Summary of reported electrical and gas accidents

1 January 2010 to 31 December 2010
Table of Contents

2010 Summary of Reported Electrical and Gas Accidents......................................................... 3
Executive Summary and analysis of 2010 accident data......................................................... 3
High Risk Areas 1993-2010........................................................................................................ 3
Background to Accident Summaries......................................................................................... 5
Accident Data Collection and Recording................................................................................. 6
Accident Analysis..................................................................................................................... 7
Electricity Analysis.................................................................................................................. 7
Natural Gas Analysis................................................................................................................ 13
Liquefied Petroleum Gas (LPG) Analysis.................................................................................. 18
Appendix A – Accidents and accident notification ................................................................. 25
Electrical notifiable accidents (Jan-March 2010).................................................................... 26
Electrical notifiable accidents (April - June 2010)................................................................. 33
Electrical notifiable accidents (July - September 2010)......................................................... 42
Electrical notifiable accidents (October - December 2010).................................................... 52
Gas notifiable accidents (Jan-March 2010)............................................................................. 69
Gas Notifiable Accidents (April - June 2010)......................................................................... 71
Gas notifiable accidents (July - September 2010)................................................................... 81
Gas Notifiable Accidents (October - December 2010)............................................................. 90
2010 Summary of Reported Electrical and Gas Accidents

1 January 2010 to 31 December 2010

For a number of years Energy Safety has published an annual summary report of notifiable electrical and gas accidents.

Key points to note are:

- The reports will now be published on a quarterly basis.
- Only completed investigations will be reported in each quarter, regardless of the date of the accident.
- Trend analysis will continue to be published on an annual basis for each calendar year.
- From 1 January 2009 responsibility for investigating workplace electrical and gas related accidents transferred to the Department of Labour. Information on such events are no longer included in the Energy Safety reports or trends analysis.

Executive Summary and analysis of 2010 accident data

Overview of 2010

During 2010 a total of 44 notifiable accidents were reported to Energy Safety consisting of:

- Nine notifiable electrical accidents, which caused one fatality and injured eight people.
- Fifteen notifiable and six non-notifiable natural gas accidents, with no fatalities, however five of the notifiable accidents caused injury to six people.
- Twenty notifiable and ten non-notifiable LPG accidents, with ten of the notifiable accidents causing two fatalities and injuries to thirteen people.

High Risk Areas 1993-2010

High-Risk Areas 1993-2010

Electrical and gas accident information from the last 18 years (1993-2010) has been categorised into relevant groups before being analysed for trends, frequency and common causes. The information is also analysed for the severity and frequency of total accident occurrences for each of these groups.

Electrical Accidents

Since 1st January 2009 responsibility for the investigation and reporting of worker and workplace accidents, in the electricity and gas sectors, transferred from Energy Safety to the Department of Labour (DoL).
All electrical accidents investigated during 2009 by Energy Safety are combined as a single electrical accident category to enable analysis of them (from 1993-2008 these were known as general public accidents).

- **Young people (age 17 years and less)**
  Young people were involved in 40% of general public accidents (238), causing 15 fatalities and injuring 84 people.

- **Domestic environment**
  Nearly half (47%) of accidents involving the general public occurred in the non-domestic environment, causing 16 fatalities and injuring 109 people.

**Natural Gas Accidents**

**Equipment**

- **Mains/Service and regulator stations**
  13% of the notifiable accidents (179) and over 50% of the total non-notifiable accidents (566) reported to Energy Safety involved mains/service/regulator stations. Eleven of 23 mains/service/ regulator stations notifiable accidents caused injury to fourteen people.

- **Water heaters/boilers**
  32% of the notifiable accidents involved water heaters. Fourteen of 58 notifiable water heater accidents caused one fatality and injury to 16 people. Water heaters also accounted for about 5% of the total non-notifiable accidents.

- **Space heaters**
  28% of the notifiable accidents involved space heaters. Thirteen of 50 notifiable space heater accidents caused three fatalities and injury to eleven people. Space heaters accounted for 19% of the total non-notifiable accidents.

- **Cookers/ovens**
  18% of the notifiable accidents involved cookers/ovens. Nine of 32 notifiable cooker/oven accidents caused one fatality and injury to ten people. Cookers/ovens accounted for 10% of the total non-notifiable accidents.

**Liquefied Petroleum Gas (LPG) Accidents**

**Equipment**

- **Cookers/ovens**
  30% of the notifiable accidents (325) involved cookers/ovens. 65 of 96 notifiable cooker/oven accidents caused 15 fatalities and injury to 87 people. Cookers/ovens accounted for 13% of the total non-notifiable LPG accidents.

- **Cabinet heaters**
  35% of the notifiable accidents involved cabinet heaters. 47 of 114 notifiable cabinet heater accidents caused nine fatalities and injury to 48 people. Cabinet heaters accounted for 32% of the total non-notifiable accidents.

- **Containers (Refillable)**
  8% of the notifiable accidents involved LPG refillable containers. Fourteen of 21 notifiable container accidents caused four fatalities and injury to 16 people. Containers (refillable) accounted for 19% (90) of the total non-notifiable accidents.
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

Environmental

- **Caravans**
  11% of the total notifiable accidents (325) occurred in caravans/campervans. 29 of 37 notifiable caravan accidents caused eleven fatalities and injury to 30 people.

Background to Accident Summaries

Energy Safety is a government agency within the Ministry of Economic Development that is responsible for the administration of safety and related matters under the Gas Act 1992 and the Electricity Act 1992. Our aim is to bring a clear focus to safety, supply quality and measurement across the electricity and gas sectors.

In order to maintain assurance of the safe supply and use of gas and electricity, Energy Safety conducts a range of functions under energy-related legislation. These include monitoring and enforcement, investigation of accidents, development and the promulgation of safety standards and information.

Energy Safety has published annual summaries of notifiable accidents\(^1\) since 2001, covering a period from 1998. The summaries have provided regulatory agencies and industry participants with access to standardised summary accident information, and an analysis that highlights trends and risks. While the focus of the annual analyses has been on notifiable accidents, trends in non-notifiable accidents have also been examined.

Energy Safety replaced the annual summaries with quarterly publications at the beginning of 2009 to provide this information on a more frequent basis. The quarterly publications cover the investigations completed in that quarter. This differs from the previous annual summaries that published information on accidents that occurred within the reporting year.

The annual analyses complement the quarterly accident summaries. They examine accident data and trends related to accidents that occurred in that year. This report covers the period 1 January to 31 December 2010.

A significant change in responsibility occurred from 1 January 2009. The Department of Labour assumed responsibility as lead agency for investigating and reporting on all workplace related gas and electrical accidents. Energy Safety remains the lead agency responsible for the investigation and reporting of non-workplace accidents involving members of the public and consumers.

Energy Safety and Department of Labour maintain an arrangement by which accidents notified to one agency, where relevant, are notified to the other.

\(^1\) See Appendix A – Accidents and accident notification for definitions of notifiable accident. Notifiable accidents are generally higher-consequence accidents.
Accident Data Collection and Recording

Certain accidents have to be notified to Energy Safety. These are generally high consequence accidents. The obligation to notify falls on participants in the energy industry in the first instance. Notifications of gas and electricity related accidents also come from consumers and other agencies, such as the NZ Fire Service or through the Department of Labour. The NZ Fire Service collects information about fire incidents it attends and publishes its own analyses.

Energy Safety investigates accidents in line with its responsibilities, and records at least a basic set of data on all reported accidents, regardless of the scale of the investigation. In general, more comprehensive information is recorded for the more intensive investigations that follow significant accidents.

Because there is no obligation, and no rationale that is consistently applied by industry or industry sectors, to report non-notifiable accidents to Energy Safety, a low proportion of these accidents are reported. There have been instances where an organisation has, for a limited period, reported all accidents that have come to its attention to Energy Safety. This ‘bulk-reported’ data has been removed from analysis, particularly trend analysis because it can skew results and trends.

Energy Safety does not, in general, conduct in depth investigations of electrically-caused fires unless there is evidence of equipment failure. This is because a significant number of fires that are related to the supply or use of electricity are either not reported or are not reported in a timely manner so that Energy Safety can carry out a meaningful investigation. In any case, many electrical fires, although covered by the Electricity Act, occur from incorrect operation or misuse of electrical equipment.

The definition of “accident” is similar in the Electricity Act and the Gas Act. However there are significant differences in collection and recording of electrical and gas accident data that affect the analysis of accidents and trends:

1. Electrically-related fires are not included for analysis. As outlined above, there is evidence that there has historically been significant under-reporting of less significant electrically-related fires to Energy Safety. In addition Energy Safety’s focus has been on electrical accidents other than fire.
2. Energy Safety investigates and records gas-related accidents that involve fire, explosion, or gas ‘poisoning’. Only those accidents that involve deliberate inhalation of LPG are excluded from analysis.
3. The electrical accident database in use up until 2008, allowed investigators to record only one likely major cause for an electrical accident. The database used for gas investigations allowed investigators to record up to four likely causes or factors for a gas-related accident. The accident investigation database that has been in use since the beginning of 2008 allows a range of factors to be considered and identified for both gas and electricity.

Natural gas and LPG (liquefied petroleum gas) have different characteristics as fuels and differing distribution and utilisation patterns so they are recorded and analysed separately.

The gas accident database contains information about fatalities, injuries, fires, explosions and minor accidents for natural gas and LPG. These accidents have been analysed for severity and frequency of similar types of accident.

Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

3 These electrical accidents are those that relate to direct contact with electricity – ie ‘shock’.

4 Because modern reticulated gases do not contain carbon monoxide, this typically involves exposure to harmful products of combustion.

5 For the purposes of analysis severity is categorised broadly as ‘fatal’, ‘notifiable - injury’, ‘notifiable - other’ or ‘non-notifiable’.

Accident Analysis

In order to identify trends and risk areas, this analysis examines data collected since 1993 on notifiable electrical accidents other than fires and both notifiable and non-notifiable gas accidents.

The 18 year period from 1993 to 2010 covers the period following the introduction of the current Electricity Act and the Gas Act. Comparisons are made between the five year period from 1993 to 1997, immediately after the introduction of this legislation (the base period), with the latest five year period, from 2006 to 2010 (the current period).

This analysis includes the latest information available at the time of preparation. In some cases, the investigations are complex and may not have been completed at the time of publication. This means that each annual analysis has to review previous years’ cases where further information has been obtained.

This accident analysis does not set out to explain the reasons behind the trends and variations found. These trends may be influenced by any number of factors, including changes in the way accidents are reported, reporting level, or actual improvements in safety or safety practices. Establishing the reason behind these trends would require comprehensive data that is not always available and detailed analysis and more information, which may or may not exist.

An IT system called Energy Safety Intelligence (ESI) was implemented at the beginning of 2008. This system integrated case management of electricity and gas operational activities, and brought electricity and gas accident information into a single database. This system has more data fields and a more consistent classification facility. However, its introduction meant there were some unavoidable inconsistencies between data held on the new system and data held on previous systems. This, in turn, places constraints on the analysis that can be undertaken.

Electricity Analysis

Electricity

This section deals with notifiable non-fire electrical accidents affecting members of the public that were reported to Energy Safety. In a typical non-fire electrical accident the victim receives an electric shock that requires medical treatment. These accidents are in general due to contact with, or coming close to live electric lines, equipment or components.

Electrical accidents prior to 1 January 2009, when DoL assumed responsibility for workplace accidents, were categorised under three main occupational headings: electrical workers,
workers in other (non-electrical) occupations, and the general public. Generally, about 50% of accidents involved electrical workers, 30% involved workers in other occupations, and 20% involved members of the public.

This analysis examines accidents involving members of the public for 2010, and gives an overview for the eighteen year period from 1993 to 2010. It includes a comparison between the base period (1993-1997) and the current period (2006-2010).

One area of interest for electrical safety is protection of young people and the elderly. This section examines the number of accidents involving young people up to 18 years old, and elderly people 65 years and older.

**Current trends**

During 2010:

- There were eight non-fire electrical accidents involving members of the public, injuring a total of eight people. Over the past 18 years, the average is 11.1 accidents per year.
- There was one fatal accident involving a member of the public. The average over past 18 years is 2.3 fatalities per year.
- Nine of these injury accidents, including the fatal accident, involved 230 volt systems. The average number of accidents involving 230 volt systems over the past 18 years is 8.4.

**Longer term trends**

Observations based on analysis of trends, consequence and frequency for the eighteen year period between 1993 and 2010:

- There were 238 accidents involving members of the public that resulted in fatality or injury to a total of 252 people. Of these, 200 accidents caused injury to 210 people.

**Table 1:**

<table>
<thead>
<tr>
<th></th>
<th>Accidents (No)</th>
<th>Casualties (No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatality</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Fatality and Injury</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Injury</td>
<td>196</td>
<td>205</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>238</strong></td>
<td><strong>252</strong></td>
</tr>
</tbody>
</table>

- 42 of these were fatal accidents, each of which involved a single fatality. In four of the fatal accidents there was at least one other person injured.
- There were 200 injury accidents, causing injury to a total of 210 people.
- **Graph 1a** shows there is no significant trend in the annual number of fatal and injury accidents in this period.
- 92 (39%) of these accidents involved young people, see **Graph 1e. Table 2** gives a more detailed breakdown of these age groups.
Fifteen fatal accidents (15 fatalities) involved young people. Three of these have occurred in the last five years.

79 injury accidents injuring 84 young people and 13 of these accidents (injuring 13 people) have occurred in the last five years.

There has been a significant reduction in the number of young people who were casualties in electrical accidents during the current period compared with the base period. In the current period three of 11 fatalities, and 13 out of 49 injuries, involved young people compared with seven of 15 fatalities, and 30 out of 67 injuries, in the base period.

Only 5% of accidents involved people aged 65 years or over. This is a relatively small number compared with the age profile of the population as a whole. As accident numbers are small, no further analysis has been carried out.

The standard voltage in domestic installations is 230 V. This is the voltage that people normally interact with in their homes. However, about two-thirds of accidents involving members of the public involve 230 V.

27 (64%) of the fatal accidents and 125 (63%) of the 200 injury accidents involved 230 volt systems, two (5%) fatal accidents and 12 (6%) injury accidents involved 400 volt systems and six (14%) fatal accidents and 32 (16%) injury accidents involved 11,000 volt systems, see Graph 1c. The remainder involved higher voltages or the voltage was not specified.

26 (62%) of the 42 fatal accidents and 100 (50%) of the 200 injury accidents occurred in the domestic environment. 230 volt domestic systems were involved in 23 of the 26 fatal accidents and 84 of the 100 injury accidents.

