summary of reported electrical and gas accidents • 1 January 2001 to 31 December 2001

2001

1 January 2001 to 31 December 2001

summary of reported electrical and gas accidents

Printed December 2002

energysafetyservice
te ratonga whakaruru pūngao

MINISTRY OF CONSUMER AFFAIRS
MANATŪ KAIHOKOHOKO

The Energy Safety Service is part of the Ministry of Consumer Affairs

Energy Safety Service

33 Bowen St
PO Box 1473
Wellington
New Zealand

Telephone	04 472-0030
Fax	04 460 1365
Freefax (Industry enquiries)	0508 Safe Energy 0508 723 336
Email	info@ess.govt.nz

Web site

www.ess.govt.nz

Notification — electrical and gas accidents

Freephone	0800 10 44 77

Printed December 2002

ISBN 0-478-26320-1

contents

foreword

NOTIFIABLE ELECTRICAL AND GAS ACCIDENTS
1 January 2001 to 31 December 2001

December 2002

The Energy Safety Service (ESS) was established in December 1999 with the aim of bringing a clearer focus to safety, supply quality, and measurement across the electricity and gas sectors. The ESS is a part of the Ministry of Consumer Affairs, but is accountable to the Associate Minister of Energy.

We are responsible for ensuring the safe production, supply, installation and use of electricity and gas. One of the ESS's key functions is to investigate electrical and gas accidents and, as a result, design and implement improved safety procedures. The person in charge, or occupier, is required by law to report to the ESS any accidents caused by, or associated with, electricity or gas resulting in fatalities, serious injuries or serious property damage.

In 2001, the ESS published summaries of electrical and gas accidents notifiable under the Gas Act 1992 and the Electricity Act 1992 (except electrically caused fires) for the calendar years 1998 to 2000 (inclusive). This booklet covers notifiable gas and electrical accidents that occurred during the 2001 calendar year.

We are dedicated to working with the electrical and gas industries to promote and enhance safety for industry, consumers and the public. The ESS believes that many more accidents can be avoided by following safe working practices and adopting effective safety behaviours. This publication is designed as an important resource for communicating with the electrical and gas industries and supporting improved competency standards for workers in these industries. We believe readers can learn from the mistakes of others and make sure something similar doesn't happen to them.

Our vision is '**safe energy – safe people**'. We look forward to strengthening partnerships with all parts of the electricity and gas industries and, together with consumers and the public, achieving this vision.

Liz MacPherson
General Manager
Ministry of Consumer Affairs

Tony Leverton
Group Manager
Energy Safety Service

commentary

Background

Electrical and gas safety requirements are covered by separate legislation. Before the creation of the Energy Safety Service (ESS), the Office of the Chief Electrical Engineer administered the Electricity Act 1992 and the Office of the Chief Gas Engineer administered the Gas Act 1992. The ESS combined these two Offices, as well as introducing safety analysis and policy functions. As there are some differences between the two energy sources, energy industries and their philosophies of investigation, some differences in accident investigation, information collection and recording, have crept in over the years.

We are currently undertaking a number of projects that will better integrate the accident investigation and data management systems for reporting electrical and gas incidents.

Data Collection and Recording

This booklet contains brief descriptions and analyses of all notifiable, electrical accidents (except electrically caused fires) and both notifiable and non-notifiable gas accidents reported to the ESS during 2001. A notifiable accident represents a loss that is above the specified threshold under the Act.

For this publication, a "notifiable gas accident" means an accident causing fire and/or explosion and/or gas poisoning. A "notifiable electrical accident" means an accident causing electrical shock (which might cause burns) or a fall – but not electrically caused fires. These latter incidents have been excluded from the summaries section because of their nature and the associated difficulty in ascribing direct cause. They are, however, shown as part of a table in this report. (Further information is collected and published by the New Zealand Fire Service as part of its investigations into the causes of all fires attended.)

In this booklet, a non-notifiable gas accident means an accident or incident that causes a loss (including injury) below the threshold defined in the Gas Act 1992, and which is not usually collected from a gas supplier or the New Zealand Fire Service for recording.

Gas suppliers provide the ESS with information on non-notifiable accidents/incidents on an infrequent basis for recording purposes. Data are also collected from the New Zealand Fire Service on an infrequent basis for recording purposes. Data on non-notifiable gas accidents are not included in the analysis. The accident summaries sections cover only notifiable accidents.

NOTIFIABLE ELECTRICAL AND GAS ACCIDENTS
1 January 2001 to 31 December 2001

Reporting Accidents and Reliability of Data

There continues to be a need for greater reliability and accuracy of information arriving at ESS. In practice, we have found the more serious the accident, the more likely it is to be reported and the more accurate the information. This is because these accidents are thoroughly investigated by the responsible authority and there is a higher likelihood of publicity for serious accidents, with subsequent pressure to determine the cause of the accident and prevent a reoccurrence.

We receive both earlier notification and more accurate information from the energy industry (both business and workers) than from the general public – except for liquefied petroleum gas (LPG) accidents. In all areas, we remind both industry and the public to report all accidents to the ESS free phone (0800 10 44 77), through our website (www.ess.govt.nz), or in writing by post or fax, so that a comprehensive database can be maintained on New Zealand's electrical and gas accidents.

Unfortunately, we are often not advised about some gas and electrical incidents until they result in a fatality or very serious accident. Full and early reporting of accidents and incidents, no matter how minor, is in the interests of all. This way, we can monitor practices and behaviours, pinpoint problem areas, and take early action on improving safety before death, injury, or serious loss occurs.

Method of Analysis

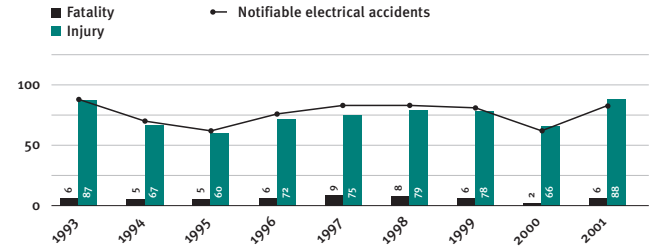
Notified accident information from the last nine years (1993 to 2001 calendar years) has been analysed for trend, frequency, common causes and type of worker involved. There are some differences in electrical and gas data collection and recording that may be of significance:

1 A "notifiable electrical accident" (as defined in the Electricity Act 1992) may include an electrically caused fire. These are not, however, included for analysis, because they are not investigated or recorded in the ESS database. Generally, the New Zealand Fire Service investigates all electrical fires in the same manner as other fires. However, a "notifiable gas accident" (as defined in the Gas Act 1992) means a gas accident causing fire and/or explosion and/or gas poisoning. All these are included for analysis because they directly involve the ESS and are all recorded in the ESS database.

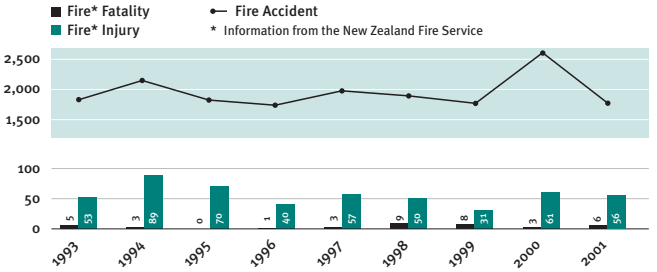
2 Electrical accident investigators usually specify a single causal factor for an electrical accident, whilst gas accident investigators may specify up to four causal factors for each gas accident. The latter approach is based on the philosophy that loss can be avoided (or reduced) by removing at least one of the causal factors. We will be looking into adopting a more consistent approach to causality in the coming two years.

NOTIFIABLE ELECTRICAL AND GAS ACCIDENTS
1 January 2001 to 31 December 2001

Notifiable Electrical Accidents 1993 - 2001 — Graph 1a



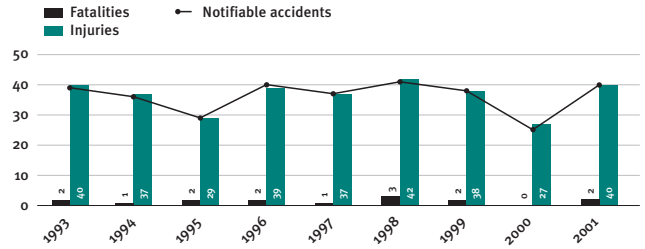
Electrical Accidents resulting in Fire 1993 - 2001 — Graph 1b



Electrical Accidents (Graphs 1a and 1b)

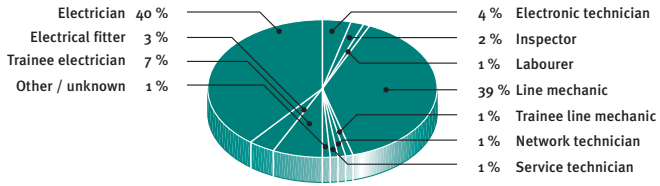
- Graph **1a** has information on all notifiable electrical accidents and graph **1b** has information on electrically caused fires.
- The New Zealand Fire Service has supplied data on electrically caused fires (graph **1b**).

Notifiable Electrical Accidents to Electrical Workers 1993 - 2001 Graph 2



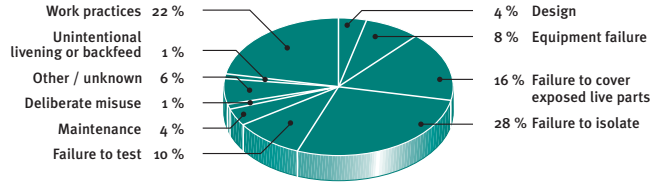
Notifiable Electrical Accidents to Electrical Workers 1993 - 2001 Graph 3

by worker category



Notifiable Electrical Accidents to Electrical Workers 1993 - 2001 Graph 4

by causal factor



Electrical Accidents

Electrical accident information is collected and recorded in the ESS's database for three main target groups; electrical workers, workers in other occupations and the general public. Accidents have been analysed for their seriousness and the frequency of total accident occurrence for each of these groups.

The nature of each group's relationship with electricity (training, familiarisation and responsibility) is quite different. All have a significant number of casualties but the reasons for accidents (causal factors) and the solutions to preventing further accidents may be different. Therefore, causality is analysed differently for each of the groups.

Electrical workers

- There is no significant change in the number of fatal and injury accidents occurring to electrical workers over the last nine years.
- In the last nine years, there were fifteen fatal accidents (six line mechanics, one trainee line mechanic, six electricians and two electrical apprentices).
- There were 311 injury accidents that caused a total of 329 injuries. Over 80% of these accidents occurred to either electricians or line mechanics while they were working. Line mechanics have a lower percentage of accidents than electricians but have more multiple casualty accidents. The overall number of casualties is similar for both occupational groups.
- The main causes of accidents to (all categories of) electrical workers were; a failure to isolate from power source (28%), not following correct work practices (22%), failure to cover exposed live parts (16%), and failure to test for live supply (10%).
- During the last three years, there has been a measurable reduction (from an average of about 16 per year to about 10 per year) in electrical accidents to line mechanics. This may be due to a reduction in the amount of line work undertaken, a reduction in accident reporting, or a real improvement in safety. In order to ascertain reasons for this reduction, we will be looking to see whether industry experience bears out the suggested safety improvements.

- About 35% of the accidents to line mechanic were caused by not following correct work practices and about 22% were due to failure to cover exposed live parts. Failure to isolate and failure to test the power supply each accounted for about 10% of accidents to line mechanics.
- During the last two years, there has been a small reduction in reported electrical accidents to registered/licensed electricians. However, there may be an increase in electrical accidents to trainee electricians. The net result is that there has been no overall change in accident rate to the electrician group.
- About 47% of the accidents to electricians are due to failure to isolate. Failure to cover exposed live parts, failure to test and not following safe work practice each accounted for about 10% of accidents to electricians.
- The causes of accidents to trainee electricians are similar to those of registered/licensed electricians. The major causes of accidents to trainees were; failure to isolate (31%), failure to follow safe work practices (27%) and failure to test (13%).

