



Review of Domestic Gas Safety
Report for the
Health and Safety Executive



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Final Report for the Health and Safety Executive

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Executive Summary

1. **The purpose of this review** is to explore the current arrangements to promote domestic gas safety across the UK, to identify areas of strength and weakness, and to make recommendations for the future.

This is a surprisingly complex subject, involving a number of disparate stakeholders and some significant tensions both within the industry and from external interests, including pressure groups.

This report has been produced after an extensive period of stakeholder consultation and involvement, commencing in February 2006 and including 2 stakeholder conferences, a questionnaire, over 50 interviews with organisations and individuals, and a series of working groups. It covers piped gas and LPG used in domestic homes in the UK. We would like to thank all those who have given so much of their time and were so helpful.

2. **The responsibility for administration of the existing regulations** rests with HSE, which delegates certain functions to a registration body known as CORGI. Any gas installation business undertaking commercial installation or maintenance of a gas appliance in UK domestic premises must be registered with CORGI. There are a number of requirements for registration, including – for every employed gas fitting operative – an assessment of competency every 5 years (the ACS scheme), a portfolio of experience and, normally, a qualification. CORGI inspects the work of registered installers at intervals. HSE is empowered to enforce the relevant legislation and may issue a written warning in response to a complaint or institute formal legal proceedings with respect to a more serious incident.
3. **This has been widely regarded as a safe industry**, and reported fatalities have reduced to less than 30 per annum. Most deaths are caused not by fire or explosion, but by CO poisoning: CO is a colourless, odourless gas given off by burning a combustible fuel, such as gas or oil, in the absence of adequate ventilation. Exposure to CO can cause death, permanent serious disability, or, at lower levels, more temporary, flu-like symptoms. As well as affecting quality of life, undiagnosed CO poisoning may prevent individuals entering employment, be a charge on the NHS, on sick pay and other support schemes.
4. There is, however, some indication that **the incidence of CO poisoning and even the level of fatalities may be under-reported**. Research also suggests that there may be a number of homes with potentially dangerous levels of background CO linked to patterns of use and faulty, or poorly ventilated, gas appliances, representing an unquantified health risk.

Recent studies further suggest that the public may have a poor awareness of the concept, dangers and causes of CO poisoning. Industry efforts to raise awareness are limited and not well co-ordinated. There is a real risk that, in the light of emerging evidence about the potential prevalence of CO, the industry may be judged irresponsible if action is not now taken to address this issue. This could have a far more damaging commercial effect than measured communication that alerts the public, including health professionals, to the dangers of CO and how to manage these.

5. **Risk patterns are changing with regard to CO poisoning:** households most at risk appear increasingly to be those where current laws do not identify a duty holder to ensure safe installation and regular checking of gas appliances, eg: owner-occupied premises rather than multiple occupancy rented accommodation. It seems unlikely that legislation and the associated enforcement will be introduced to cover this area: increased awareness of the potential CO hazard therefore appears the only option if the risk is to be reduced.
6. **It is essential that steps are taken to increase public awareness of the CO hazard,** given the potential to cause death and serious injury, changing patterns of risk and recent evidence suggesting that the public health risk may be more widespread than previously acknowledged. In order to deliver this, there will need to be:
 - additional funds
 - a co-ordinating body
 - involvement from a wider range of interests, including Health

We therefore recommend that an industry co-ordinating body be set up to initiate work and fund raising in support of CO awareness. This should be chaired by a respected and high profile public figure, and should involve a variety of interest groups and government departments, including DWP, DCLG and DH. The domestic gas registration body/bodies may play a significant and increasing role in the management and support of this group, and should be encouraged so to do. Indeed, there is logic in this co-ordinating function being assigned to the gas registration body/bodies and we so recommend.

The CO awareness co-ordinating body should explore cases for a variety of initiatives, some focused, others more wide ranging, and should act to co-ordinate existing efforts and take advantage of untapped but inexpensive opportunities, eg: leaflets which could be sent with gas bills, left by installers and the emergency services.

Funds may come from a variety of sources including industry contributions, existing surplus from registration fees, rise in registration and ACS incomes from additional registration, CORGI Trust (which receives the profits from CORGI's commercial activities). If these funding streams are insufficient, legislation may be needed to produce a levy on the industry: if this is required, other fuels which can produce CO in situations of incomplete combustion should also be included.

Other initiatives considered by the CO awareness co-ordinating body should include:

- audible CO detection alarms, which can be very effective and reliable
- what more can realistically be done by the emergency gas services when attending at a possible CO poisoning situation
- phasing out of old and open flued appliances, especially boilers, which represent higher risk
- use of the home energy rating scheme to highlight hazards and safety measures connected with domestic gas
- promotion of clinical awareness of CO symptoms and detection, especially among GPs and pathologists

Increased public CO awareness will also reduce some of the tensions within the industry. For example, if householders are aware of the dangers, they are more likely to use a registered gas professional, thus reducing the level of illegal, unregistered installers and consequent pressure from legal installers for greater investment in enforcement. This will also drive more current illegal installers to register, increasing the flow of revenue to ACS providers and the registration body: this could be used to reduce costs to installers and/or to part-fund a CO awareness campaign.

7. The current **ACS scheme** and registration systems are widely seen by installers as being too onerous and inflexible and may well discourage registration. A strong, independent voice is required to challenge the assessment system and standards for ACS certification. Steps within the industry to address this should be encouraged and accelerated. The aim should be to produce an approach that is:
 - risk based
 - simplified
 - allows individuals to demonstrate competence with a more flexible mix of assessment, inspection, qualifications, experience and continuous professional development

The registration body/bodies must ensure that registration criteria also reflect this changed approach.

8. There are some concerns about the **competence of registered installers**, particularly following recent introduction of more random inspections by CORGI. This needs further attention and we would suggest:
 - that the ACS scheme aims to improve overall standards of competence by engendering more generic skills
 - that CORGI review the action taken if a substandard installation is found, eg: compulsory additional training, higher levels of inspection and an increased registration fee
 - while supporting the concept of the gas works notification scheme, which allows more random inspections, the methodology should be reviewed, eg: allow the installer to certify his work direct with the customer and send a copy of the paperwork to CORGI, rather than the other way around
 - use of flue gas analysers should be mandatory when installing or servicing open flued appliances
9. A number of issues of some substance have been identified with respect to the interface between HSE and **the registration body**, and its management and role. We recommend that HSE review these issues and invite expressions of interest from appropriately qualified organisations wishing to take on the role of the registration body. An assessment of competency should be made by an HSE panel against a number of criteria, including:
 - delivery of key issues outlined in this report, especially co-ordinating action to promote CO awareness and changes to competency and registration systems

- a business case to demonstrate how the registration scheme will be funded without additional cost to installers
- an improvement in key safety issues
- ability to work with stakeholders and other registration bodies
- innovative approaches and added value
- probity and transparency in governance, especially with regard to conflict of interest, commercial enterprise, interface with HSE
- delivery of key aspects of the registration scheme, eg geographic cover, installer and public help lines, managing complaints
- a consumer voice

Organisations satisfying the panel would be recognised as registration bodies for a reasonable period, perhaps 5 years. If the case made by one body were considerably stronger than the others, or offered substantial additional benefits, the panel may decide to recognise only one registration provider. Registration bodies should be subject to regular and transparent reviews of performance against key indicators. This is a process akin to that used nowadays in most substantial procurements.

We recommend this process to review recognition of registration bodies be repeated at regular intervals determined from time to time by HSE: perhaps every 5 years in normal circumstances, allowing the drivers and direction of the registration body/bodies to be revised and updated, yet giving a level of consistency and ability to recover investment through a minimum period of tenure.

There is considerable debate as to whether one or more registration bodies should be recognised: there are advantages and drawbacks to either approach, none of which is currently of overriding priority or cannot be managed. While it is important that there is only one registration *scheme*, providing the system is properly set up and regulated, it could be administered by more than one registration *provider*. Whatever the short-term decision, we recommend that HSE retain a framework that allows the appointment of more than one registration body.

10. The **legislation** dealing with domestic piped gas and LPG – The Gas Safety (Installation and Use) Regulations 1998 – would benefit from some changes, especially:

- simplification: some of the current legislation appears, in practice, to be redundant, or a duplication, and it is therefore more confusing than it needs to be
- the clear and unambiguous use of a goal-setting approach, which recognises an industry code of practice to define specific standards relating to technical issues of installation and servicing, rather than setting these out in law: this would promote changes in line with technology and practice, address some ambiguity with regard to the competence of foreign workers, and could provide greater clarity about standards in prosecutions
- rationalisation of prescriptive clauses, in support of an industry code of practice

- if the above were in place, a “Hawthornes workshop manual” approach to standards could more readily occur, potentially making installation and servicing easier to understand, and therefore safer
- more minor issues relating to non-process factory gas appliances

11. The issue of **landlords’ duties** with regard to gas safety may benefit from a further review. Current legislation requires an annual safety check certificate for all multiple occupancy households where there are gas appliances. Incidents in such accommodation appear to have reduced in consequence. There are criticisms, however, that the system is not risk-based and is too onerous, and, in complete contrast, that an annual service should be required, not merely a safety check.

12. While the law with regard to **unregistered installers** appears clear – they are acting illegally if they charge for their work – it does not support a significant number of successful prosecutions, despite the apparent prevalence of illegal activity. From the perspective of the industry, action taken against illegal installers is seen as limited and an insufficiently effective deterrent. The lack of successful prosecutions may be due to:

- limited initiation of formal enforcement by HSE (or other bodies)
- courts being unconvinced that non-registration should have serious consequences
- difficulty in identifying individuals and linking them with a particular job of work
- some uncertainty about installation standards: this could be rectified by the formal recognition of an industry code of practice (see para 10)

As non-registered installers are unlikely to take part in assessment and inspection, and will probably undergo minimal levels of training and professional update, they are likely to be less safe than registered installers. We explored a number of ideas in support of reducing the number of non-registered installers, and have concluded that there is no one answer. Instead, progress should be made through a variety of ‘carrots’ and ‘sticks’, including:

- higher public awareness of CO hazard and prevention will ensure more demand for registered installers
- targeted episodes of prosecution from HSE, using current resources in a different way
- strengthened efforts to publicise prosecutions and other enforcement activity
- further exploration by HSE of penalty systems and the possibility of an increased role for the registration body/bodies
- a less rigid approach to registration and assessment, which still ensures a high level of competence, but attracts more installers
- efforts to raise penalties administered by the courts on these health and safety offences and encourage consideration of alternative sentencing which might serve as a greater deterrent, eg: community service



13. **Standard setting** within the industry generally works well, and there is consultation with ACS providers and other stakeholders. There could, however, be improvements to the ad hoc way in which standards are published for use. If released in a controlled way, perhaps in batches, it could be easier for all stakeholders to keep up to date and could minimise some uncertainty about when a change becomes compulsory or only advisory for training purposes.