Eight (15%) of the 42 fatal accidents and 35 (18%) of the injury accidents occurred in works environment. Two fatal and 19 injury accidents involved 11,000 volt systems.

In the 42 fatal accidents, 15 of the victims were young people. Nine of these cases involved 230 volt systems.

58 (38%) of the 152 fatal and injury accidents associated with 230 volt systems affected young people.

In 8 (19%) fatal electrical accidents, misuse of equipment was identified as the cause.

In cases involving members of the public, the most common causes of electrical accidents were lack of maintenance in 59 (30%) cases, and misuse actions in 37 (19%) cases, see Graph 1b.

Over 80% of accidents that involved members of the public were associated with one of four categories of equipment (see Graph 1d):
- installation fittings (21%)²
- appliances (19%),
- works distribution cable (19%), and
- domestic installation wiring (18%).

### Table 2 - Age breakdown for notifiable electric shock accidents involving members of the public:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Consequence (Frequency) 1993-2010</th>
<th>Consequence (Frequency) 2005-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young people</td>
<td>Fatal 15 (15) Injury 84 (79)</td>
<td>Fatal 3 (3) Injury 13 (13)</td>
</tr>
<tr>
<td>Child (0-4)</td>
<td>Fatal 3 (3) Injury 13 (13)</td>
<td>Fatal 0 (0) Injury 4 (4)</td>
</tr>
<tr>
<td>School age</td>
<td>Fatal 4 (4)</td>
<td>Fatal 1 (1)</td>
</tr>
</tbody>
</table>
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Fatal</th>
<th>Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5-12)</td>
<td>47 (47)</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Adolescent (13-17)</td>
<td>8 (8)</td>
<td>24 (22)</td>
</tr>
<tr>
<td>Adult</td>
<td>25 (25)</td>
<td>103 (99)</td>
</tr>
<tr>
<td>Elderly (65+)</td>
<td>2 (2)</td>
<td>9 (8)</td>
</tr>
<tr>
<td>Total</td>
<td>42 (42)</td>
<td>210 (200)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Fatality</th>
<th>Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993 - 2010</td>
<td>Failure to follow safe work practice 30%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of maintenance 27%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Misuse 19%</td>
<td></td>
</tr>
<tr>
<td>2005 - 2010</td>
<td>Failure to follow safe work practice 16%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of maintenance 14%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Misuse 8%</td>
<td></td>
</tr>
</tbody>
</table>

Graph 1a Notifiable Electrical Accidents to the General Public 1993-2010
Graph 1b Notifiable Electrical Accidents to the General Public 1993-2010 - by casual factor category

Graph 1c Notifiable Electrical Accidents to the General Public 1993-2010 - by voltage
Graph 1d Notifiable Electrical Accidents to the General Public 1993-2010 - by equipment

Graph 1e Notifiable Electrical Accidents to the General Public 1993-2010 - by age

6 Some accidents involved multiple casualties.

7 Domestic installation fittings include switches, plugs and light fittings.
Natural Gas Analysis

Natural Gas

This section deals with notifiable and non-notifiable accidents involving natural gas (gas) affecting members of the public that were reported to Energy Safety. It covers natural gas-related accidents of all types, including fire and explosion, whether or not there were casualties, or the loss related merely to property. All non-notifiable accidents except for those reported in bulk are included in this analysis.

This analysis examines accidents involving members of the public for 2010, and also for the eighteen year period from 1993 to 2010. It includes a comparison between the base period (1993-1997) and the current period (2006-2010).

Historically, data related to gas accidents did not focus on age of the victim. This section identifies general trends and examines general categories of appliance and other equipment involved in accidents.

Current trends

Examination of notifiable gas accidents shows that during 2010:

- There were no fatal natural gas accidents, and five injury accidents caused injury to six people. In the past eighteen years, there have been on average 0.3 fatalities and 3.4 injury accidents per year.
- There were fifteen notifiable accidents and all but two of these accidents resulted in fire, explosion or both.
- Space heaters were involved in three accidents, three accidents involved cooking appliances and water heaters were involved in six accidents.
- Six non-notifiable accidents were reported to Energy Safety. Reported non-notifiable accidents are down by about 25% in the last two years, and 2010 was the lowest in last 18 years.
- Mains/service and regulator stations were involved in four (67%) of these accidents. Reporting of non-notifiable distribution accidents (involving mains, services, and regulator stations &c) fell to 13% of the annual average. A possible reason for this decline is the transfer of responsibility for workplace accidents to the Department of Labour.

Longer term trends

Observations based on analysis of trends, consequence and frequency for the eighteen year period between 1993 and 2010:

- There were a total of 179 notifiable accidents and 127 (70%) of these are non-casualty accidents which resulted in property damage.
There have been only five fatal accidents (with five fatalities) and 49 injury-accidents, injuring 61 people, see Graph 2a. With this small number spread over a 18 year period it is not possible to identify a trend for fatal and injury accidents.

The last fatal accident happened in 2007. Fixed space heaters were involved in three of these fatal accidents, and cookers and water heaters have each been involved in one accident.

Three categories of appliance were involved in about 80% of notifiable accidents see Graph 2c:
- water heaters/boilers – 58 (32%);
- space heaters – 58 (28%);
- and cooking appliances – 32 (18%).
About 95% of these accidents involved a fire or explosion.

The most common causes of notifiable accidents, see Graph 2e, were:
- incorrect work – 64 (24%);
- lack of maintenance – 36 (14%), and
- not following appropriate work practices and third-party damage – 27 (10%).

About half (11 of 23) of the notifiable accidents in distribution caused injury to 14 people.

Over half (301) of the 566 non-notifiable accidents reported to Energy Safety involved distribution equipment, see Graph 2d, with a gas leak or gas escape being the outcome in over 80% of events, and fire in less than 10% of these cases. About 60% of distribution accidents, including third party strikes, involved failure to follow correct work practices.

Over a quarter (159 or 29%) of the 566 non-notifiable accidents reported to Energy Safety involved heating equipment or cooking equipment. Fire was the outcome in about 75% of these accidents.

Over a third (201 or 29%) of the non-notifiable accidents reported to Energy Safety were caused by failure to follow correct work practices, including third-party incidents involving non-gas industry workers. A further 97 (14%) were caused by lack of maintenance, 65 (9%) by incorrect work and 81 (12%) by not following correct procedures, see Graph 2f.

There were 107 non-notifiable accidents reported to Energy Safety in the last five years, compared with 121 in the initial five years period, a decrease of 12%, see Graph 2b. However, the number of non-notifiable accident level in gas distribution has dropped in last five years and especially in the last two years.

The number of non-notifiable accidents reported by the gas industry is similar to the base period (8.8 pa) and 50 (10 pa) in the current period. More non-notifiable gas distribution accidents were reported by the gas industry during 1998-2002 (90 – 18.0 pa) and 2003-2008 (92 – 15.3 pa) period.

About half of non-notifiable accidents were reported to Energy Safety by the gas industry.

Table 4: Breakdown of natural gas accidents involving members of the public by equipment type

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Consequence 16 (Frequency) 1993-2010</th>
<th>Consequence (Frequency) 2005-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains/service and regulator stations</td>
<td>Fatal 0 (0)</td>
<td>Fatal 0 (0)</td>
</tr>
<tr>
<td></td>
<td>Injury 14 (11)</td>
<td>Injury 1 (1)</td>
</tr>
<tr>
<td></td>
<td>Notifiable 23</td>
<td>Notifiable 8</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable 301</td>
<td>Non-notifiable 54</td>
</tr>
<tr>
<td>Space heaters</td>
<td>Fatal 3 (3)</td>
<td>Fatal 1 (1)</td>
</tr>
<tr>
<td></td>
<td>Injury 11 (0)</td>
<td>Injury 4 (4)</td>
</tr>
<tr>
<td></td>
<td>Notifiable 50</td>
<td>Notifiable 16</td>
</tr>
</tbody>
</table>
### Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

<table>
<thead>
<tr>
<th></th>
<th>Non-notifiable</th>
<th>Non-notifiable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cookers/ovens</strong></td>
<td>Fatal 1 (1)</td>
<td>Fatal 0 (0)</td>
</tr>
<tr>
<td></td>
<td>Injury 8 (10)</td>
<td>Injury 4 (6)</td>
</tr>
<tr>
<td></td>
<td>Notifiable 32</td>
<td>Notifiable 10</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable 54</td>
<td>Non-notifiable 8</td>
</tr>
<tr>
<td><strong>Water heaters</strong></td>
<td>Fatal 1(1)</td>
<td>Fatal 0 (0)</td>
</tr>
<tr>
<td></td>
<td>Injury 16 (13)</td>
<td>Injury 3 (3)</td>
</tr>
<tr>
<td></td>
<td>Notifiable 58</td>
<td>Notifiable 13</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable 29</td>
<td>Non-notifiable 7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Fatal 5 (5)</td>
<td>Fatal 1 (1)</td>
</tr>
<tr>
<td></td>
<td>Injury 61 (49)</td>
<td>Injury 18 (15)</td>
</tr>
<tr>
<td></td>
<td>Notifiable 179</td>
<td>Notifiable 54</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable 566</td>
<td>Non-notifiable 107</td>
</tr>
</tbody>
</table>

**Table 5: Factors in natural gas accidents involving members of the public**

<table>
<thead>
<tr>
<th></th>
<th>Period 1993-2010</th>
<th>Period 2005-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Causes</strong></td>
<td>Work practice, interference by third parties, operation error 10%</td>
<td>Work practice, interference by third parties, operation error 8%</td>
</tr>
<tr>
<td></td>
<td>Lack of maintenance 14%</td>
<td>Procedure 13%</td>
</tr>
<tr>
<td></td>
<td>Assembly, connection, installation, alteration 24%</td>
<td>Assembly, connection, installation, alteration 24%</td>
</tr>
<tr>
<td></td>
<td>Procedure 11%</td>
<td>Lack of maintenance 7%</td>
</tr>
<tr>
<td></td>
<td>Design factor 5%</td>
<td></td>
</tr>
</tbody>
</table>

**Graph 2a: Notifiable Natural Gas Accidents 1993-2010**

![Notifiable Natural Gas accidents 1993-2010 graph](image-url)
Graph 2b: Non-notifiable Accidents 1993-2010

Graph 2c: Notifiable Natural Gas Accidents 1993-2010 by equipment
Graph 2d: Non-notifiable Natural Gas Accidents 1993-2010 by equipment

Graph 2e: Notifiable Natural Gas Accidents 1993-2010 by causal factor
Graph 2f: Non-notifiable Natural Gas Accidents 1993-2010 by casual factor

Non-notifiable Natural Gas Accidents 1993-2010
By causal factor

10 This category includes cookers, ovens and other cooking appliances.

11 This includes assembly, connection, installation and alteration.

12 This includes mains, services, regulator stations and meters.

13 Incorrect work includes incorrect assembly, connection, installation and alteration.

14 Distribution includes mains, services and regulator stations.

15 The main reason for this drop is the change of responsibility for reporting and investigating workplace accidents.

16 The first number represents casualties and the bracketed number represents accidents.

Liquefied Petroleum Gas (LPG) Analysis

Liquefied Petroleum Gas (LPG)

This section deals with those notifiable and non-notifiable accidents involving liquefied petroleum gas (LPG) affecting members of the public that were reported to Energy Safety. It includes LPG fuel gas-related accidents of all types, including fire and explosion whether there were casualties, or property loss. Non-notifiable accidents, other than those reported by bulk reporting, are included.

This analysis examines accidents involving members of the public for 2010, and also for the eighteen year period from 1993 to 2010. It includes a comparison between the base period (1993-1997) and the current period (2006-2010). In addition to accidents involving
members of the public Energy Safety retains an interest in equipment, which is reflected in this analysis – the same is true for other fuels.

Historically, data related to gas accidents did not focus on age of the victim. This section identifies general trends and examines general categories of appliance and other equipment involved in accidents.

LPG is normally used as a fuel for heating, cooking or lighting. However, in a few cases LPG is deliberately inhaled, with serious consequences. Energy Safety is not the lead agency for investigating incidents that involve deliberate LPG inhalation.

Deliberate LPG inhalation accidents differ from other LPG accidents as the fuel is knowingly misused or handled without any fault in the equipment or fuel. Analysis that included this data might give the impression that LPG is a more dangerous fuel than it actually is in normal use.

Energy Safety’s database records 17 deliberate LPG inhalation accidents that resulted in 17 fatalities during the last 18 years. Fifteen of these were reportable under the Gas Act. Teenagers or young men were involved in all of these accidents. Generally, victims inhale LPG from a canister, but in some cases they use larger refillable cylinders.

Deliberate LPG inhalation accidents are not included in LPG accidents analysis.

**Current trends**

Examination of notifiable LPG accidents shows that during 2010:

- There were 20 notifiable accidents that involved fatality, injury or significant property damage, one less than last year. The average annual notifiable accident is 18.1 over the past 18 years.
- There were two fatal accidents causing two fatalities. Over the last 18 years, the average number of fatalities has been two per year.
- Nine of the notifiable accidents injured thirteen people. This is higher than the average over the last 18 years of eight notifiable injury accidents, causing an average of 11 injuries.
- The appliances involved in both fatal accidents were refrigerator accidents in caravans (vehicle).
- Cookers were involved in three of these nine notifiable injury accidents, and cabinet heaters were involved in four such accidents.
- Cabinet heaters and cooking appliances were involved in over two-thirds of these notifiable accidents. Two-thirds of cooker and cabinet heater accidents resulted in a fire or explosion.
- There were 10 non-notifiable accidents reported to Energy Safety. This is 39% of the annual average number (26) over the last 18 years. Eight of these accidents resulted in fires or explosion.
- Barbecues and cabinet heaters were each involved in three each non-notifiable accidents.

