerous Goods Act 1961

# SUMMARY OF ACCIDENT REPORTS 1991

**Explosives and Dangerous Goods Division**
Mineral House, 100 Plain Street, East Perth, Western Australia, 6004

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# ACCIDENT REPORTS 1991
# EXPLOSIVES AND DANGEROUS GOODS ACT 1961

Regrettably, two fatalities and several injuries resulted from activities associated with the transport, storage and use of explosives and dangerous goods in 1991. Both fatalities were the result of road accidents involving road trains, one being attributed to the collision itself whilst the other was a result of fire involving the flammable liquids load after a rollover.

Several injuries resulted from traffic accidents in which the dangerous goods were incidental and not a cause of the incident. One serious injury resulted from irresponsible action by a licensed shotfirer involved in the preparation and firing of home made "bombs".

This summary details 52 accidents which were reported to the Division in 1991, of which storage, transport and explosives accounted for 27, 22 and 3 respectively. Seven transport accidents involved "non-dangerous goods" and are excluded from the statistical analysis.

Overall the severity of accidents reported during the year has been greater than previous years. The most significant are highlighted in the introductory notes to each section.

Operator error continues to be a major cause of all accident categories, an area which will be pursued with the promulgation of new regulations for the storage of dangerous goods.

This problem has also been recognised in the transport area resulting in greater emphasis on operator training in the revised Australian Code for the Transport of Dangerous Goods by Road and Rail due for release in 1992.

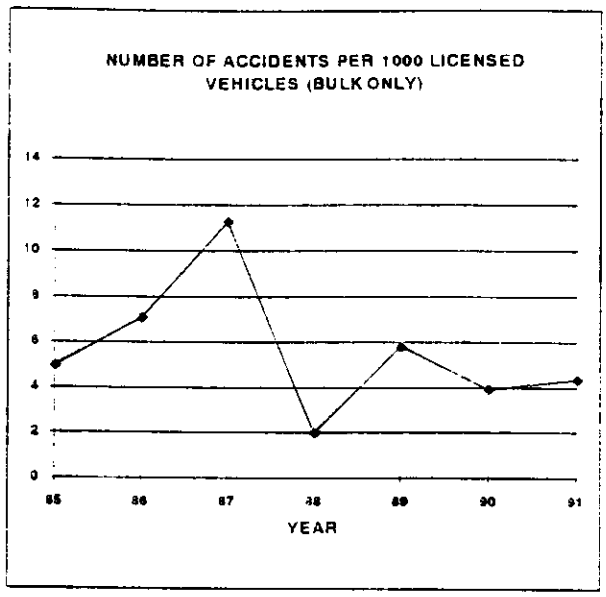
**K Price**
**CHIEF INSPECTOR**
31 January 1992

## PREDOMINANT CAUSE STATISTICS FOR DANGEROUS GOODS ROAD TRANSPORT ACCIDENTS

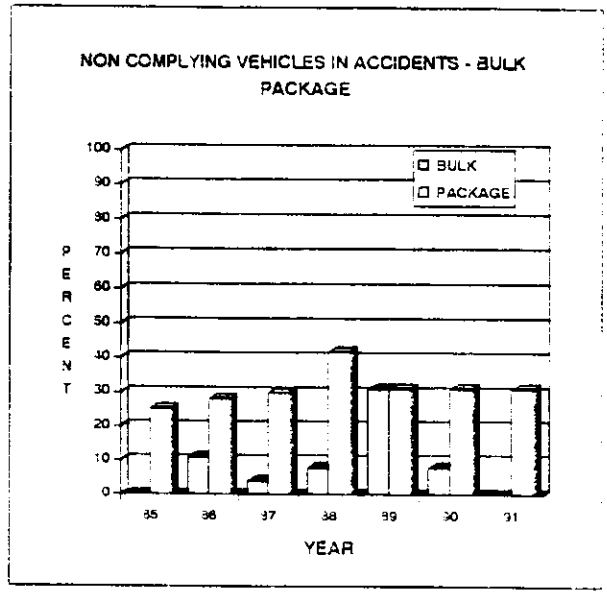
| | 1991 | | 7 Year Average | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Accident (Note 1) | 2 | 13.3 | 3.1 | 17.0 |
| Road Conditions | 1 | 6.7 | 1.4 | 7.7 |
| Equipment Failure (Note 2) | 3 | 20.0 | 3.4 | 18.7 |
| Operator Error (Note 3) | 7 | 46.7 | 7.4 | 40.7 |
| Inadequate Maintenance | 1 | 6.7 | 1.0 | 5.5 |
| Sabotage/Vandalism | 0 | 0.0 | 0.3 | 1.6 |
| Construction Fault | 0 | 0.0 | 0.0 | 0.0 |
| Unknown/Non Specific | 1 | 6.6 | 1.6 | 8.8 |
| Total Incidents | **15** | **100.0** | **18.2** | **100.0** |

NOTES:
1. ACCIDENT includes vehicle traffic accidents and general accidental occurrences.
2. EQUIPMENT FAILURE refers to the failure of some component used in the transport, handling or packaging of the dangerous goods.
3. OPERATOR ERROR includes failure of operator to comply with transport regulations.
4. Some incidents involving non dangerous goods (NDG) have been recorded, however these are excluded from statistical analysis.
5. Decimal averages are rounded up to one place.

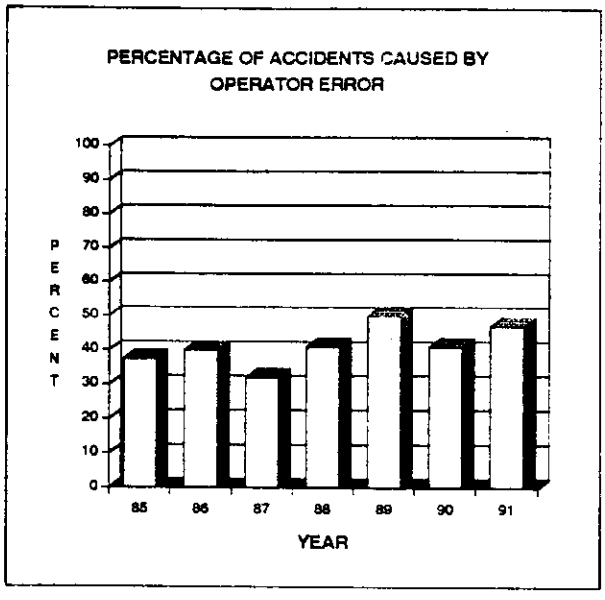
# SELECTED ROAD TRANSPORT ACCIDENT STATISTICS



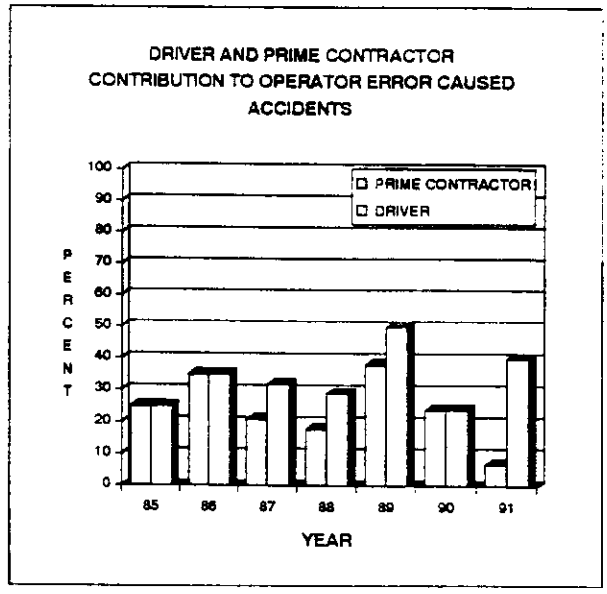

Accidents reported in comparison to the number of vehicles licensed to transport dangerous goods shows a levelling trend approaching 4 per 1000.




The percentage of accidents involving package vehicles which did not comply fully with the Dangerous Goods Regulations is significantly higher than for bulk vehicles.




Operator error is consistently a predominant cause of all transport accidents.



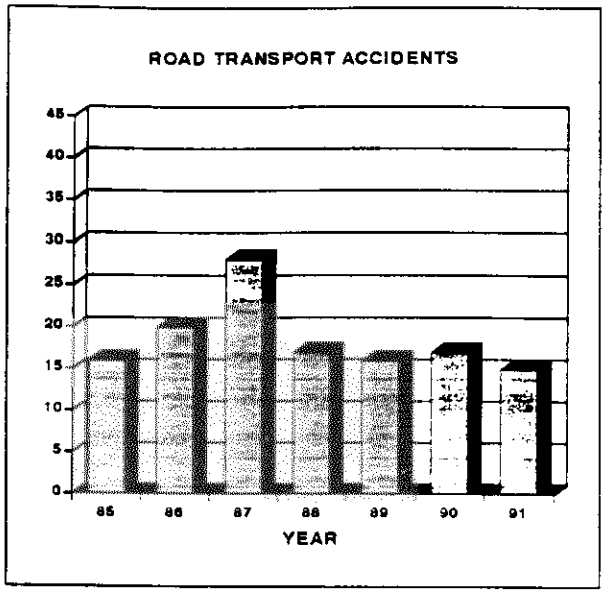

The major contributors to operator error caused accidents are prime contractors and drivers.

