

Energy Safety Service Electricians' and Gasfitters' compliance with energy safety legislation

Qualitative Research Report

9 March 2005

CONFIDENTIAL

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with energy safety legislation**

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Executive Summary

In 2002, the Energy Safety Service (ESS) and Ministry of Consumer Affairs (MCA) commissioned BRC to conduct a telephone survey of Electricians and Gasfitters, to learn more about tradespersons' attitudes, knowledge and behaviour with respect to the relevant energy safety legislation. The 2002 survey found a significant proportion of Electricians and Gasfitters did not engage in the correct testing, reporting, certification or other obligations required by the relevant legislation. However, a low proportion of tradespersons acknowledged that they had created an unsafe work environment in the last 12 months, while a high proportion of tradespersons reported that they were unaware of their legal obligation to report certain types of hazards and accidents to ESS. In addition, a substantial proportion of both Electricians and Gasfitters were unaware of ESS and/or the role of this agency in monitoring safety-related and reporting requirements.

Based on the findings of the 2002 survey, the overall aim of the current research was to explore in-depth the underlying reasons for the following, and to identify appropriate courses of action:

- Shortcomings in tradespersons' knowledge of accident reporting obligations and processes.
- Obligations and regulations relating to testing new installations and issuing Certificates of Compliance and Gas Certification Certificates.
- Awareness of responsibilities under the energy safety acts and regulations.

The broad research objectives were as follows:

- To explore the underlying reasons why a significant proportion of tradespersons are not aware of and not complying with the requirements of energy safety legislation.
- To identify a feasible course of action (or actions) for modifying safety behaviours among tradespersons.
- To identify tradespersons' knowledge of ESS and how this might be improved.

Given the context of the 2002 quantitative findings, summarised in this section are key findings for the qualitative research. Refer to subsequent sections for full discussion of these findings.

Time/cost pressures, and insufficient testing, supervision, and skill are considered common causes of accidents and hazards

Gasfitting accidents and hazards are considered rare

All Gasfitters believed that accidents in the gasfitting trade were rare, given the nature of the work, the current legislation, and work practices. Therefore, little needed to (or could) be done by tradespersons or others to prevent hazards, as most practices were considered safe enough.

- Consistent with this opinion, few Gasfitters reported that they had personally experienced an accidental or near miss hazard¹ in the last year, or indeed, ever.

However, the following were discussed as general causes of actual or potential accidents and hazards (although these were not considered common per se):

- Time and/or cost pressures.
- Carelessness and insufficient testing.
- Lack of supervision.

The following were most frequently reported as the most effective means of avoiding hazards:

- Full testing of work.
- Taking more time, being more careful (even if this means passing the costs on to consumers, given that this cost will contribute to customer safety).
- Adequate training (i.e. in the need for testing, and use of testing equipment).
- More thorough reading and comprehension of the Standards book, and manufacturers' instructions.
- Fully informing customers of appliance/installation operating instructions.

¹ Accidental and near miss hazards were defined as those that may have been hazardous to the tradesperson, other people or to property.

Electrical accidents and hazards are more common

Given the nature of electrical work, this industry was generally considered by Electricians to be more hazardous than gasfitting. Consistent with this perception, most of the Electricians interviewed reported that they had experienced at least one shock or burn in the last year, with several tradespersons having received many more shocks in this time. However, most of the shocks they had experienced were considered to be minor.

Importantly, in contrast to Gasfitters, Electricians were less likely to consider electrical accidents as uncontrollable or unavoidable; i.e. most hazards were believed to be the result of working on live electrical systems, which in many cases is avoidable. The following were reported as the main reasons why tradespersons worked live, or accidents might occur:

- Time and/or cost pressures, and customer expectations of time and cost (i.e. minimisation of time and cost).

The fact that they have to get jobs done so quickly, the pressure that you have to get the job done, whether that is because of the way the job has been priced or the pressure that the customer is putting on you, so you have to get the job done fast (Electrician, Owner/Supervisor, Christchurch).

- Potential disruption to customer.

You will get people ringing up saying, "You have wrecked my alarm clock" or "the dishwasher is not coming back on", and if you are only going to change a power point you are only going to blow your screwdriver up if you do something stupid, so my argument is it is worth the punt just do it live and put it back on (Electrician, Employee, More than 5 years, Wellington).

- Carelessness/lack of concentration or testing.
- Homeowner negligence or inexperience.

The following were most frequently reported as the most effective means of avoiding hazards:

- Always isolating power/never working on live systems.
- Asserting right to isolate power (i.e. to customer).
- Being less busy/taking more time, greater concentration/awareness.
- Ability to charge more.

- Changing customer expectations about rates and need for full testing.
- Stricter laws about “DIY” electrical work.

A generally low level of awareness of accident/hazard reporting requirements exists, especially among Electricians

Regardless of the circumstances (e.g. serious accidents, potential hazards, concerns about certifying appliances or installations), relatively few tradespersons – and particularly Electricians – were aware of the ESS or the need to report these circumstances to the ESS.

- Consistent with the 2002 quantitative results, few Electricians in the current research reported that they would report accidents or hazards to a government agency. In fact, even after prompting, many were unaware of the role of ESS, MCA, the Ministry of Economic Development or Ministry of Commerce in accident and hazard notifications.
- In contrast, most Gasfitters were aware of the need to inform ESS about accidents and hazards - this was particularly the case among Craftsman Gasfitters, while less experienced Gasfitters lacked this awareness.
- Also consistent with the 2002 quantitative research, few Electricians were aware of the requirement to report hazardous appliances, installations or fittings to the ESS or other government agencies. While the Commerce Commission was mentioned, no Electricians mentioned the role of the ESS.
- In contrast, many Gasfitters, and particularly Craftsman Gasfitters, were aware of the legal requirement to report these circumstances to ESS. Several Gasfitters reported an awareness of ESS’ role in inspecting or investigating hazard notifications. These Gasfitters were also aware of the ESS’ appliance register website.
- In terms of seeking clarification about whether a new appliance or installation was certified, most Gasfitters reported that they would refer to the ESS website of registered appliances if they needed to confirm product registration.
- In contrast, no Electricians reported awareness of the ESS generally, or the ESS website specifically, as a source of information for clarifying certification issues.

Among both Electricians and Gasfitters, the following were other frequently reported avenues for reporting serious accidents and hazards:

- OSH/ACC.
- Registration Boards – EWRB for Electricians and the PGDB for Gasfitters.
- Employers/Supervisors.

Similarly, Gasfitters and Electricians mentioned the following as other people or organisations they would contact to report hazardous appliances, installations or fittings:

- Appliance/property owner.
- Registration Board s – EWRB for Electricians and the PGDB for Gasfitters.
- Other sources included the manufacturer or supplier, fellow tradespersons, employers, inspectors, and ECANZ.

In relation to clarifying the certification of appliances and installations, consistent with the 2002 quantitative survey, several Gasfitters and Electricians mentioned that in the first instance, they would refuse to install an appliance or installation if they were unsure whether or not it conformed to regulations. The owner would be informed, and if necessary, instructed to get a suitable replacement. In addition, Gasfitters would consult with the following sources (other than the ESS):

- Manufacturer/supplier.
- PGDB.
- Also, other tradespersons/colleagues, and the Standards book.

Electricians suggested they would consult the following sources in these circumstances:

- Inspector/other tradespersons.
- Standards book.
- EWRB and/or ECANZ.
- Manufacturer/supplier.

An independent electrical inspector... I would give him a call and ask him and they are normally a wealth of information. They might even go and research it a bit themselves if it confuses them, which is good (Electrician, Employee, Less than 5 years, Auckland).

I would ask the Registration Board what needs to be done, I don't want to spend the day chasing around people and telling them about faulty equipment. I just want to phone up the Registration Board and say, "Here it is, what are you going to do about it, what do you want me to do about it" and give them the sample, then they can follow it through. Once I have let the Registration Board know, it is out of my hands (Electrician, Employee, Less than 5 years, Christchurch).

Reasons for non-reporting

Reasons for non-reporting of accidents and hazards were generally similar for both Gasfitters and Electricians (i.e. regardless of trade). The primary issues included the following:

- The hassle of reporting.
- A perception that agencies and/or inspectors often come after the wrong person (i.e. the person reporting the hazard rather than the person actually at fault).
- Reluctance to "back-stab" or "dob in" colleagues or other tradespersons.
- Among Gasfitters especially, a general consensus that there is currently no organisation that supports or "is there for" the Gasfitter.

Encouraging appropriate reporting

There was a general consensus among both Gasfitters and Electricians that reporting is the tradesperson's own responsibility. Therefore, if a tradesperson won't report now, very little (or no Government agency) is going to change their attitudes or behaviour. Despite this, the following were discussed as potential means of improving compliance:

- Clearer and more widely distributed guidelines about reporting requirements and the reporting process.
- Greater promotion and publicity of reporting issues generally.
- Greater promotion of safety and reporting obligations through Gasfitters' compulsory annual accreditation system, and other trade-related training programmes.

- An easily accessible/well-publicised 0800 phone number.
- A “rating” system on practising licences.
- Wider distribution and promotion of the annual Accident Summary handbook.

Colleagues and standards books, but not the ESS, are considered the most useful sources of information

Only a few Gasfitters mentioned ESS as a useful source of information (i.e. those few with existing awareness of ESS). Importantly, **no Electricians mentioned the ESS**. Even among tradespersons reporting ESS as their most useful source, the agency was considered mainly in relation to its online appliance register, rather than as a source of other types of information.

In contrast, among Gasfitters, the following were frequently mentioned as the most useful sources of information and advice:

- Standards book.
- Fellow tradespersons, and inspectors.
- PGDB.
- Manufacturers.

Similarly, among Electricians, the following sources were considered most useful:

- Inspectors.
- Standards book.
- ECANZ and EWRB.

Tradespersons believe testing requirements are typically met, though several issues may contribute to non-testing

When Electricians were asked whether, in the last 12 months, they had personally been in a position where they think they should have carried out an appropriate test but did not do so, most respondents reported that they had not been in such a situation – i.e. they always test as required.

Similarly, most Gasfitters reported that, in the last 12 months, they had not been in a position where they think they should have carried out an appropriate test but did not do so.

The apparent contradiction between the perceived high level of compliant testing, and the extent to which inadequate testing is considered a factor contributing to accidents and hazards (as well as the low levels of compliance measured in the 2002 quantitative survey), suggests at least one of two possibilities:

- A tendency to believe that “others” are not testing, rather than themselves (i.e. depersonalising the extent of non-testing, not wanting to be seen as doing the wrong thing).
- Possible low awareness of all the required tests (and therefore not really knowing whether or not the prescribed requirements are actually being met).

Reasons for non-testing

There was a general consensus among Gasfitters and Electricians that in most cases, the required testing is usually completed as required, and therefore lack of testing is not a considerable problem among tradespersons generally. However, when discussing why tradespersons might not complete all tests when these are required, Gasfitters and Electricians generally discussed the same common issues. The following were most typically considered as possible reasons for non-testing:

- Time and/or cost pressures, and the “hassle” of testing.
- Perception of “adequate” or basic testing, together with laziness, over-confidence, or complacent attitudes.
- Insufficient training or understanding of testing requirements, or lack of adequate testing equipment.

Encouraging appropriate testing

As for issues related to reporting obligations, there was a general perception of tradespersons having self-responsibility for testing and awareness of requirements, particularly under the current self-certifying system. Therefore, if a tradesperson currently won't do all the required tests (despite legal obligations), nothing more will encourage them to change their behaviour.

[If] you are doing self-certifying work then the onus is on you to make sure it is done right, there should be no need for someone else to be on your shoulder (Gasfitter, Craftsman Supervisor, Auckland).

However, Gasfitters suggested the following strategies as possible means of improving testing compliance:

- More regular auditing/inspections/supervision.
- Appropriate training through the compulsory annual accreditation system.
- Appropriate encouragement and promotion of testing compliance issues through trade newsletters and journals.

Among Electricians, the following strategies were considered as possible means of improving testing compliance:

- Less time pressure, and/or the ability to charge more realistic rates.
- Appropriate training and communications.
- More regular auditing, inspections, and supervision.
- Clearer and more accessible guidelines.
- Clearer requirements on Certificates of Compliance (CoCs).

Electricians are less likely than Gasfitters to comply with certification requirements

Gasfitters almost unanimously reported no knowledge or concern about non-issuing of compliance certificates, either personally or among Gasfitters generally. Specifically, most respondents did not know of other Craftsman Gasfitters who did not issue Gas Certification Certificates (GCCs) when they should (i.e. they believed that all Craftsmen issue certificates whenever required, or at least did not know of circumstances where this was not true).

- Furthermore, few respondents could think of any reasons why a tradesperson would not issue a GCC when required.

In contrast, half of the Electrician respondents were aware of others who had not issued CoCs when these were probably required. However, two Electricians who were aware of non-issuing of CoCs insisted that, while CoCs might not be issued for small jobs (e.g. installing a new power point) because of the cost, they were always issued for big projects. Also, CoCs were always issued whenever a customer requested one.

Other suggested reasons for not issuing CoCs included the following:

- Inconvenience of buying CoCs and filling them out.
- Inadequate auditing, and a perception that nothing gets done with CoCs.

We keep them all at home, and if they are going to audit they will ring up and say, "I want this and this one". I have been audited and they took five out and they were all like 'install a towel rail', 'install a security light', all these stupid ones. I said to the guy "I have done 15 houses here, I would really like you to do one of those", [but I was told] "No we are not doing those". (Electrician, Employee, Wellington).

Given the above, Electricians reported a few potential means of improving the issuing of CoCs in their industry:

- Encouragement through training and communications – particularly, getting tradespersons into the habit from as early as possible.
- Reducing the cost.
- More frequently passing the cost on to the consumer, even for small jobs.
- More regular and more comprehensive auditing.

While most tradespersons believe government agencies have an important role in trade safety, there is low awareness of the ESS' role

Most tradespersons believed that government agencies **should** have a role in relation to safety in domestic gasfitting and electrical work. However, there was some difference of opinion about what this role is or should be, in particular how much of a role the government should have. Most tradespersons believed that the government has an important role in overseeing safety (particularly as it is “independent” from the industry, unbiased, and free from commercial pressures). In contrast, other tradespersons would prefer the government to be less “hands-on”, believing it should not get overly involved or intervene in issues that should be handled by the trade itself.

Also, Gasfitters and Electricians were typically less certain about which government agencies are or should be responsible for these functions. Importantly, many tradespersons were unaware of ESS altogether (even after prompting) – this was particularly true of Electricians. Only a small number (of more experienced) tradespersons mentioned the ESS as having a role in relation to safety. Some tradespersons had heard of the ESS but had no (or only a vague) understanding of what the ESS was or does. Some tradespersons knew there was some government Ministry or agency that had involvement in energy safety issues, but did not know or could not recall what Ministry this was.

- Even among Gasfitters who were aware of the ESS, this was mainly in relation to its role in the regulation of registered appliances (particularly through its online registered gas appliance database). Only a few had any awareness of ESS' role in accident and hazard notification, reporting, and inspection.

Improving communication between ESS and tradespeople

Given the generally low awareness of ESS and its functions, most tradespersons were adamant that ESS has a lot to do to raise awareness of its existence and role. In particular, tradespersons need to be made aware of fundamental information:

- Who ESS is.
- What ESS' role is in relation to energy safety.
- What ESS actually does to fulfil this role.
- How this role differentiates it from other related organisations.
- What obligations and responsibilities tradespersons (and the trades generally) have in relation to ESS.

In terms of how ESS could best communicate with tradespeople, two suggestions were provided most frequently:

- Direct mail communication (e.g. letters and informative material) with individual tradespersons, and with businesses.
- Advertising through relevant trade journals, newsletters, and related publications.

