DEPARTMENT OF
MINERALS AND ENERGY
WESTERN AUSTRALIA

GOVERNMENT OF
WESTERN AUSTRALIA

Explosives and Dangerous Goods Act 1961

SUMMARY OF ACCIDENT REPORTS

1998

ISSN 1038-6254

EXPLOSIVES AND DANGEROUS GOODS DIVISION

MINERAL HOUSE, 100 PLAIN STREET, EAST PERTH, WESTERN AUSTRALIA

Table of Contents

Summary of Accident Reports 1998

Summary Overview

1998 was a bleak year for dangerous goods accidents.

Transport accidents were higher than the 10-year average; there were five more explosives accidents than the zero recorded in 1997; and storage accidents increased by 3 to 19.

Some of the explosives accidents are particularly noteworthy. Two were caused by the misuse of explosives in a mischievous way. This certainly re-enforces the dictum that it is foolhardy to play with explosives.

Despite the increase in numbers, the year was not without some bright spots.

For many years Westrail has invested in training its people in the safety aspects of dangerous goods transport. This has resulted in a vigilant and competent staff who identified a series of problems with sulfuric acid transport and acted promptly in every case to minimise the danger.

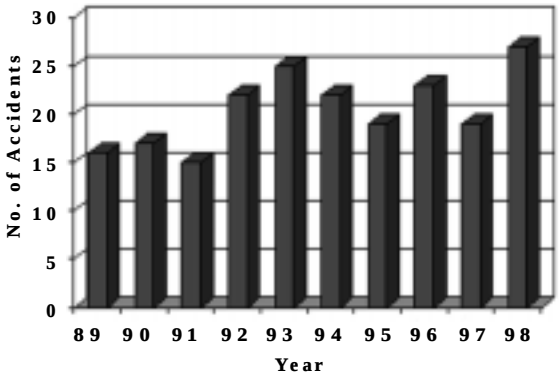
- We will be working hard to make 1999 better and safer.
- Training seminars in dangerous goods transport have been scheduled.
- New transport legislation will be introduced for dangerous goods and explosives.
- There will be more legal action; prosecutions or on the spot fines.
- Industry will be made more aware of its responsibility to keep accidents down.

K Price
Director
EXPLOSIVES AND DANGEROUS GOODS DIVISION

14 May 1999

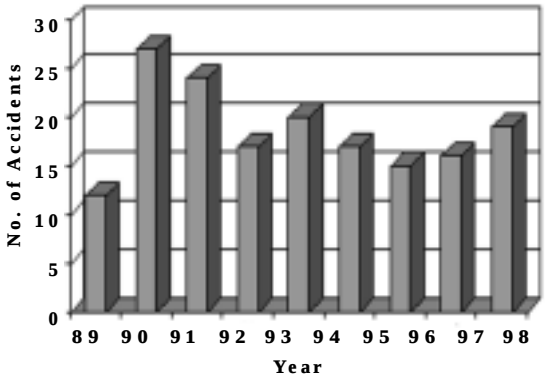
Explosives and Dangerous Goods Accident Statistics

Transport Accidents



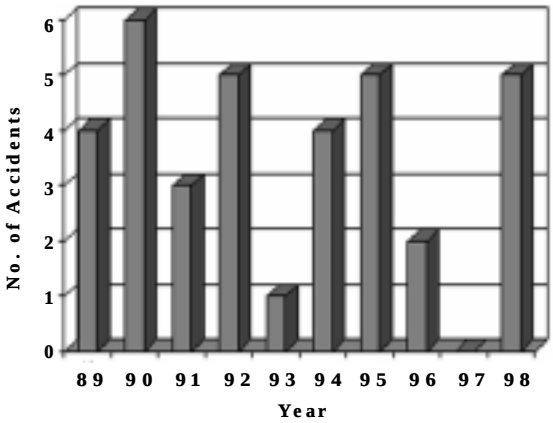
The number of dangerous goods transport accidents recorded in 1998 was more than the number recorded in 1997.

Storage Accidents



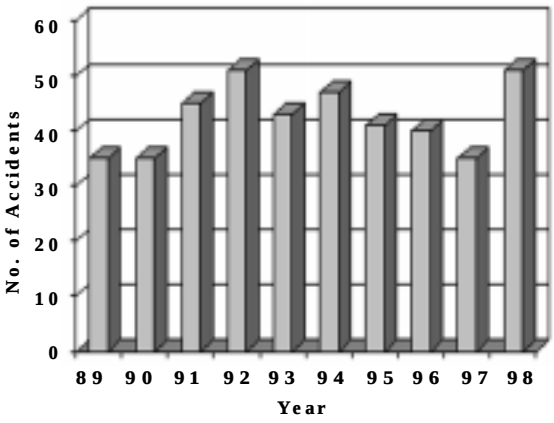
The number of storage accidents recorded in 1998 was three more than recorded in the previous year. However, 19 accidents is in line with the ten-year average of approximately 20.

Explosives Accidents



Five accidents were recorded in 1998, the same number of accidents as 1995 and 1992.

Total Accidents



The total number of accidents recorded in 1998 is more than the number recorded in the previous years.

Explosives Accidents

Introduction

It was most discouraging that five incidents involving explosives were recorded by the Division in 1998. This is the same number as in 1995 and twice the total of the last two years.

Two of the incidents involved unauthorised use of explosives that resulted in injuries to the users. The first involved a teenage boy who sustained superficial injuries whilst handling detonators. The second incident involved a farmhand sustaining severe injuries when he initiated a cartridge of high explosives. Both of these injuries highlight that only persons with demonstrated experience with explosives should handle them.

Another of the incidents resulted in a small burn to a spectator at a fireworks display, when fireworks were accidentally fired over the spectators' area. This injury, though minor, emphasises the need for fireworks operators to ensure that correct separation distances are maintained between the display area and spectators.

Explosives Accident Summary Report

	Date	Location	Goods	Class	Comments
W02	31/01/1998	YARRIE	**Fuse, Safety**	1.4	A two metre length of safety fuse burnt in less than five seconds resulting in a premature blast.
W01	28/03/1998	GERALDTON	**Detonators, Non-Electric**	1.1	A teenage boy sustained superficial injuries to his hand and face when he accidentally initiated a detonator.
W03	02/04/1998	ONGERUP	**Explosive, Blasting, Type E**	1.1	A farmhand misusing explosives and using short fuses received servere injuries.
W04	05/09/1998	BROOME	**Fireworks**	1.4	A spectator received a small burn when fireworks were accidentally fired over the spectators' area.
W05	11/12/1998	BEDFORDALE	**Explosive, Blasting, Type B**	1.1	Flyrock from a blast landed on occupied residential properties, however there were no injuries.

Explosives Accident Report

Date	:	31 January 1998	**Time**	1350 hours
Location	:	Marble Bar-Shay Gap Rd YARRIE		
Explosives Involved	:	**FUSE, SAFETY**		
		Class	:	1.4
		Compatibility Group	:	S
		UN No.	:	0105
		Quantity Present	:	4 metres
		Quantity Involved	:	2 metres

Incident

A near fatal accident occurred at a minesite when the safety fuse used to initiate a blast burned at an accelerated rate.

The blast crew had previously been experiencing problems with the safety fuse resulting in misfires and hence tied two 2-metre rods to the trunkline. As the shotfirer lit the second fuse, he heard a "popping" sound from the first fuse he lit and immediately afterwards the blast initiated. Instead of the anticipated 200 seconds for the fuses to burn, it is estimated that it took only five seconds for the first fuse. The shotfirer and his assistant took refuge behind a nearby parked vehicle. Both blast crew members were only ten metres from the closest portion of the blast and fortunately were located on the bench rather than at the base of the section being fired. No-one was injured, but two vehicles were damaged as a result of the incident.

Cause

The rapid burning rate of the safety fuse was the primary cause of the incident.

Consequences

A ban was immediately placed on the use and sale of the safety fuse. The burnt fuse and the remainder of the roll was taken for forensic examination. Samples of the fuse from the same manufacturing batch were also examined in the country of origin. It was concluded that the most likely cause of the rapid burning rate of the fuse was that it was subjected to catastrophic physical damage. The supplier of the fuse has subsequently withdrawn it from the market place.

EA : W02/98 **FILE No. : 90/98**

Explosives Accident Report

Date	:	28 March 1998	**Time**	2000 hours
Location	:	Mullewa Rd GERALDTON		
Explosives Involved	:	**DETONATORS, NON-ELECTRIC**		
		Class	:	1.1
		Compatibility Group	:	B
		UN No.	:	0029
		Quantity Present	:	7
		Quantity Involved	:	1

Incident

A teenage boy took seven plain detonators to the local speedway in Geraldton. During the evening, the boy placed one of the detonators in a toilet paper roll and set fire to it, however the detonator failed to detonate. The boy then tried to remove the detonator from inside the toilet roll with a stick, holding a cigarette lighter to see what he was doing. Soon afterwards the detonator detonated.

The boy received superficial injuries to his hand and face, and spent three days in hospital.

Cause

Poor security at the boy's father's farm allowed the boy to obtain and misuse the detonators.

Consequences

The remaining six detonators were disposed of by the Police. The detonators were originally obtained from the boy's father's farm and more detonators located at the farm were also disposed of.

EA : W01/98 **FILE No. : 52/98**

Explosives Accident Report

Date : 2 April 1998 **Time** 1600 hours

Location : Gnowangerup-Jerramungup Rd
ONGERUP

Explosives Involved : **EXPLOSIVE, BLASTING, TYPE E**

Class	:	1.1
Compatibility Group	:	D
UN No.	:	0241
Quantity Present	:	21 kg
Quantity Involved	:	0.125 kg

Incident

A farm employee received serious injuries when a cartridge of explosives exploded in his hand.

The owner of the farm, the employee and some friends had a barbecue together with some beers. While the owner and friends were still talking inside the shed, the employee decided to initiate a few cartridges of explosives in close proximity to the shed. After lighting the fuse of one of the cartridges and while still holding it, the cartridge detonated prematurely in his hand. The employee was rushed by ambulance and Royal Flying Doctor Service to a hospital in Perth. The length of the fuse was only approximately 150 millimetres.

The injuries received by the employee were loss of the right hand to just beyond his wrist, loss of his right eye and severe lacerations to the right side of his face and upper body.

Cause

A farmhand misusing explosives was the main cause of the accident.

Consequences

The owner of the farm was charged by the Police for illegally obtaining and possessing explosives. All the explosives were confiscated by the Police and subsequently destroyed.

EA : W03/98 **FILE No. : 91/98**

Explosives Accident Report

Date	:	5 September 1998	**Time**	2015 hours
Location	:	Napier Tce BROOME		
Explosives Involved	:	**FIREWORKS**		
		Class	:	1.4
		Compatibility Group	:	G
		UN No.	:	0336
		Quantity Present	:	100 kg
		Quantity Involved	:	0.2 kg

Incident

During a fireworks display, a piece of fireworks landed in the spectators' area and a spectator received a small burn, which was treated by ambulance officers.

Cause

One of the ground based firework devices consisted of a number of cartridges within one package and during the firing of this device, there was a malfunction which involved cartridges separating. Investigation indicated that the separation distance between the spectators' area and the fireworks firing zone was less than prescribed in Australian Standard 2187.4-1998.

Consequences

The permit of the fireworks operator was suspended. A Divisional inspector supervised the operator's next fireworks display and, based on a satisfactory performance, the operator's permit was reinstated.