Levels of risk

The most important safety measurements for workers are the odds of being killed or injured by electricity. Data from the last five years have been used to calculate the odds of dying or being injured by electricity.

The table on the next page shows the levels of risk involved in a lifetime's working with electricity. For line mechanics (include trainee line mechanics), the chance of dying from an electrical accident is one in 83 and being injured one in 3.8. That means, one in every 83 line mechanics had a fatal accident during their working life and nearly one in four line mechanics had an injury accident in their working life. The risk is much lower for electricians and apprentice electricians (one in 500 of dying and one in 21 of being injured). Other occupations are much less at risk, with a one in 17,045 chance of dying as a result of an electrical accident and a one in 1,410 chance of being injured. The general public has a smaller lifetime risk, with a one in 22,619 chance of dying as a result of an electrical accident and a one in 4,113 chance of being injured.

NOTIFIABLE ELECTRICAL ACCIDENTS
1 January 2001 to 31 December 2001

Risk Levels in Working with Electricity — Table 1

Group	Accident	Average per year	Lifetime probability[a]
Line mechanics[b]	Fatality	0.6	83
	Injury	13.0	3.8
Electricians[c]	Fatality	0.6	500
	Injury	14.0	21.4
Other Occupations[d]	Fatality	2.2	17,045
	Injury	26.6	1,410
General public[e]	Fatality	2.4	22,619
	Injury	13.2	4,113

Note:

a Lifetime probability = number in group / average per year multiplied by average lifetime exposure)

b The estimated number of line mechanics is 2,000 (registered and working under employer licence) and their average working life is 40 years.

c The estimated number of electricians is 12,000 (registered and working under employer licence) and their average working life is 40 years

d The estimated number of other occupations is 1.5 million. (source: tables 17 and 25 of the National Summary Censuses 1996 and 2001.) The average working life of other occupation workers is 40 years.

e The estimated population of New Zealand is 3.8 million and life expectancy is 70 years

High risk areas and suggestions for improvement

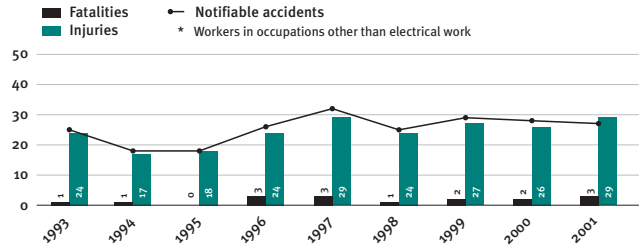
The last nine years of accident analysis of electrical workers highlights the following areas where accident risk is higher and safety performance is poorer:

- Line mechanics
- Electricians

Safety performance could be improved by:

- Appropriate ongoing training (for both types of worker) for working with live supply and regular assessment of work practices when working.
- Putting an emphasis on following safe work practices, including covering live parts.
- Testing and isolating of live lines where feasible.

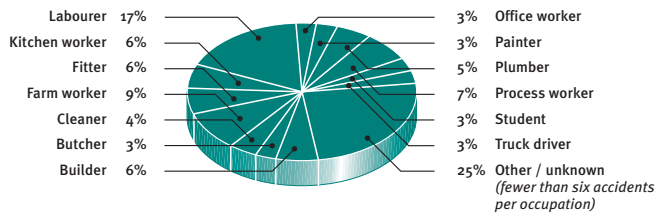
Notifiable Electrical Accidents to People In Other Occupations* 1993 - 2001 Graph 5



Notifiable Electrical Accidents to People In Other Occupations* 1993 - 2001 Graph 6

by occupation

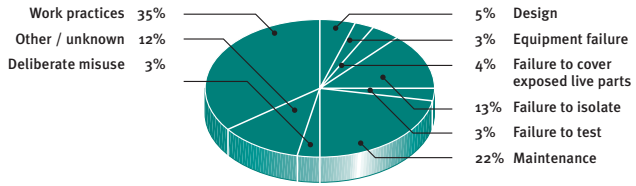
* Workers in occupations other than electrical work



Notifiable Electrical Accidents to People In Other Occupations* 1993 - 2001 Graph 7

by causal factor

* Workers in occupations other than electrical work



Other Occupations (Non-electrical Workers)

- Over the last nine years, there were 229 notifible accidents to workers in other occupations, that caused 218 injuries (almost all were a single injury accident) and 16 fatalities (in single-fatality accidents). Eleven of the fatal accidents involved high voltage systems (above 230 volts). There were nine accidents to farm workers – six of these involving high voltage systems.
- There appears to be no injury accident trend for any occupational group other than the fact that about 17% of the accidents were to labourers. No single industry is identified as the labourers' employer. About 80% of labourers were injured by a high voltage system while working (either cutting or digging) near underground or overhead lines.
- The major causes of accidents were; not following correct work practices (35%), a lack of maintenance (22%), and failure to isolate (13%).

High risk areas and suggestions for improvement

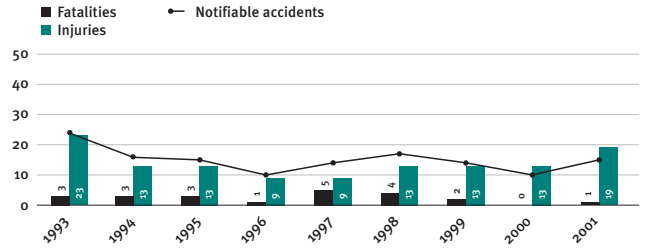
The last nine years of accident analysis highlights the following areas where accident risk is high and safety performance is poor for workers in other occupations:

- Farming industry
- All workers involved in digging or working near high voltage live lines

Safety performance could be improved by:

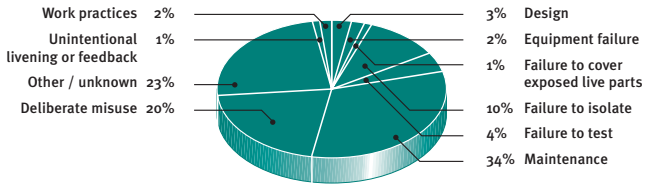
- Improving the electrical safety knowledge of the farming community and other occupational groups who generally work close to live power lines.
- Using residual current devices (RCDs) in commercial and industrial environments.

Notifiable Electrical Accidents – to the General Public 1993 - 2001 Graph 8



Notifiable Electrical Accidents – to the General Public 1993 - 2001 Graph 9

by causal factor



General public

- There were 135 electrically caused accidents to the general public in the nine-year period from 1993 to 2001.
- 22 accidents to the general public caused 22 fatalities. Fifteen of these involved 230 volt supply and four involved 11,000 volt supply. Of the 22 fatal accidents, there were four children and six students who were victims. Eight of these ten accidents involved a 230 volts supply system. Of the 22 fatal accidents, 14 occurred in a domestic environment, three commercial, two industrial and three in an electrical work environment.
- Twenty-three percent of the fatal electrical accidents to the general public were caused by misuse (sometimes deliberate). Lack of maintenance and failure to test power supply were each the cause of about 14% of these accidents. The cause of seven of the fatal accidents was unclear.
- Appliances (nine accidents) and power lines (eight accidents) were the major contributors to fatal accidents.

- 116 accidents caused injury to 125 people. Children were involved in about 20% of these accidents and students in 26% of the accidents.
- About 70% of these injuries were caused by a 230 volt power supply and about half of these were to children and students.
- About 50% of injury accidents occurred in the domestic environment whilst another 15% occurred in the commercial environment and a similar percentage occurred in the industrial environment.
- Power lines (32%), appliances (25%) and domestic installations (24%) were involved in 82% of all accidents. About 40% (20% of all accidents) of the appliance and installation accidents were due to a lack of maintenance of appliances and installations.

High risk areas and suggestions for improvement

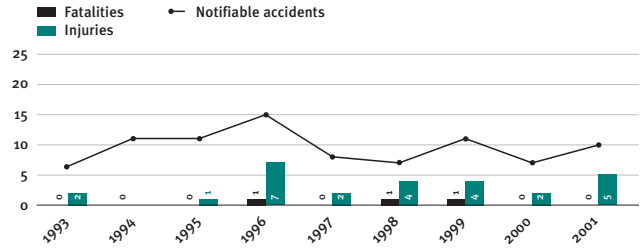
Analysis of the last nine years of electrical accidents to the general public highlights the following areas where accident risk is high and safety performance is poor:

- Children
- Students
- Homeowners

Safety performance could be improved by:

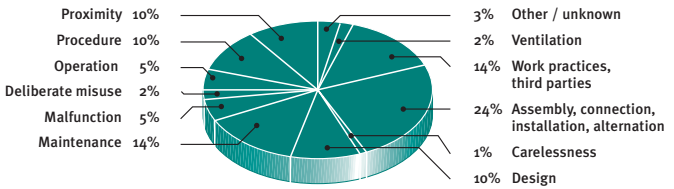
- Improving electrical safety in areas where there are children.
- Improving the safety knowledge of students.
- Encouraging homeowners to have electrical appliances and installations maintained.
- Encouraging homeowners to use RCDs in wet areas (kitchen, bathroom and laundry) and with portable tools, and having child protection safety devices in homes.
- Improving the understanding of the danger of overloading power circuits and working near power lines.

Notifiable Natural Gas Accidents 1993 - 2001 Graph 10

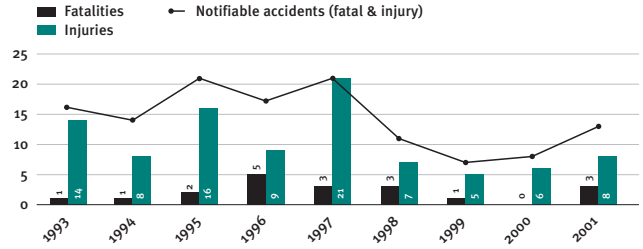


Notifiable Natural Gas Accidents 1993 - 2001 Graph 11

by causal factor

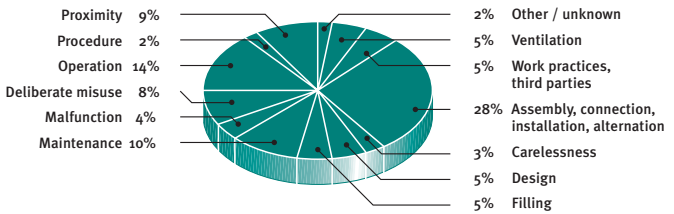


Notifiable LPG Accidents 1993 - 2001 Graph 12



Notifiable LPG Accidents 1993 - 2001 Graph 13

by causal factor



NOTIFIABLE GAS ACCIDENTS
1 January 2001 to 31 December 2001

Gas Accidents

Gas accident data cover the use of two gases – natural gas and liquefied petroleum gas (LPG). These two gases have different characteristics, industries, categories of appliances, and methods of distribution and use.

The gas accident database contains information about fatalities, injuries, fires, explosions and minor accidents for natural gas and LPG. Gas accidents have been analysed for seriousness (fatal, injury notifiable, and non-notifiable) and frequency (high, medium and low) of similar types of accident. Here 'non-notifiable' means an accident or incident causing a loss (including injury) below the threshold defined in the Gas Act 1992.

As previously noted, the bulk non-notifiable accident data received infrequently from some gas suppliers as well as the New Zealand Fire Service, are not included in this analysis because they represent only a partial coverage and their inclusion could produce a distorted analysis.

Natural Gas (1993 – 2001)

- Analysis of natural gas accidents over the past nine years shows no change in the number of fatal and injury accidents. Also, the number of these accidents is statistically small and if there is any trend, it is hiding within the normal random variation.
- Over the past nine years, there has been an average of about nine notifiable accidents per year. There have been no significant changes during this period.
- The number of non-notifiable accidents (excluding the bulk reporting of accidents by gas suppliers and the New Zealand Fire Service) has been slowly increasing (15 in 1993 to over 50 in 2001).