Many strategies have the potential to improve awareness, compliance, and safe behaviour

While it is widely believed that it is the tradesperson's own responsibility to comply with standards and other obligations, the following suggestions were provided as potential means of improving awareness of safety issues, and encouraging compliance with standards, codes, and other requirements:

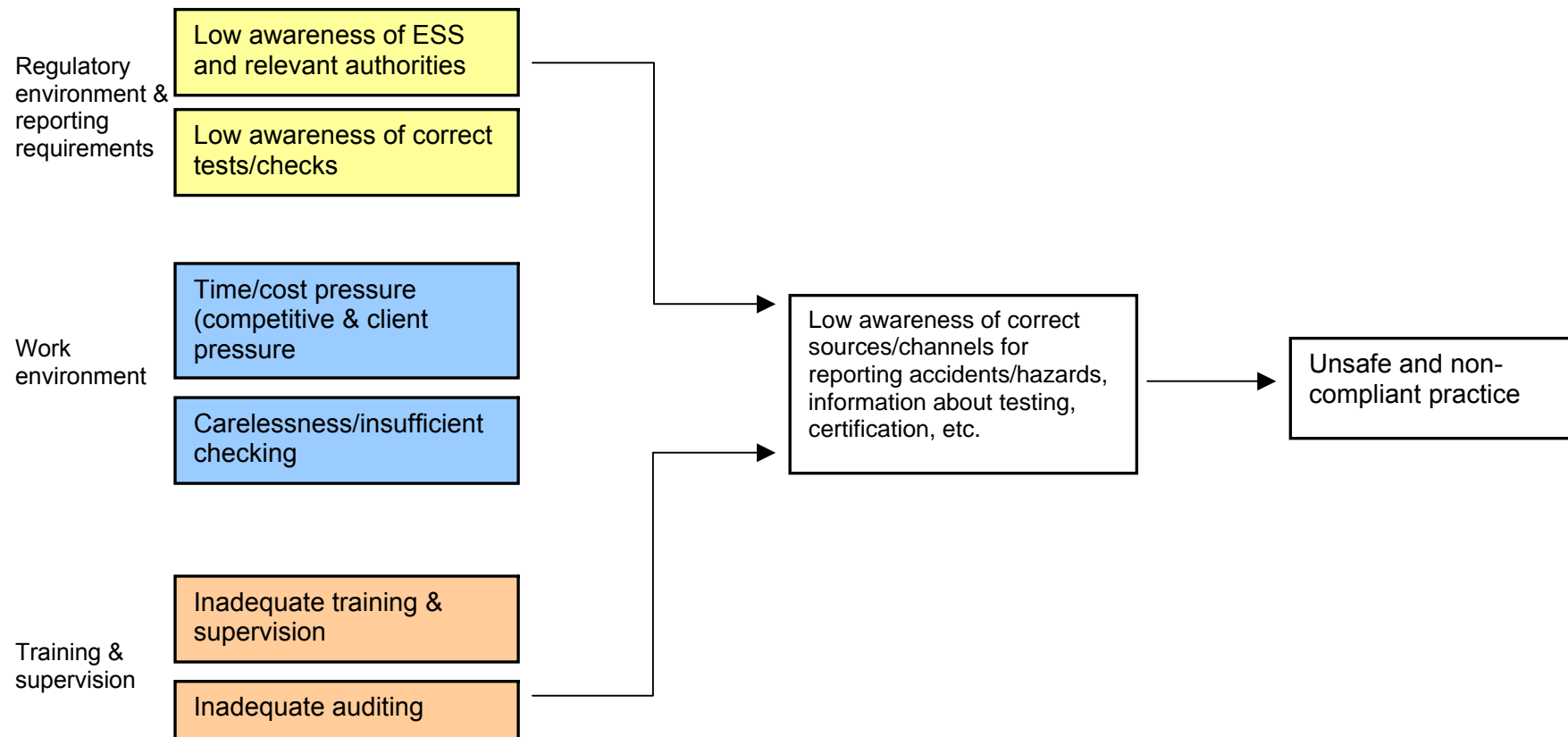
- More regular inspections or auditing.
- Occasional seminars organised by the ESS and/or registration boards.
- Safety communications in trade publications (e.g. newsletters, magazines, journals).
- Compulsory safety/testing courses.

- Encouraging the electrical industry to charge more realistic rates, and helping to change customers' expectations accordingly.
- Encouraging more young people to enter the industry through apprenticeships.
- A specific safety section in the Standards books.
- Ratings on practising licenses that reflect the extent to which tradespersons have met or demonstrated safety, compliance and reporting obligations and/or knowledge.
- Wider distribution and promotion of the annual ESS/MCA Accident Reports Summary booklet.
- Communications for the general public, educating them about the risks involved in gasfitting and electrical work, the need to use registered tradespersons.

Conclusions and recommendations

The following model (Figure 1) provides a high-level summary of the primary factors contributing to an increased risk of accidents and hazards common to both the electrical and gasfitting trades, focusing on factors related to the regulatory environment & reporting requirements, the work environment, and training/supervision issues.

Figure 1: Model of factors contributing to increased accident and hazard risk



Conclusions

Based on the findings from the 2002 quantitative research, and the qualitative research discussed above and in the remainder of this report, we have highlighted the following conclusions for further consideration:

1. Gasfitters and Electricians generally believe their respective industries are, for the most part, accident- and hazard-free

Concurrently, there is a general belief that the majority of tradespersons comply with reporting, testing, and certification requirements most (if not all) of the time.

- a. This perceived compliance contradicts with the low levels of compliance reported in the 2002 quantitative research. However, current respondents may be dissociating themselves or depersonalising the extent to which non-testing occurs, because of not wanting to be seen as doing the wrong thing. i.e. expressing a belief that “others” may not comply, but not “myself”. Also, the identification that certain problems or issues may exist for “other” tradespersons can be taken as tacit acknowledgement that these issues do exist in the trades generally, despite respondents depersonalising themselves from these problems. Taken together with evidence from the quantitative research, there is reasonable evidence that safety and compliance issues do exist in the electrical and gasfitting trades.
- b. Also, some tradespersons may be unaware of all the prescribed tests and reporting requirements, and therefore would not know whether or not all requirements are actually being met (i.e. they think they are meeting all requirements, when in fact they are not).
- c. In addition, several tradespersons reported that they don't know the extent to which other tradespersons might comply with requirements, indicating that a certain level of “under-reporting” exists.

2. There are exceptions to the perceived levels of compliance

In particular, the risk of accidents or hazards is considered to be greater in the electrical industry, given the nature of the work involved. Also, specific pressures exist in both trades (e.g. time, cost, training, testing) that are perceived to contribute to current levels of accident risk, non-reporting of accidents and hazards, non-testing, and non-issuing of compliance certificates. In addition, there are concerns that consumers and other unqualified tradespersons put themselves at risk when they attempt to work on electrical or gas installations and appliances, because they lack the required skill and knowledge.

3. There is confusion about the reporting process among tradespersons in both industries

Confusion exists regarding the appropriate circumstances to report, who to report to, how the reporting process works, and what might be their continued involvement in inspections or other related activity.

4. The ESS is in a good – but under-utilized – position to improve awareness and compliance amongst tradespeople

Importantly, most tradespersons agree that government agencies should have a role in relation to safety in domestic gasfitting and electrical work, particularly as such agencies are “independent” from the industry, unbiased, free from commercial pressures, and in a position to oversee the whole of these industries. In addition, the ESS is already providing the services and functions that are required.

5. However, there is currently low awareness of the ESS and related information

This is particularly true among Electricians, who have very little awareness of the annual Accident Summary handbook, or ESS generally. However, while most Gasfitters are aware of the appliance registration website, there is relatively little awareness of other information, including the annual Accident Summary handbook.

6. Even where tradespersons are aware of the ESS, there is confusion about ESS' exact role

As discussed earlier, there is lack of knowledge about who ESS is, what ESS' role is, what ESS does to fulfil its role, how this role differentiates it from other related organisations, and what obligations and responsibilities tradespersons have in relation to ESS. As such, in the eyes of tradespersons generally, the ESS is currently not effective in carrying out its role.

7. Also, there is confusion about the roles of a number of related agencies

The existence of several industry-related organisations, including the ESS, the Commerce Commission, the registration boards, OSH, and ECANZ, leads tradespersons to frequently confuse which agency is responsible for what, with little awareness of what distinguishes one agency from another. This confusion is compounded by the fact that, in general, tradespersons do not typically contact or interact with these organisations on a regular basis.

Recommendations

Given the above conclusions, BRC suggests the following recommendations should help to increase awareness of ESS, and safety and compliance issues generally, among tradespersons:

1. There is a need to raise the ESS' profile and relevance for tradespersons, as well as raising awareness of safety and compliance requirements

Taken together, the findings of both the qualitative and quantitative research indicate a need for more clear, unambiguous communications that are frequent and wide-reaching (i.e. targeted towards tradespersons and the industries generally) that clarify the role of ESS, the obligations of tradespersons to the ESS (and related organisations), and other safety and compliance requirements.

Importantly, the ESS needs to proactively promote itself and safety/compliance requirements. Tradespersons are already busy enough with their own daily work to specifically seek out this information for themselves – they don't have time to make this a priority. Therefore, information needs to be provided to them directly, as easily accessible and "digestible" as possible.

2. There is a need for closer links between all relevant trade agencies

All agencies involved in the electrical and gasfitting trades, including the ESS/MCA, the registrations boards, ECANZ, and OSH, have a part to play in increasing tradespersons' knowledge of safety and compliance issues. To differing degrees, tradespersons already have contact and relationships with some or all of these organisations. However, there is a need for closer links between all these agencies, with a primary aim to more clearly communicate the respective roles and responsibilities of each agency, and to point tradespersons in the right direction when required.

In its position as an "independent" supervisory body, the ESS is possibly best placed to initiate these inter-agency links and relationships.

3. A variety of opportunities exist for the ESS to introduce, or encourage the introduction of, a wide range of interventions to increase awareness and compliance

Given their understanding of their own industries, and what information channels currently do and do not work for tradespersons, Gasfitters and Electricians have suggested a wide variety of strategies that could assist the ESS and similar agencies to increase awareness of trade-related issues, and to promote higher levels of compliance and safe practice amongst tradespeople – including communications (in trade newsletters, journals and magazines), appropriate training and examinations (including re-training and refresher courses), legislation, and general support for, and links with, the industries.

4. Additional research will allow the ESS to adequately monitor the progress of interventions, communications and tradesperson behaviour

Following a sufficient period to allow interventions to “bed-down” and have some measurable effect on tradesperson behaviour (e.g. probably in two to three years time), additional quantitative research will allow the ESS to monitor the impact of any interventions on tradespersons’ behaviour, and to assess the extent to which communications have improved the ESS’ profile among tradespersons.

This monitoring research may best be operationalised by updating the 2002 quantitative research, and following the bedding down period could be continued on a regular (possibly annual) basis to provide the ESS with frequent information on which to make better decisions about trade safety and compliance requirements.

Introduction and information requirements

Background

The Energy Safety Service (ESS) and the Ministry of Consumer Affairs (MCA) comprise the Consumer Affairs branch of the Ministry of Economic Development. The MCA policy section is responsible for the development of legislation relating to electrical and gas appliance safety and installation. The ESS performs safety-related functions under that legislation.

In 2002, a telephone survey of Electricians and Gasfitters was conducted, to learn more about tradespersons' attitudes, knowledge and behaviour, with respect to the relevant energy safety legislation. The survey also explored the extent to which domestic electrical and gas appliance installations complied with the relevant safety requirements and legislation.

The 2002 survey found a significant proportion of Electricians and Gasfitters did not engage in the correct testing, reporting, certification or other obligations required by the relevant legislation. However, a low proportion of tradespersons acknowledged that they had created an unsafe work environment in the last 12 months, while a high proportion of tradespersons reported that they were unaware of their legal obligation to report certain types of hazards and accidents to ESS. In addition, a substantial proportion of both Electricians and Gasfitters were unaware of ESS and/or the role of this agency in monitoring safety-related and reporting requirements.

Research and information requirements

Based on the findings of the 2002 survey, the overall aim of this research was to explore in-depth the underlying reasons, and to identify appropriate courses of action, for the following:

- Shortcomings in tradespersons' knowledge of accident reporting obligations and processes.
- Obligations and regulations relating to testing new installations and issuing Certificates of Compliance and Gas Certification Certificates.
- Awareness of responsibilities under the energy safety acts and regulations.

The broad research objectives were as follows:

- To explore the underlying reasons why a significant proportion of tradespersons are not aware of and not complying with the requirements of energy safety legislation.
- To identify a feasible course of action (or actions) for modifying safety behaviours among tradespersons.
- To identify tradespersons' knowledge of ESS and how this might be improved.

In the context of the above research objectives, the specific information areas covered by this research are:

- Identify the underlying reasons for tradespersons' not reporting electrical and gas-related serious accidents when they should, and unsafe installations and appliances that present immediate danger to life or property, and how this might be improved.
- Identify sources of information and advice tradespersons use for determining whether the work that they undertake conforms to regulations, as well as reliability and satisfaction with the information.
- Identify the underlying reasons for tradespersons' not issuing CoCs and GCCs, explore low awareness of correct circumstances for issuing CoCs and GCCs, and to encourage behaviour change to influence the issuing of appropriate certificates.
- Identify the underlying reasons as to why electrical shocks and gas leaks occur, and how this situation might be practically improved.
- Identify why a significant number of tradespersons do not carry out appropriate tests after new installations or repairs, and do not own or have access to the relevant test equipment.
- Identify the underlying reasons behind the significant number of tradespersons that do not own and/or use relevant (installation) standards and codes.

- Identify feasible strategies for changing incorrect behaviour, in order that legislative safety requirements are met.

Method

Sample design

Given the need for in-depth qualitative information related to electrical and gas safety awareness, knowledge and behaviour, individual elicitation interviews were considered to be the most appropriate and cost-effective methodology. Given a requirement to include tradespeople from three urban locations across New Zealand (i.e. Auckland, Wellington, and Christchurch), it was agreed to conduct face-to-face interviews with Wellington tradespeople, and to conduct phone interviews with non-Wellington tradespeople.

Gasfitter respondents were randomly selected from the Plumbers, Gasfitters and Drainlayers Board (PGDB) database of registered Gasfitters, with ESS acting as an “intermediary” on BRC’s behalf to achieve this.

The Electrical Workers Registration Board (EWRB) was unable to provide a similar database of registered Electricians. Instead, an electronic database of Electricians and Electrical Contractors was obtained from the Telecom Yellow Pages. Organisations and/or individual Electricians were then randomly selected from this database. Where an electrical organisation was contacted, a screening process was used to select the required Electrician, with only one respondent recruited from any one company.

A total n=17 interviews were completed, including n=9 with Gasfitters and n=8 with Electricians. For each trade, respondents were selected to fulfil a number of criteria based on regional location, number of years of registered practise, and/or supervisory experience.

In each of the three regions, one Gasfitter was recruited for each of the following three criteria (i.e. n=3 Gasfitters per region):

- Craftsman Supervisor.
- Craftsman Non-Supervisor.
- Registered Gasfitter (Non-Craftsman).

Similarly, in each of the three regions, one Electrician was recruited for each of the following three criteria (i.e. n=3 Electricians per region):²

- Owner-operator and/or Supervisor.
- Employee with more than five years experience.
- Employee with five or fewer years experience.

Interviewing

Both face-to-face and telephone interviewing took place in or from BRC's office in central Wellington, between 19 November 2004 and 13 January 2005. Interviews took the form of semi-structured discussions lead by the project managers. Interview guides were used to guide discussions, allowing for the use of open-ended probing for additional information where necessary. Copies of the interview guides are included in Appendix A.

Reporting

In each of the following sections, detailed findings are presented and discussed in relation to each of the required information areas outlined above.

Findings are discussed separately for Electricians and Gasfitters where respondents provided differing issues or responses. However, where common issues or themes were raised by both sets of tradespersons, the discussion has been combined for both Electricians and Gasfitters.