EA : W04/98 **FILE No. : 155/98**

Explosives Accident Report

Date : 11 December 1998 **Time** 1200 hours

Location : Albany Hwy
BEDFORDALE

Explosives Involved : **EXPLOSIVE, BLASTING, TYPE B**

Class	:	1.1
Compatibility Group	:	D
UN No.	:	0082
Quantity Present	:	200 kg
Quantity Involved	:	200 kg

EXPLOSIVE, BLASTING, TYPE E

Class	:	1.1
Compatibility Group	:	D
UN No.	:	0241
Quantity Present	:	6 kg
Quantity Involved	:	6 kg

DETONATOR ASSEMBLIES, NON-ELECTRIC

Class	:	1.1
Compatibility Group	:	B
UN No.	:	0360
Quantity Present	:	100
Quantity Involved	:	100

Incident

A construction company was using explosives for the widening of Albany Highway in the outer metropolitan area of Perth. One of the blasts resulted in flyrock falling approximately 200 metres from the blast area. The flyrock landed on occupied residential properties, however there were no injuries.

Cause

The incident investigation indicates that flyrock appears to be due to inadequate use of earthen cover or blast mats over blast holes, though experience from previous similar blasts suggested that blast mats may not have been necessary.

Consequences

The blasting sub-contractor was advised to cease blasting operations at the project until such time as they could provide assurance that there would not be a recurrence. The blasting sub-contractor revised blasting procedures before being allowed to recommence blasting operations. Subsequent blasting operations have progressed satisfactorily.

The Division is evaluating the possibility of prosecution for breaches of the Explosives Regulations 1963.

EA : WO5/98 **FILE No. : 199/98**

Dangerous Goods Storage Accidents

Introduction

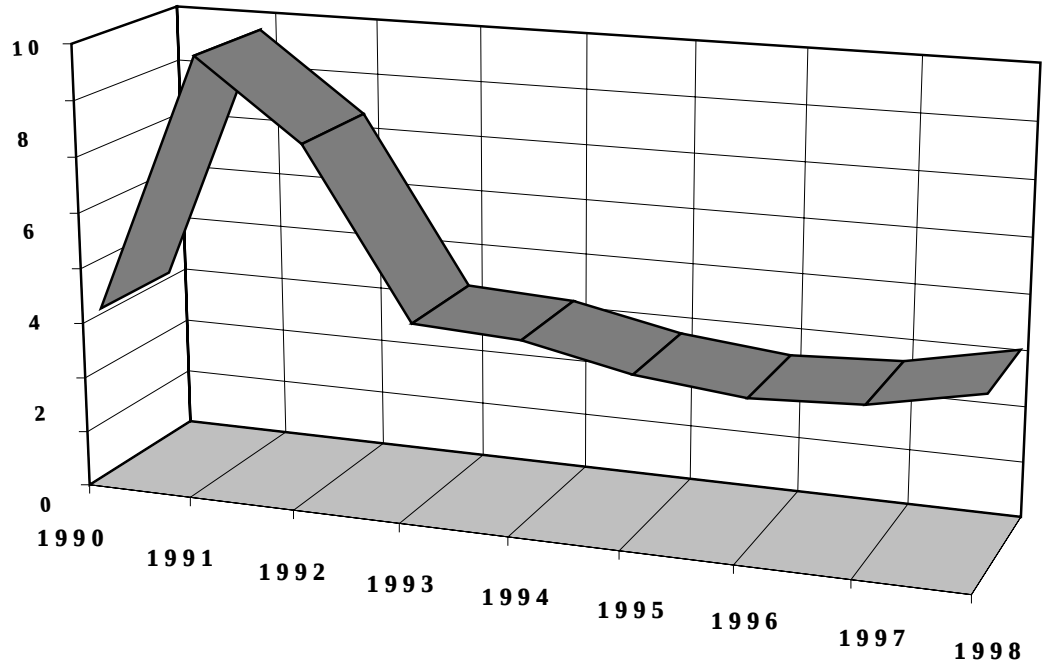
Nineteen accidents involving the storage of dangerous goods, that met the criteria for the recording of an accident, were reported to the Division in 1998, compared to sixteen in 1997 and fifteen in 1996.

Though there has been a slight increase over recent years, the trend for accidents involving storage of dangerous goods is static.

Of the nineteen incidents, five occurred at sites classified as major hazards facilities (MHFs). MHFs are sites which due to the complexity of the processing plant and/or quantity of stored or processed dangerous goods, are required to have in place additional safeguards such as formalised safety management systems and risk assessments, in order to control the hazards from these sites. None of the recorded incidents from existing MHFs resulted in a significant off-site impact nor were residential populations affected.

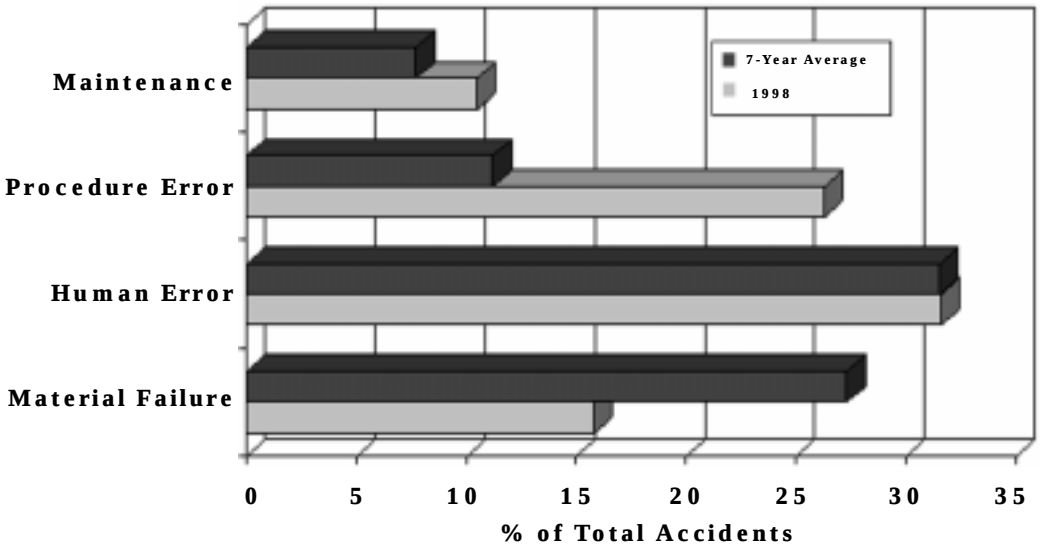
The most significant incident of 1998 was a leak of 54 tonnes of LP Gas from a Kwinana refinery. Due to the safety systems in place and favourable weather conditions, the leak was dispersed and did not ignite. The operators of this facility are currently formalising site safety systems to meet the requirements of the MHFs Standard. An analysis of this incident carried out by the Division has shown that in a 'worst case' situation the leakage was unlikely to escalate to an extent that would lead to any loss of supply to the state or any significant off-site impact.

Selected Storage Accident Statistics



Number of Accidents per 1 000 licensed Premises

The 1998 figure is similar to that recorded in recent years, confirming the trend of about three accidents per 1 000 licensed premises. There are almost 6 000 premises licensed to store dangerous goods in Western Australia.



Causes of Storage Accidents - (1998 vs 7-Year Average)

In line with previous years, the major causal group of storage accidents is the failure of people to follow standard operating procedures (reported as human error).

Dangerous Goods Storage Accident Summary Report

	Date	Location	Goods	Class	Comments
W01	01/01/1998	WOOROLOO	**Chlorine**	2.3	Failure to follow operating procedures resulted in chlorine gas escaping from a 58 litre cylinder. This resulted in two persons requiring medical attention and the isolation of the leak by the Fire and Rescue Service.
W04	12/01/1998	COOLGARDIE	**Diesel Fuel**	C1	Diesel fuel spilt from a vehicle at a service station site onto a public road.
W02	15/02/1998	NEWMAN	**Calcium Hypochlorite, Hydrated**	5.1	Chlorine gas emanating from spilt hydrated calcium hypochlorite caused chlorine gas detectors to activate at a swimming pool complex.
W03	16/02/1998	NEWMAN	**Calcium Hypochlorite, Hydrated**	5.1	Chlorine gas emanating from corroded drums of hydrated calcium hypochlorite caused chlorine gas detectors to activate at a swimming pool complex.
W07	23/02/1998	KWINANA	**Titanium Tetrachloride**	8	A release of titanium tetrachloride, from a process vessel fracture, reacted with moisture in the air to produce a highly visible cloud, which drifted off-site.
W05	04/03/1998	CANNING VALE	**Hydrochloric Acid**	8	Contaminated product was used for the preparation of a dipping bath which produced a smelly vapour. Independent testing showed that the contaminant was turpentine and the manufacturers were notified.
W06	16/03/1998	MANDURAH	**Petrol**	3	A boat caught fire at the forecourt of a service station when the boat was being refuelled.
W08	28/03/1998	CHRISTMAS ISLAND	**Diesel Fuel**	C1	Approximately 60 000 litres of diesel fuel was lost from a bulk storage tank when corrosion of the underside of the tank floor created a hole.
W09	29/03/1998	WANNEROO	**Methyl Bromide**	2.3	A potting mix fire produced sufficient heat to cause a nearby methyl bromide cylinder to explode.

Dangerous Goods Storage Accident Summary Report

	Date	Location	Goods	Class	Comments
W12	13/05/1998	KWINANA BEACH	**Hydrogen Chloride**	8	Solid material which dislodged during maintenance, reacted with water in a sump to produce titanium dioxide and hydrogen chloride gas. The releaseexceeded the capacity of the scrubber and drifted off-site.
W13	20/05/1998	KWINANA	**Ammonia**	2.3	A release of ammonia occurred after liquid ammonia entered a flare system. The incident resulted from a maintenance problem with level indication instrumentation and lack of procedures for appropriate alignment of valves.
W10	19/06/1998	NORTH FREMANTLE	**Ethyl Mercaptan**	3	Overfilling was suspected as the cause of a burst rupture disc on an ethyl mercaptan cylinder that resulted in a vapour leak.
W11	04/07/1998	KWINANA	**Nitric Acid**	8	Nitric acid was released from a nitric acid absorber tower when inappropriate (mild steel) flange bolts failed due to corrosion.
W14	11/08/1998	KWINANA	**Ammonia**	2.3	Ammonia was vented from a flare when the flare capacity was exceeded whilst commissioning a new liquid ammonia pipeline.
W15	07/09/1998	BASSENDEAN	**Petroleum Gases, Liquefied**	2.1	A bleed valve iced during filling of an autogas tank and began leaking once thawed.
W19	08/10/1998	COLLIE	**Sodium Hypochlorite**	8	Using incompatible material for pipe fittings caused 6 500 litres of sodium hypochlorite to leak out of a 13 000 litre tank.
W17	05/11/1998	MYAREE	**Sulfur Dioxide**	2.3	A minor sulfur dioxide gas leak was caused by a pipe being crushed by machinery.
W18	01/12/1998	KWINANA	**Petroleum Gases, Liquefied**	2.1	A gasket failure resulted in loss to atmosphere of LP Gas from a storage vessel.
W20	04/12/1998	WELSHPOOL	**Ethanol**	3	A spectacular fire destroyed a packing shed used for flammable liquids and solids. Frictional ignition of sulfur was the likely cause of the fire.

Dangerous Goods Storage Accident Report

Date	:	1 January 1998	**Time**	0655 hours
Location	:	Linley Valley Rd WOOROLOO		
Dangerous Goods Involved	:	**CHLORINE**		
		Class	:	2.3
		Sub-Risk	:	5.1
		UN No.	:	1017
		Packing Group	:	-
		Quantity Present	:	58 litres
		Quantity Involved	:	32 litres

Incident

During maintenance of a swimming pool chlorination system the chlorine regulator was removed prior to the valve on the chlorine cylinder being fully closed. This led to the uncontrolled release of chlorine gas, which resulted in the pool attendant and a prison officer requiring medical attention and the area being cordoned off until the Fire and Rescue Service was able to isolate the leak. No persons off-site were affected.

Cause

Failure to follow correct procedures caused the release of chlorine gas.

