

safe energy safe people

2002 - 2003 Annual Review

Annual Review of the Energy Safety Service for the period July 2002 - June 2003



energysafetyservice

te ratonga whakaruru pūngao

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Vision

safe energy safe people

Purpose

The Energy Safety Service works to ensure:

- electricity and gas are produced, distributed and used safely
- electrical and gas equipment, installations and appliances are safe for consumers and the public
- energy measurement is accurate and fair
- petroleum fuels, and electricity and gas are fit for their purpose.

The ESS does this by promoting effective practices throughout the energy sector, and ensuring compliance and conformance with those practices.

The Energy Safety Service is part of the Ministry of Consumer Affairs, itself an operating branch of the Ministry of Economic Development.

Introduction

The 2002 – 2003 year was a busy one for the Energy Safety Service (ESS) as we implemented a number of new energy safety initiatives and continued to build on programmes and relationships already in place.

We continued to work on the changes sought by Government regarding accountability in relationships for electricity and gas safety through the *EnergySafe* project. After consultation in 2000, the *EnergySafe* Working Party developed recommendations that were agreed to by Cabinet in October 2001. Since then, there has been considerable work undertaken to translate Cabinet's decisions into legislation. It is hoped that the Energy Safety Review Bill, which will give effect to the *EnergySafe* proposals will be drafted and tabled in Parliament before the end of the 2003 calendar year.

The electrical installation practices of New Zealand and Australia were aligned through the introduction of the new Joint Wiring Standard, AS/NZS 3000, on 1 January 2003. This Standard further harmonises electrical safety standards with those in Australia and other countries.

An important new initiative was the introduction of the gas appliance safety regime. The central feature of the gas appliance safety regime is a mandatory supplier declaration requirement. It is designed to strengthen and make more transparent, suppliers' commitments to their safety obligations by placing declarations on a website for industry and public scrutiny, without placing significant compliance costs on industry. It has the strong support of industry.

Stage two of the revised electrical appliance safety regime was implemented in September 2002. The electrical appliance safety regime requires supplier declarations for certain appliances while others require ESS approval. This was developed to facilitate a greater degree of harmonisation with Australia and improved regulatory practice. It is designed to facilitate the Trans-Tasman Mutual Recognition Arrangement (TTMRA) with Australia, providing market equivalence between New Zealand and Australia.

An important electricity safety initiative in 2002 – 2003, was the work done with industry to develop the Electricity Industry Strategic Plan, *PowerSafe*. This document provides all parts of the electricity industry with a blueprint for improving the safe supply and use of electricity, appliances and equipment. *PowerSafe* was launched in December 2002. Since then, the ESS has worked with industry groups towards implementing actions identified in the plan.

The equivalent of *Powersafe* for the gas industry, *Delivering Gas, Delivering Safety (DGDS)*, has been in place for some years. Over the past year, the ESS has continued to build on progress already made. Issues worked on in 2002 – 2003 included competency and training, transport, measurement and gas quality.

Communicating with industry and the public on energy safety is another important part of the ESS's work. During 2002 – 2003, a number of major publicity campaigns were undertaken and new resources developed. One major campaign was around the introduction of the Electricity Amendment Regulations 2002. Another campaign informed the gas industry about changes to the gas appliance safety regime. A public awareness campaign around LPG cabinet heater safety involved the production and distribution of 400,000 swing tags with safety messages. Other publicity included placing articles in a wide range of publications and managing media coverage of energy safety issues.

Significant progress was made this year in safety initiatives with Maori. Following the completion of a successful community-based home safety project in Tairāwhiti, the ESS has launched a similar initiative in Taitokerau (Northland). In addition, the contract with the Maori Women's Welfare League continued to deliver consumer information, including safety messages, nation-wide.

We continued to strengthen regional links with consumers and industry with the appointment of another Christchurch-based technical advisor.

Accident investigation continued to be a significant part of our activities. This involved considerable work by ESS investigators – often in very stressful situations. The professionalism and dedication shown by staff in these circumstances is a credit to the ESS. This year also saw the signing of an accident investigation operational agreement to formalise the relationship between the ESS and Occupational Safety and Health.

This year saw, the ESS make considerable progress. However, there is still a lot of work to be done. I am confident that our achievements thus far provide us with a firm foundation for the future. Thank you to all the ESS staff and all those industry and the community who work together towards our vision of "safe energy – safe people".



Graham Boxall

Operations Manager, Energy Safety Service

Key Initiatives

Throughout the year, the Energy Safety Service (ESS) continued to work with industry and the public on a number of operational and policy initiatives that will significantly improve key aspects of energy safety in New Zealand.

EnergySafe

The *EnergySafe* project represents a watershed for safety in the electrical and gas industries. Over the past year, the ESS has remained heavily involved in its development.

The main focus of *EnergySafe* is to make the Health and Safety in Employment (HSE) Act the primary means of ensuring electrical and gas safety in workplaces. But because the HSE Act does not cover public and product safety, the energy sector acts, regulations and administrative arrangements – with some changes – are also required.

Proposed legislative changes were the subject of extensive consultation during 2000. From this process, the *EnergySafe* Working Party developed recommendations that were agreed to by Cabinet in October 2001.

These covered:

- registration and licensing
- self-certification
- use of a safety compliance mark
- requirement of gas suppliers to ensure certification
- third party inspection
- exemptions from licensing
- licensing authorities' complaints process
- collection of accident information
- penalties and remedies in cases of non-compliance, and
- other general safety issues.

Since then, the ESS, the Occupational Safety and Health Service (OSH) and other parties involved in *EnergySafe* have been working on translating the Cabinet's decisions into legislation. This will involve amendments to a number of existing electricity and gas-related acts and regulations, and issue-specific action groups have been working on policy details. Two particularly contentious issues have been the provision of competency controls under the Health and Safety in Employment Act to replace the current licensing system, and the adoption of a licensing-only regime with no recognition of registration in the law.

This work has proceeded in tandem with preliminary drafting of a new Energy Safety Review Bill, which will give effect to the *EnergySafe* proposals. It is hoped that, once the outstanding matters of detail are resolved, the Bill will be drafted and tabled in Parliament before the end of the 2003 calendar year. Timing will, however, depend on other legislative priorities.

PowerSafe

The Electricity Industry Strategic Safety Plan, *PowerSafe*, was completed and launched in December 2002. This document provides all parts of the electricity industry – from large industrial users to electrical workers and appliance suppliers, and also consumers – with a blueprint for improving the safe supply and use of electricity, appliances and equipment over the next five years.

Although various agencies are responsible for implementing and monitoring different parts of *PowerSafe*, the ESS is the plan's overall custodian. Since its launch, the ESS has worked with industry groups seeking to have specific actions identified in the plan addressed and implemented over coming months.

Delivering Gas, Delivering Safety

Delivering Gas, Delivering Safety (DGDS) is the equivalent of *PowerSafe* for the gas industry. It is a strategy for the safe, reliable and economical supply and use of gas, appliances and equipment.