**Longer term trends**

Observations based on analysis of trends, consequence and frequency for the eighteen year period between 1993 and 2010:

- There were 29 fatal accidents, which resulted in 36 fatalities.
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

- Cooking equipment was involved in 10 (34%) of fatal accidents, resulting in 15 (42%) fatalities. Cabinet heaters were involved in eight fatal accidents resulting in nine fatalities. Five of these eight fatal accidents were within last four years.
- Nineteen of these 34 fatalities involved fire or explosion (in 17 accidents); sixteen fatalities involved carbon monoxide poisoning in eleven cases.
- There is no clear long-term trend to indicate any change in the number of fatal accidents over the last 18 years, see Graph 3a. However, there appears to have been a spike in the number of fatal cabinet heater accidents from 2007 to 2009 compared to the long term trend.
- There have been 325 notifiable accidents, and 128 (28%) of the total 325 notifiable accidents and 215 (37%) of the 464 non-notifiable accidents were caused by poor assembly, connection, installation of or alteration to an appliance. When analysing gas related accidents it worth noting that many of these accidents may have had more than one cause attributed to them.
- A total of 144 notifiable injury accidents caused injuries to 202 people.
- Cooking appliances were involved in 40%, and cabinet heaters 27% of injury accidents. Close to two-thirds of injuries were caused by these two types of equipment.
- Of the total 325 notifiable accidents, 155 (48%) involved fire or explosion that did not result in casualty.
- A total of 464 non-notifiable accidents were reported to Energy Safety. No accident trend has been demonstrated over this period (see Graph 3b).
- 147 (32%) non-notifiable accidents involved cabinet heaters, 90 (19%) involved containers, 73 (16%) barbecues and 62 (13%) cooking equipment.
- Over 67% (313) of non-notifiable accidents involved fire or explosion and more than 27% (125) involved gas escape.
- 26% of the total 789 notifiable and non-notifiable accidents were reported by Department of Labour or local body inspectors and 20% were reported by New Zealand Fire Service.
- The main causes of the notifiable accidents (See Graph 3c) have been:
  - Incorrect assembly, connection, installation or alteration (28%),
  - incorrect operation (13%),
  - lack of maintenance (12%), and
  - operating close to flammable material (6%).
- These causes were also the major contributors to non-notifiable accidents reported to ES (see Graph 3d).
- The major contributors to notifiable accidents have been:
  - Cabinet heaters (35%),
  - containers (8%) and
  - cookers and ovens (30%).
  - This equipment has contributed to a similar level of non-notifiable accidents (see Graph 3e). Together, these three types of equipment have contributed to about two-thirds of the total number of non-notifiable accidents. Barbecues have contributed to 16% of non-notifiable LPG accidents, but only for about 3% of notifiable accidents (see Graph 3f).
- Gas equipment fuelled by canisters (non-refillable) was involved in 18 notifiable accidents over the last 18 years, which is about 6% of total LPG notifiable accidents.
- Two canister fuelled notifiable accidents caused five fatalities (14% of total LPG fatalities) and 16 notifiable accidents injured 29 people (14% of total LPG injury).
- 11% (37) of notifiable LPG accidents (325) occurred in caravans. Ten of these were fatal, causing eleven fatalities. Nineteen of the notifiable accidents injured 30 people, 15% of total LPG injuries.
Table 6: Breakdown of LPG accidents involving members of the public by equipment type

<table>
<thead>
<tr>
<th>Equipment type</th>
<th>Consequence 18 (Frequency) 1993-2010</th>
<th>Consequence 19 (Frequency) 2005-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fatal 9 (8)</td>
<td>Fatal 5 (5)</td>
</tr>
<tr>
<td></td>
<td>Injury 48 (39)</td>
<td>Injury 11 (10)</td>
</tr>
<tr>
<td></td>
<td>Notifiable (114)</td>
<td>Notifiable (52)</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable (147)</td>
<td>Non-notifiable (19)</td>
</tr>
<tr>
<td>Cabinet heaters</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fatal 15 (10)</td>
<td>Fatal 2 (2)</td>
</tr>
<tr>
<td></td>
<td>Injury 87 (58)</td>
<td>Injury 27 (16)</td>
</tr>
<tr>
<td></td>
<td>Notifiable (96)</td>
<td>Notifiable (26)</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable (62)</td>
<td>Non-notifiable (14)</td>
</tr>
<tr>
<td>Cookers &amp; ovens</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fatal 4 (4)</td>
<td>Fatal 0 (0)</td>
</tr>
<tr>
<td></td>
<td>Injury 16 (10)</td>
<td>Injury 1 (1)</td>
</tr>
<tr>
<td></td>
<td>Notifiable (21)</td>
<td>Notifiable (4)</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable (88)</td>
<td>Non-notifiable (14)</td>
</tr>
<tr>
<td>Containers (refillable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fatal 5 (4)</td>
<td>Fatal 2 (2)</td>
</tr>
<tr>
<td></td>
<td>Injury 6 (6)</td>
<td>Injury 1 (1)</td>
</tr>
<tr>
<td></td>
<td>Notifiable (17)</td>
<td>Notifiable (3)</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable (6)</td>
<td>Non-notifiable (1)</td>
</tr>
<tr>
<td>Refrigerator</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fatal 5 (2)</td>
<td>Fatal 0 (0)</td>
</tr>
<tr>
<td></td>
<td>Injury 29 (16)</td>
<td>Injury 6 (2)</td>
</tr>
<tr>
<td></td>
<td>Notifiable (18)</td>
<td>Notifiable (2)</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable (0)</td>
<td>Non-notifiable (2)</td>
</tr>
<tr>
<td>Canister and canister equipment (mainly cookers) (non-refillable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fatal 36 (29)</td>
<td>Fatal 11 (10)</td>
</tr>
<tr>
<td></td>
<td>Injury 202 (144)</td>
<td>Injury 50 (34)</td>
</tr>
<tr>
<td></td>
<td>Notifiable (325)</td>
<td>Notifiable (106)</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable (464)</td>
<td>Non-notifiable (93)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fatal 36 (29)</td>
<td>Fatal 11 (10)</td>
</tr>
<tr>
<td></td>
<td>Injury 202 (144)</td>
<td>Injury 50 (34)</td>
</tr>
<tr>
<td></td>
<td>Notifiable (325)</td>
<td>Notifiable (106)</td>
</tr>
<tr>
<td></td>
<td>Non-notifiable (464)</td>
<td>Non-notifiable (93)</td>
</tr>
</tbody>
</table>

Table 7: Factors in natural gas accidents involving members of the public.

<table>
<thead>
<tr>
<th>Period 1993-2010</th>
<th>Period 2005-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main causes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28% assembly, connection, installation, alteration</td>
</tr>
<tr>
<td></td>
<td>13% operation error</td>
</tr>
<tr>
<td></td>
<td>12% lack of maintenance</td>
</tr>
<tr>
<td></td>
<td>5% design</td>
</tr>
<tr>
<td></td>
<td>20% assembly, connection, installation, alteration</td>
</tr>
<tr>
<td></td>
<td>7% operation error</td>
</tr>
<tr>
<td></td>
<td>13% lack of maintenance</td>
</tr>
<tr>
<td></td>
<td>7% design</td>
</tr>
</tbody>
</table>

Table 8: Environment factors in LPG accidents involving members of the public.

<table>
<thead>
<tr>
<th>Environment</th>
<th>Consequence 19 (Frequency) 1993-2010</th>
<th>Consequence 19 (Frequency) 2005-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Notifiable electrical and gas accidents
1 January 2010 to 31 December 2010

<table>
<thead>
<tr>
<th>Caravan/campervan</th>
<th>Fatal 11 (10)</th>
<th>Injury 30 (19)</th>
<th>Notifiable (37)</th>
<th>Non-notifiable (11)</th>
</tr>
</thead>
</table>

| Fatal 3 (3) | Injury 8 (4) | Notifiable (9) | Non-notifiable (2) |

**Summary of Reported Accidents**

**Graph 3a: Notifiable LPG Accidents 1993-2009**

**Graph 3b: Non-notifiable LPG Accidents 1993-2009**
Graph 3c: Notifiable LPG Accidents 1993-2009 by casual factor

Graph 3d: Non-notifiable LPG Accidents 1993-2009 by casual factor
Graph 3e: Notifiable LPG Accidents 1993-2009 by equipment

Graph 3f: Non-notifiable LPG Accidents 1993-2009 by equipment

17 Energy Safety is also aware of a number of cases where teenagers died by inhaling LPG propellant in aerosol cans, but these cases are not included in this analysis because LPG propellant is not covered by the Gas Act 1992.

18 The first number represents casualties and the bracketed number represents accidents.

19 The first number represents casualties and the bracketed number represents accidents.
Appendix A – Accidents and accident notification

The occupier or the person in charge of the accident area is required by law to report to Energy Safety or the Department of Labour any accidents caused by electricity or gas that result in fatalities, serious injuries or significant damage to property.

A “notifiable electrical accident” has the same meaning as a “notifiable accident” in the Electricity Act 1992.

A “notifiable electrical accident” is defined as an accident that:

- Is caused wholly or partly by, or involves or affects, electricity, or involves or affects the generation, conversion, transformation, conveyance, or use of electricity; and
- Results in:
  - Serious harm to any person; or
  - Damage to any place or part of a place that renders that place or that part of that place unusable for any purpose for which it was used or designed to be used before that accident.

Serious harm means:

- Death; or
- Injury that consists of or includes loss of consciousness; or
- Injury that necessitates the person suffering the injury:
  - Being admitted to hospital; or
  - Receiving medical treatment from a medical practitioner who is, or is deemed to be, registered with an authority established or continued by section 114 of the Health Practitioners Competence Assurance Act 2003 as a practitioner of a particular health profession.

A “notifiable gas accident” has the same meaning as a “notifiable accident” in the Gas Act 1992.

A “notifiable gas accident” is defined as an accident that:

- Involves the production, conversion, supply, distribution, or use of gas; and
- Results in:
  - Serious harm to any person; or
  - Significant property damage.

Serious harm means:

- Death; or
- Harm that incapacitates, or is likely to incapacitate, the person suffering harm for 48 hours or more; or
- Harm that incapacitates, or is likely to incapacitate, the person suffering harm due to the inhalation of carbon monoxide; or
- Harm of the kinds and descriptions that are serious harm under the Health and Safety in Employment Act 1992.

A “non-notifiable gas accident” is defined as an accident that:

- Causes property loss; and/or
- Causes injury below the threshold defined in the Gas Act 1992, and is involved with what is supposed to be a safe supply or use of fuel gas.

**Electrical notifiable accidents (Jan-March 2010)**

**Electrical fire notifiable accidents**

This is the list of the 6 electrical fire notifiable accidents for which the investigation was completed between January and March 2010.

1 - Event summary: The Fire Service notified Energy Safety of an electrically initiated fire that caused significant structure damage to an office area within a bar.

Event ID 090618 01
Event date 28/05/2009
Site Commercial
Environment Building
Voltage 230
Equipment Equipment under 60065 classification
Event Fire
Casualty No casualty
Injury No injury
Property damage level Extended to the room and structure containing the equipment

Outcome of investigation It was determined the fire had initiated within an electrical component which investigation was situated on a computerised rack system. However due to the fire damage the exact component/appliance was unable to be identified.

2 - Event summary: The Fire Service notified Energy Safety of a dehumidifier which caught fire while in operation in a child's bedroom and caused extensive smoke damage in the bedroom. The child was taken to hospital suffering from smoke inhalation.

Event ID 091013 01
Event date 9/10/2009
Site Domestic
Environment Building
Voltage 230
Equipment Heat pumps; air conditioners; dehumidifiers
Event Fire
Casualty Injury
Injury Asphyxiation
Property damage level Restricted to the room containing the equipment

Outcome of The Fire Service sent the remains of the dehumidifier to Energy Safety for an investigation inspection. A close examination of the dehumidifier was carried out to determine the cause. The suspected cause is the failure of the fan motor due to a possible malfunction or a lack of ventilation with the unit’s filter being blocked or the unit too close to furniture. Energy Safety posted a safety alert for the maintenance of dehumidifiers on the Energy Safety web site.

3 - Event summary: Fire in dishwasher causing mainly smoke damage.
Event ID 091219 01
Event date 19/12/2009
Site Domestic
Environment Building
Voltage 230
Equipment Dishwashers
Event Fire
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment
Outcome of  The dishwasher was over six years old and the cause of the fire could not be investigation determined. A search for other fires in a similar appliance did not indicate any other fires.

4 - Event summary: Capacitor in coolstore plant room failed, no damage to building or person.
Event ID  100114 02
Event date  8/01/2010
Site  Industrial
Environment Building
Voltage  400
Equipment  Control panel
Event  Fire
Casualty  No casualty
Injury  No injury
Property damage level  Restricted to the direct vicinity of the equipment
Outcome of  Old power factor capacitor failed causing smoke damage to switchroom. There investigation was no damage to building and no danger to workers. The faulty equipment was repaired and the company resumed operation.

5 - Event summary: The Fire Service were called to a front loading washing machine that was emitting smoke.
Event ID  100314 01
Event date  14/03/2010
Site  Domestic
Environment Building
Voltage  230
Equipment  Appliances
### Electricity notifiable accidents

**Event**

<table>
<thead>
<tr>
<th>Event</th>
<th>Fire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casualty</td>
<td>No casualty</td>
</tr>
<tr>
<td>Injury</td>
<td>No injury</td>
</tr>
<tr>
<td>Property damage level</td>
<td>Restricted to the direct vicinity of the equipment</td>
</tr>
</tbody>
</table>

**Outcome of investigation**

The washing machine electric motor appeared to have failed and caught fire, burning the plastic cover and drive belt causing some minor damage to the plaster board wall. The socket outlet supplying power to the washing machine was protected by an RCD which tripped during the incident.

**6 - Event summary: A small fire in sign isolating switch was extinguished by staff at a cafe.**

<table>
<thead>
<tr>
<th>Event ID</th>
<th>100322 01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event date</td>
<td>22/03/2010</td>
</tr>
<tr>
<td>Site</td>
<td>Commercial</td>
</tr>
<tr>
<td>Environment</td>
<td>Outside (Above Ground)</td>
</tr>
<tr>
<td>Voltage</td>
<td>230</td>
</tr>
<tr>
<td>Equipment</td>
<td>General</td>
</tr>
<tr>
<td>Event</td>
<td>Fire</td>
</tr>
<tr>
<td>Casualty</td>
<td>No casualty</td>
</tr>
<tr>
<td>Injury</td>
<td>No injury</td>
</tr>
<tr>
<td>Property damage level</td>
<td>Restricted to the direct vicinity of the equipment</td>
</tr>
</tbody>
</table>

**Outcome of investigation**

An isolating switch faulted causing the switch contacts to burn and melt the plastic box containing the switch. The switch unit had been in operation for over four years and was mounted outside under a veranda. There was no way of determining why the switch failed but the most likely cause was corrosion in the switch.
This is the list of the 5 Electricity notifiable accidents for which the investigation was completed between January and March 2010.

1 - Event summary: The victim fell into sea when using hot air gun on boat, dragging the appliance with her.

Event ID 091222 01
Event date 30/11/2009
Site Commercial
Environment Boat
Voltage 230
Equipment Appliances
Event Electrical Shock
Casualty Injury
Injury Shock
Property damage level No property damage

Outcome if investigation A visitor to New Zealand was using an appliance on her boat, the appliance was connected through a step down transformer which was plugged into an RCD protected socket outlet. The victim slipped into the sea dragging the appliance with her and she received an electric shock prior to the RCD tripping. The appliance was rated at 110 volts. She was told not to use this type of appliance in New Zealand.