Consequences

Chlorine handling procedures have been amended in order to help prevent a repeat of this incident.

Details of this incident together with statutory safety requirements have been forwarded to the Royal Lifesaving Society for distribution to its members.

DGAS : W01/98 **FILE No. : 6/98**

Dangerous Goods Storage Accident Report

Date	:	12 January 1998	**Time**	1700 hours
Location	:	Bayley St COOLGARDIE		
Dangerous Goods Involved	:	**DIESEL FUEL**		
		Class	:	Cl
		Sub-Risk	:	-
		UN No.	:	-
		Packing Group	:	-
		Quantity Present	:	45 000 litres
		Quantity Involved	:	200 litres

Incident

Approximately 200 litres of diesel fuel spilt from a diesel refuelling service station onto a public street.

Cause

The cause could not be ascertained. However, it seems likely that the incident was due to overfilling of an unattended vehicle. The contributing factors were: no spillage control for the site and also possibly defective operating procedures and/or faulty nozzle automatic shut-off device.

Consequences

The site was inspected and the operator was instructed to comply with relevant sections of Australian Standard 1940-1993.

DGAS : W04/98 **FILE No. : 40/98**

Dangerous Goods Storage Accident Report

Date	:	15 February 1998	**Time**	1630 hours
Location	:	Rogers Pl NEWMAN		
Dangerous Goods Involved	:	**CALCIUM HYPOCHLORITE, HYDRATED**		
		Class	:	5.1
		Sub-Risk	:	-
		UN No.	:	2880
		Packing Group	:	II
		Quantity Present	:	160 kg
		Quantity Involved	:	1 kg

Incident

The Fire and Rescue Service attended the town's swimming pool complex after the chlorine gas alarm activated. The staff moved patrons to one end of the premises as required by the premises' emergency plan. During the incident it was revealed that the chlorine gas was emanating from the floor of a storage shed where hydrated calcium hypochlorite had been spilt. There was no evacuation during the incident.

Cause

Hydrated calcium hypochlorite was not cleaned up after a spill. Consequently, chlorine gas evolved.

Consequences

The licensee has ensured procedures are in place so that any spilt chemicals are cleaned in accordance with the relevant material safety data sheet.

DGAS : W02/98 **FILE No. : 39/98**

Dangerous Goods Storage Accident Report

Date	:	16 February 1998	**Time**	1700 hours
Location	:	Rogers Pl NEWMAN		
Dangerous Goods Involved	:	**CALCIUM HYPOCHLORITE, HYDRATED**		
		Class	:	5.1
		Sub-Risk	:	-
		UN No.	:	2880
		Packing Group	:	II
		Quantity Present	:	160 kg
		Quantity Involved	:	120 kg

Incident

A chlorine gas alarm activated after detecting chlorine gas at the town's swimming pool complex. The Fire and Rescue Service attended and removed three 40 kg drums of calcium hypochlorite.

Investigation revealed that a burst water pipe had forced water into the calcium hypochlorite storage. The drums had consequently corroded allowing water to react with the calcium hypochlorite, which resulted in the evolution of chlorine gas.

Cause

Inappropriate storage conditions allowed calcium hypochlorite drums to come into contact with water.

Consequences

The staff were briefed on the correct storage requirements for calcium hypochlorite and the calcium hypochlorite drum storage area was modified to be water/moisture free.

DGAS : W03/98 **FILE No. : 38/98**

Dangerous Goods Storage Accident Report

Date	:	23 February 1998	**Time**	2027 hours
Location	:	Mason Rd KWINANA		
Dangerous Goods Involved	:	**TITANIUM TETRACHLORIDE**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1838
		Packing Group	:	II
		Quantity Present	:	1 200 litres
		Quantity Involved	:	12 litres

Incident

A release of titanium tetrachloride ($TiCl_4$), from a fracture in a process cyclone, reacted with moisture in the air to produce a visible cloud of titanium dioxide particulate and hydrogen chloride.

As the cloud drifted off-site, the site operator initiated protocols for notifying neighbouring premises. There were no injuries or adverse physical effects reported as a result of the incident.

Cause

An operator failed to ensure that a feed source was at an adequate pressure to establish a flow into the process. As a result, a process upset occurred whilst quenching product from a reactor vessel. The resultant, elevated temperature caused a crack to develop at the base of the cyclone. Later investigation showed that the crack occurred at the site of a manufacturing flaw. Although the product reactor was immediately shut down and measures were taken to create a vacuum on the cyclone, the leak persisted for approximately 10 minutes as the high temperature interlock prevented the application of the vacuum until the temperature fell sufficiently.

Consequences

The facility operator has reviewed the design of the cyclone base and has updated the standard operating procedures for the supply of $TiCl_4$ to the process to prevent a recurrence.

DGAS : W07/98 **FILE No. : 61/98**

Dangerous Goods Storage Accident Report

Date	:	4 March 1998	**Time**	1800 hours
Location	:	Sherman St CANNING VALE		
Dangerous Goods Involved	:	**HYDROCHLORIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1789
		Packing Group	:	II
		Quantity Present	:	70 000 litres
		Quantity Involved	:	70 000 litres

Incident

A new 'pickling bath' was prepared by the addition of 200 litres of supplied corrosion inhibitor to 70 000 litres of a mixture containing 15% hydrochloric acid. Soon afterwards, a strong smell was evident throughout the factory. Staff began to experience symptoms of nausea, dizziness, sore eyes and breathing difficulties.

Cause

The corrosion inhibitor (hydrochloric acid) supplied to the factory was contaminated with turpentine. This produced a floating organic layer on the surface of the bath which was responsible for the troublesome vapours.

Consequences

The plant was closed and evacuated, the bath was covered with black plastic and sick staff were treated at a nearby hospital. They were released soon after. Follow-up analysis by an independent testing laboratory established the presence of turpentine, and the suppliers were notified.

DGAS : W05/98 **FILE No. : 46/98**

Dangerous Goods Storage Accident Report

Date	:	16 March 1998	**Time**	0750 hours
Location	:	Mandurah Tce MANDURAH		
Dangerous Goods Involved	:	**PETROL**		
		Class	:	3
		Sub-Risk	:	-
		UN No.	:	1203
		Packing Group	:	II
		Quantity Present	:	90 000 litres
		Quantity Involved	:	50 litres

Incident

A man was filling fuel tanks on a small boat on the forecourt of a service station when there was a small explosion. A fire started and the boat was towed away from the forecourt area. The Fire and Rescue Service attended and extinguished the fire.

The man received superficial burns and was treated at hospital.

Cause

It is suspected that the boat was not earthed effectively and that a build up of static electricity initiated the explosion.

Consequences

All fuel dispensing nozzles were checked at the service station to ensure that they were correctly earthed.

DGAS : W06/98 **FILE No. : 58/98**

Dangerous Goods Storage Accident Report

Date	:	28 March 1998	**Time**	0800 hours
Location	:	Gaze Rd CHRISTMAS ISLAND		
Dangerous Goods Involved	:	**DIESEL FUEL**		
		Class	:	C1
		Sub-Risk	:	-
		UN No.	:	-
		Packing Group	:	-
		Quantity Present	:	60 000 litres
		Quantity Involved	:	60 000 litres

Incident

Approximately 60 000 litres of diesel fuel leaked from a storage tank at a bulk fuel terminal on Christmas Island after a hole developed in the base of the tank. The storage tank was located on the top of a cliff near Flying Fish Cove and diesel fuel flowed through fissures in the cliff face into the Cove.

The Cove was closed to swimmers for several days while the diesel dispersed. A temporary bund was constructed during low tide to contain product that was leaking out of the cliff face and the collected product was pumped to a recovery tanker on the shore. During an inspection of the tank a hole, was found which was thought to have been caused by corrosion from the underside of the tank floor.

Cause

The cause of the accident was a failure of the facility operator to properly maintain and test the storage tank for corrosion.

Consequences

The company operating the tanks is decommissioning all of the storage tanks at the bulk depot. All other tanks operated by the company on the island will be tested to ensure that the tanks are structurally sound.

DGAS : W08/98 **FILE No. : 62/98**

Dangerous Goods Storage Accident Report

Date	:	29 March 1998	**Time**	1030 hours
Location	:	Elliot Rd WANNEROO		
Dangerous Goods Involved	:	**METHYL BROMIDE**		
		Class	:	2.3
		Sub-Risk	:	-
		UN No.	:	1062
		Packing Group	:	-
		Quantity Present	:	69 litres
		Quantity Involved	:	23 litres

Incident

A fire started in an old potting mix component bay. The bay was constructed from old, wooden, railway sleepers forming a box-like structure. The cause of the fire was unknown. Six hours after it was thought to be extinguished, the fire flared up again involving a nearby shed. The Fire and Rescue Service were notified and attended the incident. Once again the fire was thought to have been extinguished. Over the next 30 hours, the fire continued to smoulder and progressed closer to three nominally empty methyl bromide cylinders causing one to explode, blowing the other two clear. The fire eventually destroyed four potting mix bins and the adjacent shed before Fire and Rescue Service were called to re-attend, to extinguish the fire properly.

Cause

Heat exposure from an uncontrolled fire nearby caused a nominally empty methyl bromide cylinder to explode.

Consequences

The residual poisonous gas escaped into the atmosphere with no reports of injury. The Fire and Rescue Service advised that the correct procedure should have been to completely remove the cylinders from the area when the fire was first noticed. Despite the storage of gas being at minor levels, the owners have been directed to discuss the implementation of an emergency manifest through their local Fire and Rescue Service.

DGAS : W09/98 **FILE No. : 63/98**

Dangerous Goods Storage Accident Report

Date	:	13 May 1998	**Time**	1047 hours
Location	:	Mason Rd KWINANA BEACH		
Dangerous Goods Involved	:	**HYDROGEN CHLORIDE**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1789
		Packing Group	:	-
		Quantity Present	:	2 kg
		Quantity Involved	:	2 kg

Incident

Titanium dioxide particulate and hydrogen chloride gas was released from a chlorinator sump scrubber stack during maintenance. The release drifted off-site and through a neighbouring premises where mild skin, eye and throat irritation were reported.

Cause

A small quantity of solids and titanium tetrachloride ($TiCl_4$) remained in a cyclone dump spool despite purging the system with nitrogen during preparation for mechanical removal of solids build-up between the chlorinator and the cyclone. When the vacuum was established, the trapped material was sucked into the sump where it reacted with water evolving a volume of hydrogen chloride gas which flowed to the sump scrubber.

A valve controlling recirculation liquor flow to the column scrubber had been closed, decreasing the scrubber's effectiveness.

Consequences

The company has implemented engineering modifications and procedural changes to prevent a recurrence. Process control improvements have also been put in place to minimise the quantity of entrained $TiCl_4$ in the cyclone dump spool.

DGAS : W12/98 **FILE No. : 125/98**

Dangerous Goods Storage Accident Report

Date	:	20 May 1998	**Time**	0915 hours
Location	:	Kwinana Beach Rd KWINANA		
Dangerous Goods Involved	:	**AMMONIA**		
		Class	:	2.3
		Sub-Risk	:	8
		UN No.	:	1005
		Packing Group:	:	-
		Quantity Present	:	5 880 kilolitres
		Quantity Involved	:	700 litres

Incident

A release of ammonia from a flare at a chemical plant resulted in contractors at an adjacent plant having to seek refuge in a nearby building. The release of ammonia occurred when liquid ammonia entered the flare system from a knockout pot and extinguished the flare.

Cause

Liquid ammonia entered the flare system when a knock-out pot flooded as a result of level indicators on the pot being inoperative. Excess ammonia was in the cool down and import lines due to an open ammonia pump valve which was incorrectly lined up when commissioning the pump. Lack of appropriate procedures for lining up and starting ammonia pumps also contributed to the incident.

