Safe energy *safe people*

2004 - 2005 **Annual Review**

Annual Review of the Energy Safety Service for the period July 2004 - June 2005

energysafetyservice

te ratonga whakaruru pūngao

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safe energy
safe people

The Energy Safety Service (ESS) is part of the Consumer Affairs branch of the Ministry of Economic Development. The ESS monitors and encourages compliance with the laws relating to energy safety.

The Energy Safety Service works to create an environment in which:

- people and property are safeguarded from the dangers of gas and electricity
- gas and electrical appliances and installations are safe, and electricity supply and generating systems are safe
- the quality and measurement of gas and electricity is maintained
- the quality of petrol and diesel is maintained.

Introduction

Over the past year the Energy Safety Service (ESS) remained busy with its core business of investigating energy-related accidents, undertaking audits, increasing public awareness of energy safety, reviewing standards and petroleum monitoring. The ESS combined this with making a substantial effort to improve its procedures and develop the necessary technical support to enable the group to function more effectively. Consequently, the operation of ESS has changed for the better and improvements are continuing.

Enquiries from the public and workers from the gas and electricity industries have put pressure on ESS resources for a number of years. This has stretched resources to the limit. An agreement was reached with the Ministry of Economic Development's Contact Centre, which is already used by the Ministry of Consumer Affairs, to assist with the handling of enquiries. It is expected that the Contact Centre will not only ease pressure, but improve our speed of response. To further improve communications with the public and industry, ESS made steps towards redeveloping its website, to provide clearer and more accessible information. The new website will be up and running in 2006.

The ESS achieved a critical output for the year in the completion of a new operations manual. This manual incorporates ESS procedures into one document. It is designed to ensure, where practical, consistent policies and procedures are applied regardless of the personnel involved or whether the matter at hand is electricity or gas related. The aim is to assist ESS staff to make informed and consistent decisions in the course of their every day work.

It is not surprising the need for a wider ESS framework has grown, as it goes hand in hand with the increase of electricity use. It is estimated there are ten times as many electrical appliances used in the average New Zealand home today, and 20 times as many are left turned on, than they were 20 years ago. This is because energy has become easier to use, appliances have become cheaper and society is becoming more and more energy-dependent.

Perhaps this can be partly attributed to one of the Government's aims, which is to increase growth and living standards for all New Zealanders. For this to be achieved, in the energy industry, energy resources must be managed by industry and consumers more efficiently. Furthermore, the Government aims to increase trade, investment, open up markets for New Zealand business and provide New Zealand consumers with access to latest technology.

With this aims in mind, the New Zealand Government is negotiating a Free Trade Agreement (FTA) with China. The ESS has been involved in this process with its equivalent regulator in China, seeking to develop the electrical equipment component of the FTA. China has now become the largest supplier of electrical equipment into New Zealand, with imports reaching approximately $600 million a year, or over 25% of New Zealand's total electrical equipment imports.

Because more and more electrical products are being imported into the New Zealand market, and despite the convenience with which energy is available, electricity and gas can be very unforgiving. They can be hazardous for people, their property and the environment if not used properly. It is the job of ESS to make the public aware of this. We see the promotion of energy safety as lifesaving work. However, accidents are still occurring, the scale of this becomes clear when reading the Summary of Electrical and Gas Accidents, which ESS publishes annually. And so we remain committed to maintaining and improving the New Zealand safety record.

Throughout the past year there have been many challenges and pressures with which ESS has managed. As for the challenges and pressures to come, the public and industry can rely on ESS to manage these with consideration, to ensure the future of the New Zealand energy industry will be a good one.

Graham Boxall

Operations Manager, Energy Safety Service

Key Initiatives in 2004-05

Free Trade Agreement with China

Throughout the year, ESS was closely involved with New Zealand's ongoing efforts to secure a Free Trade Agreement (FTA) with China. China is the main supplier of $600 million worth of electrical and electronic products into this country. This status means that the two countries' safety standards and regulatory regimes are of growing mutual significance, for both commercial and consumer safety reasons. In the course of the past year's negotiations with China, ESS worked to increase mutual understanding of the two countries' regimes, paving the way for increased regulatory cooperation and the conclusion of a mutual recognition arrangement anticipated within the next two years. The focus of next year is to maintain the impetus gained from understanding each other's regimes.

Safety of LPG heaters

The ESS continued the coordination work on the safety of cabinet heaters with various government departments and affected industry sectors. Two research projects on the comparison of various connection systems and compatibility of rubber components were initiated. One of these has been completed with various recommendations being considered for implementation. Further work is needed once the results of the latest research work are completed and analysed by the working groups.

Power lines and trees

The Electrical (Hazard from Trees) Regulations, which came into force in January 2004, addressed the potential safety problems caused by trees growing close to overhead power lines and allowed arbitrators to be appointed to resolve any disputes between line owners and tree owners.