Further, this could be an opportunity to release associated standards at the same time, removing problems that may occur when the implications of one change in practice have not been worked through.

14. **The industry is fragmented and without a single voice or co-ordinating body.** Difficulties highlighted include: lack of rapid feedback about safety issues and incidents, lack of co-ordination over CO awareness opportunities and difficulty in driving change even when the direction of travel is broadly supported. There have recently been some modest steps towards self-governance within the industry, through the creation of mechanisms to revise the ACS regime. It is possible that the review of the registration system recommended above could create a body with the ability and support to draw stakeholders together: this would be welcome and we so recommend.

1 Methodology and Process

This document should be read in conjunction with *Review of Domestic Gas Safety – Executive Summary*, which outlines our conclusions and recommendations. Here we expand these and provide extra details on the methodology adopted and options considered and rejected, in association with stakeholders, during the project.

The 2006 *Review* was launched at a stakeholder forum on 20 February 2006. This was opened by Lord Hunt of Kings Heath, Minister with responsibility for Health and Safety, and was attended by over 90 stakeholders¹. The forum introduced the *Review* and stakeholders were asked to identify the key areas the review needed to address. These were determined to be (as published by HSE):

- public and other groups' awareness of CO – options for funding research, raising awareness and encouraging industry ownership through voluntary contributions
- gas installer competence – consider links between Accredited Certification Scheme (ACS), the Gas Work Notification Scheme (GWN) and the CORGI registration scheme
- unregistered installers – examine the options to reduce illegal gas installations including the penalties available and who is best placed to undertake enforcement
- legislative framework and standards – look at which parts of the existing framework add value and which parts do not. Explore whether the legislation should adopt a more goal setting approach with details set out in industry standards to allow for more flexibility. Include looking at opportunities that may flow from ODPM competent persons scheme, given that HSE has stated that in line with its strategic priorities, it would like to release resources from gas safety work. This must be dependent on securing overall improvements in the regime through better ways of working
- framework options/integration and implementation – how to develop a more coherent and better partnership approach for tackling the current and future issues facing the consumer gas industry

Our report is therefore organised primarily under the above headings.

HSE also commissioned two further pieces of work. Dr Ben Croxford (University College London) was commissioned to undertake a project to determine the extent of the CO hazard. TUV NEL was commissioned to undertake two pieces of work, a study of the potential of fixed penalty notices to result in increased prosecutions of illegal installers, and a technical review of the Gas Safety (Installation and Use) Regulations. This work has directly informed the *Review* and this report.

¹ The outcome paper from the stakeholder forum can be accessed at (Removed)

The *Review of Domestic Gas Safety* has been stakeholder led and a range of engagement techniques were used to ensure the contributions of a wide range of stakeholders were captured. These included:

- stakeholder forums
- one-to-one interviews
- telephone interviews
- work groups
- questionnaire
- desk based research

1.1 Stakeholder forums

The *Review* opened with a stakeholder forum on 20 February (see above) and closed with a final stakeholder forum held on 2 October 2006. Again opened by Lord Hunt, we presented a range of options in relation to each of the key areas addressed by the *Review* (a summary of which is included as appendix 3): stakeholders were offered the opportunity to identify preferred options and refine them. 100 stakeholders attended this event.

1.2 Interviews/telephone interviews

Interviews were undertaken with representatives from all four home nations and included a broad range industry stakeholders. Represented groups included:

- gas installers
- CO victims
- CO victim representative bodies
- gas transporters
- gas suppliers
- CORGI (the registration scheme)
- NAPIT (who have tendered to operate a registration scheme in competition with CORGI)
- gas inspectors
- training and assessment organisations (including those involved in ACS)
- central government
- Health and Safety Executive
- devolved administrations (Wales and Scotland)
- local government
- trade unions

A combination of face to face and telephone interviews were used, and many stakeholders were interviewed on several occasions throughout the *Review* as the options developed.

1.3 Work groups

Five workgroups met on two occasions to consider each of the issues identified at the stakeholder forum. Stakeholders were invited to join the workgroups and places were limited to ensure that they were both manageable and that the range of interested stakeholder groups were adequately represented. We sought to achieve a balance of backgrounds, skills and expertise on each group (including trade and industry associations, industry, CORGI, certification bodies, campaign groups and safety groups). The first meeting of each work group focused on the challenges and issues in each specific area and identified if and where further information was required. The second round of meetings sought to consider options to address the issues identified at the first meeting and provided feedback on the first draft of the *Framework Options* (as identified by the Integration and Implementation work group). The meetings were conducted under the “Chatham House Rule” of confidentiality to allow participants to freely express their views. We also held workshops both with HSE and with representatives of local authorities.

1.4 Stakeholder questionnaire

Stakeholders were also invited to submit their views through a stakeholder questionnaire (we have included a copy of the questionnaire and findings as Appendices 2 and 3). The questionnaire was publicised in *Gas Installer Magazine* and could be requested from Frontline Consultants (via the website, in writing or over the telephone) and was available from Monday 13th February to Friday 14th July. We received 289 responses from a range of organisations. The outcomes directly informed our conclusions and recommendations and allowed us to identify individuals for follow up interviews.

1.5 Desk research

We undertook a period of desk research to inform the consultation process and underpin our findings. This included examining data relating to domestic gas safety, and a summary of the key safety statistics is included below.

1.6 Stakeholder led

The *Review* was stakeholder led but was not intended to represent a full public consultation. Views were sought from a broad and representative cross section of the domestic gas supply industry (both piped and bottled) and associated stakeholders and representative groups. Whilst extensive stakeholder engagement was undertaken, the *Review* did not actively seek the views and opinions of gas installers who did not volunteer to contribute.



2 Domestic Gas Safety

2.1 Overview

Official statistics relating to domestic gas safety indicate that piped natural gas and liquid petroleum gas can be regarded as a very safe fuel. Fatalities attributed to domestic gas are very low, and reported incidents have reduced significantly over the 15 years the current regulatory regime has been operating. Risk from domestic gas, and indeed from any combustible fuel, is focused on either fire/explosion or CO poisoning. CO is an odourless and colourless gas that is formed in the incomplete combustion of organic substances – including but not limited to natural gas - and can be dangerous to the public because it interferes with normal oxygen uptake. CO may be produced when an appliance is improperly vented or maintained and can result from the inappropriate use of gas fired appliances (eg using an oven to heat a room which is poorly ventilated).

The official figures show that gas can be regarded as a very safe fuel. Comparators of risk using data from 2000 show that the annual risk of dying per head of population from the following are:

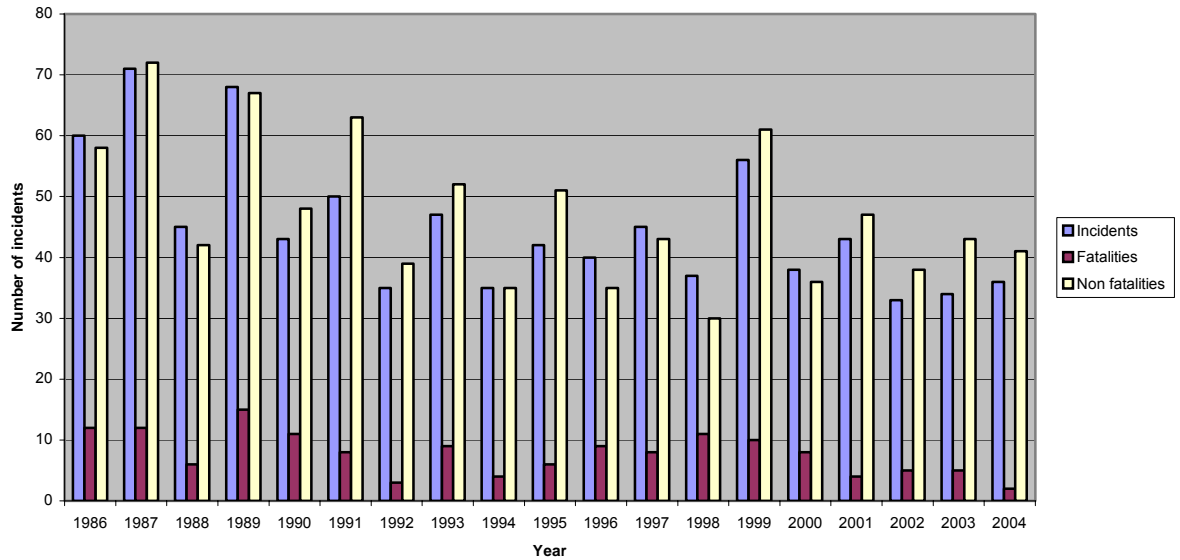
- CO poisoning from incomplete combustion (Gas), 1 in 1.8m
- an internal natural gas explosion, 1 in 11m
- all types of natural gas related incident, 1 in 1.4m
- a road accident, 1 in 15,700
- accident in home or garden, 1 in 15,000
- electrocutions in the home, 1 in 170,000
- cancer, 1 in 360
- struck by lightning, 1 in 10 million

Source: Gas Industry Safety Group, Benchmarking Study, 2000



The graph below shows the number of fire/explosion incidents relating to flammable gas: there has been a downward trend in both the numbers of incidents and deaths, with 36 incidents resulting in two fatalities in 2004.