Over the past year, the ESS has continued to play a leading role in its development and is currently working with industry groups to progress the different action points contained in the plan. These cover issues such as competency and training, transport, measurement and gas quality.

LPG safety levy proposal

A discussion paper on the proposed introduction of a levy on LPG for non-automotive uses was released by the ESS in December 2002.

The proposed \$6 per tonne levy would replace the Crown funding the ESS currently receives to carry out its LPG responsibilities under the Gas Act 1992. Crown funding has been required because LPG is currently excluded from the energy levy regime (under which the ESS's electricity, gas and petroleum safety monitoring work is funded) due to the difficulty of distinguishing between LPG used for automotive and non-automotive purposes.

However, there has been a significant increase in LPG use since the 1990s, and only 10% is now used by automotive vehicles. This trend, together with the availability of a more accurate method for differentiating automotive LPG from non-automotive LPG, means it is timely and more equitable to consider funding the ESS's LPG monitoring work in the same way as other energy sources.

A limited number of submissions on the discussion paper were received. Currently, the ESS is working to develop the best possible method by which the levy could be collected.

Safety initiatives with Maori

Following the completion of its community-based home safety project in Tairāwhiti, the ESS has launched a similar initiative in Taitokerau (Northland).

Under this programme, energy safety messages will be delivered to local people by ESS staff. In some instances, basic safety messages will be delivered by local people to local people, working within existing community networks and supported by appropriate educational and technical resources. Clear goals and measurable outcomes have been set, in consultation with local communities, and careful monitoring will take place throughout the two-year programme. The ESS will be working alongside agencies including the New Zealand Fire Service and Te Puni Kōkiri to ensure the success of this project.

Both the Tairāwhiti and Taitokerau initiatives support the wider Ministry of Economic Development strategy of targeting known areas of need. In both projects, community empowerment is an important objective – resources, skills, training and knowledge is provided to individuals and groups so that the community's safety awareness can be sustained well beyond the lifetime of the project itself.

Meanwhile, the ESS continues to work in partnership with the Maori Women's Welfare League to deliver important consumer safety messages nationwide. The past year has seen a continuation of ESS commitment to training people in regional centres so that they can deliver educational messages to the widest possible audience, using the Maori Women's Welfare League's networks.

Programme of targeted surveys and audits

As part of its role of ensuring compliance with safety practices across the energy sector, the ESS conducts regular audits and surveys targeted

at different areas of the gas and electricity industries. Over the past year, these have included gas network operators, gas retailers, specific user groups such as caravan parks, the appliance industry (both gas and electrical), early childhood centres and schools.

Through these monitoring activities, the ESS is able to work with industry to address specific areas of concern that emerge from accident reports, as well as ensuring optimum industry safety practices in general.

Adoption of AS/NZS 3000

The new joint Australia/New Zealand Standard, AS/NZS 3000 Wiring Rules, came into force at the beginning of 2003. This is an important performance-based Standard, which aims to improve residential safety while also further harmonising New Zealand electrical safety standards with those in Australia and other countries. The ESS has worked closely with regulators in Australia to develop the new wiring standard, and continues to play a key role in monitoring its implementation.

Introduction of new gas and electrical appliance regimes

The central feature of the new gas appliance safety regime, effective from November 2002, is a mandatory supplier declaration requirement. This requires manufacturers or importers of appliances to lodge a declaration of compliance with a new standard, NZS 5262, on the ESS website.

The new electrical appliance safety regime was introduced in September 2002. It also requires supplier declarations for certain appliances, while others require specific ESS approval.

An important aim of both new regimes is to strengthen suppliers' commitments to their safety obligations, without imposing undue compliance costs on the appliance industries.

Operational agreement with OSH

In addition to conducting its own investigations into gas and electricity incidents and accidents, the ESS works closely to support the Occupational Safety and Health Service's investigations into workplace accidents.

During the year, an operational agreement was concluded between the ESS and OSH, formalising the relationship between the two agencies. Technical advice and evidence provided by ESS staff helped OSH pursue a number of successful prosecutions over the year.

Legislation, Codes and Standards

Electricity

The *EnergySafe* initiative remained one of the main driving forces behind the ESS's work on amending key legislation and regulations over the past year. This far-reaching project is intended to deliver a more accountable safety regime in both the electricity and gas sectors, and has been developed by the ESS and OSH in consultation with industry and consumer representatives.

With Government having endorsed the broad principles put forward by the *EnergySafe* Working Party (ESWP) in 2001, the focus of the past year has been on resolving some of the more detailed issues. This will enable a draft Energy Safety Review Bill – the legislation that will give effect to the *EnergySafe* proposals – to be completed. A number of action groups have been working on these outstanding issues over the year, with a view to having the Energy Safety Review Bill ready to be tabled in Parliament in the 2003 calendar year.

Changes to the Electricity Regulations 1997

The majority of changes to these regulations came into force on 1 January 2003. A small number of provisions, relating to work on live high-voltage overhead electric lines, became effective from 1 April 2003.

The main aims of the amendment were:

- to update and simplify the principal regulations
- to minimise compliance costs for industry and individuals, and
- to align practices between Australia and New Zealand, through the introduction of joint wiring rules.

The major change was the adoption of the new joint Australian/New Zealand Standard AS/NZS 3000 Wiring Rules, which aligns New Zealand's electrical safety standards with Australian and international practices. The citation of the joint Standard also offers the industry flexibility in how work is undertaken, providing it complies with the safety provisions contained in the Regulations. A key aspect of AS/NZS 3000 was that it implemented a much wider application of residual current devices (RCDs), thereby increasing the safety of domestic and residential installations.

The introduction of AS/NZS 3000 and its companion standards completed the transition from national to joint standards, and removed the need for many codes of practice. (Fifteen codes applying to electrical installation work were revoked.)

Other changes to the Electricity Regulations 1997 included provisions relating to worker safety and the safety of works, electrical installations, fittings and electrical appliances. One new code of practice (ECP 54, recessed luminaires) and one revised code (ECP 34, electrical safe distances) were introduced.

Prior to the introduction of the amendments to the Electricity Regulations 1997, ESS staff took part in a number of 'roadshows' around the country to help electrical workers and others in the industry become familiar with the new requirements. Since their introduction, the ESS had provided regular updates and advice through the ESS website to assist the industry interpret and comply with the new provisions, especially AS/NZS 3000.

Changes to the Electrical Appliance Safety Regime

Stage two of a new safety regime for all electrical appliances sold in New Zealand came into effect in September 2002.

The new regulatory regime provides suppliers with straightforward methods for ensuring the safety of imported appliances. It also requires appliances with a higher potential for safety deficiencies to be subject to a supplier declaration prior to sale. A separate group of appliances require specific ESS approval or an alternative recognised certification (for example, products with a valid Australian approval) before they can be sold in New Zealand.

The changes introduced in September 2002 further aligned the New Zealand appliance safety regime with that in Australia. Additional items were added to the list of appliances requiring a supplier declaration, bringing the total to 52. This is a combined list, incorporating items requiring approval in Australia and those requiring either approval or a supplier declaration in New Zealand.