## SPECIFIC STATISTICS FOR DANGEROUS GOODS ROAD TRANSPORT ACCIDENTS

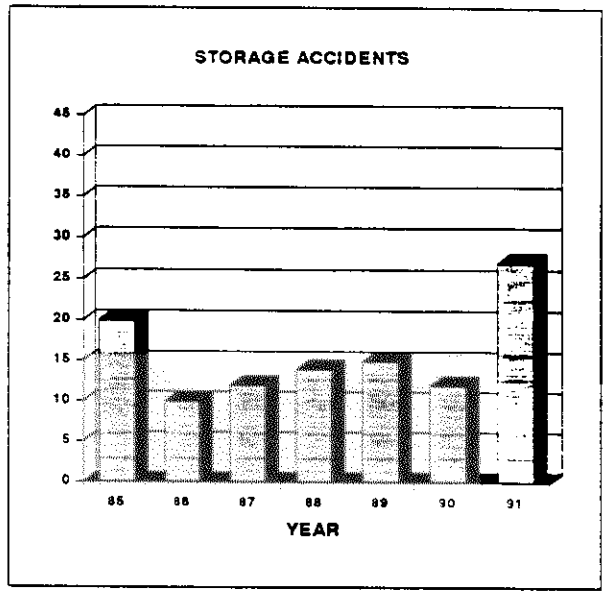
| | 1991 | 7 Year Average |
|---|---|---|
| | % | % |
| Incidents involving bulk containers | 53 | 34 |
| Incidents involving packages | 40 | 57 |
| Incidents involving IBCs | 7 | 8 |
| Incidents involving non-approved containers | 13 | 20 |
| Incidents involving unlicensed bulk vehicles | 0 | 11 |
| Non-complying bulk vehicles | 0 | 9 |
| Non-complying package vehicles | 31 | 30 |
| Operator error by consignor | 0 | 2 |
| Operator error by prime contractor | 7 | 24 |
| Operator error by driver | 40 | 33 |
| Third party caused or contributed | 0 | 9 |

NOTES:
1. INCIDENTS INVOLVING UNLICENSED BULK VEHICLES — this category specifies bulk vehicles only because package carrying vehicles are not required to be licensed to transport dangerous goods.
2. OPERATOR ERROR BY CONSIGNOR, PRIME CONTRACTOR & DRIVER — these categories refer to incidents in which operator error was the predominant cause and which parties contributed to this error.
3. Some incidents involving non dangerous goods (NDG) have been recorded, however these are excluded from statistical analysis.

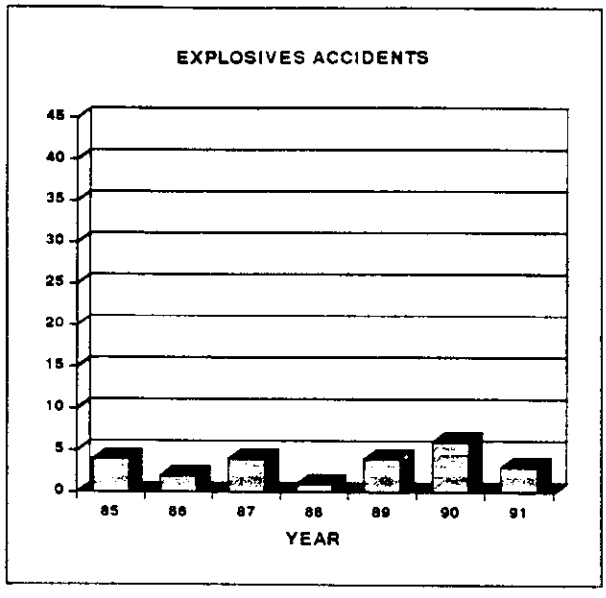
# EXPLOSIVES AND DANGEROUS GOODS ACCIDENT STATISTICS



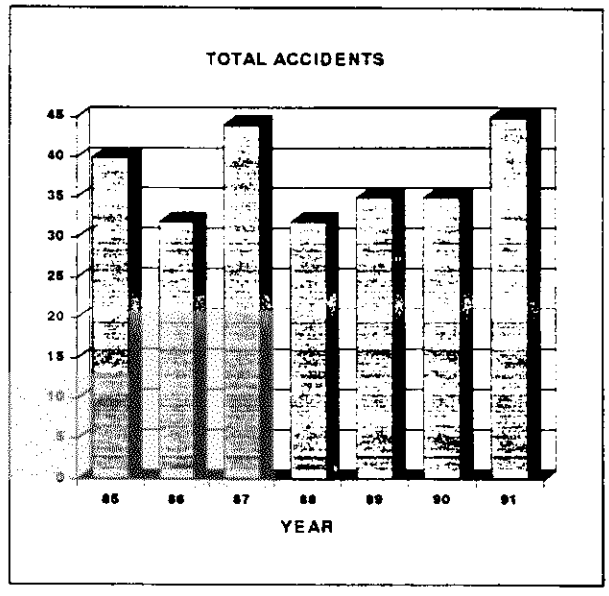

The 1987 peak is consistent with the observed national trend for that year.




The 1991 figure includes incident reporting from "Major Hazards Sites."




Annual figures are too small to allow for any statistical conclusions to be drawn.




Average is in the region of 37 per year with no distinctive trend.

# EXPLOSIVES ACCIDENTS

## INTRODUCTION

Three accidents involving explosives were reported to the Division during 1991, compared with six in 1990.

The most serious of the accidents occurred when a shotfirer was fooling with explosives. He prepared 6 home made devices and when he lit the first device, it exploded in his hand. The blast caused serious injuries to his left hand. Although relatively small quantities of explosives(propellant powder) were involved, it shows the importance of not misusing explosives, regardless of the quantity involved.

It is pleasing to note that in the past year no accidents were attributed to children acquiring discarded or unsecured explosives. It cannot be emphasised strongly enough that children and explosives do not mix. All efforts must be taken to prevent children gaining access to explosives.

The other accidents were transport related and fortunately were not of a serious nature.

# EXPLOSIVES
# ACCIDENTS SUMMARY REPORT

**FOR THE YEAR 1991**

| | Date | Location | Goods | Class | Comments |
|---|---|---|---|---|---|
| 1/91 | 26/05/91 | Port Hedland | Low sensitivity explosives | 1.5 | Primer mover and lead trailer of a road train overturned after failing to turn at a T-junction. |
| 2/91 | 23/09/91 | Paraburdoo | Ammonium nitrate | 5.1 | Exhaust leakage caused fire to cladding in the engine compartment under the cabin of a blasting agent mixing vehicle. |
| 3/91 | 29/11/91 | Mt Magnet | Propellant powder | 1.3 | A shotfirer sustained serious injuries to his hand when a home made device detonated prematurely. |

END OF SUMMARY REPORT

# EXPLOSIVES
# ACCIDENT REPORT

| | |
|---|---|
| **DATE:** | 26 May 1991 2300 hrs |
| **LOCATION:** | 40 km South of PORT HEDLAND |
| **EXPLOSIVES INVOLVED:** | LOW SENSITIVITY EXPLOSIVES<br>Class 1.5<br>Compatibility Group D<br>UN No. 0332<br>Quantity Involved 200 kg |

**SCENARIO**

A double bottom road train transporting two 20 tonne containers of emulsion explosives failed to take the turn at a T-junction and continued into the bush.

The lead trailer and prime-mover overturned resulting in the spillage of a minor amount of product.

Recovery tankers were despatched from Kalgoorlie together with transfer equipment the next day, and the recovery phase was completed the following day (almost 2 days after the accident). The damaged tankers were returned to Perth for repair.

This is the second of two similar incidents the transport company has experienced with sub-contractors. As a result of the incident, the company has reverted to using company equipment and employees.

EA : 1/91 FILE No.: 133/91

# EXPLOSIVES
# ACCIDENT REPORT

DATE: 23 September 1991 0800 hrs

LOCATION: Minesite
PARABURDOO

EXPLOSIVES INVOLVED:

AMMONIUM NITRATE
Class 5.1
Compatibility Group
UN No. 1942
Quantity Involved 0 kg

HIGH ENERGY FUEL
Class 5.1
Compatibility Group
UN No. 1479
Quantity Involved 0 kg

FUEL OIL
Class 3.3
Compatibility Group
UN No.
Quantity Involved 0 kg

**SCENARIO**

A fire resulted under the cabin in the engine compartment of a blasting agent mixing vehicle at a minesite.

The fire was caused when a crack developed in the exhaust shelter housing allowing extremely hot gases to escape onto the cabin's underside insulation(the insulation acts as a noise suppressant).

The driver of the vehicle was a holder of a Licence to Manufacture Blasting Agent and consequently had been trained in emergency procedures. He acted promptly to take corrective measures. The fire was quickly extinguished by hose and caused no damage to the vehicle beyond the insulation.

Remedial action taken by the mining company was to remove the insulation and to request the vehicle supplier to provide a suitable non-combustible replacement.

EA : 2/91 FILE No.: 266/91

## EXPLOSIVES
## ACCIDENT REPORT

| | |
|---|---|
| DATE: | 29 November 1991 1530 hrs |
| LOCATION: | Great Northern Highway<br>MT MAGNET |
| EXPLOSIVES INVOLVED: | PROPELLANT POWDER<br>Class 1.3<br>Compatibility Group C<br>UN No. 0161<br>Quantity Involved 5 g |

**SCENARIO**

A licensed shotfirer sustained serious injuries to his left hand when an unauthorised home made device detonated in his hand.

The shotfirer prepared 6 of these devices containing propellant powder early in the day and when he and a colleague were en-route to work, decided to light one of the devices, in order to create an "explosion".

With his left hand out of the window holding the device, he lit the fuse with the car's cigarette lighter but before he could throw it away, it exploded in his hand.

He was immediately taken to the local nursing post and later flown to Perth for hospital treatment.

The injuries resulting from the blast were the loss of his ring finger and the tops of several other fingers and severe lacerations to the left hand.