Seriousness of accidents

Over the past nine years, there was a total of 371 accidents. There were:

- Three fatal accidents that caused three deaths.
- Twenty-three accidents that injured 29 people.
- Eighty-six notifiable accidents, with no significant change in the average number of accidents per year, during the period.
- 285 non-notifiable accidents. The average number reported each year is slowly rising. In the last two years, the ESS received more information on

these accidents from the media and others than from usual sources (industry, New Zealand Fire Service (NZFS) and Occupational Safety and Health Service (OSH)).

Rate of occurrence

Fixed space-heaters/furnaces and cookers/ovens were involved in three fatal accidents.

Space heaters/furnaces were associated with about 20% of the total (371) natural gas accidents whilst cookers/ovens were associated with about 10% of total accidents. About 43% of the total (371) accidents were related to mains/service and regulator stations. Eighty-six of the total notifiable accidents (about 20%) were related to mains/service and regulator stations and 59% of the accidents resulted in injury. About 80% of the total mains/service and regulator station accidents were caused by not following appropriate work practices and procedures.

About 25% of the notifiable accidents were caused by incorrect assembly/connection/installation/alteration. Lack of maintenance and not following appropriate work practice/third party damage each accounted for 14% of notifiable accidents.

About 25% of the notifiable accidents involved cookers/ovens and 30% involved water heaters.

High risk areas and suggestions for improvement:

Analysis of accidents from the last nine years highlights the following areas where accident risk is high and safety performance is poor:

- Mains/service and regulator stations
- Heaters
- Cookers/ovens
- Water heaters

Safety performance could be improved by:

- Performing correct assembly/connection/installation/alterations.
- Regular maintenance of gas appliances.
- Following appropriate industry work practices when working with or near gas-supply systems.

NOTIFIABLE GAS ACCIDENTS
1 January 2001 to 31 December 2001

Liquefied Petroleum Gas (1993 – 2001)

- There has been no significant change in the number of fatal accidents during the period. However, there has been a decline in the number of injury and injury accidents over the last four years. The average number of accidents for this latter period was about five compared to the previous five years' average of about ten.
- There was a significant decline in the average number of non-notifiable accidents (excluding accidents reported by gas suppliers or the New Zealand Fire Service) to about an average of 20 accidents in the last four years (1998–2001) to an average of 31 for the previous five years (1993–97). The actual cause of this decline is unknown but one possibility is a decline in the reporting of accidents. However, discussion with industry representatives could be helpful in determining whether a trend in improving safety exists.

Seriousness of accidents

In the last nine years, there was a total of 361 LPG accidents. There were:

- Fifteen accidents causing 19 fatalities.
- Sixty-five accidents causing 94 injuries.
- A total of 123 notifiable accidents during the last nine years.
- There were 238 non-notifiable accidents in the last nine years with an average of 20 per year in last four years.

During last four years, a large proportion of accident notification (notifiable and non-notifiable) came from OSH and the media. In comparison to this, in the previous five-year period (1993–97), NZFS, OSH and the gas industry contributed a similar level of notification.

Rate of occurrence

In the past nine years, there were 15 LPG accidents that resulted in a total of 19 fatalities. These included accidents involving LPG containers (seven accidents/seven fatalities), cookers/ovens (five accidents/eight fatalities), cabinet heaters (two accidents/two fatalities) and installations (one accident/

two fatalities). Seven of the fatal accidents (eight fatalities) occurred in buildings, four (four fatalities) in caravans, two (four fatalities) in cars/vans/trucks and two (three fatalities) occurred outside.

Cabinet heaters (33%), containers (20%), and cookers/ovens (17%) were major contributors to the total notifiable and non-notifiable accidents. These three types of equipment together contributed about 78% of the total number of notifiable accidents. Barbecues contributed to about 11% of the total LPG accidents but only to about 3% of the notifiable accidents.

The main causal factors of the total LPG accidents were; incorrect assembly/connection/installation (36%), incorrect operation (10%), lack of maintenance (9%) and problems when filling (9%). These causal factors were also the major contributors to notifiable accidents (with different levels of contribution – see graph 13).

The majority of LPG accidents were to the operators/owners, and in most cases the accident was the result of incorrect operation.

High risk areas and suggestions for improvement

The last nine years of accident analysis highlights the following areas where the accident risk is high and safety performance is poor:

- Cabinet heaters
- Containers
- Cookers/ovens

Safety performance could be improved by:

- Correct assembly/connection/installation/alteration (including the possibility of improving the ease of safe use, and standardising, connectors and fittings).
- Regular maintenance of gas appliances and fittings.
- Following manufacturer's instructions.
- Avoiding overfilling LPG cylinders at service stations.

Plans for the year 2002/03

The Energy Safety Service is committed to safeguarding people and property from the dangers of electricity and gas. We oversee the safety, supply quality, and measurement requirements of the Electricity Act 1992

and the Gas Act 1992 by:

- Developing and applying internationally accepted standards to New Zealand's systems of electricity and gas safety, supply quality and measurement.
- Networking with other interested national and international organisations.
- Publicising energy safety, and advising consumers and business about the safety of energy products and services.
- Ensuring gas and electrical appliances and fittings are safe for use in New Zealand through industry surveillance and product monitoring.
- Undertaking investigations, corrective action and enforcement.

As well as our ongoing work, some of the specific activities that we are undertaking in the year 2002/03 to achieve our vision of '***safe energy – safe people***' are:

- Implementing the Government's decisions on clarifying the responsibilities for workplace safety, and product and public safety in the electricity and gas areas, through the *EnergySafe* programme.
- Working with the electrical and gas industries to jointly develop strategic approaches to safety based on agreed plans for action
- Managing supplier declaration schemes for gas and electrical appliances.
- Implementing communication strategies to improve the delivery of energy safety information to industry, consumers and the public.
- Developing and implementing a consumer awareness strategy that specifically provides Maori with relevant and timely information on electrical and gas safety.
- Producing, promoting, and distributing information on AS/NZS 3000 (Wiring Rules), residual current devices and changes to the Electrical Regulations 1997.
- Reviewing and updating a wide range of electrical and gas safety standards.
- Auditing the emergency preparedness of gas and electricity network operators and retailers.
- Conducting distribution system audits to measure the performance of gas transporters and the competence of distribution personnel.

- Inspecting high voltage installations and electricity distribution systems to assess compliance.
- Reviewing and reporting on the expertise of contractors to electricity and gas network operators.
- Gathering, exchanging and comparing information collected on electrical and gas appliance safety with international safety agencies.

Part 1

Electrical Workers

Number: 2001/002

Voltage: 400
Result: Burns
Location: Works

A trainee electrician received burns to his hand and leg when a broken cable in an underground pillar box exploded while he was in the process of stripping the outer sheath from the cable.

The trainee was given the task of joining the broken cable. He had tested the cable with a voltage tester at both ends and he did not get a voltage reading. He tried to move the cable to see if he could get it into position for joining. When the outer screen touched a live phase, it exploded.

An investigation revealed that the cable had been isolated at one end, but the link box had a back feed which caused the cable to remain live. The trainee failed in his testing to establish that the cable was still live and was not given adequate supervision.

Number: 2001/007

Voltage: 400
Result: Burns
Location: Industry

A trainee electrician was attempting to tighten screws on the live side of a main switch when the screwdriver he was using slipped and contacted and shorted two phases.

The task the trainee was given was to check screw connections on a switchboard on the downstream side of the main switch. He checked the load side of the main switch, which was in the "off" position and then decided to check the live side. He was working under supervision at the time of the accident.

Number: 2001/009

Voltage: 400
Result: Burns
Location: Works

A trainee line mechanic was fixing a cable guard to a low voltage (LV) cable on a pole and received burns to his neck when one of the screws penetrated the cable and caused a flashover.

Number: 2001/010

Voltage: 11,000
Result: Fatal electric shock
Location: Works

A trainee line mechanic was doing preparation work on a concrete pole prior to stringing the conductors of a low voltage overhead electric line when he came into contact with a live 11,000 volt pole-mounted fuse assembly and received a fatal electric shock.

Number: 2001/012

Voltage: 400
Result: Flash burns
Location: Works

A line mechanic received flash burns to his face and arms when he closed fuse gear onto a faulted cable.

Number: 2001/013

Voltage: 11,000
Result: Burns
Location: Works

Two electricians received burns when an 11,000 volt oil-filled switch in a substation exploded shortly after maintenance. It was determined that some fibres from the cleaning rags used had been left in one of the switches. This caused a failure between two of the phases within the switch shortly after re-energising. The company has instigated a checking procedure for maintenance work of this kind.

Number: 2001/014

Voltage: 400
Result: Burns
Location: Industry

An electrician received burns to his hand and face as he attempted to turn an isolating switch off. The electrician was checking numbers on motor control units in a motor control centre. The work was to isolate a motor control cell by turning off a rotary isolating switch, undoing the cell door, and pulling out the control chassis. He had performed this operation several times on adjacent cells and was attempting to work on the next cell when it exploded.

The explosion caused a fire that burnt through most of the control panel causing extensive damage to control gear and wiring.

The circuit breaker failed to clear the fault within the required time.

Number: 2001/015

Voltage: 400
Result: Electric shock
Location: Works

A line mechanic received an electric shock when he attempted to attach a stay wire to a pole. He came into contact with a live low voltage (LV) conductor and because he did not fasten his safety belt, he fell back from the ladder after receiving the shock.

At the time of the accident, he was wearing long trousers and a tee shirt but not insulating gloves.

Number: 2001/017

Voltage: 11,000
Result: Electric shock
Location: Works

A line mechanic received an electric shock and bruising when a rotten hardwood pole failed, pulling over other poles. Conductors had been unbound for a changeover onto new poles when a pole failed, pulling other poles over. The line mechanic was injured when the pole he was on, shook violently due to other poles falling. This caused him to grab a low voltage (LV) conductor that had been livened when an 11,000 volt conductor fell across it.

The team had failed to adequately identify the condition of the poles prior to commencing work.

Number: 2001/020

Voltage: 230
Result: Electric shock
Location: Commercial

A line mechanic was called in to reinstate supply after tree felling on a rural property where a tree had damaged the overhead mains. The top section of one of the poles had broken and the cross arm was reinstalled lower down the pole. The work was being done live and the line mechanic received an electric shock when he contacted a live bare phase whilst working on fitting up a temporary stay wire.

NOTIFIABLE ELECTRICAL ACCIDENTS
1 January 2001 to 31 December 2001

Number: 2001/021

Voltage: 11,000
Result: Burns
Location: Commercial

An electrical fitter suffered burns to his eyes when the top insulator on an 11,000 volt fuse holder broke when the fuse was being reinstalled. This caused the high-tension tail to fall and contact the cross-arm brace holding bolt. An arc occurred at the point at which the brace was bolted to the concrete pole.

Number: 2001/028

Voltage: N/A
Result: Fractured ribs
Location: Works

A line mechanic suffered fractured ribs when he fell 11 metres from a transmission tower. He had attached the pole strap of his line mechanic's belt onto an anti-climbing frame outrigger which slipped off whilst he was reaching out to untwist the barbed wire that was being attached to the anti-climbing barrier.

Number: 2001/029

Voltage: 230
Result: Electric shock
Location: Domestic

A trainee electrician was testing redundant cables on a house renovation job when he received an electric shock from what was thought to be a neutral conductor. It transpired that the black conductor was used as an active strap in a two-way lighting circuit. No red sleeving had been placed over the black conductor.