The new regime – under which suppliers are required to make declarations for most appliance types, and specific approvals are required for a much smaller number of appliances – is considerably simpler for suppliers and retailers to comply with. It is also an important step towards the market equivalence which New Zealand and Australia are pursuing through the Trans-Tasman Mutual Recognition Agreement, allowing for new electrical appliances that can be legally sold in one country to be sold in the other with evidence of appropriate approval or certification.

Standards

Over the year, the ESS continued to work intensively in the area of standards development, with close to 50 projects running concurrently. One hundred and thirty-three revised or new electricity standards were published during the year.

The overall aims of the ESS's work on standards were to address areas of technical inadequacy (many identified from accident trends), to harmonise New Zealand standards with those in Australia and internationally, and to influence the development of international standards in ways which enhance safety and support trade.

Alongside the refinement of standards for installations, the ESS has actively supported the adoption of international standards for domestic electrical appliances, and the revision of standards covering medical electrical technology and practices. The ESS has also participated in the revision of standards for testing secondhand and in-service electrical equipment, part of a wider strategic drive to ensure the safety of older appliances.

Issues arising from the implementation of AS/NZS 3000 have also been worked on by the ESS and Australian regulators. These have chiefly involved differences in practice between the two countries, and discussions have focused on specific areas of the standard that may require adjustment to suit regulatory objectives.

Codes of Practice

Two codes of practice have been worked on during the year relating to electrical work undertaken by homeowners. The updated versions will replace the current codes, which are not user-friendly.

Under Regulations 47 and 48 of the Electricity Regulations 1997, homeowners are permitted to do certain kinds of repairs to domestic electrical appliances and to do domestic wiring providing they comply with the codes, ECP 50 and ECP 51. Anyone undertaking domestic wiring work is required to certify the work has been completed in accordance with these codes, and that it has been tested by a licensed electrical inspector. To ensure homeowners about to embark on electrical work understand what is required of them, the ESS has begun updating explanatory pamphlets on the codes. These will be available to the public at hardware shops and similar retail outlets.

The three-part ECP 46, covering live line work, was also introduced during the year. It aims to ensure safe practices in the supply industry,

and requires the use of specialised equipment when working with live lines. This code will, under *EnergySafe*, fall within the Health and Safety in Employment Act.

Gas

Changes to the Gas Appliance Safety Regime

In September 2002, the Gas Amendment Regulations 2002 came into force, replacing the 1993 regulations.

The major changes introduced relate to appliance safety. The 1993 regulations set out broad requirements for gas appliances and fittings, but did not impose formal testing and certification requirements as found in many other countries, including Australia. In introducing new regulations, a central aim was to improve the safety of gas appliances and, as far as practicable, align New Zealand's approach with Australia's – but without imposing undue compliance costs on the industry. This was a similar approach to that which saw the introduction of supplier declaration requirements for electrical appliances.

Under the amended regulations, a new Gas Appliance Safety Regime came into effect in November 2002. Its key feature is a mandatory supplier declaration requirement. Anyone who manufactures or imports any gas appliance must now complete a supplier declaration before supplying the appliance and must, if requested, produce supporting documentation that demonstrates compliance. The supplier declaration is lodged on the ESS website, where it remains as a public record of compliance that can be scrutinised by consumers, retailers and installers.

The ESS has also implemented a monitoring process aimed at identifying non-compliant appliances or fittings. In such cases, the ESS can take remedial steps ranging from requiring further testing, to prosecution.

In completing the mandatory declaration, suppliers are required to show compliance with the appliance standard, NZS 5262: 1997. A revision of this standard was published in early 2003 and will soon be cited as the standard to which declarations are to be made. The standard identifies the essential safety requirements for gas appliances, including safety-related performance and durability requirements, and specific design standards that may be used as a means of compliance.

Since the supplier declaration regime was introduced, the ESS has worked with the gas industry to address some initial problems including lack of declaration, the provision of incorrect or inadequate information, and

the incompatibility of the type of gas used for testing and New Zealand gases. (Also see under 'Compliance', p 10.) Over the coming year, further surveys and audits of manufacturers and importers will be undertaken to assist compliance.

In addition to introducing mandatory declarations for gas appliances, the new gas regulations also contain amended provisions covering:

- certification of gasfitting work
- persons working under supervision
- the ability of non-registered persons to certify the work of others
- contracting of tests on gas measurement systems
- requirements for CNG stations
- coverage of CNG station appliances
- interpretations, and
- offences.

Standards

In addition to NZS 5262, discussed above, two other gas standards were consulted and came into force during the year. NZS 5261 concerns gas installations, both small and large. It states the performance criteria which gas installations need to meet to be safe, and gives gasfitters detailed guidelines on how to comply with these criteria.

NZS 5258 contains performance-based requirements for the management, design, installation, operation and maintenance of gas supply networks. It requires network operators to follow the ALARP principles of risk assessment, in which hazards are identified and either eliminated or reduced to As Low As Reasonably Practicable (ALARP). Once *EnergySafe* is implemented, distribution network operators will be required by law to have documented safety management systems in place in accordance with Part 1 of the new Standard. Parts 2 and 3 will be cited as means of compliance with design, construction, operation and maintenance aspects of gas supply networks.

All these new standards, including NZS 5262, are fully performance-based. Over the coming year, a major challenge for the both gas industry and the ESS therefore lies in implementing the standards and setting up an effective monitoring regime to suit the new environment.

ESS has been an active participant in the review of the Standard for gas measurement (NZS 5259). This Standard covers the way in which the gas sold to consumers (domestic users and industry) is measured and billed. The revised Standard, which is expected to be published by the end of 2003, will be similarly performance-based and better aligned with international practice.

International Relationships

Over the year, the ESS continued to represent New Zealand's interests at a range of international and bilateral forums which focus on the impact of regulation on the trade of electrical, gas and electronic products.

As the number and range of electrical and gas products imported into New Zealand increases, the ESS aims to maintain good international regulatory practices to protect the New Zealand public, while also facilitating trade. Mutual Recognition Agreements (MRAs) are an internationally-recognised means of achieving this aim, and over the past year, the ESS was heavily involved with existing MRAs and the negotiation of new agreements.

The benefits of maintaining effective international relationships with regulators in other countries extend into other areas than trade alone. These relationships also facilitate the free flow of information on technical, administrative and safety issues and allows New Zealand to benefit from the experiences of regulators and energy industries in other countries – vital given our relatively small industries and population base.

Australia

As part of New Zealand's CER relationship with Australia, the ESS continued to work closely with relevant government agencies on both sides of the Tasman. Over time, harmonised regulatory structures and mutually recognised standards covering electrical, gas and electronic products are being established.

The introduction of AS/NZS 3000 – the joint Standard covering Wiring Rules – was an important achievement (see p 3 for more detail). The development of this Standard, which effectively aligns the two countries' wiring technology and methodologies and adopts international practices, will help facilitate trade between the two countries. It also allows for freer movement of electrical workers between the Australian and New Zealand industries. The introduction of the new electrical and gas appliance safety regimes (see p 3) was another significant milestone in the move towards harmonised Trans-Tasman practices.