2 - Event summary: A teenager suffered a fatal electric shock. Contact had been made with exposed live parts on an electrical extension lead. The lead had been damaged at some time prior to its use in this tragic accident.

Event ID 091208 02
Event date 7/12/2009
Site Domestic
Environment Outside (Above Ground)
Voltage 230
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

31

Summary of Reported Accidents

Equipment Extension lead
Event Electrical Shock
Casualty Fatality
Injury Shock
Property damage level No property damage

Outcome of This was a tragic and preventable accident. This lead should not have been investigation used under any circumstance in its damaged condition. Post the investigation Energy Safety prepared safety information with regards to safe extension lead use, consumer safety checks, and reinforcement for the use of RCDs. This information was placed on the Energy Safety website. A general safety message for working safely with electricity was also prepared for a media release.

3 - Event summary: A concerned mother of a 14 month old child notified Energy Safety when her child received an electric shock while dinning in a café. The shock occurred when the child was exploring a window box display, close to where they were seated, and found a light connector with exposed live parts. The child was taken to a medical centre for an assessment where the child received an ECG and was released suffering from no harmful effects from the electric shock.

Event ID 091209 03
Event date 9/12/2009
Site Commercial
Environment Building
Voltage 230
Equipment Lighting track
Event Electrical Shock
Casualty Injury
Injury Shock
Property damage level No property damage

Outcome of Energy Safety proceeded with a site visit to the cafe to investigate the
investigation accident. A disused lighting track connecting within the windowbox display was found with its contact still exposed. A test was carried out to determine the voltage on the contacts which tested at 230 volts. The severity of this hazard was pointed out to the cafe owner who then organised for the remedial work to be carried out on that same day. The case has been referred to Energy Safety’s Compliance Officer.

4 - Event summary: Mains cable at house was repaired and the phase and neutral transposed livening the earthed metal in the house.

Event ID 091217 03
Event date 17/12/2009
Site Domestic
Environment Building
Voltage 230
Equipment Mains
Event Electrical Shock
Casualty Injury
Injury Shock
Property damage level No property damage

Outcome of The inspector who made the connections and livened the cable did not test for correct polarity prior to livening the cable. As a result of his actions the earthing system at the house became live causing the occupants to receive shocks. The matter was referred to the Electrical Workers Registration Board for disciplinary action.

5 - Event summary: AFire in hot water cylinder cupboard at holiday park/backpackers. Suspect hot water cylinder thermostat faulty.

Event ID 100114 03
Event date 13/01/2010
Site Commercial
Environment Building
Notifiable electrical and gas accidents
1 January 2010 to 31 December 2010

Voltage 230

Equipment Appliances

Event Fire

Casualty No casualty

Injury No injury

Property damage level Restricted to the room containing the equipment

Outcome of investigation A thermostat mounted on the water heater faulted causing the insulation on the heater to burn. The polystyrene insulation melted and caused minor fire damage in the local of the water heater. There were other water heaters at the site and the thermostats were checked and found to be working without problems. The ratings of the thermostats were found to be well rated for the current draw of the heaters.

Electrical notifiable accidents (April - June 2010)

Electrical fire notifiable accidents

This is the list of the 9 electrical fire notifiable accidents for which the investigation was completed between April and June 2010.

1 - Event summary: The Fire Service attended a house fire which extensively damaged the kitchen, dinning/family room areas and the entire roof space. The Fire Safety Officer determined the most likely cause for the fire was an electrically initiated fire.

Event ID 091228-01

Event date 29/12/2009

Site Domestic

Environment Building

Voltage 230

Equipment DVS unit, Heat transfer systems, Air ventilation systems
Event: Fire

Casualty: No casualty

Injury: No injury

Property damage level: Extended to multiple rooms

Outcome of investigation: The fire was investigated by the Fire Service and the insurance investigators. At the time of the fire the house was not occupied; the family who occupied this house were on holiday and had left the house approximately four days prior to the incident occurring. Also just prior to the fire there had been a power outage affecting the area for just over an hour, however this was ruled out as a factor contributing to the fire.

The investigators concluded the area of origin that was most extensively damaged was in the roof space above the kitchen where a down light was positioned. The insurance investigator sent items from the fire to be examined by an electrical engineer who also confirmed a possible failure with the down lights.

The investigators opinion was the lights may have be left on by the home owner before they left for their holiday, although they deny this because it was dark when they left and they thought they may have noticed a light on. The Fire Safety Officer also concluded most likely cause of the fire appeared to be a down light in this area, however he considered this could not be clearly established as the definitive cause.

2 - Event summary: Energy Safety was requested to assist the Fire Service with determining if an oven was the point of origin in a commercial building fire with substantial structural damage.

Event ID: 100209-01
Event date: 9/2/2010
Site: Commercial
Environment: Building
Voltage: 230
Equipment: Ovens; Hobs; Grills (Stationary)
Event: Fire
Casualty: No casualty
Injury No injury

Property damage level Extended to multiple rooms

Outcome of A site investigation was carried out. The commercial building was under going refurbishments at the time of the fire. The fire was located on the first floor within the kitchen and lounge areas. It appears from Energy Safety’s observation that the point of origin was the oven. It also appears this may have been due to an element being energised on the top of the oven, where any materials placed on the oven would have ignited.

For this situation to take place the oven would have had to have somebody physically turn the power on thus energising the element. It was not determined who may have been involved and whether this action was intentional or accidental. The Police were the lead agency with this investigation.

3 - Event summary: A fire occurred in the water heater compartment.

Event ID 100404-01
Event date 4/4/2010
Site Domestic
Environment Building
Voltage 230
Equipment Water Storage Heaters
Event Fire
Casualty No casualty
Injury No injury
Property damage level Extended to multiple rooms

Outcome of A report was received from the Fire Service concerning a fire in a hot water investigation heater compartment. A request was made for further details of the fire but these could not be obtained.

4 - Event summary: The control panel of a dishwasher caught fire.
### Event ID 100412-01
**Event date:** 11/4/2010  
**Site:** Domestic  
**Environment:** Building  
**Voltage:** 230  
**Equipment:** Dishwasher  
**Event:** Fire  
**Casualty:** No casualty  
**Injury:** No injury  
**Property damage level:** Restricted to the room containing the equipment  
**Outcome of investigation:** The fire occurred in the dishwasher control panel. A request was made to the dishwasher supplier for the safety documentation and test reports for the dishwasher. The documents were examined and were found to be of order. The make and model of the dishwasher have been noted for comparison should a similar event occur in the future with this type of dishwasher.

5 - **Event summary: Outdoor meter box caught fire, damage was confined to metal meter box.**

**Event ID:** 100428-02  
**Event date:** 28/4/2010  
**Site:** Domestic  
**Environment:** Outside (Above Ground)  
**Voltage:** 230  
**Equipment:** Switch/distribution board  
**Event:** Fire  
**Casualty:** No casualty  
**Injury:** No injury
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

Property damage level

Outcome of investigation but it was most likely a loose terminal in the mains switch or water heating control relay.

6 - Event summary: Possible cause of domestic garage fire thought to be a unused old electric clothes dryer that was again put to use.

Event ID 100502-01
Event date 2/5/2010
Site Domestic
Environment Building
Voltage 230
Equipment Clothes Dryers
Event Fire
Casualty No casualty
Injury No injury
Property damage level Restricted to the room containing the equipment

Outcome of investigation The clothes dryer control panel was damaged during the fire and the investigation components were so badly damaged they could not be examined to determine the cause.

7 - Event summary: Bathroom heater caught fire, damage was confined to unit.

Event ID 100511-02
Event date 11/5/2010
Site Domestic
Environment Building
Voltage 230
Notifiable electrical and gas accidents
1 January 2010 to 31 December 2010

Equipment Appliances
Event Fire
Casualty No casualty
Injury No injury
Property damage level No property damage

Outcome of The heater was over four years old and it appears that the lampholders may have had loose connections. This combined with reduced air flow past the lamps caused the plastic body of the light fitting to melt onto the lamps. The body of the fitting melted and dropped down onto the bathroom floor. The plastic body did not continue to burn and no damage to the bathroom occurred.

8 - Event summary: Fault in welder caused components to smoke.
Event ID 100516-01
Event date 15/5/2010
Site Domestic
Environment Building
Voltage 230
Equipment Equipment under 60519 category
Event Fire
Casualty No casualty
Injury No injury
Property damage level No property damage

Outcome of Mig welder internal components failed causing smoke damage to shed. The investigation welder was examined by the supplier and no cause could be found as to why the welder failed.

9 - Event summary: Main fuse box on house caught fire causing minor damage to fuse box and wiring.
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

Event ID 100531-05
Event date 31/5/2010
Site Domestic
Environment Building
Voltage 400
Equipment Switch/distribution board
Event Fire
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment

Outcome of Water ran down cable from power pole entered main switch causing tracking investigation between phases in main switch.

Electricity notifiable accidents

This is the list of the 4 Electricity notifiable accidents for which the investigation was completed between April and June 2010.

1 - Event summary: Energy Safety received a notification when an incident occurred involving an exposed live cable shorting against a digger preparing a site for concrete paths.

Event ID 100324-02
Event date 23/3/2010
Site Works or Distribution
Environment Outside (Above Ground)
Voltage 400
Equipment Cable
Event Other/Unknown (Electrical)
Casualty No casualty
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

<table>
<thead>
<tr>
<th>Injury</th>
<th>Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property damage level</td>
<td>No property damage</td>
</tr>
</tbody>
</table>

Outcome of investigation
The incident occurred on stage three of a construction site for a three stage housing estate complex. A digger working on the site had come into contact with an exposed cable that was live and shorted against the metalwork of the digger.

A site electrician was called over to test the cable and found live cable. A network contractor was notified to isolate the cable and make the site safe. The cable was found to have been mistakenly livened approximately two weeks prior to this incident occurring, when a network contractor was livening one of the other stages.

The incident has been referred to the Electrical Workers Licensing Group for their consideration.

2 - Event summary: Oil column heater switch or thermostat caused plastic cover to melt onto carpet and cause local damage to carpet and smoke in room.

<table>
<thead>
<tr>
<th>Event ID</th>
<th>100409-02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event date</td>
<td>9/4/2010</td>
</tr>
<tr>
<td>Site</td>
<td>Domestic</td>
</tr>
<tr>
<td>Environment</td>
<td>Building</td>
</tr>
<tr>
<td>Voltage</td>
<td>230</td>
</tr>
<tr>
<td>Equipment</td>
<td>Appliances</td>
</tr>
<tr>
<td>Event</td>
<td>Fire</td>
</tr>
<tr>
<td>Casualty</td>
<td>No casualty</td>
</tr>
<tr>
<td>Injury</td>
<td>No injury</td>
</tr>
<tr>
<td>Property damage level</td>
<td>Restricted to the direct vicinity of the equipment</td>
</tr>
</tbody>
</table>

Outcome of investigation
It was not possible to determine if the thermostat or on/off switch failed investigation causing the plastic cover to melt.
3 - Event summary: A contractor installing a heat pump/air conditioning unit on a new house received electrical burns to their clothing after brushing past an exposed live cable.

Event ID 100421-02
Event date 21/4/2010
Site Commercial
Environment Building
Voltage 230
Equipment Cable
Event Other/Unknown (Electrical)
Casualty No casualty
Injury Shock
Property damage level No property damage

Outcome of A contractor installing the air conditioning unit into a new house, which was under construction, contacted a live wire that shorted out on their leg and burnt their jeans.

The cable the contractor contacted was stripped with bare conductors showing ready to be terminated on the outside of the house and left live (this work was completed by another electrical contractor).

This incident was referred to the Department of Labour as this was a workplace incident and also referred to the Electrical Workers Licensing Group for their consideration.

4 - Event summary: A home owner received an electric shock when he touched his meter box.

Event ID 100427-01
Event date 23/4/2010
Site Domestic
Environment Outside (Above Ground)
Voltage 230
### Equipment Distribution pillar
### Event Electrical Shock
### Casualty Injury
### Injury Shock
### Property damage level No property damage

Outcome of The network company found that water damage in a pillar box had caused leakage current to flow between phase and neutral causing the neutral potential to rise and leak into the earth system at the house. This caused the metal meter box to become live at 230 volts.

### Electrical notifiable accidents (July - September 2010)

### Electrical fire notifiable accidents

This is the list of the 9 electrical fire notifiable accidents for which the investigation was completed between July and September 2010.

1 - Event summary: The Fire Service attended a smoke filled house that had been caused by a heater that had malfunctioned. The heater had been left unattended in the middle of the room, the damage caused was mainly to the carpet surrounding the heater and also significant smoke damage.

<table>
<thead>
<tr>
<th>Event ID</th>
<th>100628 02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event date</td>
<td>16/06/2010</td>
</tr>
<tr>
<td>Site</td>
<td>Commercial</td>
</tr>
<tr>
<td>Environment</td>
<td>Building</td>
</tr>
<tr>
<td>Voltage</td>
<td>230</td>
</tr>
<tr>
<td>Equipment</td>
<td>Appliances</td>
</tr>
<tr>
<td>Event</td>
<td>Fire</td>
</tr>
<tr>
<td>Casualty</td>
<td>No casualty</td>
</tr>
</tbody>
</table>
Injury No injury

Property damage level Restricted to the direct vicinity of the equipment

Outcome of The heater had an Australian approval and all the test documentation. The investigation cause of the failure could not be determined.

2 - Event summary: Small fire in 40 year old switchboard caused damage to a room.

Event ID 100627 01
Event date 27/06/2010
Site Commercial
Environment Building
Voltage 400
Equipment Installation
Event Fire
Casualty No casualty
Injury No injury
Property damage level Restricted to the room containing the equipment

Outcome of The fire was caused by a three phase switch that may have been damaged by investigation water, causing it to track between phases.

3 - Event summary: Home owner found garage full of smoke coming from a freezer.

Event ID 100628 01
Event date 28/06/2010
Site Domestic
Environment Building
Voltage 230
### Equipment Appliances

**Event**  Fire

**Casualty**  No casualty

**Injury**  No injury

**Property damage level**  Restricted to the direct vicinity of the equipment

**Outcome of investigation**  The freezer motor may have seized and burnt out, causing smoke damage. The freezer was over four years old, a New Zealand supplier of this make could not be identified.