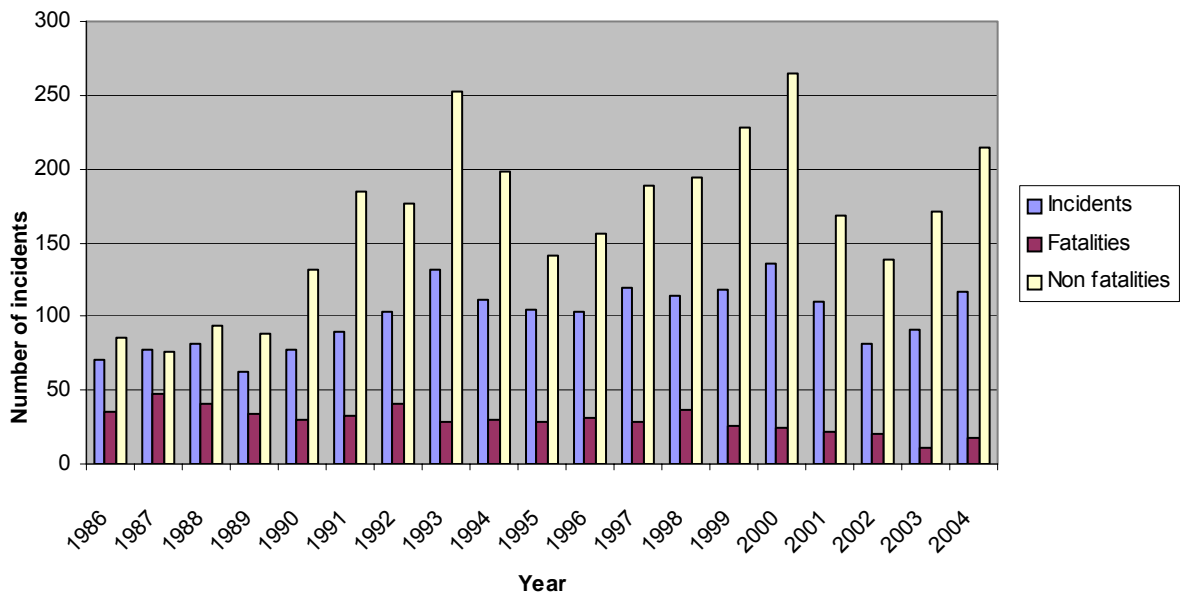
Fire/Explosion incidents relating to Flammable Gas



Source: HSE

As the graph below shows, there has been a downward trend in reported CO deaths over this period, reducing from a ten year high of 37 in 1998 to 18 in 2004 (and a ten year low in 2003). However, neither the number of reported incidents relating to CO nor the number of reported non-fatal poisonings has shown a similar reduction.

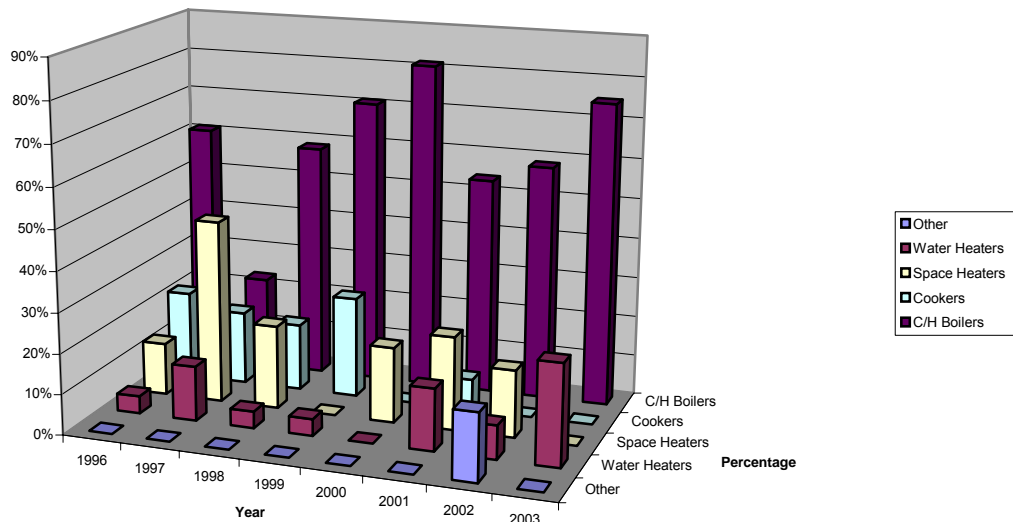
Gas Safety CO Incidents



Source: HSE

The table below shows trends in fatalities due to CO incidents by appliance type (as recorded by official statistics). It shows that central heating devices/boilers consistently account for the majority of CO fatalities. Over the last five years for which there are official statistics, water heaters and space heaters (including gas fires) have accounted for the second highest proportion of fatalities relating to CO poisoning, while incidents relating to cookers have reduced significantly over the same period.

Trend of % fatalities due to CO incidents by appliance type



Source: HSE

Advantica regularly undertake a review of incident information on behalf of HSE, which is published annually. Notable trends in the most recently published statistics² include:

- the proportion of incidents in owner occupied accommodation was higher than the occupancy statistics for GB in this category
- incidents took place more often in terraced properties than in other property styles
- the most common room locations for casualties were the living room/lounge and the bedroom
- the majority of all CO incidents involved appliances fitted with open, individual, or natural draught flues
- central heating appliances were responsible for the majority of fatal and non-fatal casualties
- the most common incident causes were a lack of servicing and flue/terminal faults
- flue and ventilation faults were common in many domestic incidents

² A review of carbon monoxide information 2003/04, Advantica, 2006
HE0502-79a

In summary, official statistics suggest that:

- the risk of fire and explosion from gas has reduced over recent years to very low levels
- while the incidence of deaths due to CO poisoning from domestic gas in the UK has reduced, this is not the case with CO poisoning incidents and non fatal poisoning
- the pattern of risk is changing, and now appears relatively higher in owner occupied terraced houses than in multiple occupancy, which may be outside the scope of current legislation
- older appliances and open flued boilers represent the highest risk

2.2 The extent of the CO hazard and awareness

Inhaling CO reduces the body's ability to carry oxygen with the result that the body's organs and cells become starved of oxygen. Symptoms relating to mild carbon monoxide poisoning may be non specific and similar to those relating to viral cold infections, and include headache, nausea, dizziness, sore throat and dry cough. In children, the symptoms can be similar to those of a stomach upset, with nausea and vomiting. More severe poisoning can result in a fast and irregular heart rate, over breathing (hyperventilation), confusion, drowsiness and difficulty breathing. Seizures and loss of consciousness can also occur, and symptoms can occur a few days or even months after exposure (including confusion, loss of memory and problems with coordination). Different people react to CO poisoning in different ways, displaying different symptoms, and some groups (particularly the old, young or those with pre-existing breathing conditions) are more susceptible. In extreme cases exposure can result in death.

Despite the figures quoted above, the incidence of CO poisoning is almost certainly higher than has been previously recognised, and the published level of fatalities may be underreported to an unknown degree. Furthermore, emerging research suggests that there may be a number of homes with potentially dangerous levels of background CO linked to patterns of use and to faulty, or poorly ventilated gas appliances, representing an unquantified health risk.

There are several active pressure groups campaigning for higher CO awareness, due to some tragic accidents leading to death and serious disablement as a result of exposure to the poison. As a result of information and contacts from these groups and interviews with survivors and their families, we conclude that it is a reasonable assumption that some deaths and injuries could be avoided if there were higher awareness of the risks and causes of CO poisoning. The *Review* received reports about and heard directly from CO victims who had reportedly been diagnosed with other illnesses, such as suspected flu (on one occasion a heart attack) and sent home, potentially to continued CO exposure. While the correct diagnosis has, in these cases, come to light, it seems fair to assume that an unknown number of cases of CO poisoning may go undetected.

It appears possible that some fatalities due to CO poisoning may not be identified. The Review was advised that pathologists do not routinely test for CO poisoning during a post mortem, and explored one case where the victim had been cremated and enquiries into a suspicious death were underway before other members of her family became ill and CO poisoning was finally detected in a retained post-mortem blood sample. We are therefore persuaded that it is possible, to put it no more strongly, that the official numbers of fatalities from CO poisoning are underreported.

As part of this review, Dr Ben Croxford, from the Bartlett School of Graduate Studies at University College London, was commissioned by HSE to undertake a Gas Appliance Check Project to research the incidence of and exposure to CO in the home. Emerging findings from this work³ can be added to an earlier study by Dr Croxford⁴. To summarise, the results of these 2 studies suggest that:

- exposure to high levels of CO in the home may be more common than is currently recognised
- there may be significant numbers of poorly maintained or installed and consequently potentially dangerous domestic gas appliances
- public awareness of the CO hazard is low

While the numbers of homes involved in these studies is small, and translating these findings into any substantiated public health risk will require further research, the indications are that the risks of CO poisoning from domestic gas are underplayed.

The All-Party Parliamentary Gas Safety Group (APPGSG) recently conducted a series of hearings into the prevalence and effect of carbon monoxide poisoning and published its findings in the report *Shouting about a Silent Killer*⁵. The report calls for the government to aim to adopt a zero fatality target in relation to CO poisonings, and for energy retailers, the government and other relevant bodies such as CORGI to jointly fund an integrated media advertising campaign to raise awareness of the dangers of CO poisoning. They have also called for energy companies to submit an annual audit of their CO-awareness activity that would in turn be placed in the public domain by the APPGSG.

Public awareness of the potential danger represented by CO poisoning appears relatively low, as evidenced by Dr Croxford's research, our questionnaire and review and the lack of a co-ordinated publicity campaign. Given low general awareness, this may be a particular issue amongst the medical community: detailed reports from CO victims and their families reinforce this supposition.

³ The key findings from the Gas Appliance Check Project – as presented at the final stakeholder forum - can be viewed (Removed)

⁴ *Carbon Monoxide Risks in the Home*, Dr Ben Croxford (UCL), 2005

⁵ *Shouting About a Silent Killer* (2006)

There is currently no co-ordinated campaign to raise awareness of the potential danger presented by CO or the steps a member of the public can take to protect themselves and their family. While various organisations, individuals and charities undertake a range of intermittent and fragmented activity, this does not maximise impact or represent an efficient use of resources. Straightforward, cost effective opportunities are missed: a CO awareness message on the back of gas bills, for example, or a brochure left by emergency service providers called on suspicion of a gas leak.

This may be particularly important if, as suggested, many households at risk are not covered by current enforcement legislation and have, in effect, no duty holder responsible for gas safety. The most, if not the only realistic method of reaching these households and further improving safety is through CO awareness raising: legislation is unlikely and enforcement impractical.