Number: 2001/032

Voltage: 230
Result: Burns
Location: Commercial

A trainee electrician received flash burns to the fingers of his left hand when he cut through live low voltage cables. The cables had earlier been identified as live.

Number: 2001/033

Voltage: 230
Result: Electric shock
Location: Commercial

An electrician received an electric shock when he was removing a timer. The case on the timer was broken and live terminals were exposed. The electrician failed to isolate the supply before attempting to work on the control panel.

Number: 2001/034

Voltage: 11,000
Result: Electric shock
Location: Works

A line mechanic was wrapping guy wire around a pole when the tail flicked and made contact with an 11,000 volt dropper. The line mechanic received an electric shock. He was on the ground near the guy wire that was coiled up on the ground.

Number: 2001/036

Voltage: N/A
Result: Fractured upper right arm
Location: Works

A line mechanic was descending a service pole after cutting away the conductors when the pole broke. He fell and fractured his upper right arm.

Number: 2001/037

Voltage: 400
Result: Electric shock
Location: Works

A cable jointer working in a damp trench was inspecting a cable joint for sharp edges after soldering. His glove was punctured by a sharp edge so contact was made with the live conductor and he received an electric shock.

Number: 2001/038

Voltage: N/A
Result: Injuries to arm, legs, and chest
Location: Works

A line mechanic was injured when the larch wood pole he was working on fractured at below ground level. He fell to the ground and received injuries to his arm, legs and chest.

Number: 2001/041

Voltage: 400
Result: Burns
Location: Works

Two electrical workers were terminating cables to a fuse connection module in a service pillar that was live. Two phases in the module were shorted out and a flashover occurred. Both received severe flash burns to face, neck, and arms, and were hospitalised. As a result of this accident, procedures were implemented to stop live work on this type of pillar box.

Number: 2001/042

Voltage: N/A
Result: Fatal
Location: Industry

An electrician was carrying out commissioning checks on a lift from the top of the car. While he was working, the car moved upward causing him to receive fatal injuries.

NOTIFIABLE ELECTRICAL ACCIDENTS
1 January 2001 to 31 December 2001

Number: 2001/043

Voltage: 230
Result: Electric shock/fall
Location: Industry

An electrician was removing the diffuser of a fluorescent fitting when he made contact with live wires. The live wires that were left dangling, should have terminated in a lamp holder.

Number: 2001/044

Voltage: 230
Result: Electric shock and burns
Location: Industry

An electrician received a shock and burns from a live terminal as he was attempting to locate a fault in a control panel. The control panel contained live exposed terminals and as he put his hand inside the panel, his finger touched a live terminal on a switch. He received a shock from his hand to his neck which was touching the metal lid.

The company has since issued staff with plastic sheeting that can be used as a barrier to stop inadvertent contact with live terminals. In this case, the panel was left live in order to try and identify the fault.

Number: 2001/050

Voltage: 11,000
Result: Burns
Location: Works

A line mechanic received burns to his hand and leg when he attempted to bind a conductor to an insulator.

The work was to install a new pole in an 11,000 volt line. The work site had been isolated by cutting jumpers at a set of insulators that were a number of poles away from the work site. The jumpers were then tucked under the insulators. At the work site, local earths were applied and the work had progressed to the point where the conductors were being attached to the insulators. The line mechanic carrying out the work of binding the conductors to the insulators thought that he had received an induction shock and carried on working. When he came down from the pole, he noticed burn marks on his hand and leg.

An investigation of the pole where the isolation had taken place revealed that the live jumper had made contact with the insulator fixing bolt, which in turn had livened the isolated conductor at 1,000 volts. It was also discovered that the isolated line at this point was not earthed.

Number: 2001/052

Voltage: 400
Result: Burns
Location: Commercial

An electrician received burns to his hand and face as a result of a phase-to-phase short circuit. He was removing the metal cover from a three-phase contactor in order to find out the size of the contacts. As the lid was prised off, two of the phase contacts shorted together at the terminals. The contactor lid did not appear to have any burn marks to indicate that it had come into contact with the live terminals. It is possible that some other foreign object inside the contactor box was disturbed when the cover was being removed. As this was an old installation, the switchboard did not have local fuses protecting the mains cable and the protection was at the 100 amp pole fuses some distance away.

The fuse board has since been modified and local fuse protection installed.

Number: 2001/053

Voltage: 400
Result: Burns
Location: Industry

An electrical trainee was stripping toughened plastic sheathed (TPS) cables in preparation for connecting to a switchboard when his side cutters hit the insulated rail of the busbar and the earthed metal of the switchboard. As a result, the trainee received burns to his hand. An investigation of the busbar system on the multi-way miniature circuit board (MCB) revealed that some of the insulated covers were soft, as if the plastic had not cured properly or did not form properly on the underside of the busbar.

Number: 2001/055

Voltage: 230
Result: Electric shock
Location: Industrial

An electrician was identifying redundant cables on a steel cable tray when his finger contacted a live conductor. The insulation had been damaged at some stage, most likely due to a friction burn that occurred during installation of conductors.

Number: 2001/056

Voltage: 400
Result: Burns
Location: Industry

An electrician received burns to his eyes when he was attempting to remove a cable gland from a switchboard. He was using a pair of pliers to remove a lock-nut, when the pliers slipped and made contact with a live busbar and earthed metal. The work being done was to remove redundant cables from the switchboard. The busbars were covered in thin plastic insulation that was damaged by the pliers when they slipped off the lock-nut.

The worker was not wearing eye protection.

Number: 2001/057

Voltage: 400
Result: Burns
Location: Works

A metering technician was installing a miniature circuit board (MCB) on a low voltage panel in a substation. He was removing insulation sleeving from the busbar when his side cutters shorted across two phases within the live panel.

Number: 2001/058

Voltage: 18,000
Result: Electric shock and bruising
Location: Works

An electrical technician suffered an electric shock and bruising as a result of a fall into a cable trench. The technician was testing high voltage cables in an indoor substation when he slipped, pulling a high voltage test lead down onto his legs as he fell into the open cable trench. It took some time for him to recover and get the test lead off his leg. The cable trench was in front of a panel where he was carrying out tests. He was aware of the trench and did not consider it to be a hazard. The high voltage test set output was 18,000 volts at 0.1 Hz.

Number: 2001/062

Voltage: 11,000
Result: Minor flash burns
Location: Works

A cable layer was carrying out excavations for a faulty street light cable and while using an electric hammer to break out surrounding concrete, struck a live 11,000 volt cable. The cable layer received minor flash burns to his face.

Number: 2001/064

Voltage: N/A
Result: Spinal injuries
Location: Works

A line mechanic was exiting an elevated work platform (EWP) bucket when he caught his foot and fell from the edge of the bucket onto the roadway. He received spinal injuries as a result of the fall. It was found that there was no steadying bar to grab whilst getting in and out of the bucket.

Number: 2001/066

Voltage: 33,000
Result: Electric shock
Location: Works

A line mechanic was working on a de-energised section of an 11,000 volt overhead line. He received an electric shock when the conductor slipped and made contact with a live 33,000 volt overhead line.

Number: 2001/067

Voltage: 230
Result: Electric shock
Location: Commercial

An electrical inspector was carrying out alteration work on a lighting control panel installing additional conductors, when he made contact with live parts of a fuse holder with his long nose pliers and received an electric shock. The control panel had not been isolated.

Number: 2001/071

Voltage: 2,500
Result: Electric shock
Location: Works

An electrical worker received an electric shock from a 2,500 volt insulation tester when carrying out tests at a substation. A pinhole was found in one of the insulation boots of the connector.

Number: 2001/078

Voltage: 230
Result: Electric shock
Location: Works

A trainee at a polytechnic was using a multimeter to test voltage and current in a lighting circuit. He unplugged the test leads from the meter and touched the live ends that caused him to receive a hand-to-hand shock. There was no apparent reason for him to unplug the test leads and he could offer no explanation.

The power supplies for the test benches were protected by RCDs and there were emergency isolation points in the test lab. Because the trainee was standing on a carpeted wooden floor, the RCD did not detect any fault current to earth.

NOTIFIABLE ELECTRICAL ACCIDENTS
1 January 2001 to 31 December 2001

Number: 2001/081

Voltage: 230
Result: Electric shock
Location: Commercial

An electrician received an electric shock when he unplugged a light fitting and made contact with the neutral pin on the plug. The plug only supplied neutral and the earth continuity. The active supply to the light fitting was supplied from elsewhere.

Number: 2001/082

Voltage: 230
Result: Electric shock
Location: Commercial

A metering technician was installing a cell phone and a three-phase current transformer meter to a circuit (current and voltage) which was already installed. While moving the cell phone by holding the aerial, he received an electric shock and minor burns to his hands and knee. It was established that the accident occurred because the installer of the metering circuit had not terminated the meter potential neutral and the current transformer star point earth. The circuit had approximately 7 amps on each phase.

Number: 2001/083

Voltage: 400
Result: Burns
Location: Commercial

A line mechanic received flash burns to his right hand when stripping a low voltage (LV) cable assumed to be dead.

Number: 2001/084

Voltage: 11,000
Result: Burns
Location: Works

A line mechanic received an electric shock and burns to his knee whilst removing a busbar cap from an 11,000 volt ring main unit. The busbar was supposedly isolated but because of an error in the operating drawings, the busbar remained alive.

Electrical accidents must be notified immediately (section 16 of the Electricity Act 1992). This can be done by freephone on: **0800 104 477**

An Electrical Accident Notification Report must also be completed. This should be filed with the Energy Safety Service within two weeks of the incident.

A report form can be found at the back of this book and online by visiting the Energy Safety Service web site at: **www.ess.govt.nz**

Part 2

Other Occupations

Number: 2001/001

Voltage: 11,000
Result: Fatal electric shock
Location: Commercial

An orchard worker received a fatal electric shock when he raised an aluminium irrigation pipe into the air and made contact with an 11,000 volt overhead power line.

The worker had earlier been informed of the danger of the power line and had been instructed not to raise irrigation pipes in the air.

Number: 2001/004

Voltage: 230
Result: Electric shock
Location: Commercial

A builder received an electric shock as he attempted to coil up a wire that was hanging down from a light fitting. The light fitting had no cover over the wires and a wire had come out of a screw terminal. It had been hanging down for a number of months. When the builder attempted to coil up the wire, he touched the bare end and received an electric shock.

An investigation revealed that a photoelectric cell controlling the light had faulted, making the cable live all the time.

Number: 2001/005

Voltage: 11,000
Result: Burns
Location: Commercial

A plumber received burns when he penetrated a live 11,000 volt cable with a pick. He was attempting to uncover a drainpipe and uncovered what he thought was concrete joint in the pipe but it was a protective slab over the power cable.

The area he was digging in was overgrown with weeds and he did not see a transformer located near where he was digging.

Number: 2001/011

Voltage: 230
Result: Electric shock
Location: Industry

A canteen worker received an electric shock from a water heater. The water heater had a pull switch to control the switching operation and the cord on the pull switch was broken. As she attempted to replace the cord she received an electric shock.

The plastic attachment point for the pull cord was broken, exposing a live screw, which she contacted when attempting to attach the cord.

The company has implemented a procedure to ensure that all damaged equipment is tagged and removed from service.

Number: 2001/018

Voltage: 230
Result: Electric shock
Location: Commercial

A maintenance worker at a fast food restaurant received an electric shock when he plugged in a freezer. It appears that the plug top was cracked allowing water ingress. The circuit was fitted with RCD protection that operated correctly

Number: 2001/019

Voltage: 11,000
Result: Burns
Location: Works

A labourer received burns to his hands and legs when the pneumatic hammer he was using struck an 11,000 volt cable. The live 11,000 cables had been previously exposed and care was being taken not to disturb them. However, a slab of concrete covering a sewer pipe which appeared to be clear of the cables, had to be removed. As the labourer began to break up the concrete, one of the cables exploded. The cables appeared to run past the concrete but actually turned and went under the slab. The cables should have been isolated to allow the safe removal of the concrete.