These developments took place within the context of the Trans-Tasman Mutual Recognition Agreement (TTMRA), under which goods legally sold in one country can be sold in the other. During the past year, a formal review of the TTMRA commenced and is scheduled for completion later in 2003. Because the electricity equipment component of the Agreement has worked well since it was implemented in 1998, the review is expected to recommend only the fine-tuning of existing arrangements.

The Electrical Regulatory Authorities Council (ERAC), comprising the ESS and the eight separate Australian state regulators, works towards the goal of harmonising the two countries' regulatory environments. It has two main roles, to ensure the existing administrative systems and infrastructure of the various regulators are compatible, and to determine what future changes might take place in regulatory practices and how.

Over the past year, ERAC's strategic management group met twice, with meetings of technical sub-groups – focused on licensing and equipment – spread throughout the year. The ESS participated in all meetings (apart from licensing), and continued to chair the electrical equipment group, an area where its expertise is recognised.

Meanwhile, New Zealand gas standards have recently been revised and they are now more compatible with both international and Australian standards. There is scope to work with Australia to develop compatible audit and compliance programmes.

An ongoing area of discussion with the Gas Technical Regulators Committee (GTRC) concerned the fact that gas appliances remain subject to 'special exemption', meaning they are not yet mutually recognised under the MRA. Special exemption products are reviewed annually. The ESS may push for gas appliances to be reconsidered once New Zealand's new appliance safety regime, and especially the mandatory supplier declaration requirement, is well in place.

APEC

The ESS continued to chair the APEC joint advisory committee on the Mutual Recognition Agreement covering electrical and electronic products.

Over the past year, the ESS has been closely involved in preparing New Zealand's submission to participate at all three levels of the MRA – sharing of information, acceptance of test reports, and acceptance of certificates of compliance. In September 2003, New Zealand expects to be one of three countries (the others being Australia and Singapore) to become full signatories.

Other countries

Electrical and electronic equipment comprise one of seven sectors in the MRA New Zealand has with the European Union. The ESS continues to monitor this agreement, provides input into reviews and gives advice to New Zealand exporters and importers about its implementation.

Similarly, the ESS has been active in implementing its electrical equipment mutual recognition responsibilities under the Closer Economic Partnership (CEP) with Singapore. This has involved training Singapore's certification and accreditation agency, and monitoring the agreement. The ESS has also played an active role in the review of the agreement. In time, it is hoped to explore the practicality of extending the agreement to the full recognition of products. This would be similar to the arrangement we have with Australia under TTMRA whereby goods legally sold in one country can be sold in the other.

Over the year, the ESS has also been in discussion with Taiwan about the possibility of concluding an arrangement covering mutual recognition of electrical product test results.

Case Study: Natural Gas Water Heater Explosion and Fire

Two children were playing in a bathroom, when one hit the red button on the gas water heater. There was an explosion and flash fire, which spread through the ceiling. The house was gutted and both children were hospitalised with burns.

The accident investigation found that there was a loose joint where the gas pipe entered the control unit, and a loose brass fan tap valve. One of the children may have pulled on the pipework, allowing a release of gas that was ignited by the piezo lighter when the child hit the red button.

A lack of maintenance was a likely factor in the accident. The landlord had purchased the house two years earlier but had not had the gas appliances checked. In fact, it is likely they had not been checked since 1984 when gas had originally been installed in the house. The occupants had noticed the smell of gas for some time before the accident.

It was recommended that the gas supplier should help to ensure the soundness of installations and target consumers with strong safety messages.

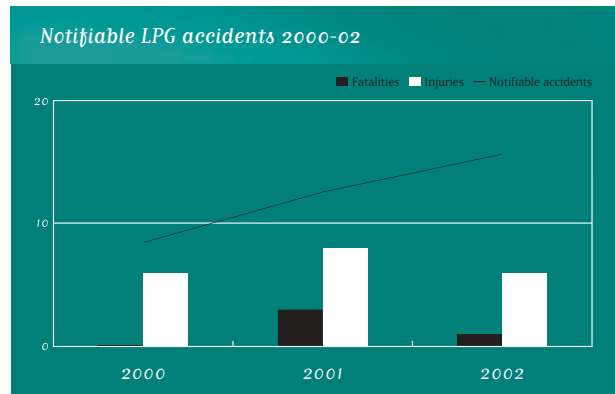
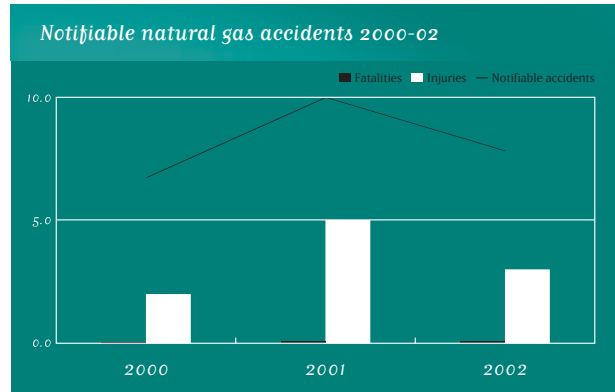
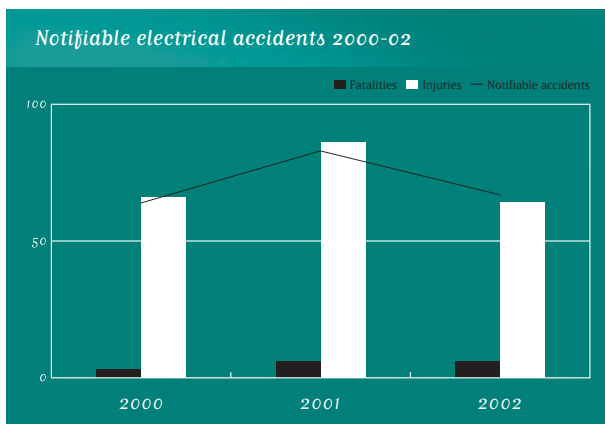
Research and Statistics

An important means by which the ESS contributes to safety is by gathering and publishing accurate, detailed and timely information about the circumstances in which gas and electrical accidents occur. Understanding the causes of accidents and tracking trends is essential to improving safety practices in workplaces and homes.

The *Summary of Reported Electrical and Gas Accidents*, first published in 2000, is an important tool for workers, employers and training organisations. In response to requests from industry, the 2002 edition – to be published by the end of 2003 – will incorporate even more detailed data and information.

The findings of a major safety perceptions survey of electricians and gasfitters were published during the year (a full report is available at www.ess.govt.nz/rules/rules_reports.asp). Around 400 people took part in the survey, which measured awareness of a range of regulatory and reporting requirements. As a result, a few areas have been identified for improvement, and these have been communicated to the Electrical Workers Registration Board and the Plumbers, Gasfitters and Drainlayers Board. The ESS has initiated follow-up action to improve some of the shortcomings found by this survey and anticipates carrying out another similar survey in a few years time.