Consequences

Formal procedures and operating instructions have now been put in place to prevent a recurrence. The inoperable low level alarm has been repaired and tested and key valves have been labelled to ensure appropriate alignment.

DGAS : W13/98 **FILE No. : 126/98**

Dangerous Goods Storage Accident Report

Date	:	19 June 1998	**Time**	0630 hours
Location	:	Rudderham Rd NORTH FREMANTLE		
Dangerous Goods Involved	:	**ETHYL MERCAPTAN**		
		Class	:	3
		Sub-Risk	:	-
		UN No.	:	2363
		Packing Group	:	I
		Quantity Present	:	1 036 kg
		Quantity Involved	:	Undetermined

Incident

Workers walking past a shipping container recently delivered to the yard for unpacking detected a smell similar to LP Gas.

The Fire and Rescue Service attended the site and found that a cylinder of ethyl mercaptan appeared to be leaking inside the shipping container.

Part of the access road to the site was closed during the incident and staff at the yard were moved upwind of the leak.

The incident was terminated when it was confirmed that the safety relief valve on the cylinder had resealed and no further leak was evident.

Cause

Investigations revealed that the leak came from a cylinder of ethyl mercaptan. The rupture disc fitted to the cylinder (in line with a safety relief valve) had burst which suggests that the cylinder may have been overfilled.

Vapour loss was minimal as the ambient temperature was around 12^{o}C at the time of the incident.

Consequences

Assistance has been sought from the Australian Maritime Safety Authority to contact its European counterparts to follow-up with the consignor to prevent the recurrence of this incident.

DGAS : W10/98 **FILE No. : 112/98**

Dangerous Goods Storage Accident Report

Date	:	4 July 1998	**Time**	0520 hours
Location	:	Kwinana Beach Rd KWINANA		
Dangerous Goods Involved	:	**NITRIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	2031
		Packing Group	:	II
		Quantity Present	:	12 000 litres
		Quantity Involved	:	700 litres

Incident

A spill of nitric acid occurred from a nitric acid absorber tower when a flange failed. An operator noticed a small leak from the flange bolts and proceeded to climb the tower towards the top isolating valve. At this time the flange bolts failed and sprayed acid into the absorber tower bund.

The operator climbed to the next level and shut down the operation of the plant. Once the acid level had dropped to below the level of the flange, gaseous oxides of nitrogen were released and travelled in an east-north-easterly direction. The operator then used water spray to reduce the impact of gas and acid mist.

Industrial neighbours were notified of the release and the acid in the bund was neutralised with lime and sand, and later used in another onsite manufacturing process.

Cause

On investigation it was found that the bolts in the flange were mild steel bolts, which were not appropriate for use in nitric acid applications. These bolts were found to be corroded, which lead to the leak.

Consequences

The company reviewed all of the bolts used in the process. Five other flanges were identified as having mild steel bolts rather than stainless steel bolts. It was found that these bolts had not been replaced since plant commissioning. All inappropriate bolts were immediately replaced with stainless steel bolts suitable for acid applications. The company has surveyed the area to ensure that no other inappropriate components have been used in the construction of the plant. To prevent a recurrence the company has also implemented quality control procedures and inspection test plans for new area projects and maintenance work.

DGAS : W11/98 **FILE No. : 124/98**

Dangerous Goods Storage Accident Report

Date	:	11 August 1998	**Time**	1030 hours
Location	:	Kwinana Beach Rd KWINANA		
Dangerous Goods Involved	:	**AMMONIA**		
		Class	:	2.3
		Sub-Risk	:	8
		UN No.	:	1005
		Packing Group	:	-
		Quantity Present	:	2 000 litres
		Quantity Involved	:	500 litres

Incident

A release of ammonia from a flare at a chemical plant occurred during the commissioning of a new pipeline. The release resulted in minor injuries and irritation to three contractors working at an adjacent premises. The release occurred when liquid ammonia entered the flare system, exceeding its capacity.

Cause

A five millimetre choke in the pipeline, used to restrict flow to the flare, was removed during the commissioning as it was thought to be too small to allow effective bleeding. As no frosting could be seen on the pipeline, operators assumed that no liquid had entered it, however the liquid ammonia had been pre-heated before entering the pipeline which limited the potential for frosting. A hazard and operability study (HAZOP) on this change was not carried out therefore the potential for release of liquid ammonia was not identified. Operators were stationed at the valve releasing vapour to the flare and at the valve admitting liquid to the pipeline. During commissioning, these valves were opened in turn. However, the line was full of liquid when it was thought to be full of vapour which resulted in an excess flow of liquid ammonia to the flare. Although the flare was not extinguished, the quantity of ammonia released into the system exceeded the flare's capacity resulting in ammonia being released into the atmosphere. As soon as operators noticed ammonia emanating from the flare, both valves were immediately closed.

Consequences

As a result of the incident, the company has reviewed the commissioning procedure and a system has been implemented to closely monitor a retention pot leading to the flare to detect the presence of liquid ammonia. Change management processes are also being reviewed to ensure that appropriate hazard assessment is carried out prior to such changes taking place.

DGAS : W14/98 **FILE No. : 128/98**

Dangerous Goods Storage Accident Report

Date	:	7 September 1998	**Time**	1100 hours
Location	:	Collier Rd BASSENDEAN		
Dangerous Goods Involved	:	**PETROLEUM GASES, LIQUEFIED**		
		Class	:	2.1
		Sub-Risk	:	-
		UN No.	:	1075
		Packing Group	:	-
		Quantity Present	:	7 500 litres
		Quantity Involved	:	22 litres

Incident

Following delivery of autogas (liquefied petroleum gas) at a service station, a leak was observed from the fill valve of an autogas storage tank. The Fire and Rescue Service attended the incident and shut off the valve. There was no ignition of the leaked autogas and no injuries reported.

Cause

The cause of this incident is considered to be the formation of a small slug of ice that was formed beneath the seat of the valve during filling of the autogas tank. After completion of the filling operation, the valve was closed, however, it would have remained partially open as the seat of the valve rested on the slug of ice. When the ice melted the leak occurred through the partially open valve. Investigation showed that only a small quantity of gas escaped and the release occurred from a bleed hole which is designed for bleeding off gas.

Consequences

Liaison with the company with regard to safety management systems is ongoing and drivers have been cautioned on the potential for ice to develop during filling operations. Regular training of drivers has also been scheduled by the company.

DGAS : W15/98 **FILE No. : 168/98**

Dangerous Goods Storage Accident Report

Date	:	8 October 1998	**Time**	2100 hours
Location	:	Powerhouse Rd COLLIE		

Dangerous Goods Involved : **SODIUM HYPOCHLORITE**

Class	:	8
Sub-Risk	:	-
UN No.	:	1791
Packing Group	:	III
Quantity Present	:	13 000 litres
Quantity Involved	:	6 500 litres

Incident

Piping connection fittings associated with a sodium hypochlorite tank failed resulting in spillage of product. Spilt sodium hypochlorite solution was contained within the tank bund.

Cause

The pipe connection fittings were checked and found to be incompatible with sodium hypochlorite. Therefore, the fittings gradually corroded during service and eventually failed.

Consequences

All fittings have been subsequently checked for compatibility with sodium hypochlorite and where necessary, replaced with compatible fittings.

To prevent a recurrence, the management of the facility has arranged for these fittings to be checked every six months and replaced annually.

DGAS : W19/98 **FILE No. : 190/98**

Dangerous Goods Storage Accident Report

Date	:	5 November 1998	**Time**	0115 hours
Location	:	McCoy St MYAREE		
Dangerous Goods Involved	:	**SULFUR DIOXIDE**		
		Class	:	2.3
		Sub-Risk	:	8
		UN No.	:	1079
		Packing Group	:	-
		Quantity Present	:	10 litres
		Quantity Involved	:	10 litres

Incident

An operator at a glass manufacturing site noticing an irritating smell alerted his manager, who advised him to shut-off the sulfur dioxide cylinder and leave the area. This action stopped the leak.

Cause

Investigation by the sulfur dioxide supplier established that the pipe connecting the cylinder and a glass annealing machine had been crushed. The stainless steel pipe had been crushed between the wall and a machine guard.

Consequences

New infeed piping has been installed and re-routed so as to avoid any contact with the machine. A sulfur dioxide sensor, fitted with both audio and visual alarms has been purchased, and is to be fitted in the vicinity of the cylinder and associated pipework.

DGAS : W17/98 **FILE No. : 174/98**

Dangerous Goods Storage Accident Report

Date	:	1 December 1998	**Time**	0520 hours
Location	:	Mason Rd KWINANA		

Dangerous Goods Involved : **PETROLEUM GASES, LIQUEFIED**

Class	:	2.1
Sub-Risk	:	-
UN No.	:	1075
Packing Group	:	-
Quantity Present	:	177 000 kg
Quantity Involved	:	54 000 kg

Incident

Approximately 54 tonnes of liquefied petroleum gas (LP Gas) was released over a period of two hours due to the failure of a gasket joint associated with an LP Gas storage and loading system.

The released LP Gas was dispersed by prevailing weather conditions, and did not ignite.

The leak was isolated by the on-site emergency response team and no injuries were reported.

Cause

The incident investigation concluded that the release was due to the design of the sandwich type flanged joint and gasket assembly that housed the excess flow valve for the suction line from LP Gas storage vessel. The trigger for the incident was the rapid closure of the excess flow valve, when the storage vessel was lined up to the loading system which was at a significantly lower pressure at the time.

Consequences

As part of the investigation, the company has identified and implemented a number of changes to prevent recurrence of the event. These include an upgrade of gaskets in the excess flow valve assembly to eliminate unwinding of the gaskets, modification of flange design to eliminate gasket failures, implementation of procedural and software changes for equalisation of pressure across the system, use of controlled installation and bolt tensioning procedures for this type of assembly, in service checks of the assembly and checking of similar equipment at the premises.

DGAS : W18/98 **FILE No. : 189/98**

Dangerous Goods Storage Accident Report

Date	:	4 December 1998	**Time**	1830 hours
Location	:	Casino St WELSHPOOL		
Dangerous Goods Involved	:	**ETHANOL**		
		Class	:	3
		Sub-Risk	:	-
		UN No.	:	1170
		Packing Group	:	III
		Quantity Present	:	8 000 litres
		Quantity Involved	:	8 000 litres
		SULFUR		
		Class	:	4.1
		Sub-Risk	:	-
		UN No.	:	1350
		Packing Group	:	III
		Quantity Present	:	30 000 kg
		Quantity Involved	:	30 000 kg
		COMBUSTIBLE LIQUID		
		Class	:	C1
		Sub-Risk	:	-
		UN No.	:	-
		Packing Group	:	-
		Quantity Present	:	8 000 litres
		Quantity Involved	:	8 000 litres

Incident

A fire on the premises of a chemical repacking and warehousing facility, destroyed a metal shed that was used for the packing of solid products and the filling of flammable liquid packages.

Paraffin drums (200 litres) that were located downwind of the packing/filling shed were also destroyed. At the peak of the fire, some of these drums exploded and were thrown 40 to 50 metres from their original location.

Dangerous Goods Storage Accident Report

Flammable liquids stored in five underground tanks, located next to the filling shed were not affected by the fire and no-one was injured in the incident.

Cause

Investigations indicate that the most likely cause of the fire was the frictional ignition of sulfur within the solids packing shed. The fire in this area eventually spread to the flammable liquids filling area.

Consequences

Investigation of this incident is continuing to determine if there is a breach of the Dangerous Goods Regulations 1992. Once the investigation is complete, industry will be advised of the lesson learnt from this incident.

DGAS : W20/98 **FILE No. : 195/98**

Dangerous Goods Transport Accidents

Introduction

Twenty-seven transport accidents were reported during 1998. Eight accidents involved rail tankers, eighteen were associated with road vehicles and one incident where a leaking drum was noticed during the transfer of a seatainer from a ship prior to road transport. This is significantly more than the ten-year average to 1997.