Number: 2001/022

Voltage: 11,000
Result: Burns
Location: Works

A construction worker hit an 11,000 volt underground cable with a jack-hammer while carrying out drainage work associated with road works. The construction worker received burns to his face, arms, hands, chest and neck as a result.

The cable position was not located prior to commencing work.

Number: 2001/023

Voltage: 230
Result: Electric shock
Location: Commercial

The manager of a lighting shop received an electric shock when she attempted to find a fault on a lighting fitting. The lighting fitting was connected to socket outlets on top of a lighting display panel. She climbed a ladder onto the lighting display and attempted to find the cord supplying power to the light. Finding what she thought was the cord; she pulled it through her hand and received an electric shock.

The cord she found, was plugged in but not connected to any fitting and had bare wires.

Number: 2001/026

Voltage: 230
Result: Electric shock
Location: Commercial

A kitchenhand was placing stainless steel food trays on top of a vertical chiller when he received an electric shock. He had made contact with the phase conductor supplying a light on top of the chiller. As the light on the chiller was not required, the wiring to the light was removed to eliminate the hazard.

Number: 2001/027

Voltage: 230
Result: Electric shock
Location: Domestic

An insulation installer was reported to have received an electric shock while installing thermal insulation in a ceiling. A check of the installation failed to determine any hazard.

Number: 2001/031

Voltage: 230
Result: Electric shock
Location: Commercial

A worker received an electric shock from a food warmer in a hospital kitchen. The flexible lead had come loose from the anchor point, pulled tight inside the body of the food warmer and contacted a heating element. At the time of the fault, the electrical protection was not operating.

A contract service company was called in to identify the cause of the electric shock and the fault was located at the burnt out flexible cable. The service person replaced the lead and re-tagged the appliance.

The fault caused the body of the food warmer to become live as a result of the flexible lead coming into contact with the heating element and burning off the insulation. This allowed the live phase conductor to touch the body of the food warmer. The food warmer, having an ineffective earth connection, remained live under these fault conditions.

The socket outlet supplying power to the food warmer had a poor earth connection due to the contact pins spreading. This high resistance did not allow sufficient current to flow to operate the electrical protection.

Since this accident, RCDs have been fitted to protect the socket outlets.

Number: 2001/035

Voltage: 400
Result: Burns
Location: Industry

A fitter was attempting to use a three-phase metal plug. When he pushed it into the socket outlet, there was a flashover causing flames to erupt from the socket. The fitter received burns to his hand as a result.

The company has made it a policy that socket outlets should be turned off prior to plugging in equipment.

Number: 2001/039

Voltage: 11,000
Result: Burns
Location: Works

A plumber was excavating when he hit an 11,000 volt cable with a pick. The cable was protected by concrete slabs, which were broken by the pick. The plumber escaped serious injury as the explosion was directed away from him.

Number: 2001/040

Voltage: 11,000
Result: Burns
Location: Works

An employee was excavating for road alterations when he contacted an 11,000 volt cable with a crowbar. He received burns to his left hand and right leg.

Number: 2001/046

Voltage: 230
Result: Electrical shock
Location: Commercial

A kitchen hand was plugging in an appliance in a wet area when she received a shock from a pendant-mounted outlet that appeared to be resting against her neck. All outlets had RCD protection that operated.

Number: 2001/047

Voltage: 230
Result: Electrical shock
Location: Commercial

A kitchen hand was using a pump to remove old cooking oil from a fat fryer. When he touched the flexible lead, he received a shock. The lead was examined and a small crack was found in both the primary and secondary insulation. The lead was damp at the time. The company has since implemented the installation of RCDs in all of its shops.

Number: 2001/049

Voltage: 11,000
Result: Burns
Location: Commercial

A labourer was moving a scaffold when it contacted an 11,000 volt overhead line. As a result, the labourer received serious injuries and burns.

Number: 2001/051

Voltage: 11,000
Result: Burns
Location: Works

A painter was water-blasting a concrete wall located next to an 11,000 volt ground-mounted switch. The switch exploded causing burns to the victim's hands and face. The switch had a warning notice attached (DO NOT HOSE) but the worker failed to see it.

Number: 2001/054

Voltage: 11,000
Result: Serious injuries and burns
Location: Works

A labourer was moving a scaffold when it contacted an 11,000 volt overhead line. The labourer received serious injuries and burns as a result.

Number: 2001/061

Voltage: N/A
Result: Electric shock
Location: Commercial

An air conditioning erector received an electric shock when he touched the tile support grid as he was climbing into a false ceiling. An electrical inspector and an electrician tested the ceiling support grid and no voltage was detected. One conclusion reached was that the step ladder the air conditioning erector was standing on, may have contacted a loose plug in a socket outlet and been livened.

NOTIFIABLE ELECTRICAL ACCIDENTS
1 January 2001 to 31 December 2001

Another explanation might be that he pulled a nerve in his hand and thought he had received an electric shock.

Number: 2001/065

Voltage: 230
Result: Electric shock
Location: Commercial

A teacher was plugging a power lead into a tape recorder when she received an electric shock. The power lead had exposed conductors and was plugged into a live socket outlet.

Number: 2001/068

Voltage: 230
Result: Electric shock
Location: Industry

A fitter received an electric shock when he touched an induction bearing heater. The heater had recently been purchased and was supplied without a plug top. The maintenance electrician fitted a plug top to the heater and transposed the phase and neutral conductors. The electrician did not test to ensure that the earth conductor was connected to the correct connection so the body of the heater was live.

Number: 2001/070

Voltage: 230
Result: Electric shock
Location: Industry

A machine operator received an electric shock as he was removing a hot air blower from a machine that was connected to a power point. The hot air blower was double insulated but had become covered in water due to a machine problem. This caused it to fault, resulting in the electric shock. Following this incident, the company installed RCDs to the machine to give added protection to workers.

Number: 2001/072

Voltage: 230
Result: Electric shock
Location: Industry

A fitter was aligning an electric motor on a refrigeration unit when he received an electric shock from a sump heater terminal block on an adjacent compressor that had a cover missing.

The compressors were installed on a trawler in the engine room and it is believed that the cover had fallen off when the vessel was at sea.

Number: 2001/073

Voltage: 230
Result: Electric shock
Location: Commercial

A cleaner was unplugging a vacuum cleaner from a socket outlet when she received an electric shock. The vacuum cleaner had been checked less than a week before the accident and was tagged as being safe. An investigation revealed that the lead had been pulled at the plug and the wires had been pulled out of the plug causing her to receive a shock as she touched the plug. The company is looking at better plugs and the use of RCDs and has informed the staff not to pull on the leads.

Number: 2001/074

Voltage: 11,000
Result: Fatal electric shock
Location: Works

A saw mill owner and a mechanic were repairing a hoist on a truck. The truck was parked below a live 11,000 volt overhead power line. During the repairs, the hoist was lifted and it made contact with the live line causing the truck to be livened. As a result, the mechanic received a fatal electric shock and the sawmill owner also received an electric shock.

Factors contributing to the accident were: failure to identify the hazard posed by the power lines overhead; the proximity of the truck to those lines; and the hoist controls were left engaged when the man exited the cab and the truck was left idling.

Following the accident, recommendations were made that the coroner be asked to highlight the dangers of working in close proximity to overhead power lines, and that OSH staff be reminded, as part of ongoing field activities, to provide clients with copies of existing leaflets which highlight this hazard.

The local power company initiated a new advertising campaign, including local television, highlighting the dangers of electrical hazards.

Number: 2001/077

Voltage: 11,000
Result: Fatal electric shock
Location: Works

An apiarist received a fatal electric shock whilst shifting pallets of beehives in the early hours of the morning when the metal boom of the hydraulically operated truck-mounted crane contacted an 11,000 volt overhead power line. Another person present received an electric shock when he went to assist the victim.

Number: 2001/080

Voltage: N/A
Result: Burns
Location: Commercial

An office worker received minor burns when an oil-filled heater developed a leak on a seam joint and sprayed a jet of hot oil onto the worker's leg.

Part 3

General Public

Number: 2001/003

Voltage: 25,000
Result: Burns
Location: Works

A student climbed onto a rail wagon parked in a rail yard and received burns from a traction overhead cable that flashed over to his body. He was caught in the ensuing arc and received burns to 50% of his body.

The goods train had been parked overnight as a washout down the line prevented it from continuing its journey.

The student was with a party of others and was one of two people to climb on the wagon. The rail company has since made significant improvements to the security of the goods yard and instigated a publicity campaign aimed at the public and local schools.

Number: 2001/006

Voltage: 400
Result: Electric shock
Location: Domestic

A homeowner received an electric shock from the metal door of a main switchboard/meter box while attempting to turn the power off. A transformer change had been done on the network but the overhead line neutral was not connected to earth. A number of electrical appliances in the house were also damaged due to the over-voltage that occurred with the floating neutral.

The supply distribution company repaired the fault.

Number: 2001/008

Voltage: 230
Result: Electric shock
Location: Domestic

A child received an electric shock from an outside water tap. A new main switchboard had been installed but there was no earth/neutral link or earth electrode.

The homeowner lodged complaints against two registered electrical workers in relation to the incident. One complaint was referred to the Electrical Workers Registration Board for a disciplinary hearing against the electrical worker, which resulted in him being found guilty of disciplinary offences under section 118(1)(a) and (d) of the Electricity Act 1992.

Number: 2001/016

Voltage: 230
Result: Electric shock
Location: Commercial

A five year old child received an electric shock when he touched a defective freezer at a supermarket. The plastic corner moulding on the freezer had been damaged, leaving the cable to the defrost element exposed – the phase of which had damage to the insulation exposing the live conductor. Although a repair using insulation tape had been attempted by an unknown person, this was not effective, as the child was able to make contact with the exposed conductor.

Number: 2001/24

Voltage: 11,000
Result: Electric shock and burns
Location: Works

A six year old child alighted from the bus after school and walked down the road towards his home. Instead of going directly home, he continued some 200 metres past his street and proceeded to climb a power pole. He reached a point just below the air break fuse switch (ABFS), some 8 to 10 metres up the pole. There he contacted the roadside conductor where it comes off the bottom of the ABFS to the carrier arm. The conductor was PVC covered but the insulation was not to full working voltage. The contact with the conductor caused a short circuit to earth – the point of entry being on his left shoulder and the exit point being his left thigh close to where the ABFS earthing point attaches to the main earth conductor. A flashover resulted and the boy was thrown clear to the ground below. He was taken to hospital by ambulance for medical attention. Following this accident, the pole and others were fitted with anti-climbing devices.

Number: 2001/030

Voltage: 230
Result: Burns
Location: Commercial

A student was turning a 16 amp flush-mounted isolating switch that controlled an air conditioning unit when the switch exploded, causing burns to his hand.

Number: 2001/045

Voltage: 230
Result: Electric shock
Location: Commercial

A student received an electric shock when he touched the exposed live parts of an electrical cord supplying a theatre spotlight. The cord had been damaged adjacent to the plug top, exposing both the phase and neutral conductors.

Number: 2001/048

Voltage: 230
Result: Burns
Location: Domestic

A child received an electric shock and burns to his thumb when he made contact with a wire inserted between the plug and the socket outlet.

Number: 2001/059

Voltage: 230
Result: Electric shock
Location: Works

A child received an electric shock when she was climbing into a spa pool. She called out to her mother who pulled her out of the pool and also received an electric shock.

The fault was investigated by the local power supply authority and was found to be a loose neutral connection in a pillar box in the street. Because the neutral connection was loose, the earth conductor was taking most of the load and current was finding its way into any good earth source – such as the concrete slab that the child was standing on. The spa pool water may have acted as the second path for the current flow. The pool socket outlet was protected by an RCD but this did not operate because the current was not flowing through the power cord.