The ESS is working with the arbitrators to increase the awareness of the new requirements for territorial local authorities, network companies and the public, to ensure a seamless transition to the regulations becoming effective on July 1 2005.

Over the past year, the arbitrators visited network companies, local councils and regional authorities in the Nelson, Christchurch and Dunedin regions to clarify their responsibilities and the new arbitration system.

Network companies – which are now required to publicly notify arrangements for cutting and trimming trees close to electricity lines – worked hard to put in place notification systems by 1 July 2005. As a result, only a very few disputes needed to be referred to arbitration; those that did concerned the removal of debris.

Industry partnerships

Recognising the need for an industry-wide approach to improving safety, ESS continued to work closely with the myriad of industry groups involved in electricity and gas safety, including the Electricity Engineers Association (EEA), the Electrical Safety Organisation, the Central Region Electrical Inspectors Association, the Electrical Institute, the Electrical Contractors Association, the Gas Association of New Zealand, and the Liquid Petroleum Gas Association (LPGA).

A good example of the value of such partnerships was the success of joint ESS/Electricity Engineers Association public safety initiatives. The two organisations formed a Public Safety Working Party to produce resources about safety around network assets, targeting children in particular, and initiated a public safety award. The inaugural winner was Hawkes Bay network company Unison, for a safety presentation that was shown to at least 1,100 local schoolchildren. Initiatives like these contributed to improved accident statistics. For the first time in several years, there were no accidents involving children accessing electrical works in 2004-05.

Other significant initiatives with industry partners included presentations to the Rural Fire Authority Conference in Blenheim on the new legislation dealing with trees and electricity, and to the EEA Live Line and Industry Safety Workshops on selected electrical accident case studies. In the first half of 2005, ESS also partnered with The Liquified Petroleum Gas Association (LPGA) and the Environmental Risk Management Authority (ERMA) to develop an LPG safety campaign for winter 2005.

Safety advice for Māori

The ESS continued to work with Māori communities in partnership with the Ministry of Consumer Affairs and the Māori Women's Welfare League (MWWL). In 2004-05, this involved promoting electricity and gas safety messages to MWWL facilitators, so that they could disseminate them to groups and communities throughout the regions. In May, ESS participated in a nationwide series of workshops for the facilitators, held in Kaikohe, South Auckland, Hamilton, Opotiki,

Wairoa, Palmerston North, Taumaranui, Blenheim and Dunedin.

Legislation, Codes and Standards

Energy safety legislation review

Drafting of the long-awaited Energy Safety Review Bill, which contains proposed legislation changes developed through the EnergySafe programme, was completed during the year. The Bill had its first reading in Parliament in June 2005, and was referred to the Commerce Select Committee. Public submissions on the Bill close in August 2005.

The Bill aims to improve the electricity and gas safety regimes to more effectively protect people and property from risk, and to improve the occupational regulation of electrical workers, gasfitters, plumbers and drainlayers. It is based substantially on agreements reached with the EnergySafe Working Party, which included representatives of industry and consumers. However, a significant change is the extension of competency-based licensing – which currently covers electricity and gas workers – to the plumbing and drainlaying regimes.

The Bill's most significant features are:

- greater flexibility in defining licence categories and competence standards;
- transition from a 'registration-plus' licensing system to a competency based licensing system;
- improved processes for complaints against licensed workers;
- electricity and gas supply systems required to be covered by safety management systems;
- the removal of areas of legislative duplication with the Health and Safety in Employment Act; and
- amendments to offence and fine provisions.

Depending on other priorities, the Bill should progress through the Select Committee process during the 2005/06 financial year. Its passage will also require a number of significant regulation amendments (see below).

Another important development in legislation over the year was the proposed introduction of an LPG Safety Levy under the Ministry of Energy (Abolition) Act. This would replace the government funding ESS currently receives for its LPG monitoring activities. At the end of the financial year, a proposal was ready for Government approval to be introduced as a separate Bill from the Energy Safety Review Bill.

Regulation amendments

The proposed changes brought about by the Energy Safety Review Bill will need to be supported by significant regulation amendments. During the year, some of the foundation work for these amendments was undertaken in consultation with industry.

In addition, some scoping of other regulation amendments – required, for example, to recognise new standards – was completed and will be further progressed in the forthcoming year.

Electricity Standards

Technological advances and innovation in product, in an environment of greater globalisation of trade, calls for constant change in our approach to ensuring a high degree of safety to the New Zealand public.

In this regard, ESS sees the establishment and development of standards as a critical path towards offering current and authoritative technical guidance to industries, suppliers and practitioners to achieve uniformity of understanding and expectation. In the 2004/05 year, there were 86 electrical standards, including amendments, published.