In summary:

- there are a number of indicators to suggest that the risk of poisoning and even death from exposure to CO may be greater than official statistics suggest
- while much of the evidence outlined above is not currently quantified, it is none the less powerful, and comes from a variety of sources with, so far as we can determine, no indicators to the contrary
- CO awareness appears low amongst the public and even in some specialist groups of professionals
- there is no coherent CO awareness raising programme
- CO awareness is therefore a key concern and should be a primary issue in informing regulatory policy in relation to domestic gas safety

It is worth noting that there are commercial benefits to the gas installation industry in promoting CO awareness. For example, if householders are aware of the dangers, demand for registered gas professionals will rise. Gas suppliers may be reluctant to invest in promotion of CO awareness if providers of other combustible fuels, which can also produce CO, do not take a similar approach. We suggest, however, that a greater commercial danger lies in consumers finding suppliers irresponsible if they do not now make the public aware of the emerging evidence.

3 Reducing the Risk of CO Poisoning

The broad alternatives discussed at the second stakeholder conference are shown at Appendix 1. There was consensus that more needed to be done, although there was some discord as to how fast and ambitious change should be. Outlined below are a range of measures for reducing the risk of CO poisoning which were discussed, along with an assessment of their effectiveness.

3.1 Awareness raising

Given the potential of CO to cause death and serious injury, the changing pattern of risk plus recent evidence suggesting that the public health risk may be more widespread than previously acknowledged, it is essential that steps be taken to increase public awareness of the CO hazard.

A significant and sustained publicity campaign promoting both the need for regular servicing and the benefits of CO alarms would alert the public to their responsibilities with respect to domestic gas safety. Public awareness of the dangers of CO is currently low, and the public are in general unaware of the two simple steps that are most likely to protect them. Raising awareness of the dangers and how to avoid them would help the public take responsibility for their own safety.

A co-ordinated and ongoing awareness campaign is the single most effective measure that could lead to a reduction in CO poisoning. Delivering increased and coordinated awareness raising will require a process (eg creation of a coordinating body) and funding from a range of sources.

3.1.1 Industry co-ordinating body

Current awareness raising activity is undertaken by a range of industry companies and groups, and is stretched across a wide range of activity. Low cost opportunities are missed. A range of messages are promoted rather than a single clear safety line. If this is to be addressed, and funding found to support a higher profile campaign, an organisation needs to be identified to take responsibility and provide leadership. We explored a number of options for this role but reached the conclusion that no existing body is currently appropriately placed to carry this out. **We therefore recommend the formation of an industry co-ordinating body, tasked with initiating work and fund raising support for CO awareness.**

This should be chaired by a respected and high profile public figure, and should involve a variety of interest groups and government departments, including Department for Work and Pensions, Department for Communities and Local Government and Department for Health. The domestic gas registration body/bodies may play a significant and increasing role in the management and support of this group, and should be encouraged so to do. Indeed, there is logic in this co-coordinating function being assigned to the gas registration body/bodies in due course and we so recommend.

The CO awareness co-ordinating body should explore cases for a variety of initiatives, some focused, others more wide ranging, and should act to co-ordinate existing efforts and take advantage of untapped but inexpensive opportunities, eg leaflets which could be sent with gas bills, left by installers and the emergency services: these could explain how simple actions like leaving a window open for ventilation can reduce risk, and using a gas grill to heat a room can be dangerous. Other initiatives to be considered by the CO awareness co-ordinating body should include those discussed elsewhere in this section.

Past attempts to set up such a focused group have failed. We suggest that an attempt at this time may be more successful, given the emerging evidence of the CO hazard, and greater levels of political interest. We would emphasise that an increase in CO awareness is of fundamental importance and, if industry and key partners do not collaborate to deliver this, it may require HSE – perhaps in association with a levy – to create a dedicated coordination facility. In association with OFGEM, it could also be considered as part of a future review of supplier licenses.

3.1.2 Funding

Coordinating activity and addressing low cost opportunities should deliver a worthwhile impact on public CO awareness; however, a really effective CO awareness campaign will require additional resources. Funds may come from a variety of sources including:

- industry contributions: all sectors of the industry could agree to make modest annual donations to the coordinating body to support an awareness raising campaign
- existing surplus from registration fees: CORGI have built up a fund to hedge the costs they will incur if their status as the registration body ends. If CORGI were awarded longer term recognition in this role, the funds could potentially be redirected to CO awareness raising
- future surplus from registration fees: CORGI have been able to fund significant investment as well as a contingency fund from registration fees. Without raising the level of fees to installers, it should be possible to generate future surpluses, which could be seen as the installer's contribution to a CO awareness campaign. Our modelling suggests that this potential will exist, albeit perhaps at a reduced level, even if multiple registration bodies are introduced (see later section of this report)
- rise in registration and ACS incomes from additional registration: there has been a steady rise in registration numbers over recent years, producing increased revenue for CORGI and ACS providers. The potential for further, continued expansion could be enhanced through higher CO awareness, which would emphasise the need for servicing and the use of a registered installer CORGI Trust: receives the profits from CORGI's commercial activities and has a mandate to spend these for the benefit of domestic gas safety: we understand that the sum of £1m has recently been gifted to the CORGI Trust for this purpose

If these funding streams are insufficient, due to lack of voluntary industry support, legislation may need to be considered to support a levy: if this is required, other fuels that can produce CO should also be included. UK gas consumption is currently 95 billion cubic meters per annum. While different supply companies use different chargeable units, only a fraction of a penny per unit would be required to fund an awareness programme.

3.2 Technology

3.2.1 Installation

Safe domestic gas begins with the proper installation of appliances in the home to ensure appropriate connection to the mains and proper ventilation to allow full combustion without the production of CO. Correctly installed appliances are not only safer, but, we are advised, will operate more efficiently and are likely to last longer. This is the area that is targeted by the current regulatory regime, which has contributed to the reduction of fire, explosion and officially recorded incidents of all types over the last 15 years. This has a continuing role to play.

3.2.2 Regular servicing and maintenance

Regular servicing and maintenance of appliances is essential if safe and efficient operation is to be ensured. This was commonly identified by stakeholders as the single most effective means of proactively safeguarding public safety. If carried out by a properly trained individual, any risk of gas leaks should be identified, the burner adjusted if necessary to optimise combustion and, importantly in this context, any risk of poor ventilation and production of CO identified. This may be due to a blocked flue, chimney, building work or DIY alterations to ventilation arrangements. Some countries make this a mandatory requirement, notably Japan, but we suggest that the pattern of owner-occupier housing and difficulties of enforcement in the UK make this an impractical option that is difficult to justify given the current level of known risk.

Promoting regular servicing and safety checks as a core message of a coordinated CO awareness raising campaign therefore represents one of the most effective ways of improving gas safety.

3.2.3 Audible CO alarms

If regular servicing represents the proactive element of a comprehensive approach to gas safety, then audible CO alarms represent a complimentary reactive element. We note the recent success in relation to the promotion of smoke detectors as an appropriate model of raising awareness and placing the responsibility for safety on the public: this also demonstrates how effective these cheap and easy to installed devices can be. As noted above, CO is colourless and odourless, and therefore impossible to detect without a CO monitor. Alarms should be audible to ensure they alert the household to the potential danger.

In the past, the reliability of these devices has been questioned. CO alarms have, however, recently been subject to both British and European standards (BS7860 and EN50291) and appear now to be very reliable as well as significantly cheaper. As with fire alarms, CO alarms must be installed in the correct location and need to have their batteries regularly replaced. Audible CO alarms will also give an alert to CO leaking from neighbouring properties: we heard of instances when this could have saved lives.

The promotion of audible CO alarms should therefore represent a second core element of a public awareness campaign.

3.2.4 'Black spot' detectors

Stakeholders were united in their belief that in the vast majority of circumstances 'black spot' detectors represent a danger to public safety. They do not have an audible alarm, and only protect the user *while they are looking at it*. They also have a relatively short life (around 3 months) and have no means of indicating that they are no longer active. Black spot detectors may consequently give a false and dangerous sense of security.

3.2.5 Advances in design and the elimination of high risk appliances

Over recent years, appliance manufacturers have made significant improvements in design, which have undoubtedly had a positive impact on public safety. The biggest change is the development of balanced flue appliances, which exchange exhaust gases for air from outside the room and will not burn without this incoming ventilation, effectively precluding the production of CO. Analysis indicates that older, open flued appliances are inherently more dangerous and that their gradual elimination is important in the reduction of CO poisoning. These appliances should continue to be phased out and replaced with modern balanced flue models, which are inherently safer, through a strategy of:

- public awareness raising
- grants to replace old stock, especially open flued boilers
- the energy rating system for houses (in England and Wales) could identify higher risk appliances without a balanced flue

There is a range of other technological solutions, such as fail safe mechanisms, that would potentially further improve public safety. Currently they are expensive, but higher public awareness of the risks of CO could increase market demand, reducing costs and generating more safety features.

3.2.6 Flue gas analysers (FGA)

FGAs represent a means of checking that an appliance is operating efficiently and not producing dangerous gases. This is, strictly speaking, a 'spot-check' that an appliance is not producing CO at a given time, a situation that could change, for example if the wind direction affects ventilation. Checking an open flued, older appliance with a FGA should, however, eliminate some level of risk and should be standard practice after installation or maintenance. The installer would also be safe in the knowledge that an appliance was not a danger at the time they left the customer. Training is required to ensure the correct operation of a FGA and we are pleased to note the introduction of an ACS module to support this.

3.3 Regulation and process

3.3.1 Emergency services

The gas emergency services make a significant and valuable contribution to public safety by 'making safe' potentially dangerous situations relating to domestic gas. We recognise the importance of their work in the case of gas leaks and the risk of fire and explosion. The current provision, however, represents a significant gap in relation to possible CO poisoning situations.