The supply distribution company repaired the fault.

Number: 2001/060

Voltage: 33,000
Result: Minor burns
Location: Works

A member of the public threw a communications cable over a 33,000 volt substation overhead busbar structure. He received minor burns to his hand. The police are taking action over the event.

Number: 2001/063

Voltage: 11,000
Result: Burns
Location: Works

A person received burns while attempting to cut through a live 11,000 volt cable located below a road/rail bridge. They and an accomplice were trying to remove the cable to sell it for scrap. The police charged them with theft.

Number: 2001/069

Voltage: 230
Result: Electric shock
Location: Works

A young woman decided to shorten a light fitting flexible cable using a pair of scissors. She was standing bare foot on a concrete floor and made no attempt to turn off the light fitting as she cut through the flex. She received an electric shock as a result. Her parents had the fitting repaired and spoke to her about the dangers of electricity.

NOTIFIABLE ELECTRICAL ACCIDENTS
1 January 2001 to 31 December 2001

Number: 2001/075

Voltage: 33,000
Result: Fatal electric shock and burns
Location: Works

A homeowner received a fatal electric shock whilst trimming a bamboo hedge when one of the partially cut canes made contact with a 33,000 overhead electric line. Another person who was assisting also received an electric shock and burns.

Number: 2001/076

Voltage: 230
Result: Electric shock
Location: Domestic

A man received an electric shock when he touched the live terminals on the supply switch to a hot water cylinder isolating switch. The switch had no cover at the time of the accident.

Number: 2001/079

Voltage: 110,000
Result: Electric shock
Location: Works

The metal mast of a yacht struck an 110,000 volt overhead transmission line. Five people in the yacht were injured. Two received serious injuries and the other three received minor injuries.

Electrical accidents must be notified immediately (section 16 of the Electricity Act 1992). This can be done by freephone on: **0800 104 477**

An Electrical Accident Notification Report must also be completed. This should be filed with the Energy Safety Service within two weeks of the incident.

A report form can be found at the back of this book and online by visiting the Energy Safety Service web site at: **www.ess.govt.nz**

Part 4

Gas Workers

Date: 12/02/2001

Location: Lower Hutt
Gas type: Natural
Accident type: Explosion

Description of loss: Damage to the top cover plate and flue of a boiler.

Summary of events: A steam generator at a factory had been affected by nuisance shutdowns for several months. On this occasion, a service engineer was called in and reset the high gas pressure switch before restarting the boiler. Hearing a chattering noise from the pilot valves, the engineer climbed to the top of the boiler to investigate. Ignition was delayed about 20 seconds, then an explosion blew off the top of the boiler and the flue. No one was injured.

The delay in ignition was due to a fault in the burner control wiring (also found at six other sites), and an obstruction in the fan inlet may have triggered the high-pressure switch. The area was also used for dispatch and receiving, so packaging could be left near the floor-level inlet.

Note: A natural gas accident occurred to a directional drill crew who were installing a duct for a power cable in Mairangi Bay on 03/05/2001 and leak response gas workers. More information on this accident can be found in the "Other Occupations" category.

The driver was hospitalised with serious burns and two others were treated and discharged. The digger was written off and other equipment and property damaged.

The three companies involved were prosecuted, most charges under the Health and Safety in Employment Act for not taking all practical steps to protect the workers, i.e. not cutting off the gas, and allowing the drill crew into an unsafe area. The power company was held responsible for rupturing the main, having failed to physically locate it, and fined for endangering the public and employees. The gas company and the leak response company were fined for excavating over a gas escape with a digger, an unsafe method contrary to gas company policy.

Gas incidents and accidents must be notified immediately (section 17 of the Gas Act 1992). This can be done by freephone on: **0800 104 477**

A Gas Incidents and Accidents Notification Report must also be completed. This should be filed with the Energy Safety Service within two weeks of the incident.

A report form can be found at the back of this book and online by visiting the Energy Safety Service web site at: **www.ess.govt.nz**

Part 5

Other Occupations

Date: 01/01/2001

Location: Lower Hutt
Gas type: Natural
Accident type: Fire

Description of loss: Total loss of shop.

Summary of events: A fire in a fish and chip shop was apparently initiated by the gas cooker. The Fire Service attended, but the shop was totally destroyed.

Solvent used to remove excessive build-up of fat from the appliance probably caught fire.

Date: 09/01/2001

Location: North Shore
Gas type: Natural
Accident type: Fire

Description of loss: Fire damage to ground floor bathroom and master bedroom ensuite. Extensive damage to ceiling and roof, and electrical wiring in the roof cavity.

Summary of events: A contractor was putting up a fence on the front boundary of a residential property. While digging a post-hole, he ruptured the service to the property with a crowbar. While the gas company was being called, escaping gas travelled along the service pipe to the gas meter near an externally mounted water heater, where the pilot light ignited it. The contractor tried unsuccessfully to douse the flames with a garden hose before the Fire Service was called. Flames spread to the meter riser, which eventually burst, and pressurised flame spread to the house. There was substantial damage to part of the house before the fire was extinguished.

Site plans had not been obtained by the contractor. No marker tape was visible for the service. Although too close to the meter, the water heater installation was satisfactory.

Date: 07/02/2001

Location: Wanganui
Gas type: Natural
Accident type: Fire

Description of loss: Fire damage to roof and surrounding area of polytechnic building.

Summary of events: A fire occurred at the outlet of an extraction fan used to ventilate a glass furnace and classroom at a polytechnic, damaging the roof.

Possibly pyrophoric action on combustible materials near the outlet of the extraction system occurred, or the combustibles may have been sucked in through the fan. The furnace reached temperatures between 1200–1400°C, radiating heat of about 300°C. Additional fireproofing was needed around the fan.

Date: 09/03/2001

Location: Christchurch
Gas type: LPG
Accident type: Gas Leak or Escape

Description of loss: Driver on ACC for two weeks with neck injuries. Vending truck damaged in collision.

Summary of events: The driver of a food vending truck had been instructed by her employer to keep the food warmer operating while driving around the city.

After two weeks on the job, the vending truck was involved in a head-on collision with another vehicle, resulting in neck injuries to the driver and damage to the truck. A 9 kg LPG cylinder, secured by a plastic bungy cord, was thrown loose and the hose ruptured, causing a leak inside the truck. The Fire Service shut off the gas at the cylinder valve. Occupational Safety and Health advised the driver to contact the ESS with her concerns about the safety of the installation that lacked flame failure and proper ventilation.

Installation of the food warmer had not been carried out by a gasfitter and was unsafe. A dangerous goods inspector found the ring burner had no flame failure device fitted and the cylinder was not adequately secured or vented.

Date:	21/03/2001
Location:	Auckland
Gas type:	Natural
Accident type:	Fire

Description of loss: Substantial damage to power and telecommunications cables and gas pipes. Power and gas to several homes cut off, and a wooden fence outside one home, partly destroyed.

Summary of events: A cable jointer was working alone, heat-shrinking telecommunications cable in a roadside excavation. Gas service pipes had been uncovered by hand the previous day but not reported. Finding heat blanket use impracticable in the restricted space, the worker shielded the pipes with aluminium protective tape, believing this was adequate. The naked flame of his torch ruptured the pipe above, and escaping gas ignited in the bottom of the trench. The worker heard the ignition and rolled clear uninjured with the torch gas bottle, then moved his van. Seconds later, a fireball erupted from the joint hole. A builder nearby, called the Fire Service. An extensive fire continued to burn, damaging utilities, while the Fire Service stood by, awaiting isolation of a 400 volt power cable in the hole.

Workers' training was revised to be more explicit about the risks of working near gas pipes.

Date:	03/05/2001
Location:	North Shore
Gas type:	Natural
Accident type:	Gas Leak or Escape, Fire

Description of loss: Digger driver hospitalised 12 days with superficial burns to face and neck, and 2nd degree burns to hands. Foreman with burns to face and hands and leak response crewman with burns to right of face and left wrist treated and discharged. Excavator extensively damaged and written off. Leak response crew's extinguishers and breathing apparatus destroyed. Connection boxes and terminations of both electrical and communication cables destroyed. Damage to footpath, letterbox and vegetation in vicinity.

Summary of events: A directional drill crew was installing a duct for a power cable under a street. The drill was directed below the position of a gas main shown on plans, but no pilot holes were dug to locate it. The main was ruptured under the footpath, causing a high volume gas escape. The gas company was notified and a local resident called the Fire Service.

The gas company's leak response crew asked the drill crew to help expose the damaged area. Their digger was used to scoop away earth until the pipe was visible, then the gas workers dug by hand for a while. Restarting the engine, the digger driver heard a small "pop" and saw yellow flames. Then a fireball erupted with a loud bang, engulfing the digger and driver, also the foreman and a gas worker. They ran out and sprayed on water with the help of the Fire Service, on standby with a hose. The driver was hospitalised with serious burns, and two others were treated and discharged. The digger was written off, and other equipment and property was damaged.

The three companies involved were prosecuted, most charges under the Health and Safety in Employment Act for not taking all practical steps to protect the workers, i.e. not cutting off the gas, and allowing the drill crew into an unsafe area. The power company was held responsible for rupturing the main, having failed to physically locate it, and fined for endangering the public and employees. The gas company and the leak response company were fined for excavating over a gas escape with a digger, an unsafe method contrary to gas company policy.

Procedures and equipment used by mains and service workers were reviewed and upgraded within the year.

NOTIFIABLE GAS ACCIDENTS
1 January 2001 to 31 December 2001

Date:	29/05/2001
Location:	Christchurch
Gas type:	LPG
Accident type:	Explosion, Fire

Description of loss: 30–50% fire damage to rear compartment of van. Superficial injury to leg of driver.

Summary of events: A commercial carpet cleaner's van was on the road with a LPG water heater switched on. A 9 kg cylinder had been filled not long before and secured with a bungy cord. As the vehicle turned down a side road, the appliance erupted in flames. The two passengers threw themselves out of the vehicle. They were not injured, but the van and its contents were destroyed. The Fire Service found the pilot lit and a chunk of ice under the spare cylinder.

Vapour leaking from the spare cylinder was probably ignited by the pilot light. The operator's procedure did not allow driving with the pilot off. The cylinder valve had opened somehow, and the internal valve of its adapter was open as well. Gas may have migrated from the rear of the service compartment to the water heater in the front section. Alternative ignition sources were the arcing from indicators or brake lights as the vehicle went round the corner.

Date: 29/05/2001

Location: Lower Hutt
Gas type: LPG
Accident type: Fire

Description of loss: Fire damage to ceiling, walls and floor.

Summary of events: A contractor was taking up old vinyl from the floor at a club, using a heat gun supplied by an LPG cylinder three metres away. Work was also being undertaken in a nearby passageway. The doors were open and a slight wind was blowing at the time. Leaking LPG was ignited by the gas burner. The resulting fire damaged the floor, ceiling and surrounding walls.

The connection was not gas-tight because of dents and scratches. The high-pressure device had no regulator, so a gas escape could quickly get out of control if the cylinder valve could not be closed.

Date: 21/07/2001

Location: New Plymouth
Gas type: Natural
Accident type: Explosion

Description of loss: Flue lifted and split open. Burner of fire box split open. Cracked motor mounting. Greatest loss was to production, as the unit was out of commission until December.

Summary of events: A painter had been in an automotive spray paint booth with gas-fired equipment running for at least five minutes. The painter heard the unit misfire, fire up again and then it exploded. Significant damage to the equipment resulted. It was out of commission for over five months.

It was suspected a carbon monoxide-fuelled explosion occurred, owing to a design fault in the heat exchanger causing excessive back pressure.

Date: 20/10/2001

Location: Wellington
Gas type: Natural
Accident type: Fire

Description of loss: First degree burns to 70% of face. Back injury aggravated by fall.