Part of this development also includes the natural progression towards providing guidance, not only for new products and installations, but also for the upkeep and longevity of equipment and installations that are already in use.

In the quest for maintenance of safety over time, ESS has encouraged the further development of in-service safety inspection and testing of electrical equipment through AS/NZS 3760 and work toward the joining of NZS 3019 and AS/NZS 3017, to provide in-service testing and inspection guidelines for electrical installations.

Because of safety concerns, due to a number of fatalities in New Zealand and Australia, resources were committed toward the amendment of the electrical fence installation standards. Work on these standards will progress through into the new contract year.

The ever increasing volume of international trade has triggered the need for the development of standards to meet the challenges of 110 volt equipment and installations being privately imported into the country. This area of development was most significantly displayed in the medical field, by initiating a standard for mobile medical electrical installations.

The ESS was also confronted with 110 volt issues associated with aircraft and resources, which are being applied to the development of a standard for the supply of electricity to aircraft on the ground.

To provide support to suppliers and to the Mutual Recognition Agreements, there is continuous and ongoing work and resources being applied to deliver adequate safety to electrical equipment.

The year has also seen the wiring rules, AS/NZS 3000, enter its five yearly review period. Intensive work has been put into the restructuring of this document to improve its layout, making it easier to read, and to support performance based thinking through the provision of fundamental safety principles and required outcomes in the case of alternate approaches to installations. To supplement AS/NZS 3000, work has progressed in hazardous area installations and preparatory work in recognition of the need for guidance in high voltage installations.

The adoption of international standards and global collaboration is an ever increasing phenomenon which has kept in alignment with the current trend in trade and provides us with conformity and assurance on an international basis.

In keeping with these trends it is envisaged that, in the future, ESS will commit more resources toward the development of standards with respect to overhaul, upgrade and disposal of equipment.

Electricity Codes of Practice

Two codes of practice received particular attention during the year. The ESS worked with the Electricity Engineers Association, network and transmission companies, the Department of Labour and the arboricultural industry to update the code of practice for trimming trees close to power lines. The ESS also continued to work with the National Committee on Live Work to develop guidelines for working on low voltage networks, and notes to help electrical workers comply with ECP 46 High Voltage Live Line Work.

Gas Standards and Codes of Practice

Following the comprehensive reviews of major gas standards undertaken over recent years, 2004/05 was a year of consolidation. Technical amendments were made to NZS 5261 (gas installation), NZS 5258 (gas distribution networks) and NZS 5262 (gas appliance safety). A revision of NZS 5428 (installation and use of LPG for non propulsive purposes in caravans and boats) began in April 2005 and is scheduled for completion in 2005/06.

Case study

Line mechanic killed working on high-voltage transmission

A line mechanic received a fatal electric shock while working on a 66kV double circuit line, with one circuit still in service. He sustained the shock when pulling up a conductor to transfer it over to a new wooden pole; over-tensioning caused the conductor to touch the live conductor on the in-service circuit.

The point of contact was some two spans back from the work site. Five conductors had been transferred over previously without incident.

Investigations showed inadequate earthing was a major cause of the accident. Consistent with industry practice of the day, temporary working earths were in place. But they failed to cut the supply within sufficient time to prevent the lethal current passing from the victim's hand – holding a chain hoist directly contacting the conductor – to his foot on a pole step.

After determining the cause of the accident, ESS and the industry immediately worked together to finalise a revised earthing code, already in preparation, and issue it. The new code provided for equi-potential bonding connections to substantially reduce the risk of injury to people in similar circumstances.

Work continued on a draft joint Australian-New Zealand standard for the statistical sampling of populations of gas meters for metrological properties. There will be increasing scope for joint Australian-New Zealand standards, as New Zealand's links with the coordinating committee for gas standards in Standards Australia have been strengthened.

The ESS's work on gas standards is contributing to the evolution of a new performance-based regulatory environment. It is recognised that more work is needed – especially in the area of gas appliances – to make compliance with the new regime both practical and effective. Overall in the 2004/05 year, there were four standards, including amendments, published.

Biofuels Standards

During the year, ESS chaired the standards committee that developed NZS 7500 (automotive biodiesel specification for manufacture and blending), published in June 2005. The ESS's involvement reflected its well-established fuel quality monitoring work and recognised expertise in the development of standards.

International Relationships

The ESS supports Government's goal of increasing trade, knowledge transfer and investment between New Zealand and other countries in order to stimulate economic growth. Its work in the area of electrical and electronic products focuses on securing good regulatory outcomes that protect public safety in New Zealand, while also meeting the Government's wider trade objectives.