When attending a callout, the emergency services do not carry CO detection equipment or flue gas analysers. There are legitimate reasons as to why this occurs, notably:

- current requirements placed on providers by supplier licenses effectively limit each visit to 30 minutes: there is considerable dispute as to whether this would provide enough time, or enough average time, to carry out a CO investigation, where indicated, if an efficient methodology were applied
- when the emergency services receive a call, the member of the public is advised to switch off all gas appliances and ventilate the property, with the result that any residual CO is likely to have dissipated by the time the emergency services arrive, making detection in a limited time frame even more difficult and arguably a practical impossibility
- emergency service operatives are not currently trained to use CO detection equipment: training and additional time at callouts to carry CO investigations would mean more staff, additional training and increased cost
- it is not easy to develop a robust protocol to identify situations where there may be a particular need for the emergency services to carry out further investigations with regard to a CO danger
- the use of FGAs appears particularly impractical and may in any event not detect CO from untested sources, whether in the house or outside

While recognising that there are significant barriers to emergency service providers identifying situations which could represent a risk of CO poisoning, current arrangements can potentially leave a dangerous situation unaddressed: for example, even if all the appliances within an apartment are switched off by the emergency service, dangerous levels of CO could still be leaking in from a neighbouring property. While evidence is limited, we are aware of one situation analogous to this which has led to a fatality. Ideas for improvement could include:

- as a minimum householders should be given a leaflet explaining the risks of CO poisoning, how it is caused, and some contact information
- some basic observations eg frequency of servicing, soot deposits, open flued appliances could help identify risk
- relatively inexpensive CO detection equipment could be left, or even sold
- some discretion about further action in specific situations according to a protocol

Further positive discussion is needed to determine how to improve safety.

3.3.2 [Landlord gas safety check](#)

Mandatory annual gas safety checks and production of a safety certificate to demonstrate that this has been carried out, have encouraged more landlords to consider the gas appliances in their properties in terms of safety: in consequence, poisoning incidents in multiple occupancy properties appear to have reduced. Despite this success, the scheme also has its critics. While landlords are required by law to have a valid Gas Safety Certificate, they are not required to undertake an annual service. Stakeholders report that there is a risk that the safety check may be seen by landlords and tenants as a substitute for regular servicing, which it is not. We also heard credible stories about forged certificates. At the other end of the spectrum, there are complaints that the regulatory burden of this system is high and, given the confusion about what it stands for, not cost effective. There is therefore merit in a review of the landlord safety certificate.

3.3.3 [Gas appliance documentation](#)

Manufacturer documentation distributed with gas appliances (for example the user manual or packaging) does not contain safety information relating to the potential hazard of CO. Manufacturers may be reluctant to do this because they do not want to create a perception of gas as an unsafe fuel, or of their product as an unsafe device. However, if manufacturers were to adopt a coordinated approach, a valuable opportunity to raise awareness could be created at a crucial time, helping to ensure that a properly qualified engineer carries out the installation of the appliance. Furthermore, if proactively implemented, it would allow the industry to claim a public relations success by placing public safety at the heart of its approach.

4 Gas Installer Competence

4.1 Demonstrating and assessing competency

The current regime seeks to ensure that operatives are competent to carry out gas work safely. Minimum requirements to work as a registered installer include:

- the need to pass an assessment every 5 years to check a range of basic gas safety competencies (the ACS scheme)
- ACS modules of competency for a range of different applications, reflected in a range of CORGI registrations
- prequalification for entry to an ACS assessment is normally required in the form of a qualification and/or portfolio of experience
- a portfolio of installations: a newly registered installer, with no recognised experience, needs to build this by working for a fully registered CORGI member

CORGI regularly inspect installers work to offer advice and check competency application in the field. The Gas Works Notification Scheme (GWN) has recently been introduced to facilitate random inspections. Worryingly, inspections under this system have shown significantly higher levels of error.

These problems are presumably due to lack of competence and/or deliberate cutting of corners: the regulatory regime needs to address both possibilities.

4.2 The ACS scheme

The ACS scheme has been running for over five years, and is a very robust system supported by UKAS Certification. Although the concept of ACS attracts support and is credited with raising standards within the industry, in practice the current ACS scheme and associated registration systems are widely seen by installers as being too onerous and inflexible, and may well discourage registration. Further, while it aims to raise and standardise knowledge of how to operate competently, random inspections indicate that this knowledge is not always applied in the field: it has been suggested that this may be due in part to a competency approach which may encourage individuals to learn by rote rather than develop generic and transferable skills.

The ACS scheme is under constant review by the ACS *Review Committee* and the recently created *Industry Liaison Group (ILG)*. The ACS *Review Committee* has made many amendments to ACS since it was first created – with many installers unlikely to be aware of the changes as they are only now due to undertake their second cycle of ACS – and while some of the concerns that expressed during the *Review* are outdated, there remain many valid criticisms. ACS may have an important role to play in future regulation of domestic gas safety but if it is to be fit for purpose it is in need of further revision.

4.3 The future of ACS

The alternatives discussed at the second stakeholder forum are included in appendix 1. There was agreement that the ACS approach to competence should be retained, but streamlined and modified.

Changes to ACS need to be made hand in hand with changes to the registration scheme, with the relevant body/bodies ensuring that registration criteria also reflect the new approach.

To successfully deliver an appropriate ACS scheme, key considerations should include:

4.3.1 Mechanism for change

A strong, independent voice is required to challenge the assessment system and standards for ACS certification. Steps within the industry to address this should be encouraged and accelerated – a process that has begun to occur through the ACS *Review Committee* and the *Industry Liaison Group (ILG)*. The introduction of the ILG should afford industry a significant role in refining the ACS scheme.

4.3.2 Risk based approach

Incorporating a risk-based approach into the ACS reassessment process – in line with the *Better Regulation Agenda* – presents an opportunity to reduce the burden on installers who consistently work to a high standard without compromising safety. Risk could be assessed through several information streams which could include:

- inspection
- complaints
- CPD
- ACS results
- training portfolio
- company quality system
- compliance with GWN

An installer who continuously scores well on some or all of these could be viewed as low risk, and “rewarded”, for example, by:

- reduced assessment requirements in terms timing and content, perhaps targeting changes on standards, or work of a type rarely carried out
- reduced inspections
- reduced registration fees

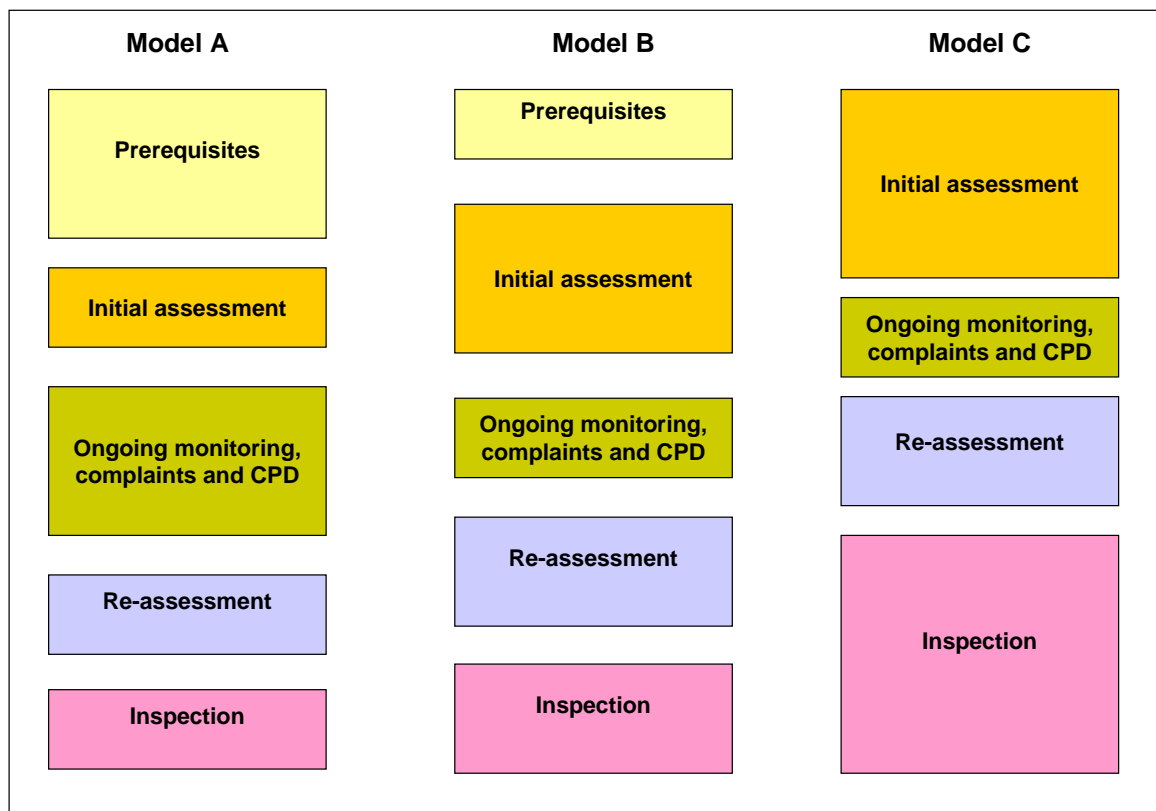
The converse would apply to individuals who performed less well and were therefore higher risk. Additional sanctions could include compulsory training following a poor inspection of work. This would deliver a very focused incentive for installers to work safely, and be up to date with standards.

This approach could also take account of a company's internal CPD and quality assurance regimes. For example, large companies with stringent internal quality assurance and CPD could submit their internal processes for inspection along with a random portion of operatives, as opposed to their entire installer workforce.

4.3.3 Flexible assessment and entry requirements

The current system can be viewed as very onerous for registered installers, and may be unnecessarily rigorous and repetitive. The risk-based approach outlined above could be extended to give more flexible ongoing assessment and entry requirements. This would allow individuals to use a blend of demonstrable experience, skills, qualifications and assessment to prove their competence. This could permit currently registered installers to tailor their demonstration of competency to suit their individual circumstances. For new entrants, it could help ensure that the industry continues to benefit from young persons working to become registered installers, and offer potential to encourage more illegal installers to join the registration scheme, thus promoting public safety.

The chart below shows how various elements could be given different weightings to demonstrate competency in different circumstances:



Model A could apply to a very experienced installer with full qualifications, who takes part in in-house continuing professional development (CPD), has a clean history of random inspections through the GWN scheme and no complaints: he could be offered reduced reassessment and external inspection. Model C might apply to an individual with little in the way of recognised experience or qualifications: he would need an extensive initial assessment and much more regular reassessment and formal inspection. Other variants might cover increased assessment for an installer who does not use gas works notification. The table below expands on these ideas, but it should be emphasised that this is purely an illustrative example: the industry will want to work through these concepts in greater detail.