---

#### 4 - Event summary: The Fire Service attended a small house fire initiated by an electric clothes heat rack.

- **Event ID**: 100703 01
- **Event date**: 3/07/2010
- **Site**: Domestic
- **Environment**: Building

**Voltage**: 230

**Equipment**: Heated Clothes Rack

**Event**  Fire

**Casualty**  No casualty

**Injury**  No injury

**Property damage level**  Restricted to the room containing the equipment

**Outcome of investigation**  The fire occurred early in the morning waking up the occupants of the house, who alerted the Fire Service.

This fire appears to have been initiated by the failure of an element within the electric clothes heat rack, initially igniting the clothes drying on the rack. The clothes heater rack was situated in the spare bedroom which suffered superficial structural damage with significant smoke and contents damage as a result of the fire.
Energy Safety will recommend a prohibition for this model of heating rack due to the increasing number of failures occurring.

5 - Event summary: Media article detailed house fire resulting in a fatality and three other persons suffering from smoke inhalation.
Event ID 100708 04
Event date 28/06/2010
Site Domestic
Environment Building
Voltage 230
Equipment Room Heaters; Fan heaters; Radiant Heaters; Oil Fin
Event Burns
Casualty Fatality
Injury Burn
Property damage Extended to the room and structure containing the equipment
level
Outcome of Possible cause identified as fan heater being smothered by bedding and investigation overheating.

Two elderly persons were in the house, both were taken to the hospital. One person suffered severe burns to his head, chest and leg and died the following day. The other suffered smoke inhalation and was discharged. Two other neighbours who came to assist also suffered smoke inhalation and were taken to the hospital.

The normal process of conducting an audit of the appliance safety documentation was not possible. The make and model of the appliance could not be determined as it was destroyed beyond recognition.

6 - Event summary: The Fire Service reported a small fire that appeared to be initiated at the switchboard in a house causing a small amount of structural damage within the wall and ceiling cavities.
Event ID 100709 01
Event date 9/07/2010
7 - Event summary: Oil column heater sparked and caused a small fire in the plastic case.

Event ID 100824 02
Event date 23/08/2010
Site Domestic
Environment Building
Voltage 230
Equipment Room Heaters; Fan heaters; Radiant Heaters; Oil Fin
Event Fire
Casualty No casualty
Injury No injury
Property damage level No property damage

Outcome of The heater involved in the minor fire was over six years old and was disposed investigation of after the event and before it could be examined.

8 - Event summary: Main switch failed and caused small fire in a meter box.
Event ID 100906 04
Event date 6/09/2010
Site Domestic
Environment Building
Voltage 400
Equipment Switch/distribution board
Event Fire
Casualty No casualty
Injury No injury
Property damage level Unknown

Outcome of investigation
It would appear that moisture had caused tracking between the phases in the main which burnt the plastic cover and base. The connections in the switch and terminations were all sound when the switch was examined.

It is possible that water had entered the mains cable, which was supplied from a power pole, and had run down the cores of the cable and entered the main switch. A number of similar instances were this has occurred and have been reported.

9 - Event summary: High bay light fitting caused fire in roof when control box caught fire.
Event ID 100922 01
Event date 22/09/2010
Site Commercial
Environment Building
Voltage 230
Equipment General
Event Fire
Casualty No casualty
Injury                  No injury

Property damage level  Restricted to the direct vicinity of the equipment

Outcome of The fire started in the plastic box containing the control gear of a high bay light fitting. The light fitting was over 8 years old. The control gear for the light fitting was completely destroyed in the fire making it impossible to determine what caused the unit to fail.

**Electricity notifiable accidents**

This is the list of the 6 Electricity notifiable accidents for which the investigation was completed between July and September 2010.

1 - Event summary: A home owner went under his house to check a hot water cylinder as the water temperature was too hot, when he touched a copper water pipe he received a fatal electric shock.

<table>
<thead>
<tr>
<th>Event ID</th>
<th>100405-01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event date</td>
<td>5/4/2010</td>
</tr>
<tr>
<td>Site</td>
<td>Domestic</td>
</tr>
<tr>
<td>Environment</td>
<td>Building</td>
</tr>
<tr>
<td>Voltage</td>
<td>230</td>
</tr>
<tr>
<td>Equipment</td>
<td>Mains entry box</td>
</tr>
<tr>
<td>Event</td>
<td>Electrical Shock</td>
</tr>
<tr>
<td>Casualty</td>
<td>Fatality</td>
</tr>
<tr>
<td>Injury</td>
<td>Shock</td>
</tr>
<tr>
<td>Property damage level</td>
<td>No property damage</td>
</tr>
</tbody>
</table>

Outcome of Connection at mains entry box was transposed causing the neutral in the installation to be live, as a result a home owner was electrocuted. The issues of competency and testing of the work done are being investigated. A compliance case is being investigated at the time of publication.
2 - Event summary: Energy Safety was notified when a home owner received an electric shock from the exterior wall cladding on their house as they brushed passed it. The home owner was assessed by a doctor after the incident and was released having suffered no serious harm from the shock.

Event ID 100508-01
Event date 8/5/2010
Site Domestic
Environment Building
Voltage 230
Equipment Low Voltage Pole Connection
Event Electrical Shock
Casualty Injury
Injury Shock
Property damage level No property damage

Outcome of The local network contractor was called to the house to investigate the cause investigation for the shock. The network contractor's faultman found a broken neutral on the network pole. Contributing to this was:

- the method of connection; and
- corrosion which had occurred between the copper connections due to the harsh conditions of the environment.

The effected connections on this pole were all replaced and tested satisfactory.

3 - Event summary: Fan heater caught fire in a bathroom.

Event ID 100721-03
Event date 20/7/2010
Site Domestic
Environment Building
Voltage 230
Equipment Heat/Light/Fan unit
### Event 1: Fire

- **Casualty**: No casualty
- **Injury**: No injury
- **Property damage level**: Restricted to the direct vicinity of the equipment

**Outcome of investigation**: The heater was compliant with the standards and had a test lab report stating it was compliant. Due to the lack of evidence left the cause of the fire could not be determined.

### Event 2: College student received electric shock

- **Event ID**: 100805-06
- **Event date**: 3/8/2010
- **Site**: Public
- **Environment**: Building
- **Voltage**: 230
- **Equipment**: Computer
- **Event**: Electrical Shock
- **Casualty**: Injury
- **Injury**: Shock
- **Property damage level**: No property damage

**Outcome of investigation**: Energy Safety has investigated this event which came to our attention through a newspaper article. The school’s electrical installation was checked, as was the computer in question. No faults or issues could be identified.

The outcome of the investigation determined the probable cause of the “shock” was static electricity built up from the nylon carpet and discharged when the student touched the grounded computer case.

### Event 3: Home owner received shock from a meter box
Event ID 100901-08
Event date 29/8/2010
Site Domestic
Environment Outside (Above Ground)
Voltage 230
Equipment Mains entry box
Event Electrical Shock
Casualty No casualty
Injury No injury
Property damage level No property damage

Outcome of Mains entry box neutral termination was corroded and allowed the earth investigation system voltage to rise. This was an old installation, weather may have contributed to the corrosion in terminals.

6 - Event summary: Fire in dishwasher.
Event ID 100909-01
Event date 9/9/2010
Site Domestic
Environment Building
Voltage 230
Equipment Dishwashers
Event Fire
Casualty No casualty
Injury No injury
Property damage level Restricted to the room containing the equipment
Outcome of  It is most likely that the motor seized and caused the windings to catch fire, investigation the dishwasher was removed from the scene before it could be examined.

**Electrical notifiable accidents (October - December 2010)**

**Electrical fire notifiable accidents**

This is the list of the 21 electrical fire notifiable accidents for which the investigation was completed between October and December 2010.

**1 - Event summary: A fire involving a dishwasher.**

<table>
<thead>
<tr>
<th>Event ID</th>
<th>100720-01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event date</td>
<td>20/07/2010</td>
</tr>
<tr>
<td>Site</td>
<td>Domestic</td>
</tr>
<tr>
<td>Environment</td>
<td>Building</td>
</tr>
<tr>
<td>Voltage</td>
<td>230</td>
</tr>
<tr>
<td>Equipment</td>
<td>Dishwashers</td>
</tr>
<tr>
<td>Event</td>
<td>Fire</td>
</tr>
<tr>
<td>Casualty</td>
<td>No casualty</td>
</tr>
<tr>
<td>Injury</td>
<td>No injury</td>
</tr>
<tr>
<td>Property damage level</td>
<td>Restricted to the room containing the equipment.</td>
</tr>
</tbody>
</table>

Outcome of  The origin of the fire was in the control panel of the washing machine. It is investigation most likely that it was caused by water ingress into the control panel, which resulted in shorting out the electrical components resulting in a fire.

An audit of the supplier’s documentation of conformity was carried out. The documents were found to be in order, that is, the washing machine complied with the relevant safety standard. There are no known issues with this type of washing machine.

The make and model of the washing machine was noted for future reference.
should a similar event occur with this model of washing machine.

2 - Event summary: Fire caused by an old power socket outlet.

Event ID 100818-03
Event date 15/08/2010
Site Domestic
Environment Building
Voltage 230
Equipment Wall outlet (socket)
Event Fire
Casualty No casualty
Injury No injury
Property damage level Extended to multiple rooms.

Outcome of The fire was in an older house. Investigation of the cause revealed only one likely ignition source, the power outlet located in a bedroom. The age of the power outlet was possibly 30 years.

Older power outlets should be checked for signs of overheating. Overheating is generally indicated by browning of the plastic cover. Where overheating has occurred the connections should be checked and if the plastic cover is found to be brittle the power outlet should be replaced.

3 - Event summary: A fire was caused by a bathroom heater.

Event ID 100826-01
Event date 25/08/2010
Site Domestic
Environment Building
Voltage 230
Equipment Room Heaters; Fan heaters; Radiant Heaters; Oil Fin
Event Fire

Casualty No casualty

Injury No injury

Property damage level Restricted to the room containing the equipment.

Outcome of The site was visited to carry out an investigation. The bathroom heater was reported to be in use for approximately 6 weeks. On examining the heater it was found the area around the terminal block had severe fire damage. It appeared that the terminal block had overheated causing the plastic housing to overheat and catch fire.

An audit of the supplier’s documentation of conformity was carried out. The documents were found to be in order, that is, the heater complied with the relevant safety standard. There were no known issues with this type of heater.

The make and model of the heater was noted for future reference should a similar event occur with this model of heater.

4 - Event summary: Bathroom heater caused fire resulting in smoke damage to walls and ceiling.

Event ID 100922-02

Event date 22/09/2010

Site Domestic

Environment Building

Voltage 230

Equipment Heat / Light / Fan unit

Event Fire

Casualty No casualty

Injury No injury

Property damage level Restricted to the direct vicinity of the equipment.

Outcome of Connections in the unit failed causing plastic body to catch fire. The heater involved was the subject of a recent product recall by the supplier.
investigation

The recall notices were not seen by the owner so his appliance was not replaced.

5 - Event summary: Fire in the vicinity of an internal switchboard.

Event ID 100927-01

Event date 26/09/2010

Site Commercial

Environment Building

Voltage 400

Equipment Switch / Distribution board

Event Fire

Casualty No casualty

Injury No injury

Property damage level Extended to multiple rooms.

Outcome of The fire was located in the vicinity of an indoor switchboard. The fire had spread up the wall into the roof cavity causing fire and smoke damage. Initially it was thought that the fire originated from the switchboard.

On further examination it was found that this was not the case, the origin of the fire was put down equipment controlling the under floor heating.

6 - Event summary: Energy Safety was requested to assist the Fire Service with determining if the switchboard was the point of origin in a fire that destroyed a commercial shed.

Event ID 101004-01

Event date 01/10/2010

Site Commercial

Environment Building
Notifiable electrical and gas accidents
1 January 2010 to 31 December 2010

<table>
<thead>
<tr>
<th>Voltage</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>Switch / Distribution board</td>
</tr>
<tr>
<td>Event</td>
<td>Fire</td>
</tr>
<tr>
<td>Casualty</td>
<td>No casualty</td>
</tr>
<tr>
<td>Injury</td>
<td>No injury</td>
</tr>
<tr>
<td>Property damage level</td>
<td>Extended to the site.</td>
</tr>
</tbody>
</table>

Outcome of A site investigation was carried out. The fire started in the early hours of the investigation morning and was unoccupied at that time.

The investigation identified that the area of the switchboard appeared to be the seat of the fire, as its position on the wall and above appeared to be the worst affected areas. However due to the severity of the fire damage, no conclusion could be made as to whether or not the switchboard itself or the failure of some component on the switchboard or the switchboard wiring was the cause of this fire.

7 - Event summary: Fire caused major damage to a warehouse, the fire started in a small workshop in the building. The area of origin was traced to the vicinity of nickel cadmium batteries which were placed on charge about 2pm. It appears that a cell of one of the batteries may have ruptured causing the fire. The fire was discovered at approx 3pm.

| Event ID   | 101008-01 |
| Event date | 01/10/2010 |
| Site       | Industrial |
| Environment| Building |
| Voltage    | 230 |
| Equipment  | Drills and impact drills |
| Event      | Fire |
| Casualty   | No casualty |
| Injury     | No injury |
| Property damage | Extended to the site. |
Outcome of The area of origin was traced to the vicinity of nickel cadmium batteries which investigation were placed on charge in one of the small rooms in the warehouse. It appears that a cell of one of the batteries may have ruptured causing the fire. The batteries were used to power a battery drill. Information from suppliers did not indicate that there had been other fires involving this type of battery.

8 - Event summary: The Fire Service reported a fatal house fire possibly involving stereo or television set.

Event ID 101011-01
Event date 09/10/2010
Site Domestic
Environment Building
Voltage 230
Equipment Equipment under 60065 classification
Event Fire
Casualty Fatality
Injury Burn
Property damage level Extended to the room and structure containing the equipment.

Outcome of A fire occurred on the ground floor of a rental apartment, the tenant had been visiting another apartment at the time and was alerted to a fire in his apartment. He decided to enter his apartment, which was on fire, in order to save some personal items.

There were a number of appliances connected by various power leads and multi boxes found melted together in the lounge area of the house. It was not possible to determine which appliance or power lead may have initiated the fire due to the intense burning that occurred in the room. The fire service spoke to other residents at the apartments reminding them of the dangers involved in entering a burning building.

9 - Event summary: A storage room was the scene of a fatal fire where a dehumidifier was in use at the time.

Event ID 101012-01
Event date 11/10/2010

Site Domestic

Environment Building

Voltage 230

Equipment Humidifiers

Event Fire

Casualty Fatality

Injury Burn

Property damage level Extended to multiple rooms.

Outcome of investigation The fire may have started as a result of some failure in a dehumidifier. The dehumidifier had been running 24/7 and the appliance was over 10 years old. The cause of the fire could not be identified as the dehumidifier was destroyed in the fire.