Five incidents involved packaged dangerous goods and twenty-one incidents involved the transport of bulk dangerous goods. It is of great concern that ten incidents involved sulfuric acid, eight rail and two road transport. The high number of road incidents involving sulfuric acid that occurred from January 1997, resulted in a comprehensive review in May 1998 with consignors and road transporters. The recommended design changes appear to have prevented any further road incidents. The continuing number of rail incidents involving sulfuric acid is unacceptable and the consignors for rail are on notice to improve their performance. The only redeeming feature of this problem is Westrail's performance detecting problems en route.

Other causes of incidents varied and included driver fatigue/inattention, failure to comply with standard operating procedures and maintenance procedures not being adequate for detection of failure prior to its occurrence. Regrettably, one incident resulted in a fatality however the dangerous goods did not cause or contribute to the fatality as the containers remained intact.

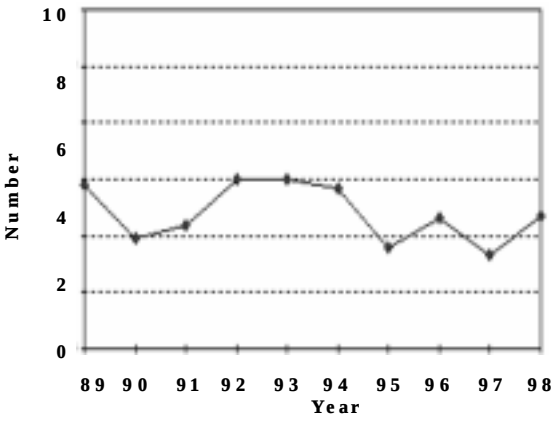
An incident involving explosives (ANFO, detonators and boosters) in late December drew attention to the specifications for the vehicles that transport mixed loads (detonators and explosives) and an investigation has been undertaken by the companies involved to address a variety of concerns. It is likely that regulatory amendments will flow from the investigation.

Refresher training for drivers appears to have had the desired effect of fewer accidents from driver behaviour.

The target in 1999-2000 will be consignors particularly in the rail mode, as this is the highest problem area.

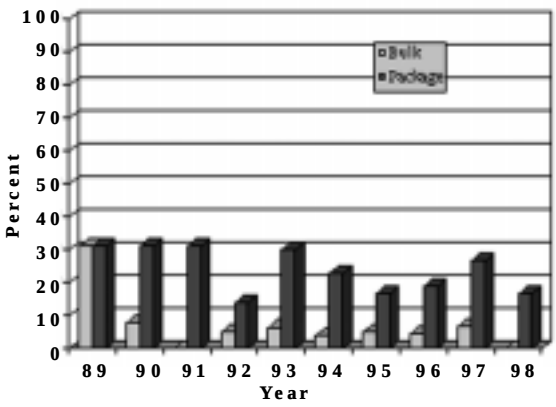
Selected Road Transport Accident Statistics

Number of Accidents per 1000 licensed Vehicles (Bulk Only)



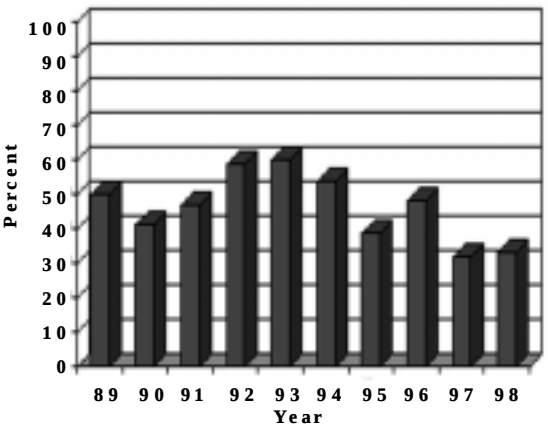
The 1998 value is higher than in 1997 due to a higher number of bulk vehicle incidents. In the last ten years, the accident rate has been between three and six.

Non Complying Vehicles in Accidents (Bulk/Package)



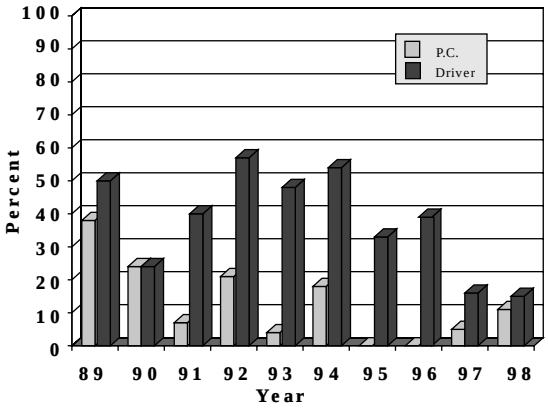
While bulk vehicles have very good compliance with the ADG Code, there is room for improvement for packaged vehicles; substandard stowage is the main problem.

Percentage of Accidents Caused By Operator Deviation From Standard Procedures



The above figure includes only deviation from dangerous goods legislation: it does not include deviation from other road safety legislation or company rules. Not following standard procedure, as a causal group for accidents has decreased from the high levels experienced in 1992, 1993 and 1994.

Driver and Prime Contractor Contribution to Operator Deviation Caused Accidents



In 1998, the driver value is substantially lower than in the 1989 to 1996 period. As was predicted in the 1996 Report, the introduction of a compulsory refresher driving course in January 1997 has improved the situation.

Dangerous Goods Transport Accident Summary Report

	Date	Location	Goods	Class	Comments
W06	03/02/1998	KALGOORLIE	**Sulfuric Acid**	8	A container was found to be leaking sulfuric acid through a fatigued weld while loaded on a rail wagon.
W01	09/02/1998	MT MAGNET	**Ammonium Nitrate**	5.1	The driver of a triple road train either fell asleep or lost concentration, causing the rear trailer to roll over and lose its entire ammonium nitrate load.
W02	13/02/1998	FORRESTFIELD	**Sulfuric Acid**	8	Approximately 200 litres of sulfuric acid spilt onto the ground after leaking from a cracked weld in a rail tanker.
W04	26/02/1998	CANNINGTON	**Sulfuric Acid**	8	A road train carrying sulfuric acid from Kalgoorlie to Kwinana spilt approximately 20 litres of acid onto the road.
W10	01/03/1998	FORRESTFIELD	**Sulfuric Acid**	8	Sulfuric acid (200 litres) was released from a rail tanker due to a faulty camlock fitting and a drain pipe valve that was left open.
W05	04/03/1998	MULLEWA	**Petrol**	3	A truck/trailer transporting petroleum products was involved in an accident at a level crossing with a locomotive and another vehicle. Approximately 250 litres of product spilt out.
W07	11/03/1998	KEWDALE	**Toluene Sulphonic Acid**	8	A rigid tray-top truck carrying 840 litres of toluene sulphonic acid lost its load when turning a corner. Drums fell from the truck and product spilt onto the road.
W03	13/03/1998	COOLGARDIE	**Sodium Hydroxide Solution**	8	A road train travelling at excessive speed, failed to negotiate a right hand turn causing the vehicles to roll over. No dangerous goods were spilt.
W08	18/04/1998	AUSKI ROADHOUSE (WITTENOOM)	**Sulfuric Acid**	8	A sulfuric acid tanker rolled over in an isolated area and a small amount of product was released. Driver fatigue may have been a contributing factor to the incident.
W11	09/05/1998	NORSEMAN	**Thiocarbamate Pesticide, Liquid, Toxic**	6.1	About seven litres of toxic thiocarbamate pesticide spilt from a Composite Intermediate Bulk Container on a semi-trailer. The driver stopped, alerted emergency services and people were evacuated from the vicinity.

Dangerous Goods Transport Accident Summary Report

	Date	Location	Goods	Class	Comments
W13	14/05/1998	FORRESTFIELD	**Sulfuric Acid**	8	A rail tanker container was found to be leaking sulfuric acid from a broken seal on a vent line valve.
W09	21/05/1998	KALGOORLIE	**Sodium Cyanide**	6.1	A small quantity of sodium cyanide liquour was lost through a damaged pressure test nozzle on an isotainer during the filling stage of a sparging process
W14	25/07/1998	UPPER SWAN	**Ammonium Nitrate**	5.1	Seven IBCs containing ammonium nitrate were slashed open by vandals at a road train assembly area resulting in 1 000 kg of product being spilt.
W15	17/08/1998	KALGOORLIE	**Petrol**	3	Petrol spilt onto the forecourt of a service station during the filling of the underground storage tanks.
W17	19/08/1998	JARRAHDALE	**Petrol**	3	Petrol was spilt at a service station when the connection between a delivery hose from the tanker and hydrant failed.
W16	03/09/1998	WIDGIEMOOLTHA	**Hydrochloric Acid**	8 8	Eleven plastic drums of acid fell from a semi-trailer because the driver was trying to avoid an accident and because of inadequate load restraint.
W23	11/10/1998	FREMANTLE	**Organic Peroxide, Type F, Liquid**	5.2	A 200 litre drum of organic peroxide leaked in a seatainer on a ship sailing from Hamburg to Melbourne. Once at port, the leaking drum was removed and transferred into an approved overdrum.
W18	15/10/1998	MOORA	**Petrol**	3	Fuel leaked from an underground tank during filling operations from a tanker. The cause was overfilling, the discharge being through an old disused suction pipe.
W20	25/10/1998	FORRESTFIELD	**Sulfuric Acid**	8	Approximately 40 litres of sulfuric acid leaked from the open tap of an overfill pipe of a rail tanker onto the ground at a marshalling yard.
W22	02/11/1998	PINJARRA	**Chlorine Gas**	2.3	A vehicle carrying two empty 920 kg chlorine drums left the road and overturned trapping the driver. The drums broke free of their chains. The driver died that evening.
W24	08/11/1998	WEST KALGOORLIE	**Sulfuric Acid**	8	A rail tanker leaked approximately 50 litres of sulfuric acid at a marshalling yard due to overfilling and subsequent failure of a valve.

Dangerous Goods Transport Accident Summary Report

	Date	Location	Goods	Class	Comments
W19	10/11/1998	FORRESTFIELD	**Sulfuric Acid**	8	Six rail tankers of sulfuric acid were found to be leaking during a transit stopover. The cause is believed to be overfilling, deviation from procedures and poor maintenance.
W21	10/11/1998	BULLSBROOK	**Hydrochloric Acid**	8	A trailer became detached from a road train resulting in approximately 120 litres of hydrochloric acid being spilt from an IBC.
W25	09/12/1998	FORRESTFIELD	**Sulfuric Acid**	8	Sulfuric acid leaked from a rail tanker through an open overflow pipe valve.
W28	14/12/1998	WYNDHAM	**Ammonium Nitrate**	5.1	While approaching a single lane bridge the driver of a triple road train took evasive action to avoid collision with an oncoming vehicle. The road train rolled into a gully and product was spilt.
W27	18/12/1998	MARVEL LOCH	**Explosive, Blasting, Type B**	1.1	A vehicle transporting explosives exploded after a tyre fire led to complete engulfment of the vehicle.
W26	22/12/1998	KEMERTON	**Sodium Hydroxide**	8	About 30 to 50 litres of sodium hydroxide leaked into the road from a tanker due to a faulty lid seal on the manway hatch of the tanker.

Dangerous Goods Transport Accident Summary Report

Date	:	3 February 1998	**Time**	2020 hours
Location	:	Hampton Loading Siding KALGOORLIE		
Dangerous Goods Involved	:	**SULFURIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1830
		Packing Group	:	II
		Quantity Present	:	29 000 litres
		Quantity Spilt	:	Undetermined

Incident

A rail crew reported that a bulk container loaded with sulfuric acid was leaking onto the floor of a flat top rail wagon. It is believed that the acid had been leaking at about one litre per minute for an unknown period of time, and was running into an acid collection area of the loading/unloading plant. The consignor made arrangements to decant the remaining product.