The past year has seen ESS intensively involved in the Free Trade Agreement (FTA) negotiations with China. Not only is China the principal supplier of electrical and electronic goods into New Zealand, but also its standards and safety regimes – together with those of other countries – increasingly influence safety outcomes in New Zealand.

The negotiations with China over the past year have particularly focused on improving understanding of the Chinese standards and conformity infrastructure, so that New Zealanders can have confidence in the safety of products from China. Developing the regulatory knowledge of New Zealand suppliers of Chinese equipment into this country has been another priority.

There have been complementary efforts to develop the Chinese export regulator's understanding of New Zealand's safety requirements, and ways to link into the Chinese hazard alert system have been explored. The capacity of both countries to align with and influence each other's regulatory system has also been a focus.

Significant progress towards the conclusion of a mutual recognition arrangement with China is expected next year.

During the year, New Zealand concluded an arrangement with Taiwan covering the mutual recognition of electrical product test results and certification. The ESS was also active in the administration of existing arrangements with the European Union and Singapore, and sought to broaden regulatory interaction in this period.

The move towards greater regulatory harmonisation with Australia continued, with more work towards the adoption of joint AS/NZS Standards. The ESS maintained an active relationship with its regulatory counterparts in Australia in both the electricity and gas areas. Progress stalled on the development of a common approach to gas appliance safety under the Trans-Tasman Mutual Recognition Agreement (TTMRA), due to the two countries' different safety management philosophies. It is hoped that the situation may change with the announcement of an upcoming review of the gas appliance regime in this country.

With New Zealand now a full signatory to the APEC Mutual Recognition Agreement on electrical and electronic products, ESS continued its efforts to encourage greater regulatory co-operation and better uptake of the Agreement.

The ESS continued to contribute towards the Electrical Regulators Advisory Committee (ERAC) and the Gas Technical Regulators Committee (GTRC). Both these bodies comprise the energy safety regulators in the states of Australia and the New Zealand regulator, ESS. The activities of these groups not only enable a better understanding of energy safety issues on both sides of Tasman, but also provides the framework for a joint approach to common issues. New Zealand, for example, participates in joint testing programmes with Australia.

Research and Statistics

The Energy Safety Service continued to support safety initiatives by analysing accident trends – presented once again in the annual *Summary of Reported Electrical and Gas Accidents* – and conducting targeted investigations into particular safety issues.

Older domestic wiring

In 2004/05, a particular area of focus was the risk associated with older electrical wiring in residential properties. Overseas research had shown that wiring systems dating from the 1940s and 1950s tended to fall short of modern electrical safety standards. Overseas, older wiring was found to be ill-suited to the demands of today's consumers, who frequently use multiple domestic appliances with considerable output and consumption. The ESS undertook several research projects to determine whether the same risks existed in New Zealand.

Using New Zealand Fire Service and Census data, together with surveys of electrical contractors and inspectors, ESS found that the fire risk from older domestic electrical wiring was in fact very low compared with other forms of fire risk (such as heat from electrical equipment). While the overall risk of electrical fires in residential properties was 0.15%, the risk of fire caused by electrical wiring installed in the 1940s and 50s was a mere 0.019%. Nor had the fire risk associated with older wiring changed significantly over the past 18 years.

Instead of recommending the progressive replacement of older wiring, ESS called for more attention to be given to a higher risk area: heat-initiated fires associated with electrical equipment (which more than doubled between 1986 and 2003). However, ESS remains actively involved in developing standards and inspection codes for all domestic wiring, and in educating homeowners about the need to carry out regular safety checks.

Tradespersons' survey

Research into the attitudes and behaviour of gasfitters and electricians was conducted during the year, with the aim of identifying why some tradespeople do not comply with legal requirements for testing, incident reporting and certification. This qualitative research involved in-depth interviews with randomly-selected tradespeople from throughout New Zealand.

Case study

Fatal accident to homeowner

A homeowner working on a water supply system received a fatal electric shock. He was attempting to adjust a ballcock on a float switch fitted to a header tank, located in the ceiling of his home. The cover plate over the 230 volt terminals had been removed at some stage, and the victim's hand inadvertently touched live terminals while he was standing, barefoot, on an earthed metallic water pipe.

While the Electricity Act 1992 permits homeowners to undertake certain electrical work themselves, this tragic accident reinforces the need to engage a registered tradesperson if the homeowner does not have the knowledge or competency to carry out the work safely. It also underscores the importance of disconnecting the electricity supply when carrying out work of this nature.

Case study

Hotel guest receives electric shock

A defective appliance in a hotel room resulted in a guest receiving an electric shock. Investigating the incident, ESS emphasised the need for hotels to undertake regular in-service testing, and to train cleaning staff to routinely check for damaged appliances and fittings while cleaning rooms.

ESS helped the hotel develop a routine check sheet and to implement safety systems. As a result of the accident, staff and management became more aware of safety hazards and how to recognise them, and put in place effective mechanisms to address potential problems.