² Due to the considerable effort required to recruit respondents around the Christmas/New Year period (particularly through the Yellow Pages source for Electricians), and because several potential respondents failed to show for appointments, it was decided to interview one less Electrician. This did not adversely impact the research because consistent responses had already been observed across the first n=8 Electrician respondents. The unfilled interview position was for an Auckland Electrical employee with more than five years experience.

Causes of accidents and hazards

Gasfitting accidents and hazards

Gasfitters typically made a distinction between “controllable” (i.e. avoidable) accidents and uncontrollable or “freak” (i.e. unavoidable) accidents. Controllable accidents were those considered to be the result of tradesperson error or negligence, and therefore safer or more effective work practices could be identified to avoid these in the future. Uncontrollable accidents were considered to be “unlucky” outcomes of a specific work situation, in particular environmental circumstances that could not be influenced or avoided by the tradesperson, and therefore could not be predicted or controlled in the future.

There are accidents that you are never going to get away from but a lot of things that are put down to accidents could have been done a bit better safety wise, but there are going to be accidents that are completely out of your control (Gasfitter, Craftsman (Non-Supervisor), Wellington).

Despite this distinction, all Gasfitters believed that accidents in the gasfitting trade were rare, given the nature of the work, the current legislation, and work practices. Therefore, little needed to (or could) be done by tradespersons to prevent hazards, as most practices were already safe enough.

- Consistent with this attitude, few Gasfitters reported that they had personally experienced an accidental or near miss hazard³ in the last year, or indeed, ever.

³ Accidental and near miss hazards were defined as those that may have been hazardous to the tradesperson, other people or to property.

- Gasfitters discussed a range of causes of actual or potential accidents and hazards, including general or systemic issues as well as more specific work practices. In terms of more specific causes (many related to tradesperson carelessness or error), the following were frequently mentioned:
 - Leaking pipes (i.e. pipes not connected properly).
 - Insufficient purging of pipes.
 - Lack of ventilation.
 - General lack of understanding about job requirements and/or the existing work environment or conditions.
 - Coming into an existing “risky” situation (i.e. left by a previous tradesperson), often without awareness of the risk.
- In terms of general or systemic issues (most of which were believed to result in the specific errors or practices discussed above), the following were typically of greatest concern:
 - Time and/or cost – i.e. doing a job as quickly as possible because of the need to move on to other jobs (i.e. not having time to engage in the safest practices). Several Craftsman Gasfitters noted the common need to quote the lowest possible price in order to “win” a job or contract (to avoid being undercut and losing the work), which then meant they couldn’t afford the time for proper safety or testing.

It comes down to money and contracts that people will try and do the quickest job possible, trying to cut corners, trying to get their job done quicker. If they quote low they have to make it up somewhere and a lot of people do it, but it is bloody silly (Gasfitter, Craftsman (Non-Supervisor), Wellington).

- Carelessness and insufficient testing – often a result of time pressure (as above). Some Gasfitters also discussed carelessness as a result of blasé attitudes among some tradespersons, including over-familiarity or over-confidence with the work. i.e. because most jobs do not result in hazards or accidents, there is a sense that Gasfitters can “get away” with not doing all the required tests.

Guys just being blasé, they think they are doing right and it back fires. New guys tend to be more safety conscious for a while, they do the test and preliminaries right, [but] when they get used to it they tend to do short cuts (Gasfitter, Craftsman (Non-Supervisor), Wellington).

- Lack of supervision (i.e. among less experienced tradespersons) – there is no guarantee that adequate testing has been completed unless a tradesperson is supervised or observed by another person; therefore, there is always a risk that unsupervised tradespersons may not engage in the safest practices. Related, there were some concerns that, due to increased workloads and/or a depleted workforce (i.e. fewer experienced practising Gasfitters today than in the past), younger tradespersons are left unsupervised more frequently now than in previous years.
- However, most Gasfitters were adamant in their belief that while the above risks and issues were the *most common* causes of hazards, these causes were not very common per se (i.e. these do not occur very frequently in absolute terms).

If you are trained and you do things properly it is very safe and very easy (Gasfitter, Craftsman Supervisor, Wellington).

Avoiding gasfitting accidents and hazards

Based on the above causes of accidents and hazards, the following were most frequently reported as the most effective means of avoiding hazards:

- Full testing of work.

Test as often as possible... when you are working on an old system the general thing is you test the gas tightness before you start the job, if there is a leak you have got to find it. If there is no leak you do the job and you test again, you always test before any appliance is hooked up (Gasfitter, Craftsman (Non-Supervisor), Wellington).

- Taking more time, being more careful (even if this means passing the costs on to consumers, given that this cost will contribute to customer safety).
- Adequate training (i.e. in the need for testing, and use of testing equipment).
- More comprehensive auditing.

The Plumbing and Gas Fitting Board that do the audits, they should do it more often. You should get audited every year and that is going to keep you on your toes. They ask you questions about different things about gas fitting and safety, I am not sure whether they come and check out your work or not (Gasfitter, Registered (Non-Craftsman), Christchurch).

- More thorough reading and comprehension of the Standards book.
- More thorough reading and comprehension of the manufacturer's instructions.

- Fully informing customers of appliance/installation operating instructions.

When we install something, part of our commissioning process is that we show the customer how to operate it, leave instructions, make sure they are all okay with the operating things. But the big problem is when you change house, normally all that information goes with the person who bought it or they might throw it out, it is generally not there. So a new person to a new house may not have had gas and not understand it, and they sometimes struggle to get things right (Gasfitter, Craftsman Supervisor, Wellington).

- A couple of Craftsman Gasfitters also suggested more thorough educating of customers about gas, and the smell of gas, is necessary.

Obviously, inform the customer of how to use the appliance safely, operation etc. Also to make sure that the customer knows the smell of gas, there are a lot of people who say "We think we have got a gas leak, I'm not too sure". So get them to smell the gas and make sure they are quite familiar with that type of odour... but just leaving the instructions is sometimes not the best thing to do, I tend to want to go back and make sure they [the customer] are there and show them (Gasfitter, Craftsman (Non-Supervisor), Christchurch).

Electrical accidents and hazards

Given the nature of electrical work, this industry was generally considered to be more hazardous than gasfitting. Consistent with this perception, most of the Electricians interviewed reported that they had experienced at least one shock or burn in the last year, with several tradespersons having received many more shocks in this time (although burns were much less frequent than shocks, with many respondents noting that they have very rarely, if ever, received a burn). However, most of the shocks they had experienced were considered to be minor - none of the Electricians interviewed reported that their shocks had resulted in any immediate or long-term health consequences, or resulted in time off work. Shocks were generally considered a natural, and even an expected, consequence of electrical work.

Importantly, in contrast to Gasfitters, Electricians were less likely to consider electrical accidents as uncontrollable or unavoidable; i.e. most hazards were believed to be the result of working on live electrical systems, which in many cases is avoidable. While some Electricians indicated that it is sometimes necessary to work on live wires (e.g. to complete certain tests), and that some accidents are uncontrollable, the consensus was that most shocks could be avoided with appropriate work practices.

I don't know if it is a common practice, I do it because I find it quicker and even when you are trying to find a fault in the house, it is quicker to find it with the power on because you are getting a response straightaway, rather than looking for a broken wire or faulty switch. But it shouldn't happen, it is a short cut (Electrician, Owner/Supervisor, Wellington).

With working on live systems being the primary cause of electrical shocks and burns, the following were reported as the main reasons why tradespersons worked live, or why accidents occur:

- Time and/or cost – as for Gasfitters, this was an over-riding concern. Many Electricians noted that isolating power supplies can slow down a job considerably, with the consequent impact on cost and/or the ability to move on to subsequent jobs sooner. As for Gasfitters, there is a certain amount of pressure to get jobs done as quickly as possible so that a greater number of jobs can be completed (i.e. to maintain income generation).

The fact that they have to get jobs done so quickly, the pressure that you have to get the job done whether that is because of the way the job has been priced or the pressure that the customer is putting on you, so you have to get the job done fast (Electrician, Owner/Supervisor, Christchurch).

- Customer expectations – related, respondents also perceived a certain level of pressure from customers, who typically don't expect to pay so much for an otherwise "quick" job (e.g. changing a light switch), because of the time required to isolate power and complete all relevant tests.

- Disruption to customer – most respondents reported a concern that electrical work can cause disruptions to the customer when mains power supplies are turned off - particularly for commercial and industrial customers, but also domestic customers (e.g. affecting computers, ovens, resetting electrical clocks and appliances). Hence, there is a desire to avoid these disruptions if possible, where the electrical work can still be completed without power isolation (again, changing light switches being a common example).

You will get people ringing up saying, “You have wrecked my alarm clock” or “the dishwasher is not coming back on”, and if you are only going to change a power point you are only going to blow your screwdriver up if you do something stupid, so my argument is it is worth the punt just do it live and put it back on (Electrician, Employee, More than 5 years, Wellington).

- Carelessness/lack of concentration or testing – as for Gasfitters, several Electricians noted that many electrical shocks are the result of tradesperson carelessness or laziness, losing concentration on the task, or wanting to complete a job more expediently. Some respondents mentioned that on relatively simple or frequent tasks they often go into “auto-pilot” mode, and may forget or neglect to realise they are working on something live. Related, as a result of being over-familiar some work, they will sometimes choose to work on a live system, or choose not to test a system, because the degree of risk is considered to be low (based on previous experience).

You do the job by remote control and you are thinking about the next bit of the job, so you don't stop, think and go (Electrician, Owner/Supervisor, Wellington).

- Miscommunication between co-workers – Several respondents noted that electrical accidents tend to occur only when working with colleagues, as a result of miscommunication. Specifically, one worker may assume that their colleague has isolated the power when in fact they have not, or power has been restored without this being communicated to co-workers.

Someone has said that something is dead and you don't check it yourself, and somewhere along the way there has been a cock up in communication, and you probably get a shock that way (Electrician, Employee, More than 5 years, Christchurch).

- Homeowner negligence/inexperience – some Electricians noted the tendency for homeowners without the necessary skill or knowledge to attempt installations, repairs or alterations of their own, often leaving unsafe components without even realising this (some respondents blamed the popularity of television shows, such as Target and DIY/renovation shows, for increasing homeowners' expectations that some electrical work is “easy enough” for them to try themselves). This was considered particularly hazardous when the Electrician is not informed of any previous work done, and therefore does not expect anything to be wrong.

Avoiding electrical accidents and hazards

Based on the above causes of electrical accidents and hazards, the following were most frequently reported as the most effective means of avoiding hazards:

- Always isolating power/never working on live systems – in some respects, considered an obvious “golden rule”, at least under ideal circumstances. However, there is often a need to test while live, so even if power is isolated during the work itself, hazards may still be unavoidable during the testing process. In some cases, stricter laws were considered necessary to stop Electricians working on live systems at all.
- Asserting right to isolate power – in terms of disruption to homeowners’ power supply, some Electricians believe that in a domestic context there is really no excuse to not isolate power. The tradesperson should feel able to assert the right to inform customers that power must be turned off – for everyone’s safety. It was believed that customers are usually understanding of this when warned in advance, and with courtesy. Again, this will require greater management of customer expectations.
- Being less busy/taking more time, greater concentration/awareness – taking the opportunity to not rush through a job would encourage Electricians to take a step back from their work and consider the safest means of testing and completing their work. After all, most tradespersons realise that it is more important to be safe than to work faster and take risky chances. In some respects, this is considered a matter of taking pride and care in one’s work. However, many Electricians consider this an ideal practice that is typically unrealistic, given the busy-ness and pressured nature of the current work environment. There is a belief among some that this issue is a greater issue for self-employed tradespersons.

When you are in a job and things are flowing along, sometimes you don’t stand back as much as you should. Having the power off is the way to do it (Electrician, Employee, More than 5 years, Christchurch).

- Ability to charge more – several more experienced Electricians suggested that the only way that workloads could be relaxed, at least enough to encourage safer practices, is by having the ability to charge customers more for electrical work. In this regard, Electricians compare themselves to other trades (e.g. Plumbers) that are able to charge more reasonably. Similarly, rates for electrical work should more accurately reflect the time and professional expertise required to complete a job thoroughly and safely. Currently the market is so competitive that any attempts to raise rates will be hampered by other tradespersons who will undercut prices. Some respondents believe that this problem could be negated by a more unified attitude among Electricians, working together to improve the standard of rates and working conditions for the industry as a whole.

Being able to charge more so when you go to a job you are not actually conscious of what it is costing, you just go in there and just do it. Instead of the customer going “That is bloody expensive for changing a switch, I could have done it myself”, because that is what we get, so you do it as quick as you can (Electrician, Owner/Supervisor, Wellington).

- Changing customer expectations – related to the above is a need to change customer expectations about what electrical work entails, and the appropriate cost of this work. In particular, customers must be made aware that Electricians are involved in “safety” work as much as, or more so, than just doing an electrical job.

If people were prepared to realise that being an electrician is actually a ‘safety job’ not a ‘doing job’, our job is... certainly as important as a dentist, probably more important than a dentist because... if you don’t do it right, you leave something dangerous (Electrician, Owner/Supervisor, Wellington).

- Greater health and safety emphasis in electrical companies – some Electricians believe that work and time pressures could be relieved by having companies adopt more stringent health and safety regulations they can fall back on. Having some “official” guidelines could help employees to resist demands to hurry through jobs.
- Stricter laws about “DIY” electrical work – to stop homeowners attempting their own electrical work when this is inappropriate or hazardous may require more stringent laws against such practice amongst unqualified people.

Causes of harm for tradespeople and consumers

Gasfitters and Electricians almost unanimously suggested that most harm to other tradespeople and consumers is most likely to be a result of installations, alterations or repairs attempted by these tradespersons or consumers; that is, without adequate knowledge, skill, or training. This was particularly the case for domestic electrical accidents, with the electricity generally considered of higher risk than gas-related installations.

Relatedly, Gasfitters were more likely than Electricians to suggest that trained professionals themselves might be the cause of harm, following incorrect or unsafe installations. However, even Gasfitters suggested that harm was more likely the result of the consumer's lack of knowledge.

Specifically, Electricians suggested the following as causes of harm for tradespeople and consumers:

- Installations/repairs attempted by unqualified/unskilled people – homeowners can be a great risk to themselves when they attempt electrical work of their own (e.g. to save money), without the requisite knowledge or skill to complete the work safely. They may make mistakes without even realising the risk they have created. This creates a risk not only for themselves, but also for any qualified tradespersons who may later come into the situation without the “trap” that has been set.

Homeowners will install a power point or a light and they can make a mistake without realising they are making a mistake. I really disagree that the homeowner is allowed to install wiring and connect an appliance. The ruling is they are not allowed to live it but they do, I don't think they should be allowed to touch anything electrical at all because it is a very dangerous industry... sometimes it can be very confusing if someone has been doing wiring and doesn't know how to terminate anything (Electrician, Owner/Supervisor, Christchurch).

- Relatedly, tradespersons or homeowners may lack adequate tools or equipment to complete a task safely. Even something as obvious as a ladder may not be safe enough to avoid risk of harm.
- Deterioration of installations – consumers may lack the necessary knowledge to recognise when an installation or appliance has deteriorated through age and use.

I think the main cause of accidents and damage to property is through deterioration of installations. The owner not being clued up enough to recognise that... we do a bit of work for one of the insurance companies and there has been one or two fires where it has been equipment failure on a switchboard... because in the circuit is where most problems seem to originate (Electrician, Employee, More than 5 years, Christchurch).

Similarly, Gasfitters suggested the following as causes of harm for tradespeople and consumers:

- Lack of knowledge/training - both tradespersons and consumers may lack the required skill for a gasfitting task. For tradespersons, this may involve not being adequately prepared for a job, not reading installation instructions thoroughly, or not getting more information when this is necessary.

Consumers may lack knowledge about how to correctly operate an appliance or installation, for example because they have not thoroughly read or understood operating manuals, or have not had instructions adequately explained by the tradesperson responsible for the installation. Also, consumers may be inadequately informed about servicing requirements.

Rough workmanship, things are not done properly... If you don't know what you are doing you have to go somewhere to find out. You should find more about the job before you jump in and go for it (Gasfitter, Registered (Non-Craftsman), Auckland).