Cause

The leak was caused by metal fatigue in a weld where the central rollover protection beam is welded to the tanker.

Consequences

All tankers in the fleet have since been subjected to metal particle impregnation testing and extensive repairs were carried out.

DGAT : W06/98 **FILE No. : 49/98**

Dangerous Goods Transport Accident Report

Date	:	9 February 1998	**Time**	2230 hours
Location	:	Great Northern Hwy MT MAGNET		
Dangerous Goods Involved	:	**AMMONIUM NITRATE**		
		Class	:	5.1
		Sub-Risk	:	-
		UN No.	:	1942
		Packing Group	:	III
		Quantity Present	:	26 000 kg
		Quantity Spilt	:	26 000 kg

Incident

While travelling north along Great Northern Highway, approximately 70 kilometres south of Mt Magnet, a triple road train hauling ammonium nitrate veered off to the right hand side of the road. When the driver corrected the alignment of the vehicle, the rear trailer rolled onto its side and separated from its converter dolly. The entire load of ammonium nitrate was lost from the rear trailer. The driver contacted his company who arranged attendance by police, emergency and recovery crews who assisted in the clean-up operation. The driver was not injured in the incident.

Cause

The incident has been attributed to driver inattention.

Consequences

The police charged the driver with careless driving. The company involved has reviewed driving hours, identified the need for additional driving staff on line haul operations and identified the need to develop a fit to drive process.

DGAT : W01/98 **FILE No. : 32/98**

Dangerous Goods Transport Accident Report

Date	:	13 February 1998	**Time**	0920 hours
Location	:	Forrestfield Marshalling Yards FORRESTFIELD		
Dangerous Goods Involved	:	**SULFURIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1830
		Packing Group	:	II
		Quantity Present	:	29 000 litres
		Quantity Spilt	:	200 litres

Incident

On arrival at the Forrestfield Marshalling Yards, a freight train hauling sulfuric acid from West Kalgoorlie was found to be leaking liquid from one of the rail tankers. The tanker was leaking at approximately 0.5 litres per minute. An earthen bund was formed around the leaking tanker and the product was decanted into another tanker and contaminated earth was neutralised.

Cause

A cracked weld where the central roll-over protection beam is welded to the tanker, caused the leak.

Consequences

The consignor has commenced metal particle impregnation testing of its tanker fleet to determine whether the incident was an isolated instance or evidence of a more widespread problem. It also highlighted the need for the ongoing maintenance program that has been adopted by the consignor for its tanker fleet.

DGAT : W02/98 **FILE No. : 33/98**

Dangerous Goods Transport Accident Report

Date	:	26 February 1998	**Time**	1930 hours
Location	:	Albany Hwy CANNINGTON		
Dangerous Goods Involved	:	**SULFURIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1830
		Packing Group	:	II
		Quantity Present	:	14 674 litres
		Quantity Spilt	:	20 litres

Incident

A road train carrying sulfuric acid was en route to Kwinana from Kalgoorlie when passing motorists advised the driver that acid was leaking onto the road from the tanker. The driver climbed on top of the tanker and found that a small amount of acid had spilt inside the rollover coaming from the camlock fitting of the fill tube of the bulk container. Temporary repairs were made and the vehicle continued its journey to Kwinana.

An emergency response team from another chemical company assisted the Fire and Rescue Service to neutralise the spilt acid and clean up road intersections where the tanker had been. After completing the clean-up operation, a survey was conducted of the route taken and no other spills were discovered.

Cause

The camlock cap on the bulk container was found to be loose. It would appear that poor maintenance of the fittings was the major contributing factor to this incident.

Consequences

After an industry-wide review, this company and other companies that transport sulfuric acid in tankers, were advised by the Division to install additional valves on discharge and fill points of top fill type tankers, to prevent the same type of accident from occurring. A recommendation for a secondary closure was made to the relevant Australian Standard Committee.

DGAT : W04/98 **FILE No. : 35/98**

Dangerous Goods Transport Accident Report

Date	:	1 March 1998	**Time**	0950 hours
Location	:	Forrestfield Marshalling Yards FORRESTFIELD		
Dangerous Goods Involved	:	**SULFURIC ACID**		
		Class	8	
		Sub-Risk	-	
		UN No.	1830	
		Packing Group	II	
		Quantity Present	29 000 litres	
		Quantity Spilt	200 litres	

Incident

The rail crew of a train transporting a consignment of sulfuric acid from Kalgoorlie to Kwinana noticed liquid leaking from a tanker while the train was stationary at the Forrestfield Marshalling Yards. The product was escaping at a rate of approximately five litres per minute. Acid flowed from the container onto the rail wagon deck, and onto the track system and ground below.

Cause

The tanker had been stationary for about three hours in temperatures approaching 40°C. The increase in temperature expanded air in the container, forcing product out through a discharge pipe due to a loose camlock fitting. Acid then accumulated in a valve line before escaping via a drain valve where a stop cock was not locked in the off position. There was also a crack in the drain pipe.

Consequences

The consignor and the owner of the rail tankers have been directed to provide specific assurances that management systems have been put in place to prevent any further occurrence of a similar nature.

DGAT : W10/98 **FILE No. : 74/98**

Dangerous Goods Transport Accident Report

Date	:	4 March 1998	**Time**	0750 hours
Location	:	Mullewa-Yalgoo Rd MULLEWA		

Dangerous Goods Involved :

PETROL

Class	:	3
Sub-Risk	:	-
UN No.	:	1203
Packing Group	:	II
Quantity Present	:	7 800 litres
Quantity Spilt	:	250 litres

DIESEL FUEL

Class	:	NDG
Sub-Risk	:	-
UN No.	:	-
Packing Group	:	-
Quantity Present	:	4 400 litres
Quantity Spilt	:	Nil

Incident

A truck-trailer combination transporting petroleum products was travelling from Geraldton to Cue. On the outskirts of Mullewa, the driver approached a level crossing and heard a locomotive sound its horn. As the driver was unable to stop, he took evasive action by swerving around the front of the train. An oncoming vehicle on the other side of the crossing obstructed the manoeuvre, and as the driver straightened his vehicle, the train slammed into the rear trailer, tearing it away from the towing vehicle, causing the trailer to slide into the oncoming vehicle. The trailer eventually came to rest in a culvert. Approximately 250 litres of unleaded petrol were slowly released through a defective/damaged vent on the tanker.

Cause

The cause of the incident appears to have been driver inattention coupled with a poorly marked and non-boom gate rail crossing.

Consequences

The driver of the other vehicle sustained minor injuries, while the fuel truck driver was uninjured. Police have charged the driver of the fuel tanker with road traffic offences.

NDG = Not Classified as Dangerous Goods for transport purposes.

DGAT : W05/98 **FILE No. : 50/98**

Dangerous Goods Transport Accident Report

Date	:	11 March 1998	**Time**	0900 hours
Location	:	Dowd St KEWDALE		
Dangerous Goods Involved	:	**TOLUENE SULPHONIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	2586
		Packing Group	:	III
		Quantity Present	:	840 litres
		Quantity Spilt	:	630 litres

Incident

When turning right at an intersection, three drums of toluene sulphonic acid fell from the truck onto the road. The drums failed and the product spilt onto the intersection. Emergency services attended the scene, cordoning off the area for four hours. During this time the road was decontaminated and then the road was reopened.

Cause

The pallet load of drums was wrapped in damaged stretch wrap and was not adequately secured on the vehicle tray within the gates. The load was wet, reducing friction between the tray and the unsecured load, allowing the 210 litre plastic drums to slip through the side gates onto the road.

Consequences

The driver, consignor and the prime contractor were advised of their obligations under the Australian Dangerous Goods (ADG) Code. There was insufficient evidence to proceed with prosecution action. An article about the incident that included advice on the stowage requirements of the ADG Code was published to inform industry of the problem.

DGAT : W07/98 **FILE No. : 51/98**

Dangerous Goods Transport Accident Report

Date	:	13 March 1998	**Time**	0115 hours
Location	:	Great Eastern Hwy COOLGARDIE		

Dangerous Goods Involved :

SODIUM HYDROXIDE SOLUTION

Class	:	8
Sub-Risk	:	-
UN No.	:	1824
Packing Group	:	II
Quantity Present	:	820 litres
Quantity Spilt	:	Nil

HYDROCHLORIC ACID

Class	:	8
Sub-Risk	:	-
UN No.	:	1789
Packing Group	:	II
Quantity Present	:	820 litres
Quantity Spilt	:	Nil

POTASSIUM HYDROXIDE SOLUTION

Class	:	8
Sub-Risk	:	-
UN No.	:	1814
Packing Group	:	II
Quantity Present	:	4 840 litres
Quantity Spilt	:	Nil

Incident

The driver of a road train travelling east on the Great Eastern Highway, Coolgardie, attempted to turn in a southerly direction onto the Coolgardie-Esperance Highway. During the turn, the prime mover, lead trailer and dolly rolled over, leaving the rear trailer in an upright position. It was subsequently discovered that the road train was transporting packaged dangerous goods.

Cause

The incident was caused by the driver attempting to turn his vehicle at excessive speed and on the wrong side of the road.

Consequences

Prosecution of the driver and prime contractor was considered but could not be effected. Charges against the prime contractor were withdrawn in the absence of corroborating evidence from the driver.

DGAT : W03/98 **FILE No. : 34/98**

Dangerous Goods Transport Accident Report

Date	:	18 April 1998	**Time**	0500 hours
Location	:	Great Northern Hwy AUSKI ROADHOUSE (WITTENOOM)		
Dangerous Goods Involved	:	**SULFURIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1830
		Packing Group	:	II
		Quantity Present	:	13 000 litres
		Quantity Spilt	:	50 litres

Incident

Approximately halfway into its journey, a semi-trailer tanker laden with sulfuric acid, bound for a minesite, rolled over causing the tank to separate from the vehicle and to spill a small quantity of acid. The prime mover was consumed by a resultant fire.

Cause

The driver reported a lack of control of the vehicle believed to be attributable to steering or tyre failure. Analysis of driving/work schedules indicate that fatigue may have been a significant factor. Spillage occurred when a discharge valve partially opened in the roll-over resulting in the contents of the discharge pipe leaking onto the ground.

Consequences

The driver of the vehicle sustained a broken wrist and burns to one of his feet in the incident. The consignor and the owner of the tanker have been requested to modify all tankers to include a secondary shut off device.

DGAT : W08/98 **FILE No. : 113/98**

Dangerous Goods Transport Accident Report

Date	:	9 May 1998	**Time**	1600 hours
Location	:	Eyre Hwy NORSEMAN		
Dangerous Goods Involved	:	**THIOCARBAMATE PESTICIDE, LIQUID, TOXIC**		
		Class	:	6.1
		Sub-Risk	:	-
		UN No.	:	3006
		Packing Group	:	III
		Quantity Present	:	16 000 litres
		Quantity Spilt	:	7 litres

Incident

The driver of a semi-trailer vehicle carrying 1 000 litre Composite Intermediate Bulk Containers (CIBCs) containing toxic liquid thiocarbamate pesticide discovered some seepage of product on the deck of the trailer during inspection at Norseman. It was estimated by the consignor that approximately seven litres of product was lost during transport.

About 200 people within one kilometre of the parked vehicle were evacuated. The leaking CIBC was removed from the semi-trailer and decanted into 200 litre drums. The drums containing the decanted product, the empty CIBC and all contaminated material were returned to the consignor.

Cause

The leakage of product was caused by a hole approximately three millimetres in diameter in the top, left corner of the CIBC. It is not known how the hole was caused.