While gasfitters believed trade-related accidents were rare, most of the electricians interviewed said they had received at least one shock or burn in the past year – chiefly through failing to turn off power before starting work, carelessness, miscommunication or lack of adequate tools. Electricians also reported limited awareness of the requirement to report accidents or hazards to ESS, a patchy approach to issuing compliance certificates after work had been completed, and a degree of acceptance that some electrical shocks or burns were inevitable.

Gasfitters were more aware of ESS's role and more likely to report accidents, although they regarded this as a matter of individual choice that was hard to influence. Both gasfitters and electricians described many reasons why testing was not always carried out – time and cost pressures, insufficient training, and a lack of suitable testing equipment.

There were mixed views about the role of the Government and ESS in energy safety. Although most tradespeople believed the Government had an important role as an independent overseer of gas and electrical safety, many were unaware of ESS and its energy safety work. However, some tradespeople wanted government to take a more 'hands-off' approach, saying safety was primarily an issue for the trades themselves.

Findings from this research were presented to key industry organisations, and published on the ESS website, www.ess.govt.nz.

Accident statistics

Notifiable LPG accidents 2001 - 04

	2001	2002	2003	2004
Total notifiable accidents	14	17	28	28
Fatalities	4	1	6	0
Injury to persons	8	6	16	19

There were no fatal LPG accidents during the 2004 calendar year – only the second fatality-free year in the last 12 years, and a marked contrast with 2003 when there were six deaths. However, the total number of notifiable LPG accidents in 2004 (28) was the highest ever recorded and roughly double the usual total.

The LPG accident statistics above, did not include fatalities caused by LPG abuse. There have been eleven known deaths from deliberate inhalation of LPG over the last twelve years, all of them young people.

Notifiable natural gas accidents 2001 – 04

	2001	2002	2003	2004
Total notifiable accidents	10	9	6	13
Fatalities	0	0	0	0
Injury to persons	5	3	1	6

2004 was also a fatality-free year for natural gas accidents, continuing the trend that began in 1999. However, the number of notifiable gas accidents and injury accidents were both well above the averages recorded over the past 12 years (9.5 and 3.3 respectively).
The number of people injured in natural gas accidents (six) was also one of the highest over the same period.

Notifiable electrical accidents 2001 – 04

	2001	2002	2003	2004
Total notifiable accidents	83	66	52	72
Fatalities	6	6	4	5
Injury to persons	86	63	50	70

The previous year's marked reduction in electrical accidents – the fewest reported for ten years – was not repeated in 2004.
The number of electrical accidents, and the fatalities arising from them, were similar to the annual average of 71 accidents and six deaths over the last 12 years.

Regional Development, Media and Publications

Regional development

The ESS offices in Auckland and Christchurch continued to build strong relationships with industry and to provide a focal point for the two-way exchange of information. This on-the-ground presence proved highly effective, and was well-received by industry groups in both areas. The wider Wellington region and the lower North Island continued to be serviced from ESS Head Office.

Over the past year, regionally-based officers travelled to most centres in their regions. Much of their time was spent working with electrical contractors on a range of issues, including concerns about non-compliant products in the market and about the manufacturers of electrical equipment. Several surveys were also undertaken in the regions (see 'Monitoring, audit and surveys' for more details).

Media and publications

Over the year ESS was involved in several communications initiatives, including a public awareness campaign focusing on LPG safety, the development and production of publications, and the distribution of safety tips and information in various media outlets.

During winter 2005 ESS partnered with the LPG Association and the Environmental Risk Management Authority to run the LPG winter public awareness safety campaign. The targeted campaign highlighted the need to use LPG safely indoors. Over 400,000 LPG cylinder 'swing tags' with safety messages printed on them were distributed to LPG filling stations around New Zealand. Advertisements, reinforcing the 'swing tag' safety messages, were also placed in community newspapers in areas where most LPG is sold over winter.

Electrical and gas safety tips for summer, and information for consumers on doing electrical work at home, were provided in columns distributed to community newspapers and other media outlets.

The ESS publications included the pamphlet ***Gas and Electrical Safety in Caravans and Motorhomes,*** published in June 2005 for anyone who owns, rents, sells, travels or lives in a vehicle using LPG or electrical appliances.

Case study

LPG water heater and carbon monoxide poisoning

A family of five, living in their remote rural home while it was under construction, were hospitalised with advanced carbon monoxide poisoning linked to a self-installed LPG water heater.

After taking a shower (supplied by the instantaneous LPG water heater), the father went to bed feeling cold; his wife had gone to bed earlier, complaining of a headache. A few hours later, their teenage daughter felt unwell and called for help. The parents tried to reach her, but felt faint and sick. The daughter phoned the emergency services, while her father managed to open skylights. Ambulance workers arrived and helped the family out of the house, the younger son collapsing on the way.