- Incorrect/unsafe installations – a Gasfitter may inadvertently install an appliance in manner, or in a setting, that may lead to harm, for example, where there is inadequate ventilation.

Number one would be a poorly installed appliance as in poorly ventilated or poorly flued. That due to lack of knowledge and not reading the code. I don't think gasfitters tend to leave too many leaks behind, but an inexperienced person could quite unwittingly install an appliance in a room that is too small or is not properly ventilated (Gasfitter, Craftsman Non-Supervisor, Wellington).

There are some things that are just beyond your control. You can have a flue sticking out through a roof and the wind could be blowing in a certain direction and blowing it back down, when you install that you are not to know that (Gasfitter, Registered (Non-Craftsman), Christchurch).

- Digging up live gas lines – other workers may inadvertently tamper with or dig up live gas lines if they haven't adequately checked for this with the relevant authorities.

A drainlayer digging if there is a gas line that is live. All I can think of is underground really, in the way of digging up a gas line that is live. Say on a building site, you have just laid the main through and it maybe under test, it may be commissioned and then they decide they want to dig from there to there. And maybe it is possible just like water, Telecom, irrigation, it can be dug up (Gasfitter, Craftsman Non-Supervisor, Auckland).

Reporting of accidents and hazards

Organisations reporting to

Serious accidents and hazards

The 2002 quantitative survey indicated that the majority of both Gasfitters (86%) and Electricians (88%) had never contacted an organisation about a serious accident. However, these tradespeople mentioned a range of organisations that they *would* contact in such a situation, including:

- *Department of Labour/OSH* (26% of Gasfitters and 55% of Electricians).
- Their *Registration Board* (58% of Gasfitters and 45% of Electricians).
- *Gas/Electricity supply authority* (56% of Gasfitters and 12% of Electricians).
- Their *boss or employer* (2% of Gasfitters and 12% of Electricians).
- Among both Gasfitters and Electricians, there was relatively low awareness of the following as organisations to contact in the event of a serious accident: *ESS/Ministry of Consumer Affairs* (10% of Gasfitters and 6% of Electricians), *Ministry of Economic Development/Ministry of Commerce* (12% of Gasfitters and 10% of Electricians), and the *Office of the Chief Gas/Electrical Engineer* (4% of Gasfitters and 5% of Electricians).

Consistent with the 2002 quantitative results, few Electricians in the current research reported that they would report accidents or hazards to a government agency – in fact, even after prompting, many were unaware of the role of ESS, MCA, the Ministry of Economic Development or Ministry of Commerce in accident and hazard notifications. Some Electricians reported a general belief that some government agency or Ministry should be informed, but were uncertain which agency this should be (a couple mentioned the Ministry of Commerce or Commerce Commission), and were unclear what role this agency would play.

Instead, many Electricians suggested that they would first make contact with OSH or electrical industry sources, whether informal (e.g. tradesperson at fault, inspectors, employer) or formal (e.g. registration board, ECANZ).

In contrast, most Gasfitters were aware of the need to inform ESS about accidents and hazards - this was particularly the case among Craftsman Gasfitters, with less experienced Gasfitters lacking such awareness. Those with awareness of ESS reported that there was a legal requirement to report to ESS, that this requirement is part of the Gasfitting Standard, and that ESS is responsible for accident investigations.

You need to contact the ESS... because they are the body which needs to get everything organised, because originally they set the standards for that. They have a list of things which you have to do, not touch the appliance, that type of thing (Gasfitter, Craftsman Non-Supervisor, Christchurch).

Among both Electricians and Gasfitters, the following were other frequently reported avenues for reporting:

- OSH/ACC – most tradespersons mentioned that OSH would have a definite role to play in the case of an accident or injury. Some mentioned that there was a legal requirement to report to OSH. It is likely that OSH have a more salient or obvious role than ESS in the context of accidents, because occupational safety is their primary role across all industries.
- Registration Board – most tradespersons also reported a legal requirement to report to their registration board. This is considered particularly important when a tradesperson is at fault, because the registration board have a responsibility to inspect accidents and hazards, and the power to reprimand, and to revoke practising licenses, where necessary (although some Electricians mentioned that this was only effective in the case of registered Electricians – the EWRB has no responsibility for or access to unregistered tradespersons). Some Gasfitters also mentioned that reporting to the registration board would allow the board to warn other tradespersons of risks and hazards.

Given the generally low awareness of ESS's role, it seems that the registration boards and OSH could be an important source of further information for tradespersons when reporting accidents and hazards, in terms of informing tradespersons of the need to also report these circumstances to ESS.

- Employers – some less experienced Electricians mentioned they would inform their employer, and that the employer would then be responsible for further notifications or reporting procedures (therefore, these younger tradespersons had little need to know what agencies should be informed, because they weren't responsible for reporting).

Regardless of the agency concerned, all respondents said they would initially contact this agency by phone, following up with a letter or official reporting form if necessary.

Hazardous appliances, installations or fittings

As revealed in the 2002 survey, only two-fifths of Electricians (38%) and Gasfitters (43%) had ever contacted an organisation in the past to report a potentially dangerous gas/electrical appliance/installation or fitting. Among these tradespeople, more Gasfitters (20%) than Electricians (5%) had reported a hazard to their *Registration Board*. Also, more Gasfitters (12%) than Electricians (5%) had contacted the *Gas/Electricity supplier* in the past. Very few tradespeople had reported a hazard to the ESS or MCA (4% of Gasfitters and 1% of Electricians).

Among all tradespeople, the following were most frequently reported in the 2002 survey as people or organisations that tradespeople *would* report to in these circumstances:

- *Registration Board* (68% of Gasfitters and 39% of Electricians).
- *Property/appliance owner* (25% of Gasfitters and 41% of Electricians).
- *Electricity/Gas supply authority* (38% of Gasfitters and 15% of Electricians).
- *Department of Labour/OSH* (4% of Gasfitters and 14% of Electricians).
- Furthermore, 14% of Electricians said that they would get in touch with their *Boss/employer/company*, while no Gasfitters said that they would do this.
- Overall, Electricians (10%) were also more likely than Gasfitters (3%) to say that they would *not contact anyone* if they came across dangerous electrical/gas appliances/installations or fittings.

- As for notification of serious accidents, there was again relatively low recall of the following as organisations to contact in the event of a potential hazard: *ESS/Ministry of Consumer Affairs* (8% of Gasfitters and 4% of Electricians), *Ministry of Economic Development/Ministry of Commerce* (8% of Gasfitters and 11% of Electricians), and the *Office of the Chief Gas/Electrical Engineer* (2% of Gasfitters and 8% of Electricians).

Again consistent with the 2002 quantitative research, few Electricians were aware of the requirement to report hazardous appliances, installations or fittings to the ESS or other government agencies. One Electrician mentioned that in the case of tradesperson error or incompetence he would report to the Commerce Commission, having dealt with them previously and who he believed have the power to prosecute. However, he believed that the Commission lacked the practical experience to assist in such circumstances, and often don't turn up to inspect these situations.

In contrast, many Gasfitters, and particularly Craftsman Gasfitters, were aware of the legal requirement to report these circumstances to ESS. As for serious accidents and hazards, several Gasfitters reported an awareness of ESS' role in inspecting or investigating hazard notifications. These Gasfitters were also aware of the ESS' appliance register website. However, there is a perception that the ESS is too reactive rather than proactive, only getting involved when something goes wrong or becomes more serious. In addition, there were some Gasfitters who were unaware of the ESS and their role, or would not consider reporting to the ESS.

Gasfitters and Electricians both mentioned the following as other people or organisations they would contact:

- Appliance/property owner – Most tradespersons mentioned that in the first instance they would inform the appliance or property owner of the hazard, isolate the problem (e.g. disconnecting, or refusing to connect, an appliance), and/or offer to fix the appliance or installation if this was possible – before reporting to an official organisation. The matter would be reported to a relevant authority only if the owner refused to have the appliance disconnected or replaced, or if it was obvious that a serious hazard had been created by a previous tradesperson.
- Registration Board – Most tradespersons would, if necessary, report the matter to their registration board, because of a legal requirement to do so. Also, the registration board holds copies of compliance certificates, so are in a position to track the history of the appliance or installation, and to identify the tradesperson that may be at fault. They are also a convenient first point of contact, because all registered tradespersons are familiar with, and have ready access to, their registration board, and can acquire more information from here as needed.

I would ask the Registration Board what needs to be done, I don't want to spend the day chasing around people and telling them about faulty equipment. I just want to phone up the Registration Board and say, "Here it is, what are you going to do about it, what do you want me to do about it" and give them the sample, then they can follow it through. Once I have let the Registration Board know, it is out of my hands (Electrician, Employee, Less than 5 years, Christchurch).

- Other sources of information – Some tradespersons, in trying to rectify the situation themselves, would contact at least one of a number of sources to get more information about the appliance or installation. These sources include the appliance manufacturer or supplier, co-workers or fellow tradespersons, employers, and inspectors that are known to the tradesperson. A couple of Electricians also mentioned ECANZ as a useful source of information in this context.

Certifying installations of new appliances or fittings

In the 2002 survey, Gasfitters and Electricians reported that they would access the following information sources if they were certifying the installation of a new appliance or fitting and were not sure if it conformed to the regulations:

- *Registration board* (53% of Gasfitters and 16% of Electricians).
- *Information from manufacturer* (29% of Gasfitters and 15% of Electricians).
- *Information from colleagues* (20% of Gasfitters and 14% of Electricians).
- *Energy suppliers* (14% of Gasfitters and 4% of Electricians).
- *Regulations book*⁴ (20% of Electricians).
- In addition, around one in six Electricians (17%) and Gasfitters (14%) said that they would *do nothing* further about it or *not connect it*

The current qualitative research generally supports the 2002 quantitative findings. As for the reporting of serious accidents or other hazards, most tradespersons indicated that there have been very few, if any, occasions when they have needed to check whether appliances or fittings conformed to regulations, prior to certifying. However, respondents were still able to comment on what they *would* do in this situation.

- As in the 2002 quantitative survey, several Gasfitters and Electricians mentioned that in the first instance, they would refuse to install an appliance or installation if they were unsure whether or not it conformed to regulations. The owner would be informed, and if necessary, instructed to get a suitable replacement.
 - However, when refusing to install an appliance, owners will often just look for the first Electrician they can find to install it – thereby negating the reason for the original refusal to install. Nevertheless, a couple of tradespersons indicated that owners are usually happy to hold off on the installation, or seek a replacement, when the safety risks are explained to them.

What happens is [consumers] just ring up another sparky and he will come and connect it because it is “dog eat dog” out there, we have been trained to be like that (Electrician, Owner/Supervisor, Wellington).

Again, there was a clear disparity between Electricians and Gasfitters. In particular, most Gasfitters reported that they would refer to the ESS website of registered appliances if they needed to confirm product registration. While one Gasfitter who knew about the website was unsure which agency was responsible for the site, most of those with awareness specifically referred to this as the ESS website.

⁴ Only applies to Electricians.

Other frequently mentioned sources of information reported by Gasfitters included the following:

- Manufacturer/supplier – as manufacturers are responsible for ensuring their appliances are certified as safe, and for attaching badge plates and approval numbers, this was reported as an obvious source of information. For example, a new appliance may not appear on the ESS website because it is still going through the certification process – in which case, manufacturers or suppliers can inform tradespersons of this.
- PGDB – Considered a general source of information for most circumstances, including product certification, if only to provide direction to more appropriate agencies. In addition, because copies of Gas Certification Certificates are sent to the PGDB, a couple of Gasfitters believed the registration board was responsible for general product compliance (and may have been confusing the PGDB with the ESS).
- A couple of Gasfitters mentioned they would refer to other sources, including consultation with other tradespersons/colleagues, or the appropriate Standards book (which in addition to the ESS website instructs tradespersons on how to install an appliance, not just whether it should be installed).

In contrast, no Electricians reported awareness of the ESS as a source of information. The ESS website currently does not provide a register of electrical appliances, and therefore, in contrast to Gasfitters, there is no perceived need among Electricians to refer to the website for direct work-related purposes. In fact, when prompted, one Electrician believed that the ESS was mainly responsible for the gas industry, and not for the electrical industry. Only one Electrician said he had contacted the Commerce Commission in the past, and had received a good response that clarified some regulations. Instead, Electricians frequently mentioned the following as sources of information:

- Inspector/other tradespersons – as in other situations, respondents felt confident that many of their concerns or queries could be resolved by discussing with other experienced tradespersons and/or inspectors.
An independent electrical inspector... I would give him a call and ask him and they are normally a wealth of information. They might even go and research it a bit themselves if it confuses them, which is good (Electrician, Employee, Less than 5 years, Auckland).
- Standards/regulations book – several Electricians believed the relevant information could be found in the current Standards or Electrical Wiring Regulations books. Related, one respondent suggested he would contact Standards NZ, as the authority for electrical standards.

- EWRB/ECANZ – A few respondents would again turn to their registration board, or ECANZ, as these are perceived to be aware of all relevant information. However, there is some concern that responses from the registration board are sometimes too slow to be useful (i.e. can not wait several days to receive information when working on an immediate/urgent job).
- Manufacturer/supplier – as for Gasfitters, several Electricians believed the manufacturer or supplier was an obvious source of relevant information. However, there was a concern that this was not practical or possible for many appliances made by overseas manufacturers.

Reasons for non-reporting

Despite their own lack of a history reporting accidents and hazards, Gasfitter and Electrician respondents highlighted several issues in relation to why tradespersons might not report accidents or hazards when they are required to. These issues were generally similar for both Gasfitters and Electricians (i.e. regardless of trade). The primary issues included the following:

- The “hassle” of reporting, particularly the time taken up by doing so (with little time at the end of a long day to fill out more forms, make phone calls, etc.), and the potential need to front at court hearings during work hours. There is a concern that what might start out as a quick phone-call will lead to considerably more involvement on the reporting tradesperson’s part, with the consequent loss of valuable work time.
 - Related to this is a perception that often nothing gets done about the report anyway (i.e. there is no follow-up or inspection), or that any follow-up happens so long after the event that it is not considered useful. Therefore, some tradespersons believe that the time they must put into the reporting process does not often result in valuable outcomes.

[It is] too time consuming to follow up and chase up, you have a busy enough day already. It might be only a phone call but I would be worried that I had to spend time going through all the proceedings and write out a report (Electrician, Employee, Less than five years, Auckland).

- A perception that agencies and/or inspectors often come after the wrong person (i.e. the person reporting the hazard rather than the person actually at fault). Therefore, in some sense there is a level of fear or distrust in the reporting process.
- Probably feeding this sense of distrust is a general uncertainty or confusion about the reporting process. This includes confusion about when, and what circumstances, to report (i.e. what is or is not “serious enough” to report, especially if a problem can be rectified without reporting to a higher authority). In addition, as highlighted in previous sections, there is confusion about whom to report to, particularly with the low level of awareness of ESS among tradespersons (and especially among Electricians). Also, there is confusion or lack of knowledge about what is involved in the reporting process, and the consequences of this process - many tradespersons are unsure exactly how extensive their involvement will be. For example, beyond making a phone call, many are unsure how likely it is they will need to write an official letter, fill out a form, or attend hearings – indeed some tradespersons are unaware that any of these processes may be necessary.

- Reluctance to “back-stab” or “dob in” colleagues or other tradespersons. Depending on the seriousness of the circumstances, many respondents believe it is not reasonable to report a fellow tradesperson, particularly when a problem is fixable or easily rectified. Several respondents said that, if they knew who was responsible for a problem, in the first instance they would contact the tradesperson concerned, make them aware of the problem, and give them the opportunity to rectify the situation. This approach was considered quicker, more effective, and more respectful than reporting, and avoids ill feeling or disharmony among specific tradespersons or the industries generally.
 - Despite this, all respondents insisted that if the circumstances were more serious, or if the tradesperson at fault refused to rectify the problem, they would definitely still report the situation. Again, uncertainty about the seriousness of circumstances results in confusion about appropriate reporting.