Consequences

The evacuation created intense media interest in the Kalgoorlie region. There were no regulatory breaches. The consignor has withdrawn from service all CIBCs of the type involved in this incident. Industry was reminded about their maintenance responsibilities with plastic CIBCs.

DGAT : WII/98 **FILE No. : 75/98**

Dangerous Goods Transport Accident Report

Date	:	14 May 1998	**Time**	1045 hours
Location	:	Forrestfield Marshalling Yards FORRESTFIELD		
Dangerous Goods Involved	:	**SULFURIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1830
		Packing Group	:	II
		Quantity Present	:	29 000 litres
		Quantity Spilt	:	9 litres

Incident

A railway line maintenance worker noticed a rail tanker leaking as it crossed over a level crossing at the approach to the marshalling yards. The terminal manager was alerted to the problem and he conducted an inspection and found that one of the rail tankers loaded with sulfuric acid was leaking. Approximately nine litres of acid escaped from the tanker. A wash down and decontamination of the area was carried out by a specialist emergency response team.

Cause

The cause of the leak was attributed to a broken seal on a vent line valve.

Consequences

Inspection of all seals has been included in an ongoing maintenance program to upgrade and repair all rail tankers in the fleet.

DGAT : W13/98 **FILE No. : 89/98**

Dangerous Goods Transport Accident Report

Date	:	21 May 1998	**Time**	1400 hours
Location	:	Paddington Gold Mine KALGOORLIE		
Dangerous Goods Involved	:	**SODIUM CYANIDE**		
		Class	:	6.1
		Sub-Risk	:	-
		UN No.	:	1689
		Packing Group	:	I
		Quantity Present	:	20,000 kg
		Quantity Spilt	:	20 litres

Incident

An ISO tank container (isotainer) containing liquid sodium cyanide was unloading at a minesite and during the fill stage of the sparging process, the driver noticed cyanide liquor running from the top of the isotainer. The driver immediately stopped the fill operation and drained the isotainer.

Cause

The incident resulted from damage caused to a protruding pressure test nozzle on top of the isotainer. The isotainer design did not conform to a particular standard, however a Competent Authority in another state had given provisional approval on a trial basis. The nozzle would normally have been protected by the end frames of the isotainer but investigations revealed that the damage most likely occurred when another isotainer being lifted over the top of the tank hit the protruding nozzle.

Consequences

The owner has redesigned isotainer concerned and all similar isotainers, so that the pressure test nozzles do not protrude outside the body of the tank. The rail authorities have also been alerted to the incident, the damage caused, and the potential consequences of spillages of this nature. The practice of lifting containers over the top of the isotainers has been prohibited by the company concerned.

DGAT : W09/98 **FILE No. : 65/98**

Dangerous Goods Transport Accident Report

Date	:	25 July 1998	**Time**	0300 hours
Location	:	Apple St UPPER SWAN		
Dangerous Goods Involved	:	**AMMONIUM NITRATE**		
		Class	:	5.1
		Sub-Risk	:	-
		UN No.	:	1942
		Packing Group	:	III
		Quantity Present	:	50 000 kg
		Quantity Spilt	:	1 000 kg

Incident

A semi-trailer loaded with Intermediate Bulk Containers (IBCs) containing ammonium nitrate was stationary at the road train assembly area. While the trailer was unattended, seven IBCs were slashed open by vandals allowing about 1 000 kg of product to spill onto the ground. Damaged IBCs were returned to the prime contractor for repairs, as damage was minimal.

Cause

Vandalism.

Consequences

This incident highlighted the problems that can occur with dangerous goods that are stored in a non-secure road train assembly area. Letters have been sent out to over fifty transport companies making them aware of the incident and advising them to ensure their dangerous goods are stored securely at road train assembly areas.

DGAT : W14/98 **FILE No. : 127/98**

Dangerous Goods Transport Accident Report

Date	:	17 August 1998	**Time**	0915 hours
Location	:	Great Eastern Hwy KALGOORLIE		
Dangerous Goods Involved	:	**PETROL**		
		Class	:	3
		Sub-Risk	:	-
		UN No.	:	1203
		Packing Group	:	II
		Quantity Present	:	6 000 litres
		Quantity Spilt	:	315 litres

Incident

During unloading operations at a service station forecourt the driver of the petrol tanker noticed a leak at the fill point and believed it was caused by the transfer hose being stretched. The driver then shut the compartment valve of the tanker, moved to the cabin of the vehicle, and released the handbrake. The tanker rolled increasing the tension on the transfer hose and snapping the tanker discharge valve releasing petrol over the driveway and parking area. The driver shut the internal valve on the tanker and informed the manager of the service station who notified the Fire and Rescue Service. The driver placed safety triangles to the front and rear of the tanker, sealing off the driveway entrances. The driver then directed traffic and people away from the spill scene until the Fire and Rescue Service and Police arrived on the scene. The Fire and Rescue Service cleaned up the spill using sand and pearlite.

Cause

The cause was human error, due to the driver not following proper procedures. The driver released the park brake of the tanker with the transfer hose connected and the tanker moved causing the compartment valve of the tanker to snap.

Consequences

The company concerned has subsequently retrained all of its drivers in fuel discharge operations and procedures to be followed in the event of an emergency.

DGAT : W15/98 **FILE No. : 131/98**

Dangerous Goods Transport Accident Report

Date	:	19 August 1998	**Time**	1930 hours
Location	:	Cnr of Southwest Hwy and Jarrahdale Rd JARRAHDALE		
Dangerous Goods Involved	:	**PETROL**		
		Class	:	3
		Sub-Risk	:	-
		UN No.	:	1203
		Packing Group	:	II
		Quantity Present	:	37 000 litres
		Quantity Spilt	:	70 litres

Incident

A fuel tanker driver was delivering fuel to a service station after normal working hours. He was delivering unleaded and leaded fuel to two receival tanks at the same time using gravity feed. When the leaded fuel discharge was complete, the driver noticed that fuel was spilling from the unleaded fuel connection. Approximately 70 litres of unleaded fuel was spilt onto the service station forecourt in the incident. The spilt fuel was absorbed onto sand by emergency services personnel and removed to an authorised waste disposal site.

Cause

The action of shutting down the delivery of the leaded fuel caused the fuel hose to move and partially break the connection between the adjacent hose and hydrant being used for the delivery of unleaded fuel.

Consequences

The company has reviewed operating procedures and issued instructions to all drivers that under no circumstance is dual delivery of product to be attempted. The connecting system between the hoses and hydrants has been replaced with a more positive locking system.

DGAT : W17/98 **FILE No. : 149/98**

Dangerous Goods Transport Accident Report

Date	:	3 September 1998	**Time**	1800 hours
Location	:	Coolgardie-Norseman Hwy WIDGIEMOOLTHA		

Dangerous Goods Involved :

HYDROCHLORIC ACID

Class	:	8
Sub-Risk	:	-
UN No.	:	1789
Packing Group	:	II
Quantity Present	:	120 litres
Quantity Spilt	:	120 litres

NITRIC ACID

Class	:	8
Sub-Risk	:	-
UN No.	:	2031
Packing Group	:	II
Quantity Present	:	100 litres
Quantity Spilt	:	100 litres

Incident

The driver of a semi-trailer travelling south along the Coolgardie-Norseman Highway in extremely poor visibility and heavy rain took evasive action to avoid a north bound road train that had rounded a bend on the wrong side of the road. A portion of the semi-trailer's load was dislodged onto the roadway in the manoeuvre. Eleven 20 litre plastic drums of hydrochloric and nitric acid were damaged or spilt, and were recovered the following morning. Heavy rain in the area at the time sufficiently diluted the acids.

Cause

The incident was caused by a road train travelling on the wrong side of the road and forcing the driver of the semi-trailer to take evasive action. However, the situation was exacerbated by inadequate load restraint of packaged goods on the semi-trailer.

Consequences

The companies concerned have been reminded of their obligations with regard to load restraint, and put on notice that further incidents will result in prosecution.

DGAT : W16/98 **FILE No. : 137/98**

Dangerous Goods Transport Accident Report

Date	:	11 October 1998	**Time**	0800 hours
Location	:	North Quay FREMANTLE		
Dangerous Goods Involved	:	**ORGANIC PEROXIDE, TYPE F, LIQUID**		
		Class	:	5.2
		Sub-Risk	:	8
		UN No.	:	II
		Quantity Present	:	6 400 litres
		Quantity Spilt	:	100 litres

Incident

One 200 litre drum containing organic peroxide was found leaking inside a seatainer loaded on a ship sailing from Hamburg to Melbourne. On arrival at Fremantle, the seatainer was removed from the ship and the emergency services removed the leaking drum from the middle of the seatainer. The leaking drum was transferred into an overdrum and removed to an approved location.

Cause

The cause of the leaking drum was a hole about one centimetre in diameter on the seam of the base of the half-empty drum. The hole may have resulted from the drum rubbing against the seatainer or from a faulty seam.

Consequences

The Division played an important role in providing technical advice to the emergency services. As the incident occurred at sea, it has been followed up by the Australian Maritime Safety Authority.

DGAT : W23/98 **FILE No. : 183/98**

Dangerous Goods Transport Accident Report

Date	:	15 October 1998	**Time**	1445 hours
Location	:	Roberts St MOORA		
Dangerous Goods Involved	:	**PETROL**		
		Class	:	3
		Sub-Risk	:	-
		UN No.	:	1203
		Packing Group	:	II
		Quantity Present	:	3 600 litres
		Quantity Spilt	:	80 litres

Incident

An underground petrol tank located at a rural service station was being filled from a tanker, when the driver noticed fuel spilling from the area around the bowsers. Approximately 80 litres of fuel was spilt. The local volunteer fire brigade contained the spill and covered it with foam. The spilt fuel was then soaked up with soil and removed. Four staff members from the premises were evacuated during the incident, but no member of the public was involved.

Cause

The driver incorrectly connected a delivery hose to the wrong underground tank, which had not been dipped prior to filling. The spilt fuel escaped onto the forecourt via an old suction pipe which had not been correctly terminated during recent tank and bowser relocation.

Consequences

Evidence has been gathered and charges are expected to be laid:

(i) against the tanker driver for breaches of the Australian Dangerous Goods Code and Dangerous Goods Regulations 1992; and

(ii) against the contractor for improper tank installation.

DGAT : W18/98 **FILE No. : 159/98**

Dangerous Goods Transport Accident Report

Date	:	25 October 1998	**Time**	1210 hours
Location	:	Forrestfield Marshalling Yards FORRESTFIELD		
Dangerous Goods Involved	:	**SULFURIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1830
		Packing Group	:	II
		Quantity Present	:	29 600 litres
		Quantity Spilt	:	40 litres

Incident

The driver of a freight train transporting sulfuric acid was checking the wagons while they were stationary in a marshalling yard. He noticed that product was leaking onto the ground from one of the tankers, and discovered that a tap on an overflow pipe had been left open. He closed the tap and the leaking ceased. The spillage was attended to by a specialist company which undertook the clean-up operations. There was no danger to the public from the incident.

Cause

The incident was caused by a deviation from operating procedures.

Consequences

The consignor has been directed to review its operating procedures in order to prevent incidents of a similar nature occurring in the future.

DGAT : W20/98 **FILE No. : 181/98**

Dangerous Goods Transport Accident Report

Date	:	2 November 1998	**Time**	1545 hours
Location	:	South Western Hwy PINJARRA		
Dangerous Goods Involved	:	**CHLORINE GAS**		
		Class	:	2.3
		Sub-Risk	:	8
		UN No.	:	1017
		Packing Group	:	-
		Quantity Present	:	Undetermined
		Quantity Spilt	:	Nil

Incident

A truck carrying two empty 920 kg chlorine drums left the road on a sweeping bend, five kilometres south of Pinjarra on the South Western Highway and overturned trapping the driver in the cab. The two empty chlorine drums broke free from their chains in the rollover and finished up on the side of the road near the vehicle. The emergency services ascertained that the chlorine drums and their contents were intact and safe to handle. The driver had to be cut free from the cab of the truck and was taken to the hospital, but died later that evening.