Summary of events: The water heater at a hall had been difficult to light for five or six years. When hot water was needed and the pilot was out, a staff member went to re-light it with a taper, as the piezo starter was not working. There was no response to the first two attempts. Bending over the unit, he was caught in a flashback, which caused superficial burns to his face and a fall aggravating a back injury. The flames self-extinguished, and the staff member then switched off the unit at the wall.

The pilot jet may have been partially blocked so there was insufficient gas to ignite the main burner. The flame was difficult to see and tended to blow out when the wind was southerly. The appliance was over ten years old and had been serviced only for problems with the pilot light. The users were apparently unaware of the need for regular maintenance.

NOTIFIABLE GAS ACCIDENTS
1 January 2001 to 31 December 2001

Date: 14/12/2001

Location: Hastings
Gas type: LPG
Accident type: Explosion

Description of loss: Electrician hospitalised with severe head injuries, in intensive care for a week, re-constructive facial surgery required. Hearing loss and slight burns to face of operator and minor hearing loss to another worker, for which both treated and discharged.

Automotive spray paint baking unit written off (~$52K). Front and rear heat exchangers and outer panels blown off, and switches and terminals damaged.

Summary of events: The owner of an automotive spray paint booth required a portable heater for baking on paint. A LPG unit purchased new as a package from Italy was partially assembled, with the fuel supply and connection obtained by the owner from a cylinder testing station.

The vendors of the spray paint booth proceeded to test the heating unit. Part way through a cycle as the burner started or soon after, a loud and violent explosion occurred. The burner and front plate flew backwards and struck an electrician on the head, knocking him unconscious. He was hospitalised with serious head injuries. Two other workers received minor injuries, and the heating unit was totally destroyed.

A fault in the wiring of the burner control was found which would prevent normal start-up and prolong gas release. None of the workers commissioning the appliance were gasfitters or experienced with combustion. OSH have initiated court action against the vendors of the spray booth with regard to the accident.

Gas incidents and accidents must be notified immediately (section 17 of the Gas Act 1992). This can be done by freephone on: **0800 104 477**

A Gas Incidents and Accidents Notification Report must also be completed. This should be filed with the Energy Safety Service within two weeks of the incident.

A report form can be found at the back of this book and online by visiting the Energy Safety Service web site at: **www.ess.govt.nz**

Part 6

General Public

Date: 19/01/2001

Location : Wellington
Gas type: LPG
Accident type: Fire

Description of loss: Fire damage to wall and ceiling in corner of room, and to door and end of bed. Smoke damage to rest of basement. Heater and cylinder disposed of.

Summary of events: A cabinet heater recovered from a demolition site two years before, was in a windowless basement furnished with a bed and various other appliances. Children were in the basement when they heard a bang from the heater and saw flames coming from it. They alerted their parents, and the Fire Service was called to extinguish the fire. The fire caused localised damage to the basement.

The dangerous goods inspector found evidence of a fire inside the heater cabinet, but no sign of a vapour explosion, though the pressure relief had vented. The heater may have been lit by the children and leakages ignited at several connections.

Date: 24/02/2001

Location: Manukau
Gas type: LPG
Accident type: Explosion

Description of loss: Severe burns to hands and moderate burns to forehead, requiring extensive hospital treatment. Explosion damage to most of house, including displacement of kitchen wall and door, a lifted roof and smashed windows.

Summary of events: A gas explosion in the early hours of the morning seriously damaged a house and caused severe burns to the resident. Neighbours called the Fire Service and assisted the injured man. He required extensive hospital treatment.

It is thought that gas supply to a portable cooker in the laundry was left on and spread through the house. It was ignited when a cigarette was lit. Odorant levels in the LPG were checked and deemed satisfactory. The cooker cylinder was checked for leaks and found to be sound.

Date: 17/03/2001

Location: Rotorua District
Gas type: LPG
Accident type: Explosion

Description of loss: Three people taken to hospital. Twenty-one year old woman received extensive burns to legs, arms, midriff and face (in hospital for ten days, now unable to work as a chef in heat or steam). Twenty-nine year old man received burns to feet and left arm (off work three days). Young girl received superficial burns to knee and shin. Minor damage to caravan (curtain burnt, etc).

Summary of events: A couple with a child entered a caravan. The windows were open and the stove had not been used that day. The woman lit a cigarette while sitting on the bed. A flash explosion caused extensive burns to her. It also caused moderate burns to her partner lying on the bed, and superficial burns to the child standing further away. A curtain burned until a CO2 fire extinguisher was used. The Fire Service arrived after the fire was out. All three were taken to hospital. The man and young girl were discharged the same day.

An inspection found the untested cylinder turned on and a loose plastic hose of an unapproved type supplying the stove. Leaking gas had built up and been ignited by the cigarette or possibly the electric refrigerator. Although the windows were open all day, the door was only opened on entry. The odorant level was satisfactory and the man noticed the smell before the explosion.

Date:	18/03/2001
Location:	Hauraki District
Gas type:	LPG
Accident type:	Explosion

Description of loss: Man hospitalised for three weeks with serious burns to 22% of his body. Woman hospitalised for one week. Launch skipper treated as outpatient for several weeks for serious burns to arm and face. Five others with minor injuries treated and discharged.

Damage contained in engine compartment and main cabin to floor/seating panels and nylon floor and squab coverings. Minimal damage to engine

Summary of events: While on a private fishing trip, a launch seemed to develop engine trouble. When the skipper lifted the engine cover to investigate, there was a flash explosion and he was caught in a fireball. A mayday call was issued and a small fire in the bilge extinguished. One severely burned man was lifted out by rescue helicopter. The skipper and six others were also injured, but damage to the vessel was slight. It was towed to a marina by the coast guard.

LPG escaping from a cylinder was ignited by the auto-helm motor. Cylinders in rear cockpit lockers were modified for horizontal storage but lacked spring-loaded no-flow valves or caps to prevent escape in transit. A shut-off valve was probably knocked open – perhaps by stowing of gear or boat movements.

Escaping vapour was sucked under the floor to the air intake filter, causing noisy engine performance. Lifting the engine hatch stopped this under-floor suction, allowing gas to make contact with the auto-helm motor. The rich gas/air mixture limited the force of the explosion.

The installation was otherwise sound and well maintained. The owners improved the engine air intake and sealed the LPG lockers off from the boat interior.

NOTIFIABLE GAS ACCIDENTS
1 January 2001 to 31 December 2001

Date:	18/04/2001
Location:	Waitakere
Gas type:	LPG
Accident type:	Fire

Description of loss: Total destruction of house.

Summary of events: A tenant set up a camp cooker in the kitchen connected by a flexible hose and regulator to a barbecue cylinder underneath because the two smaller cylinders normally used with it were empty. After some difficulty igniting it with a cigarette lighter, she saw flames around the cylinder. Then a fireball erupted. She escaped with two young children and called the Fire Service from a neighbour's home, but the fire destroyed the house.

The Fire Service recovered the damaged appliance for inspection. Apparently a leak at the cylinder connection or valve was ignited, and heat damage led to a high-pressure discharge of gas. The camp cooker was of a type tested as compliant for gas tightness and emissions – but sold for outdoor use because its emissions were close to the acceptable limit.

Date:	24/06/2001
Location:	Selwyn District
Gas type:	LPG
Accident type:	Explosion

Description of loss: Man hospitalised with 85% burns to back, legs and arms and airway, from which he died several weeks later. Explosion damage to caravan – door deformed. Some fire damage to clothing and bedding.

Summary of events: The occupant of a caravan had retired to bed after 11 p.m. At about 10 a.m. the next morning, there was an explosion causing him severe burns, though there was little damage to the caravan. The Police attended the scene, and the injured man was flown to hospital where he died several weeks later. The caravan cooker had a burner control turned on. The externally mounted cylinder was turned on and empty. A gas light found on the floor was also turned on.

Probably LPG leaking from the stove built up and was ignited by the gas light when the man woke and disturbed the air, or perhaps by a cigarette. There was no flame safeguard on the cooker, and the caravan lacked both high and low level fixed ventilation, so did not comply with standards. It had no electric connection and the few battery-powered appliances were off at the time. The occupant was said to smoke in the morning. Cigarette butts were found in an ashtray and outside the caravan.

Date:	05/08/2001
Location:	Far North District
Gas type:	LPG
Accident type:	Fire

Description of loss: Death of father and son in fire. House destroyed.

Summary of events: A small wooden house in a remote locality was not connected to mains electricity. LPG was used to supply the cooker and refrigerator. The occupants were early risers and probably in bed when the fire broke out. They tried to escape through a lounge window, but were overcome by fumes. Neighbours called the Fire Service at 8:55 p.m. The house was well ablaze and gas cylinders were outside venting as the Fire Service arrived. A portable pump was carried 480 metres up from the main road, but the roof collapsed within minutes. The father and son died and the house was destroyed.

The seat of the fire seemed to be in the kitchen near the refrigerator, which was probably in use (food inside) and operating on LPG at the time (rather than a 12 volt battery), as the cylinder valve was on. A rubber or plastic hose had been attached to the refrigerator by thin wire. Over time the hose would have deteriorated or the connection worked loose. Leakage from this unsound installation may have been ignited by its burner or the hose may have been ruptured by heat and released LPG to fuel the fire.

As a result of this accident, the Fire Service distributed free smoke alarms in houses, hardwired in new houses, and arranged inspection by competent persons of all gas installations and maintenance work. WINZ began three-day courses in home safety, targeting households at risk.

Date:	08/09/2001
Location:	Opotiki District
Gas type:	LPG
Accident type:	Fire

Description of loss: One man treated for burns to hand and fingers and radiation heat burns to face and neck. Cylinders destroyed. Fire damage to masonry and cladding of building.

Summary of events: Cooking started outside at a marae using a portable gas ring with a 9 kg cylinder on a concrete base about two metres from two 45 kg cylinders mounted on an external wall. When these cylinders were turned on 20 minutes later to supply an oven inside the building, there was an audible hiss, then both cylinders were enveloped in flames, injuring one man and damaging the exterior of the building. The Fire Service extinguished the fire and removed the badly damaged and leaking cylinders from the marae complex.

Apparently the ring burner ignited gas released from the 45 kg cylinder valves.

A faulty fitting upstream from the regulator was suspected, possibly resulting from unauthorised or non-compliant gasfitting

NOTIFIABLE GAS ACCIDENTS
1 January 2001 to 31 December 2001

common in such installations. A local dangerous goods inspector had found none with any safety instructions or regular maintenance schedule and many in unstable, insecure and poorly maintained locations. Some sites had over 100 kg of LPG stored with no licence.

The Plumbers Gasfitters and Drainlayers Board visited the site to investigate. The local territorial authority followed up with educational work on this and other maraes.

Date:	13/10/2001
Location:	Napier
Gas type:	Natural
Accident type:	Fire

Description of loss: House and contents destroyed. Dog and cat killed. Glass lacerations to feet of owner.

Summary of events: On the previous evening at 9 p.m., a space heater was turned on at the medium setting to warm pets in the night, because the weather was cold. Four or five towels and polyester clothing were left on top of the heater and a dog blanket was in front, where hot air discharged. A mother and two children were in the house during the evening. Early in the morning, the Fire Service was called out to a fire, which was hardest to extinguish near the heater, probably owing to gas release. The house and contents were destroyed and the pets killed.

The fire originated near the heater. The most likely cause was restricted ventilation to the heater, as apparently the towels and clothes completely blocked its ventilation intake.

Date:	18/10/2001
Location:	Hastings
Gas type:	Natural
Accident type:	Fire

Description of loss: Extensive fire damage to kitchen area.