	Model A	Model B	Model C
Prerequisites	Level 4 qualified installer with significant current experience	ACS Category 1 experienced gas fitting operative	No suitable prerequisites, completed some training
Initial assessment	Reduced assessment, say practical alone	Assess as now	Increased assessment covering elements expected in prerequisites
Monitoring, complaints and continuing professional development	Full work notification history without problems and ongoing in-house training and assessment monitored by a third party accredited CB	Work notification and inspections show no problems	Problem areas identified through inspection and work notification
Re-assessment	Reduced re-assessment	Reassess as now	Increased or early reassessment, perhaps re-do initial assessment
Inspection	Least amount of inspection, say every 3 rd year	Assessment as now, typically 18 months to 2 years	Increase to annual inspection

Such variation and flexibility should still be acceptable to accreditation bodies as it would be evidence based. At the same time it would satisfy the intention to vary statutory inspection according to the level of compliance (the Hampton Review). It would allow choice for the wide range of company types such that while a large employer would find it cost effective to run an in-house training and assessment programme under the supervision of a third party, while a sole trader might find it easier to notify work and pay for an off-site assessment perhaps every fifth year.

4.3.4 Reduced generic ACS modules

Currently there are 48 ACS modules that relate to domestic gas, representing an overly complicated structure that is confusing. The ILG and Review Committee should work together to identify and reduce duplication and limit the number of modules that currently comprise ACS. The current system is also inaccessible to the public, who may be expected to check not only an installer is registered but that they also have the necessary ACS qualifications to carry out the work. Clearly, this has very little chance of success with the current number of modules.

Simplifying the current system would clarify for installers the modules they need to obtain to work safely and legally, while reducing the potential for installers to mistakenly work 'out of scope'. This will also assist installers to become more discerning buyers of training as they can clearly identify the modules they require – and associated training – reducing the potential to be hard-sold training as part of the assessment process.

Finally, but importantly, each remaining module should be made more generic, so that an installer is encouraged to understand the implications and concepts behind the standards he is working to, thus reducing the potential to learn enough to get through an ACS assessment, but have problems when faced with variation in a customer's home. This could potentially have very positive safety implications and may in part address the poor performance identified in recent random inspections.

4.3.5 Fit for purpose

It is important that the ACS tests an installer's ability to work safely and is not simply an exercise in 'jumping through hoops'. Regularly reviewing the contents of the ACS will remain important to ensure that the process:

- takes account of changes in technology
- tests installer's knowledge of issues that are identified as presenting a challenge to industry, eg: faults that are commonly found by inspectors or those that are likely to have a negative impact on public safety
- assesses an individual on both their knowledge of competence and their ability to apply that knowledge in their day to day work

4.4 The gas works notification scheme

GNW has clearly proved its worth in uncovering significant variations in competency at random inspection. However, the numbers of installations and installers covered by GWN, while rising, has only reached around 50%. Given the importance of the system in checking safe working, ways to encourage its use must be found. These could include:

- there was, at best, limited consultation with industry prior to the introduction of GWN: the methodology should be reviewed in partnership with installers to make it more acceptable (eg should the installer certify his work direct with the customer and send a copy of the paperwork to the registration body (in direct contrast to how the system currently operates))
- review charges to installers for using GWN: in principle, the overall registration package should be cheaper for those who use GWN, not the reverse!
- “rewards” for installers who use GWN, particularly if they demonstrate consistently high standards of work, for example by reducing the number of times they are inspected, ACS requirements or registration fee
- impose penalties, financial burdens or additional competency requirements for installers who do not use GWN
- while not yet much apparent, in England there are potentially some advantages in GWN also serving the purpose of notification to local authority building control and these could be maximised

In short, the introduction of random inspection does offer significant potential to improve standards across the industry and add to a risk based approach: but only if GWN is more widely used. It will be difficult to address poor quality found through a GWN random inspection if all this does is to discourage further notification. Therefore, GWN needs to be strongly promoted through a system of rewards and disincentives which should be introduced as soon as possible, following industry consultation.

5 Illegal Installers

5.1 Current situation

Unregistered installers were identified by many stakeholders as one of the biggest challenges facing the industry. Informal estimates of the number of illegal installers currently operating in the UK vary wildly between 15-20% and 40-50%. Illegal installers presumably represent an increased risk to public safety since they are not subject to assessment, inspection and training. The current system of regulation is perceived to place a disproportionately high burden on registered installers while having relatively low impact on illegal installers. The high cost of compliance coupled with a perceived lack of enforcement has the potential to destabilise the current system with installers deciding not to go through the complexities of ACS and registration. Further, a registration brand that is seen as a recognised mark of quality, which the CORGI brand arguably is, represents a business asset built up with some commitment. Consequently, many installers see the apparent lack of enforcement as undermining their business.

While the law with regard to unregistered installers appears clear – they are acting illegally if they charge for their work – it does not support a significantly increased number of successful prosecutions, despite the apparent prevalence of illegal activity. This may be due to:

- limited formal enforcement by HSE: prosecution is undertaken in line with the Health and Safety Commission (HSC) policy and is only used in particular circumstances: although HSE do follow a policy of taking other, less serious action, such as issuing a warning, where complaints are received
- limited opportunities or will to enforce from other bodies such as trading standards and local authorities
- no facility for enforcement by other agencies such as CORGI
- courts being unconvinced that non-registration should have serious consequences
- difficulty in identifying individuals and linking them with a particular piece of work

The current registration system may be seen as virtually inaccessible to experienced illegal installers who would like to join. The requirement to present a portfolio of work to demonstrate competence is a particular barrier as work carried out illegally cannot be submitted. As a result, the illegal installer would have to 'buddy' with a registered installer for a period of around six months to develop the required portfolio of experience. This could drastically reduce earning potential at a time when significant additional costs are being accrued (ie ACS). There is also a perceived disincentive for legal installers to work with illegal installers in this way, in part because they may be assisting a future competitor.

5.2 The way forward

A range of options were explored to support reducing the number of non-registered installers, and we have concluded that there is no one answer. Instead, progress should be made through a variety of ‘carrots’ and ‘sticks’, including:

- higher public awareness of CO hazard and prevention will ensure more demand for registered installers, while squeezing the market for illegal installers
- targeted episodes of prosecution from HSE, using current resources in a different way to maximise impact (the “Bristol pilot” has delivered benefits through such an approach)
- strengthen efforts to publicise prosecutions and other enforcement activity, including through registration scheme newsletters
- further exploration by HSE of alternative or additional penalty systems, and a possible increased role for the registration scheme
- a less rigid approach to registration and assessment, which still promotes a high level of competence while attracting more installers
- efforts to raise penalties administered by the courts on these health and safety offences and encourage consideration of alternative sentencing which might serve as a greater deterrent, eg community service

5.3 Other initiatives

During the course of the review, a number of interesting alternative initiatives were discussed. The section below explains why we do not recommend pursuing these at this time.

5.3.1 Fixed penalty notices

The *Review* considered the potential for a fixed penalty scheme to impact on illegal installers. Current advice suggests that there is limited potential to delegate a fixed penalty scheme to a third party, and it seems unlikely that this could be achieved without recourse to primary legislation.

The potential for fixed penalty notices to have a significant impact upon illegal installers is far from clear. One of the biggest problems is that fixed penalty notices have had greatest impact in areas where an independent official observes an offence taking place (eg a traffic warden observes a car as illegally parked, or a police officer or speed camera observe a motorist speeding). Illegal installers do not operate in the public realm – they commit their offence in private dwellings – and so it will remain very difficult to establish sufficient evidence to ensure that a fixed penalty would stand up to appeal in court (the right to appeal is a requirement of EU human rights legislation).

However, it is worth HSE further exploring the potential of a fixed penalty scheme as a means of taking action against illegal installers.

5.3.2 Control at the point of sale

Many participants in the *Review* suggested control of the sale of appliances at the point of sale. Control at the point of sale would include either:

- restricting the sale of gas appliances and fittings to registered installers; or
- notification of the sale of all gas appliances to the registration body to ensure that they were fitted by a legal and registered operative (similar to TV licensing)

The benefit of point of sale control is clearly that it becomes difficult for illegal installers and DIY enthusiasts to get access to any gas appliances, at least without follow up from HSE or a registration body. This appears an attractive proposition.

Following further investigation, however, significant problems with this model emerged. Firstly, restricting the sale of appliances would probably breach European Competition Legislation. Legal advice suggests that if introduced now, the UK TV licensing system would also breach European law on the same grounds: it does not do so because the legislation was not retroactive, and therefore control at the point of sale measures that predate the legislation are exempt. Secondly, in the unlikely event that legal barriers are overcome, such a scheme would presumably require significant additional resources both to police and set up. This would include demands on retailers and would presumably be resisted. Finally, where would we draw the line? The growth of e-trade would make it difficult to police the sale of goods online (eg via eBay), while it could be argued that not only appliances but trade spare parts should also be covered. For these reasons we do not recommend that attempts are made to restrict access at the point of sale.

5.3.3 Local authority licensing

We thoroughly explored the potential for local authority licensing to govern the number of illegal installers. Under this model, gas installers would be required to register with their local authority to carry out any work. Installers would only be required to register once, with the local authority in the area where they live, but could work in any local authority. The main advantage associated with this model would be to allow easier prosecution of illegal installers since the only offence which would need to be demonstrated would be the lack of a local authority license. Supporters of this approach pointed out that local authority inspectors access a significant number of premises during the course of their daily work, and could be well placed to spot illegal installers.

On further investigation there appear to be a number of problems with this model:

- most local authorities are not enthusiastic about taking on further enforcement, and would certainly want a transfer of resources in order to promote this
- it would represent 'double registration' for installers, who would have to register with both the local authority and registration body: although we considered removing the registration scheme this attracted limited support from stakeholders

5.3.4 Public liability insurance

Throughout our work, we considered the potential of public liability insurance (PLI) to improve domestic gas safety. We considered the potential of PLI to result in an increase in prosecution for illegal or incompetent installers, before concluding that this would not result in increased enforcement beyond what already exists under the Gas Installation and User Regulations. Legal opinion indicated that a regulation regime that requires membership of a single provider (in this instance CORGI) could not require members to hold PLI.

If competition is introduced into the registration framework, PLI could offer reactive benefits in relation to domestic gas safety, for example by providing compensation for victims after an incident has occurred.