The remaining devices were later destroyed by a local shotfirer.

As a result of his actions, his Shotfirer's Permit was cancelled for 12 months. This has severely restricted him in his trade as it requires the use of a Shotfirer's Permit.

EA : 3/91 FILE No.: 294/91

# DANGEROUS GOODS STORAGE ACCIDENTS

## INTRODUCTION

Twenty seven incidents involving dangerous goods in storage were reported to the Division in 1991, compared to twelve incidents during 1990.

The increase was primarily due to the higher level of reporting of dangerous goods incidents from chemical plants classified as "Major Hazards sites"; a contribution of 12 incidents, of which 8 emanated from one plant. As a result, the Division has required the company involved to instigate a comprehensive audit of its operations. This audit will address all appropriate issues relating to releases of dangerous goods from the site.

There are now six Major Hazards sites which have prepared hazards control plans and are reporting dangerous goods incidents in accordance with the requirements of those plans.

The most significant incident for the year was a 680,000 kg release of liquid and vapour hydrocarbon which occurred over a 45 minute period at the receiving terminal of the LNG plant at Dampier during what should have been a routine shutdown operation.

Of the 15 incidents that were not from the major hazard sites, 10 incidents involved flammable or combustible liquids.

A driver error involving valve arrangements at a power station fuel tank farm resulted in a tank overflow involving 111,000 litres of diesel. Routine maintenance to a process vessel condenser unit in a wool processing plant resulted in the release of flammable vapours and its subsequent ignition. Both of these incidents could have been avoided had proper procedures been followed and adequate care taken for the task.

There were four fires involving dangerous goods storages in which arson was suspected by the police, a considerable increase over past years.

# DANGEROUS GOODS STORAGE ACCIDENTS SUMMARY REPORT

## FOR THE YEAR 1991

| | Date | Location | Goods | Class | Comments |
|---|---|---|---|---|---|
| 14/91 | 06/01/91 | Dampier | Natural Gas | 2.1 | As a result of a cavity vent failure, 2.6 tonnes of hydrocarbon vapour was released. |
| 15/91 | 07/01/91 | Dampier | Natural Gas | 2.1 | 75 tonnes of hydrocarbon was vented to atmosphere as a result of a pilot tube failure to a relief valve. |
| 1/91 | 04/02/91 | Karratha | Flammable Liquids N.O.S. | 3.1 | 300 litres of flammable liquid drained from a bulk container as a result of a valve not being closed. |
| 2/91 | 09/02/91 | Shackleton | LP Gas | 2.1 | Fire and explosion involving LP Gas leaking from a cylinder destroyed a dwelling. |
| 4/91 | 23/02/91 | Harvey | Carbon Dioxide | 2.2 | A cylinder of medical carbon dioxide ruptured while in storage due probably to overfilling and high ambient temperature. |
| 5/91 | 23/02/91 | Maddington | Thinning Liquids | 3.1 | Major fire at chemicals packaging premises destroyed buildings and stored products. |
| 3/91 | 16/03/91 | Bibra Lake | Hexane | 3.1 | Fire involving flammable liquids in a wool processing plant caused damage to the building and equipment. |
| 16/91 | 02/04/91 | Dampier | Natural Gas | 2.1 | A series of flashbacks occurred in the storage/loading flare stacks. |
| 17/91 | 13/04/91 | Dampier | Natural Gas | 2.1 | Natural gas release from LNG plant during planned shutdown — due to vibration during relief valve operation. |
| 13/91 | 13/05/91 | Kwinana | Sodium Cyanide Solution | 6.1 | A small leak was detected from weep holes around the base of a 4000 cubic metre tank. The tank was emptied and repaired. |
| 6/91 | 26/06/91 | Wongan Hills | Petrol | 3.1 | During storage, petrol leaked from the fuel tank of a whipper snipper. The gas mixture of petrol and air in the shed was ignited by an electric grinder. |
| 20/91 | 26/07/91 | Kwinana | Titanium Tetrachloride | 8 | Titanium tetrachloride liquid escaped from a tapping point when a rodding device was accidently withdrawn from the tapping point. The retaining head on the rodding device was missing. |

## DANGEROUS GOODS STORAGE ACCIDENTS SUMMARY REPORT (continued)

| | Date | Location | Goods | Class | Comments |
|---|---|---|---|---|---|
| 25/91 | 19/11/91 | Kwinana | Titanium Tetrachloride | 8 | While unblocking accumlated solids from a cyclone underflow, the blockage cleared suddenly, releasing liquid titanium tetrachloride contained behind the blockage. |
| 11/91 | 26/11/91 | Gibson | Petrol | 3.1 | Operator error caused a fire at a service station during a refuelling operation. |
| 18/91 | 28/11/91 | Willetton | Acetone | 3.1 | Fire destroyed the premises of a fibreglass factory. Cause of fire still unknown. |
| 12/91 | 01/12/91 | Leinster | Diesel Fuel | 3.3 | A driver incorrectly opened and closed valves during tank isolation for delivery, resulting in tank overflow and major spillage. |
| 27/91 | 26/12/91 | Kalamunda | Petrol | 3.1 | Petrol bomb thrown into service station resulting in fire in the office section. Fuel storage unaffected. |

END OF SUMMARY REPORT

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 6 January 1991 1815 hrs |
| LOCATION: | LNG Plant<br>DAMPIER |
| DANGEROUS GOODS INVOLVED: | NATURAL GAS<br>Class 2.1 Flammable Gas<br>Sub-Risk<br>UN No. 1971<br>Packaging Group<br>Quantity Involved 2600 kg |

**SCENARIO**

Failure of a 3/4"(20 mm) pipe on the cavity vent of the inlet isolation valve on a filter separator resulted in the release of an estimated 2.6 tonnes of hydrocarbon vapour.

The piping failed due to the vibration caused by the throttling valve on the filter separator. The release was low hazard and no evacaution was necessary.

As a result of this incident, all throttling valves will be replaced by low noise valves by April 1992 .

DGAS: 14/91 FILE No.: 287/90

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 7 January 1991 0430 hrs |
| LOCATION: | LNG Plant<br>DAMPIER |
| DANGEROUS GOODS INVOLVED: | NATURAL GAS<br>Class 2.1 Flammable Gas<br>Sub-Risk<br>UN No. 1971<br>Packaging Group<br>Quantity Involved 75000 kg |

**SCENARIO**

A pilot tube on a relief valve to the filter separator failed resulting in a release of natural gas into the local work area and through the onshore terminal vent system to atmosphere. In excess of 75 tonnes was released. The valve pilot tube failed from fatigue caused by the vibration of the throttling valve. Replacement of all such valves by low noise valves will be completed by April 1992. There was no evacuation necessary as the main release was from the raised vent and hence low hazard.

DGAS: 15/91 FILE No.: 287/90

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 9 February 1991 0000 hrs |
| LOCATION: | Cukela Rd<br>SHACKLETON |
| DANGEROUS GOODS INVOLVED: | LP GAS<br>Class 2.1 Flammable Gas<br>Sub-Risk<br>UN No. 1075<br>Packaging Group<br>Quantity Involved 45 kg |

**SCENARIO**

Liquefied petroleum gas escaping from a cylinder located inside a building was ignited by an undetermined source of ignition. The resultant explosion caused extensive damage to the unoccupied dwelling with the subsequent loss of roofing timber and demolition of external walls. An ensuing fire destroyed the flooring timbers through most of the dwelling. The fire had burnt out by the time investigators arrived and the gas cylinder was removed for examination.

At last report, the cause of this incident, the subject of a coronial inquiry, was still under investigation.

DGAS: 2/91 FILE No.: 52/91

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 23 February 1991 1030 hrs |
| LOCATION: | Becher St<br>HARVEY |
| DANGEROUS GOODS INVOLVED: | CARBON DIOXIDE<br>Class 2.2 Compressed Gas<br>Sub-Risk<br>UN No. 1013<br>Packaging Group<br>Quantity Involved 28 litres |

**SCENARIO**

On Sunday 24 February, a ruptured cylinder was found on Harvey Oval, which is located about 500m from the premises of the local gas distributor. A representative from the gas distributor later confirmed that the ruptured cylinder was from their premises.

Damage was restricted to the tin roof of the gas storage shed. The shed was of galvanised tin roof construction with wire mesh sides. The cylinder was stored in a horizontal position at the time of the explosion.

Examination of the ruptured cylinder by the gas supplier revealed that the most probable cause of the rupture was an overpressure, due to the cylinder becoming hydraulically full. This condition was reached due to the malfunction of a weigh scale at the gas supplier's premises resulting in the cylinder being overfilled, and then subjected to high ambient temperatures. The non-fitment of a safety relief device, which is permitted by the existing Code of Practice for cylinders, prevented the release of excess gas prior to the rupture.

The gas supplier was requested to conduct a detailed investigation into the cause of the incident, resulting in considerable changes to operating procedures and operator training and the eventual fitting of safety valves to all similar cylinders.

DGAS: 4/91 FILE No.: 68/91

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 23 February 1991 1400 hrs |
| LOCATION: | Ryelane St<br>MADDINGTON |
| DANGEROUS GOODS INVOLVED: | THINNING LIQUIDS<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1993<br>Packaging Group II<br>Quantity Involved 15000 litres |
| | HYDROCHLORIC ACID<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1789<br>Packaging Group II<br>Quantity Involved 2000 litres |
| | SODIUM HYDROXIDE<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1823<br>Packaging Group II<br>Quantity Involved 2000 litres |

**SCENARIO**

Fire brigade and police were called to a fire at the premises of a chemical supplier after a passer-by raised the alarm. The premises were extensively affected by the fire by the time emergency services arrived.