All five were admitted to hospital where tests revealed high blood levels of carbon monoxide. Three ambulance workers who attended also complained of headaches and general illness.

Several gas appliances connected to 9kg gas cylinders were in use in the house, whose only source of electricity was a diesel generator. However, investigations traced the carbon monoxide to the water heater – a flueless, multipoint appliance which the owner had installed himself. Earlier, it had been adequately ventilated due to a poorly sealed doorway. However, a new door had been fitted the week before the incident. Subsequently, the appliance was replaced by an externally-mounted instantaneous water heater with the cylinder housed outside.

The *Summary of Reported Electrical and Gas Accidents,* 1 January - 31 December 2003, was published in February 2005 and distributed to industry organisations. When the Gas Amendment Regulations 2004 came into effect in September 2004, an explanatory Business Note was published by ESS and distributed to industry in August 2004.

Two revised codes of practice were published in July 2004, *NZECP 50:2004 Repair and Maintenance of Domestic Electrical Appliances by the Owner of the Appliance and NZECP 51:2004 Homeowner/Occupier's Electrical Wiring Work in Domestic Installations.*

As a member of the Electricity Supply Industry Public Safety Education Working Party, ESS has continued to support and contribute to the group's important work. It continues to focus on raising awareness of safety around electricity supply industry assets through public education and information. During the year, the working group developed seasonal safety messages for distribution to the media as well as focussing on communicating safety messages to communities.

The ESS was also involved in a number of media issues. These included the safety of gas and electrical appliances; electrical and gas accidents; carbon monoxide poisoning; and the safe use of LPG.

Compliance

Electricity Accident and Incident Investigations

2004/05 was a particularly bad year for fatal electrical accidents, with seven deaths arising from 66 notifiable accidents (slightly down from the previous year). Four of those who died were members of the general public: two homeowners carrying out repairs; a youth who climbed a high-voltage tower and intentionally contacted live parts; and an elderly person who fell and remained in contact with an electric fence.

Although there were fairly few incidents involving electrical workers, the serious consequences of accidents for these workers was illustrated by the deaths of two line mechanics. An insulation installer also received a fatal shock after stapling through a cable while installing aluminium foil.

It was disappointing to see a number of electrical accidents again arising from failure to test and to isolate when undertaking installation work. However, the network companies' efforts to improve public safety around high-voltage works appeared to be delivering results, with no accidents involving children accessing works.

This was a welcome reversal of what had become a worrying trend in recent years.

Gas accident and incident investigations

The frequency of gas-related accidents and near misses continued to rise in 2004-05, with the number of events reported increasing from 130 in the previous year to 143. Approximately 30 percent were notifiable under the Gas Act; involving natural gas and LPG.

The ESS continued to be closely involved with investigations into the safety of portable LPG appliances. It assisted the Environmental Risk Management Authority's inquiry into LPG cabinet heaters, including coordinating actions arising from the inquiry's findings.

Work under the Hazardous Substances and New Organisms Act (HSNO)

During the year, ESS — together with other government and non-government agencies — participated in a series of workshops intended to find ways of filling potential gaps in the safe management of hazardous substances, including LPG. These gaps have emerged as a result of the widespread withdrawal of local authorities from HSNO activities.

Petroleum

The ESS continued to monitor the quality of automotive petrol and diesel under the Petroleum Products Specifications Regulations 2002.

The introduction of new specifications for diesel density and sulphur content in August 2004 prompted some minor adjustments in ESS's testing programme over the year. The ESS also played a role in the public information campaign surrounding lower sulphur diesel, which had been identified as potentially problematic for older diesel engines if they were not well-maintained. However, monitoring of the impact of this change on the vehicle fleet (undertaken by the Ministry of Economic Development's Resources and Networks Branch) indicates there have been few adverse effects. During the year, ESS's ongoing programme of fuel testing confirmed the fuel industry's high level of compliance with the regulations. In 2004/05, 98 fuel sample sets (representing 289 individual samples) were collected and tested at laboratories contracted to ESS.

Monitoring, auditing and surveys

Gas

The ESS continued to conduct audits and surveys in every area covered by the Gas Act – namely, the safety, supply quality and measurement of gas.

In the distribution sector, several issues were identified for improvement. These included better training and assessment of personnel working on distribution systems, especially contractors and sub-contractors. The need for this was apparent particularly in the South Island. Other concerns highlighted by the surveys were:

- the integrity of pressure entering the distribution systems
- odourisation monitoring at the source of supply and the need to clarify responsibility for it
- emergency response times and drills
- the sharing of information and data
- the adequacy of pre-planned maintenance programmes
- the timely reporting of accidents.