There was no make or model marks left on the dehumidifier and the owner of the appliance did not recall any details regarding the unit. The owner of the unit was reminded of the need to check and clean filters etc.

10 - Event summary: A fire caused by an washing machine.

Event ID 101012-02

Event date 11/10/2010

Site Domestic

Environment Building

Voltage 230

Equipment Washing Machines

Event Fire

Casualty No casualty

Injury No injury
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

Property damage level

Outcome of investigation
The origin of the fire was in the control panel of the washing machine. It is most likely that this was caused by water ingress into the control panel which resulted in shorting out the electrical components resulting in a fire.

An audit of the supplier’s documentation of conformity was carried out. The documents were found to be in order, that is, the washing machine complied with the relevant safety standard. There are no known issues with this type of washing machine.

The make and model of the washing machine was noted for future reference should a similar event occur with this model of washing machine.

11 - Event summary: A bathroom fan heater caught fire.

Event ID 101025-01

Event date 25/10/2010

Site Domestic

Environment Building

Voltage 230

Equipment Room Heaters; Fan heaters; Radiant Heaters; Oil Fin

Event Fire

Casualty Injury

Injury Asphyxiation

Property damage level Restricted to the room containing the equipment.

Outcome of investigation The home owner reported that the heater switched on by itself. On request the heater was brought to Energy Safety for an examination. On examining the heater nothing was found to suggest that the heater switched on by itself; the cord switch was working satisfactorily. Severe damage was noted around the fan motor and the rear of the plastic housing next to the fan motor.

On testing it was found the winding in the fan motor had open circuited. The motor overheated, causing the plastic housing to overheat and catch fire, resulting in the melting of the internal components of the fan and filling the house with smoke. One occupant received medical attention for smoke aspiration.
inhaled.

This model of heater is no longer sold and there are no reports of issues with this make and model. Energy Safety noted this for future reference should a similar event occur with this model of heater.

12 - Event summary: A multi box attached to work bench caused a fire in a garage.

Event ID 101102-02
Event date 24/10/2010
Site Domestic
Environment Building
Voltage 230
Equipment Wall plug
Event Fire
Casualty No casualty
Injury No injury
Property damage level Extended to the room and structure containing the equipment.
Outcome of investigation A home owner plugged a fridge into an old multi box fitted to the side of a workbench. Some time during the night the multi box appears to have failed and caused a fire. The fire caused damage to the garage which contained a car and other household items. Due to the extent of the damage it was not possible to determine why the multi box failed.

Information from the owner indicated that the multi box was old and had not been used for some time. The multi box may have failed due to high loading, such as the fridge. Multi boxes are designed to handle only light current loads such as computers and TV sets.

13 - Event summary: A fire started in a storage cupboard containing a UPS unit.

Event ID 101101-01
Event date 01/11/2010
Site Commercial
Environment Building
Voltage 230
Equipment Transformers for switch modes power suppliers
Event Fire
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment.

Outcome of An investigation into the failure of the UPS unit was undertaken by a private investigation inspector contracted by the insurance company. The inspector examined the storage cupboard at the site and determined that there would have been insufficient ventilation in the cupboard to enable the UPS system to operate safely. The inspector also examined the UPS components which were badly damaged by heating due to the lack of ventilation. It was determined that several large capacitors had failed causing them to emit smoke.

The cupboard where the UPS was installed has since been fitted with a fan to increase the flow of air across the new UPS unit to assist with cooling.

14 - Event summary: A fire occurred in a shed with a boat.
Event ID 101109-01
Event date 08/11/2010
Site Domestic
Environment Building
Voltage 230
Equipment Refrigerators; Freezers
Event Fire
Casualty No casualty
Injury No injury
Property damage Extended to the room and structure containing the equipment.
Outcome of the fire was caused by an old fridge in the investigation shed. It was established, after speaking with the owners, that the fridge was over ten years old. An insurance company and assessors were involved with the investigation. Some time later the insurance company informed Energy Safety that, due to the age of the fridge, further investigation into the cause of the fire would not be carried out. At the time of publication the causal factors of the fire remain undetermined.

**15 - Event summary: A fire in a domestic laundry.**

Event ID: 101111-01

Event date: 10/11/2010

Site: Domestic

Environment: Building

Voltage: 230

Equipment: Washing Machines

Event: Fire

Casualty: No casualty

Injury: No injury

Property damage level: Restricted to the room containing the equipment.

Outcome of the fire was reported to have been caused by a washing machine. The investigation washing machine was examined to determine the cause of the fire. On examination it was found that the most likely cause of the fire was the failure of the washing machine motor.

**16 - Event summary: Fire in bedroom involving TV and other appliances caused smoke damage to room.**

Event ID: 101112-02

Event date: 12/11/2010

Site: Industrial

Environment: Building
Voltage 230
Equipment Equipment under 60065 classification
Event Fire
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment.

Outcome of investigation A flat screen television set was recovered from the scene of the fire and examined to determine the cause of the fire. Other appliances involved in the fire were disposed of prior to a site visit.

It was not possible to determine if the TV caused the fire as the plastic enclosure had melted around all of the components. Attempts to separate the printed circuit boards from the TV caused the components on the boards to become damaged and unrecognisable.

A search for incidents involving similar TV's did not indicate any other fires being reported with this particular model.

17 - Event summary: A fire caused by a bathroom heater.
Event ID 101115-01
Event date 14/11/2010
Site Domestic
Environment Building
Voltage 230
Equipment Room Heaters; Fan heaters; Radiant Heaters; Oil Fin
Event Fire
Casualty No casualty
Injury No injury
Property damage level Restricted to the room containing the equipment.
Outcome of The heater involved had unsuitable material used in the connection unit which investigation caused overheating and eventually a fire. This type of heater was recalled in September 2010. The owner of the heater was not aware of the recall so his heater was not replaced; the owner has since been made aware of the recall.

18 - Event summary: Main switchboard failed in commercial premises causing doors to be blown open. The switchboard was destroyed in the incident.

Event ID 101208-01
Event date 04/12/2010
Site Commercial
Environment Building
Voltage 400
Equipment Mains
Event Fire
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment.

Outcome of It was possible that the main switch on the switchboard faulted causing an arc investigation fault to erupt and burn all of the panels in the board. This was possibly fuelled by the fact that the network supply transformer did not have LV protection and relied on the HV fuses to rupture. The maximum demand meters in the transformer kiosk indicated that blue phase had recorded high current during the failure indicating a blue phase fault. It was not possible due to the magnitude of the fire to examine any of the remaining equipment.

19 - Event summary: A capacitor in a light fitting failed causing smoke damage.

Event ID 101211-01
Event date 10/12/2010
Site Commercial
Environment Building
Voltage 230
Notifiable electrical and gas accidents
1 January 2010 to 31 December 2010

Equipment  Fluorescent fitting
Event  Fire
Casualty  No casualty
Injury  No injury
Property damage level  Restricted to the direct vicinity of the equipment.

Outcome of  Energy Safety are monitoring the failure of these capacitors. The failures occur with older light fittings. As these fittings are replaced the incidence of reported events has noticeably reduced.

20 - Event summary: Fire in wall cavity were TPS cables run to power and lighting circuits.
Event ID  101213-01
Event date  13/12/2010
Site  Domestic
Environment  Building
Voltage  230
Equipment  TPS Cable
Event  Fire
Casualty  No casualty
Injury  No injury
Property damage level  Restricted to the direct vicinity of the equipment.

Outcome of  It is possible that the TPS cable may have been damaged at some time during the original installation or damaged during other work in the roof space. The cable appears to have faulted where it exited a hole in a stud in the wall. The original installer could not be identified by the owner of the property as the Certificate of Compliance could not be found.

21 - Event summary: Fire in autoclave at dental centre causing smoke damage.
Event ID 101213-03

Event date 13/12/2010

Site Commercial

Environment Building

Voltage 230

Equipment Commercial water boilers and liquid heaters

Event Burns

Casualty No casualty

Injury No injury

Property damage level Restricted to the direct vicinity of the equipment.

Outcome of The autoclave water solenoid coil got hot causing the plastic mounting bracket to melt filling the room with smoke. The operating piston in the solenoid seized for some reason causing the coil to overheat. The supplier has used this type of solenoid in numerous other appliances without any issues. There may have been some contaminant in the water causing the piston to stick.

Electricity notifiable accidents

This is the list of the 3 Electricity notifiable accidents for which the investigation was completed between October and December 2010.

1 - Event summary: A member of public who had been diving at Princess Bay, Wellington, reported receiving an electric shock from a plastic shower on/off button at the Princess Bay Pavilion.

Event ID 100907-03

Event date 05/09/2010

Site Public

Environment Building

Voltage 230

Equipment Switch / Distribution board
Event  | Electrical Shock  
Casualty | Injury 
Injury | Shock 
Property damage level | No property damage 

Outcome of  | The site was visited with staff from the Wellington City Council and an electrical investigation maintenance contractor.

Several tests were conducted but it could not be established how voltage would have appeared at the switch to give an electrical shock.

The Wellington City Council undertook to remove the electrical switch and replace it with a mechanical switch with no electrical supply.

2 - Event summary: Home owner received electric shock when working in a loft on installation wiring.

Event ID  | 101013-01  
Event date | 09/10/2010  
Site | Domestic  
Environment | Building  
Voltage | 230  
Equipment | Other  
Event | Electrical Shock  
Casualty | Injury  
Injury | Shock, Burn  
Property damage level | No property damage 

Outcome of  | A home owner was rewiring lighting circuits in loft at his home. He isolated the wrong circuit before pulling wires from a conduit. As a result he received an electric shock and burns to his hand and neck.

Following the incident an electrician was engaged by the home owner to sort
out and complete the wiring.

3 - Event summary: Home owner received electric shock from meat mincer.

Event ID 101214-01
Event date 13/12/2010
Site Domestic
Environment Building
Voltage 230
Equipment Kitchen machines, Blenders, Mixers
Event Electrical Shock
Casualty Injury
Injury Shock
Property damage level No property damage

Outcome of The operating switch on the mincer had a metal toggle which was fitted in the plastic body of the mincer with no connection to the earth conductor.

The mincer was examined by an electrical inspector. He found that there may have been a fragment of conducting material in the switch, as the test he performed on the switch gave various readings, depending on the position of the mincer switch.

This fragment may have been intermittently touching the metal toggle of the switch, which would have caused the toggle to become live. The supplier of the product removed the appliances from sale and had the mincers tested. No issues were found.
Natural gas notifiable accidents

This is the list of the 2 natural gas notifiable accidents for which the investigation was completed between January and March 2010.

1 - Event summary: The last person to leave a restaurant reported that they thought they had turned off the oven. In the morning, a painter noted smoke coming from the restaurant and called the Fire Service. An investigator for the insurer engaged a craftsman gasfitter who found that the fire appeared to have started underneath oven and spread around kitchen after the regulator failed under heat.

Event ID 091130 06
Event date 27/11/2009
Site Commercial
Environment Building
Equipment Commercial ovens
Event Fire, Explosion
Casualty No casualty
Injury No injury
Property damage level Restricted to the room containing the equipment

Outcome of investigation From position of controls it was believed that the oven had run overnight with the thermostat set on high. From this, and the pattern of burning, it appeared that the fire had been caused by overheating of the oven for unknown reasons. It was considered likely that the fire had smoldered for some time and was just beginning to spread rapidly when it was discovered.

The flexible hose on an adjacent fire affected oven showed signs of stressing. There had been no restraint chain on this oven or the oven believed to have been involved in cause of fire. Hose stressing, however, was not considered to have caused the fire.

2 - Event summary: A fire originating from a continuous flow water heater resulted in significant property damage.
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

Event ID 100128 08
Event date 17/01/2010
Site Domestic
Environment Building
Equipment Water heater instantaneous
Event Fire, Explosion
Casualty No casualty
Injury No injury
Property damage level Restricted to the room containing the equipment

Outcome of investigation: Gas appeared to have leaked from the water heater ignition panel and been ignited at the pilot, with flames spreading to the pilot fascia. The burning fascia fell to the floor and melted a plastic water pipe. The released water fortuitously extinguishing the fire at early stage. An unauthorised modification had been carried out so that the water heater pilot light was permanently depressed.

LPG notifiable accidents

This is the list of the 2 LPG notifiable accidents for which the investigation was completed between January and March 2010.

1 - Event summary: A teenager hand connected a P.O.L. regulator to the cylinder of her parent’s heater in an out house. She then turned the gas on at the cylinder valve and activated the heater igniter. Almost immediately there was a ball of flame and she left the building. The fire service were called and extinguished the fire after significant damage had occurred to the building.

Event ID 100128 09
Event date 22/01/2010
Site Domestic
Environment Building
Equipment Space heater cabinet heater
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

Event Gas Leak, Escape
Casualty No casualty
Injury No injury
Property damage level Restricted to the room containing the equipment

Outcome of Owner had evidently fitted POL regulator to cabinet heater. Operator had evidently not properly tightened POL regulator into QCC cylinder valve, leading to leakage.

2 - Event summary: The owner of a new motor home advised that he and his partner experienced ill health effects, consistent with symptoms of carbon monoxide poisoning, when living in a new house bus that they had acquired a month previously. He reported a number of faults with the gas and electrical installation, that were verified on inspection, and faults with the mechanical system.
Event ID 100223 02
Event date 16/02/2010
Site Domestic
Environment Caravan
Equipment Water heater instantaneous
Event CO Poisoning (Incomplete Combustion)
casualty Injury
Injury Toxicity
Property damage level No property damage

Outcome of Occupants evidently exposed to products of combustion of gas appliances investigation venting directly into poorly ventilated motor home with possible contribution from kerosine-fueled heater with openings into motor home, close to exhaust area.

Gas Notifiable Accidents (April - June 2010)
Natural gas notifiable accidents

This is the list of the 7 natural gas notifiable accidents for which the investigation was completed between April and June 2010.

1 - Event summary: A new gas hob was installed under the supervision of a certifying gasfitter. The hob was being shut down after cooking when there was an explosion that damaged the hob beyond repair. The damaged hob was sent to the manufacturer and the certifying gasfitter installed a replacement hob but in the process damaged it. Consequently, another replacement hob was installed, this time by a different certifying gasfitter.

Event ID 100122-01
Event date 4/1/2010
Site Domestic
Environment Building
Equipment Domestic hotplate (hob)
Event Fire, Explosion
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment

Outcome of investigation The manufacturer tested the damaged cooker and concluded that it was gas tight in compliance with AS4551 (which specifies a maximum leak rate of 1 mL/min at 14 kPa). This conclusion was supported by Energy Safety’s representative who witnessed the tests. Consequently, the explosion was evidently fuelled by gas that had leaked from the installation, external to the appliance. The original hob installation was not available for inspection but the replacement hob installation was inspected by an investigator for the Plumbers, Gasfitters and Drainlayers Board (to whom the case was referred by Energy Safety).