Just the fact that a lot of guys are not that proactive about it or are not too concerned there are cowboys out there, or just because they don't want to be considered a nark or something (Electrician, Employee, Less than 5 years, Wellington).

I suppose you feel that you don't want to be backstabbing everybody. Everybody makes mistakes, but people should report it a lot more often. If I reported everything I would find it very time consuming (Electrician, Owner/Supervisor, Christchurch).

- Among Gasfitters specifically, a general consensus that there is currently no organisation that supports or “is there for” the Gasfitter. In particular, the PGDB, which is perceived as primarily existing for consumer protection, despite the fact that Gasfitters pay registration fees to the PGDB (and consequently, Gasfitters express confusion or concern about what their fees are paying for).
 - This is less of an issue for Electricians, many of whom feel they are adequately represented by ECANZ.

It used to be the Plumbers and Drain Layers Board, you had a personal contact with the gas auditors and you used to be able to speak to them, but that alley way is now closed... The Gas Board is there to protect the customer, whereas a lot of gasfitters used to think it was on their behalf. You used to have a good relation with the gas auditors, if you were unsure of something you could ask somebody, at the moment there is nobody to ask... obviously [Gasfitters] are saying, “We pay fees to the Board so we should then get something back for those fees” (Gasfitter, Craftsman Non-Supervisor, Christchurch).

It has been spelled out quite clearly in the last 12 months that the Plumbers, Gasfitters and Drain Layers Board is not there on behalf of the industry, they are solely there for the protection of the public, so they are the police force... sometimes it feels like they are working against the industry (Gasfitter, Registered (Non-Craftsman), Wellington).

Encouraging appropriate reporting

There was a general consensus among both Gasfitters and Electricians that reporting is the tradesperson's own responsibility – because of the legal requirement to report, they should be doing it anyway. In addition, most tradespersons should do what is required as a matter of pride and care in their own work (and this was the case for many reputable companies and sole traders). Therefore, if a tradesperson won't report now, very little (or no agency) is going to change their attitudes or behaviour. Despite this, the following were discussed as potential means of improving compliance:

- Clearer and more widely distributed guidelines about reporting requirements and the reporting process.
- Relatedly, greater promotion and publicity of issues generally – communications need to be clear, unambiguous, specific, frequent, and wide reaching (i.e. accessible to all relevant tradespeople). There should also be a combination of general communications (e.g. advertising through trade newsletters, magazines and journals), and more direct communications (i.e. letters to businesses and individual tradespersons).
 - Few tradespersons mentioned direct contact or advertising from relevant agencies. A small number mentioned the ESS' role in needing to encourage promotion through advertising or more direct means (e.g. letters to registered tradespersons), or believed that their registration board should be responsible for these communications.
- Greater promotion of safety and reporting obligations through the compulsory annual accreditation system (required to remain registered), and other training courses.
- An easily accessible/well-publicised 0800 phone number, with most tradespersons currently unaware of the existing ESS 0800 phone number, or its role in reporting hazards. A couple of tradespersons also suggested that the ability to make calls anonymously would improve reporting.
- A "rating" system on practising licences, with tradespersons attaining a higher service rating if demonstrating greater compliance with obligations.
- Among Gasfitters specifically, the presence of an organisation that proactively supports Gasfitters and, related, the creation of an environment where tradespersons aren't going to be blamed or victimised by the reporting process when reporting another tradesperson's error.

- At this point in the interview, no tradespersons mentioned the annual Accident Summary handbook as a means of improving compliance (although some had discussed this by the end of the interview). Most respondents were unaware of this publication, while some were aware of it but were unsure how to get copies. However, most indicated that this publication would be helpful, but that it needs to be more widely publicised and distributed (possibly sent to all registered tradespersons and companies).

Sources of information and advice

Gasfitters

Only a few Gasfitters mentioned ESS as a useful source of information (i.e. those few with existing awareness of ESS). Importantly, no Electricians mentioned the ESS (although the Commerce Commission was mentioned as most useful in one case, as they could provide all relevant information).

- Even among Gasfitters reporting ESS as their most useful source, the agency was considered mainly in relation to its online appliance register, rather than as a source of other types of information. In particular, none mentioned ESS as source of information about reporting accidents or general gasfitting information. Some concern was expressed that information and clarification about Standards and Codes was not easily accessible.
- In itself, the ESS online register of gas appliances is considered by Gasfitters to be essential – a comprehensive, useful and convenient (i.e. can be accessed from any computer) source of information.

In contrast, among Gasfitters, the following were frequently mentioned as the most useful sources of information and advice:

- The Standards and Codes book – a very important “first port of call”. Most tradespersons reported that they would usually look at the Standards book first to find an answer (and in many cases, the required information would be found here). When not aided by the Standards, tradespersons would typically turn to at least of the following sources:
- Fellow tradespersons – can rely on the accumulated wisdom of other experienced tradespersons.
- Inspectors - especially those that are personally known to the tradesperson. Again, can offer advice both formally and informally based on their experience in the industry.

- PGDB – generally considered to be a reliable repository of knowledge, although there are some concerns that they may not be as helpful now as they've been in previous years. Specifically, several tradespersons expressed concerns that the PGDB currently lacks experienced Gasfitters who can offer relevant information promptly (i.e. with a single phone call). Instead, it may now take several days for a PGDB representative to get back to an enquiring tradesperson with the required information.
- Manufacturers – for more specific appliance-related enquiries.

Electricians

Similarly, among Electricians, the following sources were considered most useful:

- Inspectors – Again, considered to be knowledgeable, experienced, easy to get hold of, prompt, and able to provide the information that a tradesperson needs to make a decision. A simple phone call to a respected inspector will often eliminate the need to go to another source.
- Standards Book – As for Gasfitters, this is also a useful first source for clarification on standards and codes, providing useful guidelines, particularly when wanting to double check something.
- ECANZ – Another organisation considered to be knowledgeable, accessible, prompt and, importantly, pro-actively supporting Electricians and their best interests.

If we didn't have ECANZ we would be in the shit I think, because they are the only organisation that we have got to rely on. The industry would not be improving without the help of ECANZ (Electrician, Owner/Supervisor, Christchurch).

- EWRB – Particularly important for more serious issues, or those related directly to registration. Always willing to help, even if it means having to check information before getting back to the tradesperson.

You always get an answer, and if they are not absolutely sure they will go away and discuss it and come back to you. (Electrician, Owner/Supervisor, Christchurch).

Testing and use of testing equipment

Extent of non-testing

When Electricians were asked whether, in the last 12 months, they had personally been in a position where they think they should have carried out an appropriate test but did not do so, almost all respondents reported that they had not been in such a situation – i.e. they always test as required.

- Several tradespersons mentioned that testing is a matter of professional pride and service standards for themselves and for their companies, as much as it is a matter of safety and performance testing.
- For the one Electrician who had not tested when he believed he should have, this was a case of not having the correct testing equipment available when needed, because the company owns too few testers to cover all staff:

The last house [I worked on] I didn't do the earth work, but I tested everything else, just because there wasn't one of the testers available... We have got 25 guys on the tools and we have got two loop impedance testers, but if one is in South Auckland and one is in Whangarei, you can't get it that day. Because of the cost we can't fit every van out with one, the cost would be horrendous... Because we can have one that we share, normally it comes out fine – it was just that one-off (Employee, Less than 5 years, Auckland).

Similarly, almost all Gasfitters reported that, in the last 12 months, they had not been in a position where they think they should have carried out an appropriate test but did not do so.

- For the one Gasfitter who had not tested when he believed he should have, this was primarily a result of time pressure and concerns about cost leading him to test some, but not all, of an existing installation:

It was an existing installation. I installed a gas hob and it was about ½ metre of pipe and two connections. I should have carried out a complete installation test but I just tested the two connections that I made. A little bit [of time pressure], but also you have in the back of your mind “time is money” so you are costing the client more money. That is always the trade off, [customers] want to pay as little as possible but get the best job they can. It is a judgement call by the person doing the job whether you do a complete installation test all over again. There are guidelines in the code as to what to test, if you are working from an isolated valve to an appliance and all you do is turn off that isolating valve you know you don’t have to do a complete installation test. But if you have to switch the gas off at the meter and alter that pipe work then you have to test the completed installation. (Gasfitter, Registered (Non-Craftsman), Wellington).

Reasons for not testing

Similar issues were raised here as were discussed in relation to accident causation. As above, there was a general consensus among Gasfitters and Electricians that in most cases, the required testing *is* usually completed as required, and therefore lack of testing is not a considerable problem among tradespersons generally (as supported by the personal experiences discussed above). In addition, there is some belief that there is a growing group of complying Electricians, and that the situation was generally good, at least for new installations and alterations.

However, when discussing why tradespersons might not complete all tests when these are required, Gasfitters and Electricians generally discussed the same common issues. The following were most typically considered as possible reasons for non-testing:

- Time/cost – A general acknowledgement that doing all the required tests can add considerable time to a job, with all the costs this involves.
 - While these costs can in theory be passed to the consumer, there was a perception among some tradespersons that many customers do not understand the costs and time involved in testing, and therefore express surprise or discontent at the length of time an otherwise “simple” job takes, and the price they are charged for this.
 - In addition, if a job has already been quoted at a specific price, and the job takes longer than expected or additional tests are required, this cost cannot be charged back to the customer.

- However, there were differences of opinion, particularly among Electricians, about how much time is required for testing, with some respondents believing that testing doesn't really require too much time. However, this difference could be a result of different work conditions or job requirements.
- Hassle of testing – more particularly for Electricians was a concern about the “hassle” that testing can often represent, not only for the tradesperson but also for the customer – in terms of causing disruption to power supply (at least when the customer is at home, e.g. at dinner time, working on a computer), resetting of electrical appliances, etc.
- Perception of “adequate” or basic testing – there was a general sense that certain basic tests can, in most cases, adequately tell the tradesperson all that he needs to know, with any additional tests not adding any additional information or value (even if legally required), and therefore are unnecessarily time-consuming.
- Laziness/over-confidence/blasé or complacent attitudes – as suggested above, some tradespersons may believe they are good enough to get away without adequate testing, based on a work history of never having an accident or creating a hazard (as far as they are aware). Several tradespersons spoke of the typical “she’ll be right” attitude resulting from over-confidence or a lack of concern.
- Lack of training and/or understanding of test requirements – considered a potential problem particularly among Gasfitters who do relatively infrequent gasfitting (e.g. primarily employed as a plumber), and therefore their training in specific tasks may be outdated, forgotten or dormant. Also acknowledged that this is a general risk for all Gasfitters, as some tasks or jobs are undertaken infrequently. In addition, it was suggested that inadequate training is a possible issue for the electrical industry also.
- Lack of adequate testing equipment – particularly among Electricians, some tradespersons may not complete all tests simply because they lack the appropriate equipment. Cost of equipment was suggested as the most likely reason for this. Similarly, some Electricians may own equipment that covers the basic tests, but not all tests.

Encouraging appropriate testing

As for issues related to reporting obligations, there was a general perception of tradespersons having self-responsibility for testing and awareness of requirements, particularly under the current self-certifying system. Therefore, if a tradesperson currently won't do all the required tests (despite legal obligations), nothing more will encourage them to change their behaviour. Some respondents believed that the testing requirements are clearly specified in the Standards book, and therefore all tradespersons should be fully aware of what they are required to do.

[If] you are doing self certifying work then the onus is on you to make sure it is done right, there should be no need for someone else to be on your shoulder. (Gasfitter, Craftsman Supervisor, Auckland).

However, Gasfitters suggested the following strategies as possible means of improving testing compliance:

- More regular auditing/inspections/supervision – there was some concern that auditing/inspections are too infrequent (or, at least, are not frequent enough to ensure greater levels of testing), as a natural result of the change to a self-certification system. However, there was also some acknowledgement that a return to higher levels of auditing and inspection may not be practical, for example because of the cost and resource demand that this would require.
- Appropriate training through the compulsory annual accreditation system – particularly where dormant or forgotten training and knowledge needs to be refreshed.
- Appropriate encouragement and promotion of testing compliance issues through trade newsletters and journals (particularly those from the PGDB).

Among Electricians, the following strategies were considered as possible means of improving testing compliance:

- Less time pressure – this could potentially be improved by having the ability or opportunity to charge more realistic rates. In turn, this would require management of customer expectations about what prices should be expected for adequate and safe work. ECANZ were considered to be an organisation in the best position to encourage this. Also, encouraging more people to enter the electrical trade could lessen time pressure by increasing the size of the worker base generally.
- Appropriate training and communications – More specific training, both for apprentices and through the two-yearly refresher courses, could remind tradespersons of the importance of testing generally, as well as providing more adequate training in the use of specific equipment. Also, more regular communications (for example, from the EWRB) could remind Electricians about the constant need for adequate testing practises.

- More regular auditing/inspections/supervision – as for Gasfitters, regular inspection of work was considered a good incentive to always test, although less likely under the current self-certification system. However, auditing of work will need to be more timely (closer to the time when a job was completed) and comprehensive (covering a wider range of more important work) if it is to have a useful role.
 - There was a suggestion that greater role modelling and encouragement from supervisors and senior colleagues should help younger tradespersons to develop good working practices – once established, these practices become easier and more natural with time.
- More/clearer/accessible guidelines – particularly with the rate at which codes and standards are updated, tradespersons need to be able to access clear guidelines about testing and other requirements.
- Clearer requirements on CoCs – there was a suggestion that if CoCs included a checklist of specific tests that are required, it would be more obvious to the tradesperson what tests they need to complete.

Ownership of testing equipment

Electricians

The majority of respondents reported that they either own, or have ready access to, the three main types of electrical testing equipment.

- Insulation Resistance Tester – almost all respondents owned or had access to this.
 - The tradesperson who did not have access to this (Employee, Less than 5 years, Christchurch) reported that this was because it was his employer's responsibility to complete the test.
- Fault Loop Impedance Tester – almost all respondents owned or had access to this.
 - The same tradesperson did not have access to this, again because it was his employer's responsibility to complete this test.
- RCD (Residual Current Device) Tester – almost all respondents owned or had access to this.
 - The tradesperson who did not have access to this reported that his company did not supply one. Also:

I wasn't aware that you had to test an RCD. I actually got told that on one of our annual safety courses by the guy taking it. I don't know many electricians that have RCD testers. (Employee, More than 5 years, Christchurch).

Gasfitters

In contrast to Electricians, Gasfitters typically reported that they owned or had access to only one of the three main types of gas testing equipment, with those not used because of a lack of relevance to domestic gasfitting work.

- Manometer – all respondents owned or had access to this, whether a digital or water gauge model.
- Flue gas analyser – Few tradespersons reported owning or having access to this.
 - Most of those who do not own or have access to a flue gas analyser reported that this was mainly used in commercial or industrial gasfitting work, not domestic work, and therefore was not relevant to the work that they do.
 - A Gasfitter mentioned that with experience he has been able to tell by eye whether an installation was producing complete or incomplete combustion, and therefore did not require a flue gas analyser.
- Smoke tube – Few tradespersons reported owning or having access to one of these.
 - Again, the primary reason for not owning or having access to a smoke tube was that this was primarily an industrial or commercial tool, and was not relevant to domestic gasfitting work.
 - A couple of tradespersons mentioned that they used other equipment (smoke matches and smoke pellets) instead.

Issuing of compliance certificates

In the 2002 quantitative study, Electricians and Gasfitters were asked to estimate the extent to which their fellow tradespersons failed to issue compliance certificates when they were supposed to, and to estimate the proportion of work requiring a certificate that was not certified. Overall, compared to the Electricians, Gasfitters estimated that less of their colleagues failed to issue Certificates of Compliance when they were supposed to, and estimated that a smaller proportion of their work, which required a Certificate, was not certified.