The volatile nature of the goods in storage (turpentine, thinners, kerosene and alcohols) resulted in the rapid spread and extent of the fire. Fire water runoff was contained in order to prevent contaminated toxic water from entering Water Authority main drains.

An exact cause of the fire could not be determined, however, the maximum daytime temperature on the day (46°C), may have contributed to the cause of the fire.

DGAS: 5/91 FILE No.: 157/91

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 2 April 1991 0000 hrs |
| LOCATION: | LNG Plant<br>DAMPIER |
| DANGEROUS GOODS INVOLVED: | NATURAL GAS<br>Class 2.1 Flammable Gas<br>Sub-Risk<br>UN No. 1971<br>Packaging Group<br>Quantity Involved Unknown |

**SCENARIO**

Following the connection of two flare stacks(commoning) to relight the failed pilot on one flare, a series of flashbacks occurred over the period 30 March to 2 April 1991. This was believed to be due to the egress of air from one stack into the other stack.

There was no effect beyond the flare stacks and no evacuation was necessary.

Flares will not be connected in this matter in future.

DGAS:16/91 FILE No.: 287/90

## DANGEROUS GOODS STORAGE ACCIDENT REPCRT

| | |
|---|---|
| DATE: | 16 March 1991 0000 hrs |
| LOCATION: | Cocos Dve<br>BIBRA LAKE |
| DANGEROUS GOODS INVOLVED: | HEXANE<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1208<br>Packaging Group II<br>Quantity Involved Unknown |

**SCENARIO**

Routine maintenance to a process vessel condenser unit in a wool processing plant resulted in hexane vapours being released to atmosphere and igniting.

The resulting fire was fed by solvents used in the wool cleaning process spreading the blaze until control was established with the aid of portable fire extinguishers.

Adjoining bulk storages of solvents (over 150,000 litres) were located in accordance with statutory requirements and were not affected by the blaze.

The cause of the blaze is believed to have been operator error due to the fact that the condenser should have been under a nitrogen atmosphere prior to opening for maintenance.

DGAS: 3/91 FILE No.: 65/91

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 2 April 1991 0000 hrs |
| LOCATION: | LNG Plant<br>DAMPIER |
| DANGEROUS GOODS INVOLVED: | NATURAL GAS<br>Class 2.1 Flammable Gas<br>Sub-Risk<br>UN No. 1971<br>Packaging Group<br>Quantity Involved Unknown |

**SCENARIO**

Following the connection of two flare stacks(commoning) to relight the failed pilot on one flare, a series of flashbacks occurred over the period 30 March to 2 April 1991. This was believed to be due to the egress of air from one stack into the other stack.

There was no effect beyond the flare stacks and no evacuation was necessary.

Flares will not be connected in this matter in future.

DGAS:16/91 FILE No.: 287/90

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 13 April 1991 0930 hrs |
| LOCATION: | LNG Plant<br>DAMPIER |
| DANGEROUS GOODS INVOLVED: | NATURAL GAS<br>Class 2.1 Flammable Gas<br>Sub-Risk<br>UN No. 1971<br>Packaging Group<br>Quantity Involved 680000 kg |

**SCENARIO**

A natural gas release occurred at the receiving terminal of the LNG plant, when shutdown was being initiated.

During the shutdown process, the inlet pressure of the slugcatcher rose above the normal operating pressure and the safety relief valve system operated.

The functioning of the relief valve caused a severe vibration in the pipework and the consequent failure of a flange system on the inlet to the relief valve.

The release continued for a period of 45 minutes. The total release of liquid and vapour hydrocarbon into the work area and vent stack was 680 tonnes.

DGAS: 17/91 FILE No.: 287/90

# Dangerous Goods Storage Accident Report

| | | |
|---|---|---|
| Date : | 29 November 1993 | Time : 0900 hrs |
| Location : | Scarborough Beach Road<br>OSBORNE PARK | |
| Dangerous Goods Involved: | LIQUEFIED ANHYDROUS AMMONIA<br>Class 2.3<br>Sub-Risk 8<br>UN No. 1005<br>Packaging Group :<br>Quantity Involved : 20 litres<br>Quantity Spilled : 20 litres | |

## Scenario :

Workers at adjacent premises detected the smell of ammonia gas emanating from a disused refrigeration plant when they arrived at work on Monday morning.

The fire brigade was contacted and emergency service agencies were activated.

Ammonia was being purged through the pipework of the disused refrigeration plant and the ammonia was bubbled into water in a 200 litre drum. Liquid ammonia gas had been removed from the storage tank five days earlier. The purging of ammonia through the water over the weekend probably saturated the solution and excess ammonia vapour was released to the atmosphere.

Fire brigade personnel sprayed water in the vicinity of the 200 litre drum until the ammonia odour was diluted sufficiently to no longer be detected. The area around the premises was evacuated while clean up operations were being carried out.

**DGAS : W11/93 File No. : 221/93**

# DANGEROUS GOODS
# STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 26 June 1991 1030 hrs |
| LOCATION: | Farm Property<br>WONGAN HILLS |
| DANGEROUS GOODS INVOLVED: | PETROL<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1203<br>Packaging Group II<br>Quantity Involved Unknown |

**SCENARIO**

After use at the weekend a petrol driven whipper snipper was placed in a shed for storage. On the following Wednesday morning an electrician began work on a new power board. For the connection of a heavy duty power cable the electrician planned to cut a hole in the metal power box. He placed the metal "box" on the cement doorstep in front of the open shed door. Before starting he noticed the petrol can near the shed doorway. After turning away to the left he began work with an electric grinding wheel. Within a short time an explosion and fire occurred in the shed.

The shed walls were "blown apart" and some items were set on fire. Two electricians were injured, one seriously enough to require hospitalisation. Other workers at the farm were able to put the fires out and give assistance to the injured men.

DGAS: 6/91 FILE No.: 164/91

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 26 July 1991 1630 hrs |
| LOCATION: | Titanium Dioxide Plant<br>KWINANA |
| DANGEROUS GOODS INVOLVED: | TITANIUM TETRACHLORIDE<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1838<br>Packaging Group II<br>Quantity Involved 10 litres |

**SCENARIO**

Titanium tetrachloride vaporisers have level indication and control systems working on differential pressure measured across two tapping points.

The lower tapping point is below liquid level and prone to fouling/blockage, hence a rod-out device(a sharpened 5mm stainless steel rod) is passed through a teflon tape-packed gland and ball valve to clear the blockage.

The rod-out device is normally left attached and is prevented from being completely withdrawn from the ball valve/gland assembly by a "retaining head" welded to the rod.

On the day in question, the operator (in the process of normal rodding) withdrew the rod completely from the assembly, allowing liquid titanium tetrachloride to escape.

The rod could be withdrawn as the welded head had been omitted. The leak was covered with foam and adsorbed into diesel.

DGAS: 20/91 FILE No.: 106/91

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 16 August 1991 1100 hrs |
| LOCATION: | Metropolitan Hospital<br>PERTH |
| DANGEROUS GOODS INVOLVED: | ANHYDROUS AMMONIA<br>Class 2.3 Poisonous Gas<br>Sub-Risk<br>UN No. 1005<br>Packaging Group<br>Quantity Involved 2 kg |

**SCENARIO**

A 2kg cylinder of ammonia exploded shortly after it was connected to the copying unit on the 2nd floor of a metropolitan hospital. The second floor and part of the sixth floor (connected via the air conditioning system) were evacuated for 2 hours, whilst the odour dissipated.

Investigations into the operations of the gas supplier revealed several deficiencies in procedures for filling and testing of such cylinders. Instructions for the rectification of these deficiencies were issued.

DGAS: 9/91 FILE No.: 235/91

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 20 August 1991 0300 hrs |
| LOCATION: | Titanium Dioxide Plant<br>KWINANA |
| DANGEROUS GOODS INVOLVED: | TITANIUM TETRACHLORIDE<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1838<br>Packaging Group II<br>Quantity Involved 60 litres |

**SCENARIO**

During the startup of a titanium tetrachloride vaporiser, the operator failed to note that the vent valve was open and connected to the snake scrubber system, via a PVC line.

It was standard operating procedure to have the vent valve shut for startup.

When the vaporiser was started up, hot titanium tetrachloride passed through the valve to the PVC line, causing it to hole and fail.

Titanium tetrachloride then escaped from the vent to the atmosphere.

The toxic cloud was noticed almost immediately by the operators who, without any protective equipment, entered the cloud and shut the valve.

The released material drifted off-site and affected an operator on an adjacent independent site. The operator required hospitalisation.

DGAS: 19/91 FILE No.: 106/91

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 22 August 1991 1830 hrs |
| LOCATION: | Titanium Dioxide Plant<br>KWINANA |
| DANGEROUS GOODS INVOLVED: | TITANIUM TETRACHLORIDE<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1838<br>Packaging Group II<br>Quantity Involved Unknown |

**SCENARIO**

During commissioning of a chlorinator, titanium tetrachloride leakage was noted from an expansion bellows in the system. Attempts to repair the leak in situ failed and in fact worsened the leak.

The ensuing titanium tetrachloride cloud did not leave the site and the chlorinator was immediately shut down for repair, a vacuum hose was used to contain the vapour emission during the shutdown.

DGAS: 21/91 FILE No.: 106/91

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 26 August 1991 0100 hrs |
| LOCATION: | Titanium Dioxide Plant<br>KWINANA |
| DANGEROUS GOODS INVOLVED: | CHLORINE<br>Class 2.3 Poisonous Gas<br>Sub-Risk 5.1<br>UN No. 1017<br>Packaging Group<br>Quantity Involved Unknown |

**SCENARIO**

During normal operation, an operator was instructed to block in a valve on one of the 3 production lines. The operator did not close the required valve, but an identical one on a different production line.