6 Legislative Framework and Standards

6.1 Overview

The legislation dealing with domestic piped gas and LPG – The Gas Safety (Installation and Use) Regulations 1998 – would benefit from some changes, especially:

- simplification: some of the current legislation appears, in practice, to be redundant, or a duplication, and it is therefore more confusing than it needs to be
- the clear and unambiguous use of a goal-setting approach, which recognises an industry code of practice to define specific standards relating to technical issues of installation and servicing, rather than setting these out in law: this would promote changes in line with technology and practice, address some ambiguity with regard to the competence of foreign workers, and could provide greater clarity about compliance standards
- rationalisation of prescriptive clauses, in support of an industry code of practice
- if the above were in place, a “Haynes workshop manual” approach to standards could more readily occur, potentially making installation and servicing easier to understand, and therefore safer
- more minor issues relating to non-process factory gas appliances

6.2 Standard setting

Standard setting with regards to technical installation and servicing within the industry generally works well, with a small number of partners (e.g. the Institution of Gas Engineers and Managers) working closely to approve and release standards. There is further consultation with ACS providers and other stakeholders, who may comment on practicalities, with regard to training for instance.

There could, however, be improvements to the ad hoc way in which standards are published for use. Currently, they are released as soon as they are completed, and while in some instances this may be necessary or desirable, it is uncoordinated, driving continual change of the ACS process and leading to confusion in the industry. If released in a more controlled way, in batches, with established common comment dates, perhaps twice annually unless there is good reason for more immediate distribution, it could be easier for all stakeholders to keep up to date. Such a system could minimise uncertainty about when a change becomes compulsory in installation or only advisory for training purposes. Further, this could be an opportunity to release associated standards at the same time, removing problems that may occur when the implications of one change in practice have not been worked through.

The concept of a *standards board*, such as that used in the rail and other industries, was supported, provided that this could be designed from within existing standard setting structures without additional resources. There are relatively few bodies responsible for the release of standards, and establishing a standards board to group releases and establish common commencement dates could be relatively cheap and cost neutral.

6.3 Industry code of practice

While much of the current legislation does not lay down specific technical standards, this is not the case throughout, giving a somewhat uneasy mix of goal setting and prescriptive approaches. While some industry stakeholders were happy to see particular technical elements specified in law, others, particularly installers and some manufacturers, offered the view that some of the prescriptive elements of the legislative framework constrain response to technological advances that can potentially offer safety improvements. We were given specific examples of technological change that HSE experts advised us were safe, but could not be implemented due to specific elements of the current legislation.

There was widespread support for adopting a goal setting approach to regulation that is supported by a flexible Industry Code of Practice (ICoP). This would see legislation changed to specify the recognition of an ICoP as the set of relevant technical standards that installers should follow. Prescriptive elements of the legislation could be removed. This would offer the significant advantages of facilitating technological advances (and possible safety improvements) and begin the process of transferring increasing levels of responsibility for regulation to industry, in line with government policy.

Installers reported that they did not always have ready access to standards and that these were complex. There is significant scope for regulatory simplification with ICoP standards set out in the form of a “Haynes Workshop Manual” to ensure that they are accessible. Standards should also focus on communicating to installers how they should change their working practices, and avoid making reference to other documents or British Standards that then have to be purchased for a fee.

6.4 Legislative complexity

Current legislation relating to domestic gas safety can be difficult for newcomers to the industry to understand and apply – a situation that is compounded by the mix of goal setting and prescriptive regulations – although we would suggest that many experienced installers generally find their way through relevant sections without any problems. While there are undoubted benefits to be had from simplifying current legislation, to make it more accessible, less confusing for industry, and more risk based, this is not necessarily an immediate priority.

Ensuring that the legislative framework is efficient and effective is in line with the *Better Regulation Agenda* but, as with other initiatives suggested in this report, change can be managed as part of a two-stage process where some progress can be achieved while waiting for legislative change, which may be slow in coming, given competition for parliamentary time and the further complexities of EU competition legislation. However, legislative change is needed if the benefits of an ICoP are to be delivered, and the chance to simplify the GSIUR should be seized at the same time.

6.5 Additional legislation

There is a degree of concern that there are public health and safety issues that sit outside the current legislative regime. If these matters are not resolved through other means, and legislation is planned to deliver regulatory simplification, it may be worth considering including some of the following additional initiatives:

- the imposition of a levy to fund CO awareness: ideally voluntary collaboration would be a better, and faster, way to address industry fund raising, but if this does not materialise, legislation should be enacted to address this (primary legislation may be required)
- the use of CO detection equipment by the gas emergency services: this should only be necessary if informed debate fails to improve the current position
- there is some minor ambiguity around the governance affecting non process gas appliances in factories: this has not apparently caused any discernable problems in practice but any legislative changes to GIUSR could offer the opportunity of addressing this

The merits of each of these initiatives is discussed elsewhere in our report, but are cited here as examples of a two stage approach to driving change. The first stage would seek to address issues on a voluntary basis; failing that it could be necessary to resort to prescriptive legislation. We suggest that, ideally, this should not be necessary: not only will there be competition for parliamentary time, but the direction of travel suggested in this report is away from prescription towards goal setting. However, the overriding concern must be to establish a comprehensive public awareness campaign about the CO hazard.

7 Framework Options

7.1 Challenges in the current regime

Along with other enablers – notably improvements in technology – the current regime has been instrumental in reducing fatalities and protecting public safety in the wake of privatisation. However the existing regime is coming under increasing pressure, and can be viewed as very robust in contrast to other industries and increasingly out of step with the government's *Better Regulation* principles.

Many other trades are coming under the governance of Competent Persons schemes, a much simpler regime than that operated for domestic gas. These offer choice to the tradesman and there is a single body to interface with for both registration and competency assessment.

Installers in particular are expressing dismay at the cost of compliance (particularly for small businesses) aggravated by a perceived lack of enforcement activity on illegal competitors. While it is in the nature of industry to complain about regulatory bodies, it is our view that there is substance in some of these concerns and that they could have a negative effect on gas safety if they drive destabilisation of the current regulatory regime.

CORGI has attracted criticism because of its commercial interests. We have heard arguments that the CORGI brand is a monopoly, legitimised by the state, funded by installers, then used to make commercial profit and compete against other industry players, potentially unfairly. CORGI Commercial started out by diversifying into areas which would assist installers, but has now gone beyond this boundary. There are additional concerns about cross subsidisation: CORGI operate Chinese walls between the commercial arm and the registration scheme, but arguably have inbuilt competitive advantages, notably a fully funded brand, ready access to the market place and the only competent persons scheme able to operate a one stop shop in registering gas works with building control.

Without in any way suggesting current impropriety, we have governance and probity concerns about the existing arrangements. These are at CORGI's discretion and have the potential to lead to poor decision making about gas safety and registration, particularly if the commercial arm of the business becomes more important. Further, there appears to us to be a potential lack of transparency about the current arrangements, given that the registration scheme is intended to operate on a non-profit basis.

It should be recognised that this situation has emerged at least in part as a result of the hands-off approach from HSE with regard to the Concordat between HSE and CORGI. Some of the current arrangements are arguably in breach of the concordat under which CORGI operate, although, importantly, HSE has not raised objections. The short term nature of the 'concordat' (12 month rolling contract) represents a high business risk to CORGI, which has, understandably, been offset by the development of a contingency fund from the surplus generated by the registration scheme.

While the CORGI brand appears to be well recognised and should be a significant asset, it is arguably not successful in promoting domestic gas safety: it is not linked with CO awareness, nor does it convince sufficient numbers of customers to buy from a CORGI registered installer. Customers have not been persuaded to check that their gas engineer has a CORGI identify card, never mind the scope of the specialist work he is licensed to undertake. There is some criticism that CORGI are confusing customers about the meaning of the brand by diversifying into other fields.

A number of installers told us that more illegals would register if they had options other than CORGI, and, although offering such choice has inherent risks, it is an indication of a level of antagonism towards CORGI that is perhaps higher than might naturally be expected from the regulated towards the regulator. Dissatisfaction with the current regime identified in this report may in part reflect increased motivation for dissatisfied stakeholders to engage with the *Review*: there may be a silent majority of installers who are satisfied with the current regime and therefore felt no need to contribute their views. Indeed, we note that during recent consultation by HSE over an application to run a rival gas registration scheme a significant proportion of those who responded were in favour of CORGI and a single registration scheme.

Current legislation appears to allow for more than one registration body to be appointed, at HSE's discretion. It is our view that other organisations have the competency, skills, infrastructure and ambition to become a registration body and, if no action is taken to clarify the position, a body other than CORGI will eventually submit a competent application as a registration body. If competition becomes a reality in such an ad hoc manner, this will raise questions about how multiple registration bodies would be managed and the affect on public safety.

HSE are seeking to reduce investment and resources allocated to domestic gas safety in line with their strategic priorities, namely focusing on health and safety in the workplace.

7.2 Alternative options

Our recommendations on the future of the registration scheme were directly informed by our work with stakeholders. Initially, a set of framework options were developed by one of the work groups, before being refined and shared with a wide range of stakeholders for further discussion and feedback. The vigorous ensuing debate included consideration of competitive tendering, competition, competent person schemes, an 'adapted' status quo and the potential benefits or drawbacks of a single or multiple registration bodies.

The full range of options is included as appendix 4. We rejected at an early stage:

- the status quo, where the level of tension brings a risk that it will become unviable
- regular re-tendering for a single registration body, which could lose the key benefit of the CORGI brand, while disruption during any handover to another body could be excessive
- franchising the CORGI brand, since it looks unlikely that terms could be agreed between franchiser and franchisee

We explored in more detail:

- retaining the concept of registration, and separate ACS providers, albeit with a streamlined regime, but recognise **multiple registration bodies**
- replacing the idea of a registration body with a low-regulation approach allied to **competent persons**, where multiple bodies provide what is, in effect, a registration scheme and ACS in one
- **retaining CORGI as a single registration** body, along with the CORGI brand, but streamline the way the system works and build on CORGI's role as an industry champion: this would only be feasible if there are some significant changes in the way that both CORGI and HSE operate

Multiple registration bodies could run in the current framework alongside CORGI, provided by organisations with similar core competencies, notably: the ability to manage a database of installers: inspect installations: access to widespread gas technical knowledge and expertise: a broad geographic base: probity and management structures: complaints processing: financial viability.