Gas companies' practices for measuring gas use and billing consumers were also monitored. This revealed some concerns about whether fixed factors were being correctly applied, and some calculation errors and slow responses to providing data to the auditor. The need for amendments to metering standards (due to cumulative errors and compressibility factors) was also identified.

In the area of gas installations, the over-riding concern was the lack of maintenance in all sectors – domestic, commercial and industrial. Other issues that emerged were the certification of unsafe installations and the lack of certificates for others.

Various problems with gas appliances were identified. Several involved suppliers not complying with the mandatory supplier declaration regime introduced in late 2002 – including failing to declare appliances sold, making declarations on the basis of inadequate information, declaring gases that may not be used in New Zealand, and declaring compliance with the wrong codes. The ESS also initiated research and a programme of work targeting specific concerns about some LPG connection systems and flame effect heaters.

A review of the mandatory supplier declaration regime has been initiated after some deficiencies were identified. The review will continue into 2005/06.

Electricity

Thirty safety and compliance audits were carried out throughout the year, targeting electricity networks, construction sites, mining and quarry sites, and commercial and industrial installations. The aim was to determine the level of conformity with the regulations, and the effectiveness of the regulatory regime. Audits also assist the company being audited to improve compliance and quality systems, and enhance safety for workers and the public.

A large number of recent accidents at caravan parks prompted ESS to initiate a programme of audits at these sites. Nine North Island sites were chosen initially; the findings are now being examined to see whether there are problems that need to be surveyed more widely.

Audits of network companies received less emphasis this year as most companies have already been audited, apart from some in more remote locations. The twelve audits that were carried out focused mainly on the security of network assets. They identified areas of weakness in the way some companies manage security, particularly at substations close to public areas. The ESS has assembled a collection of photographs to help network managers better understand the risks, and what to look for when carrying out in-house audits.

The ESS, in conjunction with Occupational Safety and Health (OSH) inspectors, also carried out several audits of high-risk construction sites in the central region of the South Island. Most were multi-storey commercial building sites. The auditors looked at site safety and the compliance of electrical installations, particularly the use of portable appliances and extension leads. In general, the electrical installations were compliant, with most sites using 'Life Guard' units (comprising socket outlets with RCD protection) to ensure safety. However, shortcomings were found in the use of portable tools and extension leads, with in-service testing inadequate or absent.

Several mines in both the North and South Islands were audited by ESS and Occupational Safety and Health (OSH) mining inspectors to check compliance with electricity regulations underground, and the safety of electrical installations above ground. While there was a good level of compliance underground, it was a different matter above ground – in particular, inadequate testing and maintenance of electrical tools and equipment in workshops and other buildings. As a result, procedures for in-service testing and maintenance have been established, as confirmed by follow-up visits by OSH.

Financial Performance

Summary of Financial Performance

The safety supply quality and measurement services provided by ESS are part of a Government appropriation, but funded largely by the electricity, gas and petroleum industries. Careful management of these resources is a priority for ESS and an important part of its accountability to its stakeholders. The following tables and graphs give a summary of financial performance for 2004/2005, including a brief explanation of how funding was used in LPG safety, natural gas safety, electricity safety and petroleum monitoring.

Liquefied Petroleum Gas safety

- Funded by Crown Revenue in 2004/2005. The introduction and implementation of a LPG levy is planned for 2005/2006 to fund the LPG safety programme.
- After a contribution by the LPGA and ERMA an additional 45% ($67,534) of LPG Operating expenses was spent on the LPG Safety Campaign.
- 9% ($13,360) of LPG Operating expenses was spent on LPG accident investigations.
- 16% ($21,737) of LPG Operating expenses was spent on LPG audits and surveys (technical services).
- 13% ($19,825) of LPG operating expenses was spent on contracts with Standards New Zealand for the revision of LPG standards.

Natural Gas safety

- There has been no change to the gas levy rate of 2 cents per gigajoule.
- The gas levy is paid by a total of 4 contributors.
- A total of $37,056 of excess gas levy collected during the year will be refunded to levy payers.
- 28% ($71,675) of gas operating expenses was spent on contracts with Standards New Zealand for the revision of gas standards.
- 6% ($14,103) of gas operating expenses was spent on gas safety investigations (technical services and domestic travel).
- 24% ($61,738) of gas operating expenses was spent on audits and surveys (technical services).

Electricity safety

- The electricity levy rate remains the same as last year at 1.05 cents per 100kwh.
- The electricity levy was paid by 15 contributors as in the previous year.
- A total of $846,816 of excess electricity levy collected during the year will be refunded to levy payers
- 44% ($435,190) of electricity operating expenses was spent on contracts with Standards New Zealand for the revision of electrical standards.
- 11% ($110,660) of electricity operating expenses was spent on electrical safety investigations and safety awareness (technical services and travel, Māori Women's Welfare League contract).
- 5% ($49,610) of electricity operating expenses was spent on electrical safety publicity, promotions and associated printing.
- 3% ($26,975) of electricity operating expenses was spent on setting up and training the Tree Arbitrators.
- 3% ($31,015) of electricity operating expenses was spent on appliance testing.