Accident Statistics



Electricity Accidents 2002

During the 2002 calendar year, electrical workers were involved in two fatal and 33 injury-causing electrical accidents (injuring 35 people). About one third of these accidents involved 230 volts, and a similar number involved 400 volts.

Among workers other than electrical workers, there were one fatal and 20 injury-causing electrical accidents (injuring 20). The general public was involved in three fatal and nine injury-causing electrical accidents (injuring nine).

Looking at the overall trend of electrical accidents over the last 10 years, there has been no significant change in the total number of fatal and injury accidents. Total fatal accidents and fatalities involving the general public reduced by about one-third over the last five years (1998-02), compared to the previous five years (1993-97).

In the last four years, there has been a measurable reduction in electrical accidents to line mechanics, but accidents involving trainees (electricians and line mechanics) have risen over the same period. Farm workers were involved in half (nine) of the fatal accidents to workers outside of the electrical industry over the last 10 years.

Gas Accidents 2002

During the 2002 calendar year, none of the eight notifiable natural gas accidents were fatal, but two injury-causing accidents affected three people. Three of the notifiable accidents involved water heaters and two involved cookers/ovens. All of these accidents resulted in fire and/or explosion.

Of the 16 notifiable accidents involving LPG during 2002, one was fatal and five caused injuries to a total of six people. LPG heaters were involved in about half of the total accidents, all of which resulted in fire and/or explosion.

From accident data gathered by the ESS over the last 10 years, no clear trend emerges in the number of fatal/injury-causing natural gas and fatal LPG accidents. However, the number of LPG injury accidents have reduced by about half in the last five years, compared with the previous five-year period. At the same time, there has been a significant rise in the number of non-notifiable natural gas accidents in the last five years.

Even though LPG heaters were involved in half of the notifiable LPG accidents in 2002, over the full 10-year period, the number of notifiable LPG heater accidents has in fact halved. Among the notifiable natural gas accidents recorded over the last 10 years, water heaters were involved in about a third.

Case Study: High Voltage Power Lines Above a School Playground

A seven year old boy suffered a badly burnt hand and scalp after grabbing an overhead high voltage power line above a school playground. He lost his balance while trying to retrieve a ball from a tree.

Before the accident, the new headmaster had expressed concern about the overhead lines and had raised it with his electricity supplier – including the possibility of undergrounding supply – and was chasing up a response at the time of the accident.

The ESS attended the accident scene, carried out an investigation, and arranged with the school and the company operating the network for the line to be made safe (i.e. the removal of offending trees). In addition, a general electrical safety audit was carried out at the school and a report with recommendations was prepared. Both the school's headmaster and the ESS followed up on putting the power lines underground. The network company carried this out at no cost to the school during the mid-term break.

Regional Development, Publicity and Promotion

Regional development and community advice

Following the establishment of an office in Christchurch in early 2002, the ESS further strengthened its presence in the South Island with the appointment of another Christchurch-based technical adviser. The ESS is committed to expanding its monitoring, advisory and safety promotion role with the energy industries and the general public outside of Wellington.

The ESS continued to participate in a range of community and regional events that offered opportunities to deliver energy safety messages to a wide audience. A specific community initiative targeted at Maori was launched in the Far North, where the ESS is working with a range of other agencies to empower local communities to tackle energy safety issues in their region. (See p 3 for more.)

Media and Publications

A major publicity initiative surrounded the introduction of the Electricity Amendment Regulations 2002 that came into effect on 1 January 2003. 32,500 business notes detailing the changes to the Regulations were produced and sent to all licensed electrical workers. Articles appeared in trade magazines and newsletters, and a series of seminars for electrical workers were held around the country. A pamphlet with information on the changes relevant to the public, *Residual Current Devices – Switching on to Safety* was made available to the public and to electrical workers to give to their customers. A section on the changes was added to the ESS website.

Another communications campaign informed the gas appliance industry about changes to the gas appliance safety regime. Business notes were posted to some 4,000 industry contacts, a new section was added to the ESS website and articles were supplied to industry magazines and newsletters.

An LPG safety campaign was carried out in conjunction with the industry. 400,000 swing tags with safety messages were produced and distributed to service stations for attachment to gas cylinders when they were filled. The pamphlet, *Keeping Safe with Gas* and the booklet, *If it Can Heat You, it Can Hurt You* were reprinted.

A number of publications for industry were produced. Energy Safety Bulletins on upgrading caravans and motorhomes to AS/NZS 3000

requirements and on increased pressure installations were produced and distributed to industry. Four thousand UV-resistant stickers warning of overhead electric power lines were printed. The booklet, *A Summary of Reported Electrical and Gas Accidents 2001* was produced and distributed.

The ESS was involved in a number of media issues. These included: a Fair Go investigation of exploding oven doors; a 20/20 programme, 'Silent Killer' on carbon monoxide poisoning; and the prosecution of a Hawke's Bay networks company after a child received burns when he put his hand into an unlocked substation.

Informative articles and advertisements on key ESS safety issues were developed for trade and consumer publications. A feature on electricity safety was produced for the teachers' magazine, *Starters and Strategies*. Specific media releases were also distributed – these covered the safety of children around electricity, the prohibition of Christmas tree lights and a nightlight, the launch of *PowerSafe*, LPG and gas safety, carbon monoxide poisoning and the prosecution of a Hawke's Bay network company.

Website (www.ess.govt.nz)

Over the year, the ESS website was enlarged and improved. A site map was added, the facility to report electrical and gas accidents online was upgraded, and a new section on the gas appliance safety regime was included.

Case Study: Substation Accident, Investigation and Prosecution

A young boy was seriously hurt when he put his hand into an unlocked substation at the side of the road. He received severe burns.

The ESS investigated the incident and successfully prosecuted the network company. In June 2003 they were fined \$5,000 and ordered to pay reparation of \$5,000 to the victim for breaching the Electricity Regulations 1997 by failing to secure an electrical substation "against access by an unauthorised person".

Immediately after the accident, the network company reviewed the security of its whole system to ensure the safety of its network. As a result the company checked the locks on all substations and placed warning signs on them. The network company has also undertaken public education campaigns to educate children and adults about the dangers of electricity.

Compliance

Electricity Accident and Incident Investigations

Some 56 electricity-related accidents were reported to the ESS during 2002-03, a year marked by an unusually high number of fatalities. Eight deaths were recorded, and there were 50 accidents causing injuries.

People in the rural environment again figured prominently among the fatalities. One rural contractor received a fatal electric shock and another person was seriously injured when an irrigation pipe they were laying came into contact with a high voltage overhead line. A farmer died when he contacted live overhead mains conductors that had fallen to the ground, and a child was killed when he became entrapped on an electric fence.

It was disappointing to note another fatality involving a homeowner painting around the mains without first requesting a disconnection. The ESS and its predecessor have instigated considerable publicity about this unsafe practice for a number of years and overall accident statistics until now, indicated a welcome shift in behaviour. Another fatality involving a young person occurred when they climbed on top of rolling rail stock in a shunting yard and came into contact with the high voltage overhead traction conductor.