The blocked-in production line overpressurised and burst its rupture disk, venting process chlorine to the snake gas collection system.

The chlorine was scrubbed in the snake system with lime.

The lime solution (containing some chlorine) was then pumped to effluent treatment where it was neutralised with acid. The ensuing pH change resulted in the release of some chlorine gas and a nearby operator was affected.

DGAS: 26/91 FILE No.: 106/91

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 6 September 1991 0200 hrs |
| LOCATION: | Titanium Dioxide Plant<br>KWINANA |
| DANGEROUS GOODS INVOLVED: | TITANIUM TETRACHLORIDE<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1838<br>Packaging Group II<br>Quantity Involved Unknown |

**SCENARIO**

As part of the normal shift routine, an operator was draining carry-over titanium tetrachloride from one of the recycle gas coolers.

The titanium tetrachloride is drained into water to hydrolyse it. The valve which is supposed to be "cracked" open, was fully open as blockage was occurring.

When the blockage suddenly gave way, the hydrolysing equipment was overwhelmed by the amount of titanium tetrachloride.

The valve was closed with some difficulty due to the release, and once closed the emission was controlled with foam.

It was estimated that the emission was controlled within 5 minutes.

DGAS: 23/91 FILE No.: 200/91

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 18 September 1991 1936 hrs |
| LOCATION: | Kent Wy<br>MALAGA |
| DANGEROUS GOODS INVOLVED: | PAINTS.THINNERS<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1263<br>Packaging Group II<br>Quantity Involved 20000 litres |

**SCENARIO**

A major fire at the premises of a paint retailer caused extensive damage to a set of commercial units.

The fire was detected remotely by a security firm following the activation of the fire alarm at the premises.

The premises was unoccupied at the time.

The fire also caused damage to more than 50% of the stock stored on site.

Investigations revealed a substantial storage of highly flammable liquids, in the form of automotive paints, thinners and other related products.

Instructions were issued to the occupiers of the premises to reduce the quantity of product stored, and to comply with statutory regulations on the storage of dangerous goods. The cause of the fire could not be established.

DGAS: 7/91 FILE No.: 227/91

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 1 October 1991 0610 hrs |
| LOCATION: | Pinetree Gully Rd<br>BURRENDAH |
| DANGEROUS GOODS INVOLVED: | PETROLEUM SPIRIT<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1271<br>Packaging Group II<br>Quantity Involved 2100 litres |

## SCENARIO

During excavation works at a service station, the fill line to an existing underground petrol tank was disconnected and left unplugged and unmarked.

Soon after the close of business, a tanker driver attended the site to complete a normal delivery and commenced filling the disconnected line. Approximately 2100 litres of petrol spilled and soaked into the exposed soil before the error was discovered.

The oil company arranged for the contaminated soil to be removed from the site and appropriately disposed of. Ground water monitoring wells were also installed to monitor for any contamination whilst soil ventilation techniques were used to disperse any remaining vapours.

DGAS: 8/91 FILE No.: 232/91

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 7 October 1991 1115 hrs |
| LOCATION: | Anvil Cl<br>SOUTH GUILDFORD |
| DANGEROUS GOODS INVOLVED: | FURFURYL ALCOHOL<br>Class 6.1 Poisonous Liquid<br>Sub-Risk<br>UN No. 2874<br>Packaging Group III<br>Quantity Involved 920 litres |
| | SULPHONIC ACID<br>Class 8 Corrosive Liquid<br>Sub-Risk 6.1<br>UN No. 2922<br>Packaging Group III<br>Quantity Involved 100 litres |

**SCENARIO**

An employee was manufacturing a batch quantity of resin. According to a standard procedure, he had decanted the furfuryl alcohol from 200 litre drums into the mixing vessel. In error, a quantity of sulphonic acid was added which gave rise to a violent exothermic reaction and started the fire which destroyed the mixing plant.

DGAS: 10/91 FILE No.: 254/91

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 16 October 1991 0430 hrs |
| LOCATION: | Titanium Dioxide Plant<br>KWINANA |
| DANGEROUS GOODS INVOLVED: | CHLORINE<br>Class 2.3 Poisonous Gas<br>Sub-Risk 5.1<br>UN No. 1017<br>Packaging Group<br>Quantity Involved Unknown |

**SCENARIO**

During lowering of the fluidised chlorinator bed level (both height and synthetic rutile concentrate), the level was allowed to drop below the minimum required to prevent complete reaction of the chlorine (chlorine slippage).

The operator ignored alarms and routine samples of the bed were not taken.

The slippage persisted until all the lime in the scrubber was absorbed and chlorine started to escape via the stack.

Action was taken to rectify the problem(by shutting down the chlorinator) following a complaint from a neighbouring premises of a chlorine smell.

The offending chlorinator was shut down and the chlorine slippage stopped.

DGAS: 24/91 FILE No.: 200/91

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 19 October 1991 1250 hrs |
| LOCATION: | Titanium Dioxide Plant<br>KWINANA |
| DANGEROUS GOODS INVOLVED: | TITANIUM TETRACHLORIDE<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1868<br>Packaging Group II<br>Quantity Involved Unknown |

**SCENARIO**

During startup of one of the chlorinator lines, the titanium tetrachloride spray lines were found to be blocked.

Operators were attempting to clear this blockage when it suddenly gave way and a large amount of liquid titanium tetrachloride passed, via the cyclone overflow, into the cyclone sump where its reaction with water present caused the vessel to overpressurise, rupturing the rupture disk.

The vaporised hydrogen chloride and titanium tetrachloride then passed to the chlorinator sump scrubber, overloading this system and giving a plume from the top of the stack which passed off-site.

DGAS: 22/91 FILE No.: 200/91

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 19 November 1991 0200 hrs |
| LOCATION: | Titanium Dioxide Plant<br>KWINANA |
| DANGEROUS GOODS INVOLVED: | TITANIUM TETRACHLORIDE<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1838<br>Packaging Group II<br>Quantity Involved Unknown |

**SCENARIO**

Site personnel attempted to unblock an accumulation of solid material between two automatic dump valves from the waste solids cyclone.

The blockage was being cleared via a split in the lower flange using rodding and nitrogen. Foam and snake vacuum hoses were being used to control the associated emissions of titanium tetrachloride.

The blockage cleared suddenly and it contained a significant quantity of liquid titanium tetrachloride which hydrolysed, resulting in a plume which moved off-site.

The emission was controlled by the further use of Hazmat foam.

DGAS: 25/91 FILE No.: 200/91

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 26 November 1991 1425 hrs |
| LOCATION: | Norseman Rd<br>GIBSON |
| DANGEROUS GOODS INVOLVED: | PETROL<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1203<br>Packaging Group II<br>Quantity Involved 8 litres |

**SCENARIO**

A petrol spill and fire occurred at a service station as the attendant prepared to fill a campervan.

Normal procedures were followed by the attendant - the nozzle removed from the bowser and the pump control lever rotated. However, as the pump started, petrol streamed out of the nozzle onto the side of the campervan adjacent to the exhaust outlet of the campervan's fridge.

The spillage was ignited, causing minor burns to the atttendant and severe damage to the campervan.

Whilst the fridge exhaust was suspected as the ignition source, this could not be confirmed as the van owner stated that the fridge was operating on electrics and not gas at the time of refuelling.

The spillage was caused by the nozzle piece being returned to the bowser support in the latched position after the previous filling operation.

This incident highlights the need for detailed operator training even for simple operations such as vehicle refuelling and for constant supervision of attendant operated sites to ensure that self-service by unauthorised persons is prevented.

Warnings regarding this type of incident have been circulated to industry in order to prevent a recurrence.

DGAS: 11/91 FILE No.: 274/91

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

DATE: 28 November 1991 1615 hrs

LOCATION: Gymple Wy
WILLETTON

DANGEROUS GOODS INVOLVED:

ACETONE
Class 3.1 Highly Flammable Liquid
Sub-Risk
UN No. 1090
Packaging Group II
Quantity Involved 100 litres

RESIN SOLUTION
Class 3.2 Flammable Liquid
Sub-Risk 6.1
UN No. 1866
Packaging Group III
Quantity Involved 300 litres

METHYL ETHYL KETONE PEROXIDE
Class 5.2 Organic Peroxide
Sub-Risk
UN No. 2550
Packaging Group I
Quantity Involved 30 litres

**SCENARIO**

Fire completely destroyed the factory section of a fibreglass manufacturing facility.

The fire brigade arrived at the factory within 15 minutes of the commencement of the fire and took 2 hours to control the blaze, but were not able save the building.

Investigations revealed that all the dangerous goods stored on the premises were consumed in the fire.

The Police and Fire Brigade are still investigating the cause of the fire.

DGAS: 18/91 FILE No.: 285/91

# DANGEROUS GOODS STORAGE ACCIDENT REPORT

| | |
|---|---|
| DATE: | 1 December 1991 **2305 hrs** |
| LOCATION: | Minesite<br>LEINSTER |
| DANGEROUS GOODS INVOLVED: | DIESEL FUEL<br>Class 3.3 Combustible Liquid<br>Sub-Risk<br>UN No.<br>Packaging Group<br>Quantity Involved 111,024 litres |

**SCENARIO**

A driver error during delivery resulted in a tank overflow.

In accordance with standard operating procedure the driver, intending to transfer 75,000 litres of fuel into one of two storage tanks supplying a powerhouse, isolated the tank in service at the time and switched supply to the second tank. Supply to the powerhouse is on a recirculating line with excess flow being returned to the supply tank.