2 - Event summary: Tenants were cooking a pizza in the gas oven. When they checked it smoke poured out of the front door, but the pizza wasn’t burnt. On closer inspection there was a flame at the bottom of the oven, under the plate that protects the gas burner. One of them threw water on the flame and it went out. They closed the oven door, waited 10 minutes, opened the oven door again and
more smoke poured out, so they checked there was no flame and monitored it for an hour or so.

Event ID 100420-03
Event date 26/3/2010
Site Domestic

Environment Building
Equipment Domestic built-in/wall ovens
Event Network Disruption
Casuality No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment

Outcome of investigation The wall oven had been installed with the burner too close to combustible investigation materials. In particular, there was no gap between the bottom of the burner and adjacent combustible material, where a line of scorching was evident. The manufacturer's installation instructions had evidently not been complied with because they specified clearances and ventilation openings. Following the fire the oven was initially taken out of service and later removed.

3 - Event summary: A tenant advised that she had operated an outside gas water heater, by lifting the lid of a surrounding wooden box. She then turned the water off in the early evening and some 7 1/2 hours later she awoke in the night to discover the house on fire. She left the house with her baby and and young child. The Fire Service was called and extinguished the fire but by then significant damage had occurred.

Event ID 100330-01
Event date 30/3/2010
Site Domestic

Environment Outside (Above Ground)
Equipment Water heater instantaneous
Event Fire, Explosion
Casuality No casualty
Injury No injury

Property damage level Restricted to the direct vicinity of the equipment

Outcome of An investigating Fire Safety Officer considered that the fire resulted from investigation heating of the wooden box enclosure by the spa pool heater. The wooden box was evidently installed too close to the water heater and instructions had evidently not been provided to the tenant to ensure the spa pool was used safely.

4 - Event summary: A partially deaf owner was at home with her child and a friend. There was a loud bang and the friend went to investigate. She found the doors to a gas water heater cupboard blown open and flames, about 1/2 metre high, about the water heater control unit. A fire developed causing extensive fire damage to the hall way and rooms off it with estimated loses of $125,000.

Event ID 100426-02

Event date 13/4/2010

Site Domestic

Environment Building, Underground

Equipment Water heater storage

Event Fire, Explosion

Casualty No casualty

Injury No injury

Property damage level Extended to multiple rooms

Outcome of The fire evidently originated about the multi functional control valve, most investigation likely as a result of leakage at the inlet or outlet. The investigator noted the use of non approved parallel threads and crox connections. The appliance evidently had not had been attended to in the previous eight years, so lack of preventative maintenance may have been a factor.

5 - Event summary: There was an explosion in a gas fired reverberatory furnace containing molten scrap aluminium. The explosion ripped a roof above the furnace, blew out windows and dislodged refractory material. A small amount of aluminium landed behind the ear of a worker, for which the worker was treated at hospital and discharged.
6 - Event summary: An industrial oven was undergoing testing by a combustion engineer after problems had been experienced. Soon after start up the oven began to cool so the engineer went to shut it down. There was an explosion in the oven that caused extensive damage. Emergency services were called and seven injured people were taken to hospital, one with a broken nose.
Outcome of  The explosion was investigated by the Department of Labour, assisted by an investigation independent expert whom they engaged. The expert advised that the explosion appeared to have resulted from products of incomplete combustion re-circulating through the burner and accumulating above the explosive limit, most likely as a result of failure of a damper in the oven's main exhaust.

7 - Event summary: Students in the dormitory of a boarding college were woken by a bang in the early morning. On investigation they discovered smoke coming into the bathroom area. The students were evacuated and emergency services were called. The Fire Service attended and found gas burning from a pipe. They isolated the gas and suppressed the fire. A gas contractor was then called to cut off the gas supply to the affected area.

Event ID 100527-01
Event date 27/5/2010
Site Public
Environment Building
Equipment Water heater storage
Event Fire, Explosion
Casualty No casualty
Injury No injury
Property damage level Extended to the room and structure containing the equipment

Outcome of  An investigating certifying gasfitter, commissioned by Energy Safety reported investigation that:

- He considered that the cause of the fire was a substandard pipe work failure under the hot water enclosure and that the gas ignited off the pilots after entering the enclosure through holes in the floor; and
- He found the gas pipe work to be substandard on the manifold under the floor with butt welds on the copper pipe instead of capillary welds and crox fittings connecting the cylinders and isolation valves to the dormitory; and
- The gas isolation valve was under the floor making it extremely difficult if not dangerous to isolate the gas supply to the dormitory in an emergency; and
- Records of gasfitting and maintenance at the college were non existent.

Consequently Energy Safety made the following recommendations that were
accepted by the college:

- Engage a certifying gasfitter to inspect, test and certify all gas installations at the college with particular attention to ensuring that the pipe work is sound and that any inaccessible or difficult to access gas isolation valves are relocated to readily accessible positions.
- Request the certifying gasfitter to document the outcome of this work.
- Institute a system of preventative maintenance for all gas installations at the college to be carried out at regular intervals of at least every other year (but preferably annually) that includes soundness testing of pipe work and servicing of gas appliances, particularly water and space heating appliances.
- Retain records, in readily retrievable form, of all gasfitting and maintenance of gas installations and appliances.

**LPG notifiable accidents**

This is the list of the 5 LPG notifiable accidents for which the investigation was completed between April and June 2010.

1 - Event summary: Children sought help after failing to wake their parents in the bedroom of their house in the morning. Attending Police found the parents dead with an outdoor table top patio heater, found in the off position, in the room.

<table>
<thead>
<tr>
<th>Event ID</th>
<th>090803-02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event date</td>
<td>30/08/2009</td>
</tr>
<tr>
<td>Site</td>
<td>Domestic</td>
</tr>
<tr>
<td>Environment</td>
<td>Building</td>
</tr>
<tr>
<td>Equipment</td>
<td>Other</td>
</tr>
<tr>
<td>Event</td>
<td>CO Poisoning (Incomplete Combustion)</td>
</tr>
<tr>
<td>Casualty</td>
<td>Fatality</td>
</tr>
<tr>
<td>Injury</td>
<td>Asphyxiation, Toxicity</td>
</tr>
<tr>
<td>Property damage level</td>
<td>No property damage</td>
</tr>
</tbody>
</table>

Outcome of In a decision from an inquest a coroner found the deaths resulted from carbon monoxide poisoning with an outdoor patio heater used indoors. The bedroom was evidently poorly ventilated. Initial test showed abnormally high emissions of carbon monoxide with the heater on high setting. The
Notifiable electrical and gas accidents
1 January 2010 to 31 December 2010

heater, retrieved by the NZ Police, was a Meteor P1093 make and model. The heater carried safety warnings that it was for use outdoors and in well ventilated areas.

During tests, this heater and six of ten new Meteor P1093 heaters emitted excessive levels of carbon monoxide. This was considered to be due to faulty emitters (perforated stainless steel mesh surrounding the burner) with incorrect injector sizes a possible contributory factor.

Due to safety concerns the heater supplier initiated two public recalls for Meteor P1093 and P1092 patio heaters. Four audits were initiated regarding safety and compliance with Meteor P1093 heaters. Educational and safety warning initiatives were taken regarding information on the safe use of patio heaters.

2 - Event summary: A volunteer mother on a school excursion set up two camping cookers. She found a cannister lever on one of the cookers more difficult to activate than on the other cooker. The cookers had been sitting on sand, cooking lunch for students. After half an hour running there was a fire and explosion with one of the cookers during which the LPG canister ripped apart causing all gas to escape. Five persons (three students and two parent helpers) received burns requiring hospital treatment, in one case requiring air evacuation to specialist burns unit.

Event ID 091209-01
Event date 4/12/2009
Site Public
Environment Outside (Above Ground)
Equipment Camping Cooker
Event Fire, Explosion
Casualty Injury
Injury Burn
Property damage level Restricted to the direct vicinity of the equipment

Outcome of investigation The aluminium burner was melted, evidently as a result of flame impingement from operation of the cooker with the trivet mounted upside down. This, possibly combined with lack of ventilation from operating on underlying sand, would have lead to overheating and rupturing of the canister. Instructions on the damaged appliance had been partially ripped off. The cooker had a
pressure sensitive device, designed to cut off gas flow in the event of overpressure. The device did not activate on testing the undamaged cooker.

The effectiveness of the device may have been compromised by operation of the cooker on sand and mounting of the trivet upside down. There is an alternative canister, with pressure relieving capabilities, with potential to mitigate canister heating hazards.

It was suggested to ERMA NZ that this might be considered in the context of controls under the HSNO Act. The cooker importer advised that only this type of canister and only cookers that could not be operated with the trivet upside down were now being imported.

3 - Event summary: Gas explosion on a boat on the hard stand at boat yard. Two males received serious burns. The boat was extensively damaged.

Event ID 100430-01
Event date 10/3/2010
Site Commercial
Environment Outside (Above Ground)
Equipment Domestic caravan/marine cooker
Event Fire, Explosion
Casualty Injury
Injury Burn
Property damage level Extended to the room and structure containing the equipment
Outcome of gas leak from or about cooker appears to have led to explosion when cooktop was lit.

4 - Event summary: The elderly owner of an old LPG cabinet heater had been having difficulty connecting a clip on regulator to the cylinder. After changing cylinders he experienced the same difficulty. Having connected the regulator he lit the heater. Some time after there was boomph sound and flames appeared at the back of the heater. He dragged the heater out onto the deck. He turned the gas off at the cylinder, burning his hand in the process, and hosed the cabinet heater until there were no more flames. The Fire Service were called but the fire was out on arrival. The owner and his partner, who had been shaken by the event, were then taken to hospital.
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

Event ID 100525-02
Event date 25/5/2010
Site Domestic
Environment Building
Equipment Space cabinet heater
Event Fire, Explosion
Casualty Injury
Injury Burn
Property damage level Restricted to the direct vicinity of the equipment

Outcome of The fire evidently resulted from leakage at the connection point between the investigation regulator and cylinder. An investigator was advised that the owner was arthritic and probably lacked the ability to securely fit the regulator. He also suggested that the regulator may have been worn with age and thus not secure. The owner was advised against using cabinet heaters for heating.

5 - Event summary: The Fire Service was called after a two year old LPG cabinet heater caught fire with the fire spreading to an adjacent wall.

Event ID 100602-02
Event date 2/6/2010
Site Domestic
Environment Building, Underground
Equipment Space cabinet heater
Event Fire, Explosion
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment

Outcome of Gas evidently leaked from the area of the supply hose end fixing to the
investigation regulator or the area of the cylinder valve outlet, possibly as a result of an inadequately tightened QCC fitting. It is noted that the back check module is designed to prevent the flow of gas when the QCC fitting was not tightened.

Gas notifiable accidents (July - September 2010)

Natural gas notifiable accidents

This is the 5 natural gas notifiable accidents for which the investigation was completed between July and September 2010.

1 - Event summary: A couple with a two year old son moved into a flat with a multi point instantaneous water heater in a bathroom that served the whole flat. The male partner reported occasional light headedness while showering. Some 10 days after moving moving in, the son was very difficult to deal with after his mother bathed him. The morning after the mother awoke feeling dizzy, nauseated, very weak and unable to walk properly. She recovered after moving elsewhere and sought advice from the national poisons centre that day. The couple sought advice about the water heater after the centre suggested it might be linked to the illness.

Event ID 100603-02
Event date 2/6/2010
Site Domestic
Environment Building
Equipment Water heater instantaneous
Event CO Poisoning (Incomplete Combustion)
Casualty Injury
Injury Asphyxiation
Property damage level No property damage.

Outcome of Tests with a combustion analyser indicated that the water heater gave off investigation excessive levels of carbon monoxide. There was an extensive build up of dust in the appliance, which when disturbed caused unsafe combustion. Also, the flue did not draw evenly with smoke test.

It was concluded that the ill health effects were most likely associated with
exposure to carbon monoxide from the water heater as a result of installation in a prohibited area (bathroom) and a lack of maintenance (dust build up). The water heater was removed and a new, outside mounted water heater installed.

2 - Event summary: Housing New Zealand advised that there had been a second reported incident involving a fire ball from a continous flow water heater.

Event ID 100629-03
Event date 24/6/2010
Site Domestic
Environment Building
Equipment Water heater instantaneous
Event Fire, Explosion
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment.
Outcome of An authorised service agent for the manufacturer examined and tested the investigation heater. The agent suggested that the unit appeared to have been affected by water when a hydrogenerator blew off in an earlier incident. He also identified a number of faults relating to installation and lack of maintenance with the heater. The agent recommended that the unit be removed from service and a new water heater was installed.

3 - Event summary: There was a hui at premises being sub leased from an educational institute. A number of persons had retired to bed (and a number of others were expected to arrive) when a smell was noticed and reported. The Fire Service was called and attending officers discovered smouldering behind a gas space heater. The Fire Service in turn called the gas distributor. A responding technician checked for gas leaks and isolated gas to the building.

Event ID 100726-03
Event date 24/7/2010
Site Public
Environment Building
Equipment  Space heater wall furnace
Event  Fire, Explosion
Casualty  No casualty
Injury  No injury
Property damage level  Restricted to the direct vicinity of the equipment.
Outcome of investigation  Particle board behind the heater had smouldered after progressive overheating by a Vulcan Quasar wall furnace. The heater was one of three that had evidently been missed during a nation wide programme in which Vulcan Quasars, manufactured between mid 1984 to the end of 1995, had been fitted with double skinned internal heat shields and over temperature cut out devices. The heaters were subsequently removed from service.

4 - Event summary: A property developer contacted Energy Safety after an apartment owner advised him that a TV mounted above a gas heater was damaged beyond repair after exposure to excessive temperature from the heater.

Event ID  100816-02
Event date  1/8/2010
Site  Domestic
Environment  Building
Equipment  Space heater flued radiant/convection
Event  Overheating
Casualty  No casualty
Injury  No injury
Property damage level  No property damage.
Outcome of investigation  After inspecting and testing the installation, the heater manufacturer advised investigation that the TV had been mounted too close to the heater with inadequate thermal protection.