- Around a third of Electricians (32%) and just under half of the Gasfitters (40%) *did not know* what proportion of their peers failed to issue Certificates of Compliance when they were supposed to.
- More Gasfitters (38%) estimated that *10% or less* of other Gasfitters probably did not issue Certificates of Compliance when they should have, compared to 19% of Electricians who thought *10% or less* of other Electricians failed to issue the Certificates.
- Thirty two percent (32%) of Electricians and just under half of Gasfitters (46%) *did not know* what proportion of their colleagues' work was not certified when it should have been.
- More Gasfitters (29%) than Electricians (16%) estimated that *up to 10%* of the work done by other Gasfitters/Electricians was probably not issued with a Certificate of Compliance even though it should have been.

Reasons for non-issuing of compliance certificates

Gasfitters

Supporting the quantitative findings indicating a perceived higher level of compliance amongst Gasfitters, in the current qualitative research Gasfitters almost unanimously reported no knowledge or concern about non-issuing of compliance certificates, either personally or among Gasfitters generally.

- Specifically, most respondents did not know of other Craftsman Gasfitters who did not issue Gas Certification Certificates (GCCs) when they should (i.e. they believed that all Craftsmen issue certificates whenever required, or at least did not know of circumstances where this was not true).
- Furthermore, few respondents could think of any reasons why a tradesperson would not issue a GCC when required.
- However, the cost to the Gasfitter of buying books of GCCs was raised as a potential issue – although this had not stopped any of the present respondents from issuing GCCS.
- Consequently, few Gasfitters could think of anything that would encourage appropriate issuing of certificates (because there was perceived to be no problem with this issue), except possibly lowering or eliminating the cost of purchasing GCC books.

Electricians

In contrast to Gasfitters, only half of the Electricians interviewed reported that, in the last year, they knew of no other Electricians who had been in a position where a Certificate of Compliance (CoC) should have been issued, but was not (although several of these respondents admitted they don't know what other tradespersons do in relation to CoCs). That is, half of the Electricians were aware of others who had not issued CoCs when these were probably required.

- However, two Electricians who were aware of non-issuing of CoCs insisted that, while CoCs might not be issued for small jobs (e.g. installing a new power point) because of the cost, they were always issued for big projects.
- Also, CoCs were always issued whenever a customer requested one.

You are meant to issue a CoC every time you install a new power point for every job. At \$7 a CoC we generally don't unless the client requests now, just because it was getting too much. We definitely do CoC's for general home installations or for big projects. But if we are just installing one power point it depends on the client, if it is a regular client that we do a lot of work for, I suppose it all depends on that. (Electrician, Employee, Less than 5 years, Auckland).

Other suggested reasons for not issuing CoCs included the following:

- Inconvenience - of buying CoCs and filling them out, especially when going through a large quantity, or only working on small jobs.
- Inadequate auditing/a perception that nothing gets down with CoCs – one Electrician was concerned that only a small number of his jobs were audited, and those that were audited were all small jobs at the expense of more major work.

We keep them all at home, and if they are going to audit they will ring up and say, "I want this and this one". I have been audited and they took five out and they were all like 'install a towel rail', 'install a security light', all these stupid ones. I said to the guy "I have done 15 houses here, I would really like you to do one of those", [but I was told] "No we are not doing those" (Electrician, Employee, Wellington).

Encouraging appropriate issuing of compliance certificates

As discussed in the previous section, Gasfitters typically do not believe there is a problem with the issuing of GCCs, and therefore could not suggest ways in which certification needs to be improved.

In contrast, Electricians reported a few potential means of improving the issuing of CoCs in their industry:

- Encouragement through training and communications – particularly, getting tradespersons into the habit from as early as possible.
- Reducing the cost.
- More frequently passing the cost on to the consumer.
- More regular/more comprehensive auditing.
- Also, there was an observation that insurance companies are more frequently asking for CoCs to be completed and sent to them when work is done. If this was made compulsory, or at least covered a greater number of jobs, compliance might be increased.

Awareness of correct circumstances for issuing compliance certificates

All Gasfitter and Electrician interviewees reported a high awareness of the correct circumstances for issuing compliance certificates.

In fact, many respondents answered conservatively, in that they also suggested that work that doesn't currently require certification should actually be certified (e.g. work on 9kg gas bottles, installation of revenue meters). According to respondents, this would provide a greater guarantee of safety and protection for both tradesperson and consumer, given that all gas/electrical work and appliances has a potential risk, and therefore still need to be completed and certified by a competent tradesperson.

Electricians

Importantly, most Electricians could correctly identify the circumstances in which a CoC should be issued:

- New installations – Electricians correctly identified this as requiring a CoC to be issued.
- Replacing existing conductors with larger capacity - Electricians correctly identified this as requiring a CoC to be issued.
- Repositioning conductors of mains - Electricians correctly identified this as requiring a CoC to be issued.
- Replacement of fittings with fittings of a different size or type – Some Electricians correctly identified this as requiring a CoC to be issued. Among those who believed a CoC was not required, reasons for this included:
 - Only changing the termination, not changing the control circuitry or the cable itself, so little chance of damage.
 - As long as the fittings are not being moved, a CoC is not needed (e.g. replacing one light with a larger one).

Gasfitters

Similarly, most Gasfitters could correctly identify the circumstances in which a GCC should be issued:

- New gas installation - Gasfitters correctly identified this as requiring a GCC to be issued.
- Alteration, extension or addition of existing installation - Gasfitters correctly identified this as requiring a GCC to be issued.
- New LPG installation supply from two 9kg cylinders - Gasfitters correctly identified this as requiring a GCC to be issued.

- Repair to gas installation/appliances after serious accidents - all Gasfitters correctly identified this as requiring a GCC to be issued.
- Replacement of an existing installation – almost all Gasfitters correctly identified this as requiring a GCC to be issued.
 - A Gasfitter believed that if you were changing one installation for another (e.g. one oven for another oven), as long as it was tested and working correctly, a GCC is probably not necessary.

Use, ownership, relevance, of standards and codes

Use and ownership

All respondents followed (and most owned) the latest standard relevant to their trade (i.e. *Gas Installation NZS5261:2003* for Gasfitters, and the *Wiring Rules, AS/NZS3000:2000* and also, in some cases, the *Electricity Regulations Compilation 2003* for Electricians).

- Among the few who did not own a copy of the latest standard, this was due to the cost of purchasing the standard. However, these tradespersons were familiar with the latest codes and standards, and could (and do) easily access a copy from their employer and/or a colleague when necessary.
- Importantly, all younger Gasfitters and Electricians owned a copy of the latest standard, as this was a requirement for their apprenticeship.

Relevance, safety, and best practice

Both Gasfitters and Electricians generally consider their standards to be very relevant, contributing to safety, and encouraging best practice (most tradespersons strongly agree that this is the case):

- Most respondents acknowledged that a line or standard has to be drawn somehow, to provide a guideline and to ensure consistent and safe practice. They unanimously believed that the current standards do a good job of this – by definition, the standards are designed to be relevant to their work, and most respondents believed that the current standard covers all the areas that tradespersons need to know about.

- Similarly, all believed that the standards contribute to safety – again, the standards are designed with safety in mind.

It gives me everything, it gives me [guidelines for] installing appliances... there is general work and safety requirements, it gives materials I can use, it gives me everything (Gasfitter, Craftsman Non-Supervisor, Auckland).

It sets down correct trade practice for installations or appliances and pipe work and if you adhere to them you can't go wrong (Gasfitter, Craftsman Supervisor, Auckland).

They set out safe work practices, and if everyone did stick to the guidelines it would reduce a hell of a lot of accidents around the work place (Electrician, Employee, Less than 5 years, Christchurch).

- However, there were some concerns that some standards are ambiguous, because they are not completely prescriptive about how or why something should be done. Because these standards are open to interpretation, they do not necessarily promote the best practice all the time.
 - On the other hand, the standards do not have to be perfect. Some flexibility is essential so that they can be adapted to fit specific circumstances.
- Also, some tradespersons indicated that it takes many years to become familiar with all the codes and standards, and they can be hard to use unless used or referred to frequently.

I feel it is a bit vague... it should be telling you how to do it, why to do it, not [just] "You have to do it". It is down to you how you do that, and that is where the self certification comes in... Some people like it because they can make things and develop things, whereas I feel it needs to be almost like a bible... I feel if I read it, and you read it, everybody comes up with a different personal opinion (Gasfitter, Craftsman Non-Supervisor, Christchurch).

Even after working a number of years I still find the way they describe things and word things quite hard to get your head around at times (Gasfitter, Registered (Non-Craftsman), Wellington).

Sometimes, some of the standards and regulations can be a little bit hard to follow, and when you read them it can be a bit vague, they leave things open, they are not as straightforward, they don't tell you exactly step by step how to do a particular job. Which is a good thing because a lot of the decisions have to be made by the tradesmen, but at the same time some of them left the window a bit too far open so that guys can do things that sometimes are a little bit dodgy (Electrician, Employee, Less than 5 years, Wellington).

Attitudes to most recent standards

In relation to the latest standards and codes specifically:

- These are generally considered to be very good or excellent – they provide a good guideline for practice, and are typically easy to follow and understand. For example, it is easy to reference the information that is required.
- There is a perception among more experienced tradespersons, and particularly Gasfitters, that the latest Standards book has improved since the previous version.
 - The latest versions are considered more compact.
 - Electricians particularly appreciate having the standards in book form, rather than in a folder.
- The amount of diagrams has increased, improving readability, though more could be provided.

The current one is very, very good, it covers a lot of information, whereas the previous codes we have had there has been a little bit of guess work involved, this one is more in-depth (Gasfitter, Craftsman Supervisor, Auckland).

I think it is a good standard. I think it is much better than the last one I had which was a bigger book, but this one is much more descriptive and explains things a lot better. It has got good pictures in it... it is well indexed and it is quite easy to follow (Gasfitter, Craftsman Supervisor, Christchurch).

It has been condensed really well from what we had before, they are compacted and most times I can find what I want. It is better written, easy to read (Electrician, Owner/Supervisor, Christchurch).

However, some criticisms and suggestions for improvement were provided:

- As indicated above, some standards are ambiguous and open to interpretation, and can cause confusion.
- Relatedly, a belief that changes to the codes and standards are too frequent, and this also causes confusion.
- Also, some concerns about the cost of the Standards book, particularly as it is updated relatively frequently.

- Organisation and layout could be improved – often difficult to find exactly what information is needed.
 - For example, some Gasfitters suggested having separate sections for domestic, commercial, and industrial work so they don't need to wade through material that is less relevant to their specific context in order to find relevant information.

The code covers such a wide range of things and I think it could be divided up... You could have the book a lot more concise, and easy to follow, if there were three different sections: domestic, commercial and industrial. That doesn't mean the existing one is not relevant, it is just not so easy to use (Gasfitter, Registered (Non-Craftsman), Wellington).
 - Similarly, a younger Electrician suggested that the standards book could be split into two separate sections or books, one covering more common “everyday” work, and the other covering less common work.
- More diagrams and pictures could be incorporated to complement the text, and this could make some information clearer.
- Also, several tradespersons were adamant that the codes and standards need to be supported by regular training and updates – for example, compulsory courses that incorporate tests.

Awareness of ESS and the role of government agencies

The role of government agencies in trade safety

Most tradespersons believed that government agencies should have a role in relation to safety in domestic gasfitting and electrical work.

- However, there was some difference of opinion about what this role is or should be, in particular how much of a role the government should have.
- Most tradespersons believed that the government has an important role in overseeing safety (particularly as it is “independent” from the industry, unbiased, and free from commercial pressures), especially in terms of:
 - Establishing and maintaining legislation and standards (in consultation with the trade industries).
 - Managing energy resources (i.e. of gas and electrical supplies).
 - An independent authority in dispute and complaint resolution, and enforcement.
 - Managing accident and hazard investigations, and prosecuting when necessary.
 - Providing information about safety.
- In contrast, other tradespersons would prefer the government to be less “hands-on”, believing it should not get overly involved or intervene in issues that should be handled by the trade itself.
 - In particular, some tradespersons are concerned that when they contact a government agency, they cannot speak to someone who has any relevant experience in the gas or electrical industries.
 - Relatedly, some auditors, inspectors, and other representatives are considered “out of touch” with the practicalities of the industry.

- Some younger/less experienced tradespersons were unclear about the role of the government, and could not suggest what this role might be (typically because it would be their supervisor or employer who would have any involvement with regulatory bodies if this was necessary).

However, both Gasfitters and Electricians were typically less certain about which government agencies are or should be responsible for these functions.

- Importantly, many tradespersons were unaware of ESS altogether (even after prompting) – this was particularly true of Electricians. Only a small number (of more experienced) tradespersons mentioned the ESS as having a role in relation to safety. Some tradespersons had heard of the ESS but had no (or only a vague) understanding of what the ESS was or does.
- Some tradespersons knew there was some government Ministry or agency that had involvement in energy safety issues, but did not know or could not recall what Ministry this was.
- Even among Gasfitters who were aware of the ESS, this was mainly in relation to its role in the regulation of registered appliances (particularly through its online registered gas appliance database). Only a few had any awareness of ESS' role in accident and hazard notification, reporting, and inspection.
- Some tradespersons believed that their registration board (either the PGDB or the EWRB) was the agency that should be responsible, particularly for inspections and auditing. Other agencies mentioned included OSH and ECANZ.

Improving communication between ESS and tradespeople

Given the generally low awareness of ESS and its functions, most tradespersons were adamant that ESS has a lot to do to raise awareness of its existence and role. In particular, tradespersons need to be made aware of fundamental information:

- Who ESS is.
- What ESS' role is in relation to energy safety.
- What ESS actually does to fulfil this role.
- How this role differentiates it from other related organisations.
- What obligations and responsibilities tradespersons (and the trades generally) have in relation to ESS.

Given the degree to which tradespersons are already familiar with, and typically seek contact with, other industry organisations (specifically, the registration boards, ECANZ, the Commerce Commission, and OSH) instead of ESS, there is a general need for ESS to establish closer direct links with these agencies. For example, when tradespersons contact an agency to report an accident or other issue, having the agency representative direct the tradesperson to the ESS as necessary. In addition, clear distinctions need to be made and clearly communicated about the respective roles of these organisations, and each organisation can contribute to clarifying the confusion around these roles.

In terms of how ESS could best communicate with tradespeople, two suggestions were provided most frequently:

- Direct mail communication (e.g. letters and informative material) with individual tradespersons, and with businesses (with individual contact details possibly acquired from the PGDB and the EWRB, as these are the most obvious and complete sources of contact details for registered tradespersons).
- Advertising through relevant trade journals, newsletters, and related publications. The newsletters and journals of the respective registration boards were considered the most obvious and effective sources of advertising and promotional information – these reach the widest audience, and are more likely to be read.

Improving compliance and safe behaviour

Improving tradespersons' awareness of, and compliance with, standards, codes and safety requirements

As discussed earlier, some respondents believed that tradespersons' awareness of safety issues could not really be improved beyond current levels – registered tradespersons are, or should be, already aware of the issues through their own training, experience, and registration processes.

In addition, it is widely believed that it is the tradesperson's own responsibility to comply with standards and other obligations, given that it is their own reputation – and, ultimately, their own practising licence – that is at stake. This is even more the case now that self-certifying processes have been introduced (with a consequent reduction in independent inspections).

However, the following suggestions were provided as potential means of improving awareness of safety issues, and encouraging compliance with standards, codes, and other requirements:

- More regular inspections or auditing – while the current two-yearly auditing process is generally considered sufficient, some believe that annual auditing could be appropriate, at least for some tradespersons (e.g. with less experience). As discussed earlier, auditing needs to be more timely, and to cover a more comprehensive range of work completed.
- Semi-regular seminars organised by the ESS and/or registration boards, fronted by knowledgeable authorities and experienced/well-respected tradespersons.
- Safety communications in trade publications (newsletters, magazines, and journals).
- Compulsory safety/testing courses for example, incorporated into Site Safe or similar training, and Gasfitters' annual accreditation system. Also, a need to follow these courses with compulsory tests or examinations that actually impact on credits gained.