Summary of events: Tenants were cooking on a gas stove late at night, when a fire started. Considerable damage to the kitchen area resulted before the Fire Service extinguished it. The gas supplier was not notified, but a contract serviceman was asked to check if the cooker could be reused. The appliance itself was not involved, only fat on the stove-top ignited.

According to a tenant, this was a cooking accident that started as a ‘fat fire'. Possibly the stove was left unattended. The appliance was in good order.

Date:	23/10/2001
Location:	Western Bay of Plenty District
Gas type:	LPG
Accident type:	Fire

Description of loss: Smoke and fire damage to interior of campervan.

Summary of events: A campervan had been purchased only ten days before. At a motorcamp, the owners turned on the gas, lit the refrigerator, and went out. On returning half an hour later, they found the campervan alight and called the Fire Service.

Gas leaking from a joint in the pipework was ignited by the permanent flame of the refrigerator. The fire seems to have started at a mechanical screw type joint near the cylinder supplying the LPG refrigerator and cooker. There was no storage cupboard for the cylinders that stood beside the refrigerator – without ventilation to the exterior.

Date:	30/11/2001
Location:	Lower Hutt
Gas type:	LPG
Accident type:	Fire

Description of loss: Garage and contents (furniture, etc) destroyed. Fire damage to adjacent building belonging to neighbour.

Summary of events: A garage used to store furniture also contained two LPG cylinders, a hot plate, and a cabinet heater. A fire destroyed the building and contents and damaged an adjacent building. Gas was implicated, as the valve of the cylinder supplying the hot plate was found open.

A gas leak was probable, as the cylinder valve was open three turns, and the hotplate control valve was a tapered cock observed to fail under working conditions when fitted to similar appliances. The source of ignition was not determined owing to the extent of damage and conflicting information from the tenants.

NOTIFICATION REPORT — Electrical Accidents

energysafetyservice
te ratonga whakaruru püngao

Electricity accidents must be notified immediately.
(section 16 of the Electricity Act 1992)

The Notification Numbers are:
All hours accident notification service **0800 104 477**
Freefax **0800 SAFE ENERGY – 0800 723 336**

An **Electrical Accident Notification Report** must also be completed. This should be filed with the Energy Safety Service within two weeks of the incident.

The address is at the bottom of this page

When reporting, please photocopy this form to preserve your book, or download a copy from **www.ess.govt.nz**

Details of victim

Name _____ ☐ Male ☐ Female

Address _____

_____

_____

Age _____ Occupation _____ Company _____

Place and time of accident

Place of Accident _____

Date of Accident ___/___/___ Time of accident _____ ☐ am ☐ pm

Causes

Description of accident (attach full details of accident including sketches/photographs) _____

_____

_____

_____

Possible cause(s) of accident _____

_____

_____

_____

_____

_____

continues 1/2

Energy Safety Service, 33 Bowen St, PO Box 1473 Wellington, New Zealand, Telephone 04 472-0030, Fax 04 460 1365

Injuries

Type of injuries (tick or number) ☐ Fatal ☐ Nonfatal

Was medical treatment required? ☐ Yes ☐ No

Was resuscitation applied? ☐ Yes ☐ No

Method of resuscitation _____

DAMAGE

Describe any damage or loss incurred by the accident _____

_____

Name(s) of any witness, investigator or other person who could provide information _____

_____

Address and contact number _____

_____

EQUIPMENT INVOLVED

Equipment involved (type) _____ ☐ Voltage

Condition of equipment involved _____ Date Installed ___/___/___

Electrical protection involved (type) _____

Did it operate correctly? ☐ Yes ☐ No

If "No", state reason it did not operate _____

_____

NOTIFIER

Name of person reporting accident _____

☐ Owner ☐ Occupier ☐ Regd. Person ☐ Employer Other _____

Company _____

Address _____

_____

Telephone ( ) _____ Facsimile ( ) _____

Date ___/___/___

NOTIFICATION REPORT — Gas appliance and installation accidents

energysafetyservice
te ratonga whakaruru pūngao

Gas accidents must be notified immediately.
(section 17 of the Gas Act 1992)

The Notification Numbers are:
All hours accident notification service 0800 104 477
Free Fax 0800 SAFE ENERGY – 0800 723 336

A **Gas Accident Notification Report** must also be completed. This should be filed with the Energy Safety Service within two weeks of the incident.

The address is at the bottom of this page

When reporting, please photocopy this form to preserve your book, or download a copy from **www.ess.govt.nz**

SECTION A Gas appliance & installation incidents or accidents

Date of incident ___/___/___ Time of incident _____ ☐ am ☐ pm

Address and/or exact location _____

Gas type
☐ LPG ☐ Natural (except CNG) ☐ CNG ☐ Tempered LPG ☐ Biogas

Accident type (tick all applicable)
☐ Fire ☐ Gas leak or escape ☐ Explosion
☐ Overheating ☐ CO poisoning (incomplete combustion)
☐ Other (please specify) _____

Environment
☐ Building ☐ Outside ☐ Caravan/mobile home
☐ Car, van or truck ☐ Other (please specify): _____

Losses involved (tick all applicable)
☐ Property damage ☐ Injury ☐ Fatality
☐ Other (please specify) e.g. lost time _____

continues 1/4

Energy Safety Service, 33 Bowen St, PO Box 1473 Wellington, New Zealand, Telephone 04 472-0030, Fax 04 460 1365

Equipment type (Tick all applicable and complete Section B)

Appliance ☐ **Commercial** ☐ **Industrial**
☐ Cabinet heater ☐ Fixed space heater ☐ Laundry dryer ☐ Vaporiser
☐ Barbecue ☐ Cooker ☐ Oven ☐ Fryer
☐ Light ☐ Water Heater ☐ Refrigerator ☐ Boiler

CNG Station
☐ Dispenser ☐ Storage vessel ☐ Compressor
☐ Container ☐ Installation pipework ☐ Other (please specify) _____

Summary description of events surrounding incident or accident (attach sketches, photos etc)

Actions to ensure safety at scene (e.g. soundness test, odorant check, emergency services callout)

Description of loss (injuries, extent of damage, costs etc)

Causal Factor(s) (tick all applicable)
☐ Alteration ☐ Assembly ☐ Carelessness
☐ Connection problem ☐ Design fault ☐ Filling of cylinder
☐ Installation ☐ Maintenance lacking ☐ Manufacturing defect
☐ Misuse ☐ Operator error ☐ Proximity to combustibles
☐ Record error ☐ Supervision lacking ☐ Third party damage
☐ Ventilation poor ☐ Working procedure error ☐ Workmanship lacking

Suspected cause(s) and/or significant factors _____

Remedial action taken or recommended (to minimise the chance of recurrence elsewhere)

Owner/ user or person working on or near equipment

Name _____ status (e.g owner, hirer, servicer) _____

Contact details _____

Occupation (of worker or user)

☐ Gas Worker ☐ Other Worker ☐ General Public

Affected parties (person(s) affected by loss)

Name _____ Occupation (if relevant) _____

Contact details _____

Age (if relevant) _____

Notifier (person completing this form)

Name _____ Date notified _____

Other persons (person(s) who may assist with enquiries)

Name _____ Occupation (if relevant) _____

Contact details _____

Other reports (Attach, or provide name & contact details) _____

SECTION B Gas equipment details

Appliance

Manufacturer _____ Make _____

Model/serial no. _____ Manufacture date or age of appliance _____

Rating (output / pressure etc) _____ Date installed or purchased _____

Installer _____ Certifier _____

Last service details _____

continues 3/4

Portable LPG

Regulator fitted? ☐ Yes ☐ No

Connection to regulator or cylinder (type)

☐ Screwed by spanner ☐ Quick-fit/clip-on ☐ Q.C.C.

☐ Screwed by hand (with spring Loading) ☐ Yes ☐ No

☐ Other (please specify) _____

Container (type) _____ ☐ Refillable ☐ Disposable

Nett capacity of LPG container _____

Container & value details (markings) _____

Regulator details (make & markings) _____

Adaptor details (markings or type) _____

Installation (type) ☐ Pipework ☐ Flue ☐ Control/safety ☐ Device ☐ Building-related ☐ Ventilation

Pipe material ☐ PE ☐ Copper ☐ Steel ☐ Other (please specify) _____

Jointing ☐ Weld & solder ☐ Mechanical ☐ Other (adhesive)

CNG station

Storage vessel ☐ Cascade ☐ Bottle test dates ☐ Bullet ☐ Relief setting Date __/__/__

Compressor

Make _____ Model _____

Relief setting _____ Date __/__/__

Dispenser _____

Make _____ Model _____

Hose markings Semiconducting ? ☐ Yes ☐ No

Other (please specify) _____

NOTIFICATION REPORT — Gas Distribution Accidents

energysafetyservice
te ratonga whakaruru püngao

Gas accidents must be notified immediately.
(section 17 of the Gas Act 1992)

The Notification Numbers are:
All hours accident notification service 0800 104 477
Free Fax 0800 SAFE ENERGY – 0800 723 336

A **Gas Distribution Accident Notification Report** must also be completed. This should be filed with the Energy Safety Service within two weeks of the incident.

The address is at the bottom of this page

When reporting, please photocopy this form to preserve your book, or download a copy from **www.ess.govt.nz**

Date of incident ___/___/___ Time of incident _____ ☐ am ☐ pm

Address and/or exact location _____

Gas type (tick all applicable)
☐ Natural ☐ Tempered LPG ☐ Landfill

Accident type
☐ Fire ☐ Gas leak or escape ☐ Explosion
☐ Overheating ☐ CO Poisoning (incomplete combustion)
☐ Other (please specify) _____

Environment
☐ Building ☐ Outside ☐ Underground
☐ Other (please specify) _____

Losses involved
☐ Property damage ☐ Injury ☐ Fatality
☐ Other (please specify) e.g. lost time _____

Notifiable under the Gas Act?
☐ Yes ☐ No ☐ Not sure

continues 1/4

Energy Safety Service, 33 Bowen St, PO Box 1473 Wellington, New Zealand, Telephone 04 472-0030, Fax 04 460 1365

Equipment type
☐ Main ☐ Service ☐ District regulator station
☐ Customer measuring station ☐ Sales gate station
☐ Meter ☐ Other (please specify) _____

Equipment details (Pipes)

Material ☐ PE ☐ Cast ☐ Steel
☐ Other (please specify) _____

Pressure ☐ HP ☐ IP ☐ MP
☐ LP Size _____ KPa/WG _____

Jointing ☐ Hf (heat) ☐ Ef (electro) ☐ Weld
☐ Mechanical ☐ Other (please specify)

Equipment details (regulators and meters)

Make _____ Model _____

Preasure _____ Last service details _____

Summary description of events surrounding incident or accident (attach sketches, photos etc)

Actions to ensure safety at scene (e.g. soundness test, odorant check, emergency services callout) _____

Description of loss (Injuries, extent of damage, costs etc) _____

Causal factor(s) (tick all applicable)

- ☐ Carelessness
- ☐ Design fault
- ☐ Misuse
- ☐ Supervision lacking
- ☐ Workmanship lacking
- ☐ Communications
- ☐ Maintenance lacking
- ☐ Working procedure error
- ☐ Third party damage
- ☐ Other _____
- ☐ Corrosion
- ☐ Material defect
- ☐ Record error
- ☐ Training inadequate

Suspected cause(s) and/or significant factors _____

Remedial action taken or recommended (to minimise the chance of recurrence elsewhere) _____

Owner/persons involved or reporting incident

Name _____

status (e.g employee, contractor) _____

Organisation _____

Contact details _____

Notifier (person completing this form)

Name _____

Date notified _____

Contact details _____

continues 3/4

GAS ACCIDENTS NOTIFICATION REPORT

Other persons (person(s) who may assist with enquiries)

Name _____

Occupation (if relevant) _____

Contact details _____

Other reports (attach, or provide name & contact details)

Name _____

Date of report _____

Contact details _____