The property developer was advised that the TV should not be mounted above the heater without thermal protection.
5 - Event summary: *Four decorative flame effect fires were installed at a bar. Six weeks later the Fire Service was called after materials surrounding one of the fires ignited. A further week later, materials surrounding another of the heaters ignited. The fire spread to an ante room with resultant significant property damage and loss of business.*

Event ID 100928-01
Event date 25/9/2010
Site Commercial
Environment Building
Equipment Other
Event Fire, Explosion
Casualty No casualty
Injury No injury
Property damage level Extended to multiple rooms.

Outcome of Combustible materials had evidently been installed too close to the fire with inadequate ventilation to prevent overheating.

**LPG notifiable accidents**

This is the list of the 8 LPG notifiable accidents for which the investigation was completed between July and September 2010.

1 - Event summary: *Occupant advised of fire around the controls of a cabinet heater.*

Event ID 100622-01
Event date 22/6/2010
Site Domestic
Environment Building
Equipment Space heater cabinet heater
Event Fire, Explosion
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment.
Outcome of investigation Investigation has been unable to determine the cause of the fire.

2 - Event summary: A Fire Safety Officer reported a fire in a cabinet heater.

Event ID 100630-03
Event date 29/6/2010
Site Domestic

Environment Building
Equipment Space heater cabinet heater
Event Fire, Explosion
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment.
Outcome of investigation Leak and subsequent fire appears to have come from a perished hose.

3 - Event summary: A consumer swapped an empty LPG cylinder for a full one obtained through a cylinder exchange. She advised that she securely fitted the full cylinder to her two year old cabinet heater and ignited it. Within a minute, as she moved away, a ball of flame erupted from the back of the heater. She dragged the heater outside, blistering her fingers and catching curtains alight as she did so. The Fire Service and Ambulance arrived and oxygen was administered to one of the consumer's dogs. Fire and smoke damage occurred to the house and contents.

Event ID 100715-01
Event date 14/7/2010
<table>
<thead>
<tr>
<th>Site</th>
<th>Domestic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>Building</td>
</tr>
<tr>
<td>Equipment</td>
<td>Space heater cabinet heater</td>
</tr>
<tr>
<td>Event</td>
<td>Fire, Explosion</td>
</tr>
<tr>
<td>Casualty</td>
<td>Injury</td>
</tr>
<tr>
<td>Injury</td>
<td>Burn</td>
</tr>
<tr>
<td>Property damage level</td>
<td>Extended to the room and structure containing the equipment.</td>
</tr>
</tbody>
</table>

**Outcome of investigation**

The description of the fire and the pattern of fire damage is consistent with investigation leakage in the back of the heater. The heater was examined and tested by an expert who concluded that the leakage resulted from a gouged and ripped outer seal. The matter was referred to the Department of Labour.

4 - Event summary: *The carer of an elderly house owner picked up a full "swappa bottle" cylinder for an LPG cabinet heater. The cylinder was installed and the heater run for 2 to 3 hours. The next day the heater was pushed into another room. The owner turned the heater on and left for 3 to 4 minutes. On her return the heater was on fire with flames burning high above the back of the heater. She pushed the burning heater onto a concrete patio outside and called the Fire Service. The street was closed during fire suppression. The Fire Service forced flames down with a spray, turned the gas off, and placed the cylinder upside down in a bucket of water where gas was observed leaking from the cylinder valve thread. The Fire Service called a gasfitter who found gas leaking from the base of cylinder valve at the base of the valve hand wheel. The gasfitter then vented remaining gas from the cylinder.*

Event ID 100721-01
Event date 17/7/2010
Site Domestic
Environment Building
Equipment Space heater cabinet heater
Event Fire, Explosion
Casualty No casualty
Injury No injury
Notifiable electrical and gas accidents
1 January 2010 to 31 December 2010

Property damage level
Restricted to the direct vicinity of the equipment.

Outcome of investigation based on the observations of the attending gasfitter, and pattern of fire damage, the fire was evidently caused by leakage from the neck of valve of the "swappa bottle" cylinder. The gasfitter's observations were corroborated by tests in which compressed air was forced into the cylinder and leakage was observed. The investigator advised the "swappa bottle" of the leakage and recommended frequent, routine leakage testing. The investigator also recommended contacting the cylinder manufacturer regarding the sealant used at the cylinder valve base.

5 - Event summary: A Fire Service investigator advised that the operator of an LPG cabinet heater described the following sequence of events: The operator heard a hissing and smelt gas after engaging regulator to cylinder. He then turned off gas at the cylinder, tightened the regulator, turned gas back on and pushed the ignition button several times. A gas flame erupted from the heater during the last attempt at ignition. The resultant fire gutted the house and the operator sustained minor burns.

Event ID 100722-01
Event date 20/7/2010
Site Domestic
Environment Building
Equipment Space heater cabinet heater
Event Fire, Explosion
Casualty Injury
Injury Burn
Property damage level Extended to the site.

Outcome of Gas apparently escaped from the cylinder or heater and ignited during investigation attempted ignition. Due to the extent of fire damage it was not possible to locate the area of escaping gas. The heater and valve had QCC connection system that is designed to prevent the flow of gas unless fully engaged.

6 - Event summary: After fitting a newly filled "swappa bottle" the owner lit his cabinet heater and ran it on a low setting. After 2½ hours he observed the heater operating satisfactorily. ½ hour later he went into the room where the heater
was running and saw blue flames coming out of the front of the heater. He turned, or partly turned, the cylinder off but the heater continued to burn. In the process he scorch both sides of his hand on the hot surface of the heater. At this time flames erupted from the heater. Burning enamel paint from the ceiling dropped onto upholstered chairs setting them alight. The owner went outside, called for help, and got the garden hose. He went back into the house to find that flames had ceased coming out of the heater. He extinguished the house fire with the garden hose. The Fire Service arrived to find the fire out but the house rendered uninhabitable.

Event ID 100723-01
Event date 22/7/2010
Site Domestic
Environment Building
Equipment Space heater cabinet heater
Event Gas Leak, Escape
Casualty Injury
Injury Burn
Property damage level Extended to the room and structure containing the equipment.
Outcome of Gas evidently leaked from heater or burner malfunctioned. Leakage from investigation cylinder or supply hose not suspected as flames came from front of heater.

7 - Event summary: The owner connected a full "swappa bottle" obtained the previous week, to a cabinet heater. The owner turned the heater on in the bathroom. Shortly afterwards he heard a noise and saw flames shooting 18 inches high, straight off the top of the cylinder. The Fire Service were called and arrived 10 minutes later.

Event ID 100830-03
Event date 30/8/2010
Site Domestic
Environment Building
Equipment Cylinder (LPG)
Event Fire, Explosion
Notifiable electrical and gas accidents

1 January 2010 to 31 December 2010

Casualty No casualty
Injury No injury
Property damage Extended to the room and structure containing the equipment.

Outcome of Gas evidently leaked from the base of the cylinder valve and ignited at the heater. The owner did not smell gas prior to the fire. The officer in charge of the Fire Service and a Hazardous Substances officer (who arrived soon after) observed gas leakage from the base of the cylinder.

The cylinder was subsequently examined at a cylinder testing agency and the leak reproduced by introducing air into the cylinder at 150 p.s.i. The tester advised that the leakage stopped after tightening and that the valve thread had been sealed with compound but not sealing tape.

The matter was referred to the Department Labour as the appropriate enforcement agency.

8 - Event summary: There was an explosion and fire in a camper van with a person inside. The explosion caused most of the doors to blow outwards and prevented immediate egress. Nearby persons, pulled the occupant out, called emergency services and doused flames. The occupant was flown to a specialist burns unit in a serious condition.

Event ID 100906-03
Event date 5/9/2010
Site Public
Environment Car, Van, or Truck
Equipment Camping cooker
Event Fire, Explosion
Casualty Injury
Injury Shock, Burn
Property damage Extended to the room and structure containing the equipment.

Outcome of The occupant had evidently been trying to light a camping cooker in the van. Likely or possible contributory factors were a lack of ventilation in a confined space and an igniter (found by the cooker) that did not operate readily.
Inadequate odor may also have been a contributory factor as a gas sample was considered not to have met regulatory criteria for detestability (although the gas was found to be adequately odorised). A high level of volatile residue was reported on analysis of the gas.

Consideration was given to the possibility that residual matter may have caused possible partial blockage of the burner injector. This was discounted because the appliance was found to operate satisfactorily when tested by a certifying gasfitter. An elastomer O-ring seal on the burner was found broken but this was discounted as a factor because the certifying gasfitter tested for leakage on the cooker and cylinder assembly and found none.

Gas Notifiable Accidents (October - December 2010)

Natural gas notifiable accidents

This is the list of the 2 natural gas notifiable accidents for which the investigation was completed between October and December 2010.

1 - Event summary: A commercial chicken shed was destroyed and two firemen were injured, one seriously, after the shed caught fire.

Event ID 101018-01
Event date 13/10/2010
Site Commercial
Environment Building
Equipment Other
Event Network Disruption
Casualty Injury
Injury Burn
Property damage level Extended to the site

Outcome of A certifying gasfitter, engaged by the Department of Labour, advised that the investigation fire was possibly caused by wood shavings inside a gas fired heater being sucked in by the fan, heated by flames and blown onto wood shavings on the
2 - Event summary: A certifying gasfitter advised that a Surefire oven SIT630 valve when turned on was locked in the full on position so that gas built up in the oven. When the chef checked what was going on the gas mixture ignited. He sustained burns, particularly to his eye and as a result was taken to hospital.

Event ID 101117-03
Event date 15/11/2010
Site Commercial
Environment Building
Equipment Commercial Ovens
Event Network Disruption
Casualty Injury
Injury Burn
Property damage level No property damage

Outcome of The oven had reportedly been left on, allowing gas to accumulate prior to investigation ignition. A reported contributory factor was the non functioning of a flame failure device.

LPG notifiable accidents

This is the list of the 5 LPG notifiable accidents for which the investigation was completed between October and December 2010.

1 - Event summary: Police and the Fire Service were called to a picnic area following an explosion and fire that completely destroyed a van, adapted for camping use. The body of a person was discovered inside the van. The police reported that there were no suspicious circumstances. A Fire Service investigator reported that the explosion and fire was believed to have been to have been fuelled by LPG and ignited by an electrical source.

Event ID 100901-07
Event date 29/08/2010
2 - Event summary: A consumer had an LPG cylinder filled, asked the attendant to check for leaks about the valve and verified that there were none. The consumer installed the cylinder in the heater, connected the regulator and wriggled or twisted the regulator to verify that there was a gas proof seal. He opened the valve and ignited the heater. Everything was O.K. Later his wife turned the heater on. He was 6 metres away when his wife called out that there was a fire. This was no more than a minute after she had lit the heater. He found the heater well alight with flames intensifying by the second. There were 20 to 30 cm high flames from burning LPG at the front and back of the heater. The lit panel was flaring about 1.4 m high, he assumed from a faulty connection. The inside of the cabinet was totally alight with the valve handle hot enough to give him blisters as he turned the gas off. As soon as he shut off the LPG supply the fire inside the cabinet subsided and the flaring in front subsided. The flames inside the heater were smothered with towels.
3 - Event summary: From time to time, during a four month period of occupancy, husband and wife tenants noticed the smell of gas. When the smell was really strong they would turn off a cylinder supplying gas hobs on an electric oven. In the evening they heard a strong hissing of gas and disconnected the regulator from the cylinder. The next day the husband reconnected the regulator, turned on the cylinder valve and noticed a hiss of gas. The wife then turned on a hob burner. She described a huge rush of gas with flames about a foot high that started to go down the side of the hob. The wife turned off the burner control and the husband turned off the cylinder valve. A loud explosion ensued that blew out the back of the unit housing the appliance.

Event ID 101001-02
Event date 25/09/2010
Site Domestic
Environment Building
Equipment Domestic hotplate (hob)
Event Fire, Explosion
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment

Outcome of Leaking gas was evidently ignited by the hob. The cause of the leakage and investigation the compliance of the installation could not be investigated as the tenant who notified the event decided not to cooperate.

4 - Event summary: A tenant turned on a hot water tap, close by an external instantaneous gas water heater. After some three minutes there was no hot water
so she turned the tap on and off 2 or 3 times. Hot water then began to flow. Seconds later there was an explosion, like a plane hitting the house, that caused the floor to shake. The tenant left the house and contacted the gas supplier who advised her to contact the fire service. The gas supplier called a certifying gasfitter who isolated gas to the water heater and later replaced the water heater with a new water heater.

Event ID 101026-01
Event date 22/10/2010
Site Domestic
Environment Outside (Above Ground)
Equipment Water heater instantaneous
Event Fire, Explosion
Casualty No casualty
Injury No injury
Property damage level Restricted to the direct vicinity of the equipment

Outcome of investigation A local service agent for the manufacturer found that electrical terminals to the hydro generator unit had corroded and that this led to delayed ignition from the build up of gas at the pilot. Another agent expressed doubt about this scenario and carried out a further examination and testing. As a result of the further work the agent expressed the view that the explosion had resulted from a loose fitting at a burner test point. The manufacturer's NZ agent advised that they would promote the use of corrosion inhibitor in training notes for the appliance and contact the Australian manufacturer regarding measures to inhibit corrosion of the terminals.

5 - Event summary: A couple purchased a new appliance comprising an electric oven with an LPG cook top. An electrician installed electricity to the appliance and a gasfitter installed a gas supply system to the cooker, without gas. Believing the gas installation work complete, the husband connected two newly purchased cylinders under the house and turned them on while his wife stood by the appliance, with the oven operating. The husband went into the house, turned on one of the burners and attempted to light it using both an in built lighter and a cigarette lighter. During attempts to light the cooker there was an explosion. The husband and wife sustained burns during the explosion and the wife broke an ankle in efforts to move away. The couple evacuated their children from the house, turned off the gas and travelled to the hospital. Before departing the wife called the gasfitter who had installed the gas supply system. The gasfitter arrived about half an hour afterwards, checked that gas was off, pulled the oven out,
checked for leaks with a gas detector (finding what he believed to be leakage in two areas), turned on a burner to depressurise the gas supply system, and tightened connections at the inlet and outlet of a length of flexible hose connected to the appliance.

Event ID 101203-01
Event date 24/11/2010
Site Domestic
Environment Building
Equipment Domestic freestanding cooker
Event Fire, Explosion
Casualty Injury
Injury Burn
Property damage level Restricted to the direct vicinity of the equipment
Outcome of investigation Gas evidently leaked from one of the fittings that was tightened after the accident (A soundness test carried out by a certifying gasfitter engaged by Energy Safety revealed that the gas installation, as found, was sound up to the burner controls). There was conflicting advice from the gasfitter who installed gas and the consumers as to whether the installation was complete at the time of the accident. The matter was referred to the Plumbers, Gasfitters and Drainlayers Board.