In switching the supply tank, the driver failed to switch the return line, hence the return was directed to the tank being filled.

The delivery was completed and unknown to the driver, the powerhouse return continued to feed the tank which he had just filled.

This went undetected for 6 hours resulting in the tank overflowing and spilling 111,000 litres of diesel. Only 37,500 litres was recovered. All of the spillage was contained within the bunded area, the unrecovered product soaked into the ground.

DGAS: 12/91 FILE No.: 276/91

## DANGEROUS GOODS STORAGE ACCIDENT REPORT

DATE: 26 December 1991 0330 hrs

LOCATION: Canning Rd
KALAMUNDA

DANGEROUS GOODS INVOLVED:

PETROL
Class 3.1 Highly Flammable Liquid
Sub-Risk
UN No. 1203
Packaging Group II
Quantity Involved 0 litres

KEROSINE
Class 3.2 Flammable Liquid
Sub-Risk
UN No. 1223
Packaging Group III
Quantity Involved 0 litres

LIQUEFIED PETROLEUM GAS
Class 2.1 Flammable Gas
Sub-Risk
UN No. 1075
Packaging Group
Quantity Involved 0 litres

**SCENARIO**

A petrol bomb was thrown into the office section of a service station in the early hours of Boxing Day.

The fire was contained mainly in the office section due to the effective action of the fire brigade.

Two of the fuel dispensers were slightly damaged in the fire, but none of the dangerous goods storage on the premises were affected.

DGAS: 27/91 FILE No.: 295/91

# DANGEROUS GOODS TRANSPORT ACCIDENTS

## INTRODUCTION

Twenty two transport accidents were recorded in 1991.Four of these involved rail transport and an additional three involved substances that are not classified as dangerous goods but are associated with the transport of dangerous goods. In effect there were 15 dangerous goods road accidents during 1991 compared with 17 for 1990 and a seven year average of 18.4.

Despite the reduced number of road accidents, the severity of the accidents was not reduced and two fatalities resulted from separate accidents in 1991.

A traffic accident involving the head on collision of two road trains, one of which was transporting ammonium nitrate resulted in the death of one of the drivers and the closure of the Brand Highway for 20 hours. A second accident, again involving a road train, left a passenger dead after the vehicle combination left the road and the cargo of aviation fuel ignited and burnt for three hours. In this latter accident, the cause of death was directly attributable to the dangerous nature of the goods on board.

Only one accident involved sodium cyanide, a reduction from the previous year when three accidents occurred. From this year's statistics, ammonium nitrate, motor spirit and hydrochloric acid all featured prominently with each being involved separately in three accidents each.

# DANGEROUS GOODS TRANSPORT ACCIDENT SUMMARY REPORT

**FOR THE YEAR 1991**

| | Date | Location | Goods | Class | Comments |
|---|---|---|---|---|---|
| 1/91 | 03/01/91 | Trigg | Hydrochloric Acid | 8 | Load shift of packages on tray top vehicle caused gate failure and spill. Gates inadequate and load not secured to vehicle. |
| 2/91 | 07/01/91 | Greenwood | Diesel Fuel | NDG | A car intercepted the path of an oncoming fuel tanker causing the tanker to roll and minor diesel spill. |
| 5/91 | 14/01/91 | West Kalgoorlie | Texanol | NDG | A leaking drum of texanol was found on a rail shipment at Kalgoorlie. Contents transferred to new drum and allowed to proceed. |
| 3/91 | 30/01/91 | Via Leonora | Sodium Cyanide | 6.1 | Road train negotiated a corner too fast, rear trailer carrying IBC's in freight container rolled over, no spillage. |
| 4/91 | 07/02/91 | Forrestfield | Diesel Fuel | NDG | Low speed collision between locomotives caused derailment with puncture to two rail tank wagons — spill of diesel fuel. |
| 13/91 | 26/02/91 | Bullabulling | Sodium Hydroxide Solution | 8 | Train derailment probably due to bearing failure. Fire spread to load but no dangerous goods involved. |
| 6/91 | 12/03/91 | Ballajura | Diluted Heptachlor | NDG | Pest control vehicle overturned in a traffic accident resulting in minor spillage of diluted pesticides. |
| 11/91 | 15/03/91 | Kwinana | Bitumen | NDG | Motor vehicle conducting overtaking manoeuvre collided with empty bitumen tanker causing serious injury to driver and passenger. |
| 7/91 | 03/04/91 | Leighton | Diesel Fuel | NDG | Derailment of five (5) rail tankers, one containing diesel fuel rolled on side. No fuel spill or tanker shell damage. Apparent cause was broken rail. |
| 8/91 | 19/04/91 | Via Kununurra | Hydrogen Peroxide | 5.1 | Lead trailer of road train caught fire enroute destroying the entire load of hydrogen peroxide and lube oils. |
| 9/91 | 23/04/91 | Hamilton Hill | Liquified Petroleum Gas | 2.1 | Articulated tanker tipped onto side whilst negotiating right hand corner. No spillage. |

NDG = Not classified as Dangerous Goods for road transport.

## DANGEROUS GOODS TRANSPORT ACCIDENT SUMMARY REPORT (continued)

| | Date | Location | Goods | Class | Comments |
|---|---|---|---|---|---|
| 10/91 | 02/06/91 | Balladonia | 2-4, D Ethylbutyl Ester | 6.1 | Rear trailer of road train rolled after avoiding kangaroos. Major spill of packaged pesticides in remote location. |
| 12/91 | 10/07/91 | Bridgetown | Acetylene | 2.1 | Cylinders left truck while negotiating bridge. Four cylinders leaked following valve damage suffered during incident. |
| 15/91 | 28/09/91 | Wooramel | Ammonium Nitrate | 5.1 | A dog trailer of a road train tipped over after several tyres blew out. |
| 14/91 | 02/10/91 | Upper Swan | Ammonium Nitrate | 5.1 | Part of a load of ammonium nitrate was lost when the hatch of the vehicle transporting the material opened in transit. |
| 18/91 | 11/10/91 | Yangebup | Hydrochloric Acid | 8 | A leaking seal allowed twenty litres of hydrochloric acid to leak into a drip tray on the vehicle. |
| 19/91 | 18/10/91 | Yokine | Hydrochloric Acid | 8 | A drum of hydrochloric acid ruptured after falling from the vehicle transporting it. |
| 16/91 | 20/10/91 | Mt Magnet | Petrol | 3.1 | Road train of petrol and aviation fuel destroyed by fire after roll over. A passenger in the prime mover was killed in the blaze. |
| 17/91 | 01/11/91 | Wilson | Petrol | 3.1 | 500 litre petrol spill whilst filling underground tanks from tanker. Internal and external valves failed to seal closed due to swarf obstructions. |
| 21/91 | 27/11/91 | Bellevue | Fenitrothion (pesticide) | 3.1 | 20 litre drum found on roadside, damaged and with slight leak. Suspected loss from vehicle due to insufficient restraint. |
| 20/91 | 02/12/91 | Regans Ford | Ammonium Nitrate | 5.1 | Head on collision of two road trains, one transporting ammonium nitrate resulted in spill and fire in the load of ammonium nitrate. |
| 22/91 | 27/12/91 | Busselton | Petrol | 3.1 | Operator error during a tanker delivery at a service station caused a 200 litre petrol spill onto the roadway. |

END OF SUMMARY REPORT

NDG = Not classified as Dangerous Goods for road transport.

## DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 3 January 1991 1430 hrs |
| LOCATION: | Charles Riley Rd<br>TRIGG |
| DANGEROUS GOODS INVOLVED: | HYDROCHLORIC ACID<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1789<br>Packaging Group II<br>Quantity Involved 200 litres<br>Quantity Spilled 40 litres |

**SCENARIO**

Nine, 20 litre packages of hydrochloric acid fell from a fully loaded tray top vehicle immediately after it had negotiated a sharp left hand bend. The load shifting against the front side restraining gate caused it to fail allowing the packages to fall from the vehicle. Package damage on impact caused a significant acid spill.

Fire Brigade personnel transferred the damaged containers to the grassed verge to contain the spillage and the spilt acid was diluted with copious quantities of water. The damaged containers were placed inside large recovery (plastic) bins for return to the consignor of the goods for product recovery and repacking.

In this incident, the gates and associated equipment were inadequate for their purpose.

DGAT: 1/91 FILE No.: 16/91

## DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 7 January 1991 1220 hrs |
| LOCATION: | Cockman Road<br>GREENWOOD |
| DANGEROUS GOODS INVOLVED: | DIESEL FUEL<br>Class Non Dangerous Goods<br>Sub-Risk<br>UN No.<br>Packaging Group<br>Quantity Involved 4000 litres<br>Quantity Spilled 5 litres |

**SCENARIO**

The driver of a fuel tanker had to brake heavily when a car darted out of a suburban side road into his path and then immediately turned right. The tanker skidded 25 metres before veering to the right and completing a 3/4 roll after the driver had lost control. The driver, although badly shaken, received only minor injuries and was treated at a local hospital.

Both the vehicle and tank were written off, primarily because of the age of the vehicle. The front left hand top corner of the tank was crushed and the internal bulk head was torn. Hatches and fittings on the top of the tank were well protected by the rollover coaming resulting in only minor product loss from the accident.

DGAT: 2/91 FILE No.: 19/91

## DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 14 January 1991 1530 hrs |
| LOCATION: | Freight Yard<br>WEST KALGOORLIE |
| DANGEROUS GOODS INVOLVED: | TEXANOL<br>Class Non Dangerous Goods<br>Sub-Risk<br>UN No.<br>Packaging Group<br>Quantity Involved 2000 litres<br>Quantity Spilled 1 litres |
| | TOLUENE<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1294<br>Packaging Group II<br>Quantity Involved 200 litres<br>Quantity Spilled 0 litres |

**SCENARIO**

A leaking 200 litre drum of texanol was found in a rail container shipment of mixed products which included toluene. The fire brigade was advised and on attendance arranged for Westrail to isolate the wagon.