Electrical workers, including a trainee, were also among the year's fatalities, and some 26 of the injury-causing accidents involved electrical workers. Considerable time and effort has gone into investigating the complex sub-station accident which caused the trainee's death and serious injuries to another electrical worker. Overall, the number of accidents involving trainees is an area of significant concern, and the ESS is working with the industry to address contributing factors such as supervision.

The ESS and the industry are also working together on safety initiatives to reduce the unacceptable level of accidents involving children and electricity (33 in the last 10 years, with five fatalities). A number of accidents have occurred in which children have climbed on or accessed high voltage electrical installations, putting themselves at risk of serious injury. Because young children cannot be expected to take full responsibility for their own safety, the industry must make extra efforts to ensure the possibility of accessing or touching live parts is eliminated. Electricity companies are looking at ways to better assess and manage such risks.

Over the year, the ESS continued to support the Occupational Safety and Health Service's investigations into workplace accidents. OSH pursued a number of successful prosecutions under the Health and Safety in Employment Act, with the ESS providing the necessary technical advice and evidence.

The ESS's technical expertise was also used by the New Zealand Fire Service and the Police in their investigations into electricity-initiated fires. Common contributing factors over the past year included loose connections, old and worn electrical fittings, and failure to follow installation instructions. Through its investigations into electricity-initiated fires, the ESS can monitor whether certain appliances or electrical fittings are consistently presenting problems, in which case it may initiate publicity or review the appropriate standards. Over the past year, it was pleasing to see fewer instances of fires caused by clothes driers – the subject of an earlier ESS publicity campaign.

Gas Accident and Incident Investigations

The ESS investigated about 100 gas-related accidents in the 2002-03 year, approximately half of them involving LPG. Twenty-three of these accidents (22 LPG) were classified as notifiable, meaning they caused significant property damage or incapacitated somebody for at least 48 hours. One fatality was recorded, when escaping LPG from an installation caused a caravan explosion and fire.

These figures highlighted recurrent concerns about the safety of portable LPG appliances, especially leakages at the cylinder regulator interface of cabinet heaters. Another concern is the maintenance of appliances. A spate of fires involving LPG fridges on Great Barrier Island highlighted not only LPG appliance safety, but also wider safety issues specific to remote rural areas.

In all these accidents, the ESS's investigations focused primarily on verifying the facts, although in several instances more detailed investigations were carried out. In one case, the ESS provided technical advice enabling OSH to prosecute a contractor. The ESS also worked closely with insurers following several accidents, including a major natural gas fire in a Tauranga shopping complex.

Hazardous Substances and New Organisms Act 1998

The ESS's work in this area focused particularly on ensuring territorial authorities maintained their capacity to provide emergency response services, support and accident follow-up, especially in cases involving LPG. The role of territorial authorities in respect of LPG safety was

previously provided for under the former Dangerous Goods Act, but their role is much more limited under its successor, the Hazardous Substances and New Organisms Act. Over the year, the ESS has worked closely with the Ministry for the Environment and the Environmental Risk Management Authority on this issue and others related to enforcement and monitoring of fuel gases.

The ESS has also collaborated with the Ministry for the Environment on the development of new regulations under the Hazardous Substances and New Organisms Act. These cover the safety of portable LPG appliances and LPG containers and are expected to come into force by May 2004.

Case Study: LPG Refrigerator Fire

A new refrigerator powered by LPG had been installed in a new home unit on Great Barrier Island and the soundness of the connections tested with soapy water. As its final location was undecided, it was left in the middle of the kitchen with a 9kg LPG cylinder beside it.

About five weeks later, the owner returned to see smoke coming from the building and the refrigerator engulfed in flames. The fire destroyed the unit and two others adjoining it.

On the day of the accident, the LPG cylinder had apparently been moved into a position where the burner box had melted the flexible hose connecting the cylinder to the refrigerator. Escaping gas had then been ignited by the burner. The accident could have been prevented by protecting the burner box with a metal cage that allowed air flow but stopped the flexible hose from touching the burner.

Petroleum

The Petroleum Products Specifications Regulations 1998, under which the ESS is charged with monitoring the quality of petrol and diesel, were replaced from September 2002. The changes made were intended to ensure fuels available in New Zealand meet the evolving technological needs of motor vehicles, and enable better environmental, health and safety performance.

As a result of these regulatory changes, the ESS has modified its petrol and diesel monitoring programme to take account of the new specifications. Some properties have changed already and more changes will be progressively introduced until 2006. For instance, the maximum limits on sulphur in petrol and diesel were lowered in September, and there will be further lowering of the sulphur limit for diesel.

In 2002/03, the ESS tested 284 samples of petrol and diesel. Testing was undertaken at an accredited independent laboratory in Whangarei, and the quality of the testing is regularly verified against the practices of other laboratories outside of New Zealand.

Monitoring, Auditing and Survey Activities

Electricity

Electrical safety at early childhood centres were the focus of a national ESS survey over the year. Twenty-one centres were visited, and in general the results were pleasing. Childcare workers were knowledgeable about safety practices and modelled good safety behaviour around electricity. Wiring and appliances, even in centres housed in older buildings, were generally well-maintained.

However, it was found that residual current devices (RCDs) were not widely used in early childhood centres. This survey provided a good opportunity for the ESS to further publicise the benefits of RCDs for such institutions.

The ESS has worked closely with a major fast food chain which has installed RCD protection in all its retail outlets. Feedback from the company shows that the value of RCDs is already evident, with no serious injuries resulting from accidents involving electricity.

Consistent with the ESS's focus on the safety of children around electricity, a survey began of schools, especially those with technology classrooms. This followed a number of incidents and accidents reported by schools. This survey is continuing into the 2003-04 year.

Other initiatives focused on changing industry behaviour and practices in view of current accident trends. One way in which the ESS does this is by providing input into the topics tested in electrical workers' and inspectors' examinations, and helping to moderate exams. Encouraging results are evident, with a considerable increase in workers' knowledge of some critical issues.

Gas

Under the Gas Act 1992, the ESS undertakes audits and surveys of safety practices in all areas of the gas industry.

Over the past year, there were new audits of two network operators and the report on another network operator audit, begun the previous year, was completed. While the audits found general compliance with the Act, the Gas Regulations and NZS 5258, the ESS made several recommendations

to address areas of concern. These included internal audit systems, competence of workers/contractors working on the network, establishment of a system for continuous monitoring of pressure (until the pressure upgrade is completed) in these networks, documentation, training, cathodic protection, regulating stations, compliance certificates by gasfitters and signing off of completed jobs. The operators have agreed to provide the ESS with regular reports outlining progress on these recommendations.

Compliance audits were undertaken of three gas retailers. These focused on their emergency response procedures, safety advice to consumers, accident reporting, supply issues and certification of systems. One retailer was found to be generally compliant, but inadequacies were identified with others. The ESS will continue to follow-up recommendations from these audits.

A gas odorisation audit of eight retailers and four network operators showed a clear lack of understanding of retailers' obligations in this area. The audit made recommendations about public education, monitoring methods and the new Standards, which will be implemented as appropriate.