Petroleum monitoring

- 98% ($309,266) of operating expenses was spent on the testing of petroleum products.

2004-05 Financial Summary

Energy Safety Service

Summarised Statement of Financial Performance for the year ended 30 June 2005

	2004/05 Actual $	2004/05 Budget $	2003/04 Actual $
Revenue			
Revenue Crown (LPG)	216,986	249,000	244,807
Electricity Levies	2,515,677	2,551,500	2,655,106
Natural Gas Levies	815,470	824,500	836,970
Petroleum Monitoring Levies	416,185	426,000	366,004
Miscellaneous Revenue	15,973	9,713	9,503
Total Revenue	**3,980,291**	**4,060,713**	**4,112,390**
Expenses			
Personnel expenses	1,381,872	1,413,627	1,496,986
Operating expenses	1,709,446	1,765,467	1,597,421
Depreciation	31,848	32,155	26,486
Capital charge	10,774	11,659	33,897
Indirect and support services	838,049	785,805	957,600
Total Expenses	**3,971,989**	**4,008,713**	**4,112,390**
Surplus/(Deficit)	**8,302**	**52,000**	-

Liquified Petroleum Gas

Summarised Statement of Financial Performance for the year ended 30 June 2005

	2004/05 Actual $	2004/05 Budget $	2003/04 Actual $
Revenue			
Revenue Crown	216,986	249,000	244,807
Miscellaneous revenue	929	141	5,595
Total Revenue	**217,915**	**249,141**	**250,402**
Expenses			
Personnel expenses	33,471	55,004	168,917
Operating expenses	148,896	159,851	12,103
Depreciation	52	49	62
Capital charge	458	496	2,373
Indirect and support services	35,038	12,741	66,947
Total Expenses	**217,915**	**228,141**	**250,402**
Surplus/(Deficit)	-	21,000	-

Electricity

Summarised Statement of Financial Performance for the year ended 30 June 2005

	2004/05 Actual $	2004/05 Budget $	2003/04 Actual $
Revenue			
Electricity Levies	2,515,677	2,551,500	2,655,106
Miscellaneous revenue	10,915	7,543	3,046
Total Revenue	**2,526,592**	**2,559,043**	**2,658,152**
Expenses			
Personnel expenses	927,198	947,632	951,566
Operating expenses	992,796	1,005,007	1,019,542
Depreciation	31,054	31,199	22,528
Capital charge	7,169	7,757	22,711
Indirect and support services	562,381	541,448	641,805
Total Expenses	**2,520,598**	**2,533,043**	**2,658,152**
Surplus/(Deficit)	5,994	26,000	-

Natural Gas

Summarised Statement of Financial Performance for the year ended 30 June 2005

	2004/05 Actual $	2004/05 Budget $	2003/04 Actual $
Revenue			
Natural Gas Levies	815,470	824,500	836,970
Miscellaneous revenue	2,077	1,836	737
Total Revenue	**817,547**	**826,336**	**837,707**
Expenses			
Personnel expenses	370,049	342,512	308,238
Operating expenses	253,677	293,075	307,598
Depreciation	682	851	3,827
Capital charge	2,489	2,694	7,457
Indirect and support services	190,302	183,204	210,587
Total Expenses	**817,199**	**822,336**	**837,707**
Surplus/(Deficit)	348	4,000	-

Petroleum Monitoring

Summarised Statement of Financial Performance for the year ended 30 June 2005

	2004/05 Actual $	2004/05 Budget $	2003/04 Actual $
Revenue			
Petroleum Monitoring Levies	416,185	426,000	366,004
Miscellaneous revenue	2,052	193	125
Total Revenue	**418,237**	**426,193**	**366,129**
Expenses			
Personnel expenses	51,154	68,479	68,265
Operating expenses	314,077	307,534	258,178
Depreciation	60	56	69
Capital charge	658	712	1,356
Indirect and support services	50,328	48,412	38,261
Total Expenses	**416,277**	**425,193**	**366,129**
Surplus/(Deficit)	1,960	1,000	-

Head Office

Manager Operations
Graham Boxall

Principal Technical Advisors
Peter Morfee
Mehdi Yassaie

Senior Technical Advisors
Richard Davenport
Bill Lowe
Tony Smith

Technical Advisors
Veerendra Bhim
Bruce Mills
Keith Rodgers
Paul Stannard

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te ratonga whakaruru pūngao

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