- Encouraging the electrical industry to charge more realistic rates – this would help ease the time and cost pressures that currently impact on compliance behaviour. This would also require changing customers' expectations accordingly. However, electrical contractors must also be encouraged to set realistic work targets, and to ensure employees complete all relevant tests and compliance certificates.
- Encouraging more young people to enter the industry through apprenticeships – helping to boost the size of the electrical and gasfitting work forces would also contribute to easing of current time pressures.
- A specific safety section in the Standards books (possibly including some sort of safety “checklist”).
- Encouraging tradespersons to regularly re-read or browse their Standards book to refresh their memory about (or just become more familiar with) specific issues, regulations or practices.
- Ratings on practising licenses that reflect the extent to which tradespersons have met or demonstrated safety, compliance and reporting obligations and/or knowledge.
- Wider distribution and promotion of the annual ESS/MCA Accident Reports Summary booklet – for example, a copy supplied to every registered tradesperson.
- Communications for the general public, educating them about the risks involved in gasfitting and electrical work, the need to use registered tradespersons (and to check that workers are registered before they start working), and that appropriate testing should be expected (despite the fact that this comes at a cost – but that better guarantees customer safety).

Appendix A – Interview guides

ELECTRICAL & GAS SAFETY ELECTRICIANS INTERVIEW GUIDE

BRC Marketing & Social Research, PN3074

November 2004

INTRODUCTION & BACKGROUND

Thank you for agreeing to take part in this research.

This is genuine research with electricians and gasfitters, to explore awareness, knowledge and behaviour with respect to electrical and gas safety practices. The research is not related to any commercial gain, and we are not selling anything.

In accordance with our professional Code of Practice, please be assured that the interview is strictly confidential, and nothing you tell us will be reported to the client in a way that might personally identify you. To avoid compromising the research, I can't tell you who the client is until the end of the interview.

The interview will take about 45 to 60 minutes.

Confirm permission for taping interview (tapes remain property of BRC).

Remind that a \$50 petrol voucher will be provided at the completion of the interview, to compensate for their time.

A. RESPONDENT DETAILS

DATE: _____ TIME: _____ BRC IDNO: _____

INTERVIEWER: _____

RESPONDENT NAME: _____

ORGANISATION: _____

POSITION: _____

LOCATION: A W C

EMPLOYMENT/SUPERVISORY STATUS?: OWNER/EMPLOYER/SUPERVISOR EMPLOYEE

EXPERIENCE: _____

B. WORK PROFILE

- 1 First of all, can you briefly describe the type of electrical work you usually do?
PROBE FULLY, INCLUDING YEARS OF EXPERIENCE, MIX OF DOMESTIC, COMMERCIAL, INDUSTRIAL (WHERE RELEVANT).

B. ELECTRICAL ACCIDENTS

2 First of all, based on your experience what do you believe is the most common cause of electric shocks and burns among electricians on domestic jobs?

PROBE: What about...?

PROBE: Why is this the most common reason?

- *Equipment failure*
- *Not testing before working*
- *Not turning off the power supply before starting work*
- *Not covering exposed parts*
- *Not following a safe work practice*
- *Not receiving adequate training or not familiar with the work*
- *Unintentionally "living"*
- *Other...?*

3 In your opinion, how could electricians avoid getting electric shocks or burns in this way?

PROBE: What could you/other electricians or any other authorities do to make your work safer?

- 1Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

4 Now thinking about accidents you have experienced on the job, about how many times in the last year have you had an electric shock or burn?

ACCIDENTS: _____

IF NONE GO Q7.

5 In your opinion, what caused this/these accidents?

PROBE FOR ANY CAUSES BELOW NOT MENTIONED ON UNPROMPTED BASIS: What about...?

- *Equipment failure*
- *Not testing before working*
- *Not turning off the power supply before starting work*
- *Not covering exposed parts*
- *Not following a safe work practice*
- *Not receiving adequate training or not familiar with the work*
- *Unintentionally "living"*
- *Other...?*

6 What could you have done differently to avoid this/these accident(s)?

- 1 Answer (**SPECIFY**)
- 2 Don't know

C. REPORTING OF ACCIDENTS AND HAZARDS

7 Thinking now about any serious electrical accidents. If you were there, you might contact the emergency services. What other organisations would you contact?

PROMPT IF NECESSARY: By this, I mean ones where someone is killed, or someone is injured enough to need medical treatment, or where there is serious damage to a property.

PROBE: Any others?

PROBE: Why would you contact this organisation? How would you contact them?

- ACC
- Building Industry Authority
- Office of the Chief Electrical Engineer (energy inspection)
- Electrical Workers Registration Board (EWRB)
- Energy Safety Service (ESS)/Consumer Affairs (Ministry of)
- Economic Development (Ministry of), Ministry of Commerce)
- Commerce Commission
- Labour (Department of)/OSH
- Property/appliance owner
- Electrical supply authority / electrical network company
- Other...?

8 And if you came across a situation while working on prescribed electrical work, where an electrical appliance, installation or fitting was hazardous, what organisations would you report it to?

PROBE: Any others?

PROBE: Why would you contact this organisation? How would you contact them?

- ACC
- Building Industry Authority
- Office of the Chief Electrical Engineer (energy inspection)
- Electrical Workers Registration Board (EWRB)
- Energy Safety Service (ESS)/Consumer Affairs (Ministry of)
- Economic Development (Ministry of), Ministry of Commerce)
- Commerce Commission
- Labour (Department of)/OSH
- Property/appliance owner
- Electrical supply authority / electrical network company
- Other...?

9 When you are certifying the installation of a new appliance or fitting, if you were not sure whether it conformed to regulations, what would you do?

PROBE: What about...?

PROBE: Why? Why not?

- *Do nothing*
- *Get more information from colleagues*
- *Get more information from energy suppliers*
- *Get more information from appliance manufacturer/agent/retailer*
- *Get more information from Energy Safety Service*
- *Get more information from Electrical Workers Registration Board (EWRB)/ Electrical Workers Licensing Group (EWLG)*
- *Get more information from Electrical Inspectors*
- *Get more information from Trade Association*
- *Anything else...?*

10 Which organisation or information source have you found most useful when you have needed relevant advice or assistance?

PROBE: Why?

PROBE: Why not other sources?

11 In the last 12 months, have you known of other electricians who you think should have contacted an organisation(s) to report an electrical accident, or an unsafe installation or appliance that presented immediate danger to life or property, but they did not?

- 1 Yes
- 2 No
- 3 Don't know

12 Thinking about electricians generally, what do you believe are the most common reasons why accidents or unsafe installations/appliances are not reported when they should be?

PROBE: Why are these reasons the most common?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

- 13 What do you believe would encourage electricians to always report accidents and hazards when they should?
PROBE: What would need to change to encourage greater reporting?
PROBE: Who or what organisation(s) should be responsible for making these changes or encouraging greater reporting? Why?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

- 14 And thinking specifically about yourself, in the last 12 months, have you been in a position where you think you should have contacted an organisation(s) to report an electrical accident, or other hazard, but you did not?

- 1 Yes
- 2 No
- 3 Don't know

] GO Q17
] GO Q17

- 17 What do you believe are the most common reasons why other workers or members of the public get injured or hurt following domestic electrical work?
PROBE: Why do you say that?

- 1 Answer (**SPECIFY**)
- 2 None
- 3 Don't know

D. TESTING & USE OF TESTING EQUIPMENT

- 18 Thinking about electricians generally, what do you believe are the most common reasons for not carrying out tests when tests are required?
PROMPT FOR INSULATION RESISTANCE TEST, EARTH CONTINUITY TEST, & POLARITY CHECK
PROBE: Why are these reasons the most common?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

- 19 What do you believe would encourage electricians to always carry out tests when they should?
PROBE: What would need to change to encourage more thorough testing?
PROBE: Who or what organisation(s) should be responsible for making these changes or encouraging more thorough testing? Why?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

20 In the last 12 months, have you been in a position where you think you should have carried out an appropriate test, but you did not?

PROMPT: For example, after new installations, additions, modifications or repairs.

- 1 Yes
- 2 No] go Q23
- 3 Don't know] go Q23

21 For what reasons did you not carry out the appropriate test at that time?

- 1 Answer (**SPECIFY**)
- 2 Don't know

22 What would have encouraged you to actually carry out the test in these circumstances?

PROBE: What would have influenced your decision to carry out a test?
PROBE: What would have made the difference between you testing or not testing?

- 1 Answer (**SPECIFY**)
- 2 Don't know

23 Thinking now about the equipment used in electrical work, which of the following equipment do you personally own or have ready access to?

- 1 An Insulation Resistance Tester
- 2 A Fault Loop Impedance Tester
- 3 An RCD (residual current device)Tester
- 4 *None*
- 5 *Don't know*

IF 1 TO 3 ALL MENTIONED IN Q23 GO Q25

24 For what reasons do you not own or have ready access to... **[EACH OF THOSE NOT MENTIONED IN Q23]**?

E. ISSUING OF CERTIFICATES OF COMPLIANCE (COCS)

25 Thinking now about Certificates of Compliance (CoCs), in the last year, have other electricians you know been in a position where you think they should have issued a Certificate of Compliance, but they did not?

- 1 Yes
- 2 No] go Q28
- 3 Don't know] go Q28

26 For what reasons have others not issued a Certificate of Compliance when one may have been required?

- 1 Answer (SPECIFY)
- 2 Don't know

27 What would encourage others to actually issue a Certificate of Compliance in these circumstances?
PROBE: What would need to change to encourage more thorough issuing of CoCs?
PROBE: Who or what organisation(s) should be responsible for making these changes or encouraging more thorough issuing of CoCs? Why?

- 1 Answer (SPECIFY)
- 2 Don't know

28 Over the last 12 months, about how many Certificates of Compliance have you issued for your own work and for others?
PROMPT IF NECESSARY: None, 1-5, 6-10, 11-25, 26-50, 51-100, More than 100.

COCS ISSUED: _____
98 ... Don't know

29 And in the last 12 months, how much of the work you were responsible for was the type that required a Certificate of Compliance to be issued? Would that be... **READ.**

- 1 None
- 2 Less than a quarter
- 3 More than a quarter but less than half
- 4 More than half but less than three quarters
- 5 More than three quarters but less than all installations
- 6 All installations
- 7 *Don't know*

30 For which types of work do you think a Certificate of Compliance should not be issued? **READ.**

PROBE: What about...?

PROBE: For what reasons do you believe a CoC should not be issued for... [EACH OF THOSE CONSIDERED AS NOT NEEDING TO BE ISSUED]?

- *Installation of revenue meters (N)*
- *Installing load control fittings of mains (N)*
- *New installations (Y)*
- *Repair of faulty conductors (N)*
- *Replacement of faulty conductors from like to like size (N)*
- *Replacing existing conductors with larger capacity (Y)*
- *Replacement of fuse with appropriate circuit breaker (N)*
- *Replacement of similar capacity electrical appliances (N)*
- *Replacement of fittings with fittings of a different size or type (Y)*
- *Repositioning conductors of a sub-circuit (N)*
- *Repositioning conductors of mains (Y)*
- *Repositioning fittings (N)*

F. OWNERSHIP & USE OF RELEVANT STANDARDS/CODES

31 Thinking now about the standards and codes established for electrical work, do you agree or disagree that “*the standards or codes I follow are relevant to my work*”? **READ. PROBE** Is that just agree/disagree or strongly agree/disagree?

- 1 Strongly disagree
- 2 Disagree
- 3 Neither agree nor disagree
- 4 Agree
- 5 Strongly agree
- 6 Don't know
- 7 Not applicable

32 For what reasons do you agree/disagree that *the standards or codes you follow are relevant to your work*?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

33 And do you agree or disagree that “*the standards or codes I follow contribute to safety*”? **READ. PROBE** Is that just agree/disagree or strongly agree/disagree?

- 1 Strongly disagree
- 2 Disagree
- 3 Neither agree nor disagree
- 4 Agree
- 5 Strongly agree
- 6 Don't know
- 7 Not applicable

34 For what reasons do you agree/disagree that *the standards or codes you follow contribute to safety*?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

35 And do you agree or disagree that “the standards or codes I follow make it clear how to engage in best practice”? **READ. PROBE** Is that just agree/disagree or strongly agree/disagree?

- 1 Strongly disagree
- 2 Disagree
- 3 Neither agree nor disagree
- 4 Agree
- 5 Strongly agree
- 6 Don't know
- 7 Not applicable

36 For what reasons do you agree/disagree that *the standards or codes you follow make it clear how to engage in best practice?*

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

37 Which electrical installation standards or codes do you follow in your work?

PROBE: What about...?

- *Electrical Codes of Practice (ECPs),*
- *Electrical Installations: Buildings, Structures & Premises, NZS3000:1997*
- *Wiring Rules, AS/NZS3000:2000*
- *Electrical Wiring Regulations 1935*
- *Electrical Wiring Regulations 1961*
- *Electrical Wiring Regulations 1976*
- *Electricity Regulations 1993*
- *Electricity Regulations 1997*
- *Electricity Regulations Compilation 2003*

38 **IF NONE IN Q31 FOLLOWED ASK:** For what reasons do you not follow any codes or standards?

IF LATEST STANDARD (AS/NZS3000: 2000) NOT USED ASK: For what reasons do you not use the latest standard (AS/NZS3000: 2000)?

PROBE: What, if anything, would encourage you to use the latest standard (AS/NZS3000: 2000)?

39 What do you think about the latest standard (AS/NZS3000: 2000)?
PROBE: Is it easy to understand / easy to follow? Why? Why not?
PROBE: Should tradespersons be required to follow all parts of the standard? Why? Why not?

40 And which electrical installation standards or codes do you actually own a copy of?
PROBE: What about...?

- *Electrical Codes of Practice (ECPs),*
- *Electrical Installations: Buildings, Structures & Premises,NZS3000:1997*
- *Wiring Rules, AS/NZS3000:2000*
- *Electrical Wiring Regulations 1935*
- *Electrical Wiring Regulations 1961*
- *Electrical Wiring Regulations 1976*
- *Electricity Regulations 1993*
- *Electricity Regulations 1997*
- *Electricity Regulations Compilation 2003*

41 **IF AS/NZS3000: 2000 NOT OWNED IN Q40, ASK:** For what reasons do you not own a copy of the latest standard (AS/NZS3000: 2000)?
PROBE: In your opinion, would it be beneficial for you to own a copy of this standard? Why? Why not?

G. KNOWLEDGE OF ESS & STRATEGIES FOR IMPROVING COMPLIANCE & SAFE BEHAVIOUR

42 In your opinion, what is the role of government agencies in relation to electrical safety?
PROBE: Who/what agencies do you think are/should be responsible for this? Why?

- 1.....Answer (**SPECIFY**)
- 2.....Don't know

43 In your opinion, in what ways could awareness of safety issues for electricians be improved?
PROBE: Why do you say that?

44 And in what ways could electricians be encouraged to comply with standards and codes, and other safety-related testing requirements?
PROBE: Why do you say that?

45 Do you have any additional comments about how safe behaviour and compliance with safety requirements could be improved among electricians?

- 1.....Comments (**SPECIFY**)
- 2.....No

46 Are you aware of the Energy Safety Service (ESS)?

- 1 Yes
- 2 No
- 3 Don't know

] go Q49
]

47 What do you believe is the role of ESS in relation to electricians?

PROBE: In your opinion, how effective is ESS in fulfilling this role? Why? Why not?

- 1 Answer (**SPECIFY**)
- 2 Don't know

48 In your opinion, how could ESS best communicate with tradespeople about electrical safety and compliance issues?

- 1 Answer (**SPECIFY**)
- 2 Don't know

49 **IF AUCKLAND OR CHRISTCHURCH RESPONDENT (PHONE INTERVIEW):**

Can I confirm your contact details in order to send you the \$50 petrol voucher to compensate for your time?

- 1 Yes (**SPECIFY**)
- 2 No

Thank you very much for your help. My name is (**NAME**) from BRC Marketing & Social Research. If you have questions or concerns about this survey, please ring the Project Manager, Shane Palmer, on 0800 500 168.