The need for improved understanding of environmental and maintenance-related safety issues was identified in an audit of several large and medium-sized gas installations. One of the large installations had been audited previously, and the new audit showed a marked improvement especially in the area of risk analysis. Among the smaller installations, it was clear that only limited planned preventative maintenance (PPM) was being carried out. The ESS will focus on delivering appropriate safety messages to this sector over the coming year.

In addition to audits, a number of surveys were conducted targeting specific industry groups. Several focused on the appliance industry, following the introduction of the new Gas Appliance Safety Regime and its mandatory supplier declaration requirement. Common problems identified in each of the three main centres surveyed were lack of model numbers, and inaccuracy and inadequacy of declaration information posted on the website. The ESS worked closely with industry groups on these issues and others, and the level of compliance improved as a result. This campaign will continue on a larger scale over the coming year.

Other surveys focused on the safety of some older appliances in Dunedin; maintenance issues in Canterbury caravan parks; and safety and maintenance practices among some North Island caravan hire companies. In view of issues identified in the last two surveys, the ESS hopes to implement a safety campaign over the coming year in relation to caravans and motor homes.

Summary of Financial Performance

The safety supply quality and measurement services provided by the 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 the ESS and an important part of its accountability to its stakeholders. The following tables and graphs give a summary of financial performance for 2002/2003, including a brief explanation of how funding was used in the LPG, natural gas, electricity and petroleum quality areas.

Liquefied Petroleum Gas

- This is currently fully funded by Crown Revenue. The introduction of a LPG levy is planned for 2004/2005.
- 63% (\$36,447) of LPG operating expenditure was spent on LPG safety publicity, promotions and associated printing.
- 17% (\$9,785) of LPG operating expenditure was spent on LPG safety investigations (technical services and domestic travel).
- 8.5% (\$5,000) of LPG operating expenditure was spent on contracts with Standards New Zealand for the revision of LPG Standards.

Natural Gas

- There has been no change to the gas levy rate of two cents per gigajoule.
- The gas levy is paid by a total of three contributors.
- A total of \$163,000 of excess gas levy collected during the year will be refunded to levy payers.
- 42% (\$95,200) of gas operating expenditure was spent on contracts with Standards New Zealand for the revision of Gas Standards: NZS 5258 Gas Distribution; NZS 5259 Gas Measurement; NZS 5261 Installation of Gas Appliances and Equipment; AS/NZS 5262 Gas Appliance Safety; NZS 5263 Gas Detection and scoping for NZS 5257 Gas Audit Protocol.

- 20% (\$45,300) of gas operating expenditure was spent on gas safety investigations (technical services and domestic travel).
- 12% (\$27,165) of gas operating expenditure was spent on gas safety publicity, promotions and associated printing.
- 11% (\$25,500) of gas operating expenditure was spent on audits and surveys (technical services).

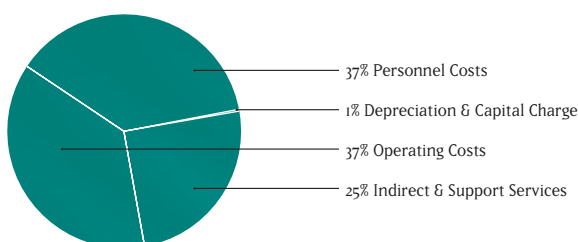
Electricity

- The electricity levy rate remains the same as last year at 1.05 cents per 100 kwh.
- The electricity levy was paid by the same 14 contributors as last year.
- A total of \$178,800 of excess electricity levy collected during the year will be refunded to levy payers.
- 59% (\$601,000) of electricity operating expenditure was spent on contracts with Standards New Zealand for the revision of Electrical Standards.
- 15% (\$154,800) of electricity operating expenditure was spent on electrical safety investigations and safety awareness (technical services and domestic travel).
- 7.5% (\$77,000) of electricity operating expenditure was spent on electrical safety publicity, promotions and associated printing.
- 2% (\$23,000) of electricity operating expenditure was spent on the development of Powersafe, a strategic safety plan for the electricity industry (technical services).

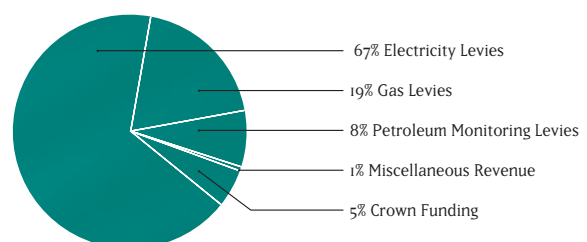
Petroleum monitoring

- Contract expenses totalling \$215,000 for the testing of petroleum products comprised 95% of the petroleum monitoring operational expenditure.

ESS Expenses July 2002 - June 2003



ESS Revenue July 2002 - June 2003



Energy Safety Service Summarised Statement of Financial Performance for the year ended 30 June 2003

| | 2002/03 Actual \$ | 2002/03 Budget \$ | 2001/02 Actual \$ |
|-------------------------------|----------------------|----------------------|----------------------|
| Revenue | | | |
| Revenue Crown (LPG) | 220,250 | 249,000 | 234,186 |
| Electricity Levies | 2,754,002 | 2,681,789 | 2,703,649 |
| Natural Gas Levies | 795,560 | 840,877 | 826,895 |
| Petroleum Monitoring Levies | 319,756 | 279,078 | 330,503 |
| Miscellaneous revenue | 21,492 | 21,506 | 26,775 |
| Total Revenue | 4,111,060 | 4,072,250 | 4,122,008 |
| Expenses | | | |
| Personnel expenses | 1,513,438 | 1,502,422 | 1,467,412 |
| Operating expenses | 1,533,860 | 1,494,388 | 1,794,562 |
| Depreciation | 14,600 | 64,208 | 36,160 |
| Capital charge | 2,548 | 2,698 | 2,064 |
| Indirect and Support services | 1,046,614 | 956,485 | 821,810 |
| Total Expenses | 4,111,060 | 4,020,201 | 4,122,008 |
| Surplus/(Deficit) | - | 52,049 | - |

Liquified Petroleum Gas Summarised Statement of Financial Performance for the year ended 30 June 2003

| | 2002/03 Actual \$ | 2002/03 Budget \$ | 2001/02 Actual \$ |
|-------------------------------|----------------------|----------------------|----------------------|
| Revenue | | | |
| Revenue Crown | 220,250 | 249,000 | 234,186 |
| Miscellaneous revenue | 21,516 | 21,506 | 21,655 |
| Total Revenue | 241,766 | 270,506 | 255,841 |
| Expenses | | | |
| Personnel expenses | 111,159 | 116,935 | 94,558 |
| Operating expenses | 57,819 | 57,638 | 102,884 |
| Depreciation | 1,023 | 3,835 | 3,723 |
| Capital charge | -1,894 | -2,006 | -2,248 |
| Indirect and Support services | 73,659 | 67,131 | 56,924 |
| Total Expenses | 241,766 | 243,533 | 255,841 |
| Surplus/(Deficit) | - | 26,973 | - |