Cause

It appears that the driver had been driving into the sun and this could be a contributing factor. A final decision cannot be made about the cause until publication of the Coroner's Report.

Consequences

The driver and his truck were licensed for dangerous goods transport and his work schedule appeared to be satisfactory. There was no evidence of any breaches of the legislation and it would appear that unfavourable environmental conditions (lighting) led to the accident. The Division will review the Coroner's Report when concluded and transport companies will be made aware of the incident and advised of any changes they should make to avoid a similar occurrence.

DGAT : W22/98 **FILE No. : 172/98**

Dangerous Goods Transport Accident Report

Date	:	8 November 1998	**Time**	1615 hours
Location	:	West Kalgoorlie Marshalling Yards WEST KALGOORLIE		
Dangerous Goods Involved	:	**SULFURIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1830
		Packing Group	:	II
		Quantity Present	:	29 600 litres
		Quantity Spilt	:	50 litres

Incident

A rail tanker was loaded with sulfuric acid on 7 November 1998 and left standing for approximately 24 hours at a marshalling yard. At 1615 hours on 8 November 1998 an inspection of the train by rail staff revealed that acid was leaking from the tanker. It is believed that approximately 50 litres of acid was lost when the product expanded and a valve failed. The consignor's emergency response team attended the spill and after sealing the leak, the tanker was cleaned and returned to the loading facility for further examination. The contaminated yard area was neutralised with soda ash and the soil removed for safe disposal.

Cause

The incident was caused by overfilling of the rail tanker and deviation from operating procedures.

Consequences

No threat was posed to the public by the incident. The consignors have been directed to examine their operating procedures and provide evidence of remedial measures that have been put in place to prevent incidents of a similar nature occurring in the future.

DGAT : W24/98 **FILE No. : 184/98**

Dangerous Goods Transport Accident Summary Report

Date	:	10 November 1998	**Time**	1200 hours
Location	:	Forrestfield Marshalling Yards FORRESTFIELD		
Dangerous Goods Involved	:	**SULFURIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1830
		Packing Group	:	II
		Quantity Present	:	29 000 litres
		Quantity Spilt	:	Undetermined

Incident

A freight train transporting bulk containers of sulfuric acid arrived at the Kwinana Freight Terminal and was inspected by the Westrail Area Manager. He observed that four tankers appeared to be leaking acid through the pressure vents, one tanker was leaking acid through the pressure vent and rollover coaming. Another tanker had the filler cap left off after loading and acid was leaking down the side of the tanker via a split in the rollover coaming. A check with the Area Manager at the Forrestfield Marshalling Yards confirmed that there was significant soil contamination at that site from a transit stop of approximately 50 minutes.

Cause

It is apparent that the incident was caused by overfilling of the tankers, poor maintenance and deviation from established operating procedures.

Consequences

While danger to the public was minimal, the incident resulted in a lengthy clean-up operation. The consignor and prime contractor have been directed to review all of their procedures and develop remedial action to prevent incidents of a similar nature.

DGAT : W19/98 **FILE No. : 177/98**

Dangerous Goods Transport Accident Summary Report

Date	:	10 November 1998	**Time**	1145 hours
Location	:	Great Northern Hwy BULLSBROOK		
Dangerous Goods Involved	:	**HYDROCHLORIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1789
		Packing Group	:	II
		Quantity Present	:	2 000 litres
		Quantity Spilt	:	120 litres

Incident

A road train transporting two 1 000 litre rigid plastic IBCs containing hydrochloric acid and general mining equipment, was travelling north on the Great Northern Highway, approximately three kilometres north of the town of Bullsbrook. The driver was travelling at 90km/h and while negotiating a slight right hand bend in the road, the rear trailer became detached from the converter dolly which coupled it to the road train combination. The trailer brakes locked on and the trailer veered to the left hand side of the road, coming to rest in a storm water drain. The force of the impact dislodged the complete load from the trailer, and in the process, one of the IBCs was punctured causing approximately 120 litres of acid to escape. Emergency services personnel attended the site and called for the assistance of a specialist company for the cleanup operation. The highway was closed for six hours but there was no significant danger to the public.

Cause

The incident was caused by the trailer not being fully locked onto the converter dolly due to a damaged locking jaw.

Consequences

The incident has been fully investigated and other converter dollies of the same type in use by the company have been inspected for signs of similar damage. No charges were laid.

DGAT : W21/98 **FILE No. 182/98**

Dangerous Goods Transport Accident Summary Report

Date	:	9 December 1998	**Time**	1145 hours
Location	:	Forrestfield Marshalling Yards FORRESTFIELD		
Dangerous Goods Involved	:	**SULFURIC ACID**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1830
		Packing Group	:	II
		Quantity Present	:	29 600 litres
		Quantity Spilt	:	14 litres

Incident

A rail tanker was found to be leaking sulfuric acid onto the ground while stopped at a marshalling yard. Approximately 14 litres of acid leaked onto the ground via an overflow valve cock which had been left open. The valve was closed and a specialist recovery company neutralised the spill and removed the contaminated soil.

Cause

A combination of overfilling, the expansion of liquid due to solar heating, a faulty vent valve and procedural error in not closing the secondary containment overflow valve resulted in the spill.

Consequences

The consignor of the sulfuric acid has undertaken a review of filling procedures to prevent overfill of containers, and to ensure that overflow valves are closed. A program has also been commenced to check and replace similar vent valves fitted to rail tankers in the fleet.

DGAT : W25/98 **FILE No. : 196/98**

Dangerous Goods Transport Accident Summary Report

Date	:	14 December 1998	**Time**	1045 hours
Location	:	Great Northern Hwy WYNDHAM		
Dangerous Goods Involved	:	**AMMONIUM NITRATE**		
		Class	:	5.1
		Sub-Risk	:	-
		UN No.	:	1942
		Packing Group	:	III
		Quantity Present	:	72 000 kg
		Quantity Spilt	:	24 000 kg

Incident

While approaching a single lane bridge, the driver of a triple road train carrying ammonium nitrate had to take evasive action to avoid a collision with an oncoming four wheel drive vehicle which failed to give way. This resulted in the entire combination of vehicles rolling into a gully, the prime mover and the front belly dumper overturning. All of the solid ammonium nitrate spilt from the front belly dumper and a few litres of diesel from the prime mover's fuel tank spilt onto the product. The contents of the second belly dumper did not spill and the IBCs of ammonium nitrate remained on the rear trailer. A small quantity of product spilt into the nearby creek.

The incident was attended by the local emergency services and product was cleaned up by the consignor and prime contractor.

Cause

The cause appears to have been inattention by the driver of the oncoming four wheel drive vehicle.

Consequences

The driver of the road train appears to have taken appropriate evasive action and avoided a collision with the other vehicle and possible extensive spillage of product into the creek.

The transport industry will be requested to assess the need for effective covers on vehicles transporting bulk solids to prevent future spillage in similar circumstances.

DGAT : W28/98 **FILE No. : 202/98**

Dangerous Goods Transport Accident Summary Report

Date : 18 December 1998 **Time** 1130 hours

Location : Marvel Loch - Forrestania Rd
MARVEL LOCH

Dangerous Goods Involved :

EXPLOSIVE, BLASTING, TYPE B

Class	:	1.1
Sub-Risk	:	-
UN No.	:	0082
Packing Group	:	-
Quantity Present	:	6 000 kg
Quantity Spilt	:	6 000 kg

EXPLOSIVE, BLASTING, TYPE E

Class	:	1.1
Sub-Risk	:	-
UN No.	:	0241
Packing Group	:	-
Quantity Present	:	1 000 kg
Quantity Spilt	:	1 000 kg

BOOSTERS, WITHOUT DETONATOR

Class	:	1.1
Sub-Risk	:	-
UN No.	:	0042
Packing Group	:	-
Quantity Present	:	0.056 kg
Quantity Spilt	:	0.056 kg

Incident

Whilst travelling on a remote section of road, the driver of an explosives vehicle heard what appeared be a tyre blow-out and on investigation observed a tyre fire at the rear of the vehicle. After attempts to extinguish the fire failed the driver abandoned the vehicle. A passing truck took him to a nearby minesite from where emergency services were alerted to the problem. An explosion which destroyed the vehicle and load occurred about 45 minutes after the fire was first observed. There were no injuries or fatalities and no breaches of the regulations.

Cause

A tyre fire resulted in the engulfment of the vehicle by fire and eventual detonation of the load.

Consequences

A thorough investigation has revealed some potential design changes for implementation across the explosives transport industry. Competent Authorities in other states and industry have also been notified of the outcome of the investigations and will be kept informed of any recommended actions taken to prevent a similar recurrence.

DGAT : W27/98 **FILE No. : 201/98**

Dangerous Goods Transport Accident Summary Report

Date	:	22 December 1998	**Time**	1515 hours
Location	:	Marriott Rd KEMERTON		
Dangerous Goods Involved	:	**SODIUM HYDROXIDE**		
		Class	:	8
		Sub-Risk	:	-
		UN No.	:	1824
		Packing Group	:	II
		Quantity Present	:	24 050 litres
		Quantity Spilt	:	50 litres

Incident

At the intersection of Old Coast Road and Marriott Road, Kemerton, a tanker containing sodium hydroxide spilt 50 litres of product. The product leaked from the manway hatch into the coaming area surrounding the hatch and then onto the road. The spilt product was covered with sand and disposed of by emergency services.

Cause

Both the tanker and the hatch lid involved in the incident were brand new. Post-incident investigations revealed an unsuitable maintenance program was in place and that the seal supplied with the new hatch lid was of the 'teflon' type. The seal physically dislodged itself from the lid resulting in leakage.

Consequences

The company has replaced existing teflon lid seals with butyl rubber seals and modified its maintenance policy to prevent a recurrence of the incident.

DGAT : W26/98 **FILE No. : 200/98**

APPENDIX 1

ACCIDENT RECORDING POLICY

Purpose

To stipulate the criteria upon which incidents involving explosives or dangerous goods reported to the Division are to be designated as Recorded Accidents.

Scope

All incidents involving the transport, storage and handling of explosives and dangerous goods where such transport, storage or handling is within the scope of the Explosives and Dangerous Goods Act 1961.

Criteria

Respective Branch Managers shall assess each reported incident to determine whether they are Recorded Accidents according to the following criteria.

1. Any incident involving explosives or dangerous goods that impacts on or presents a significant potential to impact on public safety.
2. Any unintentional fire or explosion (including sabotage) involving or impinging on explosives or dangerous goods containers or storage facilities.
3. Any uncontrolled release of explosives or dangerous goods:
   - from a bulk container or pipeline;
   - that travels or impacts off the site where storage or handling occurs; or
   - that causes serious injury to any person or substantial damage to property.
4. Any incident where explosives or dangerous goods containers can be shown to have fallen from a vehicle whilst it is in transit.
5. Any incident where a bulk container carrying explosives or dangerous goods is subjected to impact; typically through rollover or collision.

Examples of incidents that are not intended to be classified as Recorded Accidents are:

- packages falling from a forklift, sustaining damage and minor leakage with no subsequent injury, property damage or off-site effect.
- where small numbers of packages of dangerous goods are found on the roadside (with or without contents) and their origins remain undetermined.
- vehicle traffic accidents where the containers, their fittings and the dangerous goods remain intact and have not been subjected to impact, and where the dangerous goods are inconsequential to the incident.
- an escape of dangerous goods that is expected during normal operations, maintenance or transfers.
- incidents that involve substances not classified as dangerous goods but are captured by WAHMEMS due to uncertainty or misinformation.

K Price
Director
Explosives and Dangerous Goods Division

30 April, 1999