ELECTRICAL & GAS SAFETY GASFITTERS INTERVIEW GUIDE

BRC Marketing & Social Research, PN3074

November 2004

INTRODUCTION & BACKGROUND

Thank you for agreeing to take part in this research.

We are doing this research with electricians and gasfitters, to explore awareness, knowledge and behaviour with respect to electrical and gas safety practices. The research is not related to any commercial gain, and we are not selling anything.

In accordance with our professional Code of Practice, please be assured that the interview is strictly confidential, and nothing you tell us will be reported to the client in a way that might personally identify you. To avoid compromising the research, I can't tell you who the client is until the end of the interview.

The interview will take about 45 to 60 minutes.

Confirm permission for taping interview (tapes remain property of BRC).

Remind that a \$50 petrol voucher will be provided at the completion of the interview, to compensate for their time.

A. RESPONDENT DETAILS

DATE: _____ TIME: _____ BRC IDNO: _____

INTERVIEWER: _____

RESPONDENT NAME: _____

ORGANISATION: _____

POSITION: _____

LOCATION: A W C ____

EXPERIENCE/SUPERVISORY RESPONSIBILITY: _____

B. WORK PROFILE

- 1 First of all, can you briefly describe the type of gasfitting work you usually do?
PROBE FULLY, INCLUDING YEARS OF EXPERIENCE, MIX OF DOMESTIC, COMMERCIAL, INDUSTRIAL (WHERE RELEVANT),

C. GAS ACCIDENTS

2 Thinking now about accidents experienced on the job, in your experience, what do you believe is the most common cause of dangerous hazards among gasfitters on domestic jobs?
PROMPT IF NECESSARY: "Dangerous hazards" could include accidental or near miss gas leaks or gas escape, or carbon monoxide poisoning.

PROBE: What about...?

PROBE: Why is this the most common reason?

- *Equipment failure*
- *Not testing the line before working on it*
- *Not turning off the gas supply before starting work*
- *Not following a safe work practice*
- *Not receiving adequate training or not familiar with the work*
- *Unintentionally making a gas system live*

3 In your opinion, how can gasfitters avoid experiencing these hazards?
PROBE: What could you/other gasfitters or any other authorities do to make your work safer?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

4 And thinking about yourself, how many times in the last year have you experienced an accidental or near miss hazard, which may have been hazardous to you, other people or to property?

ACCIDENTS: _____

IF NONE GO Q7

5 In your opinion, what caused this/these accidents?

PROBE FOR ANY CAUSES BELOW NOT MENTIONED ON UNPROMPTED BASIS: What about...?

- *Equipment failure*
- *Not testing the line before working on it*
- *Not turning off the gas supply before starting work*
- *Not following a safe work practice*
- *Not receiving adequate training or not familiar with the work*
- *Unintentionally making a gas system live*
- *Anything else...?*

6 What could you have done differently to avoid this/these accident(s) or near miss(es)?

1 Answer (SPECIFY)

2 Don't know

D. REPORTING OF ACCIDENTS AND HAZARDS

7 Thinking now about any serious gas accidents. If you were there, you might contact the emergency services. What other organisations would you contact?

PROMPT IF NECESSARY: By this, I mean accidents where someone is killed, or needing to be off work for more than a couple of days, or where there is serious damage to property.

PROBE: Any others?

PROBE: Why would you contact this organisation? How would you contact them?

- ACC
- Building Industry Authority
- Office of the Chief Gas Engineer (energy inspection)
- Plumbers, Gasfitters & Drainlayers Board (PGDB)
- Energy Safety Service (ESS)/Consumer Affairs (Ministry of)
- Economic Development (Ministry of), Ministry of Commerce)
- Commerce Commission
- Labour (Department of)/OSH
- Property/appliance owner
- Gas supply authority
- Other...?

8 And if you came across a situation while carrying out gas-fitting work, where a gas appliance, installation or fitting was hazardous, what organisations would you report it to?

PROMPT: By hazardous, we mean it presented immediate danger to people or property.

PROBE: Any others?

PROBE: Why would you contact this organisation? How would you contact them?

- ACC
- Building Industry Authority
- Office of the Chief Gas Engineer (energy inspection)
- Plumbers, Gasfitters & Drainlayers Board (PGDB)
- Energy Safety Service (ESS)/Consumer Affairs (Ministry of)
- Economic Development (Ministry of), Ministry of Commerce)
- Labour (Department of)/OSH
- Property/appliance owner
- Gas supply authority
- Other...?

9 When you are certifying the installation of a new appliance or fitting, if you were not sure whether it conformed to regulations, what would you do?

PROBE: What about...?

PROBE: Why? Why not?

- *Do nothing*
- *Get more information from colleagues*
- *Get more information from gas suppliers*
- *Get more information from appliance manufacturer/agent/retailer*
- *Notify / Get more information from Energy Safety Service*
- *Notify / Get more information from Plumbers, Gasfitters & Drainlayers Board (PGDB)*
- *Get more information from Trade Association*
- *Anything else...?*

10 Which organisation or information source have you found most useful when you have needed relevant advice or assistance?

PROBE: What about...?

PROBE: Why? Why not?

PROBE: In what ways was this advice/assistance satisfactory or reliable?

- *ACC*
- *Building Industry Authority*
- *Office of the Chief Gas Engineer (energy inspection)*
- *Plumbers, Gasfitters & Drainlayers Board (PGDB)*
- *Energy Safety Service (ESS)/Consumer Affairs (Ministry of)*
- *Economic Development (Ministry of), Ministry of Commerce*
- *Labour (Department of)/OSH*
- *Property/appliance owner*
- *Gas suppliers*
- *Appliance manufacturer/agent/retailer*
- *Trade Association*
- *Any others...?*

11 In the last 12 months, have you known of other gasfitters who you think should have contacted an organisation(s) to report a gas accident, or an unsafe installation or appliance, but they did not?

- 1 Yes
- 2 No
- 3 Don't know

12 Thinking about gasfitters generally, what do you believe are the most common reasons why accidents or unsafe installations/appliances are not reported when they should be?
PROBE: Why are these reasons the most common?

1..... Answer (**SPECIFY**)

2..... Nothing

3..... Don't know

13 What do you believe would encourage gasfitters to always report accidents and hazards when they should?

PROBE: What would need to change to encourage greater reporting?

PROBE: Who or what organisation(s) should be responsible for making these changes or encouraging greater reporting? Why?

1..... Answer (**SPECIFY**)

2..... Nothing

3..... Don't know

- 16 Under what circumstances would you have actually reported this incident?
PROBE: What would have influenced your decision to report it?
PROBE: What would have made the difference between you reporting or not reporting?

- 1..... Answer (**SPECIFY**)
- 2..... Nothing
- 3..... Don't know

- 17 What do you believe are the most common reasons why other workers or members of the public get harmed following domestic gasfitting work?
PROBE: Why do you say that?

- 1..... Answer (**SPECIFY**)
- 2..... None
- 3..... Don't know

E. TESTING & USE OF TESTING EQUIPMENT

- 18 Thinking about gasfitters generally, what do you believe are the most common reasons for not carrying out tests when tests are required?
PROMPT FOR GAS LEAK TEST, CARBON MONOXIDE/CARBON DIOXIDE RATIO CHECK
PROBE: Why are these reasons the most common?

- 1..... Answer (**SPECIFY**)
- 2..... Nothing
- 3..... Don't know

19 What do you believe would encourage gasfitters to always carry out tests when they should?
PROBE: What would need to change to encourage more thorough testing?
PROBE: Who or what organisation(s) should be responsible for making these changes or encouraging more thorough testing? Why?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

20 In the last 12 months, have you been in a position where you think you should have carried out an appropriate test, but you did not?
PROMPT: For example, after new installations, additions, and modifications or after repairs of gas appliances.

- 1 Yes
 - 2 No
 - 3 Don't know
-] Q23
] Q23

21 For what reasons did you not carry out the appropriate test at that time?

- 1 Answer (**SPECIFY**)
- 2 Don't know

22 What would have encouraged you to actually carry out the test in these circumstances?
PROBE: What would have influenced your decision to carry out a test?
PROBE: What would have made the difference between you testing or not testing?

- 1 Answer (**SPECIFY**)
- 2 Don't know

- 23 Thinking now about the equipment used in gasfitting work, which of the following equipment do you personally own or have ready access to in your work kit?
- 1A flue gas (carbon monoxide/dioxide) analyser
 - 2Smoke tube
 - 3Manometer / other pressure measuring equipment
 - 4None
 - 5Don't know

IF 1 TO 3 ALL MENTIONED IN Q23 GO Q25

- 24 For what reasons do you not own or have ready access to... [EACH OF THOSE NOT MENTIONED IN Q23]?

F. ISSUING OF GAS CERTIFICATION CERTIFICATES (GCCS)

- 25 Thinking now about Gas Certification Certificates (GCCs), in the last year, have other Craftsman gasfitters you know been in a position where you think they should have issued a Gas Certification Certificate, but they did not?

- 1 Yes
- 2 No] GO Q28
- 3 Don't know] GO Q28

- 26 For what reasons have others not issued a Gas Certification Certificate when one may have been required?

- 1 Answer (SPECIFY)
- 2 Don't know

27 What would encourage others to actually issue a Gas Certification Certificate in these circumstances?
PROBE: What would need to change to encourage more thorough issuing of GCCs?
PROBE: Who or what organisation(s) should be responsible for making these changes or encouraging more thorough issuing of GCCs? Why?

- 1 Answer (**SPECIFY**)
- 2 Don't know

28 **IF CRAFTSMAN GASFITTER ASK:** Over the last 12 months, about how many Gas Certification Certificates have you issued for your own work and for others?
IF REGISTERED GASFITTER ASK: Over the last 12 months, about how many Gas Certification Certificates have been issued by others (i.e. Craftsman Gasfitters) for your own work?
PROMPT IF NECESSARY: None, 1-5, 6-10, 11-25, 26-50, 51-100, More than 100.

- # COCs ISSUED: _____
- 98... Don't know

29 And in the last 12 months, how much of the work you were responsible for was the type that required a Gas Certification Certificate to be issued? Would that be... **READ.**

- 1None
- 2Less than a quarter
- 3More than a quarter but less than half
- 4More than half but less than three quarters
- 5More than three quarters but less than all installations
- 6All installations
- 7*Don't know*

30 For which types of work do you think a Gas Certification Certificate should not be issued?
READ. PROBE: What about...?
PROBE: For what reasons do you believe a GCC should not be issued for... [**EACH OF THOSE CONSIDERED AS NOT NEEDING TO BE ISSUED**]?

- *New gas installation (Y)*
- *Alteration, extension or addition of existing installation (Y)*
- *Replacement of existing installation (Y)*
- *Repair of existing installation (N)*
- *Repairs to gas appliances (N)*
- *New LPG installation supply from one 9kg cylinder (N)*
- *New LPG installation supply from two 9kg cylinder (Y)*
- *New LPG installation in a caravan (N)*
- *Repair to gas installation/appliances after serious accidents (Y)*
- *Any others?*

G. OWNERSHIP & USE OF RELEVANT STANDARDS/CODES

31 Thinking now about the standards and codes established for gasfitting work, do you agree or disagree that *“the standards or codes I follow are relevant to my work”*? **READ. PROBE** Is that just agree/disagree or strongly agree/disagree?

- 1 Strongly disagree
- 2 Disagree
- 3 Neither agree nor disagree
- 4 Agree
- 5 Strongly agree
- 6 Don't know
- 7 Not applicable

32 For what reasons do you agree/disagree that *the standards or codes you follow are relevant to your work*?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

33 And do you agree or disagree that *“the standards or codes I follow contribute to safety”*? **READ. PROBE** Is that just agree/disagree or strongly agree/disagree?

- 1 Strongly disagree
- 2 Disagree
- 3 Neither agree nor disagree
- 4 Agree
- 5 Strongly agree
- 6 Don't know
- 7 Not applicable

34 For what reasons do you agree/disagree that *the standards or codes you follow contribute to safety*?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

35 And do you agree or disagree that “*the standards or codes I follow make it clear how to engage in best practice*”? **READ. PROBE** Is that just agree/disagree or strongly agree/disagree?

- 1 Strongly disagree
- 2 Disagree
- 3 Neither agree nor disagree
- 4 Agree
- 5 Strongly agree
- 6 Don't know
- 7 Not applicable

36 For what reasons do you agree/disagree that *the standards or codes you follow make it clear how to engage in best practice*?

- 1 Answer (**SPECIFY**)
- 2 Nothing
- 3 Don't know

37 Which installation standards or codes do you follow in your work?

PROBE: What about...?

- AGA601, 1995, - Gas installation code
- AGA601/AS5601, 2000 – Gas installation code
- Code of Practice for installation of gas burning appliances and equipment (NZS5261, 1990)
- The Installation of gas burning appliances and equipment (Part 1, 2, 3, NZS5261, 1996)
- Gas Installation NZS5261: 2003

38 **IF NONE IN Q37 FOLLOWED, ASK:** For what reasons do you not follow any codes or standards?
IF LATEST STANDARD (NZS5261: 2003) NOT USED ASK: For what reasons do you not use the latest standard (NZS5261: 2003)?

PROBE: What, if anything, would encourage you to use the latest standard (NZS5261: 2003)?

39 What do you think about the latest standard (NZS5261: 2003)?
PROBE: Is it easy to understand / easy to follow? Why? Why not?
PROBE: Should tradespeople be required to follow all parts of the standard? Why? Why not?

40 And which gasfitting installation standards or codes do you actually own?
PROBE: What about...?

- *AGA601, 1995, - Gas installation code*
- *AGA601/AS5601, 2000 – Gas installation code*
- *Code of Practice for installation of gas burning appliances and equipment (NZS5261, 1990)*
- *The Installation of gas burning appliances and equipment (Part 1, 2, 3, NZS5261, 1996)*
- *Gas Installation NZS5261: 2003*

41 **IF NZS5261: 2003 NOT OWNED IN Q40, ASK:** For what reasons do you not own the latest standard (NZS5261: 2003)?
PROBE: In your opinion, would it be beneficial for you to own a copy of this standard? Why? Why not?

H. KNOWLEDGE OF ESS & STRATEGIES FOR IMPROVING COMPLIANCE & SAFE BEHAVIOUR

42 In your opinion, what is the role of government agencies in relation to safety in domestic gasfitting work?

PROBE: Who/what agencies do you think are/should be responsible for this? Why?

1 Answer (**SPECIFY**)

2 Don't know

43 In your opinion, in what ways could awareness of safety issues for tradespeople involved in gasfitting be improved?

PROBE: Why do you say that?

44 And in what ways could tradespeople involved in gasfitting be encouraged to comply with standards or codes, and other safety-related testing requirements?

PROBE: Why do you say that?

45 Do you have any additional comments about how safe behaviour and compliance with safety requirements could be improved among tradespeople involved in gasfitting?

1 Comments (**SPECIFY**)

2 No

46 Are you aware of the Energy Safety Service (ESS)?

- 1 Yes
- 2 No
- 3 Don't know

] go Q49
]

47 What do you believe is the role of ESS in relation to tradespeople involved in gasfitting?
PROBE: In your opinion, how effective is ESS in fulfilling this role? Why? Why not?

- 1 Answer (**SPECIFY**)
- 2 Don't know

48 In your opinion, how could ESS best communicate with tradespeople about gas safety and compliance issues?

- 1 Answer (**SPECIFY**)
- 2 Don't know

49 **IF AUCKLAND OR CHRISTCHURCH RESPONDENT (PHONE INTERVIEW):**
Can I confirm your contact details in order to send you the \$50 petrol voucher to compensate for your time?

- 1 Yes (**SPECIFY**)
- 2 No

Thank you very much for your help. My name is **(NAME)** from BRC Marketing & Social Research. If you have questions or concerns about this survey, please ring the Project Manager, Shane Palmer, on 0800 500 168.