Electricity Summarised Statement of Financial Performance for the year ended 30 June 2003

| | 2002/03 Actual \$ | 2002/03 Budget \$ | 2001/02 Actual \$ |
|-----------------------|----------------------|----------------------|----------------------|
| Revenue | | | |
| Electricity Levies | 2,754,002 | 2,681,789 | 2,703,649 |
| Miscellaneous revenue | -22 | - | 4,579 |
| Total Revenue | 2,753,980 | 2,681,789 | 2,708,228 |

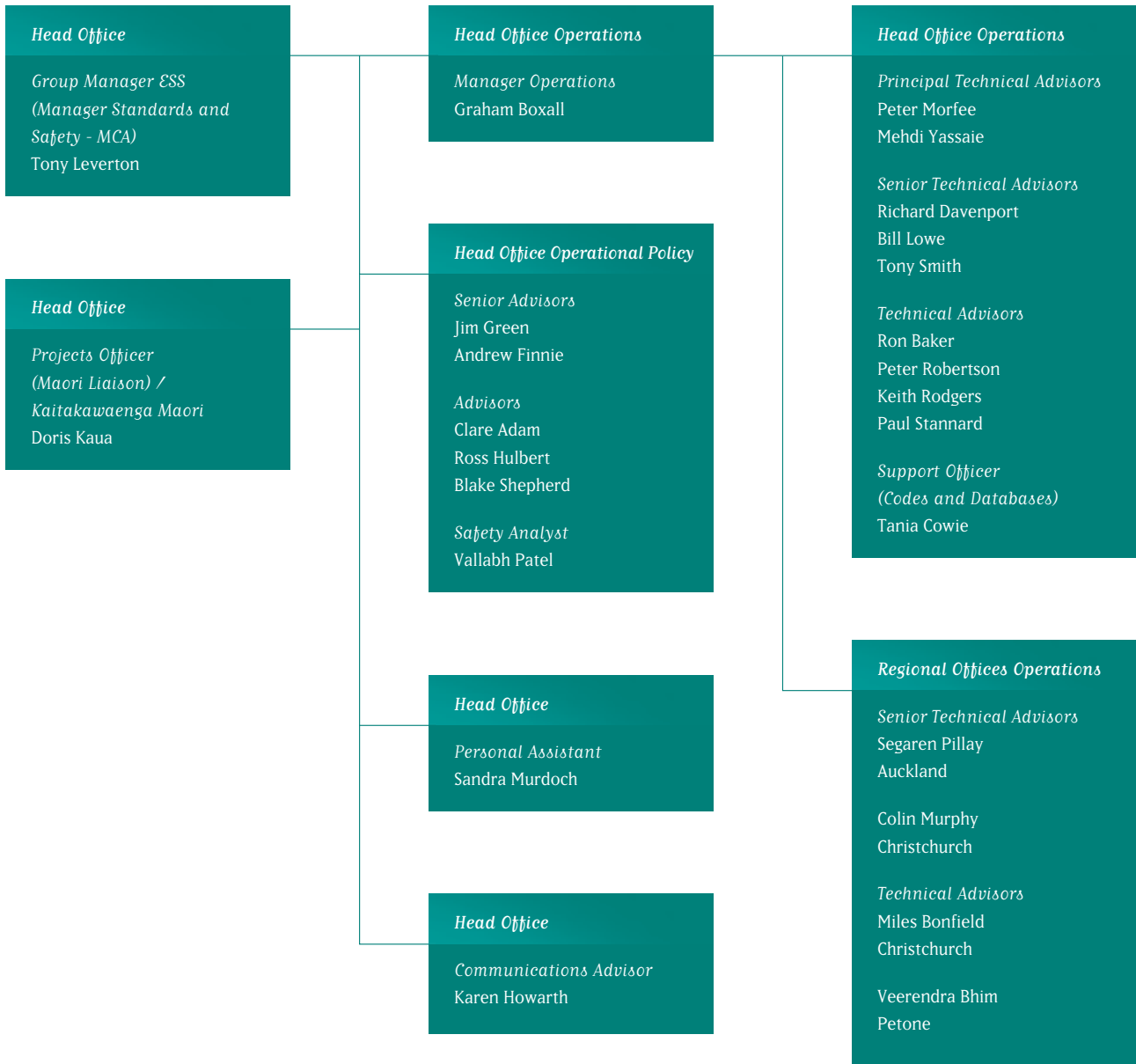
| | | | |
|-------------------------------|------------------|------------------|------------------|
| Expenses | | | |
| Personnel expenses | 1,014,625 | 1,009,673 | 1,008,308 |
| Operating expenses | 1,024,524 | 959,460 | 1,119,006 |
| Depreciation | 9,786 | 46,033 | 24,210 |
| Capital charge | 3,403 | 3,604 | 3,397 |
| Indirect and Support services | 701,642 | 641,205 | 553,307 |
| Total Expenses | 2,753,980 | 2,659,975 | 2,708,228 |
| Surplus/(Deficit) | - | 21,814 | - |

Natural Gas Summarised Statement of Financial Performance for the year ended 30 June 2003

| | 2002/03 Actual \$ | 2002/03 Budget \$ | 2001/02 Actual \$ |
|-------------------------------|----------------------|----------------------|----------------------|
| Revenue | | | |
| Natural Gas Levies | 795,560 | 840,877 | 826,895 |
| Miscellaneous revenue | -7 | - | 482 |
| Total Revenue | 795,553 | 840,877 | 827,377 |
| Expenses | | | |
| Personnel expenses | 335,884 | 324,653 | 323,804 |
| Operating expenses | 225,607 | 289,706 | 306,654 |
| Depreciation | 3,209 | 12,085 | 7,319 |
| Capital charge | 879 | 931 | 826 |
| Indirect and Support services | 229,974 | 209,820 | 188,774 |
| Total Expenses | 795,553 | 837,195 | 827,377 |
| Surplus/(Deficit) | - | 3,682 | - |

Petroleum Monitoring Summarised Statement of Financial Performance for the year ended 30 June 2003

| | 2002/03 Actual \$ | 2002/03 Budget \$ | 2001/02 Actual \$ |
|-------------------------------|----------------------|----------------------|----------------------|
| Revenue | | | |
| Petroleum Monitoring Levies | 319,756 | 279,078 | 330,503 |
| Miscellaneous revenue | 5 | - | 59 |
| Total Revenue | 319,761 | 279,078 | 330,562 |
| Expenses | | | |
| Personnel expenses | 51,770 | 51,161 | 40,742 |
| Operating expenses | 225,910 | 187,584 | 266,018 |
| Depreciation | 582 | 2,255 | 908 |
| Capital charge | 160 | 169 | 89 |
| Indirect and Support services | 41,339 | 38,329 | 22,805 |
| Total Expenses | 319,761 | 279,498 | 330,562 |
| Surplus/(Deficit) | - | -420 | - |



| | |
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The Energy Safety Service is part of the Ministry of Consumer Affairs, an operating branch of the Ministry of Economic Development.

* The Group Manager, ESS reports to the General Manager, Ministry of Consumer Affairs.

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te ratonga whakaruru pūngao