Emergency response personnel then arranged for the prime contractor to decant the contents of the leaking drum into a new container, allowing the consignment to proceed to its destination.

DGAT: 5/91 FILE No.: 44/91

## DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 30 January 1991 0600 hrs |
| LOCATION: | Turnoff to Mt Morgans Mine<br>VIA LEONORA |
| DANGEROUS GOODS INVOLVED: | SODIUM CYANIDE<br>Class 6.1 Poisonous Solid<br>Sub-Risk<br>UN No. 1689<br>Packaging Group I<br>Quantity Involved 40000 litres<br>Quantity Spilled 0 litres |

**SCENARIO**

The driver of a road train negotiated the corner into a minesite access road too fast, rolling the rear trailer onto its side. The turntable bolts on the dolly converter sheared.

After the incident, two 50 tonne cranes were used to right the trailer (with container still attached) enabling the load to proceed the short distance to the mine.

The freight container sustained slight damage and there was minimal damage to the cyanide boxes. As common to previous similar accidents involving containerised sodium cyanide, there was no product spillage.

DGAT: 3/91 FILE No.: 37/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 7 February 1991 1800 hrs |
| LOCATION: | Marshalling Yards<br>FORRESTFIELD |
| DANGEROUS GOODS INVOLVED: | DIESEL FUEL<br>Class Non Dangerous Goods<br>Sub-Risk<br>UN No.<br>Packaging Group<br>Quantity Involved 108,000 litres<br>Quantity Spilled 500 litres |

**SCENARIO**

A low speed collision between two locomotives resulted in one of the locomotives overturning and the derailment of several tanker wagons.

Two of these rail tank wagons were punctured causing fuel to spill. The spilt fuel was blanketed with foam prior to recovery and the wagons were subsequently righted. Detailed investigations into the cause of the accident were conducted by Westrail.

DGAT: 4/91 FILE No.: 40/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

DATE: 26 February 1991 1530 hrs

LOCATION: 15km West of BULLABULLING

DANGEROUS GOODS INVOLVED:

SODIUM HYDROXIDE SOLUTION
Class 8 Corrosive Liquid
Sub-Risk
UN No. 1824
Packaging Group II
Quantity Involved Unknown
Quantity Spilled 0 litres

CORROSIVE LIQUIDS N.O.S.
Class 8 Corrosive Liquid
Sub-Risk
UN No. 1760
Packaging Group III
Quantity Involved Unknown
Quantity Spilled 0 litres

CORROSIVE LIQUIDS FLAMMABLE N.O.S.
Class 8 Corrosive Liquid
Sub-Risk 3
UN No. 2920
Packaging Group III
Quantity Involved Unknown
Quantity Spilled 0 litres

**SCENARIO**

A freight train travelling west slowed to assess possible damage from a bogey that was believed to have derailed earlier. Unfortunately, the train itself derailed whilst assessment was proceeding.

An overheated bearing is believed to have transmitted fire to the load. Dangerous goods were not involved in the fire, nor were any spilled. Wagons carrying dangerous goods were disconnected, re-railed and then transported away from the site.

The amount of goods carried is not known.

DGAT: 13/91 FILE No.: 180/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 12 March 1991 1500 hrs |
| LOCATION: | Marangaroo Drive<br>BALLAJURA |
| DANGEROUS GOODS INVOLVED: | DILUTED HEPTACHLOR<br>Class Non Dangerous Goods<br>Sub-Risk<br>UN No.<br>Packaging Group<br>Quantity Involved 500 litres<br>Quantity Spilled 50 litres |
| | DILUTED CHLORPYRIFOS<br>Class Non Dangerous Goods<br>Sub-Risk<br>UN No.<br>Packaging Group<br>Quantity Involved 500 litres<br>Quantity Spilled 50 litres |

**SCENARIO**

A collision between a pest control vehicle and a sedan resulted in the pest control vehicle overturning and some dilute chemical spilling onto the roadway.

The spill was subsequently absorbed with sand and removed. A passenger in the sedan was treated in hospital after extensive contact with the spilled material which by virtue of its dilution was not classed as dangerous goods.

DGAT: 6/91 FILE No.: 64/91

## DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 15 March 1991 1435 hrs |
| LOCATION: | Mason Road<br>KWINANA |
| DANGEROUS GOODS INVOLVED: | BITUMEN<br>Class Non Dangerous Goods<br>Sub-Risk<br>UN No.<br>Packaging Group<br>Quantity Involved 0 litres<br>Quantity Spilled 0 litres |

**SCENARIO**

Whilst engaged in a overtaking manoeuvre a motor vehicle collided with the prime mover of an empty bitumen tanker. The young driver of the motor vehicle and his passenger sustained serious injuries. The bitumen tanker was not damaged.

DGAT: 11/91 FILE No.: 149/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 3 April 1991 1345 hrs |
| LOCATION: | Freight Yard<br>LEIGHTON |
| DANGEROUS GOODS INVOLVED: | DIESEL FUEL<br>Class Non Dangerous Goods<br>Sub-Risk<br>UN No.<br>Packaging Group<br>Quantity Involved 93,190 litres<br>Quantity Spilled 0 litres |
| | PETROL<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1203<br>Packaging Group II<br>Quantity Involved 22,370 litres<br>Quantity Spilled 0 litres |

**SCENARIO**

Five narrow gauge rail tank cars were derailed after striking a broken rail whilst loaded tankers were being pulled from a fuel terminal through the Westrail Leighton yards.

Four tankers remained upright and the other rolled onto its side resulting in no damage to the tanker shells nor any fuel spillage. Emergency services and consignor representatives were alerted and attended as a precautionary measure. The Westrail derailment crew attended and resolved the incident, rerailing all vehicles.

DGAT: 7/91 FILE No.: 69/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 19 April 1991 1100 hrs |
| LOCATION: | Great Northern Hwy<br>VIA KUNUNURRA |
| DANGEROUS GOODS INVOLVED: | HYDROGEN PEROXIDE<br>Class 5.1 Oxidising Liquid<br>Sub-Risk 8<br>UN No. 2014<br>Packaging Group II<br>Quantity Involved 725 litres<br>Quantity Spilled 725 litres |

**SCENARIO**

The lead trailer of a road train caught fire whilst enroute approximately 80 kilometres south of Kununurra. The trailer and the load were extensively damaged.

The products involved in the fire were hydrogen peroxide and some combustible material. The site was cleared after the incident. All hazardous materials were destroyed in the fire - its cause remained undetermined.

DGAT: 8/91 FILE No.: 86/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 23 April 1991 1820 hrs |
| LOCATION: | Stock Road<br>HAMILTON HILL |
| DANGEROUS GOODS INVOLVED: | LIQUEFIED PETROLEUM GAS<br>Class 2.1 Flammable Gas<br>Sub-Risk<br>UN No. 1075<br>Packaging Group<br>Quantity Involved 39000 litres<br>Quantity Spilled 0 litres |

**SCENARIO**

An articulated LPG tanker, turned right at a traffic light controlled intersection and on reaching the apex of its turn fell onto its left hand side and skidded onto the road-side verge.

Emergency services were mobilised and the area quickly cordoned off in order to reduce the possibility of explosion should a gas leak have developed. Preparations were also in hand if evacuation of the surrounding residences was considered necessary during any stage of the recovery process.

Recovery of the vehicle was carried out by pumping approximately 34% of the load into another road tanker, and then righting the damaged tanker using two 50 tonne mobile cranes. When the tanker was upright it was towed to the owner's depot for product removal and damage assessment.

There was no product loss and damage to the tanker barrel was limited to denting and abrasions.

DGAT: 9/91 FILE No.: 90/91

## DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 2 June 1991 1000 hrs |
| LOCATION: | Eyre Highway 60km East of BALLADONIA |
| DANGEROUS GOODS INVOLVED: | 2-4. D ETHYLBUTYL ESTER<br>Class 6.1 Poisonous Liquid<br>Sub-Risk<br>UN No. 3000<br>Packaging Group III<br>Quantity Involved 12420 litres<br>Quantity Spilled 12420 litres<br><br>TRIFLURALIN<br>Class 3.2 Flammable Liquid<br>Sub-Risk<br>UN No. 1142<br>Packaging Group III<br>Quantity Involved 640 litres<br>Quantity Spilled 640 litres |

**SCENARIO**

The driver of a road train, the rear trailer of which was loaded with packaged dangerous goods, veered suddenly to avoid kangaroos.

The rear trailer wheels dropped from the bitumen road surface and the trailer subsequently rolled over resulting in approximately 80% of its load rupturing on impact and causing a severe spill.

Emergency operations were initiated from Perth, these being hampered by difficult communications and the remoteness of the spill (approximately 1000 km east of Perth).

Salvage operations using oversize drums proceeded as far as possible and the remaining spillage was buried off the roadside. The overall salvage and cleanup operation took approximately 60 hours.