An initial assessment suggests that there are other industry bodies that could deliver this, especially if in partnership with external organisations with broader infrastructure. There would be early opportunities to make some changes in the current arrangements without legislation, for instance, giving a longer commitment to all registration schemes would be essential if they are to be financially viable, and would reduce their need to acquire a large contingency fund in case of exit.

Multiple registration bodies could have a number of benefits, including:

- driving innovation and efficiency
- attracting more installers and thus reducing safety risks
- giving installers more “one stop shop” alternatives when registering building work
- giving HSE more options and leverage over individual registration bodies
- addressing concerns about competition
- being cost neutral to installers, provided certain assumptions are met
- potentially increasing public CO awareness as new players invest in publicity

- potentially offering other choices for consumers, such as a full quality assurance approach (CORGI only deals with complaints about gas competency), or a scheme where public liability insurance is mandatory (current legislation will not accept this from a single compulsory scheme)

There would be problems to overcome, specifically:

- database links and compatibility
- consistency of registration approach
- public confusion over brands
- competition could drive registration bodies to deliver only specified services, withdrawing from some value added activities
- additional complexity
- more options for fraudulent registration
- HSE monitoring, which would involve more organisations but could potentially be more straightforward if a robust and open KPI process were used
- geographical spread
- equity of arrangements between registration bodies
- financial risk if the new registration body fails to attract enough customers across a range of installers

We see no fundamental reason why multiple registration schemes could not work well, and deliver a safe environment for consumers. The difficulties outlined above could be overcome, and the resulting regulatory framework not only helps to pragmatically address a number of immediate concerns, but is also much more in keeping with current approaches than is a monopoly provider.

Indeed, following the final stakeholder forum we were contacted by several organisations who felt that one of the key obstacles to introducing competition – namely tracking installers across registration schemes – could be readily overcome by establishing a Principle Registration Body (PRB). The PRB could consist of members of the current CORGI council (along with others who may be relevant) and sit above the different registration bodies. It would be supported by an independent secretariat – funded by the registration bodies – who would maintain and host a website and database of ‘Registered Approved Gas Installers’ (on behalf of HSE). Certification bodies would directly notify the secretariat of successful ACS candidates, who would only make details visible on the website after one of the approved registration bodies has notified them that the candidate has registered with them.

Competent persons schemes are in their infancy, but are being suggested as the way forward for accreditation of building trades, sponsored by the Department for Communities and Local Government, and could be regarded as the “minimum regulation” option. If we were to set up a similar approach for domestic gas using existing GSIUR legislation, it would be obligatory to join a scheme, but there would be choice, and the body providing competent persons accreditation could, in reality or in effect, act as a registration and assessment body, potentially easing the burden on individual installers.

This could:

- have similar benefits to those outlined above for multiple registration bodies
- give an easier option, in due course, for a fully functioning system to pass from HSE to the remit of Department for Communities and Local Government, integrated into the approach taken for other trades
- give a framework which would allow further streamlining of the regulation regime for individual installers
- bring gas installation more in line with other trades

Problems could include:

- as above for multiple registration bodies
- ensuring a fit with regimes in Northern Ireland, Scotland and Wales, although this does appear achievable
- processes which would ensure the independence of training, assessment and registration
- restructuring of existing systems and organisations to align registration, inspection and competency assessment
- the additional one-off costs that would inevitably be associated with this disruption
- uncertainty around the success of the competent persons concept

This option potentially gives a good fit for the future, but is higher risk in terms of the unproven nature of competent persons schemes and gives greater short-term disruption for sectors of the industry. These issues would need to be managed to ensure that they do not translate into an added short-term safety risk for consumers.

Retaining CORGI as a single registration body has a number of advantages, of which probably the most significant are:

- public brand recognition
- consistency of approach to installers
- a single point of reference for queries
- a tried and tested system
- a single database of all installers
- spare capacity for additional industry activities
- excellent technical support and advice
- the potential for commercial profit to be reinvested in gas safety
- the potential for CORGI to act as a focus for the industry
- minimum short term disruption

Disadvantages could include:

- concerns about probity and governance
- uncertainty over commitment to delivering the changes outlined in this paper
- criticism over ‘unfair competition’
- lost opportunities to drive innovation and attract additional installers
- limited leverage for HSE in applying the concordat
- problems with applications from other potential registration bodies

At the final stakeholder workshop participants were asked to consider four options⁶ for future delivery of the registration scheme based on the ideas outlined above, and developed in association with stakeholders throughout the *Review*:

- option 1: retain CORGI as a single registration body, along with the CORGI brand, while streamlining the way the system works and continuing the evolution of CORGI’s changed approach while building on its role as an industry champion
- option 2: subject to consultation, develop proposals for a revised framework agreement between HSE and one or more registration bodies, and invite expressions of interest (which could be measured against a range of performance criteria). This could take place every 5/10 years and the body or bodies that best fulfilled the performance criteria would be recognised for that period
- option 3: retain separate registration and ACS providers in a streamlined system, but recognise multiple registration bodies
- option 4: replace the idea of a registration body with a low-regulation approach allied to competent persons, where multiple bodies provide, in effect, a registration scheme and ACS in one

Developing a revised framework agreement between HSE and one or more registration bodies appeared to be the favoured option amongst stakeholders. Retaining CORGI as a single registration body with a revised remit also attracted significant support, coupled with concern as to how a change in approach could be secured and sustained. There was far less enthusiasm from stakeholders for options 3 and 4.

⁶ Full details for each option is included in Appendix 1: *Options Presented at Final Stakeholder Workshop*. A summary of the outcome of the second workshop may be downloaded from: (Removed)

7.3 Conclusions and recommendations

7.3.1 Registration framework

There is considerable debate as to whether one or more registration bodies should be recognised: we conclude that there are advantages and drawbacks to either approach, none of which is of overriding priority or cannot be managed. While it is important that there is only one registration *scheme*, providing the system is properly set up and regulated, it could be administered by more than one registration *provider*.

There is therefore no clear answer as to whether the benefits of retaining CORGI, albeit on a different footing, are outweighed by the advantages of multiple registration bodies. If CORGI remains the only registration body, it is essential that a number of changes are made to reflect issues raised in this report. If this cannot be achieved, either now or in the future, our assessment is that the industry should move to include alternative registration providers.

The question is therefore how we identify a process to deliver these aims, both in the short and longer term. The approach identified needs to be robust and independent of change in personnel over time. We therefore recommend that:

- HSE invite expressions of interest from appropriately qualified organisations that wish to take on the role of a registration body
- an assessment of competency should be made by an HSE panel against a number of criteria: organisations satisfying the panel would be recognised as registration bodies for a reasonable period, perhaps 5 years.
- if the case made by one body were considerably stronger than the others, or offered substantial additional benefits, the panel may decide to recognise only one registration provider
- re-tendering should occur at regular intervals, perhaps normally every 5 years
- transparent monitoring should take place every 3/6 months and the results published

7.3.2 Criteria

We recommend that HSE invite expressions of interest from appropriately qualified organisations that wish to take on the role of a registration body. Throughout our *Review* several organisations have informally expressed an interest in doing so should the regulations allow. An assessment of competency should be made by an HSE panel against a number of criteria that may include:

- delivery of key issues outlined in this report, especially co-ordinating action to promote CO awareness and changes to competency and registration systems
- a business case to demonstrate how the registration scheme will be funded without additional cost to installers
- an improvement in key safety issues

- ability to work with stakeholders and other registration bodies
- innovative approaches and added value
- probity and transparency in governance, especially with regard to conflict of interest, commercial enterprise, interface with HSE
- delivery of key aspects of the registration scheme, eg geographic cover, installer and public help lines, managing complaints
- a consumer voice

Organisations satisfying the panel would be recognised as registration bodies for a reasonable period, perhaps 5 years. If the case made by one body were considerably stronger than the others, or offered substantial additional benefits, the panel may decide to recognise only one registration provider.

This is a process akin to that used nowadays in most substantial procurements. We have attached an appendix (appendix 5) giving more details about the process that could be followed.

Registration bodies should be subject to regular and transparent reviews of performance against key performance indicators, which should reflect the criteria outlined in the tendering exercise. There should be a recognised process for identifying the need for improvements in performance, for following this through and an agreed process in case of an unresolved dispute between HSE and a registration body.

7.3.3 Retendering

We recommend that this registration body review be repeated at regular intervals determined from time to time by HSE: perhaps every 5 years in normal circumstances, allowing the drivers and direction of the registration body/bodies to be revised and updated, yet giving a level of consistency and ability to recover investment through a minimum period of tenure. HSE could retain the ability to re-tender more regularly in certain circumstances, for example in the case of an unresolved dispute with a registration body.

Whatever the short-term decision regarding one or more registration providers, we recommend that HSE retain a framework that allows the appointment of more than one registration body. This would:

- give HSE ongoing leverage over performance
- ensure that there are alternatives should there be problems with a particular registration provider
- prevent a situation arising where there is a threat to safety during hand over at the end of a five year term between sole registration providers

8 Concluding Remarks

Despite the current tensions in the system, those involved in the domestic gas industry can be proud of improvements in its safety record over the last decade and the comparatively low level of reported incidents. It is generally accepted, however, that there is a need to move on from this base:

- to secure improvements in public awareness of CO poisoning and its causes: there is evidence that this risk may well be higher than previously reported
- to review the registration and competency framework for installers, to make it best fit for purpose

The most significant improvement to public safety can be delivered by implementing a properly resourced, targeted and focused public CO awareness campaign, built around a limited number of core safety messages eg the importance of annual servicing, and installing and maintaining an approved CO alarm. This will require a coordinating body to ensure a consistent message, best use of resources and opportunities. Ideally, the industry could take the lead not only in coordinating but in funding the campaign, and being seen as a caring industry that places consumer safety at the heart of what it does. However, if industry fails to take the lead, there may be a need to recourse to legislation.

This paper suggests several changes in the registration and competency framework, most notable a process that supports a regular re-tendering of the registration body, and a streamlining of the ACS system.

Finally, we would like to thank the many stakeholders who contributed to the *Review*, all of whom gave freely both their time and expertise to support further improvements in domestic gas safety.

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