DGAT: 10/91 FILE No.: 130/91

## DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

DATE: 10 July 1991 1220 hrs

LOCATION: South Western Highway
BRIDGETOWN

DANGEROUS GOODS INVOLVED:

ACETYLENE
Class 2.1 Flammable Gas
Sub-Risk
UN No. 1001
Packaging Group
Quantity Involved 270 litres
Quantity Spilled 45 litres

COMPRESSED OXYGEN
Class 2.2 Compressed Gas
Sub-Risk 5.1
UN No. 1072
Packaging Group
Quantity Involved 430 litres
Quantity Spilled 47 litres

COMPRESSED CARBON DIOXIDE
Class 2.2 Compressed Gas
Sub-Risk
UN No. 1981
Packaging Group
Quantity Involved 95 litres
Quantity Spilled 95 litres

**SCENARIO**

A semi trailer travelling south on the South Western Highway lost part of its load of gas cylinders while negotiating a bridge. Seventeen cylinders fell from the truck, a number of which crashed through the bridge railing, landing at the edge of the river bed while the rest of the cylinders bounced along the roadway coming to rest in bush at the road edge.

Four cylinders were sufficiently damaged to lose their contents. The remaining cylinders were emptied of their contents by the consignor, prior to all the empty cylinders being removed from the scene.

DGAT: 12/91 FILE No.: 177/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 28 September 1991 1000 hrs |
| LOCATION: | North West Coastal Highway<br>WOORAMEL |
| DANGEROUS GOODS INVOLVED: | AMMONIUM NITRATE<br>Class 5.1 Oxidising Solid<br>Sub-Risk<br>UN No. 1942<br>Packaging Group III<br>Quantity Involved 28100 kg<br>Quantity Spilled 20000 kg |

**SCENARIO**

A road train consisting of a prime mover and two belly dump trailers was carrying 54 tonne of prilled ammonium nitrate. A series of blow-outs in the tyres of the second dog trailer resulted in it becoming unstable. The driver attempted to control the vehicle but it moved off the paved surface on to the road verge and eventually the rear dog trailer overturned, spilling part of the load.

DGAT: 15/91 FILE No.: 245/91

## DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 2 October 1991 1250 hrs |
| LOCATION: | Great Northern Highway<br>UPPER SWAN |
| DANGEROUS GOODS INVOLVED: | AMMONIUM NITRATE<br>Class 5.1 Oxidising Solid<br>Sub-Risk<br>UN No. 1942<br>Packaging Group III<br>Quantity Involved 32000 kg<br>Quantity Spilled 3000 kg |

**SCENARIO**

A road train was heading north on Great Northern Highway to a minesite at Cue. The hatch of the lead vehicle opened in transit spilling part of its load along the highway.

The driver noticed the spill and stopped within 500m to shut the hatch. Police closed the highway and local shire employees removed the spill by means of the Shire's road sweeper. The highway was re-opened after the spilt material was removed to the Shire's gardening centre (for recycling rather than disposal).

DGAT: 14/91 FILE No.: 233/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 11 October 1991 1750 hrs |
| LOCATION: | Stock Road<br>YANGEBUP |
| DANGEROUS GOODS INVOLVED: | HYDROCHLORIC ACID<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1789<br>Packaging Group II<br>Quantity Involved 15000 litres<br>Quantity Spilled 20 litres |

**SCENARIO**

While travelling north along Stock Road, acid leaked from a mechanical pump seal into a drip tray on the vehicle. It was suspected that some of the acid may have lapped over the drip tray and onto the roadway but no residue could be found to confirm this. Company personnel were called out to arrest the leak before the truck continued on to its destination.

Emergency response units were not activated.

DGAT: 18/91 FILE No.: 263/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 18 October 1991 1400 hrs |
| LOCATION: | Woodrow Avenue<br>YOKINE |
| DANGEROUS GOODS INVOLVED: | HYDROCHLORIC ACID<br>Class 8 Corrosive Liquid<br>Sub-Risk<br>UN No. 1789<br>Packaging Group II<br>Quantity Involved 20 litres<br>Quantity Spilled 20 litres |

**SCENARIO**

Emergency services were called to the site of an acid spill after the driver of a vehicle transporting hydrochloric acid failed to stop after one of the drums of acid fell from the back of his vehicle. The drum split losing its contents and the spilt acid was neutralized with lime prior to disposal.

DGAT: 19/91 FILE No.: 264/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 20 October 1991 2005 hrs |
| LOCATION: | Great Northern Highway<br>MT MAGNET |
| DANGEROUS GOODS INVOLVED: | PETROL<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1203<br>Packaging Group II<br>Quantity Involved 12000 litres<br>Quantity Spilled 12000 litres<br><br>AVGAS<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1203<br>Packaging Group II<br>Quantity Involved 25000 litres<br>Quantity Spilled 25000 litres<br><br>JET A1<br>Class 3.2 Flammable Liquid<br>Sub-Risk<br>UN No. 1223<br>Packaging Group II<br>Quantity Involved 40000 litres<br>Quantity Spilled 40000 litres |

**SCENARIO**

A double road train conveying motor spirit and aviation fuel left the road at a point 15km south of Mt Magnet. The vehicle combination rolled over and burst into flames resulting in the death of a passenger on the vehicle and injury to the driver and a second passenger as well as the total loss of the vehicles and load.

Volunteer fire fighters from Mt Magnet extinguished the blaze and the injured were removed to a Perth hospital by the Flying Doctor Service.

Charges were laid against the driver for driving under the influence of alcohol and his dangerous goods driver's licence was suspended pending the hearing of the charges. Charges were also laid against a passenger for unauthorised use of the motor vehicle earlier in the journey.

DGAT: 16/91 FILE No.: 248/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 1 November 1991 1110 hrs |
| LOCATION: | Service Station. Bungaree Rd<br>WILSON |
| DANGEROUS GOODS INVOLVED: | PETROL<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1203<br>Packaging Group II<br>Quantity Involved 36000 litres<br>Quantity Spilled 500 litres |

**SCENARIO**

A tanker driver was undertaking a normal petrol delivery by gravity feed into an underground tank at a service station. As the first compartment was nearing empty, he commenced preparing the second compartment for discharge by removing the cam-lock cap, resulting in an unexpected flow of petrol.

The driver took emergency action by pulling the draw bar which closes all of the internal valves simultaneously. Product continued to flow even though both the internal and external valves were closed. He then transferred the hose from the first compartment and completed the delivery, however approximately 500 litres of petrol had been spilled. Emergency services were notified and attended to clean up by absorbing the spill with sand.

Examination of the tanker's valves revealed that metal swarf had been caught in the internal valve preventing it from sealing. It is presumed that the swarf also prevented the external valve from sealing.

DGAT: 17/91 FILE No.: 253/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 27 November 1991 1700 hrs |
| LOCATION: | Elder Wy<br>BELLEVUE |
| DANGEROUS GOODS INVOLVED: | FENITROTHION (PESTICIDE)<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk 6 Poisonous Liquid<br>UN No. 2784<br>Packaging Group II<br>Quantity Involved 20 litres<br>Quantity Spilled 12 litres |

**SCENARIO**

Children in a residential area adjacent to a light industrial area were found playing with a leaking 20 litre drum of insecticide, believed to have fallen from a vehicle in transit.

Chime damage from impact caused leakage and a loss of half of the drum's contents.

Emergency services were called upon to recover the drum and spilled product using sand; all residues being packed into an overdrum and disposed under Health Department supervision.

The source of the drum could not be ascertained.

DGAT: 21/91 FILE No.: 286/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 2 December 1991 1430 hrs |
| LOCATION: | Brand Highway<br>REGANS FORD |
| DANGEROUS GOODS INVOLVED: | AMMONIUM NITRATE<br>Class 5.1 Oxidising Solid<br>Sub-Risk<br>UN No. 1942<br>Packaging Group III<br>Quantity Involved 54000 kg<br>Quantity Spilled 45000 kg |

**SCENARIO**

A road train of ammonium nitrate consisting of a prime mover and two bottom discharge trailers was travelling north on the Brand Highway when a collision occurred with a south bound road train consisting of a prime mover and two side dump trailers of mineral sands.

Both vehicles suffered extensive damage and a fire ensued gutting both combinations. Ammonium nitrate was spread over a wide area but 1 trailer retained approximately 10 tonne in the bulk hopper.

During the fire, ammonium nitrate melted and flowed some 15 metres from the crash site. Most spilt product was removed from the site but some that was buried with other crash debris continued to fume necessitating additional cleanup soon after.

The road was closed for 18 hours while heavy vehicle wreckage was removed. The driver of the mineral sands vehicle died as a result of injuries received in the crash.

DGAT: 20/91 FILE No.: 272/91

# DANGEROUS GOODS TRANSPORT ACCIDENT REPORT

| | |
|---|---|
| DATE: | 27 December 1991 1545 hrs |
| LOCATION: | Bussell Highway<br>BUSSELTON |
| DANGEROUS GOODS INVOLVED: | PETROL<br>Class 3.1 Highly Flammable Liquid<br>Sub-Risk<br>UN No. 1203<br>Packaging Group II<br>Quantity Involved 27000 litres<br>Quantity Spilled 200 litres |

**SCENARIO**

The driver of a tanker vehicle attended at a service station to refill a 10000 litre petrol underground tank.

Prior to filling, a dip reading of the tank indicated that it had sufficient capacity to take the 3690 litres of petrol from compartment 2 of the tanker vehicle.

At the time, compartment 1 on the tanker had 5140 litres of petrol on board.

Instead of connecting the loading hose to the outlet valve of compartment 2, the driver accidentally connected it to compartment 1, which contained the larger volume of petrol.

When the tank became full, approximately 200 litres of petrol flowed out of the dip point of the tank (the dip cap was not secured properly) onto the service station forecourt, then onto the highway.

Once the spillage was noticed, the driver shut the tank outlet valve on the tanker, and the police and fire brigade were contacted for assistance.

Traffic was diverted away from the spill area, while emergency services cleaned up the spill.

DGAT: 22/91 FILE No.: 293/91



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